



City of Sandy

Agenda

City Council Meeting

Meeting Date: Monday, March 1, 2021

Meeting Time: 7:00 PM

Page

1. MEETING FORMAT NOTICE

The City Council will conduct this meeting electronically using the Zoom video conference platform. Members of the public may listen, view, and/or participate in this meeting using Zoom. Using Zoom is free of charge. See the instructions below:

- To login to the electronic meeting online using your computer, click this link: <https://us02web.zoom.us/j/88971465056>
- If you would rather access the meeting via telephone, dial (253) 215-8782. When prompted, enter the following meeting number: 889 7146 5056
- If you do not have access to a computer or telephone and would like to take part in the meeting, please contact City Hall by Friday February 26 and arrangements will be made to facilitate your participation.

2. PLEDGE OF ALLEGIANCE

3. ROLL CALL

4. CHANGES TO THE AGENDA

5. PUBLIC COMMENT

Please note: the public testimony period for The Views is now closed.

The Council welcomes your comments on other topics at this time. Please see the instructions below:

- If you are participating online, click the "raise hand" button and wait to be recognized.
- If you are participating via telephone, dial *9 to "raise your hand" and wait to be recognized.

6. RESPONSE TO PREVIOUS PUBLIC COMMENTS

7. CONSENT AGENDA

- 7.1. **City Council Minutes** 3 - 11
[City Council - 16 Feb 2021 - Minutes - Pdf](#)

8. OLD BUSINESS

- 8.1. **Contract for Construction Manager / General Contractor Services** 12 - 419
[Staff Report, Proposal, Contract, and RFP](#)
- 8.2. **PUBLIC HEARING (continued): The Views** 420 - 1319
- Public testimony period has closed
- [Staff Report Update - 3.1.21](#)
[Staff Presentation Slides Update - 3.1.21](#)
[City Council Questions with Staff Responses](#)
[City Council Questions with Applicant Responses](#)
[Staff Report 2.16.2021](#)
[Updated Exhibit List](#)
[Applicant Submittals - \(EXHIBITS A - I\)](#)
[Applicant Submittals - \(EXHIBITS J - R\)](#)
[Agency Comments \(EXHIBITS S - AA\)](#)
[Additional Documents from Staff \(EXHIBITS BB-HH\)](#)
[Additional Submission Items from the Applicant \(EXHIBITS II- TT\)](#)
[Public Comments \(EXHIBITS UU-ZZZ\)](#)
[Public Comments After Agenda Publication \(before 5PM 2.16.20\) \(EXHIBITS AAAA- MMMM\)](#)
[Additional Exhibits \(EXHIBITS NNNN - RRRR\)](#)
[Additional Council Questions - \(EXHIBIT SSSS\)](#)

9. REPORT FROM THE CITY MANAGER

10. COMMITTEE /COUNCIL REPORTS

11. STAFF UPDATES

- 11.1. [Monthly Reports](#)

12. ADJOURN



MINUTES
City Council Meeting
Tuesday, February 16, 2021 6:00 PM

COUNCIL PRESENT: Stan Pulliam, Mayor, Jeremy Pietzold, Council President, Laurie Smallwood, Councilor, Richard Sheldon, Councilor, Kathleen Walker, Councilor, Carl Exner, Councilor, and Don Hokanson, Councilor

COUNCIL ABSENT:

STAFF PRESENT: Jordan Wheeler, City Manager, Jeff Aprati, City Recorder, Ernie Roberts, Police Chief, Kelly O'Neill, Development Services Director, Shelley Denison, Associate Planner, Greg Brewster, IT/SandyNet Director, and Tyler Deems, Deputy City Manager / Finance Director

MEDIA PRESENT: Sandy Post

1. MEETING FORMAT NOTE

The City Council conducted this meeting electronically using the Zoom video conference platform. A video recording of the meeting is available on the City's YouTube channel: https://www.youtube.com/channel/UCbYEclgC6VW_mV2UJGyYfg

2. CITY COUNCIL WORK SESSION - 6:00 PM

2.1. Public Meetings / Ethics / Land Use Hearings Training

Staff Report - 0377

Chris Crean, attorney with Beery, Elsner and Hammond, LLP (the firm retained by the City to provide City Attorney services), delivered a training presentation on public meetings, ethics, and land use hearing requirements under state law. He provided several reference materials that were included in the agenda packet. Particular focus was given to quasi-judicial land use procedures, in which the Council must act as a judge applying the law without bias.

Additional issues discussed included:

- Actual vs. potential conflicts of interest
- Land use application deadlines and review criteria
- Public meetings requirements
- Public records requirements

3. CITY COUNCIL REGULAR MEETING - 7:00 PM

4. Pledge of Allegiance

5. Roll Call

6. Changes to the Agenda

7. Public Comment

Linda Malone, 17740 Bluff Rd.: suggested that the Council authorize free rides on SAM during severe weather events.

8. Response to Previous Public Comments

The **City Manager** noted that this will be a recurring item on agendas going forward, with the goal of providing a regular time to respond to previous questions from the public that need more time to research. He reiterated a response to a public comment from the last meeting about the Public Safety Fee. He also noted that the City Manager Report can be used to respond to items raised by Councilors that do not result in items being added to the agenda.

9. Presentation

9.1. **Audit Presentation - Fiscal Year Ended June 30, 2020**

Staff Report - 0374

Tonya Moffitt with Marina and Co. presented the findings from the City's most recent audit. The audit included no findings. Links to the complete published audit documents were included in the agenda packet.

10. Consent Agenda

10.1. **City Council Minutes** - February 1, 2021

10.2. **Renewal of Oregon Public Works Emergency Response Cooperative Agreement**

Staff Report - 0373

Moved by Carl Exner, seconded by Richard Sheldon

Approve the Consent Agenda.

CARRIED. 7-0

Ayes: Stan Pulliam, Jeremy Pietzold, Laurie Smallwood,

Richard Sheldon, Kathleen Walker, Carl Exner, and Don
Hokanson

11. Old Business

11.1. Planning Commission Appointment

Staff Report - 0376

The **City Manager** summarized the staff report.

The Council discussed the relative merits of the three candidacies related to factors including temperament, views on growth and development, freshness of perspective, knowledge and experience, trust and honesty, and consistency with recent electoral movements.

The Council also discussed concerns raised about the fairness of the recruitment and interview process, and particularly whether applicants should be provided with interview questions in advance. It was noted that Jan Lee had recently participated on a Planning Commission interview panel as a Councilor. The consensus of the Council was that interview questions should be updated with each recruitment process and distributed in advance to interviewees in the future.

Moved by Kathleen Walker

Reopen the recruitment process for a new round of applications and interviews.

(motion not seconded)

Moved by Laurie Smallwood, seconded by Carl Exner

Appoint Jan Lee to Planning Commission Seat 4, as recommended by a majority of the interview panel.

CARRIED. 4-3

Ayes: Stan Pulliam, Jeremy Pietzold, Laurie Smallwood, and
Carl Exner

Nays: Richard Sheldon, Kathleen Walker, and Don Hokanson

11.2. PUBLIC HEARING: The Views Planned Development

Land Use File: 20-028 The Views SUB TREE FSH PD

Staff Report - 0375

Abstentions: none

Conflicts of Interest:

- **Councilor Exner** noted that he is a realtor, but cannot predict whether he may ever have business involvement in any developed properties.

Ex Parte Contact:

- **Councilor Exner** visited the site.
- **Mayor Pulliam** declined to discuss the matter with those who tried to engage with him.
- **Councilor Walker** visited the site with members of the tree committee in late 2019 or early 2020. She discussed the matter with the Parks and Trails Advisory Committee; those meeting minutes are in the record. She talked with a member of the public about concerns about an apartment building beyond her backyard. All of these interactions took place before her election. She listened to the Planning Commission meetings in November and December.
- **Councilor Sheldon** visited the site. He viewed Planning Commission meetings on the matter before his election.

Challenges to the Hearing Body: none

Staff Report:

The **Associate Planner** and **Development Services Director** delivered the staff report, which was included in the agenda packet. Councilors asked clarifying questions about the staff presentation on topics including open space and walking paths, homeowners' association maintenance and liability, and review criteria for planned developments.

Applicant Presentation:

Mac Even and Michael Robinson delivered the applicant presentation. They expressed their intention to create an inclusive development that benefits the community, and provided additional clarification regarding sidewalk construction, attached garages, and the homeowners' association. Mr. Robinson suggested the planned development would provide more amenities than a traditional subdivision, such as a dog park, basketball court, and open space. He asserted that the application meets a majority of the intent statements in the relevant code chapter. He stated that the traffic impacts of

the development would not result in unsafe conditions. He indicated that their proposal has been amended to respond to concerns raised by neighbors, including view impacts.

Public Testimony:

In Favor:

- Cassidy Moore, 1912 SW 6th Ave, Portland: will be graduating from college soon and believes the proposed development would be a great place to live. Urged the Council to look past the idea that these would simply be apartments in someone's back yard.
- Kristina Molina, 40304 Therese St: has lived in Sandy for many years, and is an agent. Has many clients who want to live in Sandy, but few homes are available at affordable prices for new homebuyers. Praised the proposed amenities.
- Buzz Ortiz, 41525 SE Vista Loop: Has lived in Sandy for many years, and believes this is a well planned development that would enhance the community. Suggested the alternative would be worse.

Opposed:

- Makoto Lane, 37828 Rachel Drive: suggested the applicant's attorney is exploiting loopholes in the code, and that planned developments simply supersede the regular code. Suggested this could be similar to the Bailey Meadows situation. Suggested too many variances are being requested. Urged that the city suspend the planned development section of the code until it can be amended.
- Greg Becker, 14585 Bluff Rd: opposed to variances from the development code. Concerned about public safety related to traffic, especially without a traffic light. Asked whether the Department of State Lands has been notified of wetlands on the property.
- John Andrade, 18509 Ortiz St: expressed concern related to small lot sizes and skepticism related to the viability of the homeowners' association. Stated that the basketball court and dog park would attract non-residents. Suggested that the development would be too similar to Gresham.
- Lisa Hull, 18265 SE Vista View Ct: concurred with Mr. Andrade. Asked about the length of the meandering sidewalk. Suggested that property values in the area would be negatively affected and views would be obstructed. Suggested lowering speed limits in the area, and raised concerns about the right turn lane.
- Randy Olson, 18515 Ortiz St: expressed disagreement with statements made by those expressing agreement with the proposal. Expressed

- concern about traffic impacts and safety in the 55 mph area.
- John Barmettler, 41613 SE Vista Loop Dr: expressed surprise that a planned development would be allowed in this area. Stated that the proposed amenities do not justify adding the development. Stated that the units would be placed too closely together. Stated that the amenities would attract non-residents. Stated concern about emergency services accessing the area. Expressed opposition to the proposed apartments and extension of Knapp St.
- Sue Gabriel, 19300 SE Longstreet Lane: longtime resident, reiterated traffic concerns and the difficulty of turning onto the highway safely. Raised safety concerns for pedestrians and cyclists. Reiterated concerns regarding impacts to wildlife in the area. Urged against granting variances to the code.

Staff Recap and Recommendation:

Staff stated that planned developments are a common tool with trade offs that need to be weighed, and that variances are allowed under the existing code. Staff suggested that some homebuyers may have interest in small homes on small lots, and stated that the traffic analysis was reviewed and confirmed by multiple independent parties. Staff questioned whether the Intent portion of the code chapter can be used as review criteria. Staff stated that the safety of the intersection of Hwy 26 and Vista Loop Drive will be specifically studied as part of the TSP update project, but that ODOT declined to pay for a speed zone study as part of the TSP.

Applicant Rebuttal:

The applicant's attorney, Mr. Robinson, asserted that the Intent portion of the code chapter can be used as review criteria, and that they meet the majority of them. He spoke in defense of what occurred during the Bailey Meadows development process. He stated planned developments are common tools and the two requested variances are justified and desirable for the community. He stated that the reviewing agencies do not object to the proposal, and that Mr. Even is trying to do the right thing. Mr. Even stated the meandering pathway would extend the length of the property, and that he is the one paying Mr. Robinson. He stated they would protect all the wetlands on the property. He questioned why ODOT previously wanted the right turn lane removed. He thanked everyone. The applicant waived final written argument.

Council Discussion:

Several Councilors indicated they have a number of additional questions about the development. Staff and Council inquired as to whether the applicant would be willing to extend the 120-day deadline, which is due to expire on March 1st, to allow questions to be addressed adequately. Mr. Robinson stated the applicant is willing to extend the 120-day clock to March 15th; when asked for a longer extension, he declined.

The Council chose to continue the hearing at its meeting on March 1, 2021. The hearing will resume at the stage at which the Council can still ask questions of staff and the applicant, but with the public testimony period concluded. The Council indicated their intention to forward their questions in writing to staff to allow staff and/or the applicant to prepare responses in advance of March 1st.

Moved by Don Hokanson, seconded by Laurie Smallwood

Continue the public hearing at a future meeting and submit questions to staff in advance to allow time to prepare responses.

CARRIED. 6-1

Ayes: Stan Pulliam, Jeremy Pietzold, Laurie Smallwood,
Kathleen Walker, Carl Exner, and Don Hokanson

Nays: Richard Sheldon

Moved by Carl Exner, seconded by Kathleen Walker

Close the public testimony period.

CARRIED. 7-0

Ayes: Stan Pulliam, Jeremy Pietzold, Laurie Smallwood,
Richard Sheldon, Kathleen Walker, Carl Exner, and Don
Hokanson

Moved by Don Hokanson, seconded by Jeremy Pietzold

Designate March 1st as the date to continue the public hearing.

CARRIED. 7-0

Ayes: Stan Pulliam, Jeremy Pietzold, Laurie Smallwood,
Richard Sheldon, Kathleen Walker, Carl Exner, and Don
Hokanson

12. New Business

13. Report from the City Manager

The **City Manager** summarized the next steps for the goal setting process, and suggested adding additional meetings in the coming months. He asked whether the Council would like to take a formal position on possible changes to Vehicle Registration Fee funding distribution. The consensus of the Council was to take no formal position. He recapped the City response to the recent winter storm.

14. Committee /Council Reports

Councilor Sheldon asked about reopening City facilities to the public. The City Manager referred to plans to open access to the Library on March 1.

Councilor Exner praised public works and SandyNet staff.

Councilor Walker referred to pending state legislation regarding homelessness. She stressed the importance of transparent meeting agendas and minutes.

Councilor Hokanson asked about when new committees could begin their work, and the Mayor encouraged him, as Chair, to begin at his discretion.

Councilor Smallwood referred to the recent Parks and Trails meeting. She urged that individual Council Members should refrain from advocating before the Legislature without the concurrence of the rest of the Council.

Council President Pietzold thanked staff, and suggested updating a list of local residents able to provide assistance during major storm events.

Mayor Pulliam thanked staff, and stressed the importance of agreeing on a legislative advocacy agenda. The Council discussed rules and expectations regarding representing Council positions with other governmental bodies.

15. Staff updates

15.1. [Monthly Reports](#)

16. Adjourn

Mayor, Stan Pulliam

City Council
February 16, 2021

City Recorder, Jeff Aprati

Draft



Staff Report

Meeting Date: March 1, 2021

From Mike Walker, Public Works Director

SUBJECT: Construction Manager/General Contractor for Existing Wastewater Treatment Plant Condition Assessment Improvements

BACKGROUND:

The City solicited proposals for Construction Manager/General Contractor (CM/GC) Services for the existing wastewater treatment plant condition assessment improvements project on January 22nd. In addition to the solicitation advertisement City, Leeway Engineering and West-Yost staff reached out to contractors that specialize in this type of work and have performed well on projects for the City in the past. We conducted a site walk-through at the plant on February 3rd with attendance by representatives from six firms.

Proposals were due Tuesday, February 16th. We received one proposal from Slayden Constructors, Inc. (Slayden) of Stayton, OR.

Staff with the City, Veolia, West-Yost and Leeway Engineering reviewed the sole proposal and contacted Slayden's references on similar projects from the City of Tillamook, Clackamas County WES and City of Lebanon. Slayden's preconstruction cost (about \$40K) and CM/GC fee (6.5%) were very competitive. The proposal was independently scored by the evaluation team. The consensus of the evaluation team was to recommend award of the contract to Slayden Constructors, Inc.

Slayden has performed work at or constructed numerous water and wastewater facilities in Oregon, Washington and Northern California for over 30 years. Slayden constructed our existing wastewater treatment plant in 1997 and expanded the City's Alder Creek water treatment plant in 2002. We have always been pleased with their work. Their higher profile projects include the Sellwood Bridge replacement and the Tri-Cities WWTP MBR facility in Oregon City that the Council toured in 2019.

As stated previously, one of the primary advantages of the CM/GC delivery method is speed. This project is on a very tight schedule and by involving the CM/GC early on in the process they are able to contribute their knowledge and experience in the design process to avoid surprises later on in the project. The tight schedule may have contributed to the fact that we only received one proposal. Fortunately, a CM/GC with Slayden's background has expertise working on an operating treatment plant where all processes must be maintained during construction.

A CM/GC contract allows the City to negotiate a Guaranteed Maximum Price (GMP) for the various work packages associated with the project. The CM/GC contract also allows the City and our consultants to require the CM/GC to competitively bid any or all of the GMP packages if we cannot agree on a negotiated GMP. The CM/GC process fixes the contractor's fee at the amount disclosed in the proposal (6.5%) and all work is 'open book' so the Owner can review materials, equipment, subcontractor and other costs at any point in the process. Council approval of the final GMP is required before the contractor can proceed to construction. Due to the amount of oversight the City has on a CM/GC contract, the competitively set fee (6.5%), and the contractor's experience and positive references, City staff recommend moving forward with an award to Slayden.

BUDGETARY IMPACT:

The project will be funded by our Clean Water State Revolving Fund (SRF) loan from the Department of Environmental Quality, the proceeds from which are included in the current biennial budget. The pre-construction fee is \$39,457 and the CM/GC fee is 6.5%. The Council will have the opportunity to review the price proposals for the project and various work packages before the Guaranteed Maximum Price is finalized and the start of construction.

RECOMMENDATION:

Authorize the City Manager to enter into a Construction Manager/General Contractor agreement with Slayden Constructors, Inc. subject to City Attorney review of the contract.

SUGGESTED MOTION:

I move to authorize the City Manager to enter into a Construction Manager/General Contractor agreement with Slayden Constructors, Inc. for the Wastewater Treatment Plant Condition Assessment Improvements project subject to City Attorney review of the contract.

LIST OF ATTACHMENTS/EXHIBITS:

CM/GC Proposal - Slayden Constructors, Inc.
CM/GC RFP and contract



REQUEST FOR QUALIFICATION

CM/GC SERVICES FOR THE
Sandy Wastewater Treatment Plant
Condition Assessment Improvements

February 16, 2021

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COVER
LETTER



February 16, 2021

Mike Walker
Director of Public Works
39250 Pioneer Blvd.
Sandy, OR 97055

Re: Sandy Wastewater Treatment Plant Condition Assessment Improvements Project

Dear Mr. Walker and Representatives of the City of Sandy, Oregon,

Slayden Constructors, Inc. (Slayden) understands that the Sandy Wastewater Treatment Plant Condition Assessment Improvements Project is key to providing environmental permit compliance, worker safety, and ease of operations for your community. This project will be made even more complex given your tight schedule, the required maintenance of operations of the facility during construction, and the City of Sandy's (the City) budget. Slayden, a corporation based in Oregon, has been building water and wastewater facilities in the Pacific Northwest since 1984. We have completed over 30 alternative delivery projects with a total value of over \$815M, and can walk you through the process of constructing under a CM/GC so that your plant is built to the best quality and value possible. Our team, comprised of Project Manager Josh Bergseng, Cost Estimating Lead Erik Brahmer, Superintendent Jerry Lawrence, and their support staff, is committed to the execution of your project.

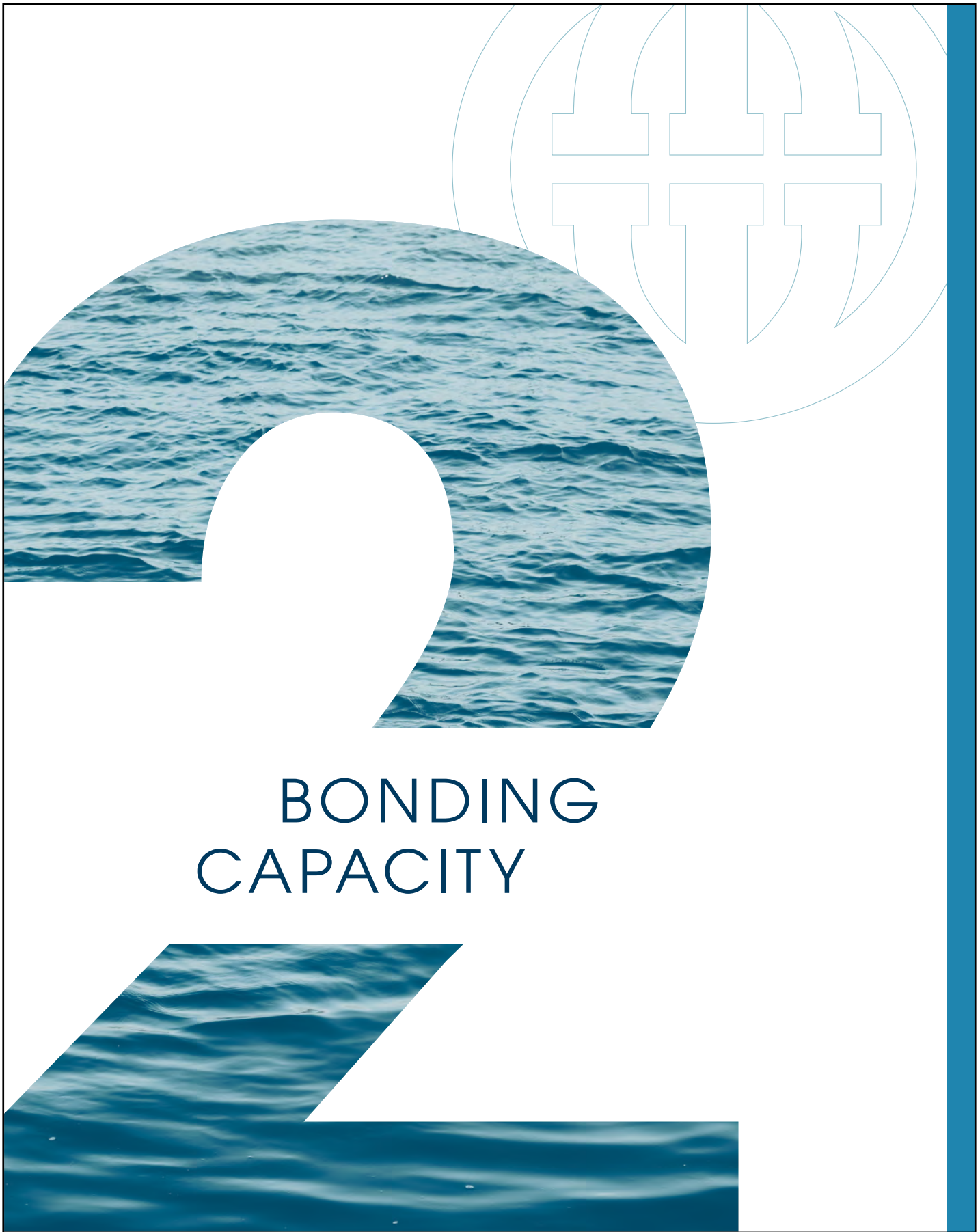
- **CM/GC Preconstruction Process** – Collaboration is the key to success. Through a series of value engineering and constructability workshops, Slayden will work with the City and Engineer to create a high-value end product. We will search for ways to improve efficiencies within the design to save you money and improve the overall capability of the plant. Because preconstruction is such an important part of an alternative delivery project, we have an entire department dedicated to it. They will ensure value through collaboration, engage in value engineering and innovative constructability reviews, and provide scheduling and estimates.
- **Schedule Management** – The City has indicated that you have a very short timeline to complete this project. Because Slayden's core work is constructing treatment plants, we have the experience to develop accurate schedules to meet your milestones. We have experience working with multiple GMPs – our recent work at Geren Island had eleven GMPs and the Riverside Park Water Reclamation Facility in Spokane has seven. Although executing multiple GMPs can be tricky, we are well-versed in the process and are happy to help you accelerate your schedule using this method so that our field crews hit the ground running and don't stop until completion.
- **Working in an Operational Facility** – Impacts to existing operations are not acceptable. We understand that your facility must continue to operate through construction, and Slayden has extensive experience working at operational facilities. We are able to navigate your site without impeding normal processes. At the same time, we have a vast array of resources that can be made available on demand. We are happy to conduct repairs or maintenance should the need arise.

As President of Slayden, I am authorized to represent our company in any negotiations or sign any contracts. I would like to thank the City of Sandy for providing this opportunity for Slayden and considering us for this project. We look forward to working with you and giving you the successful project you deserve.

Regards,

Jeffrey A. Garner
President
Slayden Constructors, Inc.

Slayden Constructors, Inc.
RFP Contact - Jeff Garner
jeff.garner@mwhconstructors.com
PO Box 247, Stayton, OR 97383
Cell: 802.598.6818
Office: 971.277.5643
OR CCB No. 208848



BONDING CAPACITY

02. BONDING CAPACITY

Slayden has a total bonding capacity of \$1,000,000,000, and can meet the \$3,000,000 bonding requirement for this project. Our bonding capacity letter from our insurance carrier is in the *Appendix*. Our current and 2021 backlog is below:

	Current	Anticipated in 2021
Backlog	\$76,686,400	\$90,000,000
Bonding Capacity	\$1,000,000,000	\$1,000,000,000
% of Bonding Capacity	8%	9%

Slayden had an aggregate construction cash flow of \$81,810,000 in 2020. Our anticipated construction cash flow for 2021 is \$76,686,944. With the addition of the Sandy Wastewater Treatment Plant project, we would expect the 2021 number to rise to \$79,686,944.

Success Story:

Kellogg Creek WWTP Improvements, Milwaukie, OR



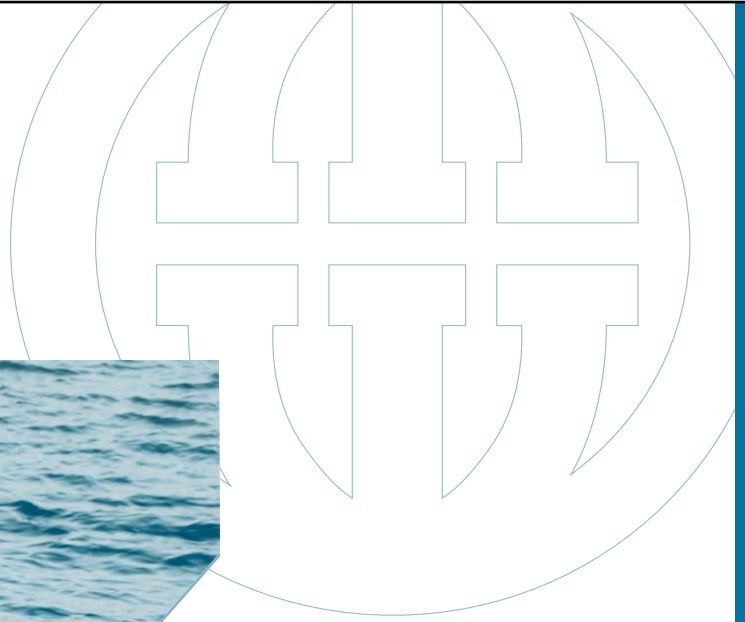
Josh Bergseng is the project manager for the Kellogg Creek Wastewater Improvement project. This plant currently treats wastewater for 77,000 residents. Over the years the equipment has aged and the pipelines have corroded and sprung leaks. Improvements provided vital upgrades and increased storage capacity for the facility.

Extensive renovations were required to reclaim lost hydraulic capacity, provide reliability for the treatment facility, and reduce noise, odor, and energy usage. The plant remained in operation during construction, requiring close coordination with on-site staff to minimize impacts to operations. The Slayden team also had a small footprint to work within and the site was located next to a park with heavy local traffic which further complicated construction logistics.

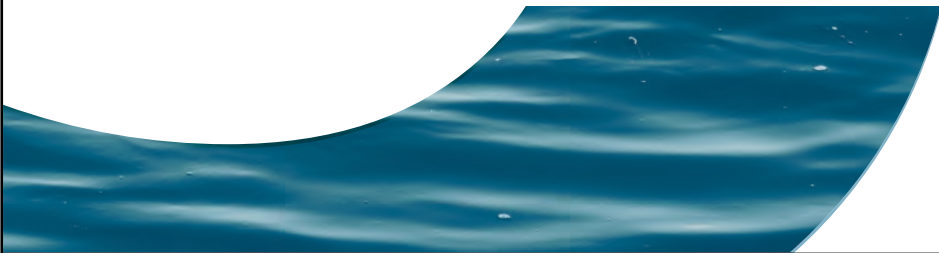
Because this project required extensive electrical upgrades, Slayden felt it was important to get the electrical sub on board during the preconstruction phase. We developed an innovative procurement strategy to enable competition prior to design completion. The request for proposal utilized a competitive indicative pricing and scoring system and ensured the best value to the project.

Project Highlights

- ✓ CM/GC Wastewater Project
- ✓ Josh Bergseng – PM
Erik Brahmer – Lead Estimator
- ✓ Operational plant
- ✓ 65% self-performed
- ✓ Electrical and HVAC Upgrades
- ✓ Use of BIM Modeling
- ✓ VE savings and scope reduction saved \$3.8M at 60% design



EXPERIENCE AND PERFORMANCE



03. EXPERIENCE AND PERFORMANCE

A. FIRM PROFILE

A LEADER IN WATER AND WASTEWATER SINCE 1984

Since 1984, Slayden has been a leading civil general contractor focused on delivering on the needs of our clients. Situated in the beautiful state of Oregon, we specialize in providing preconstruction and construction services for water and wastewater treatment as well as environmental construction including river enhancements, parks, fish facilities (hatcheries/ladders/transfer stations), and dam modifications. We are experts in our field, managing projects from less than \$10K to \$200M. In the 37 years we have been in business, we have established **a strong reputation within our markets by executing complex projects on time, within budget, and while maintaining environmental compliance.**



The Slayden team values a collaborative work environment, not only with our clients but also within our organization. Together we achieve far more than we ever could apart, building on each other's strengths and challenging each other to find areas of growth. Our people truly matter, and we strive to bring this same philosophy to each project.

ALTERNATIVE DELIVERY EXPERTS

Approximately 80% of our work is alternative delivery – we have fine-tuned our preconstruction practices to produce projects exceptional in quality and value while encouraging Designer and Owner collaboration every step of the way. We have an entire department dedicated to preconstruction, to make sure that every facet of your project is thought out from day one.

The Preconstruction Services Department is highly experienced and knows exactly what information they need from the project team to produce effective deliverables in a short span of time. **Our preconstruction team provides accurate estimates, real-time value engineering solutions, schedules that maintain the critical path, and risk mitigation logs that clearly disseminate cost, impacts, and ownership.** They work with site staff to ensure a clear information transfer during the transition from preconstruction to construction. This allows our site management team to keep doing what they do best – construct the project within budget and on time.

SELF-PERFORMING ON 100% OF OUR PROJECTS

Our ability to pinpoint value savings comes from self-performing the critical path of every project we build. **We perform site civil, yard piping, structural concrete, metals, process and mechanical piping, plumbing, and equipment setting on every project.** We plan on performing these same services on the City's project.

THE RIGHT TEAM TO KEEP YOUR SCHEDULE LEAN

Meeting your aggressive schedule will require dedication and commitment from the project team. We have several projects winding down which will provide management, craft labor, and construction equipment for this project. We can **utilize our resources flexibly to keep costs low, production up, and remain on schedule.** As a treatment plant contractor, our crews are experienced in this type of work and will keep the plant operational at all times.

EXPERIENCE IN MULTIPLE GMPs

Creating and executing multiple GMPs in a project can streamline your schedule significantly, but it requires a team who is experienced in how to schedule and implement multiple phases. Our team includes **experts in managing multiple GMP packages** who understand the critical nature of clear communication when creating scope and pricing.

Overlapping Preconstruction and Construction – Scheduling Success

During initial preconstruction of the Geren Island project, our team broke the original scope into eleven separate GMP packages. Through effective collaboration with the Owner and Designer we were able to:

- Overlap preconstruction and construction, giving earlier GMPs a head start to proceed
- Ensure scheduling and design package scope were met through close collaboration with Designer
- Focus effort on the critical path
- Procure long lead equipment early

B. SPECIALIZED EXPERTISE

Slayden understands water and wastewater projects. We have been building water and wastewater treatment plants in the Pacific Northwest for decades, and are a leader in alternative delivery methods including CM/GC and Progressive-Design-Build. We have led 30 alternative delivery projects with a combined total of \$815M, including projects with electrical, instrumentation, HVAC, and control systems. 20 of those were specifically CM/GC. We have extensive experience working in operational plants, and manage our work to minimize disruptions. Additionally, we have worked with CWSRF funded projects and are able to help guide you through the paperwork. Slayden can self-perform nearly all work and proposes to self-perform the following: civil work, yard piping, structural concrete, metals, process and mechanical piping, plumbing, and equipment setting.

Representative List of Projects

Project Name & Contact Info	Description	Delivery Method	Original / Completed Budget	# Change Orders	On Time	Muni WWTP	WWTP E&I	HVAC I&C	Operating Facility	CWSRF Funded	Direct Solicitation
Washougal WWTP Rob Charles Dep. Director/City Engineer 360.835.2662 ext. 230 rob.charles@cityofwashougal.us	Construction of IPS, flow distribution system, orbal aerator, UV effluent PS, process piping, yard piping, expansion of electrical distribution system, and demolition.	DBB	Original: \$ 12,168,984 Complete: \$ 12,719,186	12	yes	✓	✓	✓	✓		✓
Kellogg Creek WPCP Josh Clark Operations 971.804.5792 jclark2@clackamas.us	Modifications to existing facilities including, RS pumps, RAS/WAS, blower, flow control gate, ABs, electrical upgrades. 2 GMPs. 98% complete and forecast to finish \$900K under budget.	CM/GC	Original: \$ 18,560,759 Projected: \$ 17,660,000	0	on-going	✓	✓	✓	✓		✓
Lebanon WTP Ron Whitlatch Engineering Services Director 541.258.4918 rwhitlatch@ci.lebanon	New WTP with extensive mechanical piping, chemical systems, interconnections, process equipment, and yard piping. Increase in contract value due to Owner added scope.	CM/GC	Original: \$ 26,398,170 Complete: \$ 28,202,635	42	yes		✓	✓		✓	✓
Oak Lodge Solids Piping Project Haakon Ogbeide Project Manager 971.413.0301 haakon@olwsd.org	Installation of RAS pump, modifications to mechanical piping, and valves. 1 change order for emergency work.	DBB	Original: \$ 218,000 Complete: \$ 290,000	1	yes	✓	✓		✓		✓
Tillamook Lift Station Upgrade Steve Fladstol Project Manager 503.812.2880 sfladstol@tillamook.com	Installation of effluent pump building, pumps, associated mechanical piping, and valves.	DBB	Original: \$ 237,921 Complete: \$ 237,921	0	yes		✓	✓	✓		✓



2020 ROSE Award Winner

Slayden was a first place winner of the 2020 Rose Award, Utility Infrastructure Division. This award was bestowed for safety excellence by the American General Contractors (AGC), Oregon-Columbia Chapter. It recognizes chapter leaders who demonstrate safety excellence in the Pacific Northwest.

C. HISTORY OF PERFORMANCE, CLAIMS, AND DISPUTES

FINANCIAL STRENGTH

Slayden has the financial strength and capability to complete the Sandy Wastewater Treatment Plant. We have established a reputation in the Pacific Northwest for executing large complex projects on time and within budget. We are a strong and viable company. Our revenue for the last three years is below:

2020: \$81,810,000

2019: \$95,000,000

2018: \$83,500,000

Our business license number for the City of Sandy is #3734 and we will comply with any Transit Payroll Tax Requirements.

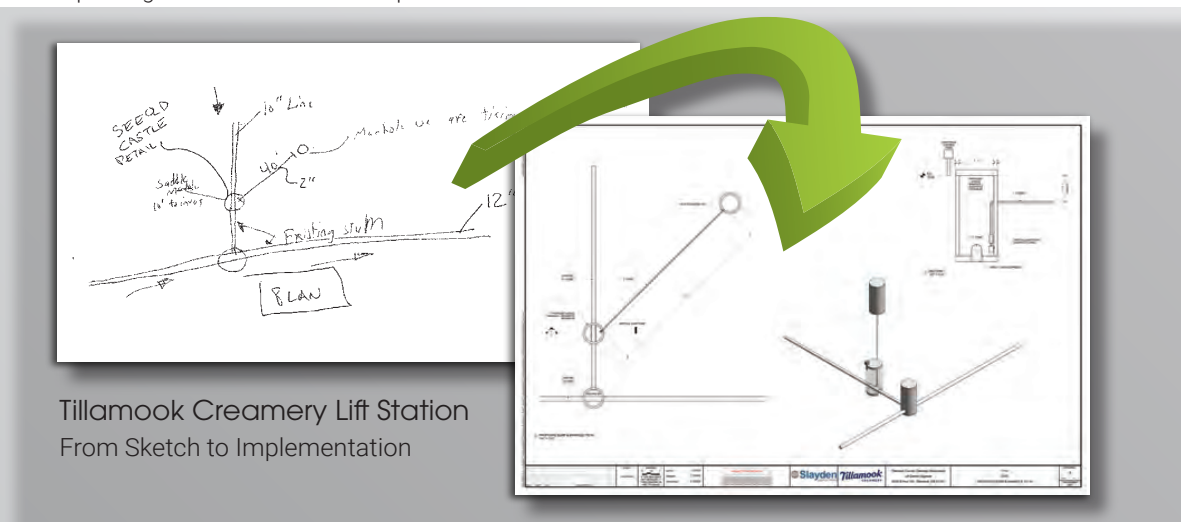
CLAIMS & DISPUTE MITIGATION

We do not have any current, pending, or completed project related litigation. Our approach to claims and disputes is simple – never have one. Of course, accomplishing this is a little more complicated and

requires a total focus on avoidance and mitigation instead of building a claim. We take a very proactive approach in the management of projects by finding potential issues before work begins. This allows a mitigation strategy to be developed and implemented in advance to minimize issues. When issues do occur we always put a focus on what is best for the project. This project first mentality requires transparency as soon as a problem is encountered, allowing both the Owner and Designer input to help solve the problem.

SLAYDEN'S SAFETY RECORD

Safety is our number one priority. This is a deeply held belief at Slayden and we are dedicated to keeping everyone involved in your project out of harm's way. This means setting clear expectations regarding health and safety requirements and encouraging every level of staff to take ownership. Our commitment to safety is exemplified by our EMR rating. **Slayden's EMR rating is .86, significantly below industry standard.** We can also confirm that we have **not had an OSHA violation in the past 24 months.**



BRINGING VALUE THROUGH DIGITAL DELIVERY

Due to the fast-paced nature of this project we do not expect to receive 100% design documents until after the project begins. On alternative delivery projects with short construction windows, many times drawings will be more like sketches than actual design documents. In these cases, the use of Building Information Modeling (BIM) can be beneficial. Slayden has an efficient digital delivery department that we can utilize as needed. We have learned that it is often more efficient for the contractor to develop only the minimum drawings necessary to expedite the procurement process. **Our BIM department can quickly convert an idea to a model that provides clear communication of concept, utilization for submittals and materials release, and visualization for construction.** For example, if we are given a P&ID and a verbal description of how pipe is to travel from one area to another, we can quickly generate a 3D drawing which can then be utilized to develop shop drawings for the pipe procurement as well as the pipe supports.

Our virtual construction department is not a profit center, but a support department which allows designers to focus on the process while Slayden focuses on the means of achieving your project goals. As you did not specifically request that the cost for digital delivery be included in our preconstruction services estimate, it is not incorporated into our cost proposal at this time. However, we would love to discuss this versatile option with you if we are selected as your CM/GC.

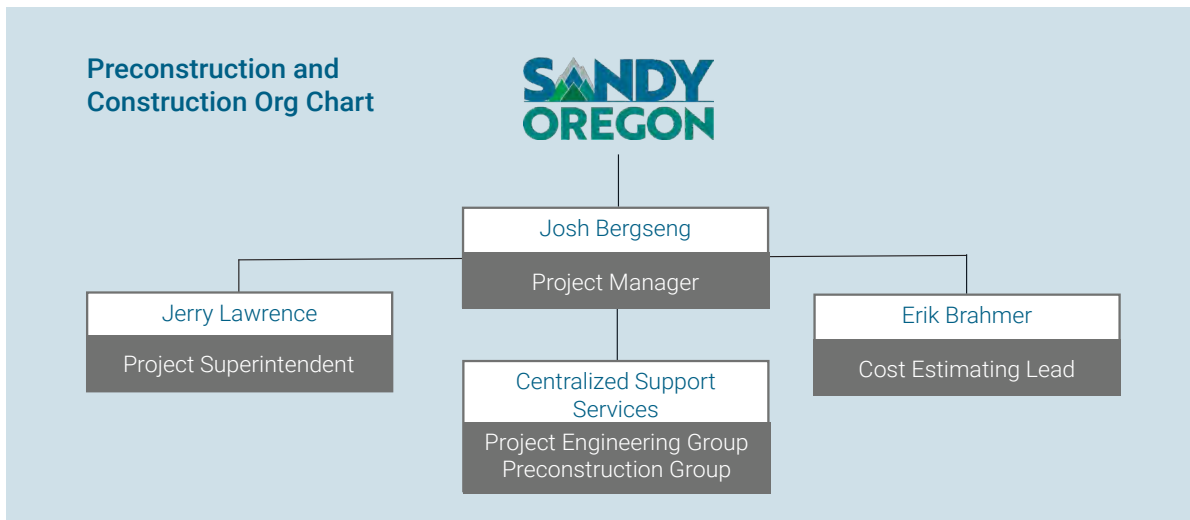


PROJECT
TEAM

04. PROJECT TEAM

A. ORGANIZATION CHART

Our team has a diverse background in CM/GC that supports creative and disciplined preconstruction activities. We also have the construction experience to ensure a successful project. Our key individuals are committed from preconstruction through construction. This approach will foster continuity by allowing the team to transition into construction operations without the risk of losing valuable information gained during the preconstruction phase.



Our Superintendent Jerry Lawrence will also oversee all self-perform activities. Slayden self-performs critical path items including civil, structural concrete, metals, mechanical piping, process equipment setting, and plumbing, and we self-perform 50% or more on almost every project.

As a specialist in treatment plant construction, Slayden has an extensive database of specialty subcontractors qualified to work on treatment plants. The page limit does not allow us to list all of them, however our key subcontractor for this project will be electrical. We have had great experiences with Christenson Electric, Team Electric, and Tice Electric, all of whom would be considered candidates for this project.

Name	Proposed Role	Level of Commitment	Roles & Responsibilities
Josh Bergseng	Project Manager	Precon: 100% Construction: 100%	Single point of responsibility and contact for the project. Overall budget responsibility. Review design at all milestone deliverables for gaps, errors, omissions and overall constructability. Lead project schedule development. Develop subcontract and procurement plan. Contribute constructability suggestions and provide VE solutions based on experience with similar projects. Lead/coordinate client participation and integrate activities between design, construction, and staff including budget, schedule, sequencing, and reviews. Oversee daily compliance with schedule, quality, safety, and budget.
Jerry Lawrence	Project Superintendent	Precon: 100% Construction: 100%	Manage staff including self-perform and subcontractors to ensure schedule is maintained. Oversee safety and quality of overall project. Participate in partnering sessions, design reviews, project phasing, and schedule development, and provide input during VE sessions and constructability reviews. Participate in subcontractor outreach and prequalification.
Erik Brahmer	Cost Estimating Lead	Precon: 20% Construction: 5%	Oversee budget, value engineering, and cost reviews to provide best value for project scope. Provide estimates and create GMPs. Prepare bid packages, vendor scope reviews, and estimate self-perform scopes of work.

B. PROJECT TEAM

Our proposed team has decades of experience managing water and wastewater projects in the Pacific Northwest. They work closely with the Owner, Designer, subcontractors, and other key team members to build lasting, quality solutions to water treatment. Josh, Jerry, Erik, and the rest of the team will be cognizant of your priorities, which include managing your project on an accelerated schedule and searching for cost saving alternatives in both preconstruction and construction.

JOSH BERGSENG PROJECT MANAGER



Josh is an experienced project manager with over 15 years of service in the construction industry. He considers collaboration and clear communication the key to success and has a versatile background in residential, commercial, heavy civil, treatment plants, and industrial fields, and has managed projects in size from \$300K to \$80M. He provides key coordination between parties including subcontractors, suppliers, Owners, and Designers as well as cost and production tracking. He has managed municipal wastewater projects that include electrical and HVAC, and is able to lead projects with facilities currently in use.

Josh is currently working on the Kellogg Creek project. He will be available and 100% committed March 1, 2021.

References:

- 1) Josh Clark, Operations, Water Environmental Services, Kellogg Creek WPCP, 971.804.5792, jclark2@clackamas.us
- 2) Haakon Ogbeide, Project Manager, Oak Lodge Water Services Dept, Oak Lodge Solids Piping Project, 971.413.0301, haakon@olwsd.org

JERRY LAWRENCE PROJECT SUPERINTENDENT



Jerry has been involved in the construction industry since he was 16 years old, when he began working at his father's construction company. Since then, he worked his way up from a general laborer to superintendent. He currently has over 20 years in the field, 16 of which are with Slayden. Jerry is well-known for his work ethic and attention to detail, and has a history of building strong relationships with Owners, subcontractors, inspectors, and Designers. Jerry is driven to ensure quality and excellence in his work and the work of those around him, and will make sure your project is done right.

Jerry is currently working at the Geren Island WTP and is available to start on Sandy WWTP immediately.

References:

- 1) Jesse Prince, Lead Project Inspector, City of Salem, 503.339.4396, jprince@cityofsalem.net
- 2) Benny Sullivan, Maintenance Coordinator, City of Hillsboro, 503.410.8639, benny.sullivan@hillsboro-oregon.net

ERIK BRAHMER COST ESTIMATING LEAD



Erik has a thorough understanding of preconstruction services and facility construction, working in the field as a project engineer on the CM/GC Willow Lake WPCF Headworks and Primary Treatment project and the CM/GC Newport Water Filtration Facility. He has also been involved in more than 150 hard bid estimates and maintains a historical database of all our projects. Erik's recent relevant and similar experience includes Spokane Riverside Park Project (7 GMPs totaling \$176M); JWC WTP Expansion (2 EWAs and 2 GMPs totaling \$27M); and the Lebanon WTP Project with Carollo (2 GMPs totaling \$26M).

Erik handles estimates as needed for multiple Slayden projects. He expects a time commitment of 20% to the Sandy Wastewater Treatment Plant during the preconstruction phase, and 5% during construction.

References:

- 1) Ron Whitlatch, Engineering Services Director, City of Lebanon, Lebanon WTP, 541.258.4918, rwhitlatch@ci.lebanon
- 2) John Kennedy, Consultant Project Manager City of Salem, Geren Island WTP, 503.434.3681, jkennedy@cityofsalem.net

CENTRALIZED SUPPORT SERVICES

Slayden offers centralized support services for project engineering and preconstruction, ensuring that your specific project needs are handled by someone with extensive experience without the price tag of a dedicated team member.

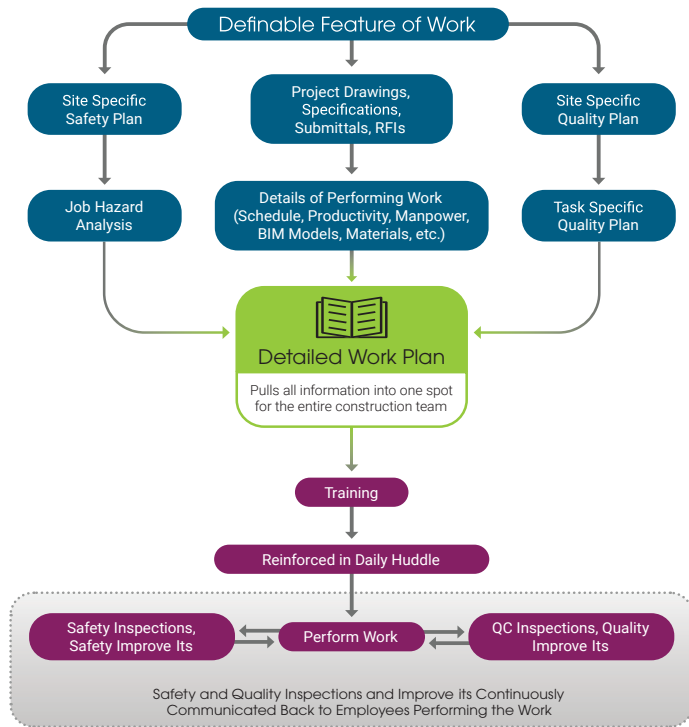
Project Engineering Support

Project Manager Josh Bergseng will lead and coordinate with our project engineering support team. Highly experienced with water and wastewater projects, this team is invaluable in both the preconstruction and construction phases of your project. During preconstruction, our project engineering team will provide meaningful feedback in partnering sessions, design reviews, project phasing, and scheduling development. They will also provide input during value engineering sessions and constructability reviews, and assist project management with scope development and procurement. During construction, the team supports project management through submittal reviews, expediting deliveries, preparing RFIs, change management, and digital collaborative delivery (BIM) coordination. They can also assist with O&Ms and closeout.

Preconstruction Support

In addition to our Project Manager Josh Bergseng, Project Superintendent Jerry Lawrence, and Cost Estimating Lead Erik Brahma, your project will have the extensive experience of our preconstruction team to lean on, ensuring decisions made at this critical stage are truly the best ones for your wastewater treatment plant. Preconstruction encompass a wide range of services essential to your project.

WORK PLAN FLOW CHART



PROCESSES TO ENSURE PROJECT SUCCESS

Before work commences, Slayden will establish a series of processes including safety, quality, schedule, procurement, and submittals, and ensure that all team members adhere to the agreed-upon workflow. This creates a clear procedure and reduces the chances of miscommunication, confusion, and mistakes. These procedures, along with work product including project drawings, submittals, schedules, and specifications, will be compiled into one master work plan. Also included in the work plan will be a health and safety plan created by our safety manager specifically for your job site, and a quality plan that covers both the overall project and the specific tasks required to construct it.

This master work plan will create one easy resource for everyone on the team, including the City and your Designer. Information within the work plan will be reinforced by serving as topics for training in the future.

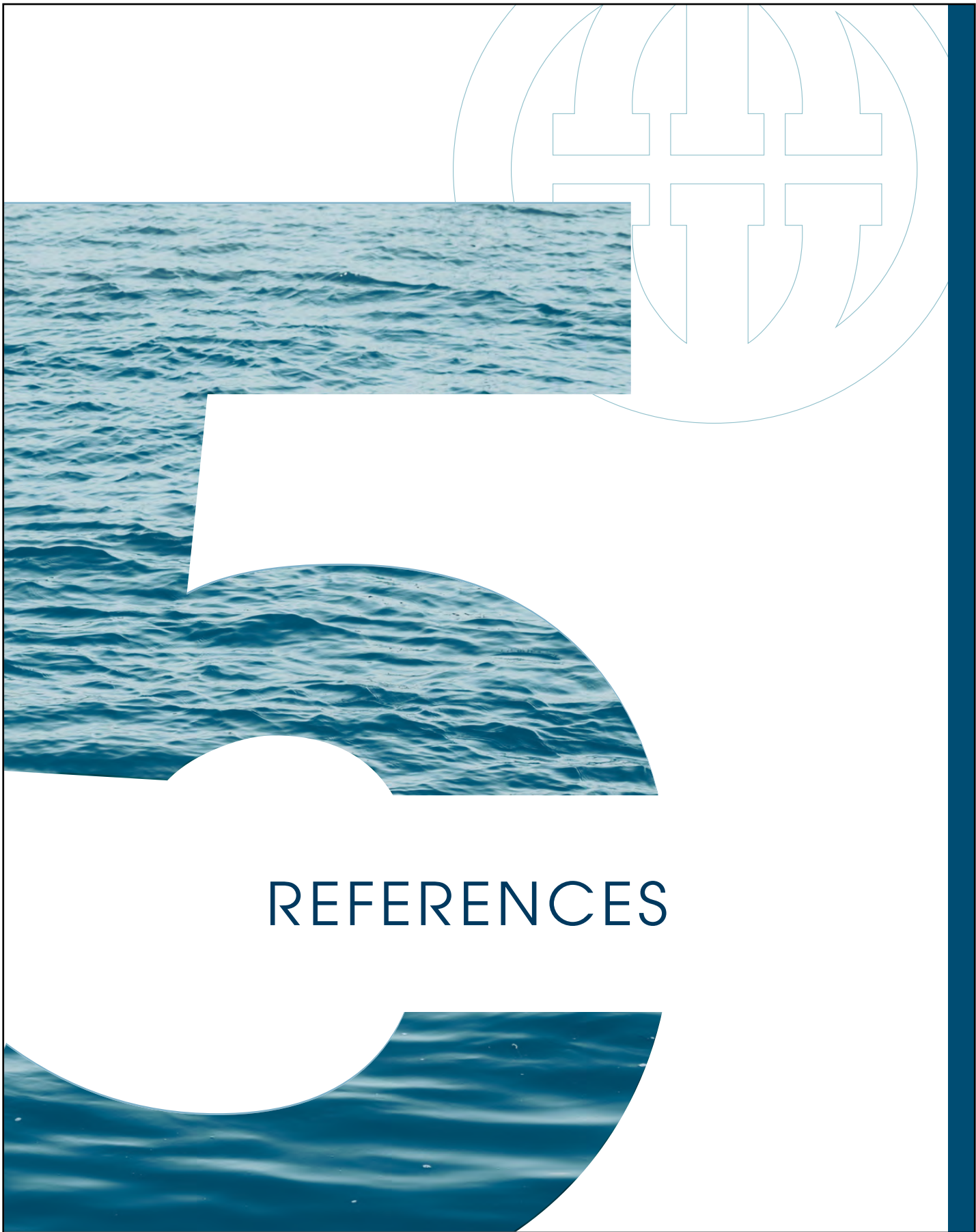
C. RESUMES

Resumes for our key personnel can be found in the *Appendix*.



We have been impressed with their management skills, starting with preconstruction where they performed value engineering that reduced costs, led procurement with detailed bid packages that brought our project qualified subcontractors and manufacturers, and produced a schedule that would get our project completed on time. Slayden has continued this into the construction phase by managing the work to stay on schedule.

– Randy Rosane, Project Manager, Water Environmental Services



REFERENCES

05. REFERENCES

* Additional references provided in Section B – Specialized Experience

Kellogg Creek WPCP, Milwaukie, OR

This \$18M CM/GC project reclaimed lost hydraulic capacity and provided reliability for the treatment facility while addressing goals to reduce noise, odor, and energy usage. The extensive renovations required for the existing facilities were constructed in and around an active treatment plant and in a constrained site adjacent to a heavily used park. Scope of work included yard utility and pavement improvements, sludge pumping systems, concrete hydraulic structures, and modifications to the hypochlorite and sodium bisulfate chemical storage and feed systems. The work included bypass systems, replacement of VFDs, and new raw sewage pumps as well as significant electrical capacity upgrades.

REFERENCE: Josh Clark, Operations, Water Environmental Services, Kellogg Creek WPCP, 971.804.5792, jclark2@clackamas.us

Lebanon WTP, Lebanon, OR

This \$28M CM/GC project for the City of Lebanon included both preconstruction and construction services. The Lebanon Water Treatment Plant included a 1,050 CY concrete intake facility located on the bank of the South Santiam River, a 1,400-sf pre-engineered metal building to house the equipment to power the intake facility, and a pre-engineered 14,000-sf building to enclose the membrane filtration system, water treatment chemical systems, electrical room, process equipment, feed and finished water pumps, and administration offices. Other scope included a new 170-ft by 56-ft concrete settling basin and two glass fused to steel bolted water storage tanks able to hold 25,000 gallons of raw water and 434,400 gallons of finished water.

REFERENCE: Ron Whitlatch, Engineering Services Director, City of Lebanon, Lebanon WTP, 541.258.4918, rwhitlatch@ci.lebanon

Tillamook Lift Station Upgrade, Tillamook, OR

This lift station upgrade for Tillamook Creamery included installation of an effluent pump building, pumps, associated mechanical piping, and valves. The existing lift station was demolished, and there was a partial demolition of existing dry well and wet well and complete mechanical demolition.

Slayden self-performed installation of a new pre-cast wet well within the existing dry and wet wells. We installed a new valve vault and flow meter vault, two new influent pumps, and mechanical piping to connect pumps to the existing tie-in point. Slayden also self-performed the design and construction of the mechanical piping and the lift station building.

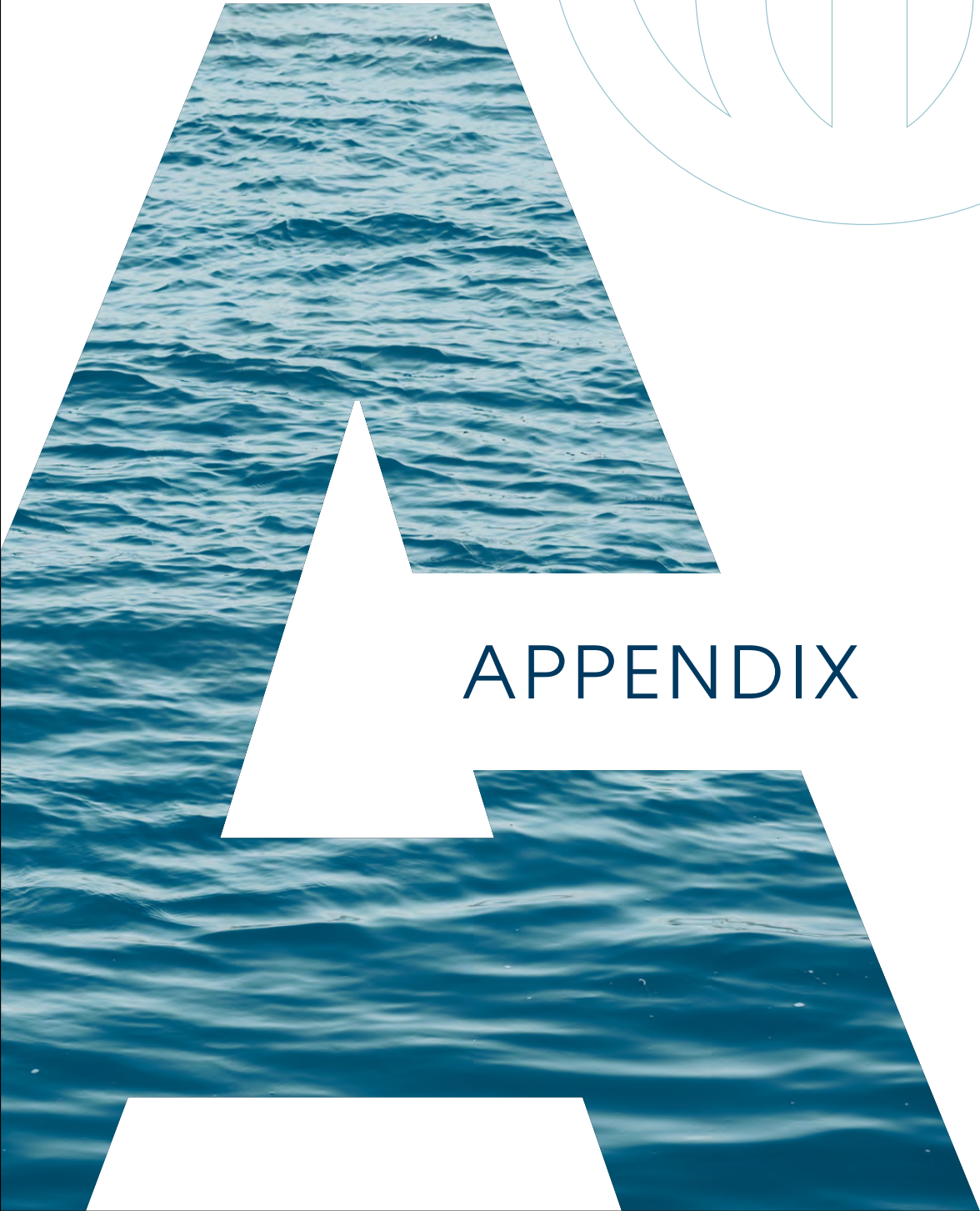
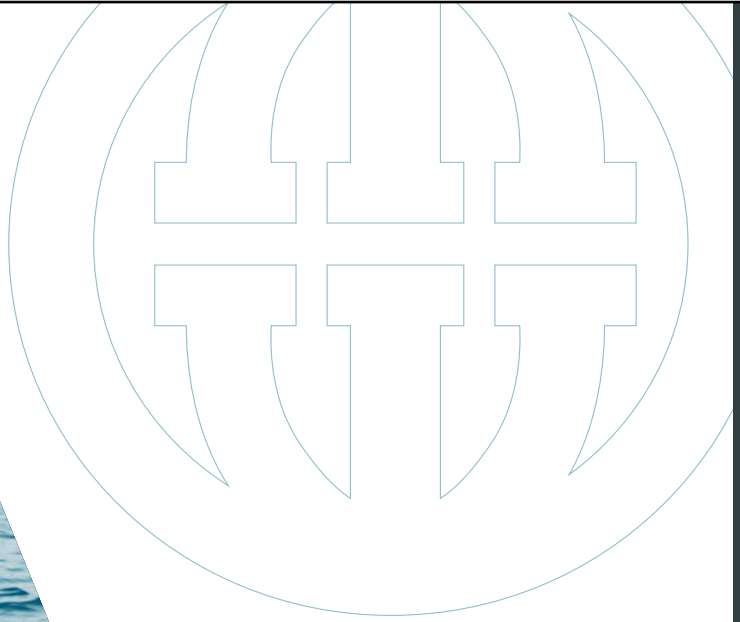
REFERENCE: Steve Fladstol, Project Manager, Tillamook, 503.812.2880, sfladstol@tillamook.com



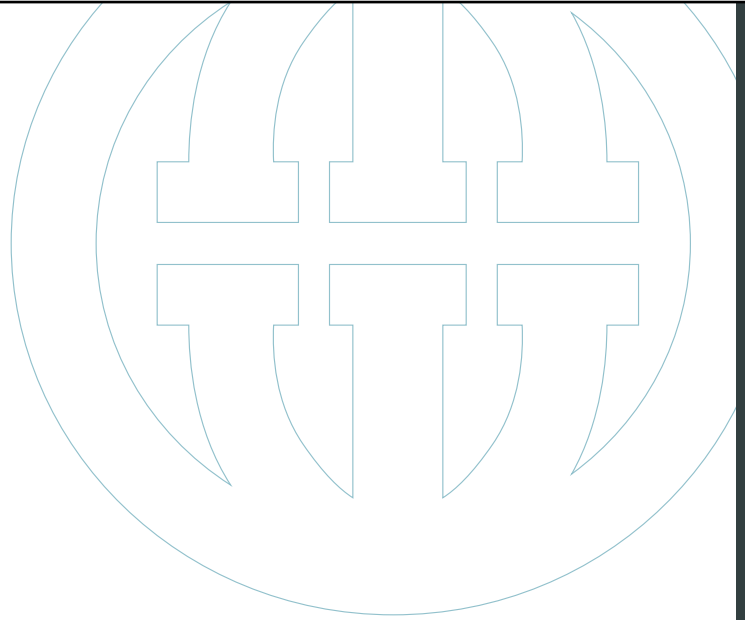
PRICE
PROPOSAL

06. PRICE PROPOSAL

CM/GC Services for Sandy Wastewater Treatment Plant Improvements Price Proposal							
1) CM/GC Fee per Item #6 of Section 8 of Request for Qualifications						6.50%	
Note: This Fee assumes Oregon Corporate Activities Tax (CATax) is reimbursable. If not then add 0.39% to Fee above.							
2) Preconstruction Services Fee per Item #6 of Section 8 of Request for Qualifications						\$39,457.00	
Slayden Preconstruction Services NTE Breakdown							
Date: 12-Jun-20							
Part	Item/Description	Project Manager	Supt.	Estimating	Contracts	Total Labor Hours	Other Direct Costs
		Josh Bergseng	Jerry Lawrence	Erik Brahmer	Gail Sullivan		
A	PROJECT MANAGEMENT						
	3.1.0 Kickoff meeting	1	1	1		3	
	3.1.1 Biweekly Meetings: 3/1/2021 - 7/23/2021	15	10			25	
	Sub-Total	16	11	1	0	28	\$ -
B	GMP 1 - Headworks, Temp. Conduit						
	3.1.2 Construction Procurement Plan	1		1		2	
	3.1.3 Constructability Reviews	1	1			2	
	3.1.4 Construction Cost Estimates / Procurement / Bid Packages	8	1	32	6	47	\$ 450.00
	3.1.5 Construction Phasing and Site Safety	2	1			3	
	3.1.6 Construction Plan	2	2			4	
	3.1.7 Project Master Schedule	3	2			5	
	3.1.8 Risk Management	2	2			4	
	3.1.9 Final Plan Review	2	2			4	
	3.1.10 GMP Proposal	0	0	0		0	
	Sub-Total	21	11	33	6	71	\$ 450.00
C	GMP 2 Through 5 (Includes tasks listed in GMP 1 above)						
	3.1.3.1 GMP 2 - Storm, Secondary Clarifier, ASSB Walkways, etc.	21	11	33	6	71	\$ 450.00
	3.1.3.2 GMP 3 - Aeration Basin, Blower Replacement, UV System	19	11	33	6	69	\$ 450.00
	3.1.3.2 GMP 4 - Chemical Feed System Improvements	17	11	33	6	67	\$ 450.00
	3.1.3.2 GMP 5 - Electrical and SCADA	16	2	18	4	40	\$ 450.00
	Sub-Total	73	35	117	22	247	\$ 1,800.00
	Total Hours	110	57	151	28	346	\$ 2,250.00
	Hourly Rate	118.00	112.00	105.00	71.00		
						Labor Total	Total ODCs
	Total Preconstruction costs (Total Hours x Hrly Rate)	\$12,980.00	\$6,384.00	\$15,855.00	\$1,988.00	\$37,207.00	\$ 2,250.00



APPENDIX



APPENDIX:
Addendums





CITY OF SANDY, OREGON

For the Construction Manager / General Contractor of

WASTEWATER TREATMENT PLANT CONDITION ASSESSMENT IMPROVEMENTS

ADDENDUM NO. 1

FEBRUARY 4, 2021

Addendum No. 1 to the plans, specifications, and/or bid documents for the above referenced Project is a part of the Contract Documents and as such, supersedes anything within the Contract Documents with which it may conflict.

A. The attached sheet indicates attendees at the Mandatory Pre-Proposal Site Visit.

B. The following questions and answers were exchanged during the Site Visit:

Q: Will the City's integrator be under this project?

A: The Automation Group (TAG) is currently under the Design Consultant contract but they may be named as a predetermined team member of the CM/GC. This would be done by amendment.

Q: Will longer lead items, such as the Chemical Feed Skids, be identified?

A: Any longer lead items will be identified during the Preconstruction phase and, if necessary, the City has committed to prepurchase any longer lead items.

Q: Can the aeration basins be isolated for the work?

A: Yes, during the dry-season, the dry-season flows should permit work on the basin. Coordination between the WWTP staff, CM/GC, and designer during Preconstruction will help plan for these improvements while keeping the plant in operation.

Q: Can the City explain the balance between self-performance versus cost-competitive bids?

A: Since CM/GC is an open-book process, the City reserves the right to have the CM/GC develop work packages and solicit bids (either informally or formal RFPs) for any proposed self-performed work that does not seem cost-competitive. The proposers should look at the Contract Documents for additional clarification.

Q: What outreach is needed to COBID-certified firms?

A: Because this project is funded by a Clean Water State Revolving Fund (CWSRF) loan, good-faith outreach efforts are required per CWSRF requirements. Please see the CWSRF requirements.

All proposers are required to provide evidence of the receipt of and acceptance of this Addendum No. 1 with their proposal. Signing in the space provided below and submitting the signed Addendum with the proposal satisfies this requirement.

If your proposal has been sent prior to the receipt of this Addendum and after reviewing the Addendum you still want to propose, place the signed Addendum or other written evidence of acceptance of the proposal changes into a sealed envelope. Mark the sealed envelope with "PROPOSAL MODIFICATIONS" and the "PROPOSAL NAME." The envelope must be delivered to the same office as the original proposal prior to the proposal closing time.

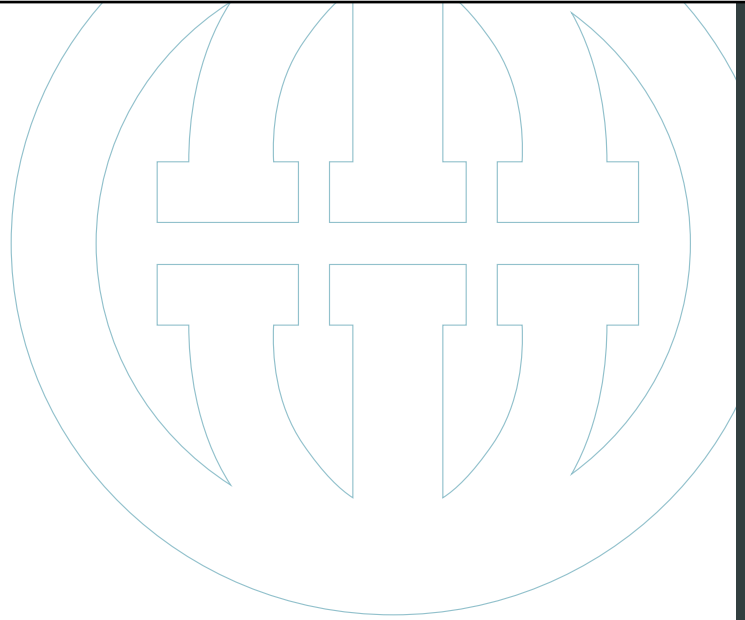
Receipt acknowledged and conditions agreed to this 5th day of February, 2021.

NAME OF FIRM:

Slayden Constructors Inc

SIGNATURE: 

DATE: February 5, 2021



APPENDIX:

Bonding Capacity Letter





Berkshire Hathaway
Specialty Insurance



February 9, 2021

City of Sandy, OR
39250 Pioneer Blvd.
Sandy, OR 97055

**Re: Slayden Constructors, Inc.
RFP: Sandy Wastewater Treatment Plant Condition Assessment Improvements Project**

To Whom It May Concern:

Berkshire Hathaway Specialty Insurance Company, XL Specialty Insurance Company, and Argonaut Insurance Company, have provided surety credit to Slayden Constructors, Inc., acting as co-sureties currently has bonding capacity on individual projects of \$250,000,000 and a total program capacity of \$1,000,000,000 for Slayden Constructors, Inc.

Berkshire Hathaway Specialty Insurance Company is rated "A++" (Superior) with a financial size category of XV (\$2 billion +) by AM Best and has a US Treasury Limit exceeding \$348 million. XL Specialty Insurance Company is rated "A+" (Superior) with a financial size of XV (\$2 billion +) by A.M. Best and has an US Treasury Limit exceeding \$200 million. Argonaut Insurance Company is rated A- (Excellent) financial size category of XIV (\$2 billion) by AM Best and has a US Treasury Limit exceeding \$95 million. The sureties are authorized to do business in the state of Oregon.

Slayden Constructors, Inc. has a minimum bonding capacity of at least \$3,000,000 available for this project for performance and payment bonds.

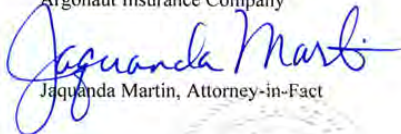
If Slayden Constructors, Inc. is awarded a contract for the referenced project and requests that we provide the necessary Performance and/or Payment Bonds, we will be prepared to execute the bonds subject to our acceptable review of the contract terms and conditions, bond forms, appropriate contract funding and any other underwriting considerations at the time of the request.

Our consideration and issuance of bonds is a matter solely between Slayden Constructors, Inc. and ourselves, and we assume no liability to third parties or to you by the issuance of this letter.

We trust that this information meets with your satisfaction. If there are further questions, please feel free to contact our office.

Sincerely,

Berkshire Hathaway Specialty Insurance Company
XL Specialty Insurance Company
Argonaut Insurance Company


Jaquanda Martin, Attorney-in-Fact



CM/GC for Sandy Wastewater Treatment Plant Condition Assessment Improvements Project

Power Of Attorney

**BERKSHIRE HATHAWAY SPECIALTY INSURANCE COMPANY
NATIONAL INDEMNITY COMPANY / NATIONAL LIABILITY & FIRE INSURANCE COMPANY**


Know all men by these presents, that **BERKSHIRE HATHAWAY SPECIALTY INSURANCE COMPANY**, a corporation existing under and by virtue of the laws of the State of Nebraska and having an office at One Lincoln Street, Boston, Massachusetts 02111, **NATIONAL INDEMNITY COMPANY**, a corporation existing under and by virtue of the laws of the State of Nebraska and having an office at 3024 Harney Street, Omaha, Nebraska 68131 and **NATIONAL LIABILITY & FIRE INSURANCE COMPANY**, a corporation existing under and by virtue of the laws of the State of Connecticut and having an office at 100 First Stamford Place, Stamford, Connecticut 06902 (hereinafter collectively the "Companies"), pursuant to and by the authority granted as set forth herein, do hereby name, constitute and appoint: **Wayne McVaugh, Sara Owens, Patricia Rambo, Jaquanda Martin, George Gionis, Cathy H. Ho, Vicki Johnston, Kaitlyn Malkowski, 1650 Market Street, Suite 1000 of the city of Philadelphia State of Pennsylvania**, their true and lawful attorney(s)-in-fact to make, execute, seal, acknowledge, and deliver, for and on their behalf as surety and as their act and deed, any and all undertakings, bonds, or other such writings obligatory in the nature thereof, in pursuance of these presents, the execution of which shall be as binding upon the Companies as if it has been duly signed and executed by their regularly elected officers in their own proper persons. This authority for the Attorney-in-Fact shall be limited to the execution of the attached bond(s) or other such writings obligatory in the nature thereof.

In witness whereof, this Power of Attorney has been subscribed by an authorized officer of the Companies, and the corporate seals of the Companies have been affixed hereto this date of December 20, 2018. This Power of Attorney is made and executed pursuant to and by authority of the Bylaws, Resolutions of the Board of Directors, and other Authorizations of **BERKSHIRE HATHAWAY SPECIALTY INSURANCE COMPANY, NATIONAL INDEMNITY COMPANY and NATIONAL LIABILITY & FIRE INSURANCE COMPANY**, which are in full force and effect, each reading as appears on the back page of this Power of Attorney, respectively. The following signature by an authorized officer of the Company may be a facsimile, which shall be deemed the equivalent of and constitute the written signature of such officer of the Company for all purposes regarding this Power of Attorney, including satisfaction of any signature requirements on any and all undertakings, bonds, or other such writings obligatory in the nature thereof, to which this Power of Attorney applies.

**BERKSHIRE HATHAWAY SPECIALTY
INSURANCE COMPANY,**

**NATIONAL INDEMNITY COMPANY,
NATIONAL LIABILITY & FIRE INSURANCE COMPANY,**

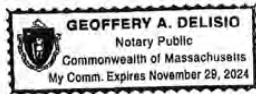
By: 
David Fields, Executive Vice President

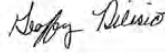
By: 
David Fields, Vice President



NOTARY
State of Massachusetts, County of Suffolk, ss:
On this 20th day of December, 2018, before me appeared David Fields, Executive Vice President of **BERKSHIRE HATHAWAY SPECIALTY INSURANCE COMPANY** and Vice President of **NATIONAL INDEMNITY COMPANY** and **NATIONAL LIABILITY & FIRE INSURANCE COMPANY**, who being duly sworn, says that his capacity is as designated above for such Companies; that he knows the corporate seals of the Companies; that the seals affixed to the foregoing instrument are such corporate seals; that they were affixed by order of the board of directors or other governing body of said Companies pursuant to its Bylaws, Resolutions and other Authorizations, and that he signed said instrument in that capacity of said Companies.

[Notary Seal]




Notary Public

I, Ralph Tortorella, the undersigned, Officer of **BERKSHIRE HATHAWAY SPECIALTY INSURANCE COMPANY, NATIONAL INDEMNITY COMPANY and NATIONAL LIABILITY & FIRE INSURANCE COMPANY**, do hereby certify that the above and foregoing is a true and correct copy of the Power of Attorney executed by said Companies which is in full force and effect and has not been revoked, IN TESTIMONY WHEREOF, see hereunto affixed the seals of said Companies this **February 9, 2021**.




Officer

BHSIC, NICO & NLF POA (2018)

To verify the authenticity of this Power of Attorney please contact us at: BHSI Surety Department, Berkshire Hathaway Specialty Insurance Company, One Lincoln Street, 23rd Floor Boston, MA 02111 | (770) 625-2516 or by email at Lem@bhspecialty.com. THIS POWER OF ATTORNEY IS VOID IF ALTERED. To notify us of a claim please contact us on our 24-hour toll free number at (855) 453-9675, via email at claimnotice@bhspecialty.com, via fax to (617) 507-8259, or via mail.

**BERKSHIRE HATHAWAY SPECIALTY
INSURANCE COMPANY**

1314 Douglas Street, Suite 1400, Omaha, Nebraska 68102-1944

ADMITTED ASSETS*

	<u>12/31/2019</u>	<u>12/31/2018</u>	<u>12/31/2017</u>
Total invested assets	\$ 5,172,183,338	\$ 4,313,185,189	\$ 4,516,104,907
Premium & agent balances (n	368,086,012	301,849,144	297,141,264
All other assets	127,524,677	140,930,406	137,220,394
Admitted Assets	<u>\$ 5,667,794,027</u>	<u>\$ 4,755,964,739</u>	<u>\$ 4,950,466,565</u>

LIABILITIES & SURPLUS*

	<u>12/31/2019</u>	<u>12/31/2018</u>	<u>12/31/2017</u>
Loss & loss exp. unpaid	\$ 634,745,558	\$ 463,103,223	\$ 327,823,391
Unearned premiums	314,117,549	241,835,588	209,113,536
All other liabilities	744,738,458	570,628,148	663,892,150
Total Liabilities	<u>1,693,601,565</u>	<u>1,275,566,959</u>	<u>1,200,829,077</u>
Total Policyholders' Surplus	<u>3,974,192,463</u>	<u>3,480,397,780</u>	<u>3,749,637,488</u>
Total Liabilities & Surplus	<u>\$ 5,667,794,028</u>	<u>\$ 4,755,964,739</u>	<u>\$ 4,950,466,565</u>

* Assets, liabilities and surplus are presented on a Statutory Accounting Basis as promulgated by the NAIC and/or the laws of the company's domiciliary state.





Power of Attorney
XL Specialty Insurance Company
XL Reinsurance America Inc.

THIS IS NOT A BOND NUMBER
LIMITED POWER OF ATTORNEY
XL 1611926

KNOW ALL MEN BY THESE PRESENTS: That XL Specialty Insurance Company, a Delaware insurance company with offices located at 505 Eagleview Blvd., Exton, PA 19341, and XL Reinsurance America Inc., a New York insurance company with offices located at 70 Seaview Avenue, Stamford, CT 06902, do hereby nominate, constitute, and appoint:

Elizabeth Marrero, Wayne G. McVaugh, Patricia A. Rambo, Sara Owens, Kimberly G. Sherrod, Joanne C. Wagner, Cathy Ho, Vicki Johnston, George Gionis, Kaitlyn Malkowski, Jaquanda Martin, Lori S. Shelton

each its true and lawful Attorney(s)-in-fact to make, execute, attest, seal and deliver for and on its behalf, as surety, and as its act and deed, where required, any and all bonds and undertakings in the nature thereof, for the penal sum of no one of which is in any event to exceed \$100,000,000.00.

Such bonds and undertakings, when duly executed by the aforesaid Attorney (s) - in - Fact shall be binding upon each said Company as fully and to the same extent as if such bonds and undertakings were signed by the President and Secretary of the Company and sealed with its corporate seal.

The Power of Attorney is granted and is signed by facsimile under and by the authority of the following Resolutions adopted by the Board of Directors of each of the Companies on the 26th day of July 2017.

RESOLVED, that Gary Kaplan, Daniel Riordan, Maria Duhart, Gregory Boal and Kevin Mirsch are hereby appointed by the Board as authorized to make, execute, seal and deliver for and on behalf of the Company, any and all bonds, undertakings, contracts or obligations in surety or co-surety with others and that the Secretary or any Assistant Secretary of the Company be and that each of them hereby is authorized to attest the execution of any such bonds, undertakings, contracts or obligations in surety or co-surety and attach thereto the corporate seal of the Company.

RESOLVED, FURTHER, that Gary Kaplan, Daniel Riordan, Maria Duhart, Gregory Boal and Kevin Mirsch each is hereby authorized to execute powers of attorney qualifying the attorney named in the given power of attorney to execute, on behalf of the Company, bonds and undertakings in surety or co-surety with others, and that the Secretary or any Assistant Secretary of the Company be, and that each of them is hereby authorized to attest the execution of any such power of attorney, and to attach thereto the corporate seal of the Company.

RESOLVED, FURTHER, that the signature of such officers named in the preceding resolutions and the corporate seal of the Company may be affixed to such powers of attorney or to any certificate relating thereto by facsimile, and any such power of attorney or certificate bearing such facsimile signatures or facsimile seal shall be thereafter valid and binding upon the Company with respect to any bond, undertaking, contract or obligation in surety or co-surety with others to which it is attached.

IN WITNESS WHEREOF, the XL SPECIALTY INSURANCE COMPANY has caused its corporate seal to be hereunto affixed, and these presents to be signed by its duly authorized officers this December 31st, 2020.



XL SPECIALTY INSURANCE COMPANY

by:

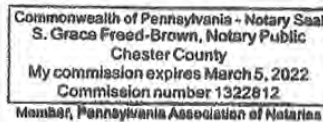
Gregory Boal, VICE PRESIDENT

STATE OF PENNSYLVANIA
COUNTY OF CHESTER

Attest:

Kevin H. Mirsch, ASSISTANT SECRETARY

On this 31st day of December, 2020, before me personally came Gregory Boal to me known, who, being duly sworn, did depose and say: that he is Vice President of XL SPECIALTY INSURANCE COMPANY, described in and which executed the above instrument; that he knows the seals of said Companies; that the seals affixed to the aforesaid instrument is such corporate seals and were affixed thereto by order and authority of the Boards of Directors of said Companies; and that he executed the said instrument by like order.



S. Grace Freed-Brown, NOTARY PUBLIC

STATE OF PENNSYLVANIA
COUNTY OF CHESTER

I, Kevin M. Mirsch, Assistant Secretary of XL SPECIALTY INSURANCE COMPANY, a corporation of the State of Delaware, do hereby certify that the above and forgoing is a full, true and correct copy of a Power of Attorney issued by said Companies, and that I have compared same with the original and that it is a correct transcript therefrom and of the whole of the original and that the said Power of Attorney is still in full force and effect and has not been revoked.

IN WITNESS WHEREOF, I have hereunto set my hand and affixed the seal of said Corporation, at the City of Exton, this 9th day of February, 2021.



Kevin M. Mirsch
Kevin M. Mirsch, ASSISTANT SECRETARY

IN WITNESS WHEREOF, XL REINSURANCE AMERICA INC. has caused its corporate seal to be hereunto affixed, and these presents to be signed by its duly authorized officers this 31st day of December, 2020.



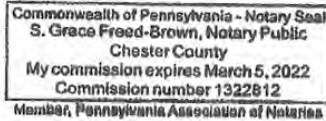
XL REINSURANCE AMERICA INC.

by: *Gregory Boal*
Gregory Boal, VICE PRESIDENT

Attest: *Kevin M. Mirsch*
Kevin M. Mirsch, ASSISTANT SECRETARY

STATE OF PENNSYLVANIA
COUNTY OF CHESTER

On this 31st day of December, 2020, before me personally came Gregory Boal to me known, who, being duly sworn, did depose and say: that he is Vice President of XL REINSURANCE AMERICA INC., described in and which executed the above instrument; that he knows the seal of said Corporation; that the seal affixed to the aforesaid instrument is such corporate seal and was affixed thereto by order and authority of the Board of Directors of said Corporation, and that he executed the said instrument by like order.



S. Grace Freed-Brown
S. Grace Freed-Brown, NOTARY PUBLIC

STATE OF PENNSYLVANIA
COUNTY OF CHESTER

I, Kevin M. Mirsch, Assistant Secretary of XL REINSURANCE AMERICA INC. a corporation of the State of New York, do hereby certify that the person who executed this Power of Attorney, with the rights, respectively of XL REINSURANCE AMERICA INC., do hereby certify that the above and forgoing is a full, true and correct copy of a Power of Attorney issued by said Corporation, and that I have compared same with the original and that it is a correct transcript therefrom and of the whole original and that the said Power of Attorney is still in full force and effect and has not been revoked.

IN WITNESS WHEREOF, I have hereunto set my hand and affixed the seal of said Corporation, at the City of Exton, this 9th day of February, 2021



Kevin M. Mirsch
Kevin M. Mirsch, ASSISTANT SECRETARY

This Power of Attorney may not be used to execute any bond with an inception date after 12/3/2022

XL SPECIALTY INSURANCE COMPANY
 STATUTORY STATEMENT OF ADMITTED ASSETS,
 LIABILITIES, CAPITAL AND SURPLUS
 December 31, 2019
 (U.S. Dollars)

Assets:		Liabilities:	
Bonds	911,024,023	Loss & loss adjustment expenses	306,587,194
Stocks	47,070,287	Reinsurance payable on paid loss and loss adjustment expenses	978,460
Cash and short-term investments	221,641,401	Unearned premiums	85,029,230
Receivable for securities	0	Ceded reinsurance premium payable	
Total Invested Assets	1,179,735,711	Funds held by company under reinsurance treaties	576,638,649
		Payable for Securities	0
		Other Liabilities	56,989,735
		Total Liabilities	1,026,223,268
Agents Balances	75,222,151	Capital and Surplus:	
Funds held by or deposited with reinsured companies	0	Aggregate write-ins for special surplus funds	
Reinsurance recoverable on loss and loss adjustment expense payments		Common capital Stock	5,812,500
Accrued interest and dividends	5,441,804	Gross paid in and contributed surplus	330,743,655
Other admitted assets	47,472,924	Unassigned surplus	(54,906,833)
Total Admitted Assets	1,307,872,590	Total Capital and Surplus	281,649,322
		Total Liabilities, Capital and Surplus	1,307,872,590

Due to the current circumstances of the Coronavirus (COVID-19) outbreak, we do not have physical access to a jurat page officer for wet signature and notarization. In lieu, we have provided electronic signature of a jurat page officer.

I, Andrew Robert Will, Vice President and Controller of XL Specialty Insurance Company (the "Corporation") do hereby certify that to the best of my knowledge and belief, the foregoing is a full and true Statutory Statement of Admitted Assets, Liabilities, Capital and Surplus of the Corporation, as of December 31, 2019, prepared in conformity with the accounting practices prescribed or permitted by the Insurance Department of the State of Delaware. The foregoing statement should not be taken as a complete statement of financial condition of the Corporation. Such a statement is available upon request at the Corporation's principal office located at 70 Seaview Avenue, Stamford, CT 06902-06040.

IN WITNESS WHEREOF, I have hereunto set my hand and affixed the seal of the Corporation at Stamford, Connecticut.



 Vice President and Controller

**Argonaut Insurance Company
Deliveries Only: 225 W. Washington, 24th Floor
Chicago, IL 60606**

United States Postal Service: P.O. Box 469011, San Antonio, TX 78246

POWER OF ATTORNEY

KNOW ALL MEN BY THESE PRESENTS: That the Argonaut Insurance Company, a Corporation duly organized and existing under the laws of the State of Illinois and having its principal office in the County of Cook, Illinois does hereby nominate, constitute and appoint:

Elizabeth Marrero, Wayne G. McVaugh, Patricia A. Rambo, Sara Owens, Joanne C. Wagner, Kimberly G. Sherrod, Marisa Thielen, Vicki Johnston, Cathy H. Ho, George Gionis, Lori S. Shelton, Kaitlyn Malkowski, Jaquanda Martin

Their true and lawful agent(s) and attorney(s)-in-fact, each in their separate capacity if more than one is named above, to make, execute, seal and deliver for and on its behalf as surety, and as its act and deed any and all bonds, contracts, agreements of indemnity and other undertakings in suretyship provided, however, that the penal sum of any one such instrument executed hereunder shall not exceed the sum of:

\$95,000,000.00

This Power of Attorney is granted and is signed and sealed under and by the authority of the following Resolution adopted by the Board of Directors of Argonaut Insurance Company:

"RESOLVED, That the President, Senior Vice President, Vice President, Assistant Vice President, Secretary, Treasurer and each of them hereby is authorized to execute powers of attorney, and such authority can be executed by use of facsimile signature, which may be attested or acknowledged by any officer or attorney, of the Company, qualifying the attorney or attorneys named in the given power of attorney, to execute in behalf of, and acknowledge as the act and deed of the Argonaut Insurance Company, all bond undertakings and contracts of suretyship, and to affix the corporate seal thereto."

IN WITNESS WHEREOF, Argonaut Insurance Company has caused its official seal to be hereunto affixed and these presents to be signed by its duly authorized officer on the 8th day of May, 2017.

Argonaut Insurance Company



by:

Joshua C. Betz, Senior Vice President

STATE OF TEXAS
COUNTY OF HARRIS SS:

On this 8th day of May, 2017 A.D., before me, a Notary Public of the State of Texas, in and for the County of Harris, duly commissioned and qualified, came THE ABOVE OFFICER OF THE COMPANY, to me personally known to be the individual and officer described in, and who executed the preceding instrument, and he acknowledged the execution of same, and being by me duly sworn, deposed and said that he is the officer of the said Company aforesaid, and that the seal affixed to the preceding instrument is the Corporate Seal of said Company, and the said Corporate Seal and his signature as officer were duly affixed and subscribed to the said instrument by the authority and direction of the said corporation, and that Resolution adopted by the Board of Directors of said Company, referred to in the preceding instrument is now in force.

IN TESTIMONY WHEREOF, I have hereunto set my hand, and affixed my Official Seal at the County of Harris, the day and year first above written.



(Notary Public)

I, the undersigned Officer of the Argonaut Insurance Company, Illinois Corporation, do hereby certify that the original POWER OF ATTORNEY of which the foregoing is a full, true and correct copy is still in full force and effect and has not been revoked.

IN WITNESS WHEREOF, I have hereunto set my hand, and affixed the Seal of said Company, on the 9th day of February, 2021



James Bluzard, Vice President-Surety

IF YOU HAVE QUESTIONS ON AUTHENTICITY OF THIS DOCUMENT CALL (833) 829 - 9137.

FINANCIAL STATEMENT
 ARGONAUT INSURANCE COMPANY
 STATUTORY BASIS as of 12/31/2019

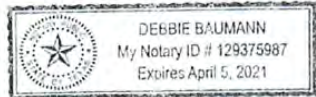
ASSETS		LIABILITIES AND SURPLUS	
CASH & INVESTED ASSETS	\$359,150,536.00	UNEARNED PREMIUMS	\$279,951,003.00
BONDS	\$849,892,572.00	LOSSES	\$473,653,148.00
STOCKS	\$603,960,156.00	LOSS ADJUSTMENT EXPENSES	\$142,367,334.00
INVESTMENT INCOME DUE AND ACCRUED	\$5,883,954.00	COMMISSIONS	-\$7,843,020.00
PREMIUM BALANCES	\$103,360,646.00	TAXES, LICENSES, AND FEES	\$13,376,634.00
NET DEFERRED TAX ASSET	\$38,388,316.00	OTHER EXPENSES	\$11,142,114.00
REINSURANCE RECOVERABLE	\$45,162,848.00	FUNDS HELD UNDER REINSURANCE TREATIES	\$105,228,622.00
OTHER ASSETS	\$44,646,911.00	CURRENT FEDERAL AND FOREIGN INCOME TAXES	\$862,931.00
TOTAL ASSETS	\$2,050,445,939.00	REMITTANCES AND ITEMS NOT ALLOCATED	\$1,531,874.00
		AMOUNTS WITHHELD/RETAINED BY COMPANY FOR OTHERS	\$7,409,994.00
		PAYABLES TO PARENT, SUBSIDIARIES, & AFFILIATES	\$2,042,440.00
		PAYABLE FOR SECURITIES	\$4,366,865.00
		PROVISION FOR REINSURANCE	\$16,461,981.00
		CEDED REINSURANCE PREMIUMS PAYABLE	\$41,418,748.00
		OTHER ACCRUED EXPENSES AND LIABILITIES	\$2,261,294.00
		TOTAL LIABILITIES	\$1,094,231,962.00
		COMMON CAPITAL STOCK	\$4,500,000.00
		GROSS PAID IN AND CONTRIBUTED SURPLUS	\$525,520,936.00
		UNASSIGNED SURPLUS	\$426,193,041.00
		TOTAL SURPLUS TO POLICYHOLDERS	\$956,213,977.00
		TOTAL LIABILITIES & SURPLUS	\$2,050,445,939.00

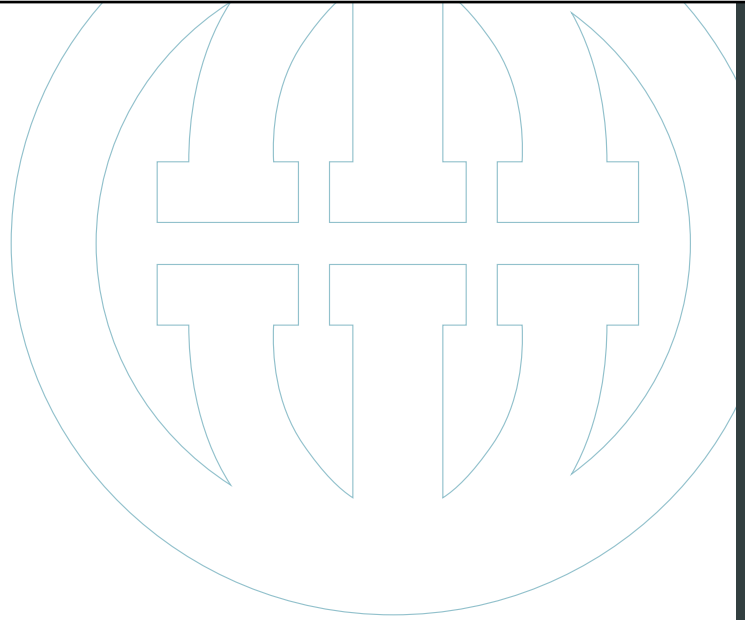
Lauren T. Welch, being duly sworn, says the she is VP US Financial Controller of Argonaut Insurance Company and that to the best of her knowledge, and belief, the foregoing statement is a true and correct statement of the financial condition of said Company as of the 31st of December, 2019.

Subscribed and sworn to before me this 1st day of May, 2020


 Notary Public


 Lauren T. Welch, VP US Financial Controller





APPENDIX:
Resumes





JOSH BERGSENG

Project Manager

Josh is an experienced project manager with over 15 years of service in the construction industry. He has a versatile background in residential, commercial, heavy civil, treatment plants, and industrial fields. Josh manages projects in size from \$300K to \$80M. He provides key coordination between parties including subcontractors, supplies, Owners, and engineers as well as cost and production tracking.

PROJECT EXPERIENCE

Project Manager, Kellogg Creek WWTP Improvements, Water Environmental Services, Milwaukie, OR

The Kellogg Creek Facility is undergoing a major construction project which will reclaim lost hydraulic capacity, provide reliability for the treatment facility, and reduce noise, odor, and energy usage. Extensive renovations were required for the existing facilities in and around an active treatment process, which required close coordination with plant staff to minimize any impacts to operations. The project site was very constrained which presented challenges. Care had to be taken when coordinating large equipment deliveries to ensure the safety of operations crews. Josh has provided the leadership to meet these challenges by engaging in active communication with plant operations and field crews.

Project Manager, Elliott West CSO Improvements, King County, Seattle, WA

Josh was the project manager for improvements to the HVAC system in this existing facility. Scope included modifying equipment, ductwork, and presenting control strategies. Corrosion repairs included and replacement of fire sprinkler systems, coatings, pipe support modification, FRP ductwork installation and modifications to slide gate in the wet well.

Project Manager, Bellingham WTP DAF Improvements, City of Bellingham, WA

Josh was the project manager for the construction of a new pretreatment system for the Bellingham Water Treatment Plant. Scope of work included ground-up construction of two new buildings and transition of utilities from overhead to underground for the new and existing plant facilities. Self-perform work included earthwork, concrete, mechanical, and HVAC. This project also included the installation of a preselected dissolved air flotation package and sodium hypochlorite packages.

Project Manager, Burlington WWTP Improvements, City of Burlington, Burlington, WA

As Project Manager, Josh oversaw this \$1.4M installation of a new UV disinfection system, demolition of two existing clarifier mechanisms and belt filter press, and installation of two new clarifier mechanisms and a belt filter press. Self-perform elements of the work included demolition and equipment setting.

EDUCATION

BS, Construction Engineering Management, Oregon State University

REGISTRATIONS/LICENSES

USACE Certified Quality Control Manager
OSHA 30-Hour

YEARS OF EXPERIENCE

Slayden: 1
Total: 15



JERRY LAWRENCE

Project Superintendent

Jerry has been involved in the construction industry since he was 16 years old when he began working at his father's construction company. Since then, he worked his way up from a general laborer to superintendent, and currently has over 20 years in the field, 16 of which are with Slayden. Jerry is well-known for his work ethic and attention to detail and has a history of building strong relationships with Owners, subcontractors, inspectors, and engineers.

PROJECT EXPERIENCE

Mechanical Superintendent, Geren Island WTP, City of Salem, Salem, OR

Jerry was the mechanical superintendent for this \$47M CM/GC project which included construction of an ozone production facility for use in treating seasonally-present algal toxins found raw water. The facility included an ozone/chemical building, electrical building and related site piping, and duct banks. The project also required updating the concrete, pumps, metals and electrical on the process pump station, and some bypass pumping.

Mechanical Superintendent, MWWC Increased Digestion Capacity Project, Metropolitan Wastewater Management Commission (MWWC), Eugene, OR

This \$11M hard bid project included construction of a fourth digester for the plant, replacement of the main boiler, replacement of the electrical gear to support the cogeneration system, replacement of the existing gas burner, and miscellaneous process pipe upgrades. The project also replaced the plant's sludge pump and modifications to the existing pump station.

Mechanical Superintendent, JWC Water Treatment Plant Improvements, Joint Water Commission (JWC), Forest Grove, OR

Jerry was the mechanical superintendent for this \$26.6M CM/GC project which upgraded the primary drinking water supply water treatment plant in Washington County, Oregon. These improvements were conducted in tandem with treatment plant operations, and one of JWC's top priorities was to prevent extended interruptions during the upgrade. There were two distinct construction packages which included a capacity increase from 75 MGD to 85 MGD, new solids drying beds, construction of a new surge basin and recycle pump station, two new filters, modifications to the existing sedimentation basins, large diameter piping, modifications to existing piping, and upgrades to the existing raw water pump station.

EDUCATION

Plumbing Apprenticeship Program,
Chemeketa Community College

REGISTRATIONS/LICENSES

Licensed Plumber - OR

TRAININGS/CERTIFICATIONS

ASME Section IX 6G - 316 SS GTAW, ER70
GTAW, 6011 SMAW

Forklift

MEWP

Confined Space

Rigging

Certified Rigging Trainer

CPR / First Aid

YEARS OF EXPERIENCE

Slayden: 16

Total: 20



ERIK BRAHMER

Cost Estimating Lead

As Lead Estimator for Slayden, Erik's responsibilities include design constructability reviews, value engineering, preparing bid packages, vendor solicitations, vendor scope reviews, and estimating self-performed scopes of work. He has provided estimating services on over 150 water and wastewater projects in the Pacific Northwest. He is an experienced estimator and will collaborate with the entire team to ensure the best value for your project.

PROJECT EXPERIENCE

Lead Estimator, Geren Island WTP, City of Salem, Salem, OR

Erik was the lead estimator for this \$47M CM/GC project which included construction of an ozone production facility for use in treating seasonally-present algal toxins found raw water. The facility included an ozone/chemical building, electrical building, and related site piping and duct banks. The project also required updates to the concrete, pumps, metals, and electrical on the process pump station, and some bypass pumping.

Estimator, Lebanon Wastewater Treatment Plant, City of Lebanon, Lebanon, OR

Erik was the estimator for this \$27M CM/GC water treatment plant project which replaced the existing aged WTP located in Lebanon, Oregon. This replacement included construction of a new intake on the South Santiam River, a new raw water pump station, new water treatment plant, and raw water transmission, sewer, and storm water pipelines. The new facility will have a capacity of 4.5 MGD with the capability to be upgraded to 8 MGD.

Estimator, JWC Water Treatment Plant Expansion, Joint Water Commission, Hillsboro, OR

This \$27M CM/GC water treatment expansion was divided into two separate construction packages. The first package included life-safety improvements for the existing structures, as well as maintenance improvements. The second package was designed to increase the facility's water capacity from 75 MGD to 85 MGD to help meet the growing demands of the Washington County region. Phase 1 included the prepurchase of major process equipment, upgrades to the rapid mix system including a new chemical injection system, new settled water flow meters, repainting and repairs of piping in the filter gallery, removal and replacement of filter media in filters 1 through 12, replacement of alum metering pumps and skids, replacement of sodium hydroxide (caustic) metering pumps and skids, and anchorage and bracing improvements for existing structures and equipment. Phase 2 included the installation of pre-purchased equipment, additional upgrades to the rapid mix basin, construction of two new filters, construction of a new backwash surge basin and recycle pump station, construction of two new solids drying beds and associated piping and decant pump station improvements, upgrades to chemical systems, site yard piping, and upgrades and expansion to the WTP communications network.

EDUCATION

BS, Construction Engineering Management, Oregon State University

TRAININGS/CERTIFICATIONS

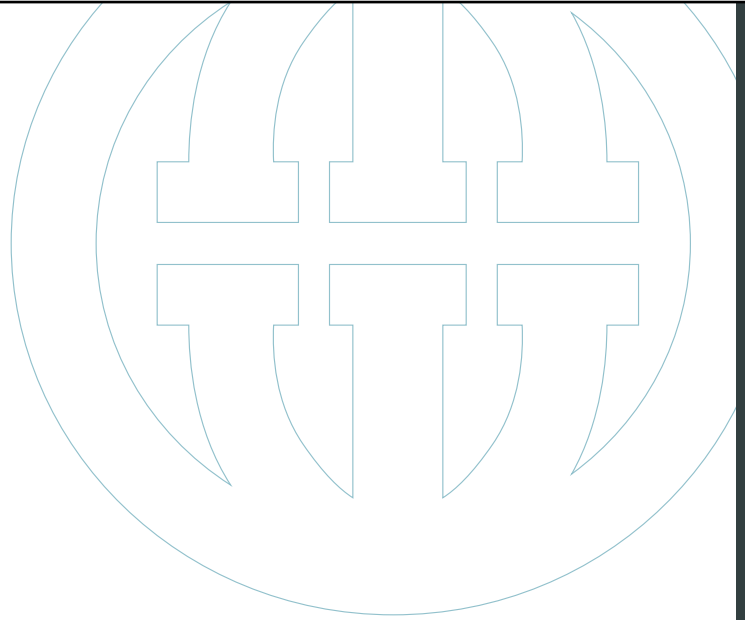
USACE Quality Control

OSHA 30-Hour

YEARS OF EXPERIENCE

Slayden: 13

Total: 13



APPENDIX:

Clean Water State Revolving Fund Forms



Attachment D
Clean Water State Revolving Fund Forms and Requirements

The following attached CWSRF forms must be submitted with the proposal:

- BC 4 – Sworn Statement of Compliance
- BC 5 – Prevailing Wage Agreement
- BC 6 – List of Contacted DBE Businesses
- BC 7 – Certification of Independent Price Determinations
- BC 8 – Fair Share Objectives, Six Good Faith Efforts, Contract Administration and Contract Language
- BC 9 – Certification Regarding Lobbying Activities
- BC 10 – Disclosure of Lobbying Activities
- BC 11 – Certification of Non-segregated Facilities
- BC 13 – Debarment and Suspension
- BC 11 – Certification of Non-segregated Facilities
- BC 12 – Non-discrimination in Employment Notice to Labor unions or Other Organizations of Workers
- BC 14 – Contractors compliance statement (EO 11246)

Form BC 4



State of Oregon Department of Environmental Quality
Sworn Statement of Compliance

Contact: [Regional Project Officer](#)

Sworn Statement of Compliance with Small, Women and Minority Business Utilization Requirements

To be eligible for award of this contract, each bidder must execute, and submit, as part of their proposal, and together with their bid, the following certification relating to SBE/WBE/MBE participation. The certification below shall be deemed a part of the resulting contract.

The bidder has taken the following affirmative steps in awarding subcontracts:

- (1) Include qualified small, minority and women's businesses on solicitation lists
- (2) Insure that small, minority and women's businesses are solicited whenever they are potential sources
- (3) Divide total requirements, when economically feasible, into smaller tasks or quantities to permit maximum participation of small, minority and women's businesses
- (4) Use the services and assistance of the Small Business Administration and the Minority Business Development Agency of the U.S. Department of Commerce as appropriate.

Contract # _____

Contract Title: Sandy WWTP Improvements

Name of Company: Slayden Constructors, Inc.

Signature of Authorized Official  Date 02/16/2021

Name and Title of Signer: Jeffrey Garner, President

Alternative formats

DEQ can provide documents in an alternate format or in a language other than English upon request. Call DEQ at 800-452-4011 or email deqinfo@deq.state.or.us.

Updated May 2019



State of Oregon Department of Environmental Quality

Prevailing Wage Agreement

Contact: Regional Project Officer

The loan recipient, prime contractor and subcontractors all must initial and sign this form.

- The prime contractor copy must be submitted as part of the bid/proposal to the loan recipient.
- A copy of this form signed by the loan recipient and the prime contractor must be submitted with the contract copy to DEQ.
- The prime contractor must obtain a signed copy of this form from each subcontractor and retain them in the prime contractor's contract file.

The undersigned understands that this public works project is funded in whole or in part by the Clean Water State Revolving Fund and is subject to the prevailing wage requirements of Oregon's Bureau of Labor and Industry and the requirements of the Davis-Bacon Act.

[Signature] The undersigned agrees that, notwithstanding any other provision of law, all laborers and mechanics employed on the project must be paid wages at rates not less than those prevailing on projects of a similar character in the locality, as determined by the United States Secretary of Labor, or the Commissioner of the Oregon Bureau of Labor and Industries, whichever is higher, per ORS 279C.838; OAR 839-025-0035(2).

When a public works project is subject to both the state and federal prevailing wage rate laws, contractors and subcontractors must pay the higher of either the state or federal prevailing wage rates for the type of work being performed, per ORS 279C.838; OAR 839-025-0035(2).

Davis Bacon (federal law) for Point Source Projects

[Signature] Davis-Bacon applies to all **treatment works construction projects** for the entirety of the construction activities financed by a CWSRF loan through the completion of construction, no matter when construction commences.

[Signature] The Loan Agreement includes specific Davis-Bacon terms and conditions contract language that must be passed through to the prime contractor and all subcontractors in their contracts over \$2,000.

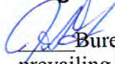
[Signature] The Secretary of Labor's determination, regarding the prevailing wages applicable in the state of Oregon, are located at: <http://www.wdol.gov/> The prevailing wages are those in effect at the time of contract award. Wages obtained through this web link should be printed at the time of contract award and included in procurement documents and all contracts resulting from the procurements.

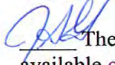
[Signature] The loan recipient or the prime contractor on behalf of the loan recipient maintains on-going wage information as a requirement of the Clean Water State Revolving Fund loan for a project subject to Davis-Bacon. The program suggests using the [wage matrix](#). You may find the [instructions](#) helpful.


[Signature] The loan recipient conducts a wage interview at 30 percent, 60 percent and 90 percent completion, with a representative group of workers during the project construction. The loan recipient must conduct additional interviews if there is any reason to suspect a contractor or their subcontractor is at risk for

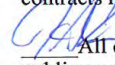
violating wage requirements. As provided in 29 CFR 5.6(a)(6), all interviews must be conducted in confidence. The loan recipient must use [Standard Form 1445](#) to memorialize the interviews.

Oregon Bureau of Labor and Industry (state law)

 Bureau of Labor and Industry prevailing wage rates apply to projects over \$50,000. Oregon prevailing wage rate regulations require every contractor or subcontractor employing workers on a public works project must pay to such workers no less than the applicable prevailing rate of wage for each trade or occupation, as determined by the commissioner, in which the workers are employed, per OAR 839-025-0035.

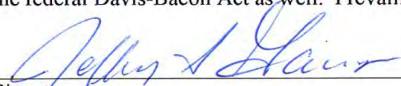
 The wage rates identified by the Commissioner of the Oregon Bureau of Labor and Industry are available [online](#).

 The prevailing wage rates in effect at the time the bid specifications are first advertised are the Oregon wage rates that apply for the duration of the project. Prevailing wages obtained through the Bureau of Labor and Industry websites must be included in the bid solicitation and incorporated in all contracts resulting from the procurements.

 All contractors and subcontractors shall file, with the Construction Contractors Board, a \$30,000 public works bond with a corporate surety authorized to do business in this state, per ORS 279C.836. The bond must provide that the contractor or subcontractor will pay claims ordered by Bureau of Labor and Industry to workers performing labor upon public works projects. It must be filed before starting work on a contract or subcontract for the project.

Payroll/Certified Statement (form WH-38)

Form WH-38 may be used by contractors for reporting their payroll as required by ORS 279C.845 on public works projects subject to the Prevailing Wage Rate Law. This form has not been officially approved by the United States Department of Labor, however it is designed to meet the requirements of the federal Davis-Bacon Act as well. Prevailing wage rate [forms](#) are available online.

 _____
Signature Date 02/16/2021

President

Title
Slayden Constructors, Inc.

Company

Alternative formats

DEQ can provide documents in an alternate format or in a language other than English upon request. Call DEQ at 800-452-4011 or email deqinfo@deq.state.or.us

Form BC 6



State of Oregon Department of Environmental Quality
List of Contacted Disadvantaged Business Enterprises
 Contact: [Regional Project Officer](#)

Name of Business	Certification #	Contact Person	Phone Number	Date of Contact	Reason for Non-participation
Will be completed during early work or at development of GMP					

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Page 1

Name of Business	Certification #	Contact Person	Phone Number	Date of Contact	Reason for Non-participation

List of Disadvantaged Businesses Contacted

Alternative formats

Documents can be provided upon request in an alternate format for individuals with disabilities or in a language other than English for people with limited English skills. To request a document in another format or language, call DEQ in Portland at 503-229-5696, or toll-free in Oregon at 1-800-452-4011, ext. 5696; or email deqinfo@deq.state.or.us.

List of Disadvantaged Businesses Contacted

Form BC 7



State of Oregon Department of Environmental Quality
**Certificate of Independent Price
Determination**

Contact: [Regional Project Officer](#)

The prime contractor must:

- Sign and submit this form as part of the bid/proposal to the loan recipient
- Include a signed copy in their contract
- Retain a signed copy of this form from each subcontractor

Bidder's Name: [Slayden Constructors, Inc.](#)

Address: [500 Willamette Ave, Stayton, OR 97383](#)

a. The bid offeror certifies that:

1. The prices in this offer have been arrived at independently without, for the purpose of restricting competition, any consultation, communication or agreement with any other offeror or competitor relating to:
 - i. Those prices
 - ii. Intention to submit an offer
 - iii. Methods or factors used to calculate the prices offered
2. The prices in this offer have not been and will not be knowingly disclosed by the offeror, directly or indirectly, to any other offeror or competitor before bid opening (in the case of a sealed bid solicitation) or contract award (in the case of a negotiated solicitation) unless otherwise required by law
3. No attempt has been or will be made by the offeror to induce any other concern to submit or not to submit an offer for the purpose of restricting competition.

b. Each signature on the offer is considered to be a certification by the signatory that the signatory:

1. Is the person in the offeror's organization responsible for determining the prices being offered in this bid or proposal, and that the signatory has not participated and will not participate in any action contrary to subparagraphs (a)(1) through (a)(3) above; or
2. Has been authorized, in writing, to act as agent for the following principals in certifying that those principals have not participated, and will not participate, in any action contrary to subparagraphs (a)(1) through (a)(3) above;
3. As an authorized agent, certifies that the principals named below have not participated, and will not participate, in any action contrary to subparagraph (a)(1) through (a)(3) above; and

Updated May 2019

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4. As an agent, has not personally participated, and will not participate, in any action contrary to subparagraphs (a)(1) through (a)(3) above.
5. If the offeror deletes or modifies subparagraph (a)(2) above, the offeror must furnish with its offer a signed statement setting forth in detail the circumstances of the disclosure.

Insert full name of person(s) in the offeror's organization responsible for determining the prices offered in this bid or proposal, and the title of his or her position in the offeror's organization:

Full Name of Person(s) in the Offeror's Organization	Title	Date
<u>Jeffrey Garner</u>	<u>President</u>	<u>02/16/2021</u>
<u>Steve Flett</u>	<u>Project Executive</u>	<u>02/16/2021</u>
<u> </u>	<u> </u>	<u> </u>

Signature of Prime Contractor 

Alternative formats

DEQ can provide documents in an alternate format or in a language other than English upon request. Call DEQ at 800-452-4011 or email deqinfo@deq.state.or.us.

BC8



State of Oregon Department of Environmental Quality

Six Good Faith Efforts, Contract Administration and Contract Language

[Regional Project Officer](#)

This form must be completed by the loan recipient, prime contractor and any subcontractor who will further subcontract on the Clean Water State Revolving Fund project within the scope of the loan. All boxes in this attachment must be initialed and the bottom signed.

- One completed attachment for the prime contractor must be submitted as part of the bid/proposal to the loan recipient.
- One completed attachment for each subcontractor who will further subcontract must be submitted before the contract award.
- A copy of those must be included in the contract copy to DEQ, along with one attachment initialed and signed by the loan recipient.

A handwritten signature in blue ink, appearing to be 'J. K. ...', written over a horizontal line.

DBE certification

All Minority Business Enterprises and Woman Business Enterprises must be certified by Oregon's [Office of Minority, Women and Emerging Small Businesses](#) or by the state in which they are located. This office administers the Disadvantaged Business Enterprise, Minority Business Enterprise/Women Business Enterprise, and Emerging Small Business programs.

A handwritten signature in blue ink, appearing to be 'J. K. ...', written over a horizontal line.

Six Good-Faith Efforts

The good-faith efforts are required methods to ensure that all DBEs have the opportunity to compete for procurements funded by the Clean Water State Revolving Fund. The loan recipient and their prime contractor are required to:

1. Ensure DBEs are made aware of contracting opportunities to the fullest extent practicable through outreach and recruitment activities. For Indian tribal, state and local government recipients, this will include placing DBEs on solicitation lists and soliciting them whenever they're potential sources.
2. Make information on forthcoming opportunities available to DBEs and arrange time frames for contracts and establish delivery schedules, where the requirements permit, in a way that encourages and facilitates participation by DBEs in the competitive process. This includes, whenever possible, posting solicitations for bids or proposals for a minimum of 30 calendar days before the bid or proposal closing date.
3. Consider in the contracting process whether firms competing for large contracts could subcontract with DBEs. For Indian tribal, state and local government recipients, this will include dividing total requirements when economically feasible into smaller tasks or quantities to permit maximum participation by DBEs in the competitive process.
4. Encourage contracting with a consortium of DBEs when a contract is too large for one of these firms to handle individually.


Updated July 2020


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BC8


5. Use the services and assistance of the federal Small Business Administration, Minority Business Development Agency of the U.S. Department of Commerce, and the state Office of Minority, Women and Emerging Small Business.
6. If the prime contractor awards subcontracts, require the prime contractor to take steps one through five above.
7. **Native American provisions 40 CFR, Section 33.304**
The recipient agrees to comply with the contract administration provisions of 40 CFR, Section 33.304. Any recipient, whether or not Native American, of an EPA financial assistance agreement for the benefit of Native Americans, is required to solicit and recruit Indian organizations and Indian-owned economic enterprises and give them preference in the award process prior to undertaking the six good faith efforts. If the efforts to solicit and recruit Indian organizations and Indian-owned economic enterprises is not successful, then the recipient must follow the six good faith efforts.

Contract administration


 The Loan Recipient must require its prime contractor to employ the six good faith efforts even if the prime contractor has achieved its fair share objectives.

 If a DBE subcontractor fails to complete work under the subcontract for any reason, the Loan Recipient must require the prime contractor to employ the six good faith efforts if soliciting a replacement subcontractor.

 The Loan Recipient must require its prime contractor to pay its subcontractor for satisfactory performance no more than 30 days from the prime contractor's receipt of payment from the Loan Recipient.

 The Loan Recipient must require written notification from its prime contractor prior to any termination of a DBE subcontractor for convenience by the prime contractor.

Specific contract language

 All contracts between the Loan Recipient and prime contractor, and prime contractor and subcontractors must include the following statement required by 40 CFR Part 33:

"The contractor shall not discriminate on the basis of race, color, national origin or sex in the performance of this contract. The contractor shall carry out applicable requirements of 40 CFR part 33 in the award and administration of contracts awarded under EPA financial assistance agreements. Failure by the contractor to carry out these requirements is a material breach of this contract which may result in the termination of this contract or other legally available remedies."

BC8

The undersigned has initialed the items above and understands the resulting responsibility for each item.



02/16/2021

Signature

Date

President

Title

Slayden Constructors, Inc.

Company

Accessibility

Alternative formats DEQ can provide documents in an alternate format or in a language other than English upon request. Call DEQ at 800-452-4011 or email deqinfo@deq.state.or.us.

Updated July 2020

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Form BC 9



State of Oregon Department of Environmental Quality
Certification Regarding Lobbying Activities

Contact: [Regional Project Officer](#)
503-229-LOAN

This form must be signed by the prime contractor and submitted by the loan recipient by the time the contract is award. A copy must be included in the contract copy to DEQ. The prime contractor must obtain a signed copy of this form from each subcontractor, and retain them in the prime contractor's contract file.

The undersigned certifies, to the best of his or her knowledge and belief, that:

- (1) No Federal appropriated funds have been paid or will be paid, by or on behalf of the undersigned, to any person for influencing or attempting to influence an officer or employee of any agency, a Member of Congress, an officer or employee of Congress, or an employee of a Member of Congress in connection with the awarding of any Federal contract, the making of any Federal grant, the making of any Federal loan, the entering into of any cooperative agreement, and the extension, continuation, renewal, amendment, or modification of any Federal contract, grant, loan, or cooperative agreement.
- (2) If any funds other than Federal appropriated funds have been paid or will be paid to any person for influencing or attempting to influence an officer or employee of any agency, a Member of Congress, an officer or employee of Congress, or an employee of a Member of Congress in connection with this Federal Contract, grant, loan, or cooperative agreement, the undersigned shall complete and submit Standard Form LLL, "Disclosure of Lobbying Activities," in accordance with its instructions.
- (3) The undersigned shall require that the language of this certification be included in the award documents for all sub-awards at all tiers (including subcontracts, subgrants, and contracts under grants, loans, and cooperative agreements) and that all sub-recipients shall certify and disclose accordingly.

This certification is a material representation of fact upon which reliance was placed when this transaction was made or entered into. Submission of this certification is a prerequisite for making or entering into this transaction imposed by *Section 1352, Title 31, U.S. Code*. Any person who fails to file the required certification shall be subject to a civil penalty of not less than \$10,000 and not more than \$100,000 for each such failure.


Signature

02/16/2021

Date

Alternative formats

DEQ can provide documents in an alternate format or in a language other than English upon request. Call DEQ at 800-452-4011 or email deqinfo@deq.state.or.us.

Updated May 2019

DISCLOSURE OF LOBBYING ACTIVITIES

Complete this form to disclose lobbying activities pursuant to 31 U.S.C. 1352

(See reverse for public burden disclosure.)

1. Type of Federal Action: a. contract ___ b. grant c. cooperative agreement d. loan e. loan guarantee f. loan insurance	2. Status of Federal Action: a. bid/offer/application b. initial award c. post-award	3. Report Type: a. initial filing b. material change For Material Change Only: year _____ quarter _____ date of last report _____
4. Name and Address of Reporting Entity: <input type="checkbox"/> Prime <input type="checkbox"/> Subawardee Tier _____, if known: Congressional District, if known:	5. If Reporting Entity in No. 4 is a Subawardee, Enter Name and Address of Prime: Congressional District, if known:	
6. Federal Department/Agency:	7. Federal Program Name/Description: CFDA Number, if applicable: _____	
8. Federal Action Number, if known:	9. Award Amount, if known: \$ _____	
10. a. Name and Address of Lobbying Registrant (if individual, last name, first name, MI):	b. Individuals Performing Services (including address if different from No. 10a) (last name, first name, MI):	
11. Information requested through this form is authorized by title 31 U.S.C. section 1352. This disclosure of lobbying activities is a material representation of fact upon which reliance was placed by the tier above when this transaction was made or entered into. This disclosure is required pursuant to 31 U.S.C. 1352. This information will be reported to the Congress semi-annually and will be available for public inspection. Any person who fails to file the required disclosure shall be subject to a civil penalty of not less than \$10,000 and not more than \$100,000 for each such failure.	Signature: _____ Print Name: _____ Title: _____ Telephone No.: _____ Date: _____	
Federal Use Only:	Authorized for Local Reproduction Standard Form LLL (Rev. 7-97)	

NOT APPLICABLE

INSTRUCTIONS FOR COMPLETION OF SF-LLL, DISCLOSURE OF LOBBYING ACTIVITIES

This disclosure form shall be completed by the reporting entity, whether subawardee or prime Federal recipient, at the initiation or receipt of a covered Federal action, or a material change to a previous filing, pursuant to title 31 U.S.C. section 1352. The filing of a form is required for each payment or agreement to make payment to any lobbying entity for influencing or attempting to influence an officer or employee of any agency, a Member of Congress, an officer or employee of Congress, or an employee of a Member of Congress in connection with a covered Federal action. Complete all items that apply for both the initial filing and material change report. Refer to the implementing guidance published by the Office of Management and Budget for additional information.

1. Identify the type of covered Federal action for which lobbying activity is and/or has been secured to influence the outcome of a covered Federal action.
2. Identify the status of the covered Federal action.
3. Identify the appropriate classification of this report. If this is a followup report caused by a material change to the information previously reported, enter the year and quarter in which the change occurred. Enter the date of the last previously submitted report by this reporting entity for this covered Federal action.
4. Enter the full name, address, city, State and zip code of the reporting entity. Include Congressional District, if known. Check the appropriate classification of the reporting entity that designates if it is, or expects to be, a prime or subaward recipient. Identify the tier of the subawardee, e.g., the first subawardee of the prime is the 1st tier. Subawards include but are not limited to subcontracts, subgrants and contract awards under grants.
5. If the organization filing the report in item 4 checks "Subawardee," then enter the full name, address, city, State and zip code of the prime Federal recipient. Include Congressional District, if known.
6. Enter the name of the Federal agency making the award or loan commitment. Include at least one organizational level below agency name, if known. For example, Department of Transportation, United States Coast Guard.
7. Enter the Federal program name or description for the covered Federal action (item 1). If known, enter the full Catalog of Federal Domestic Assistance (CFDA) number for grants, cooperative agreements, loans, and loan commitments.
8. Enter the most appropriate Federal identifying number available for the Federal action identified in item 1 (e.g., Request for Proposal (RFP) number; Invitation for Bid (IFB) number; grant announcement number; the contract, grant, or loan award number; the application/proposal control number assigned by the Federal agency). Include prefixes, e.g., "RFP-DE-90-001."
9. For a covered Federal action where there has been an award or loan commitment by the Federal agency, enter the Federal amount of the award/loan commitment for the prime entity identified in item 4 or 5.
10. (a) Enter the full name, address, city, State and zip code of the lobbying registrant under the Lobbying Disclosure Act of 1995 engaged by the reporting entity identified in item 4 to influence the covered Federal action.

(b) Enter the full names of the individual(s) performing services, and include full address if different from 10 (a). Enter Last Name, First Name, and Middle Initial (MI).
11. The certifying official shall sign and date the form, print his/her name, title, and telephone number.

According to the Paperwork Reduction Act, as amended, no persons are required to respond to a collection of information unless it displays a valid OMB Control Number. The valid OMB control number for this information collection is OMB No. 0348-0046. Public reporting burden for this collection of information is estimated to average 10 minutes per response, including time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the collection of information. Send comments regarding the burden estimate or any other aspect of this collection of information, including suggestions for reducing this burden, to the Office of Management and Budget, Paperwork Reduction Project (0348-0046), Washington, DC 20503.

Form BC 11



State of Oregon Department of Environmental Quality
Certification of Non-Segregated Facilities

Contact: [Regional Project Officer](#)
503-229-LOAN

This form must be signed by the prime contractor and submitted by the time of contract award from the Loan Recipient. A copy must be included in the contract copy to DEQ. The prime contractor must obtain a signed copy of this form from each subcontractor, and retain them in the prime contractor's contract file.

Applicable to federally-funded construction contracts and related subcontracts exceeding \$10,000 which are not exempt from the Equal Opportunity clause.

The federally-assisted construction contractor certifies that he does not maintain or provide for his employees any segregated facilities at any of his establishments, and that he does not permit his employees to perform their services at any location, under his control, where segregated facilities are maintained. The federally-assisted construction contractor certifies further that he will not maintain or provide for his employees any segregated facilities at any of his establishments, and that he will not permit his employees to perform their services at any location, under his control, where segregated facilities are maintained. The federally-assisted construction contractor agrees that a breach of this certification is a violation of the Equal Opportunity Clause in this contract.

As used in this certification, the term "segregated facilities" means any waiting rooms, work areas, rest rooms and wash rooms, restaurants and other eating areas, time clocks, locker rooms and other storage or dressing areas, parking lots, drinking fountains, recreation or entertainment areas, transportation, and housing facilities provided for employees which are segregated by explicit directive or are, in fact, segregated on the basis of race, creed, color, or national origin, because of habit, local custom, or otherwise. The federally-assisted construction contractor agrees that (except where he has obtained identical certifications from proposed contractors for specific time periods) he will obtain identical certifications from proposed subcontractors prior to the award of subcontracts exceeding \$10,000 which are not exempt from the provisions of the Equal Opportunity Clause, and that he will retain a copy of such certification.


Signature

02/16/2021
Date

Jeffrey Garner, President
Name and Title of signer (please type)

Alternative formats

DEQ can provide documents in an alternate format or in a language other than English upon request. Call DEQ at 800-452-4011 or email deqinfo@deq.state.or.us.

Undated May 2019



State of Oregon Department of Environmental Quality
Non-discrimination in Employment

Notice to Labor Unions or Other Organizations of Workers

Contact: Regional Project Officer

503-229-LOAN

The CWSRF loan recipient must provide this notice to the contractor and subcontractor(s) advising the labor union or workers' representative of the contractor's commitments under Executive Order No. 11246. The contractor will send a signed notice to each labor union or representative of workers with which he has a collective bargaining agreement or other contract or understanding, and shall post copies of the notice in conspicuous places available to employees and applicants for employment.

TO: _____
NAME OF UNION OR ORGANIZATION OF WORKERS

The undersigned currently holds contract(s) with City of Sandy, OR
NAME OF LOAN RECIPIENT

Using funds or credit of the U.S. government, or one or more subcontractors with a prime contractor holding such contracts.

Slayden Constructors Inc will comply with all regulations if contract is awarded

You are advised that under the provisions of the above contract(s) or subcontract(s) and in accordance with Section 202 of Executive Order 11246 dated Sept. 24, 1965, as amended, the undersigned is obliged not to discriminate against any employee or applicant for employment because of race, color, religion, sex or national origin. This obligation not to discriminate in employment includes, but is not limited to, the following:

- EMPLOYMENT, UPGRADING, TRANSFER OR DEMOTION
- RECRUITMENT OR RECRUITMENT ADVERTISING
- RATES OF PAY OR OTHER FORMS OF COMPENSATION
- SELECTION FOR TRAINING INCLUDING APPRENTICESHIP, LAYOFF OR TERMINATION

This notice is furnished to you pursuant to the provisions of the above contract(s) or subcontract(s) and Executive Order #11246.

Slayden Constructors, Inc. 02/16/2021
CONTRACTOR OR SUBCONTRACTOR(S) DATE

Alternative formats

DEQ can provide documents in an alternate format or in a language other than English upon request. Call DEQ at 800-452-4011 or email deqinfo@deq.state.or.us

Updated May 2019

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State of Oregon Department of Environmental Quality
**Debarment and Suspension for
 Loan Recipient and all Contracts
 of \$25,000 or more**

Contact: [Regional Project Officer](#) or call 503-229-LOAN

The recipient must complete, sign and submit this to the DEQ project officer before the loan project contract is awarded, along with a System for Award Management report for each contractor and subcontractor proposed to perform work within the scope of the loan. **Every contractor paid under this loan agreement with a contract equal to or greater than \$25,000, including professional services, must be registered on the [System for Award Management](#).** Award approval by DEQ is contingent on *none* of the contractors and subcontractors being excluded on the System for Award Management.

The recipient and all subsequent prime and subcontractors must fully comply with Subpart C of 2 Code of Federal Regulations Part 180 and 2 CFR Part 1532, entitled "Responsibilities of Participants Regarding Transactions (Doing Business with Other Persons)." The following contractors and subcontractors are proposed to perform work within the scope of the loan agreement. Use additional pages if necessary.

Loan recipient: City of Sandy, OR Loan number: unknown

Project: Sandy WWTP Improvements

Contractor name and mailing address	Phone number and email address	DUNS and CAGE number codes for contracts equal to or greater than \$25,000	Contract \$ Amount
Slayden Constructors, Inc. 500 Willamette Ave Stayton, OR 97383	503.769.1969 jeffrey.wall@mwhconstructors.com	DUNS: 080149595 CAGE: 7KHC3	TBD
Subcontractors TBD			

Jeffrey Garner
 Signature of Authorized Loan Recipient Representative

02/16/2021
 Date

Jeffrey Garner, President
 Name and Title of Authorized Representative (type or print clearly)

Alternative formats
 DEQ can provide documents in an alternate format or in a language other than English upon request.
 Call DEQ at 800-452-4011 or email deqinfo@deq.state.or.us



ALERT: SAM.gov will be down for scheduled maintenance Saturday, 02/13/2021 from 8:00 AM to 1:00 PM.

Entity Dashboard

- Entity Overview
- Entity Registration
 - Core Data
 - Assertions
 - Reps & Certs
 - POCs
- Reports
 - Service Contract Report
 - BioPreferred Report
- Exclusions
 - Active Exclusions
 - Inactive Exclusions
 - Excluded Family Members

RETURN TO SEARCH

Slayden Constructors, Inc. 500 Willamette Ave
 DUNS: 080149595 CAGE Code: 7KHC3 Stayton, OR, 97383-9420
 Status: Active UNITED STATES
 Expiration Date: 04/27/2021
 Purpose of Registration: All Awards

Entity Registration

Please click the 'Edit' button to update the entity.

Page Description

This page contains a view of the entire Entity Registration record. To print or save a copy of this registration, select Print. To view a specific section of the registration, select one of the sub-navigation links (for example, Core Data or POCs) under Entity Registration. To access a previous version of this registration, pick from the record drop-down list then select View Selected Record. The page will reload to display the record.

PRINT

Current Record View Selected Record

DUNS Number: 080149595
 D&B Legal Business Name: Slayden Constructors, Inc.
 Doing Business As: (none)

Core Data

Business & TIN Information:

Business Information:
 Business Start Date: 11/20/2015
 Fiscal Year End Close Date: 12/31
 Company Division Name:
 Company Division Number:
 Corporate URL: www.slayden.com
 Congressional District: OR 05
 Initial Registration Date: 06/11/2019
 Submission Date: 04/27/2020
 Activation Date: 04/27/2020
 Expiration Date: 04/27/2021
 MPIN: *****7383

Physical Address:
 Address Line 1: 500 Willamette Ave
 City: Stayton
 State/Province: OR

1/29/2021

View Details - Entity Registration | System for Award Management

Country: UNITED STATES
ZIP/Postal Code: 97383 - 9420
Mailing Address:
Address Line 1: PO Box 247
Address Line 2:
City: Stayton
State/Province: OR
Country: UNITED STATES
ZIP/Postal Code: 97383
Sensitive Identifiers:
EIN: *****8451
IRS consent:
Tax Payer Name: Slayden Constructors Inc
Address Line 1: 370 Interlocken Blvd
Address Line 2: Ste 400
City: Broomfield
State: CO
Country: UNITED STATES
ZIP/Postal Code: 80021
Type of Tax: Applicable Federal Tax
Tax Year: (Most Recent Tax Year) 2018
Name of Individual Executing Consent: Mark Crouser
Title of the Individual Executing Consent: Assistant Secretary
Signature: Mark Crouser
TIN Consent Date: 04/27/2020

CAGE/NCAGE Code

CAGE: 7KHC3

Does this entity have an Immediate Owner? Yes
Immediate Owner's CAGE Code: OZEF1
Immediate Owner's Legal Business Name: MWH CONSTRUCTORS, INC.

Does this entity have a Highest-Level Owner? Yes
Highest-Level Owner's CAGE Code: 89QH5
Highest-Level Owner's Legal Business Name: MWH HOLDINGS, L.P.

Does this entity have any Predecessors? No

General Information

Country of Incorporation: UNITED STATES
State of Incorporation: OR
Company Security Level:
Highest Employee Security Level:

<https://sam.gov/SAM/pages/public/entitySearch/entitySearchEntityRecord.jsf>

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1/29/2021

View Details - Entity Registration | System for Award Management

Business Types

Check the registrant's Reqs & Certs, if present, under FAR 52.212-3 or FAR 52.219-1 to determine if the entity is an SBA-certified HUBZone small business concern. Additional small business information may be found in the [SBA's Dynamic Small Business Search](#) if the entity completed the SBA Supplemental Pages during registration.

Entity Structure

Corporate Entity (Not Tax Exempt)

Profit Structure

For Profit Organization

Entity Type

Business or Organization

Purpose of Registration

All Awards

Financial Information

Do you accept credit cards as a method of payment? No

Account Details: CIBC BANK USA - Checking

CAGE Code: 7KHC3

Electronic Funds Transfer:

Account Type: Checking
Financial Institute: CIBC BANK USA
ABA Routing Number: ****3971
Account Number: ***5290
Lockbox Number:

Automated Clearing House (ACH):

ACH U.S. Phone: (503)739-1969
ACH Non-U.S. Phone:
ACH Fax:
ACH Email: ap.slayden@mwhconstructors.com

Remittance Address:

Remittance Name: Slayden Constructors, Inc.
Address Line 1: PO Box 247
Address Line 2:
City: Stayton
State: OR
Country: UNITED STATES
ZIP/Postal Code: 97383

Executive Compensation Questions

In your business or organization's preceding completed fiscal year, did your business or organization (the legal entity to which this specific SAM record, represented by a DUNS number, belongs) receive both of the following: 1. 80 percent or more of your annual gross revenues in U.S. federal contracts, subcontracts, loans, grants, subgrants, and/or cooperative agreements and 2.

\$25,000,000 or more in annual gross revenues from U.S. federal contracts, subcontracts, loans, grants, subgrants, and/or cooperative agreements?

No

<https://sam.gov/SAM/pages/public/entitySearch/entitySearchEntityRecord.jsf>

3/9

1/29/2021

View Details - Entity Registration | System for Award Management

Does the public have access to information about the compensation of the senior executives in your business or organization (the legal entity to which this specific SAM record, represented by a DUNS number, belongs) through periodic reports filed under section 13(a) or 15(d) of the Securities Exchange Act of 1934 (15 U.S.C. 78m(a), 78o(d)) or section 6104 of the Internal Revenue Code of 1986?

Not Selected

Proceedings Questions

Is your business or organization, as represented by the DUNS Number on this entity registration, responding to a Federal procurement opportunity that contains the provision at FAR 52.209-7, subject to the clause in FAR 52.209-9 in a current Federal contract, or applying for a Federal grant opportunity which contains the award term and condition described in 2 C.F.R. 200 Appendix XII?

No

Does your business or organization, as represented by the DUNS number on this specific SAM record, have current active Federal contracts and/or grants with total value (including any exercised/unexercised options) greater than \$10,000,000?

Not Selected

Within the last five years, had the business or organization (represented by the DUNS number on this specific SAM record) and/or any of its principals, in connection with the award to or performance by the business or organization of a Federal contract or grant, been the subject of a Federal or State (1) criminal proceeding resulting in a conviction or other acknowledgment of fault; (2) civil proceeding resulting in a finding of fault with a monetary fine, penalty, reimbursement, restitution, and/or damages greater than \$5,000, or other acknowledgment of fault; and/or (3) administrative proceeding resulting in a finding of fault with either a monetary fine or penalty greater than \$5,000 or reimbursement, restitution, or damages greater than \$100,000, or other acknowledgment of fault?

Not Selected

SAM Search Authorization

I authorize my entity's non-sensitive information to be displayed in SAM public search results: Yes

Assertions

Goods & Services:

NAICS Codes Selected

237110	Yes	Water and Sewer Line and Related Structures Construction
237990		Other Heavy and Civil Engineering Construction

Product & Service Codes Selected

PSC	Description
-----	-------------

Size Metrics

Worldwide:

<https://sam.gov/SAM/pages/public/entitySearch/entitySearchEntityRecord.jsf>

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Annual Receipts (in accordance with [13 CFR 121](#)): \$ 63756121
Number of Employees (in accordance with [13 CFR 121](#)): 184

Location (Optional):

Annual Receipts (in accordance with [13 CFR 121](#)): \$
Number of Employees (in accordance with [13 CFR 121](#)):

EDI Information

Do you wish to enter EDI Information for your non-government entity? No

Disaster Response Information

Do you wish to be included in the Disaster Response Registry? Yes
Does your company require bonding to bid on Contracts? Yes

Bonding Level:

Please provide the bonding level type, value must be input in whole dollars.

Construction Bonding Level, Per Contract (dollars) 1000000000

Geographic Area Served:

State 1: OR
State 2: WA
State 3: ID

Representations and Certifications

Representations and Certifications:

I have read each of the FAR and DFARS provisions presented on this page. By submitting this certification, I, Angela Main, am attesting to the accuracy of the representations and certifications contained herein, including the entire NAICS table. I understand that I may be subject to criminal prosecution under Section 1001, Title 18 of the United States Code or civil liability under the False Claims Act if I misrepresent Slayden Constructors, Inc. in any of these representations or certifications to the Government.

READ ONLY PROVISIONS - The following FAR and DFARS provisions are provided for you to read. They do not require completion of any data. Select the provision number to expand and review the full text. When certifying to the information on this page, you are also certifying that you have read each one of these provisions.

[FAR 52.203-11](#): Certification and Disclosure Regarding Payments to Influence Certain Federal Transactions

[FAR 52.203-18](#): Prohibition on Contracting with Entities that Require Certain Internal Confidentiality Agreements or Statements-Representation

[FAR 52.209-10](#): Prohibition on Contracting with Inverted Domestic Corporations.

<https://sam.gov/SAM/pages/public/entitySearch/entitySearchEntityRecord.jsf>

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[FAR 52.212-5](#): Contract Terms and Conditions Required to Implement Statutes or Executive Orders-Commercial Items.

[FAR 52.222-38](#): Compliance with Veterans' Employment Reporting Requirements

[FAR 52.222-50](#): Combating Trafficking in Persons

[FAR 52.222-56](#): Certification Regarding Trafficking in Persons Compliance Plan.

[FAR 52.223-1](#): Biobased Product Certification

[FAR 52.225-20](#): Prohibition on Conducting Restricted Business Operations in Sudan-Certification

[FAR 52.225-25](#): Prohibition on Contracting with Entities Engaging in Certain Activities or Transactions Relating to Iran - Representation and Certifications

[FAR 52.227-6](#): Royalty Information (Alternate I)

The FAR and DFARS provisions shown below have been populated based on data you provided earlier in your registration. Please open and review each provision before you proceed from this page. If you need to correct any data, a link will be provided to the relevant page for editing.

By maintaining an active entity registration in SAM, the entity complied with requirements to report proceedings data in accordance with FAR 52.209-7 Information Regarding Responsibility Matters and with requirements to report executive compensation data in accordance with FAR 52.204-10 Reporting Executive Compensation and First-Tier Subcontract Awards.

[FAR 52.203-2](#): Certificate of Independent Price Determination.

[FAR 52.204-3](#): Taxpayer Identification

[FAR 52.204-5](#): Women-Owned Business (Other Than Small Business)

[FAR 52.204-17](#): Ownership or Control of Offeror

[FAR 52.204-20](#): Predecessor of Offeror

[FAR 52.204-26](#): Covered Telecommunications Equipment or Services - Representation

[FAR 52.209-2](#): Prohibition on Contracting with Inverted Domestic Corporations-Representation

[FAR 52.209-5](#): Certification Regarding Responsibility Matters

[FAR 52.209-11](#): Representation by Corporations Regarding Delinquent Tax Liability or a Felony Conviction under any Federal Law

[FAR 52.212-3](#): Offeror Representations and Certifications -Commercial Items

The NAICS Codes you selected on the Goods and Services page of this registration are listed in the table under 52.219-1(c). Those NAICS Codes for which you are identified as small serve to complete the small business concern representation in 52.219-1(c)(1).

You are certifying to your size status for all the NAICS codes in the table. Please review it carefully. The Y/N answers are located in the "Small Business?" column. A "Y" indicates "Small" and "N" indicates "Other than Small." This status is derived from the SBA's size standards based on the size metrics you entered.

The NAICS Codes shown are only those you selected. Use the "View More" button to see your entity's size status for any NAICS Code.

[FAR 52.214-14](#): Place of Performance-Sealed Bidding

[FAR 52.215-6](#): Place of Performance

[FAR 52.219-1](#): Small Business Program Representations (Alternate I)

The NAICS Codes you selected on the Goods and Services page of this registration are listed in the table under 52.219-1(c). Those NAICS Codes for which you are identified as small serve to complete the small business concern representation in

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52.219-1(c)(1).

You are certifying to your size status for all the NAICS codes in the table. Please review it carefully. The Y/N answers are located in the "Small Business?" column. A "Y" indicates "Small" and "N" indicates "Other than Small." This status is derived from the SBA's size standards based on the size metrics you entered.

The NAICS Codes shown are only those you selected. Use the "View More" button to see your entity's size status for any NAICS Code.

[FAR 52.219-2: Equal Low Bids](#)

[FAR 52.222-18: Certification Regarding Knowledge of Child Labor for Listed End Products](#)

[FAR 52.222-22: Previous Contracts and Compliance Reports](#)

[FAR 52.222-25: Affirmative Action Compliance](#)

[FAR 52.222-48: Exemption from Application of the Service Contract Labor Standards to Contracts for Maintenance, Calibration, or Repair of Certain Equipment-Certification](#)

[FAR 52.222-52: Exemption from Application of the Service Contract Labor Standards to Contracts for Certain Services-Certification](#)

[FAR 52.223-4: Recovered Material Certification](#)

[FAR 52.223-9: Estimate of Percentage of Recovered Material Content for EPA-Designated Items \(Alternate I\)](#)

[FAR 52.223-22: Public Disclosure of Greenhouse Gas Emissions and Reduction Goals-Representation.](#)

[FAR 52.225-2: Buy American Certificate](#)

[FAR 52.225-4: Buy American-Free Trade Agreements-Israeli Trade Act Certificate](#)

[FAR 52.225-6: Trade Agreements Certificate](#)

[FAR 52.226-2: Historically Black College or University and Minority Institution Representation](#)

[FAR 52.227-15: Representation of Limited Rights Data and Restricted Computer Software](#)

Grants Certifications

The Grants Certifications are a common set of certifications and representations required by Federal statutes or regulations in accordance with the grants guidance under Title 2 of the Code of Federal Regulations (2 CFR 200.208 Certifications and Representations). Those non-Federal entities who intend to apply for, or are already recipients of Federal grants or agreements, must read and agree to the corresponding certifications and representations. Registrants who reply yes to the following question are required to keep these certifications and representations current, accurate, and complete as part of their entity registration.

Does Slayden Constructors, Inc. wish to apply for a Federal financial assistance project or program, or is Slayden Constructors, Inc. currently the recipient of funding under any Federal financial assistance project or program? **No**

Points of Contact

Mandatory Points of Contact:

Accounts Receivable POC

<https://sam.gov/SAM/pages/public/entitySearch/entitySearchEntityRecord.jsf>

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Title:	Staff Accountant
First Name:	Calvy
Middle Name:	
Last Name:	Yue
Email:	calvy.yue@mwhconstructors.com
US Phone:	(303)547-5400
Extension:	
NON US Phone:	
Notes:	

Electronic Business POC

Title:	Vice Pres & Business Controller
First Name:	Matt
Middle Name:	
Last Name:	Smith
Email:	Matt.L.Smith@mwhconstructors.com
US Phone:	(971)277-5682
Extension:	
NON US Phone:	
Notes:	
Address Line 1:	PO Box 247
Address Line 2:	
City:	Stayton
State/Province:	OR
Country:	UNITED STATES
ZIP/Postal Code:	97383

Government Business POC

Title:	Vice Pres & Business Controller
First Name:	Matt
Middle Name:	
Last Name:	Smith
Email:	Matt.L.Smith@mwhconstructors.com
US Phone:	(971)277-5682
Extension:	
NON US Phone:	
Notes:	
Address Line 1:	PO Box 247
Address Line 2:	
City:	Stayton
State/Province:	OR
Country:	UNITED STATES
ZIP/Postal Code:	97383

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Optional Points of Contact:



IBM-P-20210128-1548
WWW6

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Forms

[CM/GC for Sandy Wastewater Treatment Plant Condition Assessment Improvements Project](#)

Form BC 14



State of Oregon Department of Environmental Quality
Contractor's Compliance Statement
Executive Order #11246

Contact: [Regional Project Officer](#)
503-229-LOAN

This form must be signed by the prime contractor and submitted by the time of contract award from the Loan Recipient. A copy must be included in the contract copy to DEQ.

Date 02/16/2021

This statement relates to a proposed contract with City of Sandy, OR

(Name of CWSRF loan recipient)

who expects to finance the contract with assistance from the Environmental Protection Agency. I am the undersigned bidder or prospective contractor. I represent that:

I have I have not participated in a previous contract or subcontract subject to *Executive Order 11246* of September 24, 1965 (regarding equal employment opportunity) or a preceding similar Executive Order. I agree to comply with all the provisions of this Executive Order and the rules, regulations, and relevant orders of the Secretary of Labor. (*41 CFR 60-1.4(b); 41 CFR 60 1.7 (b)*)


Signature

02/16/2021
Date

Jeffrey Garner, President
Name and Title of signer (please type)

Alternative formats

DEQ can provide documents in an alternate format or in a language other than English upon request. Call DEQ at 800-452-4011 or email deqinfo@deq.state.or.us.

Updated May 2019

1



JEFF GARNER

500 Willamette Avenue

Stayton OR 97383

971.277.5643

jeff.garner@mwhconstructors.com

WHERE INNOVATION MEETS ELEVATION



REQUEST FOR QUALIFICATION

CITY OF SANDY, OREGON

Construction Manager/General Contractor

for

Sandy Wastewater Treatment Plant

Condition Assessment Improvements Project



LEEWAY
engineering solutions

"Providing the freedom to act and change"

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Section 1 - Introduction

The City of Sandy, Oregon (“City”) requests from Construction Manager/General Contractor (CM/GC) firms to provide CM/GC services for pre-construction and construction for the Sandy Wastewater Treatment Plant (WWTP) Condition Assessment Improvements Project (“Project”).

The Project will upgrade the WWTP existing processing facilities to provide greater ease of operability, worker safety, and environmental permit compliance. This project is part of a greater effort in Sandy to improve the wastewater system. See “Section 4 – Scope of Work” for additional information regarding services to be provided. Project elements and construction costs are subject to change in the future at the City’s discretion.

The use of the CM/GC process has been approved by the governing body in accordance with the public notice and hearing process in ORS Chapter 279C.335. Construction firms with previous general experience on similar projects are encouraged to submit a proposal.

The City of Sandy (The City) has retained the following consultants in the development and design of the Project:

WWTP Operation: Veolia Water Technologies (Veolia)
Owners Representative: Leeway Engineering Solutions, LLC (Leeway)
Engineer: West Yost and Associates (West Yost)

The CM/GC will be required to report to the City and Owner’s Representative (collectively referred to as “Owner”) and collaborate with the Project Team, the Owner Representative and the Engineer.

This project is funded by the Clean Water State Revolving Fund (CWSRF) which is administered through Oregon Department of Environmental Quality (DEQ).

Project information, proposal requirements and procurement schedule are provided below.

Section 2 - Project Contact

The Director of Public Works is the issuing officer for this Request for Proposal (RFQ) and the point of contact for the City for all process and contract questions as well as protests.

Mike Walker
Director of Public Works
39250 Pioneer Blvd, Sandy, OR 97055
mwalker@ci.sandy.or.us

Brittany Park, PE
Owner’s Representative
Leeway Engineering Solutions
brittany.park@leewayengineeringsolutions.com

Section 3 - Background

The City of Sandy is located approximately 25 miles east of Portland, OR with a population of about 11,000. The WWTP is located on the south side of Tickle Creek near SE Jarl Road.

The City of Sandy has started a large program to improve their wastewater collection, conveyance, and treatment system. The Wastewater System Facilities Plan (WSFP) identified

improvements to be implemented in three phases until 2040. This project, the WWTP Condition Assessment Improvements Project, was identified in the WSFP under Phase 1 improvements. Other projects will include collection system rehabilitation, a new satellite treatment facility, and a new outfall.

The WWTP was first built in 1971 and included screening, contact stabilization process, effluent polishing pond, and disinfection using a chlorine contact tank. A major update was completed in 1997 to add grit removal, activated sludge secondary treatment process, disk cloth filtration, and UV disinfection. For the past 17 years, treatment plant operations have been contracted out; currently the plant is operated by Veolia North America (Veolia).

The treatment plant effluent is used for irrigation by a local nursery during the summer months, May through October. During the winter months, November through April, the effluent is discharged to Tickle Creek.

The City of Sandy has experienced operational and maintenance issues with the current WWTP system. They have exceeded National Pollutant Discharge Elimination System (NPDES) permit effluent limits for total suspended solids (TSS), biochemical oxygen demand (BOD), ammonia, E. coli bacteria, chlorine, and stream discharge dilution requirements.

Section 4 – Project Description

The objective of the project is to upgrade the Sandy WWTP to increase the ease of operability, worker safety, and environmental permit compliance.

The Project will include improvements to the WWTP, including to the headworks, secondary treatment, disinfection, solids treatment and SCADA system. These upgrades are needed to address operational, maintenance and other deficiencies, restore functionality to the WWTP required for NPDES permit compliance. The project is on an accelerated schedule and must be complete as soon as possible to comply with the Mutual Agreement and Order between the City and DEQ. The successful Respondent will be able to meet the schedule outlined in Section 7.

A preliminary design was completed in July 2020 by Murraysmith. The City then contracted with West Yost and Associates (West Yost) to develop the final design for the Project and to provide engineering services during construction.

West Yost is currently working on the evaluation of the preliminary design scope to finalize potential adjustment to the current preliminary design. The CM/GC will start on the project between the 30% and 90% design phase. It is anticipated that work will be separated out into five CM/GC Guaranteed Maximum Price (GMP) packages listed below.

GMP 1: Headworks Influent Screen and Grit Equipment Replacement, Screen Hoist, and Temporary Conduit Replacement.

GMP 2: Stormwater, Secondary Clarifiers, ASSB Walkways, Railings, and Davit Cranes

GMP 3: Aeration Basin, Blower Replacement, and UV System Replacement

GMP 4: Chemical Feed Systems Improvements for Alkalinity Addition and Process Water Chlorination

GMP 5: Solids Building Combustible Gas Detection, PLC Replacement, and SCADA System Upgrades

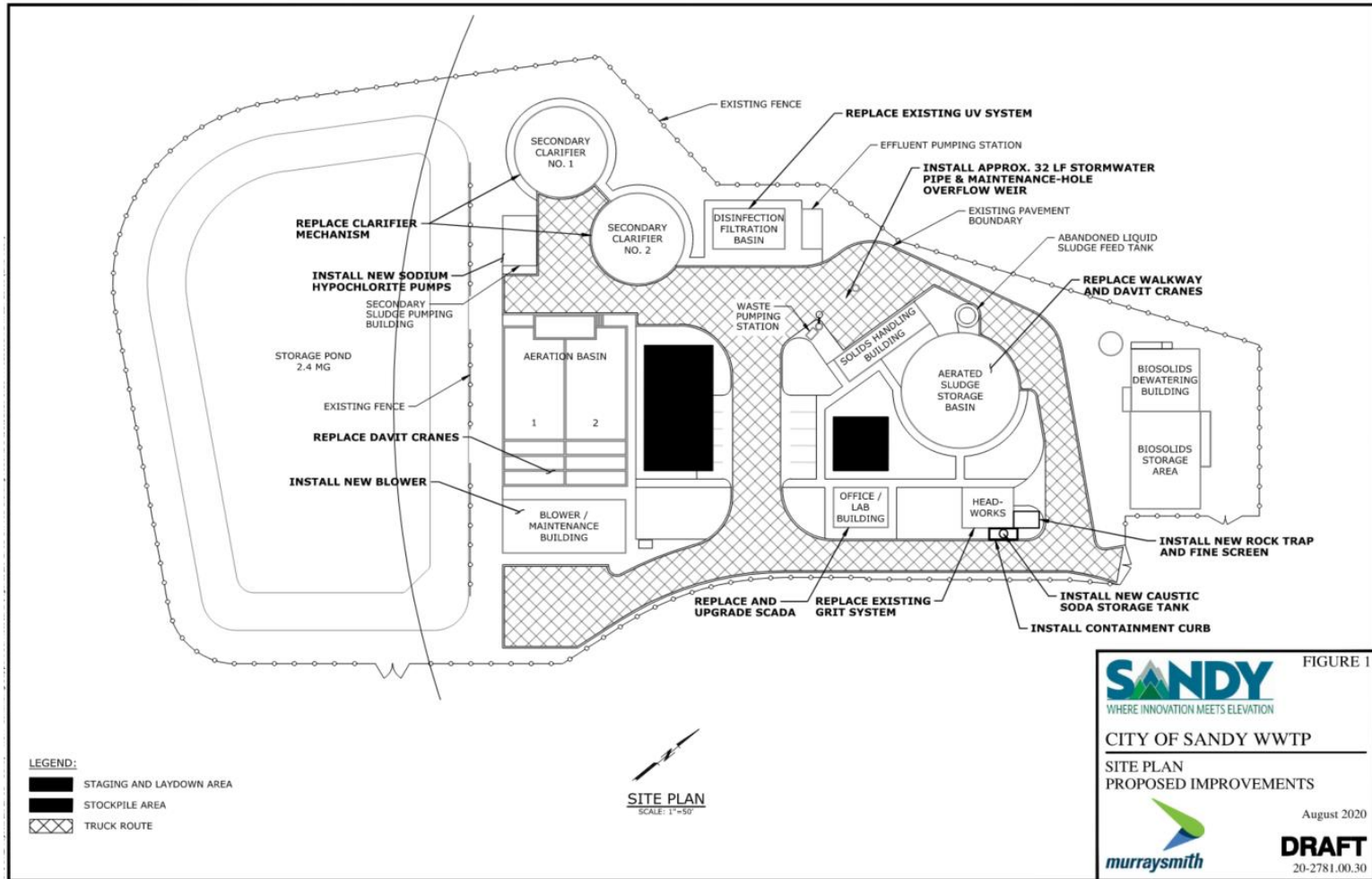
Project elements and construction costs are subject to change in the future at the City's discretion.

1. Planned WWTP Improvements

The Preliminary Design Report, found in Attachment A, detailed the scope of the improvements included in the Project, which are illustrated in Figure 1. Adjustments to the scope will be made based on the Evaluation of Design Scope Project Phase.

Facilities must remain operational during construction; and therefore, successful completion of the Project will require complex construction sequencing.

Figure 1. Map of the City of Sandy Wastewater Treatment Facility.



Section 5 – Preconstruction Services Scope of Work

The CM/GC shall actively participate as a team member with the City, Owner’s Representative, the Engineer, and System Suppliers during the Design and Construction Documents Development Phases prior to construction. The CM/GC shall be responsible for providing necessary consulting expertise to the City to ensure that the project scope, material selection goals, the construction budget and the project schedule are met. During this preconstruction period, the CM/GC shall provide the appropriate professional personnel that were named in response to the Request for Proposals for CM/GC Services and other such personnel as necessary to perform the required Preconstruction Services. Personnel shall include but shall not be limited to, a professional Project Manager or higher level person to attend all meetings described herein and provide or oversee the services the CM/GC is obligated to perform. The Project Manager shall ensure the development of a functional, constructible and cost-effective Project. Work to prepare for and conduct GMP negotiations is not a part of the work contemplated under this section and will not be paid for by the City.

Payment for Phase 1 will be made based on a Lump Sum, not-to-exceed basis, up to the Phase 1 – Pre-Construction Services project amount. Work to prepare for and conduct GMP negotiations is not a part of the work contemplated under this section and will not be paid for by the City.

The City reserves the right to terminate the successful Respondent’s services at any time during Phase 1 and continue with an alternate CM/GC procurement or other procurement, if deemed in the best interests of the City. If this occurs, the successful Respondent will be paid at the agreed upon contract amount for services rendered up to termination.

1. General Provisions

The CM/GC shall work collaboratively and proactively with the City, Engineer, Owner’s Representative, and equipment suppliers to proceed with the planning, design, and development of the Work in a manner which supports the City’s efforts to meet the construction schedule and to keep costs within the City’s budget. The key staff for the City, Owner’s Representative, Engineer, and CM/GC firm shall form the Project Management Team (PMT) for the Project. The CM/GC shall provide Construction Services throughout the Project as defined herein from the preconstruction period through construction phase and startup.

Open Book accounting is required for both the preconstruction and construction phases of the project. The CM/GC must provide all mark-ups and percentages for City approval. No cost can be buried.

2. Preconstruction Services

The CM/GC shall provide Preconstruction CM services, including but not limited to:

- Collaborate with Owner, Engineer, and equipment suppliers to develop the Project.
- Assess and recommend site logistics requirements;
- Recommend phasing, sequencing of work, developing construction packages, and construction scheduling;
- Provide a master schedule for the project using CPM scheduling.
- Provide cost-estimating expertise including knowledge of local labor and subcontracting

- markets to generate viable construction cost estimates prior to GMP;
- Submit and negotiate GMP’s to complete the construction-phase services.
- Attend Project meetings.
- Perform Constructability review services.
- Assess alternative construction options for cost savings;
- Identify products or processes for ongoing value analysis, engineering systems for life cycle cost considerations, and recommending all work necessary to support their implementation
- Provide construction cost estimates.
- Provide project design document review for optimization, life-cycle costs, constructability, risk assessment and mitigation.
- Develop a list of long lead equipment and associated schedule.
- Procure long lead equipment item per request of the City.
- Develop written work plans and permitting assistance.

3. Preconstruction Phase Work Items and Deliverables

1) Project Management Team (PMT) and Design Phase meetings:

Attend PMT meetings conducted by the Engineer during the Design Phase for assumed frequency and duration noted in the Regular Meeting Schedule Table. The PMT meetings will generally be by Microsoft Teams meetings or conference calls. The CM/GC shall participate in Design Phase review meetings as noted in the regular meeting schedule table. For these meetings, the CM/GC will have reviewed the current design documents and questions posed by City, Owner’s Representative and Engineer, and will come prepared to discuss design or other improvements.

Table 1: Regular Meeting Schedule.

Calendar Period	Project Management Team Meetings
Pre- Construction Meetings (bi-Weekly, approx. 3/1/2021-7/23/21)	Assume once every other week, 1 hour over conference call, at least 2 staff members.
90% Design Review Meetings and Preliminary Pricing Workshop	In person intensive design workshop. Assume 5 review meetings (one per GMP package), 4 hrs/each, and at least 3 staff members.

2) Construction Procurement Plan:

Develop and submit Construction Procurement Plan for review by the City, and Engineer. The Construction Procurement Plan must detail approach to self-performed and competitively bid work that meets the City’s requirements. Recommend separation of the work to facilitate bidding and award of trade contracts. Work with the City and Engineer to identify long lead-time materials and equipment. Develop a procurement strategy to mitigate potential schedule impacts due to identified long-lead items and “scope gaps” between trades.

Submit draft Construction Procurement Plans as early within the schedule as possible. There is a minimum percentage of 50% of work that must self-performed. There is no maximum amount of work that can be self-performed. Self-performed is the work completed by the primary contractor

and does not include sub-contracted work. The final Construction Procurement Plan must be approved by the City before the GMP contracts will be awarded. The City and Owner's Representative will review and may provide feedback on subcontractors, materials, or other aspects of the Construction Procurement Plans. The CM/GC should plan to bid against itself for some portions of the project as requested by the City.

3) Constructability Reviews:

Provide constructability comments continuously throughout the design development. One formal plan review will be completed at the 90% design level for each GMP package; for this review, the CM/GC shall provide written constructability review comments and cost- savings comments on plan sets.

4) Construction Cost Estimates:

The CM/GC will develop a cost estimate for the project and work with the engineer to continuously update it throughout the project design. The CM/GC will provide cost estimates for alternative construction ideas as requested. One formal review of the cost estimate will be completed at the 90% design level for each GMP package. The CM/GC shall develop all construction cost estimates with due diligence as their content is critical to the decision-making process for the execution of the project, funding availability and development of work packages.

Preparation of Cost Estimates should include the following:

- a. Review the scope of work prepared by the Engineer.
- b. Provide a construction cost estimate for the Project based on the 90% Construction Documents. The estimate shall comply with the requirements of the Association for the Advancement of Cost Engineering International (AACE International) Class 2 (+20% to -15%) or Class 1 (+10% to -15%) and be considered the initial foundation for the GMP. This estimate should be developed at the start of the project and built on as the design is developed. At the 90% design level, a formal review will be completed on the final cost estimate that has been built throughout the project design.
- c. Engineer will review estimates. CM/GC will respond to any comments from Engineer.
- d. Provide an updated cost estimate after City acceptance.

5) Construction Phasing and Site Safety:

Coordinate with plant operations staff (Veolia) to understand how the plant operates and best means and methods for tying into existing systems to minimize disruptions to operations. Provide comments on construction feasibility and safe working conditions with the constructability review comments. Provide alternative designs and/or materials as appropriate. Comment on site logistics requirements. This activity shall include review of record drawings and investigate the existing conditions at the Project Site to ensure that the Contract Documents reflect the actual site conditions. Recommend and provide when requested by the City, additional tests or investigations to verify existing conditions and/or capability of existing systems.

6) Construction Plan:

The CM/GC shall submit a Construction Plan outlining the processes and procedures that shall be used to perform the aspects of the Work. The Construction Plan shall include the following:

- Plans and actions necessary to comply with environmental requirements;
- Staging areas for construction Equipment and Material storage
- List of work and construction activities by other contractors and subcontractors;
- Temporary facilities to maintain flow and processing;
- Dust/dirt/debris mitigation;
- Temporary erosion control;
- Storm water drainage management;
- A Site-Specific Safety and Healthy Plan
- Plan to facilitate, pay, an acquire all required environmental and building permits.

Draft Plan shall be submitted with each GMP submission.

7) Project Master Schedule:

Develop a project master schedule incorporating the Engineer's Project schedule to create a comprehensive Critical Path Method (CPM) Project Schedule for the Project, using the latest version of Microsoft Project. The schedule shall list all major work packages with an appropriate critical path to complete the design, construction, and startup. Schedule shall be submitted with the GMP and shall be updated monthly with changes and progress and submitted with monthly invoice in native file format and PDF. Schedule shall include each specific CM/GC preconstruction tasks.

8) Risk Management:

Participate in a risk review workshop. In the workshop, the CM/GC will work collaboratively with the City, the Owner's Representative, and the Engineer to develop a project risk register and determine additional activities necessary to mitigate risks prior to GMP negotiations.

9) Final Plan Review:

Provide qualified staff to review the Final Design Drawings and Specifications and provide general coordination assessment comments and constructability comments of the design. Provide written documentation of review comments.

10) Guaranteed Maximum Price Proposal:

In response to Owner's GMP Proposal Request, and in accordance with the terms of the Contract, the CM/GC shall deliver to the Owner a proposed GMP (up to five GMP "packages") for the Project for the Owner's review and acceptance (the "GMP Proposal"). If any actual Subcontractor offers are available at the time the CM/GC shall use those subcontractor offers in establishing the GMP Proposal. Except as permitted under ORS 279C.337(3), OAR 137-049-0690(5)(k) and the terms of the Contract, the CM/GC's selection of subcontractors must be competitive.

The GMP Proposal shall be in conformance with the Construction Procurement Plan, based on the 90% Plans and Specifications, and in accordance with the General Conditions of the Contract. If necessary, Owner and CM/GC shall negotiate the direct cost of the construction in order to agree on a final GMP. Proceeding to the Construction Services Phase (Phase 2) is contingent on The City's acceptance of the GMP.

The GMP shall be the total of items a through j. GMP Proposal shall be organized according to, and including, the following items:

- a. Cost Model per the following requirements that identifies:
 - CM/GC Fee
 - Reimbursable Costs of the Work
 - General Conditions Reimbursement
 - CM/GC Contingency
- b. Prepare an updated cost estimate from Section 5.3.4 for the entire Work in a format approved by the City, based upon the design documents. Upon completion of the estimate, the CM/GC Contractor shall present to the City one estimate of the construction cost based upon agreed assumptions including: the date of commencement of construction, duration of construction, the phasing of construction (and bidding), escalation factors, design contingency and Negotiated Support Services costs. Cost estimates shall be submitted in a Schedules of Values spreadsheet in an excel document. The supporting documentation shall be submitted in PDF files and include subcontractor and supplier quotes, personnel hourly rates, equipment rental rates, labor hours, contingency justification, procurement plans, and all other cost estimate supporting materials. The cost estimate shall be updated to include City's and CM/GC's document review comments to achieve a total reconciliation of the total project/each work phase. In the event that the reconciled estimate is higher than the City's budget, and as directed by the City, the CM/GC Contractor shall present to the City a list of value analysis/value engineering cost- savings equal to or greater than the amount the estimate exceeds the budget and continue to work with the Engineer to define a scope that is within the budget.
- c. Identifying any changes from from Owner-accepted Construction Procurement Plan in Section 5.2.3.
- d. Baseline Construction Schedule in Section 5.2.7 with critical path of the work and include the anticipated Notice to Proceed Date, Substantial Completion Date and Final Completion Date upon which the GMP Proposal is based.
- e. Schedule of Values aligned with GMP.
- f. A list of the Documents, including all addenda thereto as well as list of drawings, technical specifications, reports, pre-construction plans etc. which were used in preparation of the GMP Proposal.
- g. A list of the clarifications and assumptions made by the CM/GC in the preparation of the GMP Proposal to supplement the information contained in the Documents.
- h. A list of eligible General Conditions Reimbursement items.
- i. Payment for the construction of the Project will be paid through a Schedule of Values or Bid Schedule developed by the CM/GC and the Owner and Engineer during the Pre-Construction Services Phase. The GMP is not a lump sum contract (although some bid items may be lump sum) and most items are measured and paid at actual quantities. The CM/GC assumes all risk with performance of the bid items, including management of its subcontractors and suppliers. In accordance with ORS 279C.337(2)(g), the City will not pay any amount that exceeds the GMP as reflected in the GMP amendment, unless the excess amount results from material changes to the Scope of Work set forth in the Contract and the Owner agrees to the changes in writing. Respondents are encouraged to suggest additional specific services they can offer that may be of benefit to the design

and pre-construction planning activities described above for Phase 1. The CM/GC shall identify any additional service and the cost for each additional service being offered and describe the benefit to the Owner.

- j. Except as the City may otherwise agree in the Contract, any savings the CM/GC realizes in its performance of the Work will accrue solely to the City. The terms “savings” or “cost savings” for the purposes of this procurement and the Contract are defined in ORS 279C.337(4).

Section 6 – Construction Service Scope of Work

If the City accepts the GMP, which it may choose or decline to accept in its sole discretion, the City and the CM/GC will enter into a GMP amendment. After the GMP amendment is executed, the Construction Phase will begin. This final phase of the work includes construction, management, and completion of all construction work elements within the required schedule on a GMP basis.

Construction is anticipated to require five GMP packages. The City reserves the right to authorize early construction work prior to execution of the GMP amendment, as may be permitted in the contract between City and the CM/GC.

1. Construction Services

Acceptance of the GMP by the City and receiving a Notice to Proceed (NTP) initiates the Construction Services Phase, which will include complete construction services for the actual construction of the Project. The CM/GC shall be responsible for construction means, methods, sequencing, scheduling, coordination, selection and supervision of subcontractors (subject to the City review under the terms of the Contract), and self-performing a portion of the Work, per the Contract Documents. Phase 2 Construction Services required of the CM/GC include, but are not limited to, the following tasks:

- Procure and furnish payment and performance bonds prior to execution of the construction contract.
- Provide necessary insurance coverages and certificates, consistent with the Project General Conditions, prior to the execution of the construction contract.
- Identify any proposed changes from Phase 1 in Key Personnel (as identified in Qualifications) and obtain City approval for such change(s). Identify any changes from Phase 1 in City-approved Subcontractors and obtain City approval for such change(s).
- Submit the Construction Plan with each GMP.
- Update and implement plans developed during the Pre-Construction Services Phase.
- Any other plans as required during the Pre-Construction Services Phase.
- Maintain a critical path schedule and fully advise the Owner of work progress status. Provide monthly reports of work progress in comparison to estimated scheduled Projections. Explain significant variations and provide supporting information, as required by the Owner. Develop schedule recovery action plans if Project work lags behind projected work schedule by greater than 30 calendar days.
- Make available all cost and budget estimates, including supporting materials and records to the City. Provide monthly reports of actual costs in comparison to estimated cost

projections. Explain significant variations and provide supporting information, as required by the City. Develop recovery action plans when required.

- Provide the following reports, as required by the City:
 - a. Monthly Payment Applications with supporting documentation
 - b. Two-week construction activity forecast (two-week look ahead)
 - c. Weekly construction status report
 - d. Monthly Project update report
 - e. Updated Comprehensive Construction Schedule on a monthly basis
 - f. Monthly Bureau of Labor and Industries (BOLI) Certified Payroll reports
 - g. Supporting document as required by any special funding sources, such as DEQ CWSRF loans
- Provide the following coordination and administration services:
 - a. Project Superintendent - Maintain the originally identified, full-time Superintendent(s) as identified in the Qualification with necessary staff at the active work site to coordinate and provide direction of the work. The Superintendent will be required to ensure adequate Quality Control management, Project Scheduling and Project Site Safety Management. It is anticipated that the project superintendent will be onsite full time for the construction duration of 5 – 7 months and work continuously with plant staff.
 - b. Provide additional staff, as required, to properly manage the Project and ensure conformance with plans and specifications.
 - c. Conduct daily internal staffing and planning meetings.
 - d. Coordinate with all public and private utility providers in the project area. Coordinate all public and private utility work done by others.
- Plan for and participate in weekly schedule and coordination meetings with the Owner.
- Provide 3rd party inspection services.
- Provide contract management services, as described below:
 - a. Review and process all twice-monthly applications for payment by subcontractors and material suppliers in accordance with the terms of the Contract. Review and resolve, on behalf of the City, all subcontractors’ and/or material suppliers’ requests for additional costs.
 - b. Contracts administration as defined in the Contract Documents.
 - c. Change management as defined in the Contract Documents.
- Furnish one-year warranty and associated services, per Contract Documents.
- Implement any other plans as required during the Pre-Construction Services.

Section 7 - Schedule and Budget

Table 2 contains the proposed project schedule. The total project budget is \$3M, which includes construction management, and construction.

Table 2: WWTP Condition Assessment Improvements Project Schedule

Task	Completion Date
Preliminary Design	August 2020
GMP 1 – Headworks Design	April 2021
GMP 2 – Clarifiers/ ASSB/Stormwater	April 2021

GMP 3 – Aeration Basin/ Blowers/ UV	May 2021
GMP 4 – Chemical Feed Systems	March 2021
GMP 5 – Electrical and SCADA	July 2021
Construction Complete	December 2021

Section 8 - Qualification Contents

Interested and qualified firms are invited to submit a Response that demonstrates their capabilities in performing similar projects similar to the Project in nature and scale.

Qualifications submitted for this project must address all requested information to qualify for evaluation. Firms are encouraged to keep the responses brief and to the point, but sufficiently detailed to allow evaluation and differentiation of the firm and team.

Responses must include the following items:

1. Cover letter

The Cover Letter must include the following:

- Project title
- Full legal name of proposing business entity
- Structure or type of business entity
- Name(s) of the person(s) authorized to represent the firm in any negotiations
- Name(s) of the person(s) authorized to sign any contract that may result
- Contact person’s name, mailing or street addresses, phone and fax numbers and email address
- introductory letter expressing interest in the project

2. Bonding Capacity

Provide a letter from the firm’s surety that verifies the ability to bond at least \$3,000,000 for this Project. The surety must be authorized by law to do business in Oregon and must have an A.M. Best Company Rating of “A” or better. Project will require separate Payment and Performance Bonds from the selected firm. Letter can be placed in the Appendix.

Describe current and future workload as a percentage of firm’s total bonding capacity. Compare aggregate construction cash flow for the past 12 months and projected through the duration of the project with anticipated cash flow for the project.

3. Experience and Performance (25 points)

a. Firm Profile

Provide a statement on how your firm’s overall experience with providing services related to

wastewater treatment project design and construction support in the Pacific Northwest. The statement should demonstrate the firm's ability to meet the project schedule provided and similar services, with a focus on construction in a municipal treatment facility, as required to successfully complete the project.

b. Specialized Expertise

Provide a representative list of successfully completed recent projects and current projects under development managed by the proposed firm and Project Manager in the Pacific Northwest comparable to the contemplated work within the past 5 years. Provide contact information (name, title, email address and phone numbers) for client project staff on each of these projects. For each project include a description of the project, delivery method, original project budget and completion amount, the number of change orders, and if the project was completed on schedule.

Additional points are available for CM/GC firms showing applicable experience in key technical areas of the Project that are critical to the execution of this Project. These areas are the following:

- Municipal wastewater treatment facility work
- Municipal Wastewater treatment electrical and instrumentation improvements
- HVAC, instrumentation, and control systems installation
- Construction during facility operation
- Experience with CWSRF funded projects
- Experience with direct solicitation

c. History of Performance, Claims, and Disputes

Provide the following information:

- Annual revenue for the past 3 years.
- A list and description of all current, pending, and completed project related litigations that your firm has been involved with
- Current EMR (Experience Modification Rating)
- A statement as to if the firm has been cited for an OSHA violation in the past 24 months. If yes, provide details including specific violations(s) and date(s).

4. Project Team (35 Points)

a. Organization Chart

Provide an organization chart showing the staffing Proposal for the key individuals assigned to the Project Team. The Organization Chart shall include level of commitment, and responsibilities. Indicate the Project Manager, Project Superintendent, and Cost Estimating Lead should. Indicate type of work and Lead Foreman for self-performed work. List potential specialty subcontractors for work not self-performed. The Organization Chart shall show personnel for both the pre-construction and construction phases.

b. Project Team

The City wishes to engage a team that has the ability and experience to provide quality work in a timely manner; a commitment to collaborative project delivery; the resources, capacity and capabilities to deliver the work given other contract obligations; a commitment to a safe workplace for employees, the public, and the City’s employees.

Information for the proposed team should include the following:

- Brief Bios for “Key Personnel”. Key Personnel shall include, at a minimum, the Project Manager, Project Superintendent, and Cost Estimating Lead.
- Two references each for the Project Manager, Project Superintendent and Cost Estimating Lead.

In submitting Qualifications, Respondent represents that the specific members of the Project Team identified in its Response shall be available to Work on this Project and to perform the services described for the complete duration of the Project or as specifically indicated if not the complete duration. Indicate the current and anticipated Project assignments for each person and completion dates for those Projects.

c. Resumes

Provide resumes with the history of employment, education, registrations, work experience, length of time with the firm, and any other information demonstrating the qualifications and abilities of key project staff including experience in comparable projects. Resumes shall be limited to one page per person and can be placed in the Appendix.

5. References (20 points)

Provide a minimum of three (3) references from previous clients on similar projects completed within the past five (5) years. Please include client’s name, address, email, and telephone number.

6. Price Proposal (20 points maximum)

Submit price proposals conforming to the requirements of this RFQ and based on the Scope of Services listed in the Section 5 and Section 6.

The price proposal should identify any assumptions used to develop the Phase 1 Pre-Construction Cost. Include an estimate of expenses and a description of what expenses have been included. Identify staff to be involved in pre-construction along with an estimate of hours and individual billing for each staff.

This Pre-Construction Cost will be the basis for negotiating the pre-construction services phase of the Contract with the City.

CM/GC Fee: The CM/GC Fee shall be the maximum sum payable to the CM/GC by the City for the CM/GC’s performance of all construction management, project management and

administration services as defined herein and in the General Conditions. The CM/GC Fee shall be determined by applying the CM/GC fee percentage as identified in the Proposal to the direct costs of the project including General Conditions Reimbursement and any authorized Bid Alternates.

State the CM/GC Fee as a percentage for which the CM/GC would contract to perform this Project. The percentage so stated in the Proposal shall be the maximum allowable contractual markup on the direct cost of the work, and shall be based on the recovery of ALL indirect costs, overhead costs, G&A costs, and profit, if the CM/GC is awarded the construction contract.

7. Clean Water State Revolving Fund Forms (Attachment D)

The contractor and all subcontractors must be System for Award Management (SAM) registered at the time of Qualification submission. Requirements for the CWSRF Loan program is available on the program website: <https://www.oregon.gov/deq/wq/cwsrf/Pages/default.aspx>.

Respondents shall submit completed Clean Water State Revolving Fund Forms provided as Attachment D. If form is not applicable, mark as not applicable but still include in qualifications. These forms can be placed in the appendix of the qualification.

Qualification Limitations

- Responses are limited to a total of 10 pages of text. Appendixes are not included in the page count. Concise responses are appreciated.
- The limitation does not apply to covers or dividers unless they are used to convey project information. Any 11x17 pages will be counted as two pages. A two-sided page counts as two pages.
- Pages beyond these page limitations will not be evaluated.

Section 9 - Pre-Proposal Meeting and Site Visit

There will be no formal Pre-Proposal meeting. A mandatory site visit to the WWTP will be held on Wednesday, February 3 at 2:00 p.m. In keeping with the State of Oregon, City of Sandy and Veolia Water Technologies requirements regarding COVID-19, face coverings will be required at all times. In addition, no more than 2 representatives from each interested firm will be allowed to attend in order to maintain smaller groups. Please RSVP by Tuesday, February 2 at 5:00pm, with your intent to participate in the site visit and provide your contact information (name, email, and phone number). Details on site access and driving directions will be provided to attendees that RSVP by the time and date above. Attendees who do not RSVP may be precluded from participating.

Please send RSVP to:

Mike Walker
Director of Public Works
City of Sandy
mwalker@ci.sandy.or.us

Brittany Park, PE
Owner's Representative
Leeway Engineering Solutions
brittany.park@leewayengineeringsolutions.com

Section 10 – Qualification Review and Selection

Selection Criteria

The City will evaluate responses per ORS 279A.065. The selection of the CM/GC for this project will be accomplished through a process with an optional interview, as follows:

1. An Evaluation Committee (Committee) will be appointed to evaluate the Qualifications received. For the purpose of scoring Qualifications, each Committee member will evaluate each response in accordance with the requested information listed in Section 6.

The Committee will require a minimum of ten (10) working days to evaluate and score the responses. At any point during the evaluation process, the City is permitted, but is not required, to seek clarification of a response. However, a request for clarification does not permit changes to a response. Each evaluation criterion has been assigned points based on its relative value to Project as a whole. Evaluation will be based on the criterion given in Table 3. Responses that do not include all required pass/fail (P/F) items will not be scored further.

Table 3. Qualification Scoring Criteria

Evaluation Criteria	Points
1. Cover Letter	P/F
2. Bonding Capacity	P/F
3. Experience and Performance a. Firm Profile b. Specialized Expertise c. History of Performance, Claims, and Disputes	25
4. Project Team a. Organization Chart b. Project Team c. Resumes	35
5. References	20
6. Price Proposal	20
7. Clean Water State Revolving Fund Forms	P/F
Total Possible Points	100

2. Optionally and at the discretion of the selection committee, the City will invite up to three

of the top-ranked Respondents for an interview. The interview will be for the purposes of distinguishing teams with close total scores from the project qualifications and price proposals. Evaluation will be based on the criterion given in Table 4.

Table 4. Interview (optional) Scoring Criteria

Criterion	Maximum Possible Points
Oral Interview by subsection	100
Total Maximum Points Available for Interview and/or Presentation	100

The City will award the Project contract to the firm with the highest total sum of points awarded for combined project qualifications, price proposal, and interview (if conducted) (200 points maximum).

Unsuccessful firms will be notified as soon as possible. The City has the right to reject any or all respondents for good cause in the public interest, and the Procurement Officer may waive any evaluation irregularities that have no material effect on upholding a fair and impartial evaluation and selection process.

Point of Contact

Point of Contact: All communications shall be through the contact(s) referenced in Section 2 of the RFQ. At the City’s sole discretion, communications with members of the evaluation committee, other City staff, or elected City officials for the purpose of unfairly influencing the outcome of this RFQ may be cause for the Respondent’s qualifications to be rejected and disqualified from further consideration.

The City has the right to reject any or all submittals for good cause in the public interest, and the Procurement Officer may waive any evaluation irregularities that have no material effect on upholding a fair and impartial evaluation and selection process.

Cost of Submittal

Firms responding to this solicitation do so at their own sole expense. The City is not responsible for any costs associated with submitting responses to this solicitation.

Submittal of Qualifications

To be considered, the applicant must submit two (2) identical copies and one (1) digital (Adobe .pdf file) copy of the response must be received by Mike Walker, Director of Public Works at 39250 Pioneer Blvd, Sandy, OR 97055 by the date and time of Tuesday, **February 16, 2021 at 4:00pm**. Please mark the submittal on the outside of the sealed envelope with the following:

“CM/GC Services for the Sandy Wastewater Treatment Plant Condition Assessment

Improvements Project".

Any addenda to this RFQ will be in writing and will be issued to all persons or businesses that have indicated an interest in this project. No response will be considered if it is not responsive to any issued amendments.

The City reserves the right to negotiate an agreement with the selected firm based on fair and reasonable compensation for the scope of work and services proposed as well as the right to reject any and all responses deemed unqualified, unsatisfactory, or inappropriate, to waive defects or informalities and to offer contact with any firm in response to this RFQ. The City will not pay any costs incurred by the firm in preparing or submitting the response. This RFQ does not constitute any form of offer to contract.

Selection Schedule

The following dates are proposed as a timeline for this project:

Event	Date and Time
Mandatory Site Visit	Wednesday, February 3, 2021 at 2:00 PM
Written responses due	Tuesday, February 16, 2021 at 4:00 PM
Notice of Short-Listed Firms	Friday, February 19, 2021
Interviews (if necessary)	Wednesday, February 24, 2021
Notice of Intent to Award issued	Thursday, February 25, 2021
Notice to Proceed	Tuesday, March 2, 2021

The City reserves the right to make adjustments to the above noted schedule as necessary. Pursuant to ORS 279C.337(2)(i)(D), any Respondent who is not selected may request a meeting with the City within seven days after the date of the Notice of Intent to Award. The City will respond to any timely submitted meeting request with a date and time for the meeting.

Section 9 – Contract Award

Sample Form of Contract

A sample Professional Services Agreement is attached to this document. This is intended to demonstrate the basic framework of the Agreement between the City and the selected firm and not the final form of Agreement between the parties.

CM/GC Selection

The City will award the Contract to the Respondent with the highest combined score from the written response and interview. Should the City not reach a favorable agreement with the highest scoring Respondent the City, at its sole discretion, shall terminate negotiations with the highest scoring Respondent and commence negotiations with the second highest scoring

Respondent and so on until a favorable agreement is reached. The City may terminate negotiations at any time and may cancel the solicitation if it finds it is in the City's best interest to do so.

Contract Development

The qualification and all responses provided by the successful Respondent may become a part of the final contracts. The form of contracts shall be the City's Contracts for Construction Management / General Contractor construction services. A form of Contract will follow via an addendum to this RFQ.

Protest Procedures

A Respondent who objects to the terms and conditions of this RFQ may submit a written solicitation protest to the City in accordance with OAR 137-049-0260 no later than seven (7) days prior to the date qualifications are due. Thereafter, the City will not accept any solicitation protests and will not entertain changes or challenges to the terms and conditions of the RFQ.

Following the Notice of Intent to Negotiate and Award, the public may view response documents. However, any proprietary information so designated by the Respondent as a trade secret or confidential and meeting the requirements of ORS 192.501, 192.502 and/or ORS 646.461 et seq., will not be disclosed unless the City of Sandy determines that disclosure in the public interest is required. At this time, Respondents not awarded the contract may seek additional clarification or debriefing, request time to review the selection procedures or discuss the scoring methods utilized by the evaluation committee.

Respondents who are eliminated at any stage of the evaluation process will be notified of their elimination. At that time, Respondents who wish to protest their elimination shall file a protest within seven (7) calendar days of the notice. Protests submitted to the City may only originate from those Respondents who would receive the contract if their protest was successful. Protests must be in writing and received by the City within seven (7) calendar days, unless otherwise noted, following the date the City's Notice of Intent to Negotiate and Award. The protest must specifically state the reason for the protest and show how its proposal or the successful proposal was mis-scored, or show how the selection process deviated from that described in the solicitation document. No contract will be awarded until the protest has been resolved. Protests must be timely and must include all legal and factual information regarding the protest, and a statement of the form of relief requested. Protests received later than specified or from other than the Respondent who would receive the contract if the protest was successful will not be considered. The exercise of judgment used by the evaluators in scoring the written responses and interviews, including the use of outside expertise, is not grounds for appeal.

The City may waive any procedural irregularities that had no material effect on the selection of the proposed consultant, invalidate the proposed award, amend the award decision, request the evaluation committee re-evaluate any response or require the City to cancel the solicitation.

Section 10 - Business Compliance

Respondents shall comply with all applicable federal, state, and local laws and regulations regarding all

matters concerning this RFQ and its contracts. Respondents shall comply with Title VI of the Civil Rights Act of 1964 and its corresponding regulations.

The Respondent shall be responsible for the following:

Oregon Construction Contractors Board

Respondents must be licensed with the State of Oregon Construction Contractors Board (OCCB) in accordance with ORS 701.005 and any other specialty licensing as required in the RFQ specifications prior to submitting a bid to the City. Respondents must have their OCCB license at the time of submitting this response in order for the qualification to be considered responsive.

For information contact:

CONSTRUCTION CONTRACTORS BOARD
700 Summer St. NE, Suite #300
Salem, OR 97310
(503) 378-4621
Website: <http://www.oregon.gov/ccb>

Prevailing Wage Rates

All work on this project is subject to the State of Oregon Bureau of Labor and Industries (BOLI) Prevailing Wages Rates. The Prevailing Wage Rates for the construction work will be the rates in the BOLI publication titled “Prevailing Wage Rates for Public Works Contracts in Oregon”, including any applicable amendments, in effect at the time the CM/GC contract becomes a public works contract, and which are hereby incorporated into this contract by this reference. The CM/GC contract becomes a public works contract either when the contract first constitutes a binding and enforceable obligation on the part of the CM/GC to perform or arrange for the performance of construction, reconstruction, major renovation or painting, or when the CM/GC contract enters the construction phase, whichever occurs first.

In accordance with OAR 839-025-0020(8), the CM/GC will have a binding and enforceable obligation to perform or arrange for the performance of construction after the public agency and CM/GC commit to the guaranteed maximum price. The CM/GC contract enters the “construction phase” when the agency first authorizes the performance of early construction-type work directly related to the public works project.

The prevailing wage rates in effect on the date of this solicitation are available online: <https://www.oregon.gov/boli/employers/Pages/prevailing-wage-rates.aspx>. In addition, copies of the current BOLI wage rates that will apply to the Work may be obtained from the Bureau of Labor & Industries, 800 NE Oregon St. #32, Portland OR 97232, and phone (503) 731-4200. However, such rates may change before the CM/GC contract becomes a public works contract. As stated above, the applicable rates for construction are those in existence at the time the construction contract or early work is authorized.

Every subcontract must provide that work on the project is subject to the State of Oregon Bureau of Labor and Industries Prevailing Wage Rates. The RESPONDENT awarded the contract is required to post a Public Works Bond with the Oregon Construction Contractors

Board (OCCB) unless exempt prior to start of work on the project. The Subcontractors awarded the contract are required to post a Public Works Bond with the Oregon Construction Contractors Board unless exempt prior to start of work on the project.

Certification as an EEO Affirmative Action Employer

All Respondents must be certified as Equal Employment Opportunity Employers.

Business Tax Registration

All RESPONDENTS must be in compliance with the City of Sandy's Business License and Transit Payroll Tax requirements.

Project Funding

The Respondent's response shall include the Respondent's true estimated cost or fixed price to perform the work regardless of the City's budgeted funds for this work. If the City and the CM/GC are unable to agree on the terms of a final construction contract or if the project does not proceed to construction for any reason beyond the control of the CM/GC, then the CM/GC shall be reimbursed for the actual costs of providing the services during the pre-construction services phase, in a not-to-exceed amount.

It is anticipated that the work under the contract resulting from this solicitation will be funded by the Department of Environmental Quality through the Clean Water State Revolving Federal (CWSRF) Loan program. The selected contractor shall work with the City to ensure all forms, documentation and audits are completed in compliance with funding agency requirements. CWSRF forms and requirements are found in Exhibit A. Requirements for the CWSRF Loan program are available on the program website:

<https://www.oregon.gov/deq/wq/cwsrf/Pages/default.aspx> .

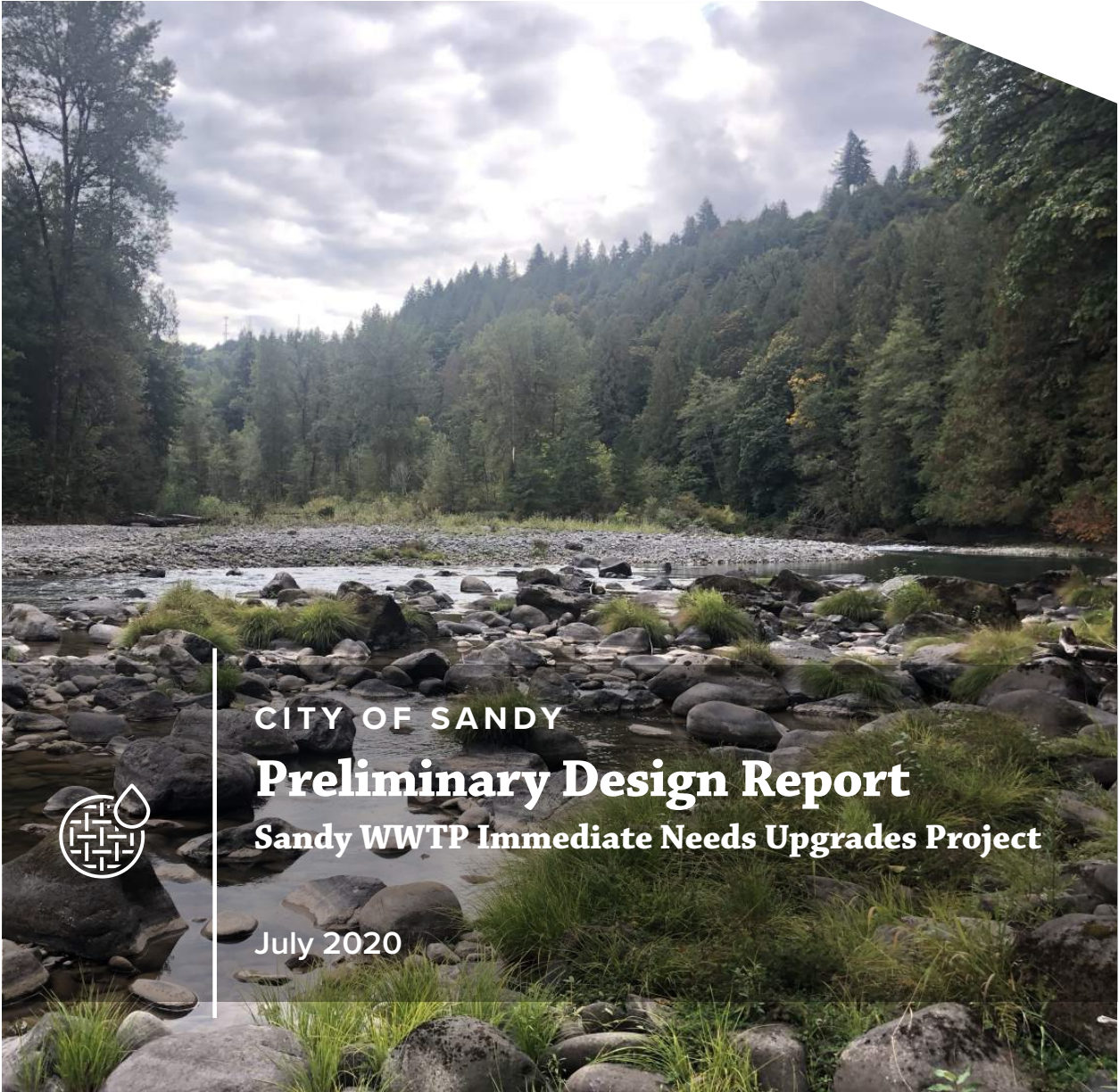
Attachment A – Preliminary Design Report Sandy WWTP Immediate Upgrades Project

Attachment B – General Conditions

Attachment C – Sample Contract

Attachment D – Clean Water State Revolving Fund Forms and Requirements

Attachment A
Preliminary Design Report Sandy WWTP Immediate Upgrades Project



CITY OF SANDY
Preliminary Design Report
Sandy WWTP Immediate Needs Upgrades Project

July 2020

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Appendix

Appendix A – Current NPDES Permit

Appendix B – Condition Assessment Reports

Appendix C – Violations

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Section 1

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Section 1

Introduction

1.1 Purpose

The purpose of this preliminary design report is to document the further evaluation and selection of projects to be included as part of the Immediate Needs Upgrades Project at the City of Sandy Wastewater Treatment Plant (WWTP) that were identified in the Wastewater System Facilities Plan (Facilities Plan), Murraysmith 2019. It is anticipated that the selected repairs and improvements will be carried forward to both final design and construction during the summer of 2021-2022.

1.2 Background

The City owns and operates the City of Sandy WWTP to serve the residents and businesses of Sandy, Oregon. For nearly 20 years the City has used contract operators to operate the plant, the plant is currently operated by Veolia North America (Veolia).

The treatment system, shown in **Figure 1-1**, was first constructed around 1971 and included screenings, contact stabilization process, effluent polishing pond, and disinfection using a chlorine contact tank before discharging into Tickle Creek. The last major treatment plant update occurred in 1997 when the entire plant was updated to include grit removal, activated sludge secondary treatment process, disk cloth filtration, and UV disinfection. During the summer months from May through October, treated WWTP effluent is utilized for irrigation by a local potted plant nursery. During the winter months from November through April, when no irrigation water is needed at the nursery, water is discharged to Tickle Creek.

The treatment plant has exceeded its National Pollutant Discharge Elimination System (NPDES) permit effluent levels for total suspended solids (TSS), biochemical oxygen demand (BOD₅), ammonia, *E. coli* bacteria, chlorine, and stream discharge dilution requirements on several occasions since 2019.

In 2017, the City retained the services of Murraysmith to develop a Wastewater System Facilities Plan for the next 20 years. The facilities plan completed in 2019 evaluated both improvements required for the collection and the existing treatment system. The 2019 Facility Plan also recommended the construction of a new Eastside Satellite Treatment Facility that will be constructed in two phases in 2026 and 2036 that will eventually treat half of the flow from the collection system.

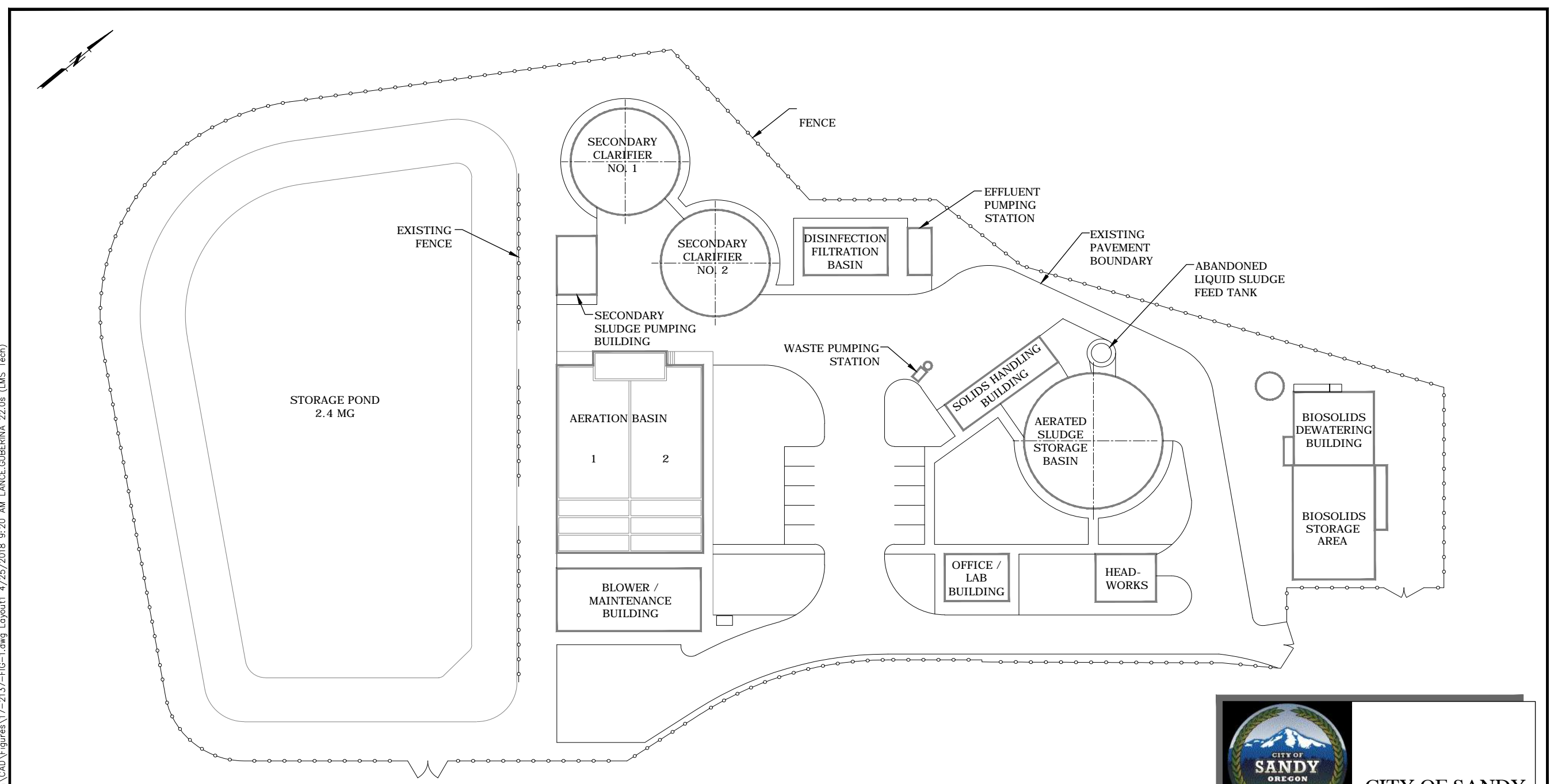
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The facilities plan also outlines several immediate needs projects to improve performance of the plant. In addition, Curran-McCleod performed a condition assessment in July 2019 of the plant and identified additional improvements that required immediate implementation. Since the 2019 condition assessment, several operational and mechanical improvements have been made to the facility by the City and the Contract Operator, Veolia. Based on improvements identified in the 2019 Facilities Plan, the 2019 Curran-McCleod condition assessment, and recent feedback from the Contract Operator, the following immediate needs improvements projects have been identified herein.



1.3 Overview

The preliminary design report is divided into five sections including Introduction, Planning and Design Criteria, Existing Facilities Evaluation, Proposed Improvements, and Project Implementation.

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SITE PLAN
SCALE: 1/4" = 1'-0"

	CITY OF SANDY WWTP
	July 2020
EXISTING SITE PLAN	
FIGURE 1-1	
	Project # - 20-2781

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Section 2

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Section 2

Planning and Design Criteria

2.1 Regulatory Considerations

City of Sandy National Pollution Discharge Elimination System (NPDES) Permit #102492 was renewed January 23, 2010, allowing the discharge of treated effluent to Tickle Creek about one mile downstream of the plant (Outfall 001) during the Winter NPDES Permit Season from November 1st to April 30th, and to a local potted plant nursery for recycled water irrigation during the Summer NPDES Permit Season from May 1st to October 31st (Outfall 002). A copy of the City’s NPDES Permit is included in **Appendix A**. The NPDES Permit expired on November 30, 2013. In 2020 the City submitted a renewal application.

Table 2-1 is a summary of waste discharge limitations for the Sandy WWTP Outfall 001 to Tickle Creek as contained in Schedule A of the City’s NPDES Permit.

Table 2-1
Outfall 001 NPDES Waste Discharge Limits^a

	Monthly Average Concentration (mg/L)	Weekly Average Concentration (mg/L)	Daily Maximum Concentration (mg/L)	Monthly Average Load ^b (lb/day)	Weekly Average Load ^b (lb/day)	Daily Maximum Load ^{b,c} (lb)
Winter Season (November 1 through April 30)						
BOD ₅	10	15	NA	125	187	250
TSS	10	15	NA	125	187	250
Ammonia	3.7	NA	10.9	NA	NA	NA

Notes:

- a) From current Sandy WWTP NPDES Permit #102492 for File Number 78615.
- b) Mass load limits are based upon WWTP average dry weather design flow of 2.5 MGD.
- c) The daily mass load limit is suspended on any day in which the flow to the treatment facility exceeds 2.5 MGD.

Abbreviations:

- mg/L = Milligrams per liter.
- lb/day = Pounds per day.

During the allowed Winter NPDES Permit Season discharge to Tickle Creek from November 1st to April 30th, the current permit does not allow for discharge to Tickle Creek when the available stream dilution is less than 10 based on the following equation:

$$Dilution = \frac{(Q_e + Q_s)}{Q_e}$$

Where: Q_e = WWTP Discharge Flow in MGD
 Q_s = Tickle Creek Flow measured at a gauging station 1 mile upstream from Outfall 002

The NPDES does allow for emergency overflow discharge to Tickle Creek at the plant site (Outfall 003) when flows exceed 4.0 MGD.

2.2 Design Criteria and Planning Period

As part of the Facilities Plan, the 20-year flow and load projections for the entire system was developed as shown on **Table 2-2 through Table 2-4**.

Table 2-2
Summary of Existing and Projected Flow Characteristics

Flow	Existing Flow, MGD	2040 Flow, MGD
AAF	1.4	2.39
ADWF	1.0	2.0
AWWF	1.78	3.05
MMDWF	1.5	2.4
MMWWF	2.6	4.1
PWF	4.0	6.6
PDF	8.9	14.3
PIF	10.3	17.1

Table 2-3
Current BOD₅ and TSS Loads

Parameter	2017 Population	Monthly Average			Maximum Monthly Average		
		Concentration (mg/l)	Load (ppd)	Load Factor (ppcd)	Concentration (mg/l)	Load (ppd)	Load Factor (ppcd)
Summer Season (May 1 through October 31)							
BOD ₅	11,800	286	2,465	0.209	455	3,594	0.305
TSS	11,800	280	2,376	0.201	456	3,465	0.294
Winter Season (November 1 through April 30)							
BOD ₅	11,800	192	2,397	0.203	297	3,467	0.294
TSS	11,800	190	2,383	0.202	342	3,927	0.333

Table 2-4
2040 BOD and TSS Loading Projections

Parameter	2040 Population	Monthly Average		Monthly Maximum	
		Load Factor (ppcd)	Load (ppd)	Load Factor (ppcd)	Load (ppd)
Summer Season (May 1 through October 31)					
BOD ₅	22,400	0.209	4,679	0.305	6,822
TSS	22,400	0.201	4,511	0.294	6,577
Winter Season (November 1 through April 30)					
BOD ₅	22,400	0.203	4,550	0.294	6,582
TSS	22,400	0.202	4,524	0.333	7,454

As outlined in the Facilities Plan, a new Eastside Satellite Treatment Facility that will treat half of the collection system flow will be constructed in two phases (2026 and 2036) by the end of the planning period; therefore, the existing treatment plant will only treat half of the 2040 flow in the long-term, but will need to treat all of the current flow in the near term. A summary of the projected flows only to the Sandy WWTP based on the decreased flow to the plant once the Eastside Facility is constructed are shown in **Table 2-5**, and the revised wastewater loads to the Sandy WWTP are shown in **Table 2-6** and **Table 2-7**.

Table 2-5
Summary of Existing and Projected Flow Characteristics for Sandy WWTP

Flow Event	2017	2020	2025	2026 ¹	2030	2035	2036 ²	2040
AAF	1.4	1.45	1.53	0.93	1.14	1.35	0.76	1.20
ADWF	1.08	1.12	1.18	0.72	0.88	1.05	0.59	0.93
AWWF	1.78	1.85	1.95	1.19	1.45	1.73	0.97	1.53
MMDWF	1.41	1.46	1.54	0.94	1.15	1.37	0.77	1.21
MMWWF	2.66	2.76	2.91	1.8	2.17	2.58	1.44	2.27
PWF	5.01	5.19	5.48	3.34	4.08	4.85	2.71	4.28
PDF	5.87	6.08	6.42	3.91	4.77	5.68	3.18	5.02
PIF	9.05	9.38	9.9	6.40	7.730	9.13	5.63	7.00

Notes:

1. First phase of Eastside Satellite Plant begins operation in 2026
2. Second Phase of Eastside Satellite Plant begins operation in 2036

Table 2-6
Sandy WWTP Monthly Average BOD and TSS Loading Projections

Year	Dry Weather Monthly Average			Wet Weather Monthly Average		
	Flow	BOD, lbs/day	TSS, lbs/day	Flow	BOD, lbs/day	TSS, lbs/day
2020	1.12	2,691	2,588	1.85	2,613	2,600
2025	1.18	3,089	2,971	1.95	3,000	2,986
2026*	0.7175	1,878	1,806	1.19	1,827	1,818
2030	0.8775	2,322	2,233	1.45	2,256	2,245
2035	1.05	2,824	2,716	1.73	2,744	2,730
2036*	0.585	1,577	1,517	0.97	1,533	1,525
2040	0.925	2,337	2,248	1.53	2,270	2,259

Table 2-7
Sandy WWTP Maximum Month BOD and TSS Loading Projections

Year	Dry Weather Maximum Month			Wet Weather Maximum Month		
	Flow	BOD, lbs/day	TSS, lbs/day	Flow	BOD, lbs/day	TSS, lbs/day
2020	1.46	3,926	3,785	2.76	3,785	4,287
2025	1.54	4,508	4,345	2.91	4,345	4,922
2026	0.9375	2,744	2,645	1.78	2,650	3,002
2030	1.1475	3,394	3,271	2.17	3,273	3,707
2035	1.37	4,124	3,976	2.58	3,975	4,502
2036	0.765	2,307	2,224	1.44	2,223	2,518
2040	1.205	3,411	3,288	2.27	3,288	3,724

Once the Eastside Satellite Treatment Facility opens in 2026, solids from that plant will also be sent to the Sandy WWTP through the sewer collection system since the satellite treatment facility will not have solids handling facilities. As a result, the design for the Sandy WWTP will have to account for the additional load coming from the Eastside Satellite Treatment Facility solids.

2.3 Reliability Criteria

The City of Sandy WWTP must meet EPA Reliability Criteria, Class I. Class I redundancy is required for treatment works whose discharge into their respective receiving streams could permanently or unacceptably damaged by degraded water quality in the effluent for only a few hours. This reliability criteria requires preliminary, primary treatment, and disinfection have redundant components so that if one basin is out of service for several days, the treatment plant can still meet monthly treatment requirements. A more detailed discussion of the reliability requirements is covered in the Facility Plan.

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Section 3

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Section 3

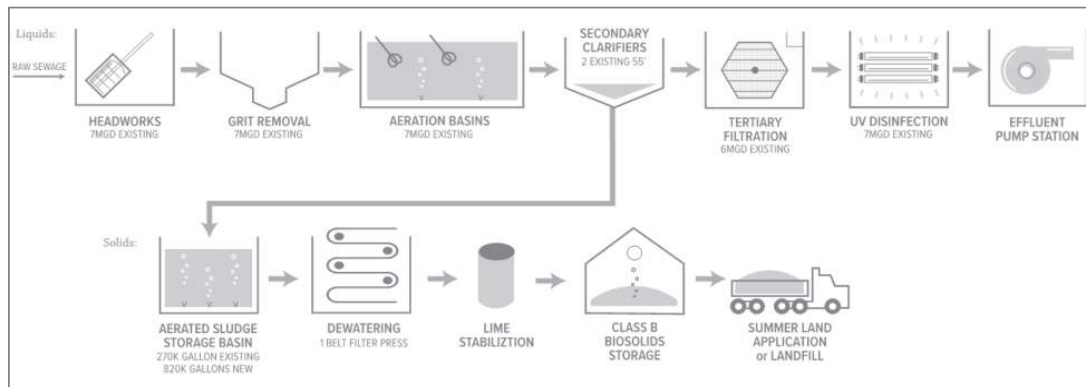
Existing Facilities Evaluation

3.1 Background

The City of Sandy has recently completed three independent condition assessments. The first condition assessment, conducted in 2018 by Murraysmith as part of the 2019 Facilities Plan work, evaluated the facility while under Jacobs operations staff. In 2019, the operations contract transitioned from Jacobs to Veolia. Several improvements were made by Veolia after the transition. Both Veolia and Curran-McLeod assessed the updated condition of the facility in 2019. All three condition assessments informed the capital improvement projects (CIP) outlined in this report and are included in the **Appendix B**. Health and safety projects and projects with the highest impact on treatment performance and permit compliance are prioritized. The deficiencies noted were discussed with City and Contract Operators staff to determine the priority, cost, and status of the proposed improvements.

The existing process schematic is shown on Figure 3-1 below. A detailed list of mechanical equipment can be found in the Existing WWTP Capacity Evaluation of the Facilities Plan.

Figure 3-1
Existing WWTP Process Schematic



A summary of the design capacity of the facility is listed in Table 3-8. The plant lacks redundancy for 2040 Maximum Monthly Average Wet-Weather Flows (MMWWF) in the headworks, secondary treatment, and tertiary filter. As noted earlier, the facilities plan includes the construction of a satellite facility which is planned to reduce the peak flows at the existing plant by approximately 50 percent.

Table 3-8
Design Capacity of Unit Processes at Sandy WWTP

Headworks Treatment	
<i>Mechanical Fine Screen</i>	6.6 MGD
<i>Influent Flow Measurement</i>	9.2 MGD
<i>Grit Chamber</i>	7.0 MGD
<i>Grit Pump</i>	250 GPM @ 30 FT TDH
<i>Grit Concentrator</i>	250 GPM
Secondary Treatment	
<i>Aeration Basin</i>	
Number of Trains	2
Total Basin Volume	740,000 gallons
Selector Zone Cells (3 per train)	75,000 gallons each
Aerobic Cells (1 per train)	145,000 gallons each
Average Sidewater Depth	17.79 feet
<i>Internal Recirculating Pumps</i>	Two each 750 GPM @ 12.0 FT TDH
<i>Process Blowers (No. 1-3) aeration basin</i>	1,350 SCFM
<i>Process Blower (No. 4) aeration basin</i>	1,199 SCFM
<i>Air Compressor – backup</i>	46.2 CFM
<i>Secondary Clarifier</i>	
Capacity (each)	Two each 3.5 MGD
<i>Return Activated Sludge Pump Station</i>	Two each 600 GPM @ 23 FT TDH
Filtration	
<i>Disk Filter</i>	6 MGD
<i>EQ Pumps from Effluent Filtration to Pond</i>	980 gpm @ 27 FT TDH
Disinfection (By UV Oct 15 – May 15)	
<i>UV System</i>	7.00 MGD
Disinfection (By 12.5% Sodium Hypochlorite, May 15 – Oct 15)	
<i>Sodium Hypochlorite Storage Tank</i>	Two each 1,000 gallons
<i>Sodium Hypochlorite Pump</i>	5.0 gph
<i>Sodium Bisulfite</i>	55-gal drum
Effluent Pump Station	
<i>Effluent Pump Station</i>	Four each 700 GPM @ 108 FT TDH
Solids Treatment	
<i>Aerated Sludge Storage Basin</i>	
Center Well	90,000 gallons
Cell No. 1:	90,000 gallons
Cell No. 2:	180,000 gallons
<i>ASSB Decant Pumps</i>	50 GPM @ 22 FT TDH
<i>Lime Slurry Pump</i>	25 gpm @ 69 FT TDH

<i>Dewatering Press</i>	160 GPM; 640-1680 Dry LBS/HR
<i>Dewatered Sludge Pump</i>	15 gpm
<i>Utility Water Pumps</i>	50 GPM @ 100 psig
<i>Utility Water Flowmeter</i>	8 - 450 gpm
<i>Utility Water Pumps</i>	750 GPM @ 12.0 FT TDH

3.2 Performance Evaluation

Recent violations from 2019 have documented Sandy WWTP violating their NPDES permit for discharging to Tickle Creek outside of the permitted season, discharging chlorine through the stormwater drain, exceeding permit limits for BOD₅, TSS, ammonia, *E. coli* bacteria, and stream discharge dilution requirements. A copy of the DEQ enforcement letter is included in **Appendix C**.

In 2018, Murraysmith completed an on-site evaluation of the major unit processes as part of the Facilities Plan to identify specific areas for improvements. As part of this on-site evaluation, several unit processes were identified as needing repair or upgrades to keep the WWTP in good working condition. Since 2018, several maintenance improvements have been made on the system as noted earlier by the contract operators, Veolia. The following section summarizes remaining process deficiencies that need to be addressed based on conversations with the City and Veolia.

3.2.1 Headworks

The headworks was not adequately screening out rags and grit debris, which clogged downstream pumps and processes, and ultimately affected the desirability of the dewatered biosolids. Recent repairs to the screens have improved performance, but several repairs are still needed. In addition, there are no means of removing the screen from the channel to allow for routine maintenance which makes the screen vulnerable to future performance problems. If the screen is not repaired or replaced, rags and other large debris can bypass the screen causing clogging on equipment and lead to poor performance.

The grit removal system pump was recently repaired, but the equipment is near the end of its useful life and needs to be replaced.

3.2.2 Aeration Basin Splitter Box

A new aeration basin splitter box was installed in 2018 that controls flow to the aeration basin and the equalization basin using two fixed weirs. The weir to the equalization basin is 6 inches above the weir to the aeration basin, so some flow begins to divert to the equalization basin when the flow to the aeration basin exceeds 2.0 MGD. Because the weir is fixed, the operators cannot control the rate of flow or amount of water being diverted to the equalization basin which can lead to either overflowing the equalization basin or overloading the downstream treatment processes. Therefore, the improving flow split control to the equalization basin should improve performance by controlling peak flows.

3.2.3 Aeration Basin

For many years, there was no aeration control system in the aeration basins which lead to inefficient and at times unstable treatment performance. In addition, there were several noticeable air leaks in the air piping at the time of the condition assessment. Veolia has repaired some of the more obvious air leaks and installed dissolved oxygen (DO) probes into the aeration basins, but the current aeration system is not able to efficiently match the air flow demand using the existing blower and SCADA controls. Gaps in the operating range of the blowers, mainly between the small blower and the three larger blowers, create inconsistency in air delivery and basin DO. This can lead to non-ideal dissolved oxygen concentrations that can impair biological removal of BOD and ammonia which can result in permit violations.

The influent wastewater has relatively low alkalinity. As a result, the aeration basin has pH issues due to alkalinity consumption when nitrification is occurring in the basins. The lower pH can inhibit biological treatment which can result in permit violations. Veolia has installed a temporary sodium hydroxide feed system at the headworks facility to increase pH and mitigate the pH issue, but system is temporary does not have automatic controls to allow for flow to be adjusted based on system performance.

3.2.4 Secondary Clarifiers

The clarifiers were installed as part of the 1997 upgrades and are in need of service and repairs. In 2019, the scum arm broke off and fell into the clarifier. In addition, the effluent weirs are not level causing short circuiting of flow through the units. The return activated sludge (RAS) box leaks which leads to inefficient clarifier performance. Ovivo Eimco, the clarifier manufacturer, as well as Rebuild-It Service Group performed a site visit and inspection of the clarifier units in June 2020, a copy of the field visit report is included in **Appendix D**.

3.2.5 Effluent Filter

The effluent fabric disk filters were also installed in 1997. Aqua-aerobics, the filter manufacturer, inspected the filters in February 2020, and identified several mechanical issues including missing seals, worn cloth media and frames, and misalignment of shoes required for backwashing. This has resulted in the filters not operating effectively which has led to permit exceedances in TSS and BOD. The filters are being repaired as part of maintenance program in May-June 2020. A copy of the Aqua-Aerobics field visit report is included in **Appendix E**.

3.2.6 UV Disinfection

The UV Disinfection system was also installed in 1997. The unit, Trojan UV4000, is no longer supported by the manufacturer and finding parts for the system is difficult. In addition, several parts need replacing including the control panel, UV transmittance meter, and the quartz sleeve cleaning system. Issues with the UV Disinfection system has led to permit exceedances for *E. coli* bacteria.

3.2.7 Aerated Sludge Storage Basin

The existing aerated sludge storage basin (ASSB) is one of the original structures at the plant and is showing age. The walkway installed around the centerwell is constructed of a single plank of wood and non-OSHA approved handrailing. This walkway creates a non-safe working environment for the operators that will need to be improved.

3.2.8 Biosolids Dewatering Building

The biosolids dewatering building does not have a combustible gas detector installed which creates a potential health and safety hazard for the operators. The National Fire Protection Association standards (NFPA 820) require combustible gas detectors with any new installation, addition, or modification to a facility. Gas detection is primarily for methane gas, although detectors for hydrogen sulfide gas and oxygen monitoring is also sometimes used. Due to the density of methane gas, the detector should be located near the roof of a structure. Hydrogen sulfide and oxygen monitors are placed in the breathing zone. Alarm signaling for combustible gas detection and ventilation are mandated by NFPA 820.

3.2.9 Process Water System

Process water at the site is pumped from the filter effluent channel to the blower building where it is stored in a hydropneumatic tank before being used throughout the site. During the winter season, the process water is not disinfected because no chlorine is added to the water and the water is withdrawn before UV disinfection. Therefore, use of the process water can result in a health and safety concern for the operators of the plant.

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Section 4

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Section 4

Proposed Improvements

4.1 Introduction

To address the issues identified in the condition assessment, the following section will describe improvements to be made to individual unit processes at the facility as well as the design criteria for each process.

4.2 Fine Screen

The fine screen is installed to protect the downstream treatment processes by removing large debris and rags from the influent. The fine screen basket drum was previously damaged during a storm event which resulted in some of the influent to bypass the screen. The screen has been repaired, but because there is no means of removing the screen from the channel, all the required maintenance on the system cannot be performed. The following section discusses the improvements that are proposed to address the issue.

4.2.1 Design Criteria

The existing drum screen will be replaced in kind with a Lakeside Raptor Fine Screen. Since the system will be replaced with equipment by the same manufacturer, the fine screen channel will not be modified. The control panel will also be upgraded to improve operational control by SCADA.

To improve maintenance accessibility, a lift system will be installed next to the screen. The total fine screen weight is 2,900 pounds, but to pivot the screen out of the channel requires a lifting force of 2,300 pounds. To lift the screen from the channel, a wall-mounted lift system rated at 3,0000 pounds will be installed. These proposed improvements are shown in **Drawing M-1**.

The hoist will be equipped with an electric motor to allow for easier operation. The motor can be powered by PN-900 by adding a new circuit breaker to the panel.

4.3 Vortex Grit Removal System

The vortex grit removal system is designed to remove sand, gravel, bone, eggshells, coffee grounds, and other particles that are denser than other biodegradable organics in the wastewater. As noted earlier, the existing vortex grit system is at the end of its useful life and needs replacing due to the abrasive environment in which it operates. Replacing the mechanical components of the grit removal system will improve protection of downstream equipment including the aeration

system diffusers and mechanical equipment. The following section summarizes the design criteria for replacing the grit system.

4.3.1 Design Criteria

The PISTA® grit vortex grit removal system will be replaced in kind with equipment supplied by Smith and Loveless. Since the system will be replaced with equipment by the same manufacturer, the grit chamber will not be modified. The proposed improvements are shown in **Drawing M-1**. The new system will have the same peak treatment capacity of 7.0 MGD as the existing system.

Existing electrical conduit and control connections from the Blower Building failed recently and caused circuit breakers to trip and downtime. An above ground temporary cable has been installed to allow operations to continue. Inspection and permanent repair/replacement of the conduit and wiring will be part of the system improvements.

4.4 Alkalinity Feed System

Wastewater alkalinity is a measure of the ability of wastewater to buffer pH changes. The process of nitrification that occurs in the aeration basins consumes alkalinity which results in lower pH that can inhibit biological treatment processes. The influent wastewater at the plant does not have enough natural alkalinity to prevent nitrification from lowering the pH to suboptimal levels. Veolia installed a temporary sodium hydroxide tank and feed system in the Headworks, but the system is manually adjusted and does not allow for any feedback controls. Replacing the current temporary alkalinity feed system with a flow paced alkalinity feed will allow for maintaining optimum pH in the aeration basins which will assist in the biological processes to oxidize BOD and ammonia to meet permit.

4.4.1 Design Criteria

The alkalinity feed system will consist of a 5,000-gallon polypropylene tank that contains caustic soda (sodium hydroxide) solution. The tank will be surrounded with a 14-foot long by 14-foot wide by 5-foot tall concrete wall to provide secondary containment to prevent accidental spilling. Ultrasonic level transmitters will be located in the tank to detect the liquid level as well as to provide a high-level alarm during filling that will include both local and SCADA notifications. The sodium hydroxide will be delivered upstream of the Parshall flume using two redundant diaphragm chemical metering pumps rated up to 500 gallons per day with double contained PVC piping. The chemical metering pumps will be equipped with pulsation dampeners, calibration column, backpressure relief valve, and ball valve check valves. In addition, the piping and equipment will be heat traced to prevent freezing in the winter. The flow rate of the alkalinity feed will be flow paced using flow data from the Parshall flume as well as the measured pH in the aeration basins.

The caustic soda feed pumps will be controlled by PLC-100 and requires a new circuit breaker and control relay be added to PN-900.

Analog control of the dosing pump is available at PN-900/PLC-100 located in the Office/Laboratory. Existing PLC analog output modules have spare capacity. New instrumentation will be installed to measure pH and Alkalinity at Aeration Influent and used for feedback to PLC-100 for dosing control.

The Alkalinity Feed System Improvements are shown in **Drawing M-1**.

4.5 Aeration Basin Splitter Box

The current aeration basin splitter box does not allow enough control of flow to the equalization basin due to the elevation of the fixed weirs installed. The proposed improvements will install a new flow control structure that includes an automatic gate that can be controlled by SCADA to divert the flow the equalization basin.

4.5.1 Design Criteria

The existing 16-inch PVC bypass pipe from the aeration basin splitter box to the equalization basin will be extended into the equalization basin to a concrete flow control structure. The flow control structure will consist of a 6-foot tall by 4-foot long by 4-foot wide concrete box. Flow out of the flow control structure will be regulated using a motor actuated slide gate. To provide access to the flow control structure, a 3-foot wide aluminum walkway will be installed from the road to the flow control structure.

In addition, a 350 gallons per minute (gpm) submersible pump will be installed at the flow control structure, that will discharge into the 16-inch bypass pipe to allow for drainage of the equalization basins back into the aeration basin as needed.

Lastly, to track the flow into and out of the equalization basin as well as the current water level in the equalization basin, a 12-inch Krohne TIDAFLUX 2300 mag meter will be installed on the bypass pipe and an ultrasonic level transmitter will be installed in the equalization basin at the flow control structure.

The aeration basin splitter box improvements are shown in **Drawing M-2**.

4.6 Aeration Basin Blowers

The blower building is equipped with three constant speed multistage centrifugal blowers rated at 1,350 standard cubic feet per minute (scfm) and one variable speed rotary lobe blower rated between 400-1,100 scfm that provide air for the aeration basins. Veolia recently installed DO probes into the aeration basin to improve aeration control. The air demand from the control scheme attempts to operate the blowers in the performance gaps in the blower capacity, which causes frequent cycling of the blowers that can lead to decreased blower life. To address this issue, two new variable speed blowers will replace two of the multi-stage centrifugal blowers to improve

performance and reduce energy cost. Additionally, there is no means of controlling the air flow to the two aeration basins which has resulted in imbalanced air flow.

4.6.1 Design Criteria

To identify the current and future air demand for the aeration basins, a Biowin model of the plant was constructed and the air demand was estimated based on the current and projected loads identified in the **Section 2.2**. Based on the model, the range of air demands is from 1,200 scfm to 2,200 scfm. Therefore, two of the blowers will be replaced with variable speed blowers to operate from 300 to 1200 scfm. The blower improvements are shown in **Drawing M-3**.

To address the air flow imbalance concerns, two new motor-operated butterfly control valves will be installed on the main process air branches for the two aeration basins. Control of the valve will be based on achieving a target DO in each basin. The proposed locations of the motor operated butterfly valves are shown in **Drawing M-4**.

4.7 Secondary Clarifier

The existing secondary clarifiers were installed in 1999. The clarifier mechanism is a suction type configuration provided by Ovivo Eimco that consists of five suction tubes located along the scrapper arm that draws sludge into a central sludge box located in the center well through siphon. The current secondary clarifier mechanisms have some area of corrosion, a scum scrapper mechanism is missing, and the effluent weir is not balanced creating significant short-circuiting issues in the clarifiers. As noted earlier, Rebuild-it Service Group and Ovivo Eimco inspected the clarifiers on June 30, 2020. The following section summarizes the repairs required to improve clarifier performance and effluent water quality.

4.7.1 Design Criteria

Based on the inspection by the clarifier manufacturer, several elements of the secondary clarifier should be replaced or repaired including the scum skimmer arm, scum beach flush valves, seals on the sludge box, sludge pipe valves, spray nozzles, effluent baffles, and the main drive. In addition, the energy dissipating inlet (EDI) and the effluent weir need to be leveled. The clarifier improvements are shown in **Drawing M-5**.

4.8 Process Water Chlorination

The process water system currently does not have the capability to be disinfected throughout the year. To address these concerns, two new sodium hypochlorite pumps will be installed adjacent to the existing sodium hypochlorite pumps and connected to existing piping that will deliver the hypochlorite to the process water piping.

4.8.1 Design Criteria

Two diaphragm metering feed pumps rated up to 100 gallons per day (gpd) will be installed adjacent to the existing sodium hypochlorite feed pumps in the secondary sludge pumping station. The pumps will be equipped with pulsation dampeners, calibration, column, and pressure relief valve. In addition, the pumps will be connected to the existing carrier water system in the secondary sludge pumping station to prevent air binding in the pipes due to volatilization of the hypochlorite. Existing double contained piping previously installed by the city from the secondary sludge pumping station to the process water piping will be used to deliver hypochlorite to the process water system. The hypochlorite will be mixed into the process water through an injection quill. The process water improvements are shown in **Drawing M-6**.

4.9 UV Disinfection System

The existing UV disinfection system exceeded effluent limits a few times and the equipment is at the end of its useful life and the manufacturer is no longer supporting the equipment. Replacement of the UV system will ensure that the disinfection system will meet permit limits in the future.

4.9.1 Design Criteria

The UV disinfection will be replaced with a new Trojan Signa UV disinfection system in the existing channel. With a design flow of 7 MGD with one redundant bank and assuming a design dose of 30 mJ/cm² and 65 percent UV transmittance, the UV system would have three banks, two duty and one redundant. A design of ten lamps per bank for a total of 30 lamps, including ten redundant lamps, would produce a maximum power draw of 21.1 kW. Because the system configuration is significantly different, channel modification will be required. The UV improvements are shown in **Drawing M-7.1 and M-7.2**.

The UV disinfection system will be supplied with a new standalone PLC and Operator Interface. The PLC will have the ability to communicate with SCADA via Ethernet connection for remote monitoring.

4.10 Stormwater Control

The stormwater drainage system at the plant is discharged into Tickle Creek through the same outfall as the effluent pump station overflow discharge (Outfall 003). The City is concerned that there is a potential for accidental discharge of hazardous materials or chlorinated process water into Tickle Creek. Currently, the contract operator has inserted an inflatable plug into the stormwater drainage to prevent accidental discharge.

4.10.1 Design Criteria

To address stormwater issues, a new manhole will be installed in between storm drain manhole #2 and #3. The manhole will be equipped with an outlet control weir. The weir elevation will be set to prevent low frequency storm events as well as accidental flows from discharging into Outfall 003. A new 10-foot, 8-inch PVC pipe will be installed between the new manhole and the waste pump station where most low flows will be pumped to the aeration basin for treatment. Large storm events will result in water overflowing the weir to discharge to Outfall 003. The stormwater improvements are shown in **Drawing M-8**.

4.11 ASSB Walkway and Railing

The existing aerated sludge storage basin (ASSB) has a wood plank walkway around the perimeter of the center chamber where valves are accessed to adjust aeration in the outer chamber. The walkway is small and the handrailing is insufficient for OSHA standards. Replacing the walkway would improve overall health and safety for the operators.

4.11.1 Design Criteria

The existing wood walkway and hand railing around the perimeter of the center chamber of the ASSB will be replaced with a 3-foot-wide platform with OSHA approved handrailing. The platform will be constructed of aluminum grating that is non-slip, anti-corrosion, anti-rust, high strength, light structure, with a high bearing capacity. The design requires approximately 350 square feet of grating. The ASSB improvements are shown in **Drawing M-9**.

4.12 Davit Cranes

There are four davit cranes at the ASSB and one davit crane on the north end of the aeration basin. All are heavily corroded and extremely difficult to operate to lift pumps. One has capacity to lift 1,000 pounds, three have capacity to lift 500 pounds. The cranes on the ASSB have insufficient reach and all the cranes require too much force to crank. The one crane on the aeration basin must be moved manually to use it in three different locations. The crane is very heavy and awkward for a single operator to move. Replacing the davit cranes would help to alleviate the health and safety concerns.

4.12.1 Design Criteria

The four davit cranes on the ASSB will be replaced with equivalent capacity cranes, but with greater reach where required and with less force required to crank. The one crane on the aeration basin will be replaced with three cranes, each permanently mounted at one of the three locations where cranes are required. The davit crane replacements are shown in **Drawing M-8**.

4.13 Combustible Gas Detector Replacement

Fire and explosion hazards in wastewater treatment plants may be mitigated with adequate gas detection and signaling. NFPA 820 Standard for Fire Protection in Wastewater Treatment and Collection Facilities requires sludge pumping station dry wells in unclassified or divide two spaces to have Lower Explosive Limit sensors and O₂ sensors as well as audio/visual alarms.

4.13.1 Design Criteria

Install two MSA ULTIMA® X5000 Gas Monitor A-X5000 gas detectors inside the solids building to monitor O₂, CO and Methane gases. The 4-20mA signals will be connected to PLC-300 and will require the addition of an Analog Input Module. A 24vdc power supply will be supplied to be located in PN-1011. The meters include a dry contact output to interface with a warning beacon/sounder. Beacon/sounder will be 24vdc and the sensors can be wired in parallel and require an additional conduit to PN-1011.

4.14 SCADA Improvements and PLC Upgrades

The existing SCADA system and PLCs are in disrepair and do not provide much assistance in operation. Replacing the SCADA system and PLCs will improve overall operability and reliability of the plant. Historical data logging and automatic report generation will be incorporated to facilitate mandatory reporting compliance. The internet connection is slow and although the system can be accessed remotely using VPN navigation is cumbersome due to limited bandwidth.

4.14.1 Design Criteria

Replacing the PLC hardware, SCADA computer and software will modernize the system and allow for future improvements moving forward and the enhancements listed in this section have been identified as priorities.

The SCADA system computer will be replaced. The new computer will include a Windows 10 Operating system and sufficient hard drive space to accommodate several years of historical data logging. The computer will use a RAID 1 hard drive configuration to help prevent loss of data. Two new 27-inch monitors, keyboard, and mouse will be included.

The Cimplicity SCADA software will be upgraded to accommodate the Windows 10 operating system. Industrial Gateway Server software will provide the required communications drivers to interface with the PLCs.

Several enhancements to the existing WWTP SCADA system programs will be provided including:

1. Alarming: The existing Auto-Dialer system will be replaced with an automated software solution capable of dial-out modem, SMS Text, and email notification. Each alarm will have a unique alarm message and all alarms will be reviewed and verified. Unused alarms will

be removed. A new SCADA screen will be added to allow for configurable alarm set points – LL, L, Hi, Hi-Hi, etc.

2. Screens will be updated to incorporate modern graphics that are easy to navigate.
3. Graphics will be modified for the replacement UV Disinfection System.
4. It is recommended that the City invest in High speed internet to improve remote monitoring experience. It is also recommended that a VPN connection appliance be installed that allows for system integrator remote support of the PLC's and SCADA system. At this time options for high speed internet are limited to trenching cable from the WWTP to the area of HWY 26 or using Satellite Internet.

The PLC replacement and SCADA upgrades will require the installation of an Ethernet Network between several buildings including the Office/Laboratory, Blower/Maintenance, Secondary Sludge, Effluent P.S., and Dewatering. Fiber Ethernet switches will be installed in each building and the GE Genius communication cables will be replaced with multi-mode fiber optic cables.

The PLC replacement will include all hardware including Rack, Power Supply, Processor, and analog and digital IO cards. The following PLC's are included in the Immediate Needs Improvements Project:

Panel	PLC	Location
PN-9000	PLC-100	Office/Laboratory Building
PN-1004	PLC-200	Blower/Maintenance Building
PN-1011	PLC-300	Secondary Sludge Pump Station
PN-1014	PLC-400	Effluent Pumping Station
PN-1050	PLC-500	Dewatering Building

PLC-500, which is currently not in service, will be placed back online. Research as to why the PLC was taken out of service has not been performed under the scope of this report. If control issues prevent automatic operation, they should be addressed in future improvement phases or as a separate project. Spare PLC hardware will be provided included at least one of each part number in installation base.

Prior to installation, all PLC programs will be uploaded from the old hardware to assure data and set points are saved. Several PLC code modifications will be provided including:

1. Review and test all Automatic functions.
2. Add programming for Headworks chemical dosing control based on pH and Alkalinity feedback at Aeration influent.

3. Add programming to assure the automated systems will restart after a power outage without operator intervention.

4.15 Electrical Equipment Personnel Safety Improvements

The existing Switchgear, MCCs and Electrical Panels are not properly labeled for electrical hazards to warn personnel of danger as required by NFPA and OSHA.

In addition, some of the electrical equipment is in mechanical disrepair and there are areas where electrical equipment clearance requirements are obstructed with items in storage.

4.15.1 Proposed Improvements

MCCs and Switchgear will be inspected and serviced by qualified electrician. Electrical warning label requirements will be assessed, and labels applied to electrical equipment as determined by the assessment. In addition, physical ingress to some electrical equipment is possible currently due to field modifications to the equipment in the past. These situations will be identified and corrected to help ensure operations staff safety. Items in storage in violation electrical equipment clearance requirements will be identified.

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Section 5

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Section 5

Project Implementation

5.1 Schedule

After completion of this preliminary design report in the Summer of 2020, final design, and construction of upgrades to the existing WWTP are expected to be complete July 2022. This is dependent upon the completion of the milestones listed in **Table 5-1** below. In addition, upgrades to the collection system are expected November 2021 to reduce peak flows.

Table 5-1
Schedule of Existing WWTP Improvements

Task	Duration	Completion Date
Preliminary Design	3 months	July 2020
DEQ Review	1 month	August 2020
60% Design	2 months	September 2020
90% Design	2 months	November 2020
DEQ Review	1 month	December 2020
Final Design	2 months	January 2021
Contract Bid and Award	3 months	April 2021
Immediate Needs Construction	15 months	July 2021

5.1.1 Materials and Equipment Acquisition

Due to long lead times in receiving some equipment and materials, it is advisable for the contractor to purchase some items as soon as possible after the contract has been awarded. The UV system has approximately 14-16 weeks after approved submittals, which usually takes at least two weeks. Therefore, provisions should be made in the schedule to account for these lead times.

5.1.2 Funding Opportunities

Replacement of the current multistage centrifugal blowers with turbo or hybrid blowers as well as the installation of the air flow control valve would represent a significant savings in energy. Therefore, it is recommended that the City pursue opportunities to obtain funding through the Energy Trust of Oregon.

5.1.3 Operation During Construction

It is important for the facility to meet permit during the implementation of these improvements. Therefore, the projects should be completed in a sequence that will ensure proper performance and continuous operation. The proposed improvements allow for sequencing of new facilities and modification of existing facilities. Most facilities will require construction during the summer when influent flow is low to allow for partial shutdown of unit processes. A few improvements can be performed anytime. Lastly, some improvements will need to be delayed until the summer of 2022 due to lead time for equipment and expected bid date. Anticipated sequencing of work is outlined below.

Summer-Fall 2021 Improvements

- Light construction work: Davit Crane installation at Aeration Basin, Aerated Sludge Storage Basin, and Headworks
- Instrumentation and Control Improvements: SCADA Upgrades and PLC Replacement
- Vortex Grit System Replacement
- Screen Replacement
- ASSB Walkway and Railing Improvements
- Alkalinity Feed System Improvements
- Aeration Basin Flow Control Improvement
- Blower Replacement and Air Flow Control Valves
- Stormwater Control Improvements

Summer 2022 Improvements

- Secondary Clarifier Mechanism Repair
- UV System Replacement

The items noted above are an abbreviated list of the critical elements of a sequencing plan. As part of the final design phase, a detailed sequencing plan will be developed with the City and incorporated into the contract documents taking into account priorities at the plant. The plan will identify the logical progression of work elements, restrictions on work activities, limits on outages and interruptions in service and key project milestones. The sequencing plan will also define responsibilities, the need for contingency plans and consequences for failing to adhere to the requirements of the plan.

5.1.4 Cost Estimate of Work

Construction costs were estimated based on recent construction costs for similar facilities, published standard construction cost data, and the Engineer’s experience on similar projects. Standard mark-ups applied to conceptual construction cost estimates are summarized in **Table 5-2**.

**Table 5-2
Applied Mark-ups for Conceptual Cost Estimates**

Item	Mark-up as Percent of Construction Cost
General Conditions (incl. Mobilization)	7%
Construction Contingency	20%
Engineering/Surveying/Legal/Administrative	25%

The engineer’s estimate of probable cost for the work described above is shown in **Table 5-3**.

**Table 5-3
Engineer’s Estimate of Probable Cost**

Item No.	Item	Total
Immediate Needs Upgrades		
1	Fine Screen	\$358,000
2	Vortex Grit Removal System	\$356,000
3	Alkalinity Feed System	\$138,000
4	Aeration Basin Splitter Box	\$217,000
5	Aeration Basin Blowers	\$355,000
6	Secondary Clarifiers	\$350,000
7	Process Water Chlorination	\$53,300
8	UV Disinfection System	\$690,000
9	Stormwater Control	\$65,000
10	ASSB Walkway and Railing	\$95,000
11	Davit Cranes	\$35,100
12	Combustible Gas Detector	\$23,700
13	SCADA System Upgrade	\$111,180
14	PLC Replacement	\$182,000
15	Electrical Equipment Personal Safety Improvements	\$11,520
Total		\$3,040,800

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Appendix

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Appendix

Appendix A - Current NPDES Permit

Appendix B - Condition Assessment Reports

Appendix C – Violations

Appendix D – Secondary Clarifier Inspection Reports

Appendix E - Disk Filter Site Inspection Report

Appendix F – Drawings

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APPENDIX A



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DFQ 1/2

Expiration Date: November 30, 2013

Permit Number: 102429

File Number: 78615 ⁹² ^{CRS} ^{11/21/12}

**NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM
WASTE DISCHARGE PERMIT**

Department of Environmental Quality
Northwest Region – Portland Office
2020 SW 4th Ave., Suite 400, Portland, OR 97201
Telephone: (503) 229-5263

Issued pursuant to ORS 468B.050 and The Federal Clean Water Act

SOURCES COVERED BY THIS PERMIT:

ISSUED TO:	Type of Waste	Outfall Number	Outfall Location
City of Sandy 39250 Pioneer Blvd Sandy, OR 97005	Treated Wastewater	001	R.M. 2.1
	Reclaimed Water Reuse	002	Iseli Nursery Pond IV
	Emergency Overflow	003	R.M. 3.4

FACILITY TYPE AND LOCATION:
Activated Sludge
City of Sandy Wastewater Treatment Plant
33400 SE Jarl Road
Boring, OR 97009


RECEIVING STREAM INFORMATION:
Basin: Willamette
Sub-Basin: Lower Willamette

Receiving Stream: Tickle Creek
LLID: 1223744453954 2.1 D
County: Clackamas

Treatment System Class: Level III
Collection System Class: Level II

EPA REFERENCE NO: OR-002657-3

This permit is issued in response to Application No. 977145 received September 1, 2006.
This permit is issued based on the land use findings in the permit record.



1/23/10

Greg L. Geist, Manager Water Quality Source Control Section
Northwest Region

Date

PERMITTED ACTIVITIES

Until this permit expires or is modified or revoked, the Permittee is authorized to construct, install, modify, or operate a wastewater collection, treatment, control and disposal system and discharge to public waters adequately treated wastewaters only from the authorized discharge point or points established in Schedule A and only in conformance with all the requirements, limitations, and conditions set forth in the attached schedules as follows:

	<u>Page</u>
Schedule A - Waste Discharge Limitations not to be Exceeded.....	3
Schedule B - Minimum Monitoring and Reporting Requirements	6
Schedule C - <i>Not Applicable</i>	11
Schedule D - Special Conditions	12
Schedule E - <i>Not Used (pretreatment not required)</i>	
Schedule F - General Conditions.....	19

Unless specifically authorized by this permit, by another NPDES or WPCF permit, or by Oregon Administrative Rule, any other direct or indirect discharge of waste is prohibited, including discharge to waters of the state or an underground injection control system.

SCHEDULE A

1. Waste Discharge Limitations not to be exceeded after permit issuance.

a. Outfalls 001 & 003 - Treated Effluent

- (1) May 1 - October 31: No discharge to waters of the State.
- (2) November 1 - April 30: No discharge to the waters of the state is permitted at times when *stream dilution is less than 10*. Stream dilution is calculated as follows:

Dilution = $(Q_s + Q_e)/Q_e \geq 10$, where
 Q_s = Tickle Creek flow measured at gauge, per Schedule B, 1.e (Note7).
 Q_e = Effluent flow measured, per Schedule B, 1.b.

Parameter	Average Effluent Concentrations		Monthly* Average lb/day	Weekly* Average lb/day	Daily* Maximum lbs
	Monthly	Weekly			
BOD ₅	10 mg/L	15 mg/L	125	187	250
TSS	10 mg/L	15 mg/L	125	187	250

* Winter mass loads are based upon the prior permit's average wet weather design flow = 1.5 MGD. The current facility design average dry weather flow (ADWF) = **1.25 MGD**; and the design average wet weather flow (AWWF) = **1.85 MGD**. The daily mass load limit is suspended on any day in which the flow to the treatment facility exceeds 2.5 MGD (twice the design ADWF).

(3)

Other parameters	Limitations
<i>E. coli</i> Bacteria	Shall not exceed 126 organisms per 100 mL monthly geometric mean. No single sample shall exceed 406 organisms per 100 mL (See Note 1).
pH	Shall be within the range of 6.0 - 9.0
BOD ₅ and TSS Removal Efficiency	Shall not be less than 85% monthly average for BOD ₅ and 85% monthly for TSS.
Ammonia (NH ₃ -N)	Shall not exceed 10.9 mg/L daily maximum or 3.7 mg/L monthly average.

- (4) Regulatory Mixing Zone. No wastes may be discharged or activities conducted that cause or contribute to a violation of water quality standards in OAR 340-041 applicable to the Willamette basin, except as provided for in OAR 340-045-0080 and the following regulatory mixing zone:

The regulatory mixing zone (RMZ) is that portion of Tickle Creek extending 50 feet downstream and 5 feet upstream from the outfall. The zone of initial dilution (ZID) extends in the stream 5 feet from the discharge point.

- (5) Chlorine. Chlorine and chlorine compounds must not be used as a disinfecting agent of the treated effluent, and no chlorine residual is allowed in the effluent discharged to the stream.

b. **Outfall 002 - Recycled Wastewater**

- (1) No discharge to state waters is permitted. All recycled water shall be distributed on land, for dissipation by evapo-transpiration and controlled seepage by following sound irrigation practices so as to prevent:
- a. Prolonged ponding of treated recycled water on the ground surface;
 - b. Surface runoff or subsurface drainage through drainage tile;
 - c. The creation of odors, fly and mosquito breeding, or other nuisance conditions;
 - d. The overloading of land with nutrients, organics, or other pollutant parameters; and
 - e. Impairment of existing or potential beneficial uses of groundwater.
- (2) Prior to land application of the recycled water, it shall receive at least Class B treatment as defined in OAR 340-055:
- Class B recycled water must not exceed a median of 2.2 Total Coliform organisms per 100 milliliters, based on results of the last seven days that analyses have been completed, and 23 Total Coliform organisms per 100 milliliters in any single sample.
- (3) Where an irrigation method is used to apply Class B recycled water directly to the soil, there are no setback requirements.
- (4) Where sprinkler irrigation is used to apply Class B recycled water, there must be a minimum of 10 feet from the edge of the site used for irrigation and the site property line.
- (5) There must be a minimum of 50 feet from the edge of the irrigation site to a water supply source used for human consumption.

- (6) Where sprinkler irrigation is used to apply Class B recycled water, the recycled water must not be sprayed within 10 feet of an area where food is being prepared or served, or where a drinking fountain is located.
- (7) If aerosols are generated when using recycled water for an industrial, commercial, or construction purpose, the aerosols must not create a public health hazard.
- (8) The public and personnel at the use area must be notified that the water used is recycled water and is not safe for drinking. The Recycled Water Use Plan must specify how the notification will be provided.

c. **Outfall 003 - Emergency Overflow of Treated Effluent**

No discharge to waters of the state is permitted from Outfall 003 when the treatment facility's peak, instantaneous wet weather flow is less than 4.0 MGD.

d. **Groundwater**

No activities shall be conducted that could cause an adverse impact on existing or potential beneficial uses of groundwater.

NOTES:

1. If a single sample exceeds 406 organisms per 100 mL, then five consecutive re-samples may be taken at four-hour intervals beginning within 28 hours after the original sample was taken. If the log mean of the five re-samples is less than or equal to 126 organisms per 100 mL, a violation shall not be triggered.

SCHEDULE B

1. Minimum Monitoring and Reporting Requirements

The Permittee shall monitor the parameters as specified below at the locations indicated. The laboratory used by the Permittee to analyze samples shall have a quality assurance/quality control (QA/QC) program to verify the accuracy of sample analysis. If QA/QC requirements are not met for any analysis, the results shall be included in the report, but not used in calculations required by this permit. When possible, the Permittee shall re-sample in a timely manner for parameters failing the QA/QC requirements, analyze the samples, and report the results.

a. Influent

The facility influent sampling location is the following: All influent grab samples, measurements, and composite samples are taken at the Parshall flume upstream of any return flows to the headworks. The Parshall flume is located downstream of the raw screening and grit removal processes. All samples for toxics are taken in the same location.

Item or Parameter	Minimum Frequency	Type of Sample
Total Flow (MGD)	Daily	Measurement
Flow Meter Calibration	Semi-Annual	Verification (See Note 1)
BOD ₅	2/Week	Composite
TSS	2/Week	Composite
pH	3/Week	Grab

b. Treated Effluent Outfalls 001 & 003

The facility effluent sampling location is the following: Effluent grab samples and measurements are taken at the discharge from the UV disinfection unit. Composite samples and samples for toxics are taken at the same location. Effluent temperature measurements are taken at Outfall 001.

Item or Parameter	Minimum Frequency	Type of Sample
Total Flow (MGD)	Daily	Measurement
Flow Meter Calibration	Semi-Annual	Verification (See Note 1)
BOD ₅	2/Week	Composite
TSS	2/Week	Composite
pH	3/Week	Grab
<i>E. coli</i>	2/Week	Grab (See Note 2)
UV Radiation Intensity	Daily	Reading (See Notes 1 & 3)
NH ₃ -N	2/Week	Grab

Chlorine Residual	Daily	Grab
Pounds Discharged (BOD ₅ and TSS)	2/Week	Daily Maximum Calculation
Pounds Discharged (BOD ₅ and TSS)	1/Week	Weekly Average Calculation
Pounds Discharged (BOD ₅ and TSS)	Monthly	Monthly Average Calculation
Average Percent Removed (BOD ₅ and TSS)	Monthly	Calculation
Metals: As, Cd, Cr, Cu, Pb, Hg, Fe, Ni, Ag, Zn; and Alkalinity & pH.	Quarterly during winter season	24-Hour Composite (Note 4)
Effluent Temperature (°C)	5/Week	Grab (Note 5)
Whole Effluent Toxicity (WET) Testing	See Schedule D, Item #2 to determine sampling frequency.	24-Hour Composite

c. **Biosolids Management**

Item or Parameter	Minimum Frequency	Type of Sample
Sludge analysis including: Total Solids (% dry wt.) Volatile solids (% dry wt.) Biosolids nitrogen for: NH ₃ -N; NO ₃ -N; & TKN (% dry wt.) Phosphorus (% dry wt.) Potassium (% dry wt.) pH (standard units) Sludge metals content for: As, Cd, Cu, Hg, Mo, Ni, Pb, Se & Zn, measured as total in mg/kg.	Annually	Composite sample must be representative of the product that is land applied (See Note 6).
Record of locations where biosolids are applied on each ODEQ approved site. Site location maps must be maintained at the treatment facility for review upon request by ODEQ.	Each Occurrence	Date, volume, and map locations where biosolids were applied (See Note 1).
Quantity and type of alkaline product used to stabilize biosolids (when	Each occurrence	Measurement (See Note 1).

required to meet federal pathogen and vector attraction reduction requirements in 40 CFR 503.32(b)(3) and 40 CFR 503.33(b)(6).		
Initial time when solids that received alkaline agent ascended to pH \geq 12.	Each batch	Date, time, and actual pH measurement (corrected to standard at 25°C) (Note 1).
2 hours after initial alkaline addition and sustained at pH \geq 12.	Each batch	Date, time, and actual pH measurement (corrected to standard at 25°C) (Note 1).
24 hours after initial alkaline addition and pH \geq 11.5 was sustained.	Each batch	Date, time, and actual pH measurement (corrected to standard at 25°C) (Note 1).

d. **Recycled Wastewater Outfall 002***

*Grab samples must be taken at Iseli Nursery at the recycled water forcemain discharge point.

Item or Parameter	Minimum Frequency	Type of Sample
Quantity Irrigated (gallons/day)	Daily	Measurement
Flow Meter Calibration	Annually	Verification (Note 1).
Quantity Chlorine Used	Daily	Measurement
Total Chlorine Residual	Daily	Grab
pH	2/Week	Grab
Total Coliform	3/Week	Grab
Nutrients (TKN, NO ₂ +NO ₃ -N, NH ₃ , Total Phosphorus)	Quarterly	Grab (See Note 1).

e. **Tickle Creek (November 1 – April 30)***

Item or Parameter	Minimum Frequency	Type of Sample
Flow (upstream)	2/Week	Measurement (See Note 7)
Stream Dilution	2/Week	Calculation
Metals*: As, Cd, Cr, Cu, Pb, Fe, Ni, Ag, Zn; & Alkalinity and pH.	Quarterly during winter season	Grab (Note 4)

*Take metal grab samples at least 50 feet upstream of the Outfall 001 discharge point.

2. **Discharge Monitoring Reports (DMRs) - Reporting Procedures**

- a. Monitoring results shall be reported on approved DMR forms. The reporting period is the calendar month. Reports must be submitted to the Department's Northwest Region - Portland office by the **15th day** of the following month.
- b. DMRs shall identify the name, certificate classification and grade level of each principal operator designated by the permittee as responsible for supervising the wastewater collection and treatment systems during the reporting period. Monitoring reports shall also identify each system classification as found on Page One of this permit.
- c. DMRs must list all equipment break-downs and all bypassing events. Additionally, the facility's log book must list break-downs and bypassing events, and describe the reasons and corrective action taken to remedy the situation. The log book must be kept current and be available for ODEQ inspection during site visits.

3. **Annual Report Submittals**

- a. **I&I Report.** The Permittee shall have in place a program to identify and reduce inflow and infiltration (I&I) into the sewage collection system. An annual report shall be submitted to the Department by **February 19** each year that details sewer collection maintenance activities to reduce I&I. The report shall state those activities that have been done in the previous year and those activities planned for the following year.
- b. **Biosolids Handling Report.** For any year in which biosolids are land applied, a report must be submitted to the Department by **February 19** of the following year that describes solids handling activities for the previous year and includes, but is not limited to, the required information outlined in OAR 340-050-0035(6)(a)-(e).
- c. **Recycled Water Use Report.** By no later than **February 19** of each year, the Permittee shall submit to the Department an annual report describing the effectiveness of the recycled water system to comply with approved Recycled Water Use Plan, the rules of Division 055, and the limitations and conditions of this permit applicable to use of recycled water.

NOTES:

1. **Mandatory Record Keeping.** This data must be recorded in the treatment facility log book, per the specified minimum frequency. All data must be kept current, and be open for review by DEQ staff during site visits &/or inspections.
2. **E. coli Monitoring.** *E. coli* monitoring must be conducted according to any of the following test procedures as specified in **Standard Methods for the Examination of Water and Wastewater, 19th Edition**, or according to any test procedure that has been authorized and approved in writing by the Director or an authorized representative:

Method	Reference	Page	Method Number
mTEC agar, MF	Standard Methods, 18th Edition	9-29	9213 D
NA-MUG, MF	Standard Methods, 19th Edition	9-63	9222 G
Chromogenic Substrate, MPN	Standard Methods, 19th Edition	9-65	9223 B
Colilert QT	Idexx Laboratories, Inc.		

3. UV Radiation Intensity. The intensity of UV radiation passing through the water column will affect the system's ability to kill organisms. To track the reduction in intensity, the UV disinfection system must include a UV intensity meter with a sensor located in the water column at a specified distance from the UV bulbs. This meter will measure the intensity of UV radiation in mWatts-seconds/cm². The daily UV radiation intensity shall be determined by reading the meter each day. If more than one meter is used, the daily recording will be an average of all meter readings each day. Intensity meter(s) must be calibrated at a frequency recommended by the manufacturer. The manufacturer's UV intensity curves shall be used to determine when UV bulbs must be replaced or cleaned. Record all daily UV intensity readings in the treatment facility's log book. Record any change of UV bulbs. Daily UV intensity readings are required for at least 5 days per week.

4. Metals Testing. Whenever possible, a permittee should always use a test method as indicated 40 CFR Part 136 with a Quantitation Limit (QL) that is lower than the permitted effluent limit or water quality criteria for priority pollutant scans. A list of the analytic methods approved by the department and of the applicable QLs is located in the amended tables for Appendix B: Non-detect Analytical Data and Minimum Practical Quantification Levels, located on the web at: <http://www.deq.state.or.us/wq/pubs/imds/rpaamend.pdf>. The permittee must ensure that all monitoring analysis reports contain both the QL and detection level of the method as defined below:

***Detection Level:** Same as the "Method Detection Limit" (MDL) derived using 40 CFR 136, Appendix B.*

***Quantitation Limit:** Same as the Method Reporting Limit (MRL). It is the lowest level at which the entire analytical system must give a recognizable signal and acceptable calibration for the analyte. It is equivalent to the concentration of the lowest calibration standard, assuming that all method-specified sample weights, volumes, and cleanup procedures have been employed.*

Nov 2007 Appendix B		
IMD		
Quantitation Limit		
(QL) Required		
Metal	Symbol	ug/L
Arsenic	As	0.05
Cadmium	Cd	0.1
Chromium	Cr	0.4
Copper	Cu	10

Lead	Pb	5
Nickel	Ni	10
Silver	Ag	1.0
Zinc	Zn	5
Iron	Fe	100
Mercury	Hg	0.01

All metals in terms of "Total Recoverable." Effluent and Tickle Creek alkalinities must be measured whenever metal samples are taken. Measure Tickle Creek alkalinity at a location at least 50 feet upstream of the Outfall 001 discharge point.

5. Temperature Measurements. Take daily temperature measurements between the hours of 1400 and 1600. Alternatively use continuous monitoring by Department approved method. When continuous monitoring is used, report the daily maximum temperature on the discharge monitoring report (DMR). After winter season Years 2009-20010 & 20010-2011, temperature measurements are not required.
6. Biosolids. Biosolids composite samples shall be taken from reference areas in the biosolids storage area pursuant to Test Methods for Evaluating Solid Waste, Volume 2; Field Manual, Physical/Chemical Methods, November 1986, Third Edition, Chapter 9. Inorganic pollutant monitoring must be conducted according to Test Methods for Evaluating Solid Waste, Physical/Chemical Methods, Second Edition (1982) with Updates I and II and third Edition (1986) with Revision I.
7. Stream Flow. Tickle Creek flow measurements shall be made at the established gauging station that is located approximately one mile upstream of Outfall 001.

SCHEDULE C

Compliance Schedules and Conditions

NOT APPLICABLE

SCHEDULE D

Special Conditions

1. Biosolids

- a. Biosolids Management Plan. All biosolids must be managed in accordance with the current DEQ approved Biosolids Management Plan (the Plan), site authorization letters issued by DEQ, and land use approval from the designated municipality &/or county. Any changes in biosolids management or application activities that differ significantly from operations specified under the approved Plan require the prior written approval of the DEQ.
- b. Biosolids Management Plan Update. Permittee must submit a revised Plan for Department approval within 120 days of permit issuance that reflects actual biosolids treatment, storage, and land application practice.
- c. Changes in Biosolids Standards. This permit may be modified to incorporate any applicable standard for biosolids use or disposal promulgated under section 405(d) of the Clean Water Act; if the standard for biosolids use or disposal is more stringent than any requirements for biosolids use or disposal in the permit, or controls a pollutant or practice not limited in this permit.

2. Whole Effluent Toxicity Testing*

**On January 2003 the Permittee submitted its "Tickle Creek Outfall Mixing Zone Study." The report was prepared for the City on contract by Curran-McLeod, Incorporated Consulting Engineers. Since the City is only allowed to discharge to Tickle Creek during winter season (November 1 through April 30) each year, the Mixing Zone (MZ) Study focused on worst-case conditions for winter season stream flows. This permit requires the City to maintain a minimum dilution of 10 when discharging to Tickle Creek per Schedule A, 1.a (2). This dilution criterion was used with the 7-day average low creek flow with a reoccurrence interval of 10-years (7Q10 low flow = 0.31 m³/s) for the MZ analysis. Conductivity measurements were taken to estimate dilution in the zone of initial dilution (ZID) and the MZ. Based on the stream conductivity study, worst-case dilution at 7Q10 low flow was determined to be approximately 1.7 at the ZID boundary and 3.7 at the MZ boundary (MZ Study, P. 13, D.2, Table).*

- a. The permittee shall conduct whole effluent toxicity (WET) tests as required in Schedule B of this permit. The Permittee shall conduct whole effluent toxicity (WET) testing prior to application for renewal of this permit. Part E (Toxicity Testing Data) of U.S. EPA Form 2A prescribes WET testing requirements and options.
- b. Two sampling options. The facility shall sample once per year over the first four years of the permit. The sampling events and toxicity tests should take place in a different quarter each year (i.e. Year 1, Qtr 1). Alternatively, the facility may choose to conduct all tests within a single year of the permit, in which case, the tests shall be conducted quarterly.

c. Acute Toxicity Testing - Organisms and Protocols

- (1) The permittee shall conduct 48-hour static renewal tests with *Ceriodaphnia dubia* (water flea) and 96-hour static renewal tests with *Pimephales promelas* (fathead minnow).
- (2) All test methods and procedures shall be in accordance with **Methods for Measuring the Acute Toxicity of Effluents and Receiving Waters to Freshwater and Marine Organisms**, Fifth Edition, EPA-821-R-02-012 (October 2002). Any deviation of the bioassay procedures outlined in this method shall be submitted in writing to the Department for review and approval prior to use.
- (3) Tests shall be conducted on final effluent sample collected a 24-Hour Composite sample. No treatments to the final effluent (i.e. dechlorination, etc), except those included as part of the methodology, shall be performed by the laboratory unless approved by the Department prior to analysis.
- (4) Acute tests shall be conducted on a control (0% effluent) and the following dilution series, unless otherwise approved by the Department in writing: 6.25%, 12.5%, 25%, 60%, and 100%.
- (5) An acute WET test shall be considered to show toxicity if there is a statistically significant difference in survival between the control and 60% percent effluent.

d. Chronic Toxicity Testing - Organisms and Protocols

- (1) The permittee shall conduct tests with: *Ceriodaphnia dubia* (water flea) for reproduction and survival test endpoint, *Pimephales promelas* (fathead minnow) for growth and survival test endpoint and *Raphidocelis subcapitata* (green alga formerly known as *Selanastrum capricornutum*) for growth test endpoint.
- (2) All test methods and procedures shall be in accordance with **Short-Term Methods for Estimating the Chronic Toxicity of Effluents and Receiving Waters to Freshwater Organisms**, Fourth Edition, EPA-821-R-02-013, October 2002. Any deviation of the bioassay procedures outlined in this method shall be submitted in writing to the Department for review and approval prior to use.
- (3) Tests shall be conducted on final effluent samples collected as 24-hour composite samples. No treatments to the final effluent (i.e. dechlorination, etc), except those included as part of the methodology, shall be performed by the laboratory unless approved by the Department prior to analysis.
- (4) Chronic tests shall be conducted on a control (0% effluent) and the following dilution series, unless otherwise approved by the Department in writing: 6.25%, 12.5%, 25%, 60%, and 100%.

- (5) A chronic WET test shall be considered to show toxicity if the IC₂₅ (25% inhibition concentration) occurs at dilutions equal to or less than the dilution that is known to occur at the edge of the mixing zone, i.e. IC₂₅ ≤ 25%.

e. Dual End-Point Tests –

- (1) WET tests may be dual end-point tests in which both acute and chronic end-points can be determined from the results of a single chronic test. The acute end-point shall be based on 48-hours for the *Ceriodaphnia dubia* (water flea) and 96-hours for the *Pimephales promelas* (fathead minnow).
- (2) All test methods and procedures shall be in accordance with **Short-Term Methods for Estimating the Chronic Toxicity of Effluents and Receiving Waters to Freshwater Organisms**, Fourth Edition, EPA-821-R-02-013 (October 2002). Any deviation of the bioassay procedures outlined in this method shall be submitted in writing to the Department for review and approval prior to use.
- (3) Tests shall be conducted on final effluent samples collected as described in item d. (3).
- (4) Tests run as dual end-point tests shall be conducted on a control (0% effluent) and the following dilution series, unless otherwise approved by the Department in writing: 6.25%, 12.5%, 25%, 50%, 60%, and 100%.
- (5) Toxicity determinations for dual end-point tests shall correspond to the acute, c. (5), and chronic, d. (5), described above.

f. Evaluation of Causes and Exceedances

- (1) If any test exhibits toxicity, as defined in sections c. (5) or d. (5) of this permit condition, another toxicity test using the same species and Department approved methodology shall be conducted within two weeks, unless otherwise approved by the Department.
- (2) If two consecutive WET test results indicate acute and/or chronic toxicity, as defined in sections c. (5) or d. (5) of this permit condition, the permittee shall immediately notify the Department of the results. The Department will work with the permittee to determine the appropriate course of action to evaluate and address the toxicity.

g. Quality Assurance / Reporting

- (1) Quality assurance criteria, statistical analyses, and data reporting for the WET tests shall be in accordance with the EPA documents stated in this condition.

- (2) A bioassay laboratory report for each test shall be prepared according to the EPA method documents referenced in this Schedule. This shall include all QA/QC documentation, statistical analysis for each test performed, standard reference toxicant test (SRT) conducted on each species required for the toxicity tests, and completed Chain of Custody forms for the samples including time of sample collection and receipt. Reports shall be submitted to the Department within 45 days of test completion.
- (3) The report should include all endpoints measured in the test, i.e. NOEC, LOEC, and IC₂₅.
- (4) The permittee shall make available to the Department, on request, the written standard operating procedures they, or the laboratory performing the WET tests, are using for all toxicity tests required by the Department.

h. Reopener

- (1) The Department may reopen and modify this permit to include new limitations, monitoring requirements, and/or conditions as determined by the Department to be appropriate, and in accordance with procedures outlined in Oregon Administrative Rules, Chapter 340, Division 45, if:
 - a. WET testing data indicate acute and/or chronic toxicity.
 - b. The facility undergoes any process changes.
 - c. Discharge monitoring data indicate a change in the reasonable potential to exhibit toxicity.

3. **Priority Pollutant Scan.**

The permittee must perform all testing required in Part D of U.S. EPA Form 2A with priority pollutant scans no more than 4 ½ years old. Two of the three scans must be performed no fewer than 4 months and no more than 8 months apart. The effluent samples shall be 24-hour daily composites, except where sampling volatile compounds. In this case, six (6) discrete samples (not less than 100 mL) collected over the operating day are acceptable. The permittee shall take special precautions in compositing the individual grab samples for the volatile organics to insure sample integrity (i.e. no exposure to the outside air). Alternately, the discrete samples collected for volatiles may be analyzed separately and averaged.

Whenever possible, a permittee should always use a test method with a **Quantitation Limit (QL)** that is lower than the permitted effluent limit or water quality criteria for priority pollutant scans. A list of the analytic methods approved by the department and the applicable QLs are located in the amended tables for Appendix B: Non-detect Analytical Data and Minimum Practical Quantification Levels, located on the web at

<http://www.deq.state.or.us/wq/pubs/imds/rpaammend.pdf>.

The permittee must ensure that all monitoring analysis reports contain both the QL and detection level of the method as defined below:

Detection Level: Same as the "Method Detection Limit" (MDL) derived using 40 CFR 136, Appendix B.

Quantitation Limit: Same as the Method Reporting Limit (MRL). It is the lowest level at which the entire analytical system must give a recognizable signal and acceptable calibration for the analyte. It is equivalent to the concentration of the lowest calibration standard, assuming that all method-specified sample weights, volumes, and cleanup procedures have been employed.

Whenever possible, analysis for silver and arsenic should possess a minimum QL as described below:

- Silver 1.0 µg/L
- Arsenic 0.05 µg/L

4. **Recycled Water Requirements.**

The Permittee shall meet the requirements for use of recycled water under OAR Chapter 340, Division 055, *Recycled Water Use* including the following:

- a. All recycled water shall be managed in accordance with the approved Recycled Water Use Plan. No substantial changes shall be made in the approved plan without written approval of the Department.
- b. Any person having control over the treatment or distribution or both of recycled water may distribute recycled water only for the beneficial purposes described in this rule, and must take all reasonable steps to ensure that the recycled water is used only in accordance with the standards and requirements of the rules of this division (OAR 340-055-0012 (1)).
- c. The Permittee shall notify the Department within 24 hours if it is determined that the treated effluent is being used in a manner not in compliance with OAR 340-055. When the Department offices are not open, the permittee shall report the incident of noncompliance to the ***Oregon Emergency Response System*** (Telephone Number 1-800-452-0311).

5. **Recycled Water Use Plan.** The Recycled Water Use Plan must be updated to reflect changes in Sandy's wastewater treatment facility, recycled water transfer system, and irrigation practices. The Plan must reflect changes to OAR Chapter 340, Division 055, *Recycled Water Use*. OAR 340-055 was recently revised and the latest addition was posted by the State on June 1, 2008. An updated Recycled Water Use Plan must be submitted to the Department within 120 days of permit issuance. Should revisions be minor, the Permittee may submit an addendum to the Plan by that date.

6. **Operator Certification.** The Permittee shall comply with Oregon Administrative Rules (OAR), Chapter 340, Division 049, "Regulations Pertaining To Certification of Wastewater System Operator Personnel" and accordingly:

- a. The Permittee shall have its wastewater system supervised by one or more operators who are

certified in a classification and grade level (equal to or greater) that corresponds with the classification (collection and/or treatment) of the system to be supervised as specified on page one of this permit.

Note: A "supervisor" is defined as the person exercising authority for establishing and executing the specific practice and procedures of operating the system in accordance with the policies of the permittee and requirements of the waste discharge permit. "Supervise" means responsible for the technical operation of a system, which may affect its performance or the quality of the effluent produced. Supervisors are not required to be on-site at all times.

- b. The Permittee's wastewater system may not be without supervision (as required by Special Condition 5.a. above) for more than thirty (30) days. During this period, and at any time that the supervisor is not available to respond on-site (i.e. vacation, sick leave or off-call), the permittee must make available another person who is certified at no less than one grade lower than the system classification.
 - c. If the wastewater system has more than one daily shift, the Permittee shall have the shift supervisor, if any, certified at no less than one grade lower than the system classification.
 - d. The Permittee is responsible for ensuring the wastewater system has a properly certified supervisor available at all times to respond on-site at the request of the Permittee and to any other operator.
 - e. The Permittee shall notify the Department of Environmental Quality in writing within thirty (30) days of replacement or redesignation of certified operators responsible for supervising wastewater system operation. The notice shall be filed with the Water Quality Division, Operator Certification Program, 400 East Scenic Drive, Suite 307, The Dalles, OR 97058. This requirement is in addition to the reporting requirements contained under Schedule B of this permit.
 - f. Upon written request, the Department may grant the Permittee reasonable time, not to exceed 120 days, to obtain the services of a qualified person to supervise the wastewater system. The written request must include a justification for a time extension, a schedule for recruiting and hiring, the date the system supervisor availability ceased, and the name of the alternate system supervisor(s), as required by 6.b. above.
7. **Notification Requirement.** The Permittee shall notify the DEQ Northwest Region - Portland Office (phone: **(503) 229-5263**) in accordance with the response times noted in the General Conditions (Schedule F) of this permit of any malfunction, so that corrective action can be coordinated between the Permittee and the Department.

8. **Groundwater.** The Permittee shall not be required to perform a hydrogeologic characterization or groundwater monitoring during the term of this permit provided:

- a. The facilities are operated in accordance with the permit conditions, and
- b. There are no adverse groundwater quality impacts (complaints or other indirect evidence) resulting from the facility's operation.

If warranted at permit renewal, the Department may evaluate the need for a full assessment of the facilities impact on groundwater quality.

9. **Spawning Beds Investigation and Report.** Permittee shall use a qualified fisheries expert to investigate Sandy's regulatory mixing zone in Tickle Creek at Outfall 001 for active spawning during winter discharge season. The investigation shall also evaluate the area and quality of spawning habitat inside the mixing zone. The report must be submitted to the Department by June 1, 2011.

SCHEDULE F

NPDES GENERAL CONDITIONS – DOMESTIC FACILITIES

SECTION A. STANDARD CONDITIONS

1. Duty to Comply with Permit

The permittee must comply with all conditions of this permit. Failure to comply with any permit condition is a violation of Oregon Revised Statutes (ORS) 468B.025 and the federal Clean Water Act and is grounds for an enforcement action. Failure to comply is also grounds for the Department to terminate, modify and reissue, revoke, or deny renewal of a permit.

2. Penalties for Water Pollution and Permit Condition Violations

The permit is enforceable by DEQ or EPA, and in some circumstances also by third-parties under the citizen suit provisions 33 USC §1365. DEQ enforcement is generally based on provisions of state statutes and EQC rules, and EPA enforcement is generally based on provisions of federal statutes and EPA regulations.

ORS 468.140 allows the Department to impose civil penalties up to \$10,000 per day for violation of a term, condition or requirement of a permit. The federal Clean Water Act provides for civil penalties not to exceed \$32,500 and administrative penalties not to exceed \$11,000 per day for each violation of any condition or limitation of this permit.

Under ORS 468.943, unlawful water pollution, if committed by a person with criminal negligence, is punishable by a fine of up to \$25,000, imprisonment for not more than one year, or both. Each day on which a violation occurs or continues is a separately punishable offense. The federal Clean Water Act provides for criminal penalties of not more than \$50,000 per day of violation, or imprisonment of not more than 2 years, or both for second or subsequent negligent violations of this permit.

Under ORS 468.946, a person who knowingly discharges, places, or causes to be placed any waste into the waters of the state or in a location where the waste is likely to escape into the waters of the state is subject to a Class B felony punishable by a fine not to exceed \$200,000 and up to 10 years in prison. The federal Clean Water Act provides for criminal penalties of \$5,000 to \$50,000 per day of violation, or imprisonment of not more than 3 years, or both for knowing violations of the permit. In the case of a second or subsequent conviction for knowing violation, a person shall be subject to criminal penalties of not more than \$100,000 per day of violation, or imprisonment of not more than 6 years, or both.

3. Duty to Mitigate

The permittee must take all reasonable steps to minimize or prevent any discharge or sludge use or disposal in violation of this permit that has a reasonable likelihood of adversely affecting human health or the environment. In addition, upon request of the Department, the permittee must correct any adverse impact on the environment or human health resulting from noncompliance with this permit, including such accelerated or additional monitoring as necessary to determine the nature and impact of the

noncomplying discharge.

4. Duty to Reapply

If the permittee wishes to continue an activity regulated by this permit after the expiration date of this permit, the permittee must apply for and have the permit renewed. The application must be submitted at least 180 days before the expiration date of this permit.

The Department may grant permission to submit an application less than 180 days in advance but no later than the permit expiration date.

5. Permit Actions

This permit may be modified, revoked and reissued, or terminated for cause including, but not limited to, the following:

- a. Violation of any term, condition, or requirement of this permit, a rule, or a statute
- b. Obtaining this permit by misrepresentation or failure to disclose fully all material facts
- c. A change in any condition that requires either a temporary or permanent reduction or elimination of the authorized discharge
- d. The permittee is identified as a Designated Management Agency or allocated a wasteload under a Total Maximum Daily Load (TMDL)
- e. New information or regulations
- f. Modification of compliance schedules
- g. Requirements of permit reopener conditions
- h. Correction of technical mistakes made in determining permit conditions
- i. Determination that the permitted activity endangers human health or the environment
- j. Other causes as specified in 40 CFR 122.62, 122.64, and 124.5
- k. For communities with combined sewer overflows (CSOs):
 - (1) To comply with any state or federal law regulation that addresses CSOs that is adopted or promulgated subsequent to the effective date of this permit
 - (2) If new information, not available at the time of permit issuance, indicates that CSO controls imposed under this permit have failed to ensure attainment of water quality standards, including protection of designated uses
 - (3) Resulting from implementation of the Permittee's Long-Term Control Plan and/or permit conditions related to CSOs.

The filing of a request by the permittee for a permit modification, revocation or reissuance, termination, or a notification of planned changes or anticipated noncompliance, does not stay any permit condition.

6. Toxic Pollutants

The permittee must comply with any applicable effluent standards or prohibitions established under Oregon Administrative Rules (OAR) 340-041-0033 and 307(a) of the federal Clean Water Act for toxic pollutants, and with standards for sewage sludge use or disposal established under Section 405(d) of the Clean Water Act, within the time provided in the regulations that establish those standards or prohibitions, even if the permit has not yet been modified to incorporate the requirement.

7. Property Rights and Other Legal Requirements
The issuance of this permit does not convey any property rights of any sort, or any exclusive privilege, or authorize any injury to persons or property or invasion of any other private rights, or any infringement of federal, tribal, state, or local laws or regulations.
8. Permit References
Except for effluent standards or prohibitions established under Section 307(a) of the federal Clean Water Act and OAR 340-041-0033 for toxic pollutants, and standards for sewage sludge use or disposal established under Section 405(d) of the Clean Water Act, all rules and statutes referred to in this permit are those in effect on the date this permit is issued.
9. Permit Fees
The permittee must pay the fees required by Oregon Administrative Rules.

SECTION B. OPERATION AND MAINTENANCE OF POLLUTION CONTROLS

1. Proper Operation and Maintenance
The permittee must at all times properly operate and maintain all facilities and systems of treatment and control (and related appurtenances) that are installed or used by the permittee to achieve compliance with the conditions of this permit. Proper operation and maintenance also includes adequate laboratory controls and appropriate quality assurance procedures. This provision requires the operation of back-up or auxiliary facilities or similar systems that are installed by a permittee only when the operation is necessary to achieve compliance with the conditions of the permit.
2. Need to Halt or Reduce Activity Not a Defense
For industrial or commercial facilities, upon reduction, loss, or failure of the treatment facility, the permittee must, to the extent necessary to maintain compliance with its permit, control production or all discharges or both until the facility is restored or an alternative method of treatment is provided. This requirement applies, for example, when the primary source of power of the treatment facility fails or is reduced or lost. It is not a defense for a permittee in an enforcement action that it would have been necessary to halt or reduce the permitted activity in order to maintain compliance with the conditions of this permit.
3. Bypass of Treatment Facilities
 - a. Definitions
 - (1) "Bypass" means intentional diversion of waste streams from any portion of the treatment facility. The permittee may allow any bypass to occur which does not cause effluent limitations to be exceeded, provided the diversion is to allow essential maintenance to assure efficient operation. These bypasses are not subject to the provisions of paragraphs b. and c. of this section.
 - (2) "Severe property damage" means substantial physical damage to property, damage to the treatment facilities which causes them to become inoperable, or substantial and permanent loss of natural resources that can reasonably be expected to occur in the absence of a bypass. Severe property damage does not mean economic loss caused by delays in production.
 - b. Prohibition of bypass.

- (1) Bypass is prohibited and the Department may take enforcement action against a permittee for bypass unless:
 - i. Bypass was unavoidable to prevent loss of life, personal injury, or severe property damage;
 - ii. There were no feasible alternatives to the bypass, such as the use of auxiliary treatment facilities, retention of untreated wastes, or maintenance during normal periods of equipment downtime. This condition is not satisfied if adequate backup equipment should have been installed in the exercise of reasonable engineering judgment to prevent a bypass that occurred during normal periods of equipment downtime or preventative maintenance; and
 - iii. The permittee submitted notices and requests as required under General Condition B.3.c.
 - (2) The Department may approve an anticipated bypass, after considering its adverse effects and any alternatives to bypassing, when the Department determines that it will meet the three conditions listed above in General Condition B.3.b.(1).
- c. Notice and request for bypass.
- (1) Anticipated bypass. If the permittee knows in advance of the need for a bypass, a written notice must be submitted to the Department at least ten days before the date of the bypass.
 - (2) Unanticipated bypass. The permittee must submit notice of an unanticipated bypass as required in General Condition D.5.
4. Upset
- a. Definition. "Upset" means an exceptional incident in which there is unintentional and temporary noncompliance with technology based permit effluent limitations because of factors beyond the reasonable control of the permittee. An upset does not include noncompliance to the extent caused by operation error, improperly designed treatment facilities, inadequate treatment facilities, lack of preventative maintenance, or careless or improper operation.
 - b. Effect of an upset. An upset constitutes an affirmative defense to an action brought for noncompliance with such technology-based permit effluent limitations if the requirements of General Condition B.4.c are met. No determination made during administrative review of claims that noncompliance was caused by upset, and before an action for noncompliance, is final administrative action subject to judicial review.
 - c. Conditions necessary for a demonstration of upset. A permittee who wishes to establish the affirmative defense of upset must demonstrate, through properly signed, contemporaneous operating logs, or other relevant evidence that:
 - (1) An upset occurred and that the permittee can identify the causes(s) of the upset;
 - (2) The permitted facility was at the time being properly operated;
 - (3) The permittee submitted notice of the upset as required in General Condition D.5, hereof (24-hour notice); and,
 - (4) The permittee complied with any remedial measures required under General Condition A.3 hereof.
 - d. Burden of proof. In any enforcement proceeding the permittee seeking to establish the occurrence of an upset has the burden of proof.
5. Treatment of Single Operational Upset

For purposes of this permit, A Single Operational Upset that leads to simultaneous violations of more than one pollutant parameter will be treated as a single violation. A single operational upset is an exceptional incident that causes simultaneous, unintentional, unknowing (not the result of a knowing act or omission), temporary noncompliance with more than one Clean Water Act effluent discharge pollutant parameter. A single operational upset does not include Clean Water Act violations involving discharge without a NPDES permit or noncompliance to the extent caused by improperly designed or inadequate treatment facilities. Each day of a single operational upset is a violation.

6. Overflows from Wastewater Conveyance Systems and Associated Pump Stations

a. Definitions

(1) "Overflow" means any spill, release or diversion of sewage including:

- i. An overflow that results in a discharge to waters of the United States; and
- ii. An overflow of wastewater, including a wastewater backup into a building (other than a backup caused solely by a blockage or other malfunction in a privately owned sewer or building lateral), even if that overflow does not reach waters of the United States.

b. Prohibition of overflows. Overflows are prohibited. The Department may exercise enforcement discretion regarding overflow events. In exercising its enforcement discretion, the Department may consider various factors, including the adequacy of the conveyance system's capacity and the magnitude, duration and return frequency of storm events.

c. Reporting required. All overflows must be reported orally to the Department within 24 hours from the time the permittee becomes aware of the overflow. Reporting procedures are described in more detail in General Condition D.5.

7. Public Notification of Effluent Violation or Overflow

If effluent limitations specified in this permit are exceeded or an overflow occurs that threatens public health, the permittee must take such steps as are necessary to alert the public, health agencies and other affected entities (e.g., public water systems) about the extent and nature of the discharge in accordance with the notification procedures developed under General Condition B.8. Such steps may include, but are not limited to, posting of the river at access points and other places, news releases, and paid announcements on radio and television.

8. Emergency Response and Public Notification Plan

The permittee must develop and implement an emergency response and public notification plan that identifies measures to protect public health from overflows, bypasses or upsets that may endanger public health. At a minimum the plan must include mechanisms to:

- a. Ensure that the permittee is aware (to the greatest extent possible) of such events;
- b. Ensure notification of appropriate personnel and ensure that they are immediately dispatched for investigation and response;
- c. Ensure immediate notification to the public, health agencies, and other affected public entities (including public water systems). The overflow response plan must identify the public health and other officials who will receive immediate notification;
- d. Ensure that appropriate personnel are aware of and follow the plan and are appropriately trained;
- e. Provide emergency operations; and
- f. Ensure that DEQ is notified of the public notification steps taken.

9. Removed Substances

Solids, sludges, filter backwash, or other pollutants removed in the course of treatment or control of wastewaters must be disposed of in such a manner as to prevent any pollutant from such materials from entering waters of the state, causing nuisance conditions, or creating a public health hazard.

SECTION C. MONITORING AND RECORDS

1. Representative Sampling

Sampling and measurements taken as required herein shall be representative of the volume and nature of the monitored discharge. All samples must be taken at the monitoring points specified in this permit, and shall be taken, unless otherwise specified, before the effluent joins or is diluted by any other waste stream, body of water, or substance. Monitoring points may not be changed without notification to and the approval of the Department.

2. Flow Measurements

Appropriate flow measurement devices and methods consistent with accepted scientific practices must be selected and used to ensure the accuracy and reliability of measurements of the volume of monitored discharges. The devices must be installed, calibrated and maintained to insure that the accuracy of the measurements is consistent with the accepted capability of that type of device. Devices selected must be capable of measuring flows with a maximum deviation of less than ± 10 percent from true discharge rates throughout the range of expected discharge volumes.

3. Monitoring Procedures

Monitoring must be conducted according to test procedures approved under 40 CFR part 136, or in the case of sludge use and disposal, under 40 CFR part 503, unless other test procedures have been specified in this permit.

4. Penalties of Tampering

The Clean Water Act provides that any person who falsifies, tampers with, or knowingly renders inaccurate any monitoring device or method required to be maintained under this permit may, upon conviction, be punished by a fine of not more than \$10,000 per violation, imprisonment for not more than two years, or both. If a conviction of a person is for a violation committed after a first conviction of such person, punishment is a fine not more than \$20,000 per day of violation, or by imprisonment of not more than four years, or both.

5. Reporting of Monitoring Results

Monitoring results must be summarized each month on a Discharge Monitoring Report form approved by the Department. The reports must be submitted monthly and are to be mailed, delivered or otherwise transmitted by the 15th day of the following month unless specifically approved otherwise in Schedule B of this permit.

6. Additional Monitoring by the Permittee

If the permittee monitors any pollutant more frequently than required by this permit, using test procedures approved under 40 CFR part 136, or in the case of sludge use and disposal, under 40 CFR

part 503, or as specified in this permit, the results of this monitoring must be included in the calculation and reporting of the data submitted in the Discharge Monitoring Report. Such increased frequency must also be indicated. For a pollutant parameter that may be sampled more than once per day (e.g., Total Chlorine Residual), only the average daily value must be recorded unless otherwise specified in this permit.

7. Averaging of Measurements

Calculations for all limitations that require averaging of measurements must utilize an arithmetic mean, except for bacteria which shall be averaged as specified in this permit.

8. Retention of Records

Records of monitoring information required by this permit related to the permittee's sewage sludge use and disposal activities shall be retained for a period of at least five years (or longer as required by 40 CFR part 503). Records of all monitoring information including all calibration and maintenance records, all original strip chart recordings for continuous monitoring instrumentation, copies of all reports required by this permit and records of all data used to complete the application for this permit shall be retained for a period of at least 3 years from the date of the sample, measurement, report, or application. This period may be extended by request of the Department at any time.

9. Records Contents

Records of monitoring information must include:

- a. The date, exact place, time, and methods of sampling or measurements;
- b. The individual(s) who performed the sampling or measurements;
- c. The date(s) analyses were performed;
- d. The individual(s) who performed the analyses;
- e. The analytical techniques or methods used; and
- f. The results of such analyses.

10. Inspection and Entry

The permittee must allow the Department or EPA upon the presentation of credentials to:

- a. Enter upon the permittee's premises where a regulated facility or activity is located or conducted, or where records must be kept under the conditions of this permit;
- b. Have access to and copy, at reasonable times, any records that must be kept under the conditions of this permit;
- c. Inspect at reasonable times any facilities, equipment (including monitoring and control equipment), practices, or operations regulated or required under this permit, and
- d. Sample or monitor at reasonable times, for the purpose of assuring permit compliance or as otherwise authorized by state law, any substances or parameters at any location.

11. Confidentiality of Information

Any information relating to this permit that is submitted to or obtained by DEQ is available to the public unless classified as confidential by the Director of DEQ under ORS 468.095. The Permittee may request that information be classified as confidential if it is a trade secret as defined by that statute. The name and address of the permittee, permit applications, permits, effluent data, and information required by

NPDES application forms under 40 CFR 122.21 will not be classified as confidential. 40 CFR 122.7(b).

SECTION D. REPORTING REQUIREMENTS

1. Planned Changes

The permittee must comply with OAR chapter 340, division 52, "Review of Plans and Specifications" and 40 CFR Section 122.41(I) (1). Except where exempted under OAR chapter 340, division 52, no construction, installation, or modification involving disposal systems, treatment works, sewerage systems, or common sewers may be commenced until the plans and specifications are submitted to and approved by the Department. The permittee must give notice to the Department as soon as possible of any planned physical alternations or additions to the permitted facility.

2. Anticipated Noncompliance

The permittee must give advance notice to the Department of any planned changes in the permitted facility or activity that may result in noncompliance with permit requirements.

3. Transfers

This permit may be transferred to a new permittee provided the transferee acquires a property interest in the permitted activity and agrees in writing to fully comply with all the terms and conditions of the permit and the rules of the Commission. No permit may be transferred to a third party without prior written approval from the Department. The Department may require modification, revocation, and reissuance of the permit to change the name of the permittee and incorporate such other requirements as may be necessary under 40 CFR Section 122.61. The permittee must notify the Department when a transfer of property interest takes place.

4. Compliance Schedule

Reports of compliance or noncompliance with, or any progress reports on interim and final requirements contained in any compliance schedule of this permit must be submitted no later than 14 days following each schedule date. Any reports of noncompliance must include the cause of noncompliance, any remedial actions taken, and the probability of meeting the next scheduled requirements.

5. Twenty-Four Hour Reporting

The permittee must report any noncompliance that may endanger health or the environment. Any information must be provided orally (by telephone) to DEQ or to the Oregon Emergency Response System (1-800-452-0311) as specified below within 24 hours from the time the permittee becomes aware of the circumstances.

a. Overflows.

(1) Oral Reporting within 24 hours.

- i. For overflows other than basement backups, the following information must be reported to the Oregon Emergency Response System (OERS) at 1-800-452-0311. For basement backups, this information should be reported directly to DEQ.

- a) The location of the overflow;

- b) The receiving water (if there is one);
 - c) An estimate of the volume of the overflow;
 - d) A description of the sewer system component from which the release occurred (e.g., manhole, constructed overflow pipe, crack in pipe); and
 - e) The estimated date and time when the overflow began and stopped or will be stopped.
- ii. The following information must be reported to the Department's Regional office within 24 hours, or during normal business hours, whichever is first:
 - a) The OERS incident number (if applicable) along with a brief description of the event.
- (2) Written reporting within 5 days.
- i. The following information must be provided in writing to the Department's Regional office within 5 days of the time the permittee becomes aware of the overflow:
 - a) The OERS incident number (if applicable);
 - b) The cause or suspected cause of the overflow;
 - c) Steps taken or planned to reduce, eliminate, and prevent reoccurrence of the overflow and a schedule of major milestones for those steps;
 - d) Steps taken or planned to mitigate the impact(s) of the overflow and a schedule of major milestones for those steps; and
 - e) (for storm-related overflows) The rainfall intensity (inches/hour) and duration of the storm associated with the overflow.

The Department may waive the written report on a case-by-case basis if the oral report has been received within 24 hours.

- b. Other instances of noncompliance.
 - (1) The following instances of noncompliance must be reported:
 - i. Any unanticipated bypass that exceeds any effluent limitation in this permit;
 - ii. Any upset that exceeds any effluent limitation in this permit;
 - iii. Violation of maximum daily discharge limitation for any of the pollutants listed by the Department in this permit; and
 - iv. Any noncompliance that may endanger human health or the environment.
 - (2) During normal business hours, the Department's Regional office must be called. Outside of normal business hours, the Department must be contacted at 1-800-452-0311 (Oregon Emergency Response System).
 - (3) A written submission must be provided within 5 days of the time the permittee becomes aware of the circumstances. The written submission must contain:
 - i. A description of the noncompliance and its cause;
 - ii. The period of noncompliance, including exact dates and times;
 - iii. The estimated time noncompliance is expected to continue if it has not been corrected;
 - iv. Steps taken or planned to reduce, eliminate, and prevent reoccurrence of the noncompliance; and
 - v. Public notification steps taken, pursuant to General Condition B.7
 - (4) The Department may waive the written report on a case-by-case basis if the oral report has been received

within 24 hours.

6. Other Noncompliance

The permittee must report all instances of noncompliance not reported under General Condition D.4 or D.5, at the time monitoring reports are submitted. The reports must contain:

- a. A description of the noncompliance and its cause;
- b. The period of noncompliance, including exact dates and times;
- c. The estimated time noncompliance is expected to continue if it has not been corrected; and
- d. Steps taken or planned to reduce, eliminate, and prevent reoccurrence of the noncompliance.

7. Duty to Provide Information

The permittee must furnish to the Department within a reasonable time any information that the Department may request to determine compliance with the permit or to determine whether cause exists for modifying, revoking and reissuing, or terminating this permit. The permittee must also furnish to the Department, upon request, copies of records required to be kept by this permit.

Other Information: When the permittee becomes aware that it has failed to submit any relevant facts or has submitted incorrect information in a permit application or any report to the Department, it must promptly submit such facts or information.

8. Signatory Requirements

All applications, reports or information submitted to the Department must be signed and certified in accordance with 40 CFR Section 122.22.

9. Falsification of Information

Under ORS 468.953, any person who knowingly makes any false statement, representation, or certification in any record or other document submitted or required to be maintained under this permit, including monitoring reports or reports of compliance or noncompliance, is subject to a Class C felony punishable by a fine not to exceed \$100,000 per violation and up to 5 years in prison. Additionally, according to 40 CFR 122.41(k)(2), any person who knowingly makes any false statement, representation, or certification in any record or other document submitted or required to be maintained under this permit including monitoring reports or reports of compliance or non-compliance shall, upon conviction, be punished by a federal civil penalty not to exceed \$10,000 per violation, or by imprisonment for not more than 6 months per violation, or by both.

10. Changes to Indirect Dischargers

The permittee must provide adequate notice to the Department of the following:

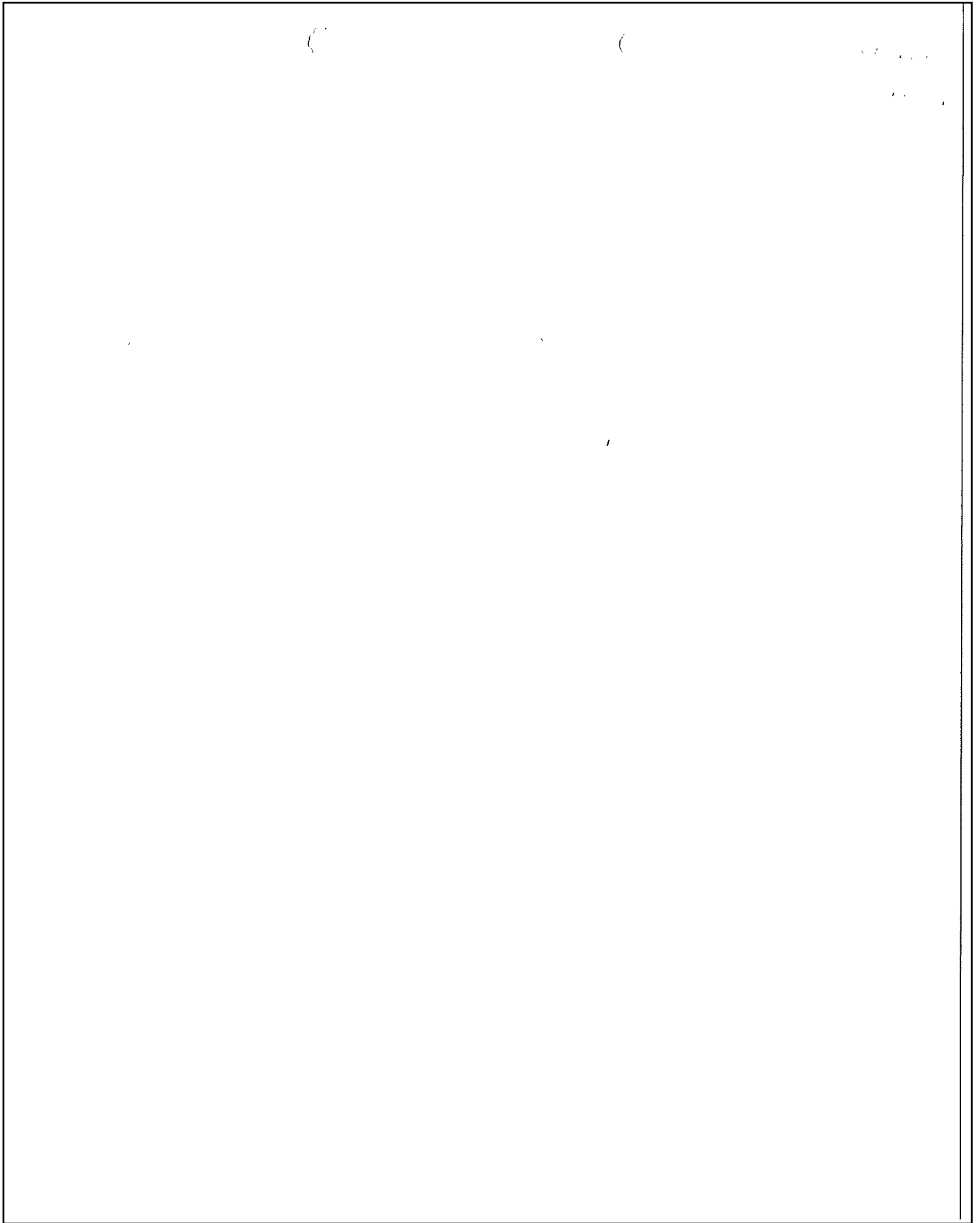
- a. Any new introduction of pollutants into the POTW from an indirect discharger which would be subject to section 301 or 306 of the Clean Water Act if it were directly discharging those pollutants and;
- b. Any substantial change in the volume or character of pollutants being introduced into the POTW by a source introducing pollutants into the POTW at the time of issuance of the permit.

- c. For the purposes of this paragraph, adequate notice shall include information on (i) the quality and quantity of effluent introduced into the POTW, and (ii) any anticipated impact of the change on the quantity or quality of effluent to be discharged from the POTW.

SECTION E. DEFINITIONS

1. *BOD* means five-day biochemical oxygen demand.
2. *CBOD* means five day carbonaceous biochemical oxygen demand
3. *TSS* means total suspended solids.
4. "*Bacteria*" includes but is not limited to fecal coliform bacteria, total coliform bacteria, and *E. coli* bacteria.
5. *FC* means fecal coliform bacteria.
6. *Total residual chlorine* means combined chlorine forms plus free residual chlorine
7. *Technology based permit effluent limitations* means technology-based treatment requirements as defined in 40 CFR Section 125.3, and concentration and mass load effluent limitations that are based on minimum design criteria specified in OAR Chapter 340, Division 41.
8. *mg/l* means milligrams per liter.
9. *kg* means kilograms.
10. *m³/d* means cubic meters per day.
11. *MGD* means million gallons per day.
12. *24-hour Composite sample* means a sample formed by collecting and mixing discrete samples taken periodically and based on time or flow. The sample must be collected and stored in accordance with 40 CFR Part 136.
13. *Grab sample* means an individual discrete sample collected over a period of time not to exceed 15 minutes.
14. *Quarter* means January through March, April through June, July through September, or October through December.
15. *Month* means calendar month.
16. *Week* means a calendar week of Sunday through Saturday.
17. *POTW* means a publicly owned treatment works.

Schedule F, last update 9.18.2009
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Revised: 22Jan2010





APPENDIX B



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CITY OF SANDY
WASTEWATER TREATMENT FACILITY
INTERIM REPAIRS AND IMPROVEMENTS
REPORT

July 2019

CURRAN-McLEOD, INC
6655 SW HAMPTON, SUITE 210
PORTLAND, OREGON, 97223

**City of Sandy
Wastewater Treatment Facility
Interim Repairs and Improvements
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CITY OF SANDY
WASTEWATER TREATMENT FACILITY OPERATIONAL EVALUATION
JUNE 2019

1. Introduction

A draft Wastewater System Facilities Plan was prepared by Murray Smith for the City of Sandy. According to an analysis of unit processes and projection of sewage flows, the facility is nearing or at its treatment capacity and is in need of a major upgrade and expansion. The facilities plan identified feasible wastewater treatment and collection system improvements for the next 20 year planning period.

As a part of the facilities plan, an assessment of the current condition of the facilities was conducted. The assessment identified deficiencies in the unit processes, specific equipment and systems. Many of these deficiencies are adversely affecting the day to day operation of the treatment facility. Some of the deficiencies are related to equipment reaching the end of its service life, lack of maintenance and others are related to the systems at or over their design capacity.

The purpose of this document is to identify those system components that can be repaired or replaced to restore all processes on an interim basis until major treatment system improvements are undertaken.

2. Primary Treatment

a. Rotamat Inclined Rotary Drum Screen

The existing fine screen was installed in 1996. It has a 1/4" bar spacing with a maximum hydraulic capacity of 6.6 mgd according to the manufacturer's literature. The screen drum was damaged by large debris and was out of service a few years ago until the drum could be replaced. Recently, the screen drive failed and the screen was again out of service until the City received and installed the replacement drive.

Failure of the screening system has resulted in debris clogging downstream pumps and processes. The debris is collected in the sludge which also affects the desirability of the dewatered biosolids. A recent assessment of the screening system also noted that large objects and rags are bypassing the screen. It was recommended that the screen be replaced or repaired and that a second mechanical screen be installed.



Existing fine Screen

Recommended Improvements

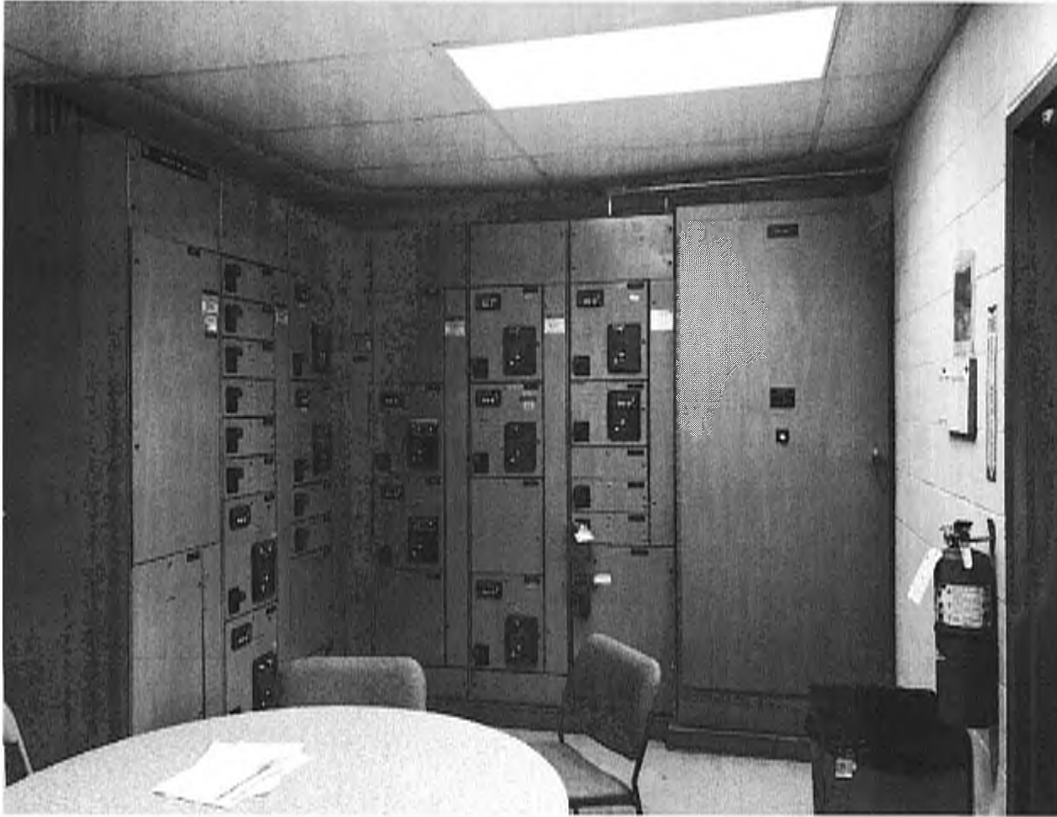
The existing screen has reached the end of its service life and needs to be replaced. In addition, obtaining replacement parts has been difficult since the manufacturer does not maintain parts on hand. The existing basket screen utilizes 1/4 bar spacing, preference should be given to using a basket screen with a perforated plate, which is more effective at removing debris.

Two new mechanical screens should be installed. The recommended design alternative for the treatment facility in the draft facilities plan projects the current Peak Instantaneous Flow (PIF) as 10 mgd with the recommended design alternative having a PIF of 14 MGD in 20 years. It would be reasonable to have the combined capacity of the two screens be in excess of the PIF rather than each one having to meet the PIF since it is a rare occurrence. Therefore each screen could have a hydraulic capacity of 8-10 mgd. The existing manual bypass screen should remain in service.

One screen would be installed in the existing channel. The second screen would be installed in a new channel. The new channel would be constructed parallel to the existing channel on the end of the existing structure. No roof extension would be included at this time. There is adequate space on the Northeast side of the headworks structure to install the channel without impacting the existing access road.



480 volt 3-phase power is provided to the existing headworks screen control system (PN-1000) from MCC-A located in the Blower/Maintenance Building. According to the record drawings a 3/4" conduit runs from MCC-A to the existing screening system control panel. The conduit run is adequately sized to pull in up to 4-#8 THHW/THHN conductors if the conduit runs are Schedule 40 PVC and/or rigid galvanized conduit according to NEC conduit fill tables. However, this would be a tight fit and a difficult pull. If larger conductors are required for the new screening systems, a new conduit run would need to be installed. In any case, the feeder breaker in MCC-A will need to be replaced with a larger breaker or a different plug to carry the increased load.



MCC-A in Blower Maintenance Building

It should be noted that ideally the second screen should be powered from a different MCC to meet EPA Class 1 Reliability requirements, however, this may not be possible. The only other MCC that may be easily accessible to connect to is MCC-D located in the Biosolids Dewatering Building. This would require trenching, installation of a new conduit run, and modifications of the MCC to add a new feeder breaker, provided there is adequate space to do so.

The existing screen status and alarms are hard wired to the PLC in the Office/Lab Building. The existing conduit run can be extended and used for alarm and status signals from the new screens. If necessary, spare conduits stubbed up on the southwest corner of the headworks structure could also be used for this purpose.

The estimated cost to replace the existing headworks screen, construct a second channel with second screen and make all other associated improvements: \$645,000.

b. pH Alkalinity Adjustment

To elevate the pH of the treatment process and increase alkalinity for nutrient removal A caustic feed system was recently positioned at the headworks structure. A neat solution of 25% sodium hydroxide is injected into the screened wastewater upstream of the Parshall flume.



pH and Alkalinity Adjustment system at Headworks

As can be seen from the previous photo the installation is temporary with a portable containment system, tote and a single chemical feed pump. The other totes appear to be empty. The system is not protected from the elements and is located next to the main entrance road without any provision for protecting the system from vehicular damage. Other considerations that need to be taken in to account include:

- Caustic soda solution is highly corrosive and can be hazardous to personnel.
- The viscosity of 25% caustic soda solution increases rapidly when its temperature falls below 0 °F.

Recommended Improvement

A permanent alkalinity feed system needs to be provided. To avoid construction of a chemical storage/feed facility, space could be allocated in the shop area of the Blower/Maintenance building for the system. The shop areas provides:

- A controlled environment that will maintain a constant temperature;
- Accessibility by fork lift to move totes into and out of the building;
- Space for storage of additional totes; and
- Security reducing the risk of tampering or vandalism.

Since the alkalinity adjustment system is integral to the ongoing successful operation of the treatment facility, a second chemical feed pump should also be installed, or at the very least, kept on hand as a backup.

Injection of the caustic soda could occur at the aeration basin splitter box or at the upstream manhole. Mixing energy should be adequate at either location. However, routing the chemical feed line to the splitter box would be easier.

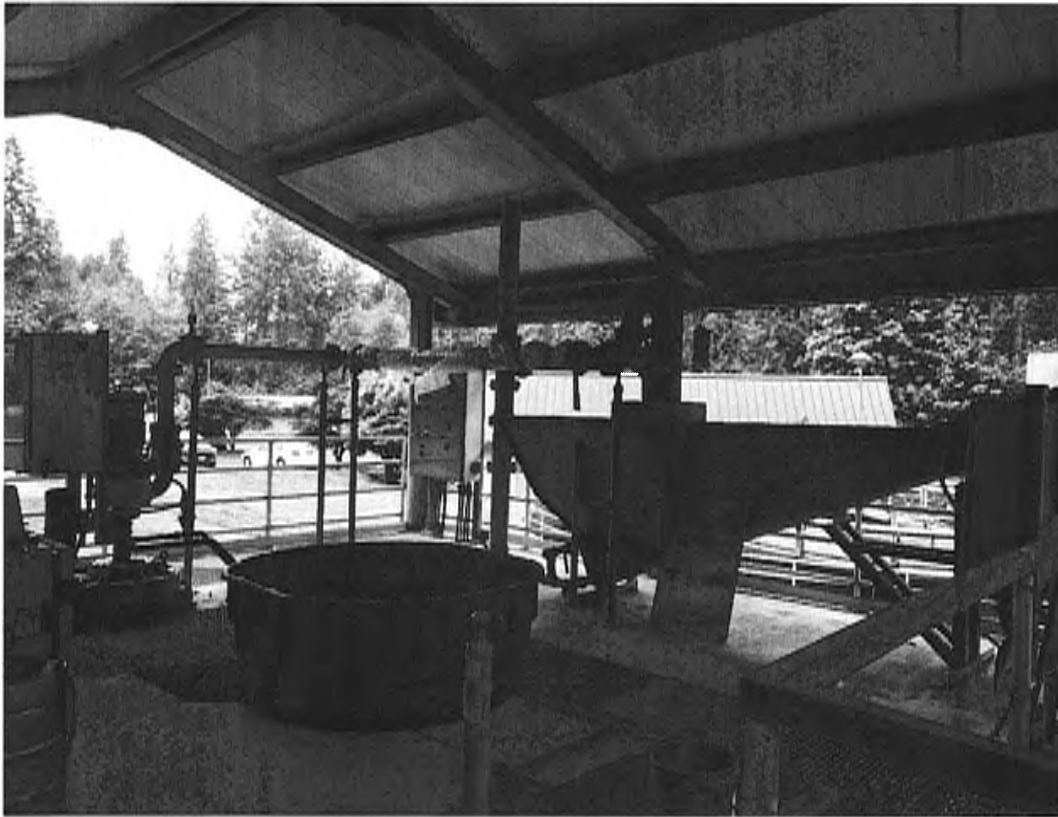
Adjustment of the chemical feed rate could continue to be a manual operation, or automated to respond to changing pH or flow conditions. Automated control if desired will be addressed in the Aeration Basin Monitoring and Control section of this document.

120 VAC power from the chemical feed pumps would be provided from panelboard CBP-1 in the control room of the Blower/Maintenance building. Adequate spare space exists to add a control circuit breaker if one is needed.

Estimated cost of recommended improvement to relocate the caustic feed system to the building and provide and install second feed pump and accessories: \$12,000.

c. Pista Grit System

The existing Pista Grit System has a hydraulic capacity of 7.0 MGD. The Condition Assessment has recommended that the system be replaced. The preliminary list of recommended improvements contained in the draft facilities plan also suggests that a second grit removal system be installed.



Pista Grit Removal Equipment

Recommended Improvements

The system, is reaching the end of its service life and should be replaced. However, the system although needed to remove grit from the raw sewage, is not a critical component of the treatment process. As such the system can continue to operate in the interim until a major treatment facility upgrade is implemented.

According to the Condition Assessment the grit motor also freezes up in the winter. To protect the system against freezing temperatures self regulating heat tracing with insulation can be installed. Power could be provided from the vacuum priming panel 120 VAC circuit since the heat tracing would be very low wattage, or by extending a 120 VAC circuit from the existing convenience outlet on the side of the main Pista Grit control panel.

Estimated cost of recommended improvement to heat trace and insulate the Pista Grit pump: \$750.

3. Secondary Treatment System

a. Aeration Basin Flow Split

The wastewater treatment facility evaluation noted that there was an imbalance in the flow split between the two aeration basins. Improvements completed in 2018 addressed this issue with the installation of an Aeration Basin Splitter box. The splitter box was baffled and included an overflow weir to reduce turbulence and more evenly distribute the incoming flow into the aeration basin distribution channel. This improvement appears to be functioning as intended. The splitter box also provides a means by which to bypass screened sewage to the storage pond. No additional improvements are recommended at this time.

b. Mixed Liquor Recycle and Secondary Clarifier Flow Split.

Mixed liquor flows from each aeration basin (Cell No. 4 and Cell No. 8) through a 3 foot wide wedging slide gate into a common 3'-6" wide channel extending approximately halfway across the end of each basin. The mixed liquor from each aeration basin cell is blended in the common channel before it discharges from the channel over two 4'-0" long weirs to provide a flow split to the two clarifiers. The internal recycle pump station is located at the end of cell No. 8. Mixed liquor flows into the pump station through a 3 foot wide slide gate.



Aeration Basin No. 1 (Cell No. 4)



Aeration Basin No. 2 (Cell No. 8)

The plant evaluation report expressed a concern that only one of the two aeration basins has a mixed liquor recycle. With ML from both aeration basins discharging into the common channel, the IR pump station receives a blend of ML from both basins.

Recommended Improvements

There are two IR pumps, the discharge line from each pump can return ML to any one of the 4 cells in each aeration basin train. If only one pump is operational the out of service pump needs to be repaired and put back in service.

The aeration basin splitter box improvements as noted in the evaluation, have improved the raw sewage flow split between the basins. If there is an imbalance in the IR flow between the basins, there may be an issue with the performance of the pumps due to impeller wear, clearances or other obstructions. The pumps should be examined for these issues. A flow measurement estimate should be done by measuring pump shutoff head and the TDH of a second point on the pump curve. To do this a pressure gauge with an isolation diaphragm would need to be temporarily installed in each pump discharge line.

If there is a continued need to monitor the flow from each pump, a flow meter could be installed in each line to provide IR flow rate readings. An additional step would be to replace each pump starter with an adjustable frequency drive. The speed could be

controlled either manually or automatically based on the flow meter readings. Additional SCADA and PLC programming would be needed to make this operation fully functional. This is not a critical improvement and is an option that could be implemented if it is considered to be beneficial for the operation of the facility.

The evaluation report also linked the internal recycle with and imbalance of flow to the secondary clarifiers. There is no flow measurement device located between the aeration basins and the clarifiers. The flow split to the secondary clarifiers is controlled by the two 4 foot long weirs with the IR pump discharge located upstream of the weirs.

On May 16th, the discharge over the two weirs was observed to be free flowing with no surcharging of ML over the weirs from the 20" clarifier inlet pipes. To determine if there is an imbalance in flow to the two clarifiers from the aeration basins, the elevation of the weirs should be measured. If they are found to be at different elevations they should be adjusted accordingly which will require the weirs to be moved by loosening the stainless steel fasteners holding the weirs in place and raising or lowering the weirs as needed and retightening the bolts. This would require the discharge channel be isolated and a temporary pumping system be installed to pump ML into the two chambers downstream of the weirs, or dewatering a cell to use the time refilling when there would be no discharge

Estimated cost of the recommended improvements:

- Add two flow magnetic meters, electrical and signal wiring and SCADA programming: \$35,000
- Replace soft starters with variable speed pump controls and SCADA control programming: \$50,000.

c. Aeration Basin Dissolved Oxygen Monitoring Control

The two aeration basin dissolved oxygen (DO) probes (Cells No. 4 and No. 8) were added to the aeration basin after the initial plant design. The DO probes simply monitor the DO in the basins and do not have any control over the aeration process.

Improvement Alternatives

Operational improvement options that could be used to control the aeration process could consist of the following:

- Installation of an electric motor operated valve with a positioner in each of the air lines to the aeration basin. Use the existing dissolved oxygen probe in each

basin to control the air flow by positioning the respective valve to maintain the desired DO level in each basin.

- Expanding the DO system to add up to four (4) additional probes in the aeration basin with the two (2) existing DO probes in each aeration basin train. One probe could be installed in Anoxic Cells No. 2 and No. 3 in Train No. 1 and in Cells No. 6 and No. 8 in treatment train No. 2. These probes would again be individually coupled with a motor operated valve and positioner to control the flow of air into each cell.

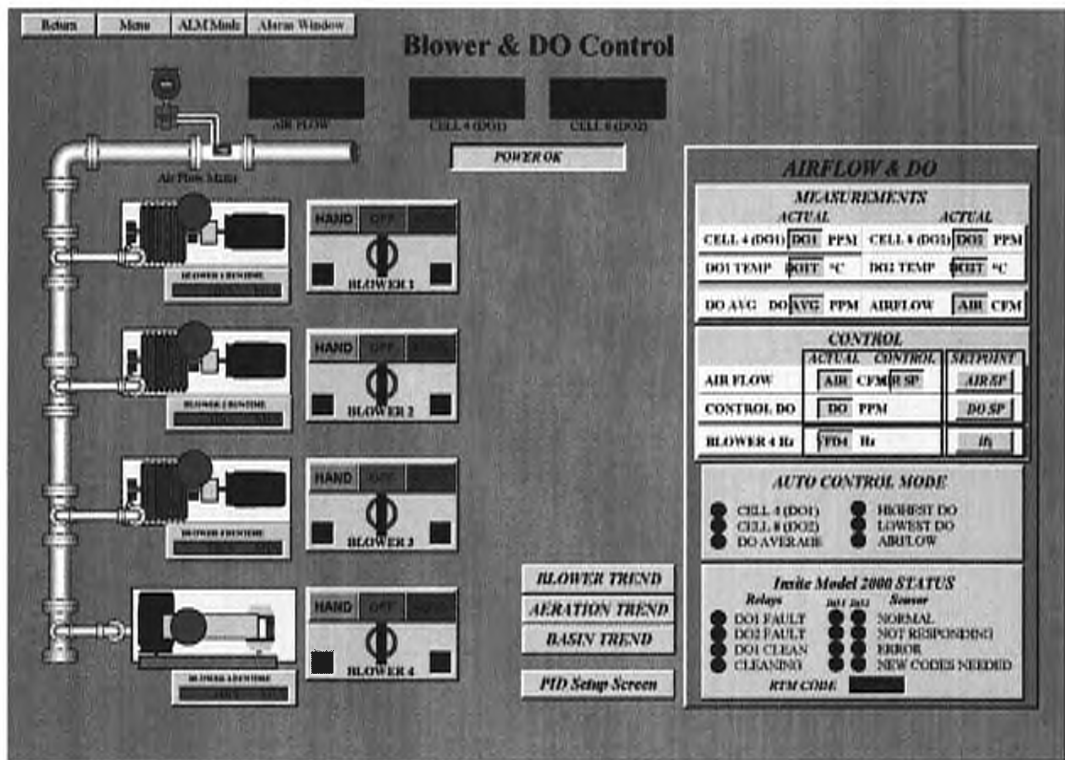
Depending on the range of operation, these options would probably require a portion of the air to be bled off through another valve to prevent the centrifugal blowers from going into a surge condition. If the positive displacement blower can be used to provide the necessary air to the basins, air could simply be wasted through the blowoff valve. An alternative to simply wasting the air through a valve would be to route a new air line to the sludge holding tank and use the air to aerate the tank.

If it is determined that the air demand in the aeration basins will be low at night, it would also be necessary to change the blower motor controls from soft starters to VFDs to slow the centrifugal blowers down to prevent them from going into a surge condition. It may also be possible to just use the PD blower at night to maintain a minimum DO.

To control the operation of the valves and blowers:

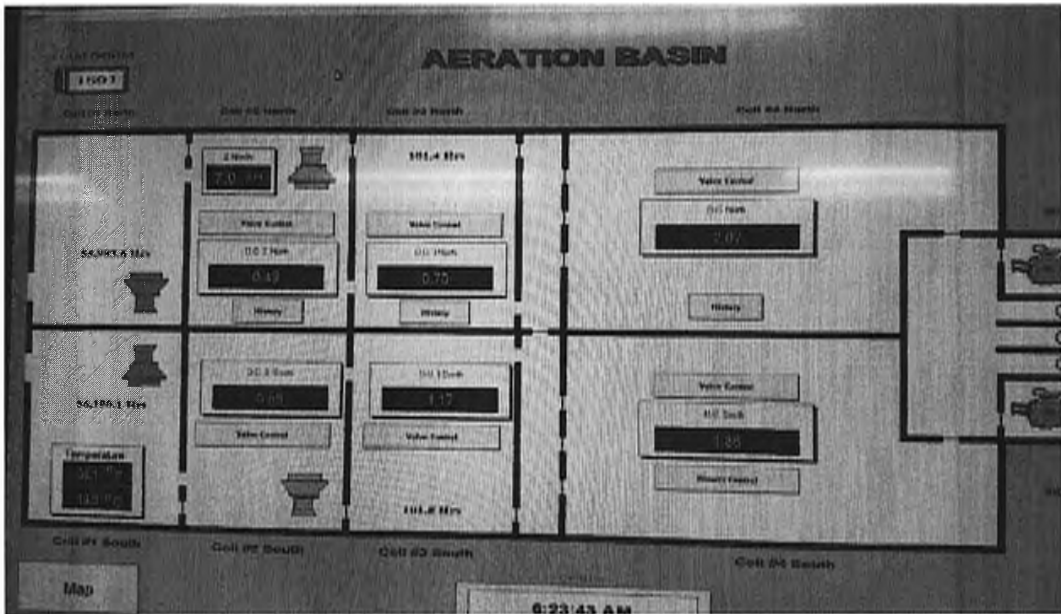
- Additional control and power wiring will be needed for the electric operated valves and DO probes.
- Discrete and analog Inputs and outputs cards will need to be added to PLC rack No. 2 in panel PN-1004 in the Blower/Maintenance building.
- Programming changes to the PLC and SCADA will be needed to control the operation and display the operational status of the aeration process.
- Replace soft starters with VFDs and add control loops to allow process control of blower speed.

A SCADA screen was developed for the DO and blower control and is shown below, but is non-functional.

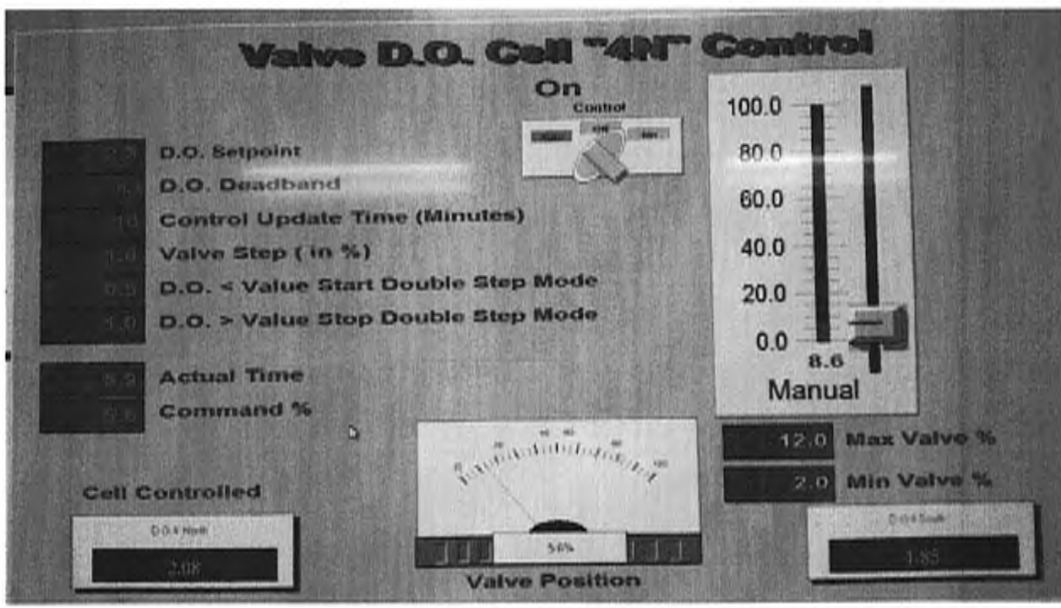


Existing SCADA and Blower and DO control Screen

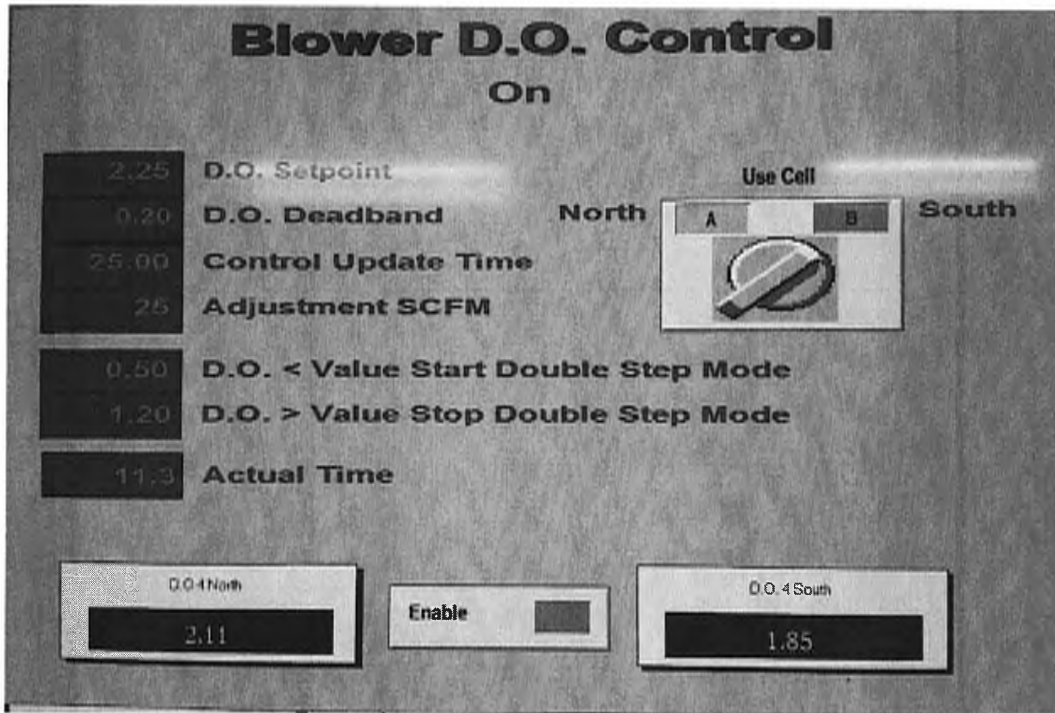
The following photos show how a similar process was implemented and controlled at the Canby wastewater treatment facility. A similar system could be utilized at the Sandy WWTP to optimize treatment.



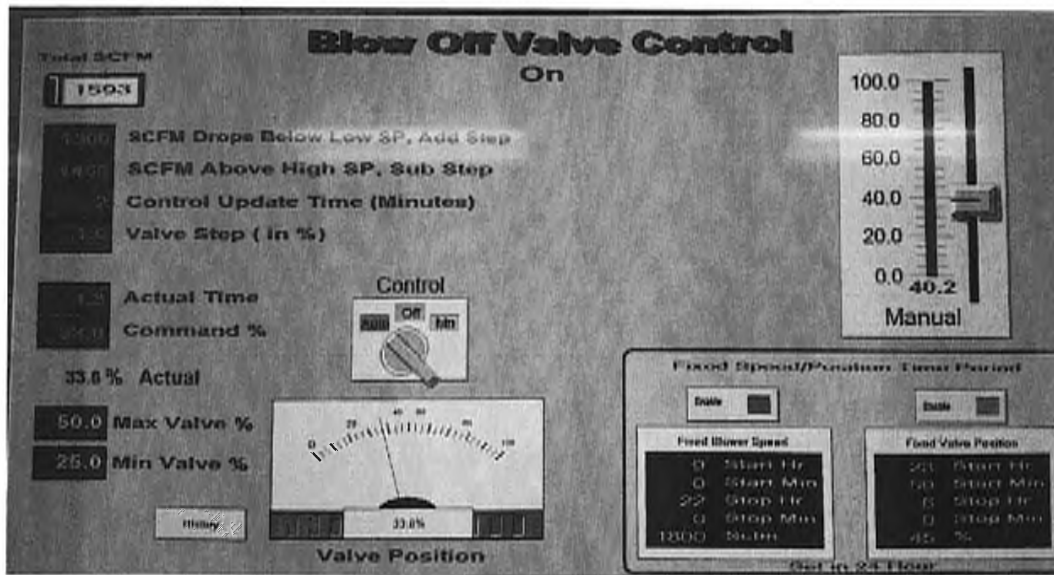
Aeration Basin DO Main Control Screen



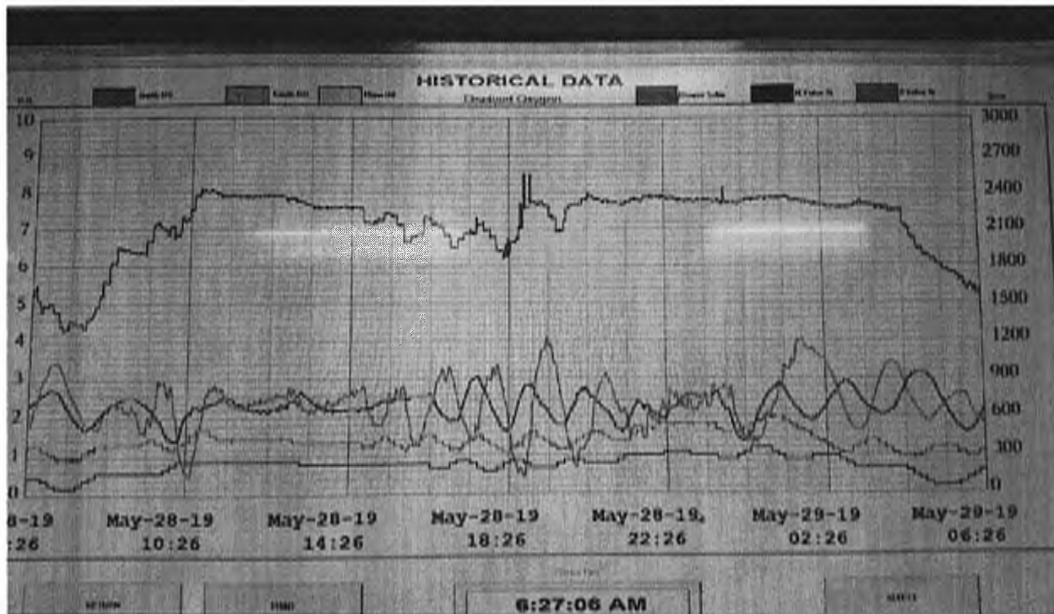
Typical Valve Control Screen



Blower DO Control Screen



Blow off Valve Control Screen



Historical Data and Trending Screen

Estimated Cost of Improvements:

- Aerobic basin Cells No. 4 and No. 8. Add two (2) motor operated electric valve actuators with positioners and position indication. Install power and analog signal field wiring, analog and discrete I/O modules and PLC and SCADA programming: \$60,000.
- Swing Cells. Add DO probes (4), four (4) motor operated electric valves with positioners and position indication. Install power and analog signal field wiring, analog and discrete I/O modules and PLC and SCADA programming: \$140,000.
- Blow off Valve with positioners and position indication. Install power and analog signal field wiring. No piping to sludge basin: \$20,000.
- Replace three (3) centrifugal blower soft starters with AFDs, field wiring modifications, analog signal or ethernet wiring, analog and discrete I/O modules, and PLC and SCADA programming: \$150,000.

d. Aeration Basin pH Monitoring

It was pointed out in the facility Evaluation Report that there is no pH monitoring system and therefore a lack of data to optimize treatment.

The pH of the wastewater has been low due to over aeration which has stripped out the natural alkalinity of the water. To compensate for the low pH sodium hydroxide is being added at the headworks. It is assumed that manual grab samples of the wastewater are being taken to determine if the correct pH is being maintained to optimize the treatment process. Samples would only be taken during normal day time working hours.

Recommended Improvement Options

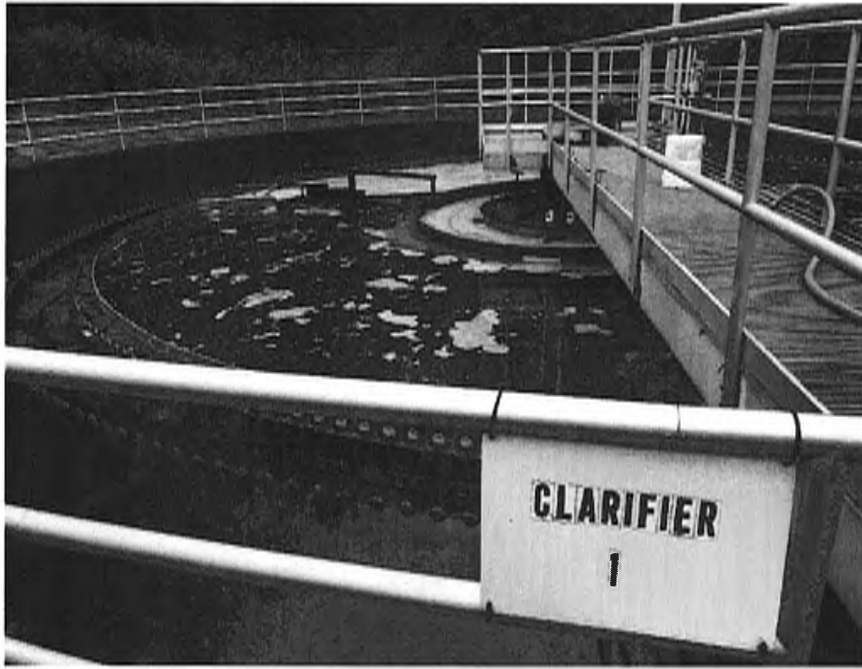
To provide data to better control the process an online pH monitoring system could be installed. The proposed location of the system would need to be determined to provide the optimum sampling location and a good response time.

The system could simply monitor the process or it could be used to control the caustic feed system. In either case, the instrument would need to be powered and an analog or Ethernet signal would need to be sent to a new SCADA screen via the PLC in panel PN-1004 in the Blower/Maintenance Building office.

Estimated cost of recommended improvements to add pH meter, field wiring, PLC and SCADA programming: \$18,000.

e. Secondary Clarifier Condition

The clarifier weirs and baffles need to be inspected for signs of deterioration when the clarifier is out of service. If they are found to be brittle or damaged they need to be replaced. And when the weirs are reinstalled they need to be leveled to have an even draw of clarified water around the entire perimeter. Currently, Clarifier No. 1 weirs are out of level resulting in uneven flow over the weirs.



Clarifier No. 1



Clarifier No. 2

Scum removal from the secondary clarifiers is a persistent problem with the excessive amount of foam coming from the aeration basins. The quantity of foam reaching the secondary clarifiers should be reduced with improvements to the aeration system and alkalinity control. It should also be noted that an automatic flushing system that was installed in the scum trough of each clarifier has been removed. Restoration of the flushing system could help flush the scum from the clarifier scum troughs and reduce the buildup of scum on the surface of each clarifier. However, the scum is pumped into the WAS so this will increase the volume of WAS that needs to be stored and treated.

Page 28 of the Condition Assessment Field Notes in Appendix F of the draft Wastewater Facilities Plan also identified other repairs and improvements:

- Repair of the water spray-down on secondary clarifier No. 1;
- Increasing the slope of the scum trough to the scum pump station;
- Assessing the effect of polymer on scum flow; and
- Spot repair of the outside wall cracks.

Recommended Improvements

Repair of the spray-down system and assessment of the effect of the polymer should be considered and undertaken. Increasing the slope of the line from the scum troughs could potentially be achieved with a coating system in the pipe, but should only be considered after resolution of the aeration basin foaming issue and restoration of the scum trough flushing system.

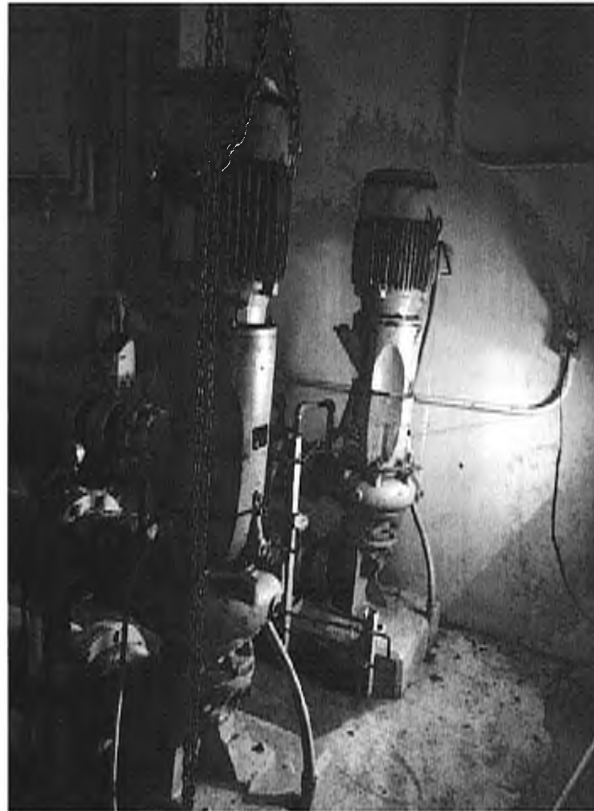
It is not unusual to observe surface fractures in concrete walls. These do not pose a threat to the integrity of the clarifier and efforts to patch or repair the cracks would only be a cosmetic improvement.

Cost estimates are as follows for the various improvements

- Repair the spray-down system clarifier No. 1: \$1,500.
- Increase slope on scum trough discharge lines: \$20,000.
- Repair and replace clarifier scum trough flushing system: \$3,000.
- Replace weirs and baffles, if necessary: \$40,000
- Level weirs: \$4,000.

f. Return Activated Sludge (RAS) Pumps

There are two RAS pumps. Each pump has a design capacity of 600 gpm. One pump is dedicated to each clarifier with the ability to have a single pump serve both clarifiers by repositioning the pump suction piping valves during a pump outage event. The discharge from each pump is measured by a magnetic flow meter.



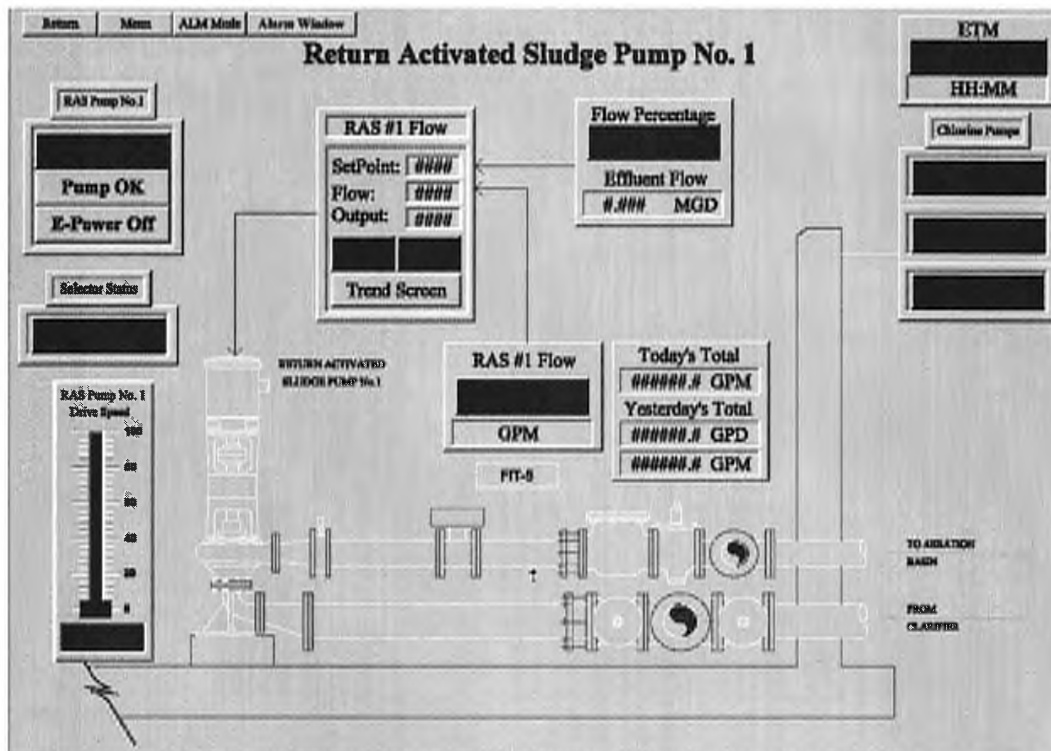
RAS pumps

Recommended Improvements

We concur with the assessment on Page 30 of the Condition Assessment Field Notes in Appendix F of the draft Wastewater Facilities Plan that the RAS pumps have reached the end of a typical service life after 20 years and should be replaced. However, the pumps should be kept in service until a major facility upgrade can be completed. In the event of a single pump failure, one pump may not be optimal, but can serve both clarifiers. However, it may be more difficult to maintain a balance of RAS from each clarifier and could adversely impact the treatment process. In light of this concern a new pump

should be purchased and installed and the existing pumps should be repaired in turn this will result in a spare RAS pump being on hand.

An additional recommended improvement in the Condition Assessment is that the RAS pumps should have automated flow control. The original design of the RAS pump control system allowed the operators to manual or automatically control the operation of the RAS pumps as shown below.

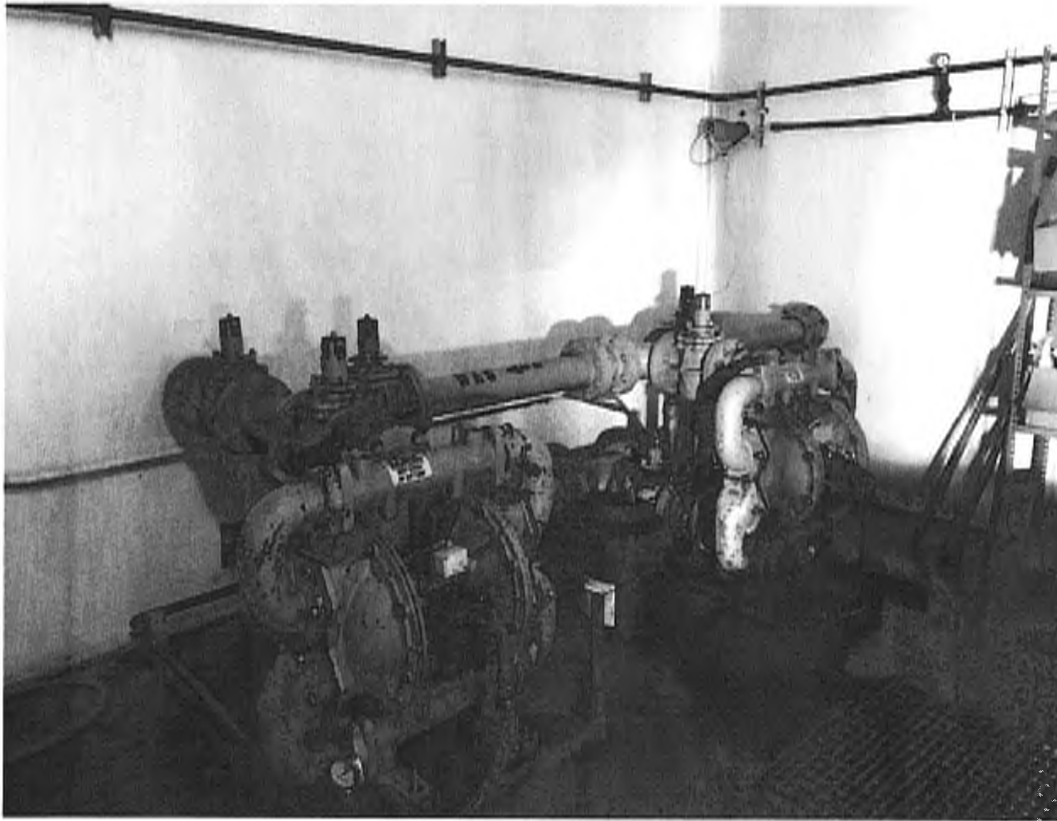


Automatic flow control of the pumps, other than effluent flow based control may be possible but, would be impacted by several variables: Changing mixed liquor sludge concentrations and quality, sludge solids distribution between the aeration basins and the clarifiers, changes in organic loading and the sludge wasting rates. Any significant change in the automated control of the RAS pumps should be based on additional operating experience only after other secondary treatment process improvements have been made.

Estimated cost of RAS pump improvements to provide a spare pump and review and update pump controls in SCADA: \$20,000.

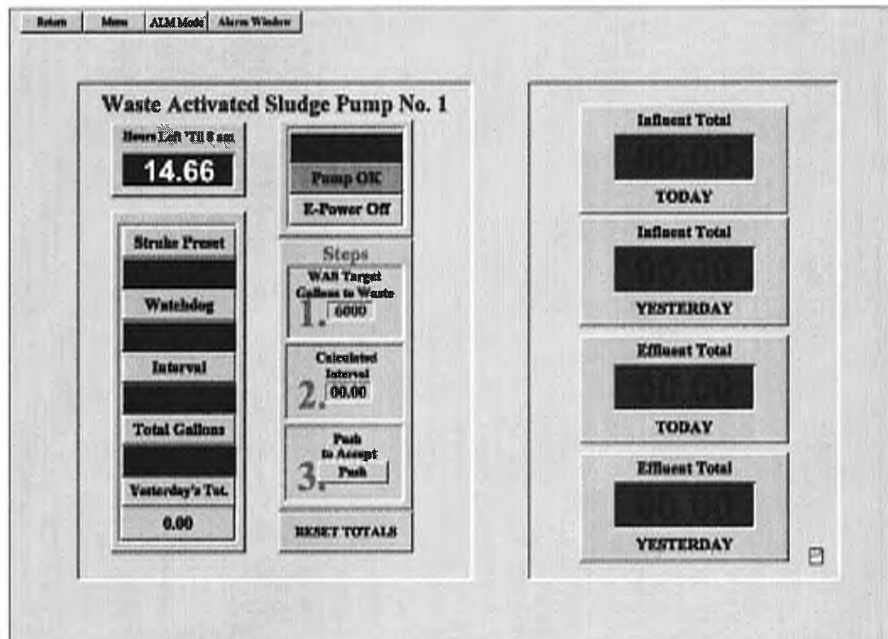
g. Waste Activated Sludge (WAS) Pumps.

As with the RAS pumps, the WAS pumps have also reached the end of their service life. We did not observe the operation of the pumps, but the Condition Assessment noted the pump are "rocking, very noisy and have corroded metal." The pumps are relatively inexpensive when compared to the RAS pumps and should be replaced if there is a fear of imminent failure.



Waste Activated Sludge Pumps

The Assessment also recommended two other improvements: Installation of flow meters and automated flow controls. With the initial installation of the pumps in 1998, automatic controls were included that would count the number of each pumps pulsations. SCADA was programmed to set the volume of wasting based on the number of strokes since each stroke is a fixed volume. It is implied from the recommended improvements that the automated operation with flow measurement is no longer functional.



WAS Pump No. 1 SCADA control (Typical of 2 Screens)

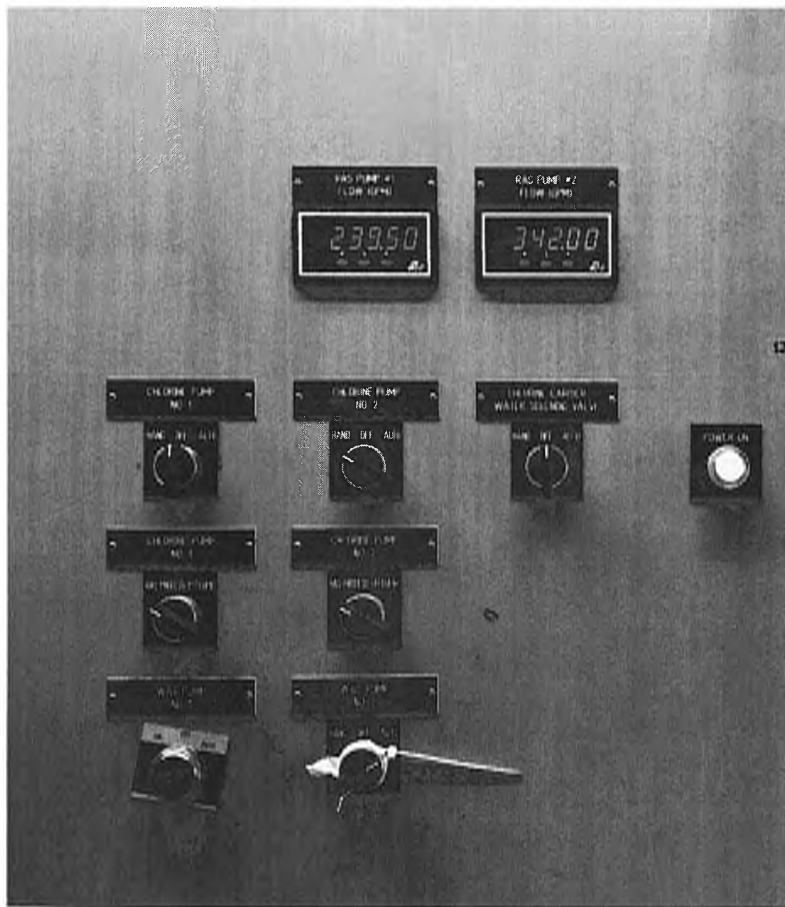
Recommended Improvements

The purchase of new air driven positive displacement pumps should be considered and include a stroke counter. SCADA programming should also be reviewed to determine if there is a programming issue that prevents the program from proper initiating and controlling the wasting operation. The SCADA programming should be as described in the "*System Operation Manual in Section I.D. Waste Activated Sludge Pumps*" and be modified as needed in response to current operational needs. Based on the initial design we would not recommend installation of a flowmeter, which would be less accurate than counting the pump pulses and having a known volume for each pump stroke.

Estimated cost of replacing both WAS pumps and review and update pump controls in SCADA: \$40,000.

4. Sodium Hypochlorite Disinfection System

The original sodium hypochlorite feed system consisted of a 3,000 gallon bulk storage tank which has since been replaced with two smaller tanks. There were also two analog signal paced chemical feed pumps. Chlorine could be injected at three points: The RAS line at the aeration basin, the reclaimed process water pumps and the effluent filtration/disinfection basin. Selection of the injection point was controlled by positioning valves in the chemical pump discharge manifolds and selecting the pacing signal on PN-1011.



Panel PN-1011 in Secondary Sludge Pumping Building

The chemical feed pump discharge piping is basically the same as originally installed with the exception of the addition of an above ground feed line that exits the building to chlorinate the effluent. This temporary line was installed to eliminate accidental leakage of chlorine to Tickle Creek through the site foundation drainage system form a

failed chlorination line. Carrier water line modifications have been made eliminating the process water flow indicator and control solenoid valve.

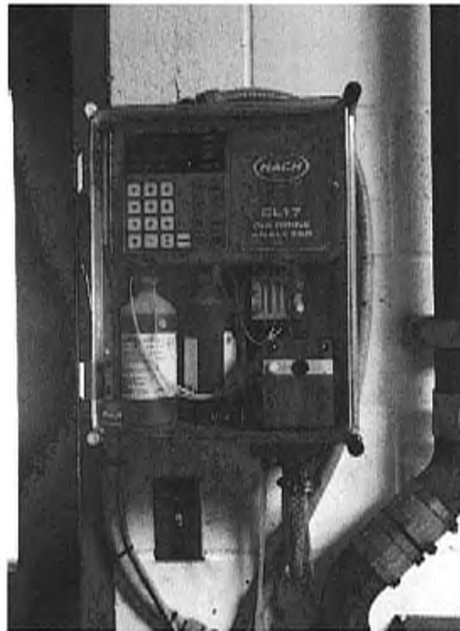
The Assessment noted two needs, inspection of the storage room to determine the effectiveness of the secondary containment and installation of a check valve, pulsation dampener and calibration column on the hypochlorite feed pump. Since the Assessment, these issues have been addressed with the exception of installation of the check valve and pulsation dampener.

Section VIII, Tab L "*Hypochlorite Chlorine Feed System*" of the Systems Operations Manual describes how the chlorine feed system was to function in relation to each of the discharge points. There is only one functional chemical feed pump plumbed to the pump discharge piping (Pump No. 2) and it is being used to chlorinate the effluent discharged to the Isley Nursery. It appears that the pump has an analog input for speed control, but the pump is operating in a "Hand" position with the feed point selector switch in the "RAS" position so more than likely the chlorine dose is not being flow paced. Process water is not being chlorinated.

Recommended Improvements

Since the second pump is not installed, the chlorine system as configured is a single point of failure. A second chlorine pump with analog capability should be installed. Ideally, the pump should be a peristaltic type to preclude the possibility of chlorine off gassing preventing the pump from functioning properly. A peristaltic pump would also eliminate the need for the above referenced check valve and pulsation dampener. The control programming should also be revisited to verify that it is functional for selection of the pump in service and flow pacing.

In conjunction with the chlorine feed pump improvements the residual chlorine analyzer needs to be replaced or repaired as needed. The analyzer measures the chlorine residual of the recycled water pumped to Isley Nursery.



Residual Chlorine analyzer

Estimated cost of improvements:

- Provided an install second peristaltic chemical feed pump with analog speed control and programming: \$6,000.
- Replace Hach residual chlorine analyzer: \$5,000.

5. AquaDisk Filters

The Condition Assessment of the draft facilities plan identified five recommended improvements:

- Repair the high pressure wash pump leak,
- Contain wiring on the high pressure wash pump,
- Examine and repair drive of Filter No. 2,
- Improve flow split between Filter No. 1 and Filter No. 2, and
- Re-evaluate alkalinity dosing from disk filters to head of aeration basin to correct low pH.

The alkalinity adjustment system has been moved to the headworks, it appears the exposed wiring issue at the high pressure wash pump has been taken care of and Filter No. 2 was in operation so the drive issue may have been addressed.



Filter Unit No. 2



Filter Unit No. 1

Recommended Improvements

The remaining issue of the flow split between the filters can be addressed by having the elevation of each weir box overflow shot to determine if there is a significant difference in elevation between the two inlet boxes. Both weirs should be set at the same elevation over the length of the weir (elevation 515.80) which is 2.2 feet below the top of the basin walls. If there is significant difference in elevation, or they are out of level it will be difficult to adjust the weir box since there is no adjustment. The only solution would be to install an adjustable weir on one or both of the boxes. An insignificant difference in elevation should be tolerable with respect to filter operations even though one filter may receive higher loading which will simply mean more frequent cleaning of the filter fabric.

The City should also consider changing the filter fabric to a deep pile type. This is an innovation utilized by AquaDisk which eliminates the need for the high pressure wash system.

The City should also consider having an AquaDisk factory representative evaluate the filter condition and operation to determine what additional improvements are needed since the filters are an integral part of the treatment process.

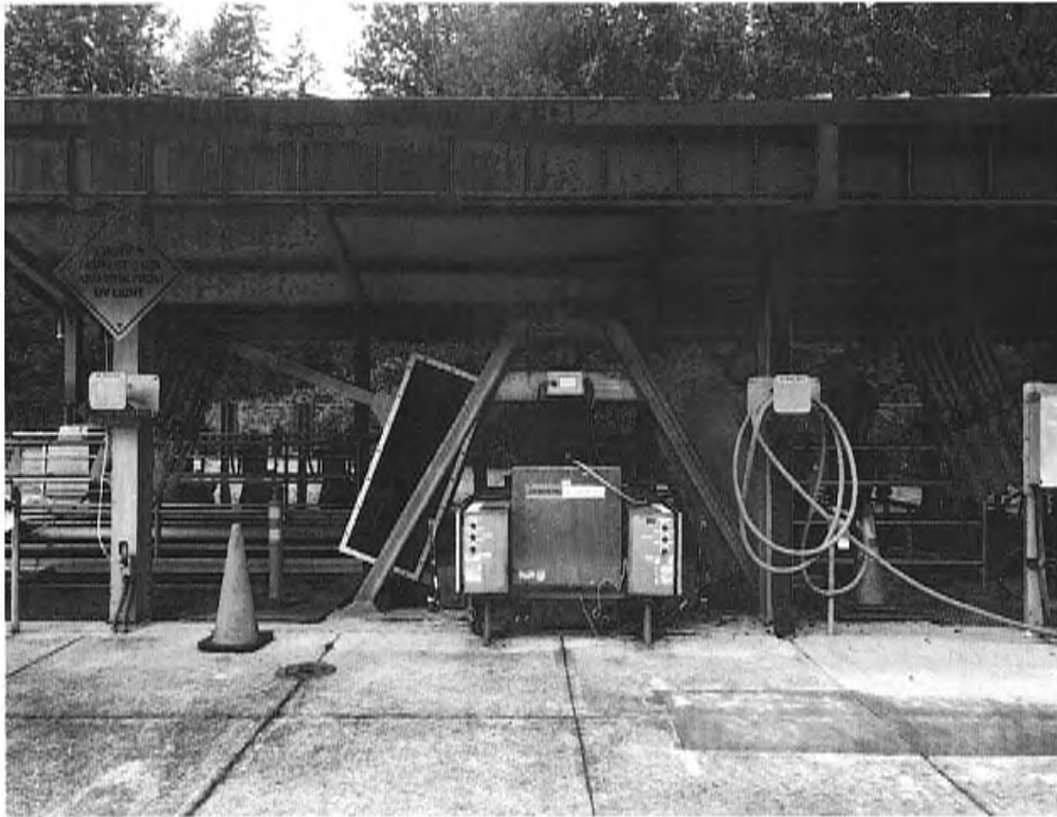
In association with the disk filter improvements there is the need to address the overflow opening between the metering chamber and disk filter inlet channel. The overflow is at a elevation above that of the filter inlet, but below the elevation of the filter basin outlet emergency overflow weir. The intent was for the overflow to serve as a last point of controlled diversion in the basin. Due to recent high winter wet weather flows to the facility and issues with the operation of the disk filters, there has been a potential for secondary clarifier effluent to bypass the filters and disinfection. To avoid this issue and the potential for bypassing disinfection, the opening between the metering chamber and the disk filter should be closed with a gasketed aluminum plate. This will divert all flow through the filter chambers and UV disinfection system.

Estimated Cost of improvements:

- Obtain services of factory representative to assess the condition of the filter and make recommendations as to repairs: \$3,000.
- Seal opening between filter inlet channel and effluent metering basin: \$1,750.

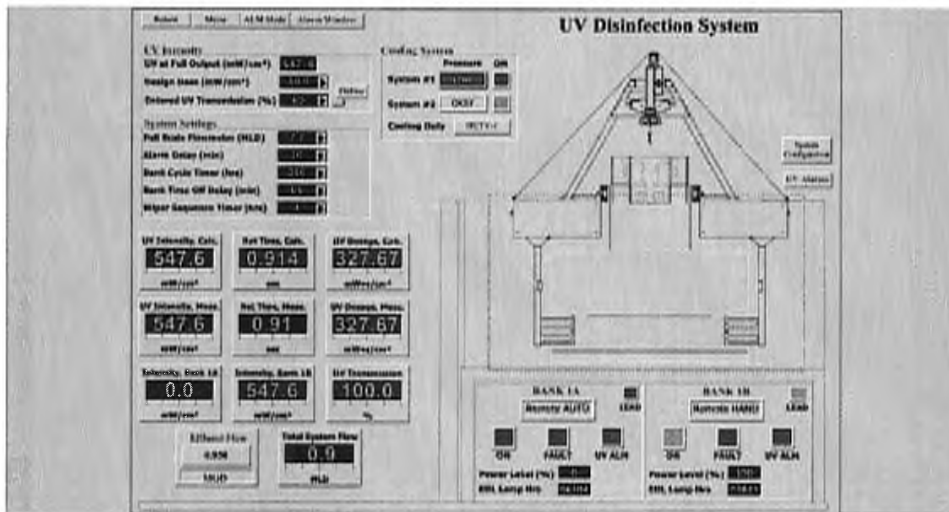
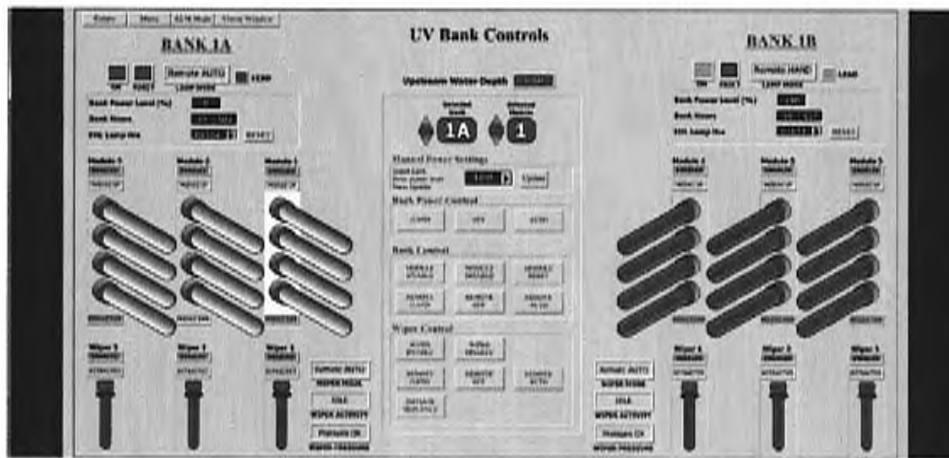
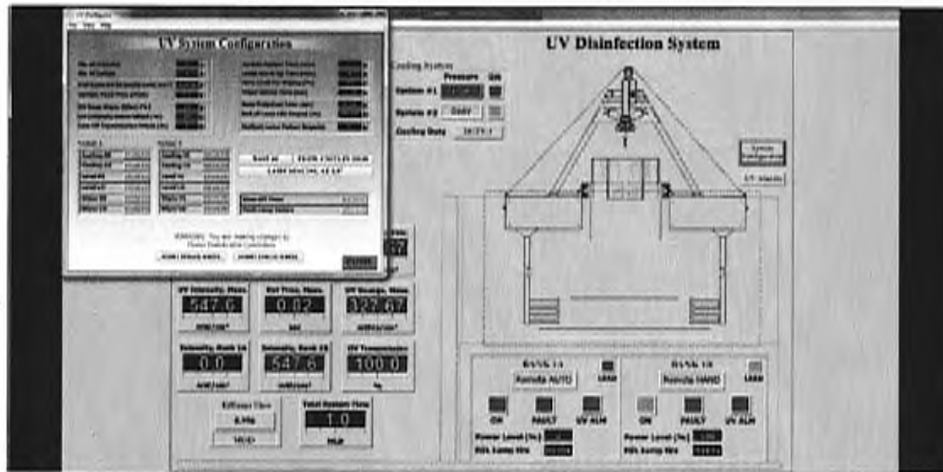
6. UV Disinfection System

The existing channel and UV disinfection system has a hydraulic capacity of 7.0 MGD and is adequate to disinfect flows up to this flow provided the UV transmittance and TSS concentrations are within the required design parameters. PIF according to the draft Facilities Plan are currently projected to be 10 mgd. which is beyond the design capacity of the disinfection unit. The existing Trojan UV4000 is obsolete and is at the end of its service life.



Trojan UV4000 UV Disinfection Unit

The UV transmittance meter has failed along with the lamp cleaning mechanism. There have been instrumentation failures that the City has worked around with the help of the City's systems integrator to develop new programming and SCADA controls to maintain the systems operation. Examples of the replacement SCADA is shown in the following series of screen shots.



Recommended Improvements

We concur with the recommendation that the disinfection system needs to be replaced due to multiple system failures. Any UV disinfection system design should consider a direct replacement with the UV4000Plus by Trojan or similar system and medium or low pressure systems to determine what is feasible and most cost effective. The existing system provides redundancy through the use of two light banks. A similar design should be considered or redundancy addressed with the addition of a second channel and disinfection unit. No interim improvements are recommended until a major facility improvement is undertaken. The existing system needs to be maintained with consumable spare parts such as spare ballasts, bulb and quartz sleeves.

7. Solids Treatment

a. Aerated Sludge Storage

The existing sludge storage tank has approximately 360,000 gallons of storage in three cells. Flows and loadings to the treatment facility over the last 20 years have increased, resulting in an increased production of waste sludge. The draft facilities plan concluded that the WWTP does not have current capacity for the sludge flows as evident by the use of the EQ storage pond to store sludge. However, this was due in part to the inability to maintain a stable flow rate to the belt press from the submersible transfer pump. This has since been resolved by the current operators, which will allow more efficient operation of the dewatering process. This does not however, resolve the need for additional sludge storage. There is no short term resolution of this issue.



Aerated Sludge Storage Tank

b. Submersible Dewatering Operation Feed Pump

The existing submersible pump with variable speed control is feeding approximately 70 gpm to the belt press at a reasonably stable flow rate. If this is the case, there is no reason to replace the submersible pump as called for in the Condition Assessment or List of Recommendations in the draft facilities plan.

Recommendation

The pump is critical to the dewatering operation with the lack of adequate sludge storage. A second pump needs to be on hand to replace the existing pump should it fail. It is our understanding that the City has a second pump on order or being repaired which will full fill this need. No other improvements would be needed at this time.

c. Polymer Feed System

The Condition Assessment recommended that the polymer injection system be replaced based on the report that it is difficult to operate.

Recommendation

The condition of the system should be assessed by the local representative Wm. H Reilly Company to determine if it can be rebuilt or if does needs to be replaced. If the unit needs to be replaced it is estimated to cost \$25,000 for a similar system.

d. Belt Filter Press

The Condition Assessment also recommended the belt press be replaced. Veoila recently replaced the damaged belt and the press continues to be operational.

Recommendation

The long term goal is to replace the belt press, but in the interim, the belt press must be properly maintained to dewater the biosolids. In light of this, the condition of the belt press needs to be assessed by a representative of the supplier, the Ashbrook Corporation, to determine potential issues with the ongoing operation of the belt press. Any critical components or operational issues will need to be repaired to keep the press in operation.

Estimated cost to have a factory trained technician on site to conduct an assessment: \$3,000.

8. Instrumentation and Controls

The Condition Assessment concluded that the facility electrical and controls are outdated and many items are not functional.

a. Motor Control Centers.

The motor control centers although outdated are for the most part, in good condition.

Recommendations

Any modification of the motor control centers to provide interim services should limited since obtaining replacement parts has been difficult during recent upgrades.

It was also recommended that an arc flash analysis be conducted. It identifies any safety issues associated with the operation and maintenance of the power distribution and motor control systems. According to NFPA 70E 130.5, "An arc flash risk assessment...shall be updated when a major modification or renovation takes place. It shall be reviewed periodically, at intervals not to exceed 5 years, to account for changes in the electrical distribution system that could affect the results of the arc flash risk assessment." The estimated cost of this analysis is between \$25,000, and \$35,000.

It may be possible to defer conducting the assessment until the facility is expanded. However, this could expose staff to unknown risks on the interim.

b. Programmable Logic Controllers

There are five (5) GE 90-30 Series PLCs at the treatment facility which have reached the end of their service life. In addition, there are several GE PLCs located remote from the treatment facility at sewage pump stations and the water treatment facility. It was recommended that the PLCs at the treatment facility be replaced with Allen-Bradley PLCs.

Recommendations

Allen-Bradley controls a major portion of the water and wastewater PLC market so it is understandable why changing over to A-B would be considered. However, migration to Allen-Bradley PLC platforms at the wastewater treatment facility may not be in the best interest of the City given the use of GE PLCs in other locations. Also GE has replaced the GE 90-30 with the Rx3i series which uses the same I/O system as the GE Series 90-30 but offers more high speed I/O modules. The Rx3i also is purported to be a seamless replacement for the 90-30 which should be a cost savings to the City since programming changes would be less extensive. Also in the interim the existing I/O modules can be used and the existing systems can be expanded with new modules that should be able to populate the existing racks.

The estimated cost to replace the five (5) existing PLCs is \$125,000.

9. Estimated Repair Cost Summary

The following table provides an estimated cost summary of the interim repairs and improvements for the wastewater treatment facilities.

Wastewater Treatment Facility		
<i>Item</i>	<i>Repair/Improvement</i>	<i>Estimated Cost</i>
2. Primary Treatment		
2.a	Replace existing headworks screen, add second channel and screen, extend roof line to increase combined screening capacity meet 20 year PIF MGD .	\$525,000
2.b	Remove pH Alkalinity Adjustment system from headworks and locate in existing maintenance building.	\$10,000
2.c.	Heat Trace and insulate Pista Grit Pump	\$1,000
3. Secondary Treatment System		
3.a	Aeration Basin Flow Split (completed)	\$0
3.b	Mixed Liquor Recycle and Secondary Clarifier Flow Split Add two flow magnetic meters, electrical and signal wiring and SCADA programming. Replace soft starters with variable speed pump controls and SCADA control programming.	\$30,000 \$40,000
3.c	Aeration Basin Dissolved Oxygen Monitoring Control Aerobic basin Cells No. 4 and No. 8. Add two (2) motor operated electric valve actuators with positioners and position indication. Install power and analog signal field wiring, analog and discreet I/O modules and PLC and SCADA programming. Blow off Valve with positioner and position indication. Install power and analog signal field wiring. No piping to sludge basin	\$50,000 \$20,000

	Swing Cells. Add DO probes (4), four (4) motor operated electric valves with positioners and position indication. Install power and analog signal field wiring, analog and discreet I/O modules and PLC and SCADA programming.	\$110,000
	Replace three (3) centrifugal blower soft starters with AFDs, field wiring modifications, analog signal or Ethernet wiring, analog and discreet I/O modules, and PLC and SCADA programming.	\$120,000
3.d	Add pH meter, field wiring, PLC and SCADA programming	\$15,000
3.e	Secondary Clarifier Condition	
	Repair the spray-down system clarifier No. 1., Increase slope on scum trough discharge lines, Repair and replace clarifier scum trough flushing system, Replace & level weirs and baffles	\$70,000
3.f	Return Activated Sludge (RAS) Pumps. Provide spare pump and review and update pump controls in SCADA	\$30,000
3.g	Waste Activated Sludge (WAS) Pumps. Replace both WAS pumps and review and update pump controls in SCADA	\$40,000
4. Sodium Hypochlorite Disinfection System		
	Provided and install second peristaltic chemical feed pump with analog speed control and programming	\$6,000
	Replace Hach residual chlorine analyzer	\$5,000
5. AquaDisk Filters		
	Obtain services of factory representative to assess the condition of the filter and make recommendations as to repairs	\$3,000
	Seal opening between filter inlet channel and effluent metering basin.	\$2,000
6. UV Disinfection System		
	No Interim improvements	\$0

7. Solids Treatment		
7.d	Aerated Sludge Storage	\$0
7.d	Submersible Dewatering Operation Feed Pump	\$0
7.c	Polymer Feed System	\$30,000
7.d	Belt Filter Press. Factory trained technician on site to conduct an assessment.	\$3,000
8. Instrumentation and Controls		
8.a	Motor Control Centers - Arc flash assessment	\$40,000
8.c	Programmable Logic Controllers - Replace	\$125,000

Total Estimated Construction Cost	\$1,275,000
Engineering & Contingency (25%)	325,000
TOTAL IMPROVEMENT COSTS	\$1,600,000

**COMMENTS_SANDY WATER AND WASTEWATER EVALUATION
REPORTS (JULY 2019, Curran-McLeod, Inc.)**

August 13, 2019

WASTEWATER

General Comments

The following issues were not addressed in the Sandy Wastewater Evaluation Report. Some of the items noted may be relevant to more specific issues in the evaluation report. Some or all of the items listed may also be addressed in other studies and/or reports:

1. In general the automation features at the wastewater treatment plant need to be evaluated. Most of the systems are either not functional or do not function as originally intended. Adequacy of alarm functions also need to be included.
2. There have been a number of documented releases of chlorinated water migrating from WWTP underground piping to Tickle Creek.
 - a. Subsurface piping integrity needs to be evaluated
 - b. Facility storm drain piping is directed to the outfall (#3) manhole
 - c. Consideration needs to be given for eliminating drainage off the site and addressing high risk drains which currently go to Tickle Creek.
3. No disinfection is applied to in-plant reuse water (#3 Water). Plant workers are in contact with the reuse water, which must be disinfected.
4. The Evaluation Report does not mention critical spares, redundancy or reliability. Critical unit processes, such as the belt press do not have redundancy. A failure of this process can have significant negative affects given lead times for replacement components.
5. To contain overflows at the head works due to equipment failures and by-passing Veolia recommends installation of containment curbing.
6. The evaluation does not address current issues with chlorine disinfection of Nursery water resulting in total coliform exceedances when chlorine

levels are high... Several issues including mixing and prevention of re-growth in the pipe also need to be addressed.

7. The effluent quality is significantly impacted by various plant side streams containing high levels of ammonia. There are no plant provisions for treating both the volumes and concentrations of these side streams. Veolia recommends an evaluation be performed to develop a plan for addressing side streams.
8. The sludge conveyer system for transport of solids is problematic and becomes nonfunctional when moisture levels are too low. Consideration should be given for replacing with a belt type conveyer system.
9. The basement area containing the RAS and WAS pumps have potential for hazardous gasses. The HVAC appears very small for this space and consideration should be given for installation of hazardous gas analyzers.

Specific Comments

1. P 2/37: The existing rotomat screen has not been adequately maintained due to lack of a hoist system to lift it from the channel vertically such that routine maintenance cannot be effectively performed. Veolia recommends installation of an A frame type system to allow current and any and new equipment to be properly maintained.
2. P 10/37: Report states that one of the secondary process internal recycle (IR) pumps is not operational. The two IR pumps recycle mixed liquor within the aeration basin. Both pumps are mechanically operational but one does not run due to a faulty control system.
3. P- 7/37 Locating new chemical tanks in the existging shop area will reduce an already limited work space which also is used for critical part storage.
4. P 8/37: First paragraph states that grit removal is “needed but not a critical component of the treatment process”. Veolia staff feels the

removal of grit is extremely important as it does affect downstream mechanical and biological processes.

5. P11/37: Report incorrectly states the DO probes in the aeration basins (one for each parallel basin) “simply monitor the DO in the basins and do not have any control functionality”

The DO monitoring system was not just intended for monitoring. The probes are part of a control loop that modulates air flow to the basins from one of the four aeration basin blowers. The control loop is not functional and the DO monitoring instrumentation has been in a failed state for an unknown amount of time.

6. P 11-12/37: This section addresses establishing DO control functionality in the aeration basin. The proposed system calls for motorized valves on the discharge side of the blowers prior to being directed to the aeration basins.

Veolia staff recommends restoring the current control system and utilize the one VFD controlled blower that was originally integrated into the PID control loop.

7. P 17/37: Second paragraph states low pH and alkalinity are the result of “over aeration”. Veolia has very little historical process information including trends for DO, alkalinity and ph. Seasonal changes and trends in alkalinity are unknown; evaluations and comparisons of DO vs. alkalinity cannot be made at this time given the lack of data.

Wet weather flows and increased I & I introduce organic acids into the influent which can reduce the alkalinity and limit the nitrification process.

8. P 19//37: Veolia concurs with the recommendation to repair or replace the clarifier brush cleaning system. However, estimated costs look unrealistic. A new clarifier brush cleaning system will cost closer to \$40,000.
9. P 32/37 Sludge pumps are difficult to maintain including rag removal using existing davits and amaturally operated hoist. Veolia recommends replacing existing davits with electric hoists... The existing walkway system also needs to be evaluated for OSHA compliance,

10. P 33/37 Operation with a single belt press is problematic given the age of the equipment, the lack storage and the need to press 5 days a week. . Ideally there would be a redundant press or at a minimum the piping and connections for use of a portable press during an emergency,

WATER

General Comments

1. The configuration of the storage tanks for hypochlorite solution at the WTP needs to be evaluated and improved to provide for more efficient delivery of solution.

The inverts of the manifolded storage tanks are set at elevations that require manual transfer of solution from one tank to another when the tank levels are about 50% full. Manual transferring of solution is time consuming and could also be a significant problem if the WTP was capable of operating in an automatic mode.

2. Veolia strongly recommends configuring the WTP instrumentation and control system such that remote operation of that facility can be performed from the wastewater treatment plant.

Specific Comments

Specific comments, condition concerns and recommendations have, for the most part, already been integrated into the WTP Facility Evaluation (July 2019, Curran McLeod).

SANDY WASTEWATER TREATMENT FACILITIES O & M STATUS

Sandy Council
Sept 16, 2019



Contents

1. Introduction
2. Initial Operations Plan (IOP)
3. IOP Objectives
4. Facility Condition
 - WWTP Condition
 - WWTP Condition Summary
5. Summary
6. Discussion



INTRODUCTION

- Veolia began Operation and Maintenance responsibilities March 1, 2019
- Veolia-Sandy Team
 - Tom Romesberg_Project (Facilities) Manager
 - Mike Greene_General Manager Northwest Water
 - Melissa Sandvold_Vice President Northwest
 - Local Area Support
 - Administration
 - Finance
 - Health & Safety
 - Information Systems
 - Technical

INITIAL OPERATIONS PLAN (IOP)

- Veolia submitted a three month operations plan to the Oregon DEQ and City of Sandy prior to commencement of contract
- Plan set out milestones and objectives, based on the knowledge of the facility at that time (prior to March 1)

IOP OBJECTIVES



- Establish The Following:
 - Local Area Network for WWTP and Systems Operations - **Complete**
 - Condition assessment of the facilities and related assets- **Initial Phase Complete**
 - Maintenance Management System (MMS)
 - Equipment numbering-**Complete**
 - Establish database, for all equipment/assets_**Complete**
 - Review all manufacturer's equipment manuals and determine routine maintenance tasks_**Complete for Critical Assets**

IOP OBJECTIVES



- Establish:
 - Process Control Management Plan
 - Describe unit processes
 - Define input and output variables
 - Tracking mechanisms for variables
 - Locate and verify all available data
 - Set up database and trend reports
 - PCMP is established; Need More Data

IOP OBJECTIVES

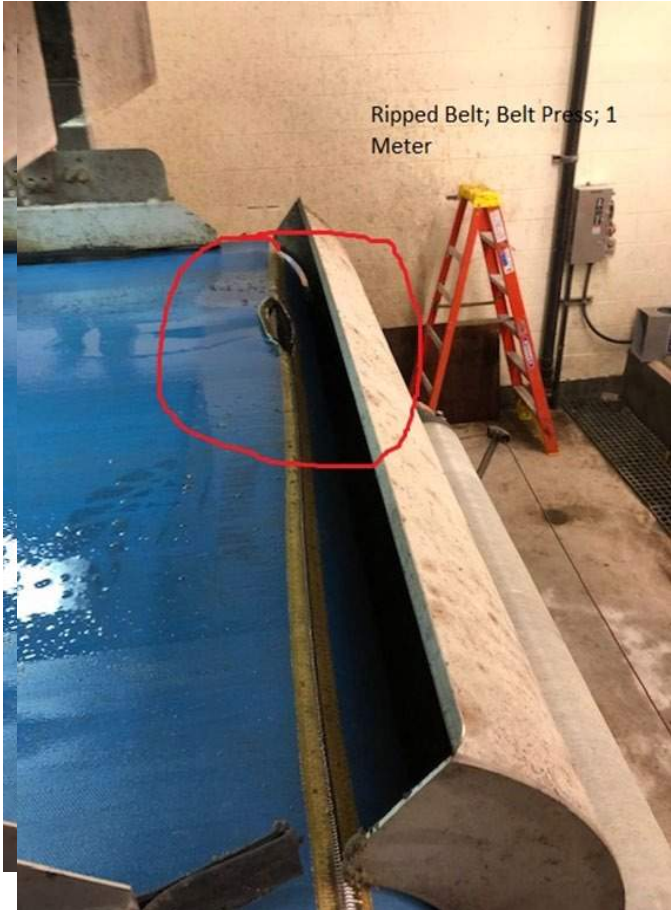
- Perform a condition assessment on critical assets - **Complete**
- Evaluate effectiveness of the secondary process (aeration basins and selectors)-
Not Finished; developing database & addressing instrumentation needs
- Dewater, inspect and clean both aeration basins - (there is no record of this ever having been done before)
 - **Underway**
 - **Unforeseen Issues**

FACILITY CONDITION

- On March 1 there were significant deficiencies at wastewater treatment facilities.
- Wastewater
 - Significant components related to the plant control and automations systems had either limited functionality or were completely inoperable
 - Obsolete and/or unsupported components
 - Many elements of the electrical and mechanical systems had failed
 - Some had been disabled
 - Some failed systems were bypassed
 - Facility condition indicated significant deferred maintenance



WWTP Condition – Belt Filter Press



- Belt press processes residuals
- Critical to maintain solids inventory and secondary process
- Main belt misaligned, tripped out and close to failure, with no spares
- New belts purchased; one installed; second as critical spare
- New bearings and seals installed

WWTP Condition – Grit Removal (PistaGrit)



Vacuum Prime System Before



Vacuum Prime System After



WWTP Condition – UV DISINFECTION



- Only one of two UV banks operable, March 1
- Incomplete disinfection process during plant solids wash out due to heavy rain;
- Unable to use second bank in series for more effective disinfection
- UV system underwent significant repairs this summer
- Both banks are currently operable and ready for winter inflow & infiltration induced flows

WWTP Condition – Recycle Water Pump



- Critical to operation of Belt Filter Press – Solids Processing
- Discharge connection sheared from discharge pipe
- Unable to maintain system pressure, affecting other processes
- Both pumps replaced; system integrity currently OK

WWTP Condition _ Failed Hydropneumatic Tanks



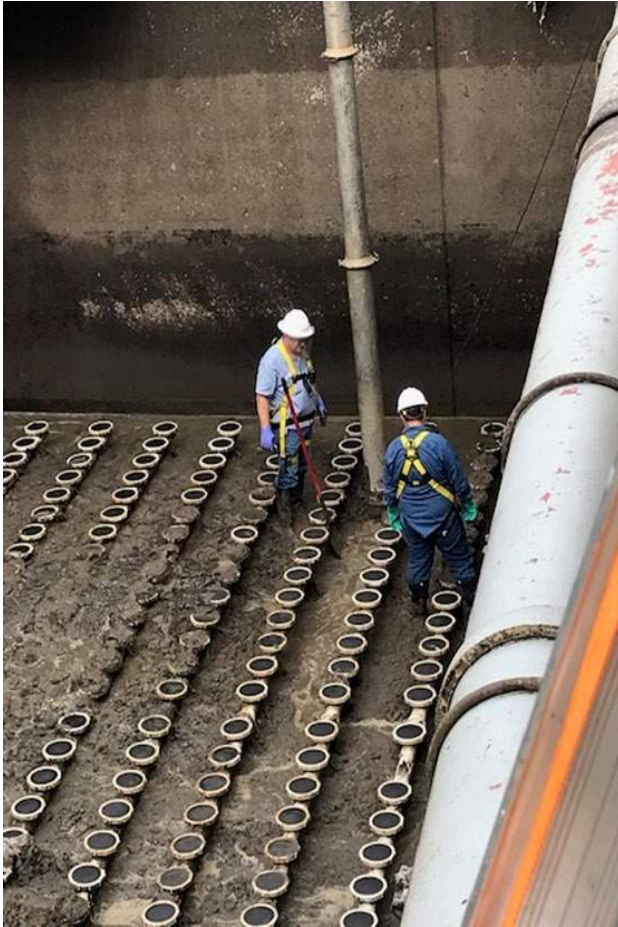
- Tanks mitigate pressure surges and water hammer
- Failed tanks result in fitting, pipe and joint failures
- System provides water to critical processes
- Veolia has received quotes to replace

PLAN OBJECTIVES_AB-CLEAN & INSPECT



- Sandy Vactor Truck & Crew assisting in Aeration Basin project
- Exposed diffusers
- Major O&M project

PLAN OBJECTIVES_AB-CLEAN & INSPECT



- Veolia O&M Staff cleaning and inspecting air diffuser system
- Confined Space procedures used to insure worker safety

PLAN OBJECTIVES_AB-CLEAN & INSPECT



- Selector Zone – Anoxic
- Blinded diffusers
- Excessive Grit

PLAN OBJECTIVES_AB-CLEAN & INSPECT



- Main air diffuser distribution piping
Sheared in selector zone
- Sheared diffuser piping was valved off from the network
- Sheared pipe resulted in no air supplied to this section of the secondary process
- Section has been repaired

WWTP CONDITION SUMMARY



- The following processes & equipment were either inoperable or required some level of repair:
 - Belt Press
 - Head Works
 - Grit Removal
 - Screening
 - Drive mechanism
 - PistaGrit
 - Cont....

WWTP CONDITION SUMMARY



- Secondary Sludge (Waste Activated Sludge) Pump
- Process Water Pumps
- Chlorine Storage and Delivery System
- Instruments and Controls
 - General lack of control loop integrity
 - Instruments inoperable, obsolete, most not working as intended
 - Aeration basin air control loop (critical process control feature); instruments and control loop in failed state

SUMMARY

- Veolia commenced contract O&M Services with the City of Sandy March 1, 2019
- At the request of the Oregon DEQ, Veolia submitted an initial (3-month) Operations Plan
- Most of the objectives in the Operations Plan have been addressed and/or achieved.
- Overall facility condition is improved but there is more to be accomplished on some objectives
- The initial condition of both the wastewater treatment plant and water treatment plant was poor with many critical components inoperable or with limited functionality

DISCUSSION

- Veolia's efforts so far in Sandy have had a strong focus on addressing the mechanical, electrical, instrumentation and control issues at both the water and wastewater treatment plants
- So far, the repair efforts have focused on the WWTP due to the immediate needs and regulatory sensitivity
- Given the initial condition of the facility with major unit processes not fully functional, there have been regulatory excursions
 - These are predictable and unavoidable given the overall system functionality and limitations

DISCUSSION

- A disproportionate amount of staff time has been spent repairing or reacting to system failures relative to normal operations
- As the facility issues are addressed and are resolved the focus will shift to a more proactive mode of operation.
 - Spend more time on preventive maintenance rather than reactive/corrective maintenance
 - Utilizing a formal process control approach, spend more time maximizing process efficiency and effectiveness
 - Maximizing the secondary process, including AB Selectors was a goal of the IOP. This has not been achieved to the desired level in the initial several months of operations
 - Process effectiveness is critical to permit compliance
 - Mechanical integrity is critical to process effectiveness



Wrapping Up

- Questions
 - Or
- Comments



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SITE VISIT NOTES

Client: City of Sandy
Project Name: WFSP Continuing Support Services
Description: Discuss and assess issues at WWTP with Veolia operations staff
Date & Time: April 21, 2020, 0900 to 1130 hr
Location: Sandy Wastewater Treatment Plant
Attendees: Tom Romesberg, Eric ???, (Veolia); Andrew Szatkowski (Murraysmith)
Notes by: Andrew Szatkowski

Discussion began at the headworks.

HEAD WORKS

Tom said that DEQ wanted a second fine screen so there is redundancy of screening. If a second screen is too expensive for the money available for immediate needs work, then maintaining a stock of critical spares would probably be acceptable. Tom and Eric have a list of the critical parts. The lower bearing is the item most likely to fail.

Operators need a way to lift the lower end of the fine screen from the sewage and hold it in place while they work on the lower bearing and other components on the wetted end. There is a picking eye so all we need to do is provide a beam they can run a chain hoist along.

Probably best if beam is supported by columns rather than attached to the existing roof structure. One column could be located to the east of the concrete structure in which the headworks are located. Second column can be between the screen and the grit chamber. Alternatively, we could extend the beam to the west of the concrete structure and they could use the chain hoist to do work on the vacuum pump of the grit removal system as well. The lifting eye for the fine screen is not precisely aligned with the motor of the vacuum pump, but it's close enough we should be able to locate a beam such that it can serve both purposes.

Tom and Eric questioned why we had a second grit system listed as medium a priority, but the second fine screen is only low priority. Seems like that prioritization should be reversed.

Ultimately a second fine screen is needed, even if not done under this immediate repair work. Right now, when the fine screen becomes clogged the sewage flows through a bar screen that

requires manual cleaning. Even before the level rises high enough to flow to the backup bar screen, there can be bypassing of the fine screen, around the sides of the screen.

Tom and Eric would like the caustic soda pH adjustment system installed in the open grassy space to the west of the headworks, east of the office and lab building. Northstar would like to get away from supplying totes and operators would like to stop using totes as well. In this past winter, they went through about one tote per week of 25% NaOH. The contact at northstar for this account is Layne.

The caustic soda also needs to be able to feed to the back end of the plant. This will allow for pH adjustment of the treated effluent prior to discharge in the event of a process upset that causes pH excursion of the effluent. This only an emergency measure, but they did need to feed NaOH to the effluent for about one week this past winter.

BLOWER AND MAINTENANCE ROOM

Somebody has proposed the caustic soda be located in the maintenance area of the blower and maintenance building. Operators need the space that is not occupied with storage, blowers and MCC for doing maintenance work. So it would be best to build a small structure located as noted above to house the NaOH storage and feed equipment.

The bucket for blower No. 2 in the MCC has been modified in a manner that would appear to my untrained eye to violate NEC requirements.

On the exterior of the north wall of the blower and maintenance bldg, Veolia has installed an ammonia sensor in the channel that provides influent to the aeration basins. This is also the location of a gate that allows influent to bypass the aeration basins and be sent to the equalization pond. Currently, operators need to manually open that gate whenever flows exceed something like 3.5 mgd. When an operator leaves for the weekend or overnight, they need to look at the weather forecast and try to guess what to do with the bypass gate. It would be much better to have an electrically actuated gate that is under control of the SCADA system. That way, operators could select a setpoint for influent flows and have the gate open automatically if flows exceed that value. **THIS MAY NOT BE IN THE LIST OF LONG TERM WORKS YET.**

SECONDARY TREATMENT

There is currently only one davit crane on the north end of the aeration basin. This crane needs to be moved to one of three mount locations to pull the four pumps installed at the north end of the basin (the two internal recycle pumps and the two pumps used to draw sewage from equalization basin). Operators would prefer to have three permanently mounted cranes so they don't have to muscle the one crane they have here to any of the three locations where they pull pumps.

Not certain what the capacity of the crane on the aeration basin is, but it appears to be 500 pounds. The one they have is difficult to operate. Requires a significant force on the crank to operate.

\\ad.msa-ep.com\Portland\PDX_Projects\20\2781 - Sandy - WSFP Continuing Support Services\Task 2 WSFP Continuing Support Svcs\2.4 Existing WWTP Immed. Needs Rep\PreDesign Report\appendix\Site Visit Notes_04-21-20.AS.docx

Veolia staff have already fixed the torque mechanism. The secondary clarifiers both need complete OEM rebuild. There is significant short-circuiting due to leaking RAS seals.

SECONDARY SLUDGE PUMPING BUILDING

The ventilation in the secondary sludge pumping building – which is also the chlorine building – is too small and the exhaust is from high, whereas it should be down low, since chlorine is heavier than air. Can fix the height issue by installing intake near floor with ducting to high exhaust louver. Regarding the undersized, penetrations, that could be more problematic to fix.

SOLIDS

There are four davit cranes on the aerated sludge storage basin. One has capacity 1,000 pound, three have capacity 500 pounds. Same problems as the crane at the aeration basin: too much force required to crank; reach on at least one is insufficient (I think that's the 1,000 pound capacity unit); all are rusted.

The walkway around the ASSB needs replacing.

The filter belt press needs a major overhaul. The manufacturer's rep (Ashbrook) said that will cost more than \$100K. That cost may be just parts, not sure. They run the press for about 8 hours at 70 gpm and the ASSB needs about 14 hours to decant that pressate since it can only pump out at about 50 gpm. The decant process may be limited by a 2-inch line from the pump discharge to the headworks. Can the pressate be sent anywhere else in the plant to treat it? When the belt press is rehabilitated, the problem may get worse.

The Moyno pumps in the filter building are problematic. It would be better to have a conveyor to send the filter cake to the biosolids storage area.

The Polyblend system is obsolete and no longer supported by the manufacturer.

SITE

There are four catch basins that flow into the manhole just outside the fence to the north of the site. This manhole is also where the overflow from the disinfection basin goes ("outfall 3"). Foundation drains for the aeration basin, secondary clarifiers and disinfection basin also flow to this manhole. Underground leakage of chlorinated solution causes chlorinated water discharge through this route.

It would be best to separate the storm water and the foundation drains from the treated plant flows by capturing the stormwater and foundation drain water inside the fence and pumping it to the headworks.

Tom would like curbing along the NE corner of the site to prevent storm water from running offsite and control any spills from the biosolids storage area. Also would like to see if some strategically located swales could reduce the amount of storm water they need to deal with.



APPENDIX C



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Oregon

Kate Brown, Governor

Department of Environmental Quality
Northwest Region Portland Office/Water Quality
700 NE Multnomah Street, Suite 600
Portland, OR 97232-4100
(503) 229-5263
FAX (503) 229-6957
TTY 711

CERTIFIED MAIL NO. 7017 2400 0000 9122 9945

June 4, 2019

MIKE WALKER, PUBLIC WORKS DIRECTOR
CITY OF SANDY
39250 PIONEER BLVD
SANDY, OR 97055-8016

**RE: Pre-Enforcement Notification Letter
City of Sandy Sewage Treatment Plant
NWR-WQ-2019-PEN-4595
File # 78615 Permit # 102492
Clackamas County**

Dear Mr. Walker:

The DEQ has reviewed the following four reports submitted by the City of Sandy:

- February 2019 Discharge Monitoring Report.
- March 2019 Discharge Monitoring Report.
- April 2019 Discharge monitoring report.
- May 7, 2019 5-day report regarding a recycled water spill and discharge of chlorine containing water (OERS report No. 2019-1147).

These reports detail violations and exceedences of limits in the facility's National Pollutant Discharge Permit (NPDES) No. 102492.

In the "NPDES Permit 5 Day Report" submitted to the DEQ May 7, 2019 by email and revised May 8, the City of Sandy's operator reported a leak of chlorine into the facility's recycled water system. The recycled water system was also leaking, resulting in water containing chlorine entering the facility storm drainage system and then being discharged to Tickle Creek at outfall 003. The city's operator measured residual chlorine in the discharge at a concentration of between 0.15 and 0.19 ppm. This is more than eight times the acute toxicity water quality standard for residual chlorine.

The February Discharge Monitoring Report (DMR) reported that the Sandy STP exceeded the daily Five day Biochemical Oxygen Demand (BOD₅) load limit for one day, the weekly average BOD₅ concentration limit for one week, and the weekly average BOD₅ load limit for two weeks. The Sandy Sewage Treatment Plant (STP) also exceeded the daily Total Suspended Solids (TSS) load limit on four days, the weekly average TSS concentration limit for four weeks, the weekly average TSS load limit for three weeks. The facility also exceeded the monthly average limits for BOD₅ concentration, TSS concentration and TSS load, ammonia (NH₃-N) concentration, and for minimum monthly TSS percent removal.

The March DMR reported that the Sandy STP exceeded the daily TSS load limit on two days, the weekly average TSS concentration limit for two weeks, and the weekly average TSS load limit for one week. The facility exceeded the daily concentration limit for NH₃-N on four days. The facility also exceeded the monthly average limits for BOD₅ concentration, TSS concentration and TSS load, and for NH₃-N concentration. The facility also failed to perform monitoring for stream dilution for this month.

The April DMR reported that the Sandy STP exceeded the daily concentration limit for NH₃-N on two days, and exceeded the daily maximum effluent limit for *E coli* bacteria on seven days. The Sandy STP also exceeded the weekly average BOD₅ concentration limit and load limit for one week, the weekly average TSS concentration limit for four weeks, and the weekly average TSS load limit for one week. The facility also exceeded the monthly average limits for BOD₅ concentration and load, TSS concentration and load, and for NH₃-N concentration, as well as the monthly geomean limit for *E coli* bacteria. The facility also failed to perform monitoring for stream dilution for this month.

On December 31, 2018 Mr. Mike Walker's certification to supervise operation of a sewer collection system expired. Mr. Mike Walker's renewal application was determined to be incomplete as it did not contain valid proof of the Continuing Education Credits required for renewal. Sandy's NPDES permit requires that Sandy have its wastewater collection system supervised by one or more operators who are certified in a classification and grade level that corresponds with the classification of the system as specified on page one of the permit. We have not received a "Designation Form for Supervisory Wastewater System Operator" designating a person with a valid certification to supervise Sandy's collection system. Therefore Sandy's sewer collection system has been operating without the supervision of a certified operator since Jan 1, 2019.

Based upon the information submitted by the City of Sandy's representatives in the reports referenced above, the DEQ has concluded that City of Sandy is responsible for the following violations of Oregon environmental law:

VIOLATIONS:

ORS 468B.025(1) No person shall:

- (a) Cause pollution of any waters of the state or place or cause to be placed any wastes in a location where such wastes are likely to escape or be carried into the waters of the state by any means.
 - (b) Discharge any wastes into the waters of the state if the discharge reduces the quality of such waters below the water quality standards established by rule for such waters by the Environmental Quality Commission.
1. As described above in the May 7, 2019 email report, the City of Sandy's operator reported a discharge of water containing residual chlorine to Tickle Creek through Outfall 003. Sandy's operator measured residual chlorine in the discharge at a concentration of more than 0.15 mg/l. The chlorine discharge is believed to have started about May 1 when Sandy's chlorine disinfection system started. This discharge exceeded the water quality acute toxicity standard for chlorine (.019 mg/l, OAR 340-041-8033, Table 30). This is a Class 1 violation of Oregon environmental law.

ORS 468B.025(2); No person shall violate the conditions of any waste discharge permit issued under ORS 468B.050. The City of Sandy operates a wastewater treatment and disposal system pursuant to NPDES Permit # 102492:

2. Schedule A, Condition 1(a)(2) limits the daily mass load of BOD₅ in effluent to a maximum of 250 lbs/day.
 - a. On February 27, 2019, Sandy discharged effluent with a mass load of 274 lb, exceeding the limit by 9%. This is a Class 3 violation.
3. Schedule A, Condition 1(a)(2) limits the daily mass load of TSS in effluent to 250 lbs/day.
 - a. On February 20, 2019, Sandy discharged 271 lb, exceeding the limit by 8%. On February 21, 2019, Sandy discharged 292 lb, exceeding the limit by 17%. On February 28, 2019, Sandy discharged 252 lb, exceeding the limit by 1%. On March 13, 2019, Sandy discharged 272 lb, exceeding the limit by 9%. These are Class 3 violations of the permit.
 - b. On February 27, 2019, Sandy discharged 486 lb, exceeding the limit by 94%. On March 12, 2019, Sandy discharged 395 lb, exceeding the limit by 58%. These are Class 1 violations.
4. Schedule A, Condition 1(a)(3) limits *E. coli* bacteria in a single effluent sample of effluent to 406 organisms per 100 ml.
 - a. On April 9, 10, 13, 16, and 17 of 2019, Sandy discharged effluent containing greater than 2420 organisms per 100 ml, exceeding the limit by more than 5 times. These are Class 2 violations of the permit.
 - b. On April 2, 2019, Sandy discharged effluent containing 816 organisms per 100 ml, exceeding the limit by 101 %. On April 3, 2019, Sandy discharged effluent containing 921 organisms per 100 ml, exceeding the limit by 127 %. These are Class 3 violations.
5. Schedule A, Condition 1(a)(3) limits the daily concentration of NH₃-N in effluent to 10.9 mg/l.
 - a. On March 20, 2019, Sandy discharged effluent with a concentration of 14.3 mg/l, exceeding the limit by 31%. On March 21, 2019, Sandy discharged effluent with a concentration of 12.9 mg/l, exceeding the limit by 18%. On March 26, 2019, Sandy discharged effluent with a concentration of 14.0 mg/l, exceeding the limit by 28%. On March 27, 2019, Sandy discharged effluent with a concentration of 12.1 mg/l, exceeding the limit by 11%. On April 2, 2019, Sandy discharged effluent with a concentration of 13.7 mg/l, exceeding the limit by 26%. On April 3, 2019, Sandy discharged effluent with a concentration of 14.7 mg/l, exceeding the limit by 35%. These are Class 1 violations.
6. Schedule A, Condition 1(a)(2) limits the weekly average concentration of BOD₅ in effluent to 15 mg/l..
 - a. For the week ending March 2, 2019 Sandy discharged effluent with an average concentration of 22 mg/l, exceeding the limit by 48%. For the week ending April 13, 2019, Sandy discharged effluent with an average concentration of 22 mg/l, exceeding the limit by 48%. These are Class 2 violations.
7. Schedule A, Condition 1(a)(2) limits the weekly average mass load of BOD₅ in effluent to 187 lb/day.
 - a. For the week ending February 23, 2019 Sandy discharged an average of 195 lb/day, exceeding the limit by 4%. This is a Class 3 violation of the permit.
 - b. For the week ending February 16, 2019, Sandy discharged an average of 344 lb/day, exceeding the limit by 84%. For the week ending April 13, 2019, Sandy discharged an average of 607 lb/day, exceeding the limit by 225%. These are Class 1 violations.
8. Schedule A, Condition 1(a)(2) limits the weekly average concentration of TSS in effluent to 15 mg/l.

- a. For the week ending April 6, 2019, Sandy discharged effluent with an average concentration of 16 mg/l, exceeding the limit by 7%. For the week ending April 20, 2019, Sandy discharged effluent with an average concentration of 17 mg/l, exceeding the limit by 13%. For the week ending April 27, 2019, Sandy discharged effluent with an average concentration of 17 mg/l, exceeding the limit by 13%. These are Class 3 violations of the permit.
 - b. For the week ending February 23, 2019, Sandy discharged effluent with an average concentration of 18 mg/l, exceeding the limit by 20%. For the week ending March 23, 2019, Sandy discharged effluent with an average concentration of 23 mg/l, exceeding the limit by 57%. These are Class 2 violations.
 - c. For the week ending February 9, 2019, Sandy discharged effluent with an average concentration of 23 mg/l, exceeding the limit by 53%. For the week ending February 16, 2019, Sandy discharged effluent with an average concentration of 27 mg/l, exceeding the limit by 80%. For the week ending March 2, 2019, Sandy discharged effluent with an average concentration of 37 mg/l, exceeding the limit by 147%. For the week ending March 16, 2019, Sandy discharged effluent with an average concentration of 32 mg/l, exceeding the limit by 111%. For the week ending April 13, 2019, Sandy discharged effluent with an average concentration of 31 mg/l, exceeding the limit by 107%. These are Class 1 violations.
9. Schedule A, Condition 1(a)(2) limits the weekly average mass load of TSS in effluent to 187 lb/day.
- a. For the week ending March 16, 2019, Sandy discharged an average mass load of 328 lb/day, exceeding the limit by 75%. This is a Class 2 violation.
 - b. For the week ending February 16, 2019, Sandy discharged effluent with an average mass load of 781 lb/day, exceeding the limit by 318%. For the week ending February 23, 2019, Sandy discharged an average mass load of 282 lb/day, exceeding the limit by 51%. For the week ending March 2, 2019, Sandy discharged an average mass load of 396 lb/day, exceeding the limit by 112%. For the week ending April 13, 2019, Sandy discharged an average mass load 881 lb/day, exceeding the limit by 371%. These are Class 1 violations.
10. Schedule A, Condition 1(a)(2) limits the monthly average concentration of BOD₅ in effluent to 10 mg/l.
- a. During March 2019, Sandy discharged effluent with a monthly average concentration of 13 mg/l, exceeding the limit by 30%. This is a Class 2 violation.
 - b. During April 2019, Sandy discharged effluent with a monthly average concentration of 16 mg/l, exceeding the limit by 60%. This is a Class 1 violation.
11. Schedule A, Condition 1(a)(2) limits the monthly average mass load of BOD₅ in effluent to 125 lb/day.
- a. During April, 2019 Sandy discharged effluent with an average mass load of 221 lb/day, exceeding the limit by 77%. This is a Class 1 violation.
12. Schedule A, Condition 1(a)(2) limits the monthly average concentration of TSS in effluent to 10 mg/l.
- a. During February 2019, Sandy discharged effluent with a monthly average concentration of 26 mg/l, exceeding the limit by 160%. During March 2019, Sandy discharged effluent with a monthly average concentration of 22 mg/l, exceeding the limit by 119%. During

April 2019, Sandy discharged effluent with a monthly average concentration of 20 mg/l, exceeding the limit by 100%. These are Class 1 violations.

13. Schedule A, Condition 1(a)(2) limits the monthly average mass load of TSS in effluent to 125 lb/day.
 - a. During February 2019, Sandy discharged effluent with an average mass load of 400 lb/day, exceeding the limit by 220%. During April 2019, Sandy discharged effluent with an average mass load of 306 lb/day, exceeding the limit by 145%. These are Class 1 violations.
 - b. During March 2019, Sandy discharged effluent with an average mass load of 173 lb/day, exceeding the limit by 38%. This is a Class 2 violation.
14. Schedule A, Condition 1(a)(3) limits *E. coli* bacteria in effluent to a monthly geomean of 126 organisms per 100 ml.
 - a. During April 2019, the monthly geomean of *E. coli* bacteria test results for the Sandy facility was 225 organisms per 100 ml, exceeding the limit by 79%. This is a Class 3 violation.
15. Schedule A, Condition 1(a)(3) limits the monthly average concentration of NH₃-N in effluent to 3.7 mg/l.
 - a. During February 2019, Sandy discharged effluent with a monthly average concentration of 5.5 mg/l, exceeding the limit by 49%. During March 2019, Sandy discharged effluent with a monthly average concentration of 10.1 mg/l, exceeding the limit by 173%. During April 2019, Sandy discharged effluent with a monthly average concentration of 5.2 mg/l, exceeding the limit by 40%. These are Class 1 violations.
16. Schedule A, Condition 1(a)(3) requires that removal of TSS not be less than 85%.
 - a. For the month of February 2019, removal of TSS was 81%, 4% less than the requirement. This is a Class 3 violation.
17. Schedule B Condition 1(e) requires calculation of stream dilution two times per week. Stream dilution was not calculated and reported on the DMR for the months of March and April. These are Class 1 violations.
18. Schedule D, Condition 6 states "The Permittee shall have its wastewater system supervised by one or more operators who are certified in a classification and grade level (equal to or greater) that corresponds with the classification (collection and/or treatment) of the system to be supervised as specified on page one of this permit." On December 31, 2018, Mr. Mike Walker's certification to supervise operation of a sewer collection system expired. As of May 24, 2019 DEQ has not received notification from the city designating a new supervisor for the city's collection system. This is a Class I violation.

Class 1 violations are considered to be the most serious violations; Class 3 violations are the least serious.

The violations cited above posed a threat to the environment. Therefore, the matter is being referred to the DEQ's Office of Compliance and Enforcement for formal enforcement action. Formal enforcement action may result in assessment of civil penalties and/or a DEQ order. A formal enforcement action may include a civil penalty assessment for each day of violation.

If you believe any of the facts in this Pre-Enforcement Notice are in error, you may provide written information to me at the address shown at the top of this letter. The Department will consider new

information you submit and take appropriate action. Please submit any additional information by June 19, 2019.

CORRECTIVE ACTIONS:

To reduce the likelihood of future exceedences, the DEQ requests that Sandy take the following corrective actions: Notify DEQ when each item is complete.

Plant

Facility Operational Improvements

All to be completed by October 1, 2019.

Headworks: Repair Rotomat. Identify and purchase critical spare parts. Revise rock catcher so all influent flow goes through the Rotomat during normal operation (up to design flow).

Aeration Basins: Drain, clean and inspect both basins.

Improve controls/monitoring so both basins can be operated effectively.

- Aeration monitoring and control.
- RAS/WAS control - metering and monitoring
- Flow/split control.

Clarifiers: Drain, clean and inspect both clarifiers

Filters: Improve controls to implement automatic cleaning operation.

Prevent filter bypass from bypassing the Ultra Violet (UV) system. (No UV system bypasses).

UV Disinfection: Repair controls and connect to the SCADA system.

Ensure both banks are fully operational and in good working order.

Effluent Pumps: Ensure pumps are in good working order and operating at design capacity.

SCADA System

Complete an evaluation by August 1, 2019. Submit a copy of the evaluation to the DEQ when completed. Complete SCADA system improvements by November 1, 2019.

A full assessment of the SCADA system needs to be performed. Existing automatic operation, control systems and monitoring systems need to be placed back into service.

Collection System

Fats, Oils Grease Program Implementation

August 1, 2019, adopt all rules needed for program

September 1, 2019, notify all facilities of requirements.

November 1, 2019, inspect all facilities.

Inflow removal

Smoke Testing/Inflow Removal for basins #2 and #8. Complete by November 1, 2019.

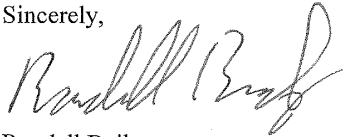
Smoke Testing/Inflow Removal for basins other than #2 and #8. Complete by November 1, 2020.

Supervision

Designate a supervisor that is currently certified to operate a level II collection system, and notify the DEQ using the certified operator designation form on or before July 15, 2019.

The DEQ endeavors to assist you in your compliance efforts. Should you have any questions about the content of this letter, please contact me in writing, by email at bailey.randall@deq.state.or.us or by phone at 503-229-5019.

Sincerely,



Randall Bailey,
Source Control Section
Northwest Region, Water Quality

Cc:

Office of Compliance and Enforcement, DEQ Headquarters
Jordan Wheeler, City Administrator, City of Sandy, P.O. Box 1045, Sandy, OR 97055

Ecc:

Jeff Boechler, ODFW, (jeff.boechler@state.or.us), Jon Germond, ODFW (Jon.P.Germond@state.or.us),
Kristi Asplund, Basin Coordinator. Kimi Gryzb, Wastewater Operator Certification Program

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APPENDIX D

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Rebuild-it Services Group
6810 South 300 West, Suite 8
Midvale, Utah 84047
www.rebuild-it.com
www.rsgclarifiers.com



RSG
Clarifier Experts



PROPOSAL DATE: July 7, 2020

PROPOSAL NUMBER: Q122887

PREPARED FOR:

City of Sandy WWTP
Sandy, OR
Attention: Michael Greene
PH: 503-582-9655
E-Mail: mike.greene@veolia.com

SCOPE OF WORK:

Parts to replace the existing skimmer assembly, new sludge box seals, new sludge pipe valves, refurbishment of existing EIMCO C30LT drive unit and installation labor.

PREPARED BY:

Rebuild-it Services Group, LLC.
6810 South 300 West, Suite 8
Midvale, Utah 84047
Terry A. Reyburn
Main: (888) 709-5676
Direct: (385) 235-6924
Mobile: (801) 828-5369
E-Mail: treyburn@rebuild-it.com
Website: rebuild-it.com

LOCAL REPRESENTATIVE:

Treatment Equipment Company
Chris McCalib
Mobile: (206) 909-1546
E-Mail: chris@tec-nw.com
Website: treatmentequipment.com

New Clarifiers - Replacement Drives - ODS Pumps – Turn-key Labor – Dorr-Oliver® Parts – Rotary Distributors – Drive Rebuilds



PROJECT SUMMARY:

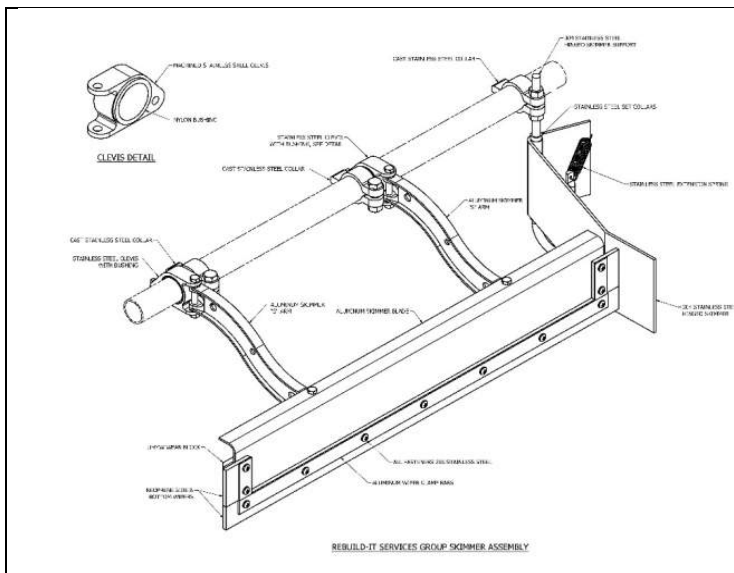
Rebuild-it Services Group, LLC. (RSG) is pleased to offer the following proposal to refurbish the existing 54-foot diameter EIMCO Clarifier. We will include the parts as outlined below provide refurbished drive unit, new skimmer assembly, sludge valves and sludge box seals.

SCOPE OF WORK:

We include the following:

Parts for refurbishment.

- Supply of (6) 4" sludge valve with clamps.
- Seals and back-up bar for sludge collection box.
- Skimmer assembly:
 - 4'-0" RSG skimming device.
 - Skimmer support.
 - Skimmer blade.
 - Skimmer arm.
- Freight to job site.
- Engineering of new skimmer assembly.



EIMCO-RSG PREMIUM SKIMMER ASSEMBLY

Benefits and features:

- All Stainless steel and aluminum materials only. (No carbon steel).
- Cast Stainless Steel collars
- Skimmer can be retrofitted to any clarifier
- Available in 3', 4', 5' and 6' assemblies
- Patent pending stainless steel clevis with nylon insert.
- Corrosion resistant
- Built to last for longer life
- Maintenance free
- Easy to install



Proposal No. Q122887

SURFACE PREPARATION AND PAINT:

Drive unit: Surface preparation of SSPC-SP6 following by two (2) coats of Tnemec 161 to a 4-6 mils DFT with a final coat of a UV protected industrial grade polyurethane coating to a 6 mils minimum DFT. Color: Pencil Gray.

Submerged and Non-submerged steel: Surface preparation of SSPC-SP10 followed by Two (2) coats of Tnemec N69 hi-build epoxy to 4-6 mils DFT.

EXCLUDED ITEMS FROM SCOPE OF SUPPLY:

- Field welding
- Installation of equipment
- Finishing painting
- Shear pin sprocket design
- Electrical controls, mounting plates, brackets, conduit, wiring, mounting channels, light posts, photocells, etc.
- Concrete work
- Lubricating oils / greases
- Bi-metallic protection for aluminum handrail, floor plating.
- Access stairways, walkways, gratings, handrailing, etc. outside the tank.
- Scum spray systems, or other water piping.
- Control panels except as specifically noted.
- Parts not mentioned above



EIMCO C30LT REBUILT DRIVE UNIT:

To include the following:

- EIMCO C30LT refurbished to like new condition, drives rated for 15,000 ft. lbs., with an output speed of .05 RPM. This completely refurbished drive unit has been rebuilt to factory specifications and comes with our three-year warranty.
- Motor drive package consisting of gear motor, sprockets, chain, stainless steel chain guard and required gear motor mounts. Motor drive package will be sized to match existing drive unit output torque and RPM.
- Stainless steel oil piping.
- O&M manual.
- Shipping to job site.
- Engineering.
- Installation hardware and shims.

Items that are not included:

- Installation.
- Loading and offloading of the drive.
- Lubricants (oil to be provided by the customer).
- Electrical controls, mounting plates, brackets, conduit, wiring, mounting channels, light posts, photocells, etc.





Proposal No. Q122887

RSG DRIVE UNIT PREMIUM THREE LAYER COATING SYSTEM:

- Rebuild-it's unique coating system provides a durable coating on the drive unit that is superior to what is typically provided. All exterior drive unit surfaces:
- Blast cleaned to SSPC-SP6
- Prime coat: Tnemec Hi-Build Epoxy to a dry film thickness of 4.0 to 6.0 mils. Color: Pencil Gray
- Final coat: UV protected industrial grade polyurethane coating to a dry film thickness of 6.0 mil minimum. Color: Pencil Gray

All interior surface except for machined surfaces and gear faces:

- Power cleaned and then coated with a Tool Crib red insulating varnish.
- All machined surface will be coated with LPS 3 Rust Inhibitor All reducers and motors will have the manufactures standard finish.



Refurbished EIMCO Drive Unit by Rebuild-it

RSG Drive Rebuild Video (click picture below)

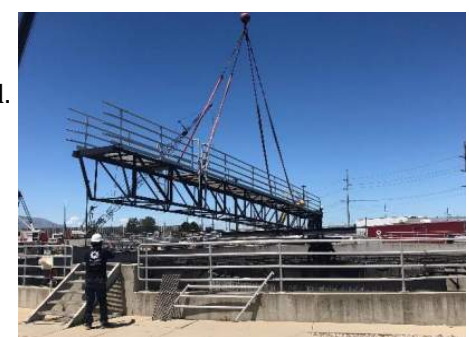
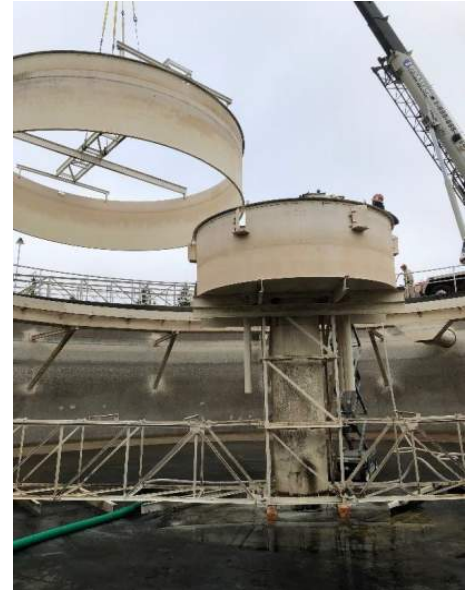


RSG TURN-KEY LABOR SERVICES:

- The scope of work for this project is as follows:
- Site mobilization and travel time to the job site.
- Removal of bridge and drive unit.
- Removal of existing drive.
- Re-Installation of drive unit.
- Installation of new skimmer assembly.
- Install of sludge valves and sludge box seals.
- Crane, mats, rigging equipment as needed.
- Rake and drive leveling.
- Touch up paint only.
- Help during start-up & testing.
- Provide all required confined space entry equipment, hoisting & rigging.
- A foreman/safety QC manager will be on site throughout the project.
- Work to be performed in one (1) mobilization.
- Demobilization of personnel and equipment.
- Field service start-up and check out services.

This proposal excludes the following items:

- Electrical disconnect and reconnect.
- Permits, fees, and/or stamped engineering documents.
- Provision of Full-Time Safety & QA/QC manager.
- Overtime premiums or weekend work.
- Temp facilities including porta-johns and disposal bins.
- Concrete demolition and/or repair.
- Covered tank or dome: Removal of dome or access panels.
- Grouting of the tank or concrete work.
- Assumes reasonable access to basins.
- No coating on site- touch up paint only if needed.
- Prevailing wage.
- Hazardous material abatement, handling and/or disposal.
- Any work not specifically included.
- Draining and cleaning of the tank.
- Disposing of old debris/parts.
- Lubrication for drive unit.





Proposal No. Q122887

PRICING:

Pricing for parts as described above	\$9,870.00
Pricing for one refurbished C30LT drive as described above	\$24,251.00
Pricing for turn-key labor services as described above	\$28,934.00

SCHEDULE:

Delivery of drive unit and steel components: 10-12 weeks
Labor services: 3-4 days
Check-out services: 1 day

OLD DRIVE CORE DISCOUNT: RSG will take over the possession of the old drive unit and apply a discount to the new or rebuilt drive unit as a core charge. The discount has been reflected in the pricing above. RSG will be responsible for all freight coordination and charges.

Please be sure to reference this quotation number and date on your purchase order.

Remit order to:

Rebuild-it Services Group, LLC.
P.O. Box 9178
Midvale, Utah 84047
Attention: Candace King, cking@rebuild-it.com



Proposal No. Q122887

PRICING AND PAYMENT TERMS:

We appreciate the opportunity to offer our parts & services. Upon receipt of an order, we assure you of our continued interest and service. RSG will provide the best service possible to ensure we exceed your expectations. The actual lead-times are based on the schedule and inventory at the time of ordering as lead times are subject to change according to the current job schedule.

This proposal, including all terms and conditions contained herein, shall become part of any resulting contract or purchase order. Changes to any terms and conditions, including but not limited to submittal and shipment days, payment terms, and escalation clause shall be negotiated at order placement, otherwise the proposal terms and conditions contained herein shall apply.

Terms: If not outline otherwise in the proposal, terms for the parts and/or equipment are 100% due after shipment or service is completed. Net 30 days from shipment or after service is completed. If the project exceeds \$50,000.00 for materials, then the payment terms are 50% up front for engineering and raw materials and 50% due shipment, still net 30 days. The prices are good for **60** days.

Sales Tax: No sales taxes, use taxes, or duties have been included in our pricing. We are required to collect sales tax for the following states: Utah, California, and Washington. If you are not tax exempt, please remit taxes directly to the governing authorities.

Freight: Prices quoted are F.O.B. shipping point with freight prepaid and added to the invoice and shipped to a readily accessible location nearest to the jobsite, unless otherwise indicated. All claims for damage or loss in shipment shall be initiated by purchaser.

Shipment: Shipping times noted within this proposal are estimated and will be finalized once an order has been received and accepted.

Field Service: Prices do not include field service unless noted in the rebuild scope of work description. Additional field service is available at \$1,000.00 per day plus expenses.

OEM Parts: If applicable RSG will quote OEM factory parts furnished by FLSmidth USA, Inc. FLSmidth owns EIMCO® and Dorr-Oliver™ registered trademarks. FLSmidth is the sole owner of EIMCO® and Dorr-Oliver® registered trademarks and brand names.



Proposal No. Q122887

WARRANTY & TERMS AND CONDITIONS:

Parts and/or Equipment manufactured or rebuilt and sold by Rebuild-it Services Group, once paid for in full, is backed by the following warranty:

For the benefit of the original user, RSG warrants all new parts and equipment sold or rebuilt RSG, LLC. to be free from defects in material and workmanship, and will replace or repair, F.O.B. its

factories or other location designated by it, any part or parts returned to which RSG's examination shall show to have failed under normal use and service by the original user within three (3) years following initial start-up, or three (3) years and six (6) months from shipment to the purchaser, whichever occurs first.

Such repair or replacement shall be free of charge for all items except for those items such as resin, filter media and the like that are consumable and normally replaced during maintenance, with respect to which, repair or replacement shall be subject to a pro-rata charge based upon RSG's estimate of the percentage of normal service life realized from the part. RSG's obligation under this warranty is conditioned upon its receiving prompt notice of claimed defects, which shall in no event be later than thirty (30) days following expiration of the warranty period, and is limited to repair or replacement as aforesaid.

This warranty is expressly made by RSG and accepted by purchaser in lieu of all other warranties, including warranties of merchantability and fitness for particular purpose, whether written, oral, express, implied, or statutory. RSG shall not be liable for normal wear and tear, corrosion, or any contingent, incidental, or consequential damage or expense due to partial or complete inoperability of its equipment for any reason whatsoever.

This warranty shall not apply to equipment or parts thereof which have been altered or repaired outside of a RSG factory, or damaged by improper installation, application, or maintenance, or subjected to misuse, abuse, neglect, accident, or incomplete adherence to all manufacturer's requirements, including, but not limited to, Operations & Maintenance Manual guidelines & procedures. When buying a drive or drive rebuild, if the drive control has not been hooked up or disabled, the warranty on the drive is not valid.

This warranty applies only to equipment made or sold by Rebuild-it Services Group, LLC (RSG).

RSG makes no warranty with respect to parts, accessories, or components purchased by the customer from others. The warranties which apply to such items are those offered by their respective manufacturers.

CONFIDENTIALITY:

All the information in this quotation is confidential and has been prepared for your use solely in considering services described. Transmission of all or any parts of this information to others or use by you for other purposes is unauthorized without our written consent.



Proposal No. Q122887

TERMS AND CONDITIONS:

Terms and Conditions appearing in any order based on this proposal which are inconsistent herewith shall not be binding on Rebuild-it Services Group (RSG). The sale and purchase of equipment described herein shall be governed exclusively by the foregoing proposal and the following provisions:

- 1. SPECIFICATIONS:** RSG is furnishing its standard equipment as outlined in the proposal and as will be covered by final approved drawings if applicable. The equipment will, however, meet the general intention of the mechanical specifications of these documents.
- 2. ITEMS INCLUDED:** This proposal includes only the equipment specified herein and does not include erection, installation, accessories, nor associated materials such as controls, piping, etc., unless specifically listed.
- 3. PRICE AND DELIVERY:** All selling prices quoted are subject to change without notice after 30 days from the date of this proposal unless specified otherwise. Unless otherwise stated, all prices are F.O.B. RSG or its supplier's shipping points. All claims for damage, delay or shortage arising from such equipment shall be made by Purchaser directly against the carrier. When shipments are quoted F.O.B. job site or other designation, Purchaser shall inspect the equipment shipped, notifying RSG of any damage or shortage within forty-eight hours of receipt, and failure to so notify RSG shall constitute acceptance by Purchaser, relieving RSG of any liability for shipping damages or shortages.
- 4. PAYMENTS:** All invoices are net 30 days. Delinquencies are subject to a 1.5 percent service charge per month or the maximum permitted by law, whichever is less on all past due accounts. Pro rata payments are due as shipments are made. If shipments are delayed by the Purchaser, invoices shall be sent on the date when RSG is prepared to make shipment and payment shall become due under standard invoicing terms. If the work to be performed hereunder is delayed by the Purchaser, payments shall be based on the purchase price and percentage of completion. Products held for the Purchaser shall be at the risk and expense of the Purchaser. Unless specifically stated otherwise, prices quoted are for equipment only. These terms are independent of and not contingent upon the time and manner in which the Purchaser receives payment from the owner.
- 5. INSTALLATION SUPERVISION:** Prices quoted for equipment do not include installation supervision, unless otherwise noted. RSG recommends and will, upon request, make available, RSG's then current rate, an experienced installation supervisor to act as the Purchaser's employee and agent to supervise installation of the equipment. Purchaser shall at its sole expense furnish all necessary labor equipment, and materials needed for installation.

Responsibility for proper operation of equipment, if not installed by RSG or installed in accordance with RSG or original manufacture instructions and inspected and accepted in writing by RSG or manufacture representing RSG.

RSG will supply the safety devices described in this proposal or shown in RSG's or manufacture represented drawings furnished as part of this order but excepting these, RSG shall not be required to supply or install any safety devices whether required by law or otherwise. The Purchaser hereby agrees to indemnify and hold harmless RSG from any claims or losses arising due to alleged or actual insufficiency or inadequacy of the safety devices offered or supplied hereunder, whether specified by RSG or Purchaser, and from any damage resulting from the use of the equipment supplied hereunder.

- 6. ACCEPTANCE OF PRODUCTS:** Products will be deemed accepted without any claim by Purchaser unless written notice of non-acceptance is received by RSG within 30 days of delivery if shipped F.O.B. point of shipment, or 48 hours of delivery if shipped F.O.B. point of destination. Such written notice shall not be considered received by RSG unless it is accompanied by all freight bills for said shipment, with Purchaser's notations as to damages, shortages and conditions of equipment, containers, and seals. Non-accepted products are subject to the return policy stated below.
- 7. TAXES:** Any federal, state, or local sales, use or other taxes applicable to this transaction, unless specifically included in the price, shall be for Purchaser's account.
- 8. INSURANCE:** From date of shipment until the invoice is paid in full, Purchaser agrees to provide and maintain at its expense, but for RSG benefit, adequate insurance including, but not limited to, builders risk insurance on the equipment against any loss of any nature whatsoever.
- 9. SHIPMENTS:** Any shipment of delivery dates recited represent RSG's best estimate but no liability, direct or indirect, is assumed by RSG for failure to ship or deliver on such dates.



Proposal No. Q122887

RSG shall have the right to make partial shipments; and invoices covering the same shall be due and payable by Purchaser in accordance with the payment terms thereof. If Purchaser defaults in any payment when due hereunder, RSG may, without incurring any liability therefore to Purchaser or Purchaser's customers, declare all payments immediately due and payable with maximum legal interest

thereon from due date of said payment, and at its option, stop all further work and shipments until all past due payments have been made, and/or require that any further deliveries be paid for prior to shipment.

If Purchaser requests postponements of shipments, the purchase price shall be due and payable upon notice from RSG that the equipment is ready for shipment; and thereafter any storage or other charge RSG incurs on account of the equipment shall be for the Purchaser's account.

If delivery is specified at a point other than RSG or its supplier's shipping points, and delivery is postponed or prevented by strike, accident, embargo, or other cause beyond RSG reasonable control and occurring at a location other than RSG or its supplier's shipping points, RSG assumes no liability in delivery delay. If Purchaser refuses such delivery, RSG may store the equipment at Purchaser's expense. For all purposes of this agreement such tender of delivery or storage shall constitute delivery.

10. SURFACE PREPARATION AND PAINTING: If furnished, shop primer paint is intended to serve only as minimal protective finish. RSG will not be responsible for the condition of primed or finish painted surfaces after equipment leaves its shops. Purchasers are invited to inspect paint in shops for proper preparation and application prior to shipment. RSG assumes no responsibility for field surface preparation or touch-up of shipping damage to paint. Painting of fasteners and other touch-up to painted surfaces will be by Purchaser's painting contractor after mechanism installation.

11. RETURN OF PRODUCTS: No products may be returned to RSG without RSG's prior written permission. Said permission may be withheld by RSG at its sole discretion.

12. BACK CHARGES: RSG will not approve or accept back charges for labor, materials, or other costs incurred by Purchaser or others in modification, adjustment, service, or repair of RSG furnished materials unless such back charge has been authorized in advance in writing by a RSG employee and a purchase order, or work requisition signed by RSG.

13. INDEMNIFICATION: Purchaser agrees to indemnify RSG from all costs incurred, including but not limited to court costs and reasonable attorney fees, from enforcing any provisions of this contract, including but not limited to breach of contract or costs incurred in collecting monies owed on this contract.

14. ENTIRE AGREEMENT: This proposal expresses the entire agreement between the parties hereto superseding any prior understandings and is not subject to modification except by a writing signed by an authorized officer of each party.

15. EXTENDED STORAGE: Extended storage instructions will be part of information provided to shipment. If equipment installation and start-up is delayed more than 30 days, the provisions of the storage instructions must be followed to keep WARRANTY in force.

16. LIABILITY: Professional liability insurance, including but not limited to, errors and omissions insurance, is not included. In any event, liability for errors and omissions shall be limited to the lesser of 25,000USD or the value of the particular piece of equipment (not the value of the entire order) supplied by RSG against which a claim is sought.

17. ARBITRATION NEGOTIATION: Any controversy or claim arising out of or relating to the performance of any contract resulting from this proposal or contract issued, or the breach thereof, shall be settled by arbitration in accordance with the Construction Industry Arbitration Rules of the American Arbitration Association, and judgment upon the award rendered by the arbitrator(s) may be entered to any court having jurisdiction.

ACCEPTED BY PURCHASER

Customer Name: _____ Customer Address: _____

_____ Contact Name: _____


Contact Phone: _____ Contact Email: _____

Signature: _____ Printed Name: _____

Title: _____ Date: _____

Fields

OVIVO FIELD SERVICE REPORT

*FIELD SERVICE ENGINEER: JACOB PARTRIDGE		*DATE(S) ONSITE: 6.30.20	*CHARGE #: FSW502-01
*Plant: Sandy WWTP *Customer Name: Tom Romesberg *Phone Number: 971-272-7152 *Email Address: Tom.Romesberg@veolia.com *Office Phone: *Cell Phone:			
*Address: 33400 SE Jarl Road *City/State/Zip: Boring OR 97055			
Contractor Name/Address:		*SERIAL #: 25451-01	*Equipment: Clarifier *Type: Eimco *Size: C30
Other Contact Names: Email Address: Phone:		Sales Agent Name:	Phone#:

NOTES

The purpose of this visit was to inspect the clarifier tanks and make recommendations for these units to try and get them back up and working properly for the customer.

Upon arrival met with Tom. Spoke with customer about their concerns for the plant. They are having a lot of problems at this plant with multiple pieces of their equipment breaking or not functioning properly from previous owner/operators, and they are working to get everything rectified. Our focus for this visit was the clarifier units. They are having flow issues into the tanks due to rags blocking their influent pipes going into the clarifiers, they are having foaming/fogging problems that cause massive buildup on the scum beach to the point where it flows underneath the baffles and into their launders. They are having issues with water flowing into their launders at inconsistent places around the circumference. They are having issues with surface debris removal into their scum beaches.

Started inspection of clarifiers. First thing that was noticed about the skimmer arms were they have been completely bent back and out of shape a couple of times. The prior operators had disconnected the torque controls for both of the drives and when the old brushes would hang up it would bend the arms out of shape. Both tanks have damaged and misaligned skimmer arms and are in need of replacement. The skimmers are rigged up to where they work slightly but watching them as they go around the tank and over the scum beach they don't do an adequate job of removal of debris. There are massive sections that the scum bypasses the arm completely, the elevation is not correct nor the position. They are not perpendicular to the radius of the baffles. The baffles themselves are not round and the skimmer is very inconsistent in where it contacts and where it doesn't. The elevation for the arms seems off due to the bent components and the arm doesn't raise and lower properly over the beach. The flush valve is also not working at all on the beach.

Went into the tank to do an inspection of the lower steel components and tank. The steel below the water surface is in very good condition overall. There are some spots where painting should be redone to keep steel in good condition. The squeegees, rake arms, feed well, and cage are in good condition. Due to some water still in the tank I was unable to see the column connection points. Looking at the top of the unit from the platform the drive sounds good on the one tank still in service and the site has since replaced the torque controls and made sure they are working to prevent further damage to the tanks. As far as the operators know the drives have not been rebuilt since they have been in service. But they also informed me that the prior operators did not maintain anything very well and they have no maintenance records. Due to the age of the drives I would recommend rebuild/replacement of the drives if possible.

The customer would like information of replacement baffles around the tank to go from 1' long to 1.5 or 2" to try and keep the scum from bypassing underneath and into their effluent launders. Looking at the tank launders around it appears that the elevation is off on the launders causing water to flow heavier on one half of the launders than the other. Also I would recommend new spray wash assemblies along the length of the walkway to assist the movement of surface scum to the outer portion of the baffles to assist with scum removal from the feed well, and water surface of the tank. Scum is being built up badly inside the dispersion well and feed well and not moving enough to the outside where the skimmer can get it out of the tank. Looking inside the center column as much as I could you can see heavy ragging buildup inside the center of the dispersion well and center column to the point where blockage is possible. The operators have mentioned to me that they have to periodically go inside and manually remove the ragging.

Overall recommendations. New skimmer arm/assemblies for both tanks. New scum beach flush valve assemblies. Possibly rebuilding of the C30 drive assemblies. Spray nozzle assemblies for both tanks to assist scum removal. Recheck and adjust elevation for launders. Adjust baffles to circumference of tank/ replace with longer baffles.

Fields



Fields



ACTIONS ITEMS

Also looking into the customers other equipment their headworks is almost completely broken down and not working. They have an old Pista Grit removal system that is running but are having water leaking into their air system. And also a Rotamat screen that is completely not working at all. The plant is going to be looking at replacement units for this plant in the near future.



OVIVO RECOMMENDATIONS



Fields



Company Use:

Project Manager:
PM Email:
PM Phone:

Contact your OVIVO Project Manager at any time for questions or concerns.

***Required Fields**



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APPENDIX E



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Aqua-Aerobic Systems Inc. Field Service Report

Purpose of Trip: Filter assessment - Mechanical/electrical inspection of filter - Customer replaced all media observing low flow capacity below the design capacity. Filter capacity is 1.5 MGD average and 3MGD max for each filter. Aqua-Aerobic to review operation and help identify issues causing the reduction in capacity

Site Name: SANDY WWTP

M.O. Number: ProjectID: 105004 ClaimID: 0 ENum: 0 SO #: 91245

Address: 33400 Jarl Road

City: Boring State: Oregon Zip: 97009

Equipment Type: Disk Filter

Contact Name: Tom Romesberg

Contact Phone: 971-271-7152

Project Manager: Aqua Rep: HOUSE DOM-WEST-REGION 2

Date of Service: 2/2/2020

Was this a startup? No If yes, was it completed? no Are revisions required to mech/elect drawings? no

Were Red-Line drawings returned to the Loves Park office? no Was revised program emailed Loves Park office? no

***** PROGRAM CHANGES *****

Date of saved/upload: na

PLC Interface Type: koyo

HMI Interface Type: zoid

Special notes / comments on program changes:

No changes made but the program is not working properly

Technician Name(s)				Daily Service Hours								
LeadTech	NumOfDays	EmpName	TripType	C/E/S	Sun	Mon	Tue	Wed	Thu	Fri	Sat	
▶ <input checked="" type="checkbox"/>	2	Johnson, Brady	Billabl Svc	91245	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	

	Sun	Mon	Tue	Wed	Thu	Fri	Sat	Total Hours
Daily Service Hours:			5					5
Daily Travel Hours:		9	7					16

Tech Signature: Brady Johnson



Aqua-Aerobic Systems Inc. Field Service Report

Site Name:

SANDY WWTP

M.O. Number:

ProjectID: 105004

ClaimID: 0

ENum: 0

SO #: 91245

SERVICES PERFORMED

- The filter equipment was inspected and an assessment was made of the necessary repairs to bring the filter back to peak performance
- The operators were met with and operations were discussed.
- They had recently changed out the cloth with needle felt. The needle felt cloth requires to be both backwashed and high pressure sprayed to be cleaned.
- Most of the new cloth has pulled out of the tension bars (see pictures). This is likely due to galling of the hardware, and the Velcro not being pulled tight under the retainer bars.
- Other issues include...
 1. Missing V-ring seal, which allows unfiltered influent to go straight to the effluent.
 2. Chain installed backwards
 3. Disks oriented backwards
 4. The hose is missing from sludge waste pump on filter #1
 5. Several springs missing from backwash shoes. This prevents proper contact between backwash shoes and disks, so cloth is not cleaned properly during backwash.
 6. Two backwash shoes missing from filter #1
 7. Disk rubbing against the submersible backwash pumps in several places causing the cloth to wear through and wearing down the frame as well. (see pictures)
 8. HMI is inoperable, so the operation of the filter cannot be modified.
 9. Bubbler system for level control is in operable. This prevents proper backwash.
 10. High pressure drain valve is inoperable yet the high pressure spray is occurring without draining down. High pressure spraying the disks while they are submerged will do nothing to clean the disks. So they get plugged with influent solids, and cannot be cleaned.
 11. Backwash is occurring due to high level. However, the filter never recovers because so many of the backwash shoes are not making contact. Therefore, the filters stay in a constant state of backwash.
 12. High pressure spray pump leaking

The following action is recommended...

Control Panel

- New HMI
- New PLC
- Remove HPS control. Convert cloth to pile cloth.
- Add analog for level control

Both Filters

- Analog level transducers (a field panel with conduit back to the panel exists for the current level control. This could be reused for analog wiring.)
- High level float switch
- New solenoid valves for operating air weir. The air weir is the device that keeps the influent from entering the filter, so that you can isolate the filter to be worked on during repairs.
- All new pile cloth (chlorine resistant 10 micron)

1/30/2020 10:16:56 AM

2 of 6



Aqua-Aerobic Systems Inc. Field Service Report

- All new frames and hardware
- All new springs
- Two new backwash shoes and mounting assembly for Filter #1 (mounting piping or HPS header is intact.)
- Pillow block bearing assembly
- V ring seal
- Bottom roller wheels
- All new backwash hoses
- New sludge waste hoses
- Remove and blind HPS header piping and spray nozzles

Repairs

- It is recommended and requested by the operator that Aqua personnel be onsite to make the repairs.



Aqua-Aerobic Systems Inc. Field Service Report



Aqua-Aerobic Systems Inc. Field Service Report

Customer Work Remaining

Site Name: SANDY WWTP

M.O. Number: ProjectID: 105004 ClaimID: 0 ENum: 0 SO #: 91245

MECHANICAL

Action Items:	Assigned to:

ELECTRICAL

Action Items:	Assigned to:



Aqua-Aerobic Systems Inc. Field Service Report

Aqua Work Remaining

Site Name: SANDY WWTP

M.O. Number: ProjectID: 105004 ClaimID: 0 ENum: 0 SO #: 91245

MECHANICAL		
Action Items:	Assigned to:	Delays:

ELECTRICAL		
Action Items:	Assigned to:	Delays:

THIRD PARTY CONTRACTORS		
Company Name:	Contact:	Tasks:

HMI is inoperable and needs to be replaced.



Interior of the filter control panel.



High pressure spray pump, which is leaking. This pump can be removed and disabled, when the plant converts to pile cloth media. The pile cloth media does not need to be sprayed to be cleaned.



The V-ring seal is missing from this filter, allowing unfiltered influent to bypass the cloth and go directly to the effluent



Backwash pumps are impacting the disks, and wearing through cloth and frames.



Torn cloth, from rubbing against backwash pumps. The torn cloth leads to influent solids going directly to the effluent.





APPENDIX F

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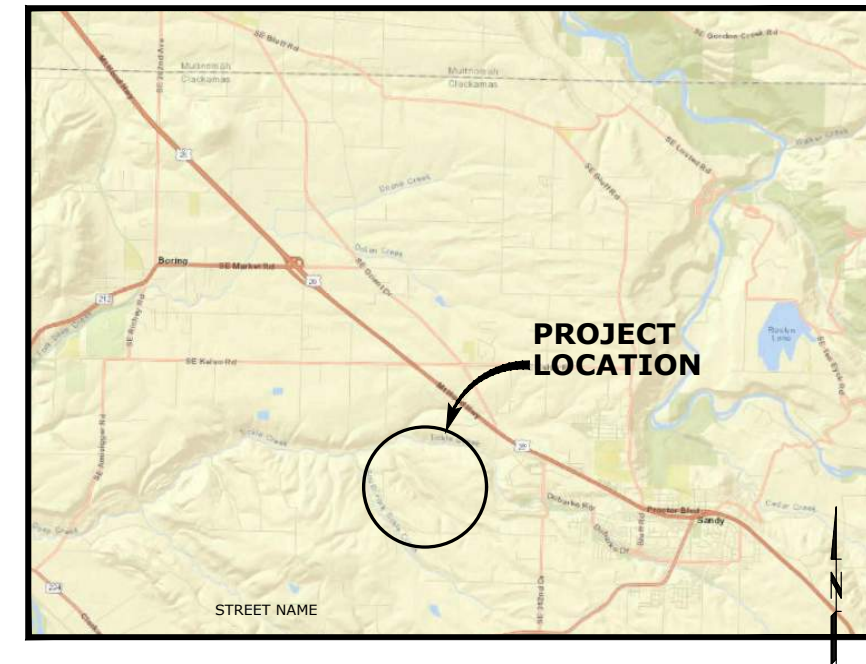


SANDY WWTP CONDITION ASSESSMENT PRELIMINARY DESIGN REPORT

VOLUME DATE

INDEX OF DRAWINGS

GENERAL		
1	M-1	HEADWORKS IMPROVEMENTS
2	M-2	AERATION BASIN FLOW CONTROL IMPROVEMENTS
3	M-3	BLOWER REPLACEMENT
4	M-4	AERATION BASIN IMPROVEMENTS
5	M-5	SECONDARY CLARIFIER IMPROVEMENTS
6	M-6	PROCESS WATER CHLORINATION IMPROVEMENTS
7	M-7.1	UV DEMOLITION
8	M-7.2	UV REPLACEMENT
9	M-8	STORM WATER IMPROVEMENTS
10	M-9	AERATED SLUDGE STORAGE BASIN IMPROVEMENTS

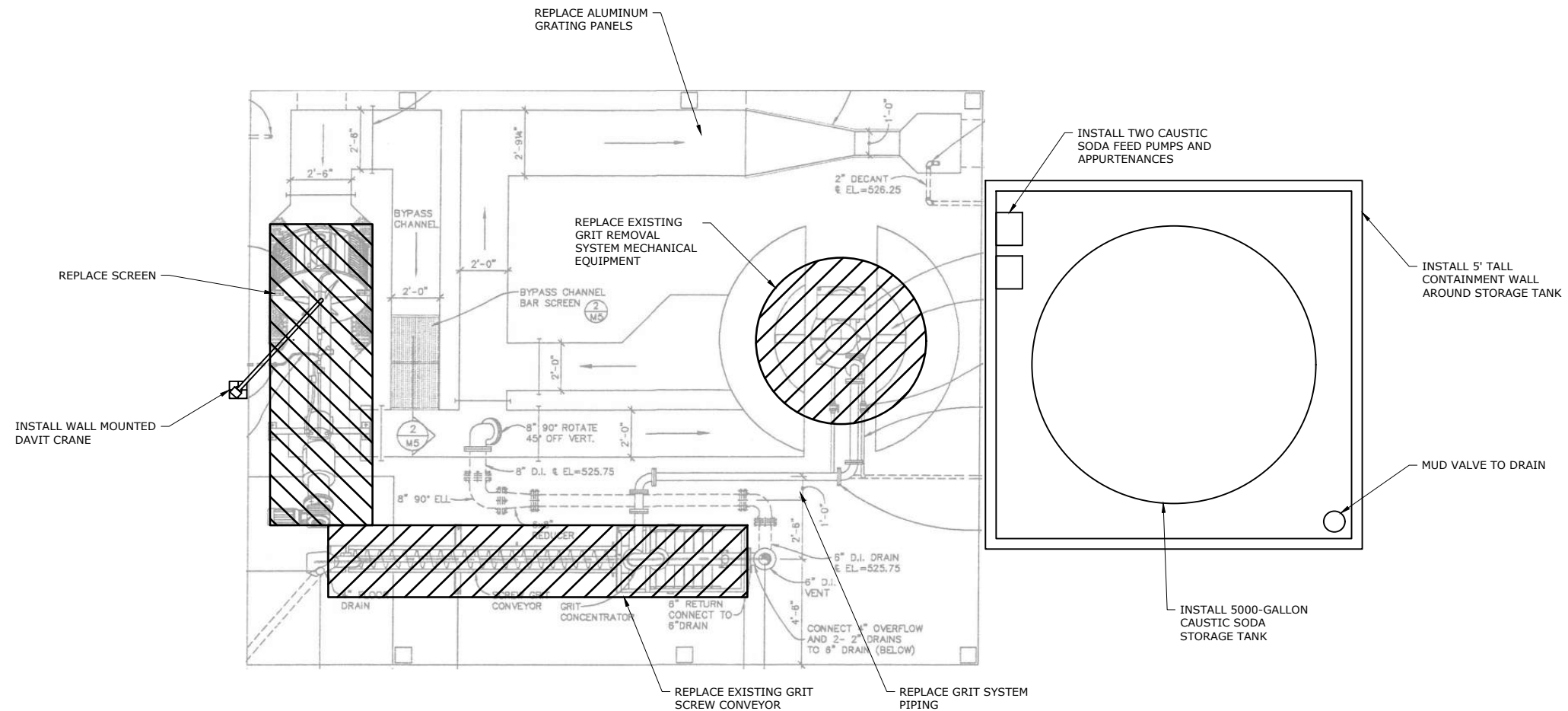


VICINITY MAP
SCALE: 1"=NTS



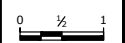
ATTENTION: OREGON LAW REQUIRES THE CONTRACTOR TO FOLLOW THE RULES ADOPTED BY THE OREGON UTILITY NOTIFICATION CENTER. THOSE RULES ARE SET FORTH IN OAR 952-001-0010 THROUGH OAR 952-001-0090. THE CONTRACTOR MAY OBTAIN COPIES OF THE RULES BY CALLING THE UTILITY NOTIFICATION CENTER. (NOTE: THE TELEPHONE NUMBER FOR THE OREGON UTILITY NOTIFICATION CENTER IS 503-246-6699.)

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HEADWORKS IMPROVEMENTS - PLAN VIEW
SCALE: 3/8"=1'-0"

NO.	DATE	BY	REVISION

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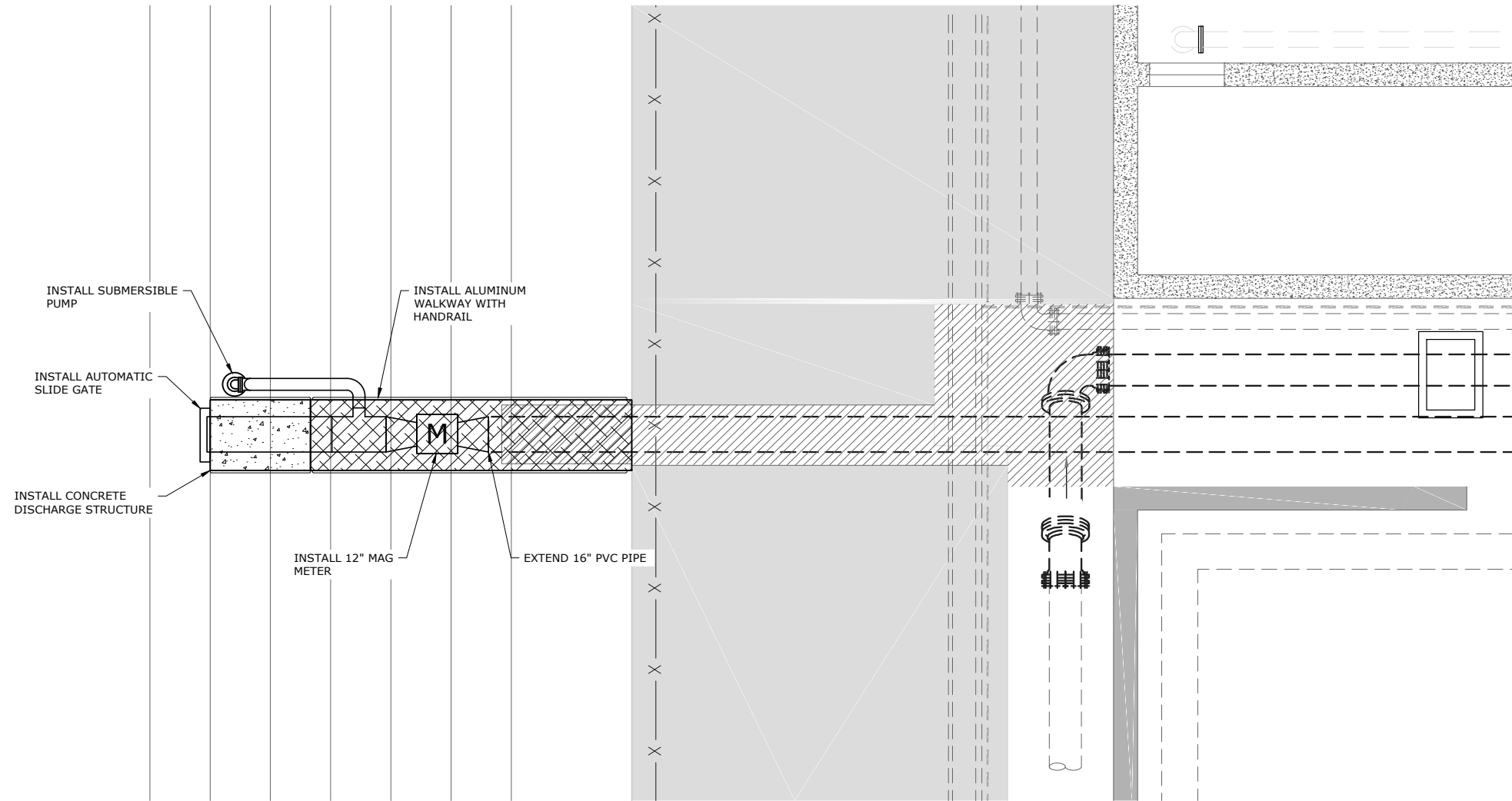


**SANDY WWTP
 IMMEDIATE NEEDS
 PRELIMINARY DESIGN
 REPORT**

HEADWORKS IMPROVEMENTS
 PROJECT NO.: 20-2781.0204 SCALE: AS SHOWN DATE: JUNE 2020

SHEET
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 2 of X

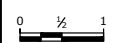
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AERATION BASIN FLOW SPLIT IMPROVEMENTS - PLAN VIEW

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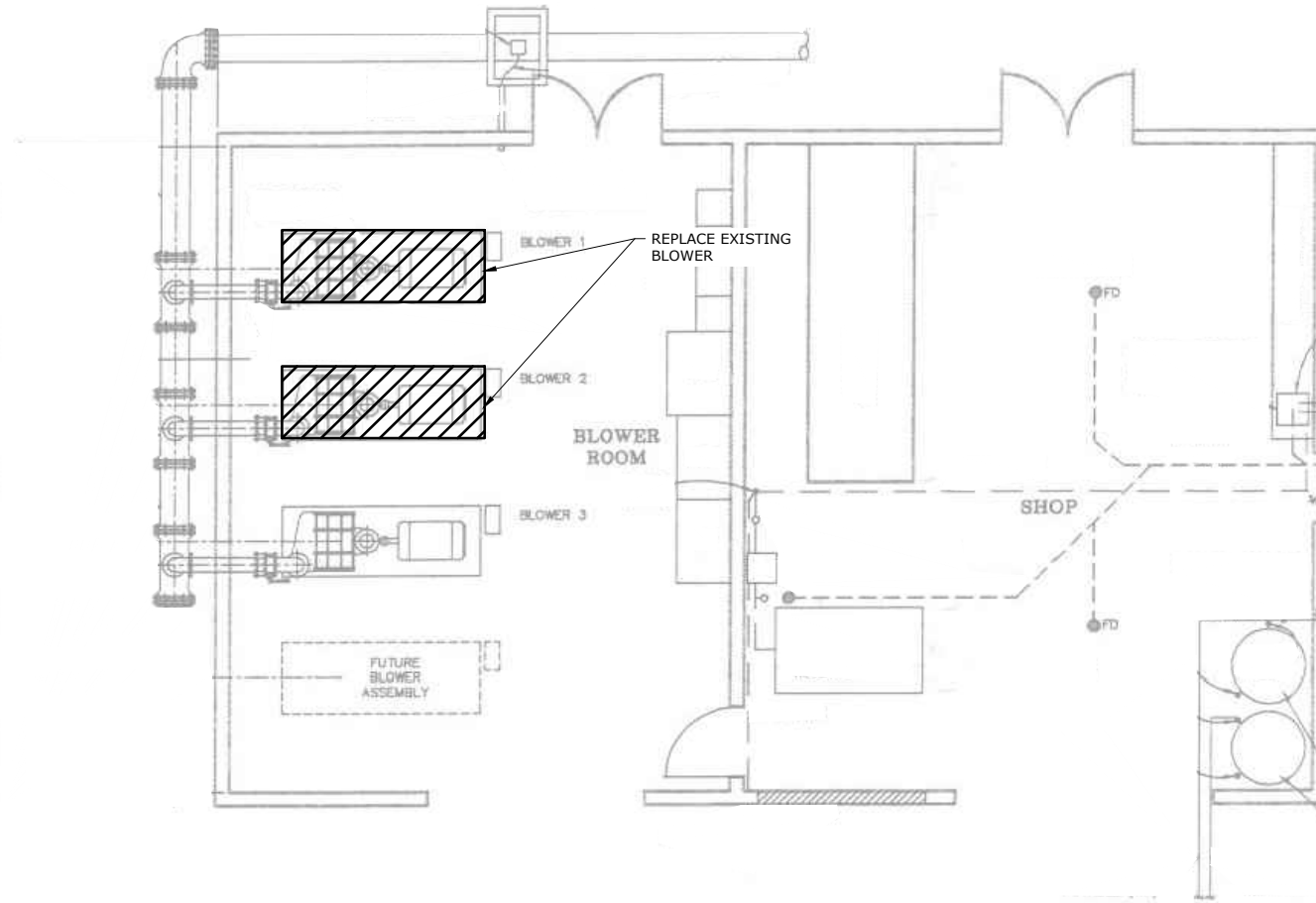
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PROJECT NO.: 20-2781.0204 SCALE: AS SHOWN DATE: JUNE 2020

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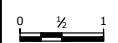
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BLOWER REPLACEMENT - PLAN VIEW

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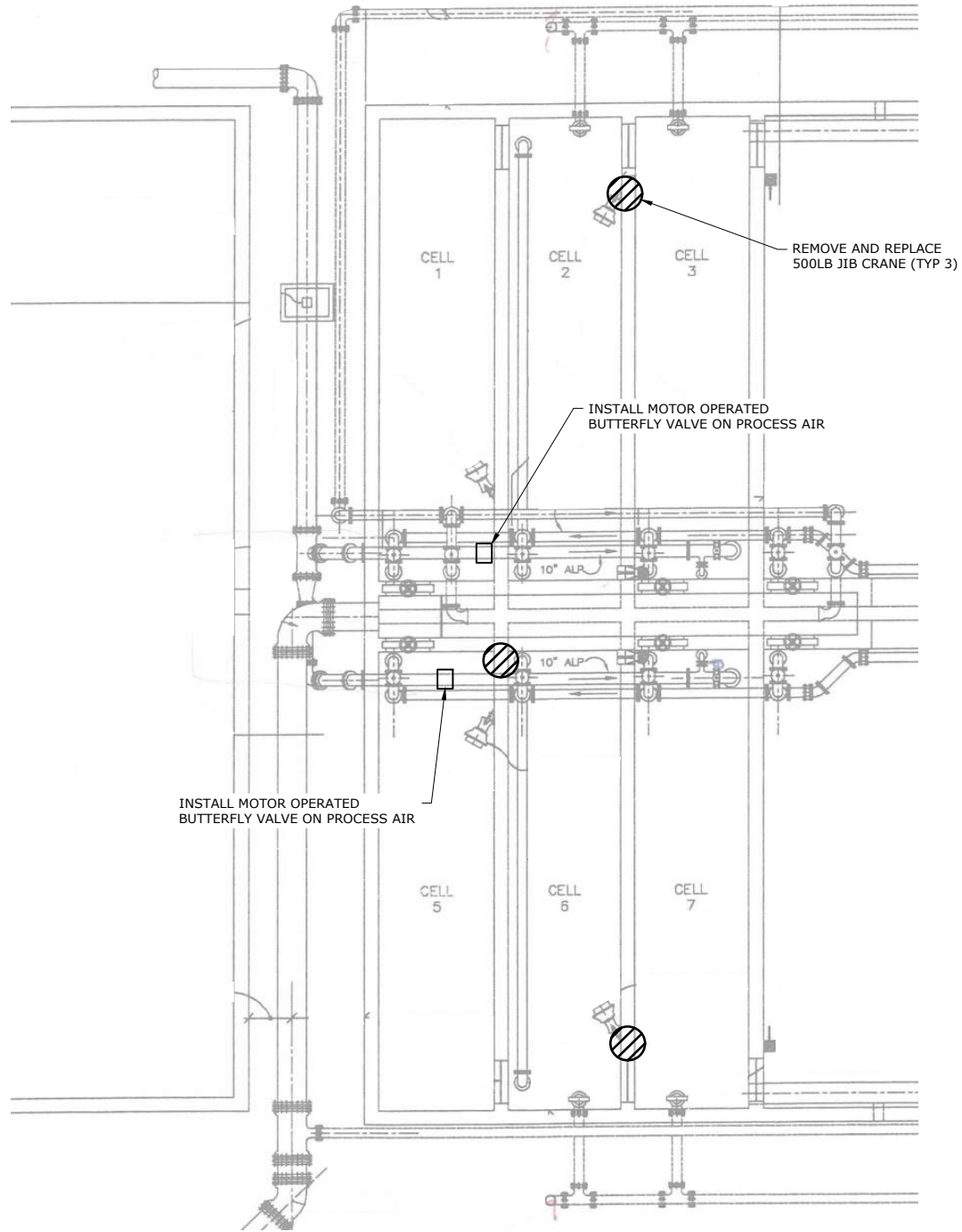
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PROJECT NO.: 20-2781.0204 SCALE: AS SHOWN DATE: JUNE 2020

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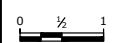
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AERATION BASIN IMPROVEMENTS - PLAN VIEW

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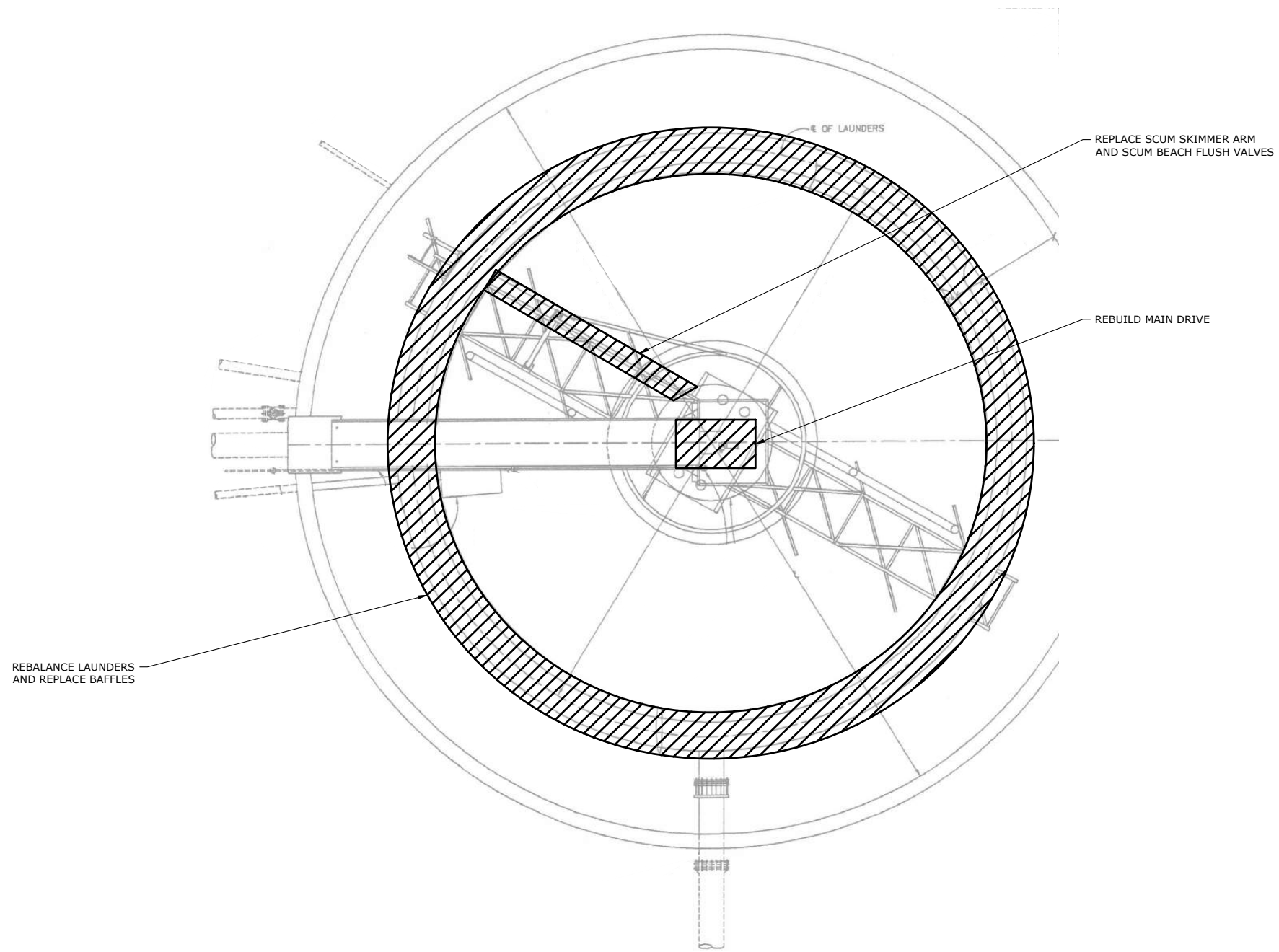
**DAVIT CRANE REPLACEMENT
 AERATION BASIN IMPROVEMENTS**

PROJECT NO.: 20-2781.0204 SCALE: AS SHOWN DATE: JUNE 2020

SHEET
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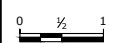
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CLARIFIER IMPROVEMENTS - PLAN VIEW
SCALE: 1/8"=1'-0"

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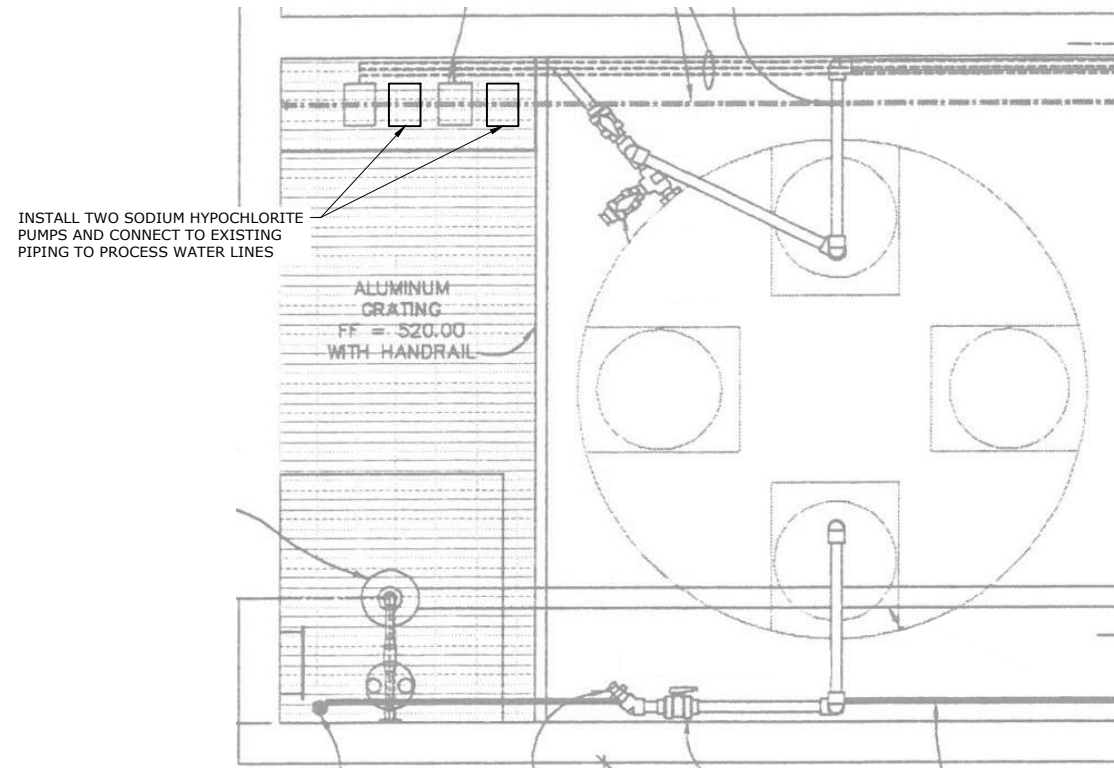


**SANDY WWTP
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 REPORT**

**SECONDARY CLARIFIER
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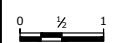
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PROCESS WATER CHLORINATION IMPROVEMENTS - PLAN VIEW
SCALE: 3/4"=1'-0"

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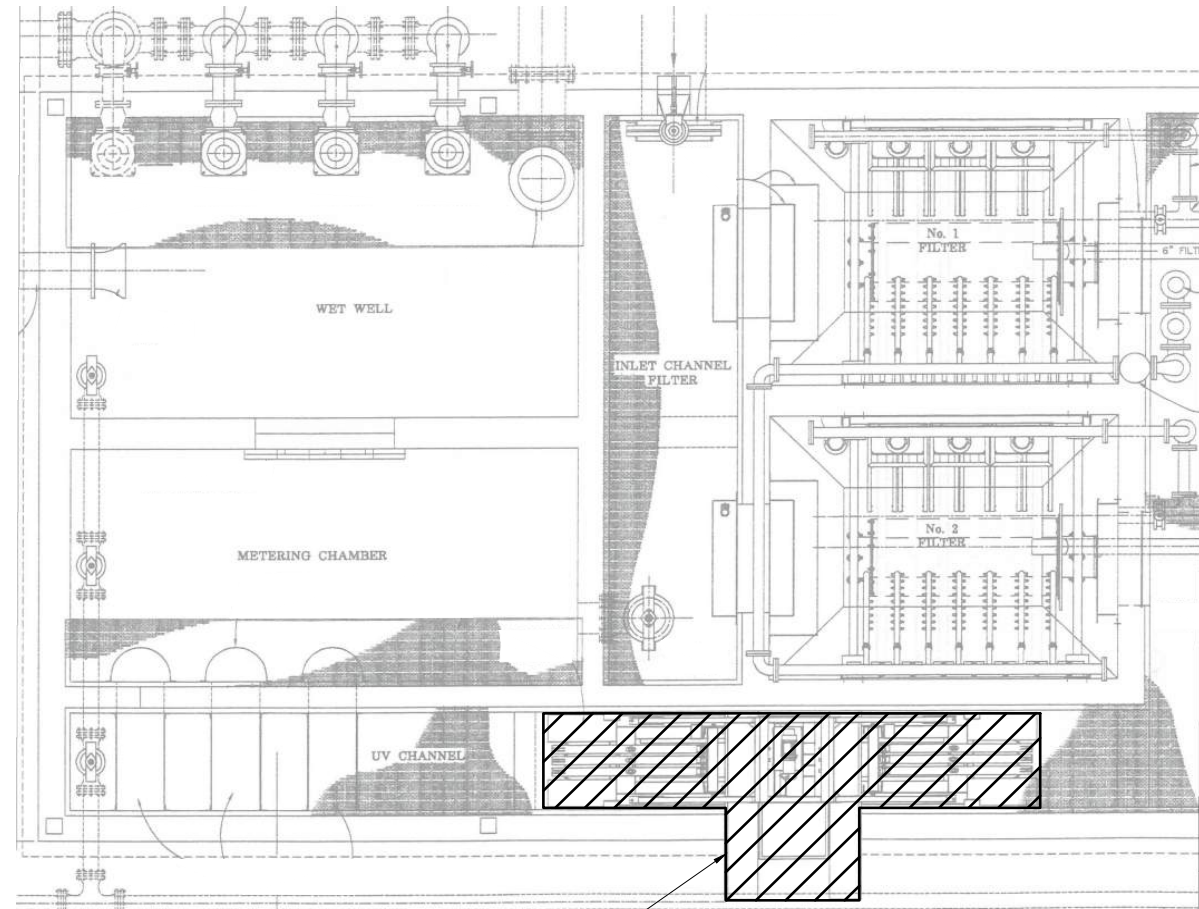
**PROCESS WATER CHLORINATION
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PROJECT NO.: 20-2781.0204 SCALE: AS SHOWN DATE: JUNE 2020

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
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REMOVE EXISTING UV SYSTEM AND REPLACE WITH NEW SYSTEM

UV SYSTEM DEMOLITION - PLAN VIEW
SCALE: 3/8"=1'-0"

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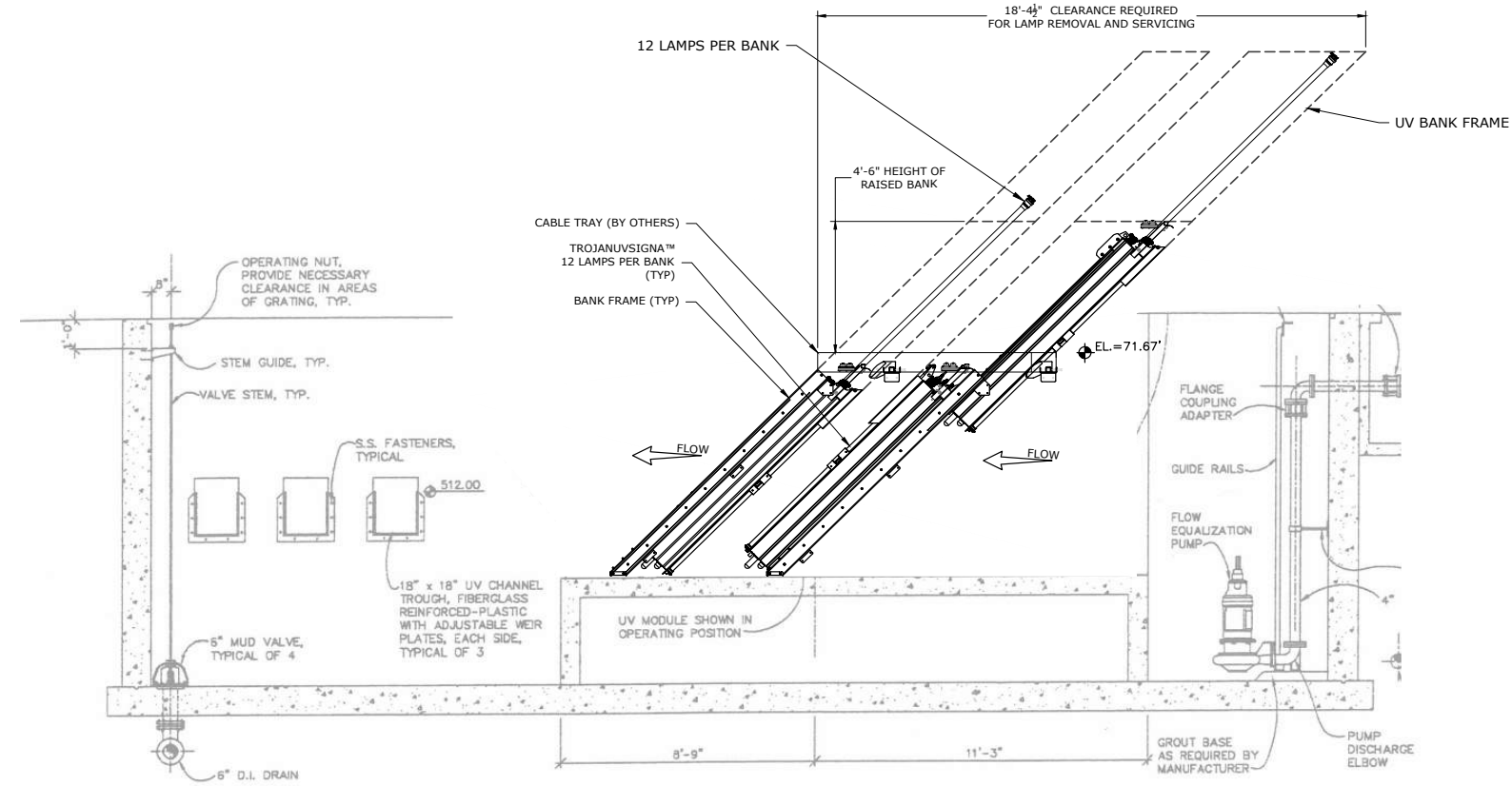


**SANDY WWTP
 IMMEDIATE NEEDS
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UV DEMOLITION
 PROJECT NO.: 20-2781.0204 SCALE: AS SHOWN DATE: JUNE 2020

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UV SYSTEM IMPROVEMENTS - PLAN VIEW
SCALE: 3/8"=1'-0"

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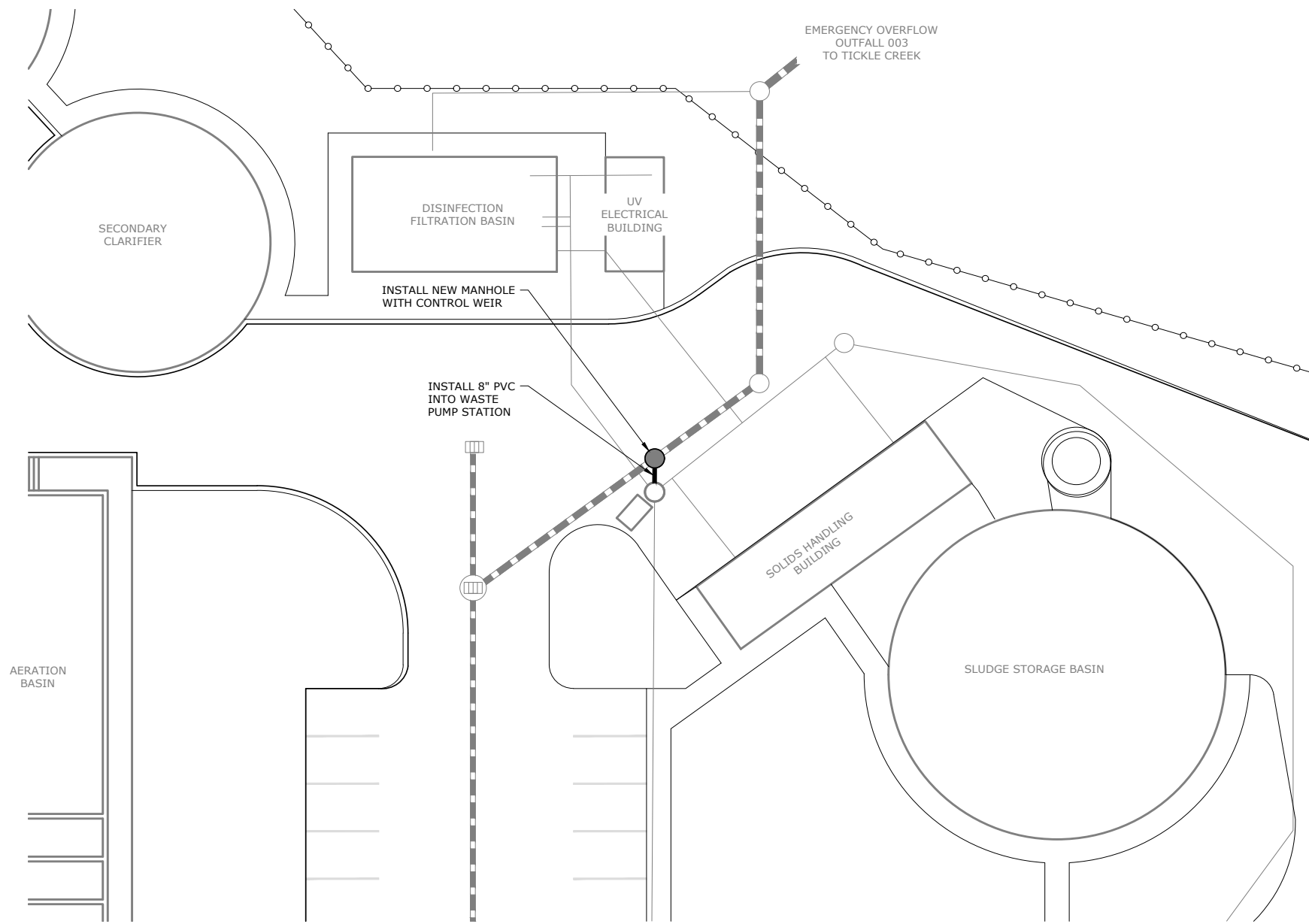


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 IMMEDIATE NEEDS
 PRELIMINARY DESIGN
 REPORT**

UV REPLACEMENT
 PROJECT NO.: 20-2781.0204 SCALE: AS SHOWN DATE: JUNE 2020


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STORM WATER IMPROVEMENTS - PLAN VIEW
SCALE: 3/8"=1'-0"

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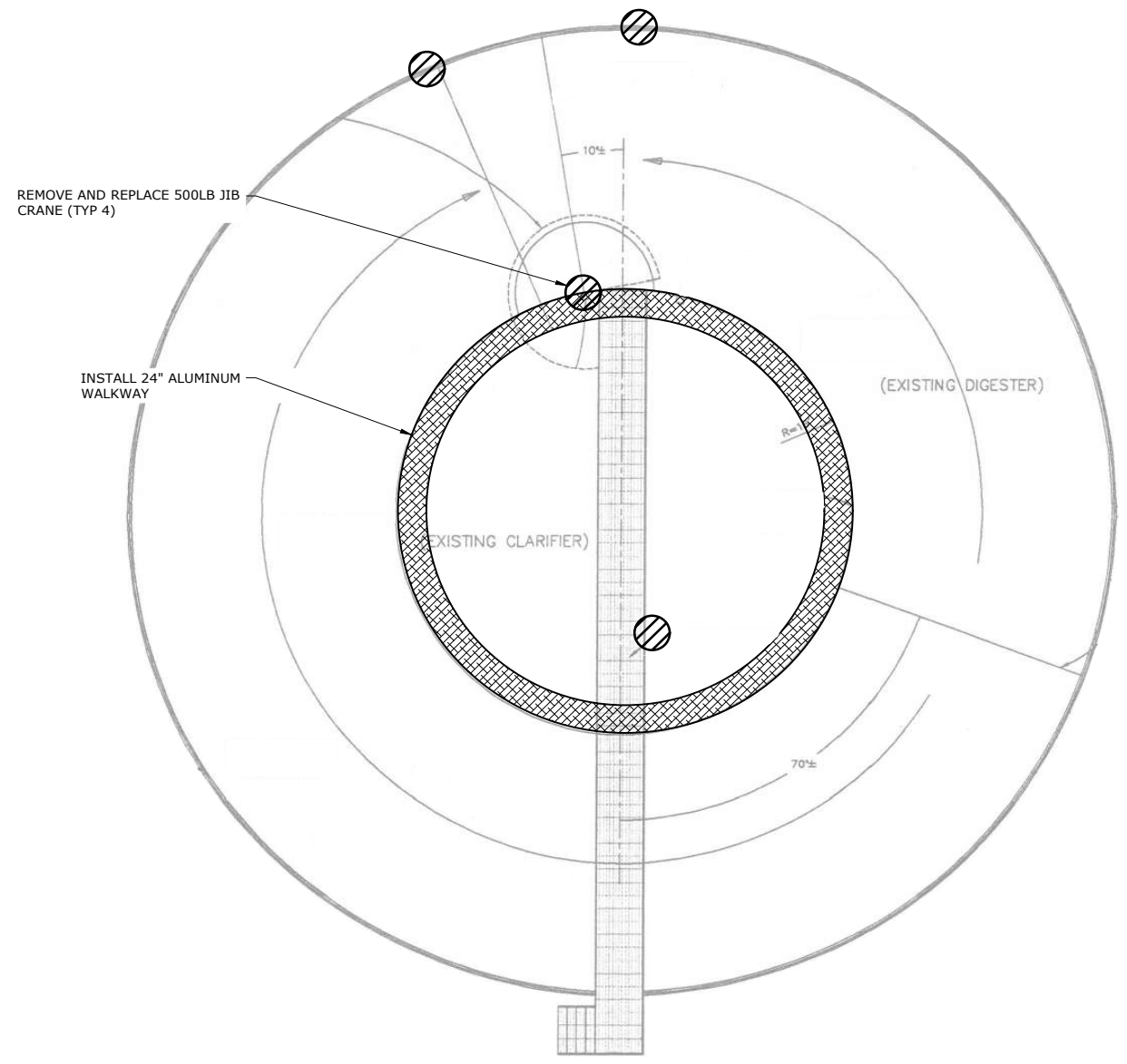


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STORM WATER IMPROVEMENTS
 PROJECT NO.: 20-2781.0204 SCALE: AS SHOWN DATE: JUNE 2020


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AERATED SLUDGE STORAGE BASIN IMPROVEMENTS - PLAN VIEW
SCALE: 3/16"=1'-0"

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**AERATED SLUDGE STORAGE BASIN
 IMPROVEMENTS**
 PROJECT NO.: 20-2781.0204 SCALE: AS SHOWN DATE: JUNE 2020

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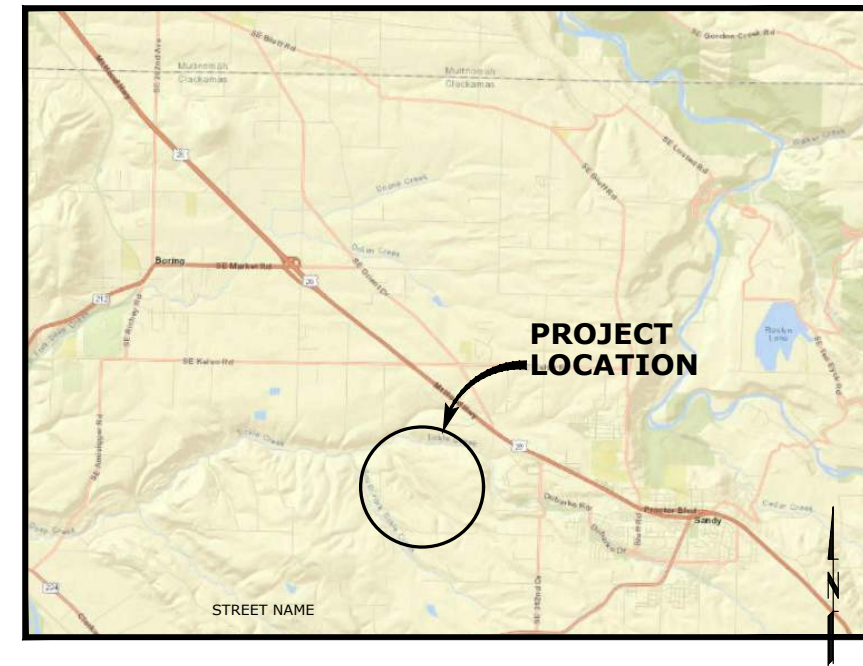
SANDY WWTP IMMEDIATE NEEDS PRELIMINARY DESIGN REPORT

VOLUME DATE

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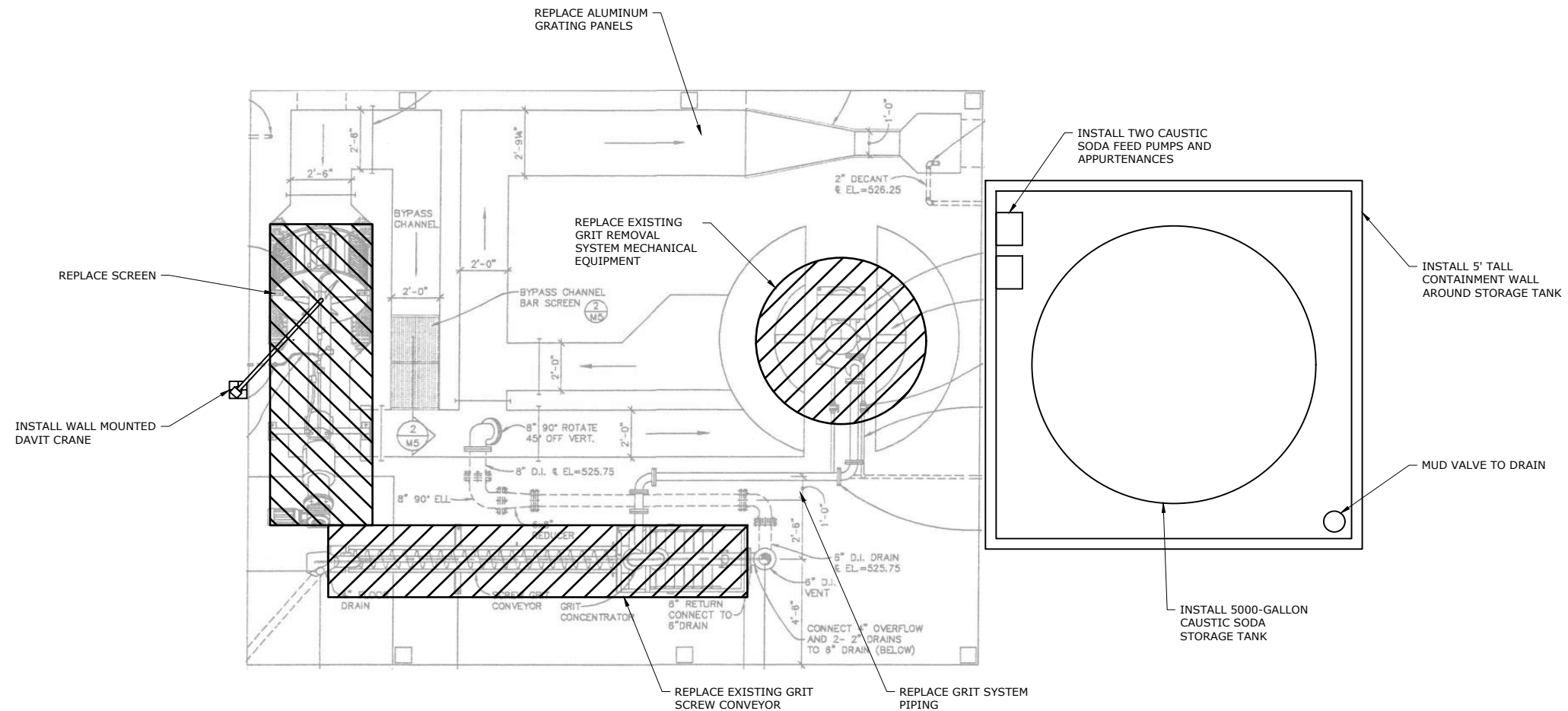


VICINITY MAP
SCALE: 1"=NTS



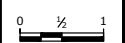
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HEADWORKS IMPROVEMENTS - PLAN VIEW
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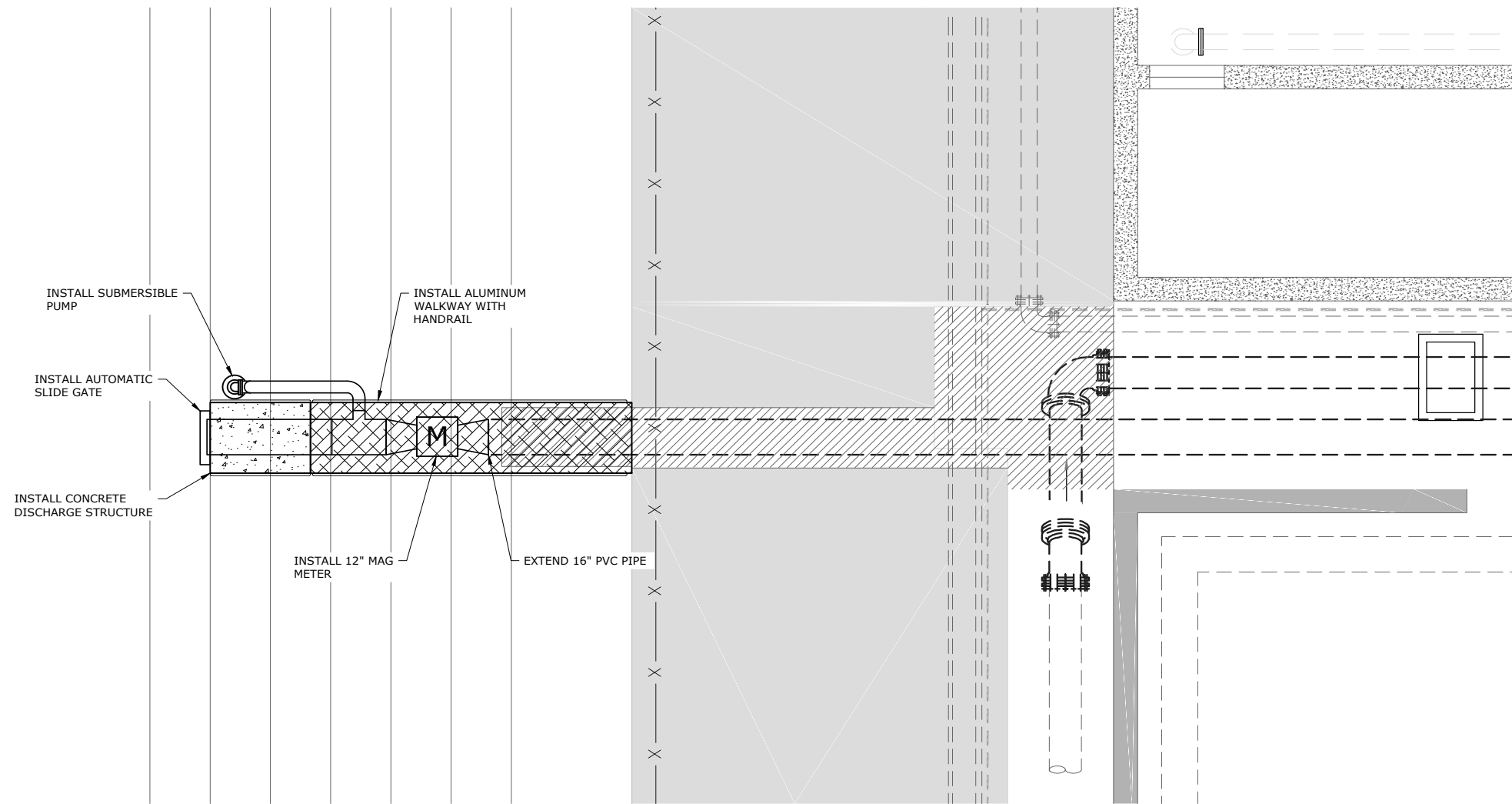


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HEADWORKS IMPROVEMENTS
 PROJECT NO.: 20-2781.0204 SCALE: AS SHOWN DATE: JUNE 2020

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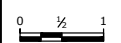
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AERATION BASIN FLOW SPLIT IMPROVEMENTS - PLAN VIEW

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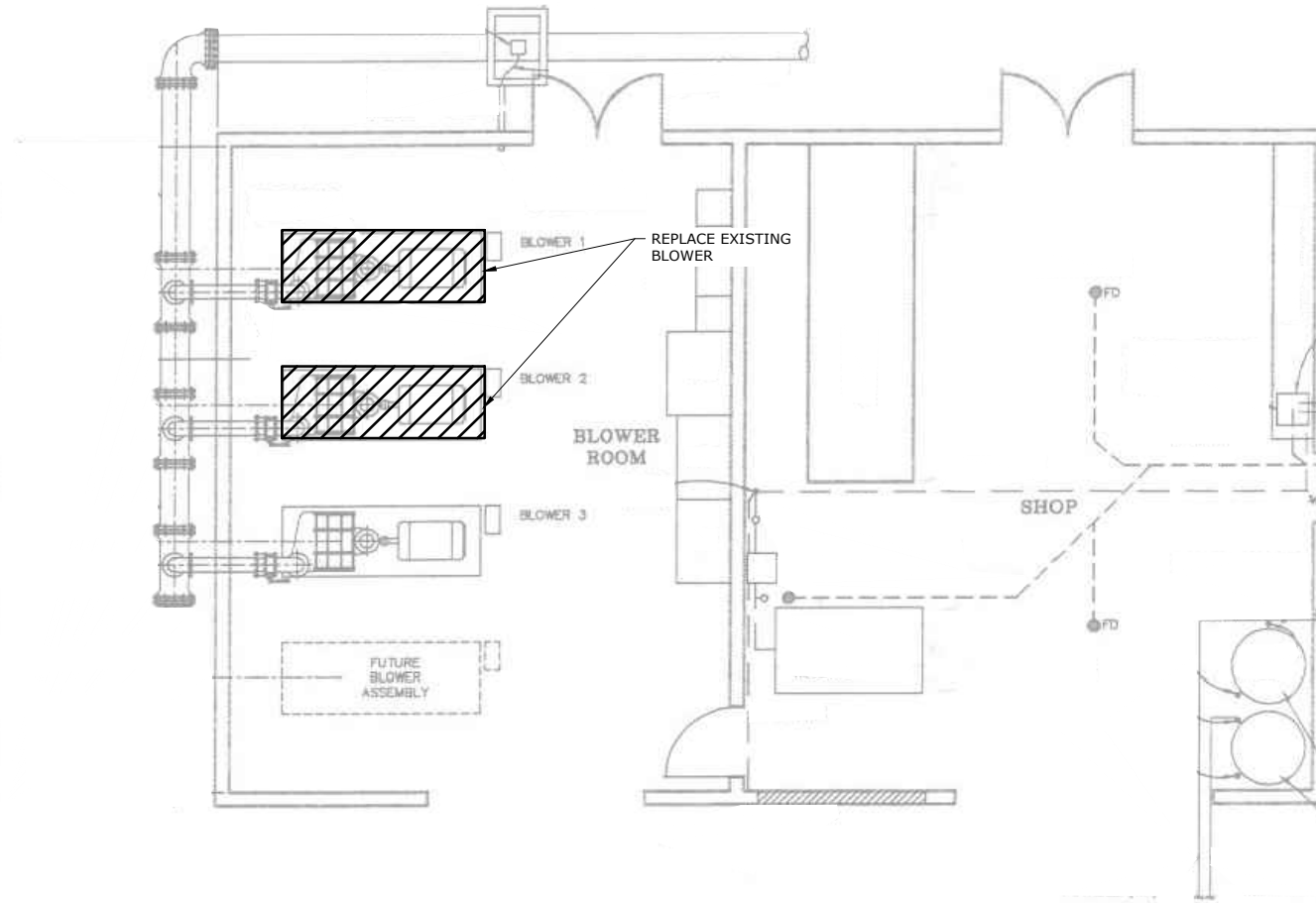
**AERATION BASIN
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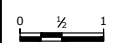
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BLOWER REPLACEMENT - PLAN VIEW

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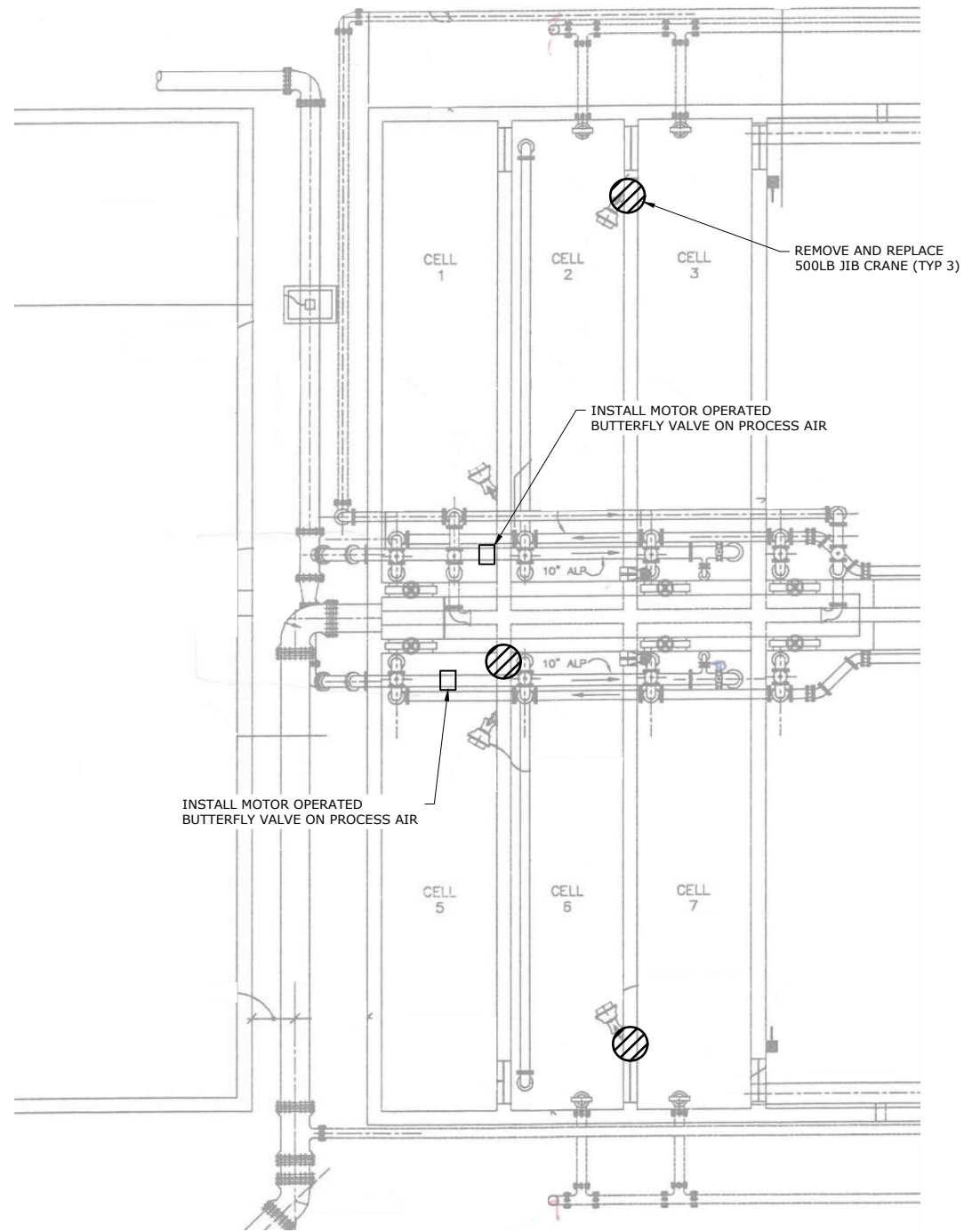
BLOWER REPLACEMENT

PROJECT NO.: 20-2781.0204 SCALE: AS SHOWN DATE: JUNE 2020

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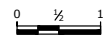
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AERATION BASIN IMPROVEMENTS - PLAN VIEW

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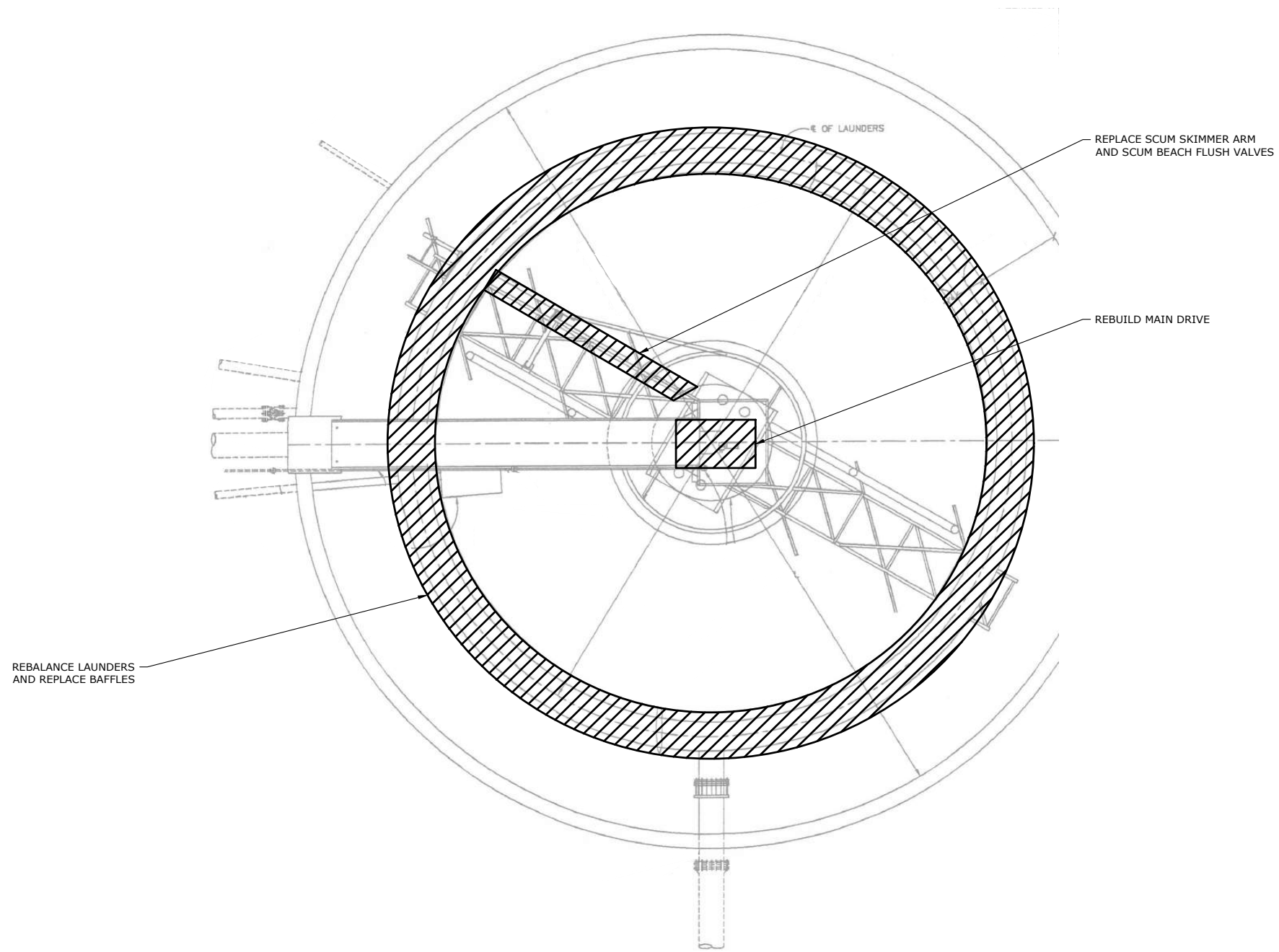
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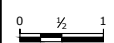
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CLARIFIER IMPROVEMENTS - PLAN VIEW
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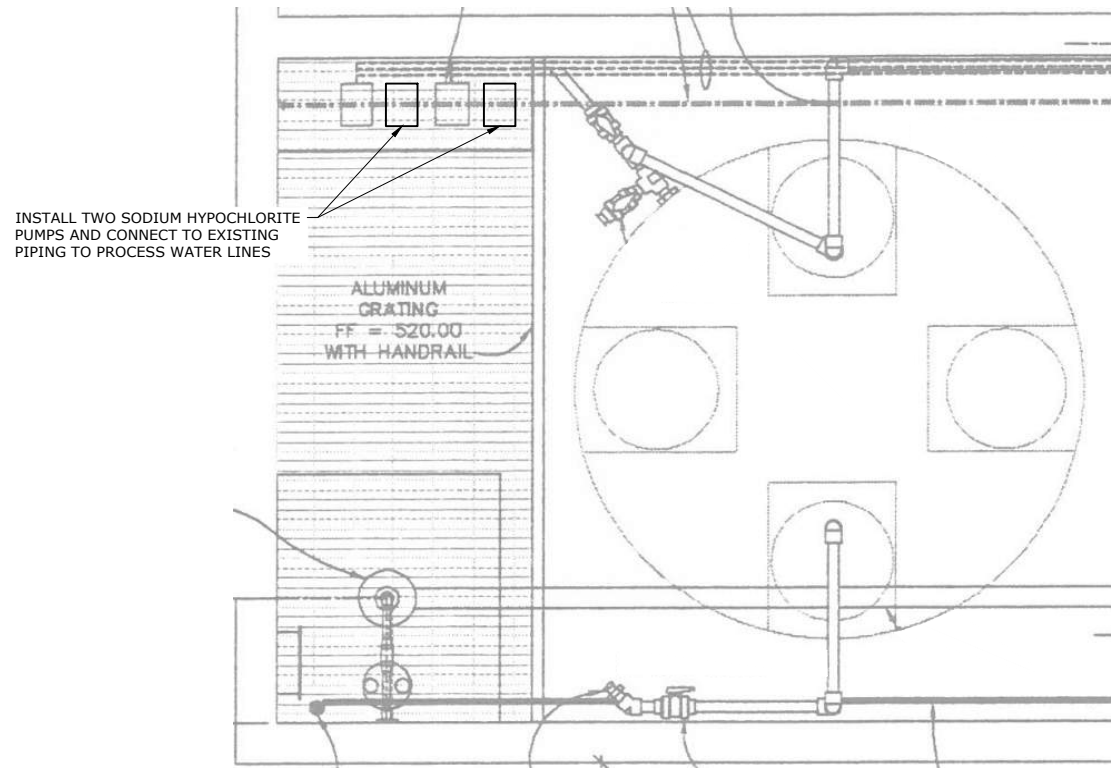


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**SECONDARY CLARIFIER
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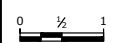
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PROCESS WATER CHLORINATION IMPROVEMENTS - PLAN VIEW
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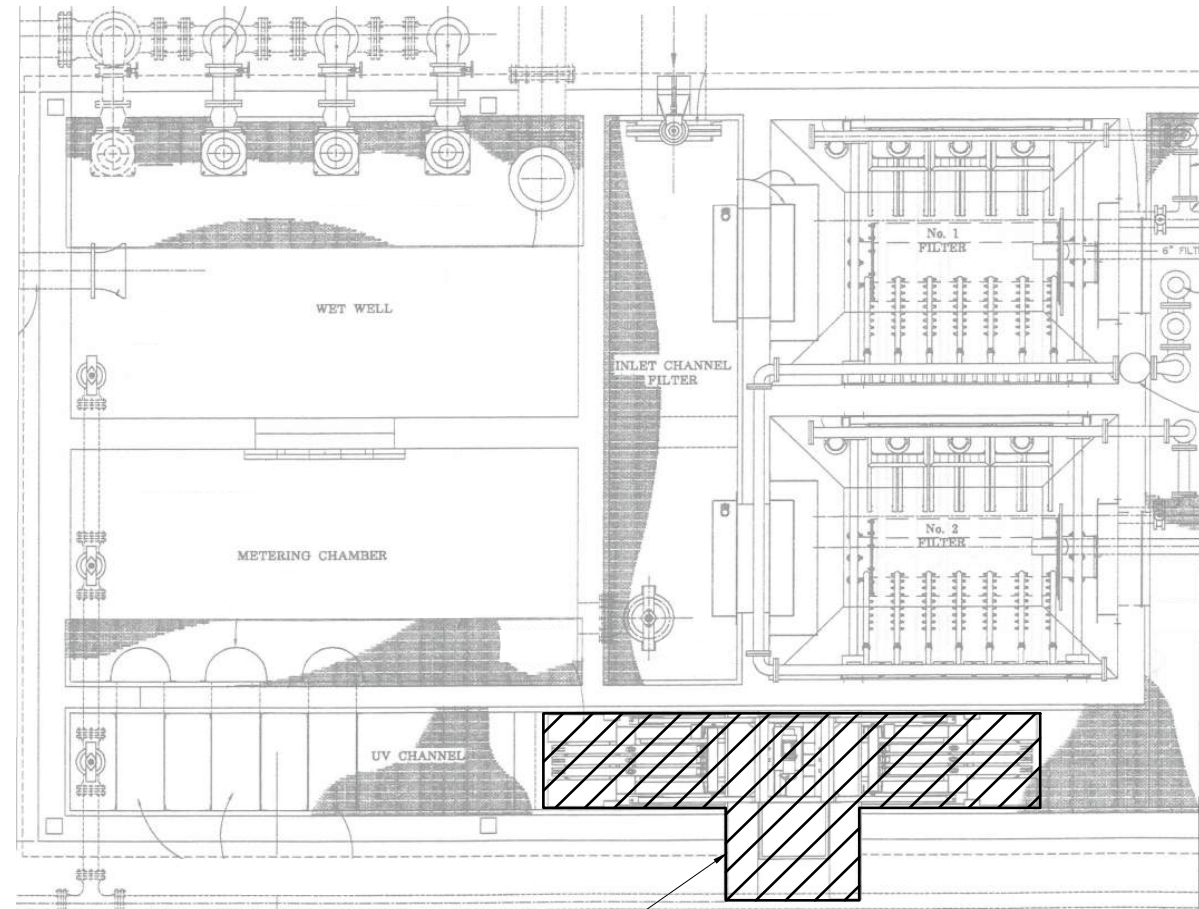
**PROCESS WATER CHLORINATION
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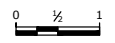
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REMOVE EXISTING UV SYSTEM AND REPLACE WITH NEW SYSTEM

UV SYSTEM DEMOLITION - PLAN VIEW
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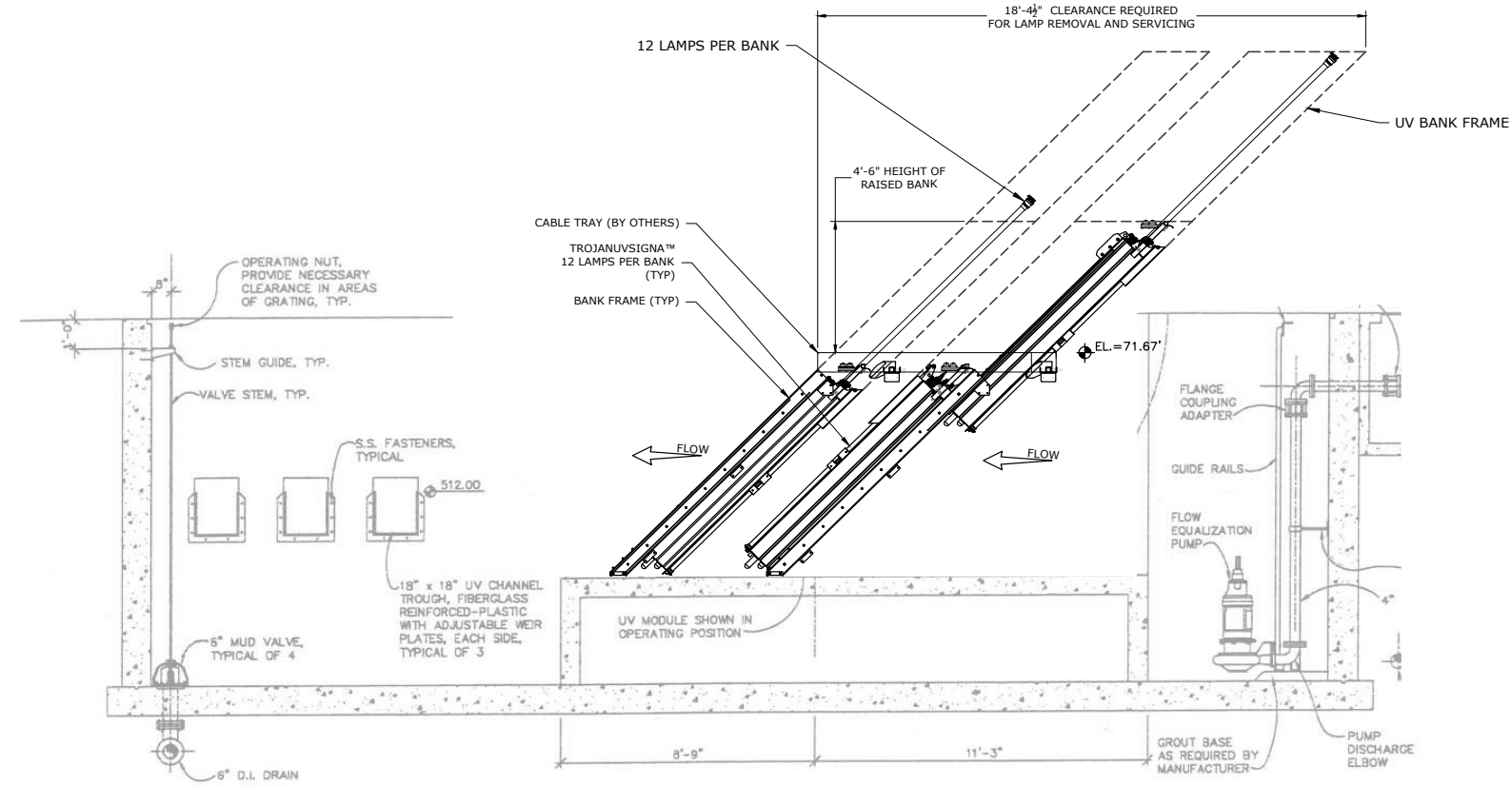


**SANDY WWTP
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 PRELIMINARY DESIGN
 REPORT**

PROJECT NO.: 20-2781.0204 SCALE: AS SHOWN DATE: JUNE 2020

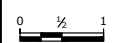
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UV SYSTEM IMPROVEMENTS - PLAN VIEW
SCALE: 3/8"=1'-0"

NO.	DATE	BY	REVISION

NOTICE

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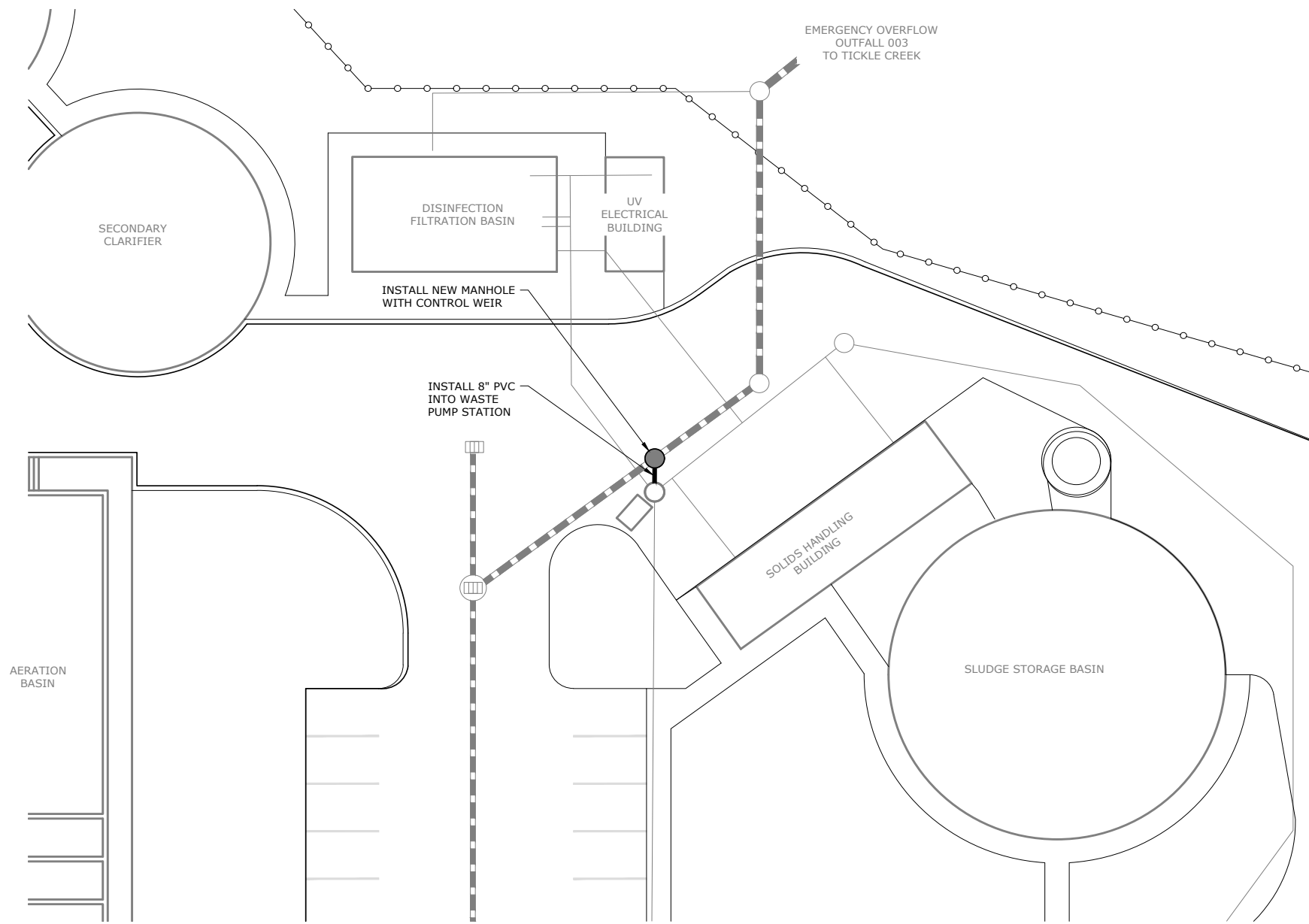


**SANDY WWTP
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 PRELIMINARY DESIGN
 REPORT**

UV REPLACEMENT
 PROJECT NO.: 20-2781.0204 SCALE: AS SHOWN DATE: JUNE 2020


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STORM WATER IMPROVEMENTS - PLAN VIEW
SCALE: 3/8"=1'-0"

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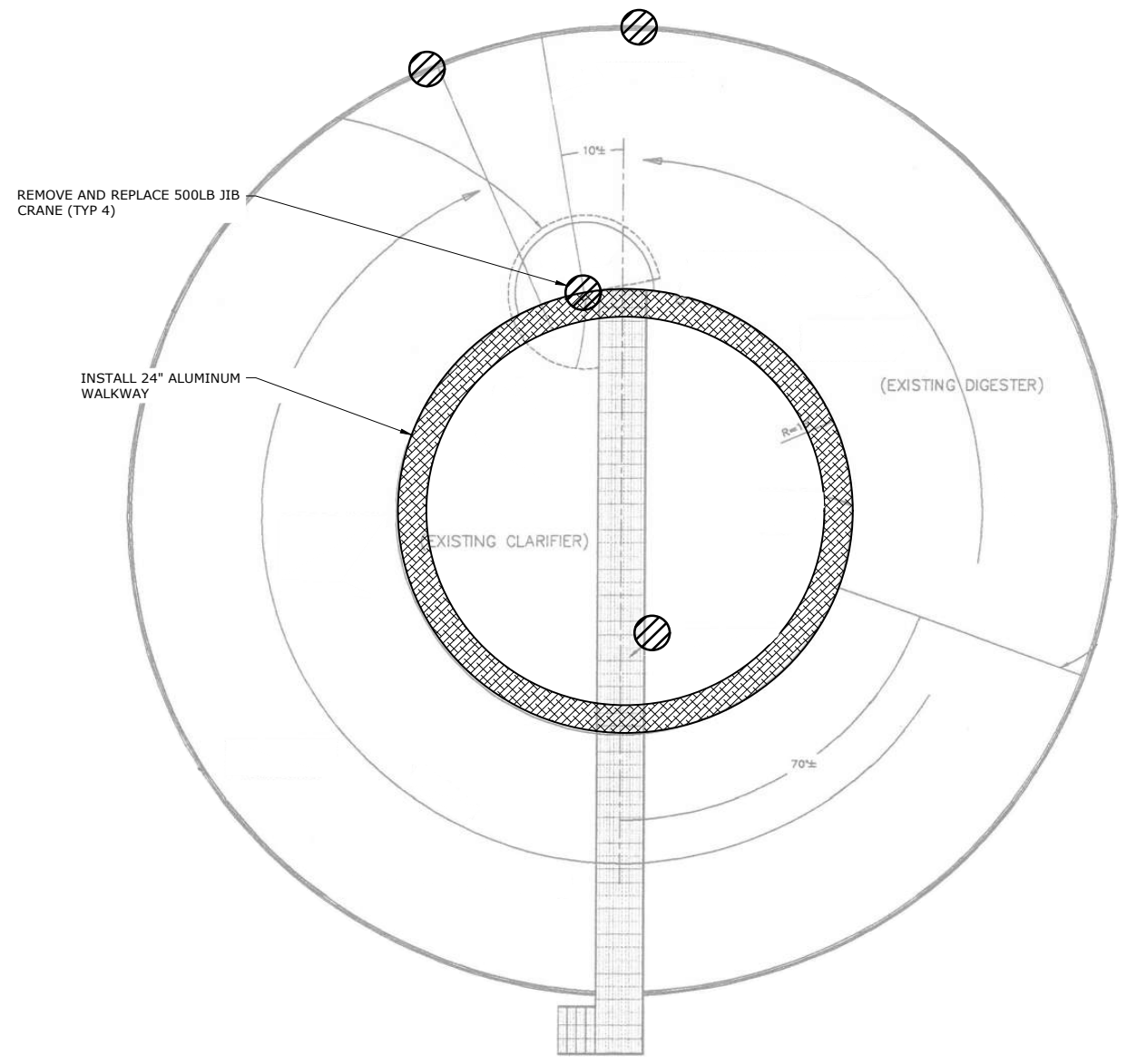


**SANDY WWTP
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 PRELIMINARY DESIGN
 REPORT**

STORM WATER IMPROVEMENTS
 PROJECT NO.: 20-2781.0204 SCALE: AS SHOWN DATE: JUNE 2020

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
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AERATED SLUDGE STORAGE BASIN IMPROVEMENTS - PLAN VIEW

SCALE: 3/16"=1'-0"

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**SANDY WWTP
 IMMEDIATE NEEDS
 PRELIMINARY DESIGN
 REPORT**

**AERATED SLUDGE STORAGE BASIN
 IMPROVEMENTS**
 PROJECT NO.: 20-2781.0204 SCALE: AS SHOWN DATE: JUNE 2020

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ATTACHMENT B

**City of Sandy, Oregon
CONSTRUCTION MANAGER/GENERAL
CONTRACTOR
GENERAL CONDITIONS**

CM/GC GENERAL CONDITIONS

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CM/GC GENERAL CONDITIONS

SECTION A GENERAL PROVISIONS

A.1 DEFINITION OF TERMS

In the Contract Documents the following terms shall be as defined below:

ARCHITECT/ENGINEER, means the Person appointed by the City to make drawings and specifications and, to provide contract administration of the Work contemplated by the Contract to the extent provided herein or by supplemental instruction of City (under which City may delegate responsibilities of the City's Authorized Representative to the Architect/Engineer).

BENEFICIAL OCCUPANCY, means the point in time where the City will occupy a portion of the work for its intended use as defined by Substantial Completion, but prior to the Substantial Completion of the entirety of the Work (as in Phased Project completion).

CHANGE ORDER, means a written order issued by the City's Authorized Representative to the CM/GC requiring a change in the Work within the general scope of the Contract Documents, issued under the changes provisions of Section D.1 in administering the Contract, including City's written change directives as well as changes reflected in a writing executed by the parties to this Contract and, if applicable, establishing a Contract Price or Contract Time adjustment for the changed Work.

CLAIM, means a demand by CM/GC pursuant to Section D.3 for review of the denial of CM/GC's initial request for an adjustment of Contract terms, payment of money, extension of Contract Time or other relief, submitted in accordance with the requirements and within the time limits established for review of Claims in these General Conditions.

CONTRACT, means the written agreement between the City and the CM/GC comprised of the Contract Documents which describe the Work to be done and the obligations between the parties.

CONTRACT DOCUMENTS, means the Solicitation Document and addenda thereto, the City of Sandy CMGC Contract form, CM/GC General Conditions, Supplemental General Conditions, if any, the accepted Offer, Plans, Specifications, amendments and Change Orders.

CONTRACT PERIOD, as set forth in the Contract Documents, means the total period of time beginning with the issuance of the Notice to Proceed and concluding upon Final Completion.

CONTRACT PRICE, means the total of the awarded Offer amount, as increased or decreased by the price of approved alternates and Change Orders.

CONTRACT TIME, means any incremental period of time allowed under the Contract to complete any portion of the Work as reflected in the project schedule.

CM/GC, CM/GC means the Person awarded the Contract for the Work contemplated and is the same Person identified and referred to in the in the CM/GC Contract as the 'CM/GC'. May also be referred to as "Contractor" in the Contract Documents.

DAYS, are calendar days, including weekdays, weekends and holidays, unless otherwise specified.

DIRECT COSTS, means, unless otherwise provided in the Contract Documents, the cost of materials, including sales tax, cost of delivery; cost of labor, including social security, old age and unemployment insurance, and fringe benefits required by agreement or custom; worker's compensation insurance; project specific insurance; bond premiums, rental cost of equipment, and machinery required for execution of the work; and the additional costs of field personnel directly attributable to the Work.

CITY, means the City of Sandy, Oregon.

CITY'S AUTHORIZED REPRESENTATIVE, means those individuals identified in writing by the City to act on behalf of the City for this project. City may elect, by written notice to CM/GC, to delegate certain duties of the City's Authorized Representative to more than one party, including without limitation, to an Architect/Engineer. However, nothing in these General Conditions is intended to abrogate the separate design professional responsibilities of Architects under ORS Chapter 671 or of Engineers under ORS Chapter 672.

FINAL COMPLETION, means the final completion of all requirements under the Contract, including Contract Closeout as described in Section K but excluding Warranty Work as described in Section I.2, and the final payment and release of all retainage, if any, released.

FORCE MAJEURE, means an act, event or occurrence caused by fire, riot, war, acts of God, nature, sovereign, or public enemy, strikes, freight embargoes or any other act, event or occurrence that is beyond the control of the party to this Contract who is asserting Force Majeure.

NOTICE TO PROCEED, means the official written notice from the City stating that the CM/GC is to proceed with the Work defined in the Contract Documents. Notwithstanding the Notice to Proceed, CM/GC shall not be authorized to proceed with the Work until all initial Contract requirements, including the Contract, performance bond and payment bond, and certificates of insurance, have been fully executed and submitted to City in a suitable form.

OFFER, means an offer to complete a specific scope for a set price in connection with an invitation to bid and a proposal in connection with a request for proposals.

OFFEROR, means an entity that submits an Offer in connection with an invitation to bid and a proposer in connection with a request for proposals.

OVERHEAD, means those items which may be included in the CM/GC's markup (general and administrative expense and profit) and that shall not be charged as Direct Cost of the Work, including without limitation such Overhead expenses as wages or salary of personnel above the level of foreman (i.e., superintendents and project managers), and expenses of CM/GC's offices at the job site (e.g. job trailer) including expenses of personnel staffing the job site office.

PERSON, means an entity doing business as a sole proprietorship, a partnership, a joint venture, a corporation, a limited liability company or partnership, or any other entity possessing the legal capacity to contract.

PLANS, means the drawings which show the location, type, dimensions, and details of the Work to be done under the Contract.

PUNCHLIST, means the list of Work yet to be completed or deficiencies which need to be corrected in order to achieve Final Completion of the Contract.

RECORD DOCUMENT, means the as-built Plans, Specifications, testing and inspection records, product data, samples, manufacturer and distributor/supplier warranties evidencing transfer to City, operational and maintenance manuals, shop drawings, Change Orders, correspondence, certificate(s) of occupancy, and other documents listed in Subsection B.9.1 of these General Conditions, recording all Services performed.

SOLICITATION DOCUMENT, means an invitation to bid or request for proposal or request for quotes.

SPECIFICATION, means any description of the physical or functional characteristics of the Work, or of the nature of a supply, service or construction item. Specifications may include a description of any requirement for inspecting, testing or preparing a supply, service or construction item for delivery and the quantities or qualities of materials to be furnished under the Contract. Specifications generally will state the results or products to be obtained and may, on occasion, describe the method and manner of doing the work to be performed. Specifications may be incorporated by reference and/or may be attached to the Contract.

SUBCONTRACTOR, means a Person having a direct contract with the CM/GC, or another Subcontractor, to perform one or more items of the Work.

SUBSTANTIAL COMPLETION, means the date when the City accepts in writing the construction, alteration or repair of the improvement to real property or any designated portion thereof as having reached that state of completion when it may be used or occupied for its intended purpose. Substantial Completion of facilities with operating systems occurs only after thirty (30) continuous Days of successful, trouble-free operation of the operating systems as provided in Section K.4.2. The Work shall not be considered Substantially Complete if items remaining to be completed cannot be completed without disruption to building occupants.

SUBSTITUTIONS, means items that in function, performance, reliability, quality, and general configuration are the same or better than the product(s) specified. Approval of any substitute item shall be solely determined by the City's Authorized Representative. The decision of the City's Authorized Representative is final.

SUPPLEMENTAL GENERAL CONDITIONS, means those conditions that remove from, add to, or modify these General

Conditions. Supplemental General Conditions may be included in the Solicitation Document or may be a separate attachment to the Contract.

WORK, means the furnishing of all materials, equipment, labor, transportation, services and incidentals necessary to successfully complete any individual item or the entire Contract and the carrying out of duties and obligations imposed by the Contract Documents.

A.2 SCOPE OF WORK

The Work contemplated under this Contract includes all labor, materials, transportation, equipment, expense and services for, and incidental to, the completion of all construction work in connection with the project described in the Contract Documents. The CM/GC shall perform all Work necessary so that the project can be legally occupied and fully used for the intended use as set forth in the Contract Documents.

A.3 INTERPRETATION OF CONTRACT DOCUMENTS

A.3.1 Unless otherwise specifically defined in the Contract Documents, words which have well-known technical meanings or construction industry meanings are used in the Contract Documents in accordance with such recognized meanings. Contract Documents are intended to be complementary. Whatever is called for in one, is interpreted to be called for in all. However, in the event of conflicts or discrepancies among the Contract Documents, interpretations will be based on the following descending order of precedence:

- (1) Contract amendments and Change Orders, with those of later date having precedence over those of an earlier date, including the GMP Amendment;
- (2) The Supplemental General Conditions;
- (3) The City of Sandy Construction Manager/General Contractor Contract Form;
- (4) The General Conditions
- (5) The Plans and Specifications
- (6) The Solicitation Document and any addenda thereto;
- (7) The accepted Offer.

A.3.2 In the case of an inconsistency between Plans and Specifications or within either document not clarified by addendum, the better quality or greater quantity of Work shall be provided in accordance with the City or City's Authorized Representative's interpretation in writing.

A.3.3 If the CM/GC finds discrepancies in, or omissions from the Contract Documents, or if the CM/GC is in doubt as to their meaning, the CM/GC shall at once notify the City or City's Authorized Representative. Matters concerning performance under, and interpretation of requirements of, the Contract Documents will be decided by the City's Authorized Representative. Responses to CM/GC's requests for interpretation of Contract Documents will be made in writing by City's Authorized Representative within any time limits agreed upon or otherwise with reasonable promptness. Interpretations and decisions of the City's Authorized Representative will be consistent with the intent of and reasonably inferable from the Contract Documents. CM/GC shall not proceed without direction in writing from the City's Authorized Representative.

A.3.4 References to standard specifications, manuals, codes of any technical society, organization or association, to the laws or regulations of any governmental authority, whether such reference be specific or by implication, shall mean the latest standard specification, manual, code, laws or regulations in effect in the jurisdiction where the project is occurring on the first published date of the Solicitation Document, except as may be otherwise specifically stated.

A.4 EXAMINATION OF PLANS, SPECIFICATIONS, AND SITE

- A.4.1 It is understood that the CM/GC, before submitting an Offer, has made a careful examination of the Contract Documents; has become fully informed as to the quality and quantity of materials and the character of the Work required; and has made a careful examination of the location and conditions of the Work and the sources of supply for materials. The City will in no case be responsible for any loss or for any unanticipated costs that may be suffered by the CM/GC as a result of the CM/GC's failure to acquire full information in advance in regard to all conditions pertaining to the Work. No oral agreement or conversation with any officer, agent, or personnel of the City, or with the Architect/Engineer either before or after the execution of this Contract, shall affect or modify any of the terms or obligations herein contained.
- A.4.2 City shall make available to CM/GC, and CM/GC shall study, the results of such test borings and information that City has concerning subsurface conditions and site geology. CM/GC shall inform City of any other site investigation, analysis, study, or test conducted by or for CM/GC or its agents and shall make the results available to City upon City's request.
- A.4.3 Should the Plans or Specifications fail to particularly describe the materials, kind of goods, or details of construction of any aspect of the Work, CM/GC shall have the duty to make inquiry of the City and Architect/Engineer as to what is required prior to performance of the Work. Absent Specifications to the contrary, the materials or processes that would normally be used to produce first quality finished Work shall be considered a part of the Contract requirements.
- A.4.4 Any design errors or omissions noted by the CM/GC shall be reported promptly to the City's Authorized Representative, including without limitation, any nonconformity with applicable laws, statutes, ordinances, building codes, rules and regulations.
- A.4.5 If the CM/GC believes that additional cost or Contract Time is involved because of clarifications or instructions issued by the City's Authorized Representative in response to the CM/GC's notices or requests for information, the CM/GC must submit a written request to the City's Authorized Representative, setting forth the nature and specific extent of the request, including all time and cost impacts against the Contract as soon as possible, but no later than twenty (20) business days after receipt by CM/GC of the clarifications or instructions issued. If the City's Authorized Representative denies CM/GC's request for additional compensation, additional Contract Time, or other relief that CM/GC believes results from the clarifications or instructions, the CM/GC may proceed to file a Claim under Section D.3, Claims Review Process. If the CM/GC fails to perform the obligations of Sections A.4.1 to A.4.3, the CM/GC shall pay such costs and damages to the City as would have been avoided if the CM/GC had performed such obligations.

A.5 INDEPENDENT CONTRACTOR STATUS

The service or services to be performed under this Contract are those of an independent contractor as defined in ORS 670.600. CM/GC represents and warrants that it is not an officer, employee or agent of the City.

A.6 RETIREMENT SYSTEM STATUS AND TAXES

CM/GC represents and warrants that it is not a contributing member of the Public Employees' Retirement System and will be responsible for any federal or state taxes applicable to payment received under this Contract. CM/GC will not be eligible for any benefits from these Contract payments of federal Social Security, employment insurance, workers' compensation or the Public Employees' Retirement System, except as a self-employed individual. Unless the CM/GC is subject to backup withholding, City will not withhold from such payments any amount(s) to cover CM/GC's federal or state tax obligations.

A.7 GOVERNMENT EMPLOYMENT STATUS

- A.7.1 If this payment is to be charged against federal funds, CM/GC represents and warrants that it is not currently employed by the Federal Government. This does not preclude the CM/GC from holding another contract with the Federal Government.
- A.7.2 CM/GC represents and warrants that CM/GC is not an employee of the City for purposes of performing Work under this Contract.

SECTION B
ADMINISTRATION OF THE CONTRACT

B.1 CITY'S ADMINISTRATION OF THE CONTRACT

- B.1.1 The City's Authorized Representative will provide administration of the Contract as described in the Contract Documents (1) during construction (2) until final payment is due and (3) during the one-year period for correction of Work. The City's Authorized Representative will act on behalf of the City to the extent provided in the Contract Documents, unless modified in writing in accordance with other provisions of the Contract. In performing these tasks, the City's Authorized Representative may rely on the Architect/Engineer or other consultants to perform some or all of these tasks.
- B.1.2 The City's Authorized Representative will visit the site at intervals appropriate to the stage of the CM/GC's operations (1) to become generally familiar with and to keep the City informed about the progress and quality of the portion of the Work completed, (2) to endeavor to guard the City against defects and deficiencies in the Work, and (3) to determine in general if Work is being performed in a manner indicating that the Work, when fully completed, will be in accordance with the Contract Documents. The City's Authorized Representative will not make exhaustive or continuous on-site inspections to check the quality or quantity of the Work. The City's Authorized Representative will neither have control over or charge of, nor be responsible for the construction means, methods, techniques, sequences or procedures, or for the safety precautions and programs in connection with the Work.
- B.1.3 Except as otherwise provided in the Contract Documents or when direct communications have been specifically authorized, the City and CM/GC shall endeavor to communicate with each other through the City's Authorized Representative or designee about matters arising out of or relating to the Contract. Communications by and with the Architect/Engineer's consultants shall be through the Architect/Engineer. Communications by and with Subcontractors and material suppliers shall be through the CM/GC. Communications by and with separate CM/GCs shall be through the City's Authorized Representative.
- B.1.4 Based upon the Architect/Engineer's evaluations of the CM/GC's Application for Payment, or unless otherwise stipulated by the City's Authorized Representative, the Architect/Engineer will review and certify the amounts due the CM/GC and will issue Certificates for Payment in such amounts.

B.2 CM/GC'S MEANS AND METHODS; MITIGATION OF IMPACTS

- B.2.1 The CM/GC shall supervise and direct the Work, using the CM/GC's best skill and attention. The CM/GC shall be solely responsible for and have control over construction means, methods, techniques, sequences and procedures and for coordinating all portions of the Work under the Contract, unless the Contract Documents give other specific instructions concerning these matters. If the Contract Documents give specific instructions concerning construction means, methods, techniques, sequences or procedures, the CM/GC shall evaluate the jobsite safety thereof and, except as stated below, shall be fully and solely responsible for the jobsite safety of such means, methods, techniques, sequences or procedures.
- B.2.2 The CM/GC is responsible to protect and maintain the Work during the course of construction and to mitigate any adverse impacts to the project, including those caused by authorized changes, which may affect cost, schedule, or quality.
- B.2.3 The CM/GC is responsible for the actions of all its personnel, laborers, suppliers, and Subcontractors on the project. The CM/GC shall enforce strict discipline and good order among CM/GC's employees and other persons carrying out the Work. The CM/GC shall not permit employment of persons who are unfit or unskilled for the tasks assigned to them.

B.3 MATERIALS AND WORKMANSHIP

- B.3.1 The intent of the Contract Documents is to provide for the construction and completion in every detail of the Work described. All Work shall be performed in a professional manner and unless the means or methods of performing a task are specified elsewhere in the Contract Documents, CM/GC shall employ methods that are generally accepted and used by the industry, in accordance with industry standards.
- B.3.2 The CM/GC is responsible to perform the Work as required by the Contract Documents. Defective Work shall be corrected at the CM/GC's expense.

- B.3.3 Work done and materials furnished shall be subject to inspection and/or observation and testing by the City's Authorized Representative to determine if they conform to the Contract Documents. Inspection of the Work by the City's Authorized Representative does not relieve the CM/GC of responsibility for the Work in accordance with the Contract Documents. The review by City or Architect of any method of construction, invention, appliance, process, article, device, or material of any kind is limited to a review for adequacy for the Work and is not approval for use by CM/GC in violation of any patent or other rights of any person or entity.
- B.3.4 CM/GC shall furnish adequate facilities, as required, for the City's Authorized Representative to have safe access to the Work including without limitation walkways, railings, ladders, tunnels, and platforms. Producers, suppliers, and fabricators shall also provide proper facilities and access to their facilities.
- B.3.5 The CM/GC shall furnish Samples of materials for testing by the City's Authorized Representative and include the cost of the Samples in the Contract Price.
- B.3.6 CM/GC shall provide materials in sufficient quantities on hand at such times as to insure uninterrupted progress of Work and shall store materials properly and protect materials as required.
- B.3.7 For all materials and equipment specified or indicated in the Drawings, CM/GC shall provide all labor, materials, equipment, and services necessary for complete assemblies and complete working systems, functioning as intended. CM/GC shall furnish incidental items not indicated on Drawings, nor mentioned in the Specifications, that can be legitimately and reasonably inferred to belong to the Work described, or necessary in good practice to provide a complete assembly or system, as though itemized here in every detail. In all instances, CM/GC shall install material and equipment in strict accordance with each manufacturer's most recent published recommendations and specifications. CM/GC shall be responsible for appropriately sequencing the Work and for verification of suitability of prior work before subsequent construction activities.
- B.3.8 CM/GC shall coordinate submittal approvals and place orders for materials and/or equipment so that delivery of same will be made without delays to the Work. CM/GC shall, upon City's reasonable request, provide documentary evidence that orders have been placed.

B.4 PERMITS

CM/GC shall obtain all trade permits necessary to comply with specific trade permit requirements. All other permits shall be supplied by City.

B.5 COMPLIANCE WITH GOVERNMENT LAWS AND REGULATIONS

- B.5.1 CM/GC shall comply with all federal, state and local laws, codes, regulations and ordinances applicable to the Work and the Contract. Failure to comply with such requirements shall constitute a breach of Contract and shall be grounds for Contract termination. Without limiting the generality of the foregoing, CM/GC expressly agrees to comply with the following as applicable:
- (1) Title VI and VII of Civil Rights Act of 1964, as amended;
 - (2) Section 503 and 504 of the Rehabilitation Act of 1973, as amended;
 - (3) the Health Insurance Portability and Accountability Act of 1996;
 - (4) the Americans with Disabilities Act of 1990, as amended;
 - (5) ORS Chapter 659A; as amended
 - (6) all regulations and administrative rules established pursuant to the foregoing laws; and
 - (7) all other applicable requirements of federal and state civil rights and rehabilitation statutes, rules and regulations.

- B.5.2 CM/GC shall comply with all applicable requirements of federal and state civil rights and rehabilitation statutes, rules and regulations; and
- (1) CM/GC shall not discriminate against Disadvantaged, Minority, Women or Emerging Small Business enterprises, as those terms are defined in ORS 200.005, in the awarding of subcontracts (ORS 279A.110).
 - (2) If CM/GC is performing work as a landscape contractor as defined in ORS 671.520(2), CM/GC must have a current, valid landscape contractor's license issued under ORS 671.560.
 - (3) If CM/GC is performing work as a Contractor as defined in ORS 701.005(2), CM/GC must have a current, valid construction contractor's license issued under ORS 701.026.
 - (4) CM/GC shall maintain, in current and valid form, all licenses and certificates required by law, regulation, or this Contract when performing the Work.
 - (5) CM/GC will notify the City immediately if any license, permit, or certification required for performance of this Contract will cease to be in effect for any reason.
- B.5.3 Unless contrary to federal law, CM/GC shall certify that it shall not accept a bid from Subcontractors to perform Work as described in ORS 701.005 under this Contract unless such Subcontractors are registered with the Construction Contractors Board in accordance with ORS 701.035 to 701.055 at the time they submit their bids to the CM/GC.
- B.5.4 Unless contrary to federal law, CM/GC shall certify that each landscape contractor performing Work under this Contract holds a valid landscape contractor's license in accordance with ORS 671.560.
- B.5.5 The following notice is applicable to Contractor or CM/GC who performs excavation Work. ATTENTION: Oregon law requires you to follow rules adopted by the Oregon Utility Notification Center. Those rules are set forth in OAR 952-001-0010 through OAR 952-001-0090. You may obtain copies of the rules by calling the center at (503)232-1987.
- B.5.6 Because the Work will include demolition work, pursuant to ORS 279C.510 the CM/GC shall salvage or recycle construction and demolition debris, if feasible and cost effective.
- B.5.7 Failure to comply with any or all of the requirements of B.5.1 through B.5.6 shall be a breach of Contract and constitute grounds for Contract termination. CM/GC will bear all costs arising from Work performed that it knew, or through exercise of reasonable care should have known, was contrary to any applicable laws, ordinance, rules, or regulations.

B.6 SUPERINTENDENCE /PROJECT MANAGEMENT

- B.6.1 CM/GC shall keep on the site, during the progress of the Work, a competent superintendent and any necessary assistants who shall be satisfactory to the City and who shall represent the CM/GC on the site and who will be empowered to obligate the CM/GC. Directions given to the superintendent by the City's Authorized Representative shall be confirmed in writing to the CM/GC. The Superintendent shall be fluent in both written and verbal English and be able to effectively communicate with the City's Representatives
- B.6.2 The Superintendent, Project Manager and Project Engineer/Assistant Project Manager (if applicable) shall not be removed from the Project by the CM/GC without the prior written authorization of the City. Requests to replace personnel must be made a minimum of thirty (30) calendar days prior to the proposed date of replacement.
- B.6.3 CM/GC shall at all times enforce strict discipline and good order among its subcontractors and employees and shall not employ or work any unfit person, or anyone not skilled in work assigned to that person. City may require the CM/GC to permanently remove any of its officers, agents, employees, or subcontractors from all City properties in cases where City determines in its sole discretion that removal of such is in City's best interests. CM/GC shall not employ any person whom the City may deem incompetent or unfit on the Project except with the prior written consent of the City. City may require removal and replacement of any or all construction superintendents, project managers, foreman, or other staff from the Project upon ten (10) business days written notice to the CM/GC.

B.6.4 CM/GC shall maintain at least one (1) set of reports on the Project prepared by CM/GC's employee(s) present on site, and which includes following information: a brief description of all Work performed on that day; a summary of all pertinent events and/or occurrences on that day including records of all tests and inspections; a list of all subcontractor(s) working on that day; a list of each CM/GC employee working on that day; the total hours worked for each employee; a complete list of all equipment on the Project that day, whether in use or not; the time Work commenced and ended; weather conditions; accidents or injuries; and Work progress made for that day ("Daily Job Reports"). CM/GC shall keep the Daily Job Reports current and in good order and shall make current copies available to City upon request.

B.7 INSPECTION

B.7.1 City's Authorized Representative and project team shall have safe access to the Work at all times.

B.7.2 Inspection of the Work will be made by the City's Authorized Representative and its' designees at its discretion. The City's Authorized Representatives will have authority to reject Work that does not conform to the Contract Documents. Any Work found to be not in conformance with the Contract Documents, in the discretion of the City's Authorized Representative, shall be removed and replaced at the CM/GC's expense.

B.7.3 CM/GC shall make or obtain at the appropriate time all tests, inspections and approvals of portions of the Work required by the Contract Documents or by laws, ordinances, rules, regulations or orders of public authorities having jurisdiction. Unless otherwise provided, the CM/GC shall make arrangements for such tests, inspections and approvals with an independent testing laboratory or entity acceptable to the City, or with the appropriate public authority, and shall bear all related costs of tests, inspections and approvals. Tests or inspections conducted pursuant to the Contract Documents shall be made promptly to avoid unreasonable delay in the Work. The CM/GC shall give the City's Authorized Representative timely notice of when and where tests and inspections are to be made so that the City's Authorized Representative(s) may be present for such procedures. Required certificates of testing, inspection or approval shall, unless otherwise required by the Contract Documents, be secured by the CM/GC and promptly delivered to the City's Authorized Representative(s).

B.7.4 As required by the Contract Documents, Work done or material used without inspection or testing by the City's Authorized Representative(s) may be ordered removed at the CM/GC's expense.

B.7.5 If directed to do so any time before the Work is accepted, the CM/GC shall uncover portions of the completed Work for inspection. After inspection, the CM/GC shall restore such portions of Work to the standard required by the Contract. If the Work uncovered is unacceptable or was done without sufficient notice to the City's Authorized Representative, the uncovering and restoration shall be done at the CM/GC's expense. If the Work uncovered is acceptable and was done with sufficient notice to the City's Authorized Representative(s), the uncovering and restoration will be paid for as a Change Order.

B.7.6 If any testing or inspection reveals failure of the portions of the Work to comply with requirements established by the Contract Documents, all costs made necessary by such failure, including those of repeated procedures and compensation for the City's Authorized Representative's and Architect/Engineer's services and expenses, shall be at the CM/GC's expense.

(1) CM/GC shall be granted one (1) re-inspection for each re-inspection required by the Contract Documents. Additional inspections required beyond the initial and re-inspection shall be the responsibility of the CM/GC. The City's Testing and Inspection firm shall not unreasonably require re-inspections.

B.7.7 When the United States government participates in the cost of the Work, or the City has an agreement with other public or private organizations, or if any portion of the Work is being performed for a third party or in close proximity to third party facilities, representatives of these organizations have the right to inspect the Work affecting their interests or property. Their right to inspect shall not make them a party to the Contract and shall not interfere with the rights of the parties of the Contract. Instructions or orders of such parties shall be transmitted to the CM/GC, through the City's Authorized Representative.

B.8 SEVERABILITY

If any provision of this Contract is declared by a court to be illegal or in conflict with any law, the validity of the remaining terms and provisions shall not be affected and the rights and obligations of the parties shall be construed and enforced as if the Contract did not contain the particular provision held to be invalid.

B.9 ACCESS TO RECORDS

- B.9.1 CM/GC shall keep, at all times on the Work site, one record copy of the complete Contract Documents, including the Plans, Specifications, Change Orders and addenda, in good order and marked currently to record field changes and selections made during construction, and one record copy of Shop Drawings, Product Data, Samples and similar submittals, and shall at all times give the City's Authorized Representative access thereto.
- B.9.2 CM/GC shall retain and the City and its duly authorized representatives shall have access to, for a period not less than six (6) years, all Record Documents, financial and accounting records, and other books, documents, papers and records of CM/GC which are pertinent to the Contract including records pertaining to Overhead and indirect costs, for the purpose of making audit, examination, excerpts and transcripts. If for any reason, any part of the Contract is involved in a dispute resolution process, CM/GC shall retain all such records until all disputes are resolved. The City and/or its agents shall continue to be provided full access to the records during any dispute resolution process.

B.10 WAIVER

Failure of the City to enforce any provision of this Contract shall not constitute a waiver or relinquishment by the City of the right to such performance in the future nor of the right to enforce any other provision of this Contract.

B.11 SUBCONTRACTS AND ASSIGNMENT

- B.11.1 CM/GC shall require each Subcontractor, to the extent of the Work to be performed by the Subcontractor, to be bound by the terms and conditions of these General Conditions, and to assume toward the CM/GC all of the obligations and responsibilities which the CM/GC assumes toward the City thereunder, unless (1) the same are clearly inapplicable to the subcontract at issue because of legal requirements or industry practices, or (2) specific exceptions are requested by CM/GC and approved in writing by City. Where appropriate, CM/GC shall require each Subcontractor to enter into similar agreements with sub-subcontractors at any level. CM/GC shall include assignment provisions in each subcontract as indicated in the termination provisions set forth in these General Conditions.
- B.11.2 At City's request, CM/GC shall submit to City prior to their execution either CM/GC's form of subcontract, or the subcontract to be executed with any particular Subcontractor. If City disapproves such form, CM/GC shall not execute the form until the matters disapproved are resolved to City's satisfaction. City's review, comment upon or approval of any such form shall not relieve CM/GC of its obligations under this Agreement or be deemed a waiver of such obligations of CM/GC.
- B.11.3 CM/GC shall not assign, sell, or transfer its rights, or delegate its responsibilities under this Contract, in whole or in part, without the prior written approval of the City. No such written approval shall relieve CM/GC of any obligations of this Contract, and any transferee shall be considered the agent of the CM/GC and bound to perform in accordance with the Contract Documents. CM/GC shall remain liable as between the original parties to the Contract as if no assignment had occurred.
- B.11.4 CM/GC shall first notify City prior to any change in the name or legal nature or status of CM/GC's entity. City shall determine if CM/GC's intended change is permissible while performing this Contract.

B.12 SUCCESSORS IN INTEREST

The provisions of this Contract shall be binding upon and shall accrue to the benefit of the parties to the Contract and their respective permitted successors and assigns.

B.13 CITY'S RIGHT TO DO WORK

City reserves the right to perform other or additional work at or near the project site with other forces than those of the CM/GC. If such work takes place within or next to the project site, CM/GC will coordinate work with the other contractors or forces, cooperate with all other contractors or forces, carry out the Work in a way that will minimize interference and delay for all forces involved, place and dispose of materials being used so as not to interfere with the operations of another, and join the Work with the work of the others in an acceptable manner and perform it in proper sequence to that of the others. The City's Authorized Representative will resolve any disagreements that may arise between or among CM/GC and the other contractors over the method or order of doing all work (including the Work). In case of unavoidable interference, the City's Authorized Representative will establish work priority (including the Work) which generally will be in the sequence that the contracts were awarded.

B.14 OTHER CONTRACTS

In all cases and at any time, the City has the right to execute other contracts related to or unrelated to the Work of this Contract. The CM/GC of this Contract will fully cooperate with any and all other contractors without additional cost to the City in the manner described in section B.13. Specifically and without limitation,

(1) CM/GC shall coordinate and work in conjunction with the City and City's third party consultants to proactively commission the Project in preparation of City occupancy and acceptance.

(2) CM/GC shall be granted one (1) re-inspection review for each inspection activity required by the Contract. Additional reviews required beyond the initial and re-inspections shall be the responsibility of the CM/GC. City and City's third party consultants shall not unreasonably require re-inspections. The City reserves the right to make the final determination if a re-inspection is required or if CM/GC may proceed by incorporating the inspection findings.

(3) CM/GC shall provide City with a copy of all written communications between CM/GC and City's consultants at the same time as that communication is made to such consultants, including, without limitation, all requests for information, correspondence, submittals, notices, and change order proposals. CM/GC shall confirm oral communications in writing.

(4) CM/GC is liable for costs incurred by City for professional services for interpretations or decisions of matters where the information sought is equally available to the party making the request.

B.15 GOVERNING LAW

This Contract shall be governed by and construed in accordance with the laws of the State of Oregon without regard to principles of conflict of laws.

B.16 LITIGATION

Any Claim between City and CM/GC that arises from or relates to this Contract and that is not resolved through the Claims Review Process in Section D.3 shall be brought and conducted solely and exclusively within the Circuit Court of Clackamas County for the State of Oregon; provided, however, if a Claim must be brought in a federal forum, then it shall be brought and conducted solely and exclusively within the United States City Court for the City of Oregon. Any trial will be to the court without a jury. In no event shall this section be construed as a waiver by the City of defense or immunity, whether sovereign immunity, governmental immunity, or otherwise, from any claim or from the jurisdiction of any court. CM/GC BY EXECUTION OF THIS CONTRACT HEREBY CONSENTS TO THE IN PERSONAM JURISDICTION OF THE COURTS REFERENCED IN THIS SECTION B.16.

B.17 ALLOWANCES

B.17.1 The CM/GC shall include in the Contract Price all allowances stated in the Contract Documents. Items covered by allowances shall be supplied for such amounts and by such persons or entities as the City may direct.

B.17.2 Unless otherwise provided in the Contract Documents:

(1) when finally reconciled, allowances shall cover the cost to the CM/GC of materials and equipment delivered at the site and all required taxes, less applicable trade discounts;

(2) CM/GC's costs for unloading and handling at the site, labor, installation costs, Overhead, profit and other expenses contemplated for stated allowance amounts shall be included in the Contract Price but not in the allowances;

(3) Unless City requests otherwise, CM/GC shall provide to City a proposed fixed price for any allowance work prior to its performance.

B.18 SUBMITTALS, SHOP DRAWINGS, PRODUCT DATA AND SAMPLES

B.18.1 The CM/GC shall prepare and keep current, for the approval of City's Authorized Representative, a schedule and list of submittals which is coordinated with the CM/GC's construction schedule and allows the Architect/Engineer reasonable time, but in no case less than ten (10) business days, to review submittals. City reserves the right to approve the schedule and list of submittals. Submittals include, without limitation, Shop Drawings, Product Data, and Samples which are described below:

(1) Shop Drawings are drawings, diagrams, schedules and other data specially prepared for the Work by the CM/GC or a Subcontractor (including any sub-subcontractor), manufacturer, supplier or distributor to illustrate some portion of the Work.

(2) Product Data are illustrations, standard schedules, performance charts, instructions, brochures, diagrams and other information furnished by the CM/GC to illustrate materials or equipment for some portion of the Work.

(3) Samples are physical examples which illustrate materials, equipment or workmanship and establish standards by which the Work will be judged.

B.18.2 Shop Drawings, Product Data, Samples and similar submittals are not Contract Documents. The purpose of their submittal is to demonstrate for those portions of the Work for which submittals are required by the Contract Documents the way by which the CM/GC proposes to conform to the information given and the design concept expressed in the Contract Documents. Review of submittals by the Architect/Engineer or City is not conducted for the purpose of determining the accuracy and completeness of other details such as dimensions and quantities, or for substantiating instructions for installation or performance of equipment or systems, or for approval of safety precautions or, unless otherwise specifically stated by the Architect/Engineer or City, of any construction means, methods, techniques, sequences or procedures, all of which remain the responsibility of the CM/GC as required by the Contract Documents. The Architect/Engineer's or City's review of the CM/GC's submittals shall not relieve the CM/GC of its obligations under the Contract Documents. The Architect/Engineer's or City's review of a specific item shall not indicate approval of an assembly of which the item is a component. Informational submittals upon which the Architect/Engineer or City is not expected to take responsive action may be so identified in the Contract Documents. Submittals which are not required by the Contract Documents may be returned without action.

B.18.3 The CM/GC shall review for compliance with the Contract Documents, approve and submit to the Architect/Engineer Shop Drawings, Product Data, Samples and similar submittals required by the Contract Documents with reasonable promptness and in such sequence as to cause no delay in the Work or in the activities of the City or of separate CM/GCs. Submittals which are not marked as reviewed for compliance with the Contract Documents and approved by the CM/GC may be returned without action.

(1) CM/GC shall be granted one (1) resubmittal review for each submittal required by the Contract Documents. Additional reviews required beyond the initial submittal and re-submittal shall be the responsibility of the CM/GC. A/E shall not unreasonably require re-submittals. The City reserves the right to make the final determination if a re-submittal is required or if CM/GC may proceed by incorporating A/E's comments.

B.18.4 By approving and submitting Shop Drawings, Product Data, Samples and similar submittals, the CM/GC represents that the CM/GC has determined and verified materials, field measurements and field construction criteria related thereto, or will do so, and has checked and coordinated the information contained within such submittals with the requirements of the Work and of the Contract Documents.

B.18.5 The CM/GC shall perform no portion of the Work for which the Contract Documents require submittal and review of Shop Drawings, Product Data, Samples or similar submittals until the respective submittal has been approved by the Architect/Engineer. CM/GC shall be responsible to provide submittals for A/E and City review in a timely manner to allow sufficient time for review and comment. Delay claims associated with submittals lacking appropriate review time allowances shall not be considered.

B.18.6 The Work shall be in accordance with approved submittals except that the CM/GC shall not be relieved of responsibility for deviations from requirements of the Contract Documents by the Architect/Engineer's or City's review or approval of Shop Drawings, Product Data, Samples or similar submittals unless the CM/GC has specifically informed the Architect/Engineer and City in writing of such deviation at the time of submittal and (i) the Architect/Engineer has given written approval to the specific deviation as a minor change in the Work, or (ii) a Change Order has been executed by City authorizing the deviation. The CM/GC shall not be relieved of responsibility for errors or omissions in Shop Drawings, Product Data, Samples or similar submittals by any review or approval thereof.

B.18.7 In the event that City elects not to have the obligations and duties described under this Section B.18 performed by the Architect/Engineer, or in the event no Architect/Engineer is employed by City on the project, all obligations and duties assigned to the Architect/Engineer hereunder shall be performed by the City's Authorized Representative.

B.19 SUBSTITUTIONS

The CM/GC may make Substitutions only with the consent of the City and at its sole discretion, after evaluation by the City's Authorized Representative and only in accordance with a Change Order. Substitutions shall be subject to the requirements of the bid documents. By making requests for Substitutions, the CM/GC represents that the CM/GC has personally investigated the proposed substitute product; represents that the CM/GC will provide the same warranty for the Substitution that the CM/GC would for the product originally specified unless approved otherwise; certifies that the cost data presented is complete and includes all related costs under this Contract including redesign costs, and waives all claims for additional costs related to the Substitution which subsequently become apparent; and will coordinate the installation of the accepted Substitution, making such changes as may be required for the Work to be completed in all respects.

B.20 USE OF PLANS AND SPECIFICATIONS

Plans, Specifications and related Contract Documents, including those in electronic format, furnished to CM/GC by City or City's Architect/Engineer shall be used solely for the performance of the Work under this Contract. CM/GC and its Subcontractors and suppliers are authorized to use and reproduce applicable portions of such documents appropriate to the execution of the Work, but shall not claim any ownership or other interest in them beyond the scope of this Contract, and no such interest shall attach. Unless otherwise indicated, all common law, statutory and other reserved rights, in addition to copyrights, are retained by City.

B.21 FUNDS AVAILABLE AND AUTHORIZED

City reasonably believes at the time of entering into this Contract that sufficient funds are available and authorized for expenditure to finance the cost of this Contract within the City's appropriation or limitation.

B.22 NO THIRD PARTY BENEFICIARIES

City and CM/GC are the only parties to this Contract and are the only parties entitled to enforce its terms. Nothing in this Contract gives, is intended to give, or shall be construed to give or provide any benefit or right, whether directly, indirectly, or otherwise, to third persons unless such third persons are individually identified by name herein and expressly described as intended beneficiaries of the terms of this Contract.

B.23 RULES REGARDING CONTACT WITH THE PRESS AND PUBLICATIONS

CM/GC shall issue no news release, press release, or other statement to members of the news media or any other publication regarding this Agreement or the Project within one (1) year of Project completion without City's prior written authorization. CM/GC shall not post or publish any textual or visual representations of the Project without approval of City.

**SECTION C
WAGES, LABOR, AND PAYMENT**

C.1 PREVAILING WAGE RATES ON PUBLIC WORKS

C.1.1 This Contract is subject to payment of prevailing wages under ORS 279C.800 to 279C.870. Each worker the CM/GC, subcontractor or other person who is party to the contract uses in performing all or part of the Contract must be paid not less than the applicable prevailing rate of wage for each trade or occupation as defined by the Director of the State of Oregon Bureau of Labor and Industries ("BOLI") in the applicable publication entitled Definitions of Covered Occupations for Public Works Contracts in Oregon. The latest prevailing wage rates for public works contracts in Oregon are contained in the following publications: The Prevailing Wage Rates for Public Works Projects in Oregon, the PWR Apprenticeship Rates, and any amendments to the PWR rates or Apprenticeship rates. Such publications can be reviewed electronically at http://www.boli.state.or.us/BOLI/WHD/PWR/pwr_state.shtml.

C.1.2 This Contract is ____/is not ____ also subject to payment of prevailing wages under the federal Davis-Bacon Act (40 U.S.C. 3141 et seq.). Notwithstanding Section C.1.1 of this Section, if this Contract is also subject to payment of prevailing wages under the Davis-Bacon Act, CM/GC and any subcontractors must pay the higher of the federal prevailing wage rate or the state prevailing wage. The latest federal prevailing wage rates can be reviewed electronically at <http://www.wdol.gov/Index.aspx> (Search for Oregon, Clackamas County, Building Construction Type). Contractors shall follow all prevailing wage rules including posting the Davis Bacon Poster at the worksite and submitting certified payroll records. The poster is available at <http://www.dol.gov/whd/regs/compliance/posters/fedprojc.pdf>. The payroll form is at <http://www.dol.gov/whd/forms/wh347instr.htm>. If the Contract is subject to federal prevailing wages, CM/GC and

any subcontractors must pay the higher of the federal prevailing wage rate (under the Davis-Bacon Act) or the state prevailing wage.

- C.1.3 The applicable prevailing wages under subsections and, if applicable, C.1.2, will be those in effect on the start of the Construction Phase as described in Section 3.b of the CM/GC Contract, and shall be incorporated by reference in the GMP Amendment or, if applicable, the Early Work Amendment.
- C.1.4 During the Construction Phase, CM/GC and all Subcontractors will keep the prevailing wage rates for this Project posted in a conspicuous and accessible place in or about the Project.
- C.1.5 The City will pay a fee to the Commissioner of the Oregon Bureau of Labor and Industries as provided in ORS 279C.825. The fee will be paid to the Commissioner under the administrative rule of the Commissioner.
- C.1.6 CM/GC or any Subcontractor also provides for or contributes to a health and welfare plan or a pension plan, or both, for its employees on the Project, it will post notice describing such plans in a conspicuous and accessible place in or about the Project during the Construction Phase. The notice will contain information on how and where to make claims and where to obtain future information.

C.2 PAYROLL CERTIFICATION; ADDITIONAL RETAINAGE; FEE REQUIREMENTS

- C.2.1 In accordance with ORS 279C.845, the CM/GC and every Subcontractor shall submit written certified statements to the City's Authorized Representative, on the form prescribed by the Commissioner of the Bureau of Labor and Industries, certifying the hourly rate of wage paid each worker which the CM/GC or the Subcontractor has employed on the project and further certifying that no worker employed on the project has been paid less than the prevailing rate of wage or less than the minimum hourly rate of wage specified in the Contract, which certificate and statement shall be verified by the oath of the CM/GC or the Subcontractor that the CM/GC or Subcontractor has read such statement and certificate and knows the contents thereof and that the same is true to the CM/GC or Subcontractor's best knowledge and belief. The certified statements shall set out accurately and completely the payroll records for the prior week including the name and address of each worker, the worker's correct classification, rate of pay, daily and weekly number of hours worked, deductions made and actual wages paid. Certified statements for each week during which the CM/GC or Subcontractor has employed a worker on the project shall be submitted once a month, by the fifth business day of the following month.

The CM/GC and Subcontractors shall preserve the certified statements for a period of six (6) years from the date of completion of the Contract.

- C.2.2 The City shall retain 25 percent of any amount earned by the CM/GC on this public works project until the CM/GC has filed the certified statements required by section C.2.1. The City shall pay to the CM/GC the amount retained under this subsection within 14 days after the CM/GC files the required certified statements, regardless of whether a Subcontractor has failed to file certified statements.
- C.2.3 The CM/GC shall retain 25 percent of any amount earned by a first-tier Subcontractor on this public works project until the first-tier Subcontractor has filed with the City the certified statements required by C.2.1. Before paying any amount retained under this subsection, the CM/GC shall verify that the first-tier Subcontractor has filed the certified statement, Within 14 days after the first-tier Subcontractor files the required certified statement the CM/GC shall pay the first-tier Subcontractor any amount retained under this subsection.

C.3 PROMPT PAYMENT AND CONTRACT CONDITIONS

- C.3.1 Pursuant to ORS 279C.505 and as a condition to CM/GC's performance hereunder, the CM/GC shall:

- (1) Make payment promptly, as due, to all persons supplying to CM/GC labor or materials for the prosecution of the Work provided for in this Contract.
- (2) Pay all contributions or amounts due the State Industrial Accident Fund from such CM/GC or Subcontractor incurred in the performance of the Contract.

(3) Not permit any lien or claim to be filed or prosecuted against the City on account of any labor or material furnished. CM/GC will not assign any claims that CM/GC has against City, or assign any sums due by City, to Subcontractors, suppliers, or manufacturers, and will not make any agreement or act in any way to give Subcontractors a claim or standing to make a claim against the City.

(4) Pay to the Department of Revenue all sums withheld from employees pursuant to ORS 316.167.

(5) Demonstrate that an employee drug testing program is in place as follows:

(A) CM/GC represents and warrants that CM/GC has in place at the time of the execution of this contract, and shall maintain during the term of this Contract, a qualifying employee drug testing program for its employees that includes, at a minimum, the following:

- i. a written employee drug testing policy,
- ii. required drug testing for all new subject employees or, alternatively, required testing of all subject employees every 12 months on a random selection basis, and
- iii. requested testing of a subject employee when the CM/GC has reasonable cause to believe the subject employee is under the influence of drugs.

A drug testing program that meets the above requirements will be deemed a "qualifying employee drug testing program". For the purposes of this section, an employee is a "subject employee" only if that employee will be working on the project job site.

(B) CM/GC shall require each subcontractor providing labor for the Project to:

- i. demonstrate to the CM/GC that it has a qualifying employee drug testing program for the Subcontractor's subject employees, and represent and warrant to the CM/GC that the qualifying employee drug testing program is in place at the time of subcontract execution and will continue in full force and effect for the duration of the subcontract, or
- ii. require that the Subcontract's subject employees participate in the CM/GC's qualifying employee drug testing program for the duration of the Project.

C.3.2 Pursuant to ORS 279C.515, and as a condition to City's performance hereunder, CM/GC agrees:

(1) If City becomes aware that CM/GC has failed, neglected or refused to make prompt payment of any claim for labor or services furnished to the CM/GC or a Subcontractor by any person in connection with the project as such claim becomes due, the proper officer(s) representing the City may pay the claim and charge the amount of the payment against funds due or to become due CM/GC under this Contract within ten (10) business days written notice to CM/GC. Payment of claims in this manner shall not relieve the CM/GC or the CM/GC's surety from obligation with respect to any unpaid claims. Notwithstanding any other remedies available to the City,

(2) If the CM/GC or a first-tier Subcontractor fails, neglects or refuses to make payment to a person furnishing labor or materials in connection with the public contract for a public improvement within thirty (30) Days after receipt of payment from City or a CM/GC, the CM/GC or first-tier Subcontractor shall owe the person the amount due plus interest charges commencing at the end of the 10-Day period that payment is due and ending upon final payment, unless payment is subject to a good faith dispute. The rate of interest charged to the CM/GC or first-tier Subcontractor on the amount due shall equal three times the discount rate on 90-Day commercial paper in effect at the Federal Reserve Bank in the Federal Reserve City that includes Oregon on the date that is thirty (30) Days after the date when payment was received from City or from the CM/GC, but the rate of interest shall not exceed thirty (30) percent. The amount of interest may not be waived.

(3) If the CM/GC or a Subcontractor fails, neglects or refuses to make payment to a person furnishing labor or materials in connection with the Contract, the person may file a complaint with the Construction Contractors Board, unless payment is subject to a good faith dispute. Every contract related to this Contract shall contain a similar clause.

C.3.3 Pursuant to ORS 279C.545, Construction workers employed by the CM/GC or its Subcontractor will be foreclosed from the right to collect for any overtime under this Contract unless a claim for payment is filed with the CM/GC or Subcontractor within 90 days from the completion of the Contract, providing the CM/GC or Subcontractor has:

(1) Caused a circular clearly printed in blackface pica type and containing a copy of this section to be posted in a prominent place alongside the door of the timekeeper's office or in a similar place which is readily available and freely visible to any or all workers employed on the Work, and

(2) Maintained such circular continuously posted from the inception to the completion of the Contract on which workers are or have been employed.

C.3.4 Pursuant to ORS 279C.580, CM/GC shall include in each subcontract for property or services entered into by the CM/GC and a first-tier Subcontractor, including a material supplier, for the purpose of performing a construction contract:

(1) A payment clause that obligates the CM/GC to pay the first-tier Subcontractor for satisfactory performance under its subcontract within ten (10) Days out of such amounts as are paid to the CM/GC by City under the Contract;

(2) An interest penalty clause that obligates the CM/GC if payment is not made within thirty (30) Days after receipt of payment from City, to pay to the first-tier Subcontractor an interest penalty on amounts due in the case of each payment not made in accordance with the payment clause included in the subcontract pursuant to paragraph (a) of this subsection. CM/GC or first-tier Subcontractor shall not be obligated to pay an interest penalty if the only reason that the CM/GC or first-tier Subcontractor did not make payment when payment was due is that the CM/GC or first-tier Subcontractor did not receive payment from City or CM/GC when payment was due. The interest penalty shall be for the period beginning on the day after the required payment date and ending on the date on which payment of the amount due is made; and shall be computed at the rate specified in ORS 279C.515(2).

(3) A clause which requires each of CM/GC's Subcontractor's to include, in each of their contracts with lower-tier Subcontractors or suppliers, provisions to the effect that the first-tier Subcontractor shall pay its lower-tier Subcontractors and suppliers in accordance with the provisions of subsections (a) and (b), above and requiring each of their Subcontractors and suppliers to include such clauses in their subcontracts and supply contracts.

C.3.5 All employers, including CM/GC, that employ subject workers who work under this contract in the State of Oregon shall comply with ORS 656.017 and provide the required Workers' Compensation coverage, unless such employers are exempt under ORS 656.126. CM/GC shall ensure that each of its Subcontractors complies with these requirements.

C.4 PAYMENT FOR MEDICAL CARE

Pursuant to ORS 279C.530, and as a condition to City's performance hereunder, CM/GC shall promptly, as due, make payment to any person, partnership, association or corporation furnishing medical, surgical, and hospital care or other needed care and attention, incident to sickness or injury, to the employees of such CM/GC, all sums of which the CM/GC agrees to pay for such services and all moneys and sums which the CM/GC has collected or deducted from the wages of personnel pursuant to any law, contract or agreement for the purpose of providing or paying for such services.

C.5 HOURS OF LABOR

As a condition to City's performance hereunder, CM/GC shall comply with ORS 279C.520 and 279C.540, as amended from time to time and incorporated herein by this reference:

Except as may otherwise be provided in an applicable collective bargaining agreement with a labor organization, CM/GC shall not employ and shall require that its Subcontractors not employ any person to perform construction work for more than ten hours in any one day, or 40 hours in any one week, except in cases of necessity, emergency, or where the public policy absolutely requires it, and in such cases, except in cases of Contracts for personal services as defined in ORS 279A.055, the laborer shall be paid at least time and a half pay:

(1) For all overtime in excess of eight (8) hours a day or forty (40) hours in any one week when the work week is five consecutive Days, Monday through Friday; and

(2) For all overtime in excess of ten (10) hours a day or forty (40) hours in any one week when the work week is four consecutive Days, Monday through Friday; and

(3) For all Work performed on Saturday and on any legal holiday specified in any applicable collective bargaining agreement or ORS 279C.540(1)(b).

(4) The requirement to pay at least time and a half for all overtime worked in excess of 40 hours in any one week shall not apply to individuals who are excluded under ORS 653.010 to 653.261 or under 29 U.S.C. Section 201 to 209 from

receiving overtime. Contractor shall and shall require its Subcontractors to give notice in writing to their employees who work under this Contract, either at the time of hire or before commencement of Work on the Contract, or by posting a notice in a location frequented by employees, of the number of hours per day and days per week that the employees may be required to work.

This Section C.5 shall not excuse CM/GC from completion of the Work within the time required under this Contract.

SECTION D CHANGES IN THE WORK

D.1 CHANGES IN WORK

D.1.1 The terms of this Contract shall not be waived, altered, modified, supplemented or amended in any manner whatsoever without prior written approval of the City's Authorized Representative, and then only in a manner consistent with the Agreement and, if not prohibited by the Agreement, the Change Order provisions of this Section D.1 and after any necessary approvals required by public contracting laws or the City's contracting rules have been obtained. Otherwise, a formal contract amendment is required, which shall not be effective until its execution by the parties to this Contract and all approvals required by public contracting laws or City's contracting rules have been obtained.

D.1.2 It is mutually agreed that changes in Plans, quantities, or details of construction are inherent in the nature of construction and may be necessary or desirable during the course of construction. Within the general scope of this Contract, the City's Authorized Representative may at any time, without notice to the sureties and without impairing the Contract, require changes consistent with this Section D.1. All Change Order Work shall be executed under the conditions of the Contract Documents. Such changes may include, but are not limited to:

- (1) Modification of specifications and design.
- (2) Increases or decreases in quantities.
- (3) Increases or decreases to the amount of Work.
- (4) Addition or elimination of any Work item.
- (5) Change in the duration of the project.
- (6) Acceleration or delay in performance of Work.
- (7) Deductive changes.

Deductive changes are those that reduce the scope of the Work, and shall be made by mutual agreement whenever feasible. In cases of suspension or partial termination under Section J, City reserves the right to unilaterally impose a deductive change and to self perform such Work, for which the provisions of B.13 (City's Right to Do Work) shall then apply.

Adjustments in compensation shall be made under the provisions of D.1.3, in which costs for deductive changes shall be based upon a Direct Costs adjustment together with the related percentage markup specified for profit, Overhead and other indirect costs, unless otherwise agreed to by City.

D.1.3 The City and CM/GC agree that Change Order Work shall be administered and compensated according to the following:

(1) *Unit pricing* may be utilized at the City's option when unit prices or solicitation alternates were provided that established the cost for additional Work, and a binding obligation exists under the Contract on the parties covering the terms and conditions of the additional Work.

(2) If the City elects not to utilize unit pricing, or in the event that unit pricing is not available or appropriate, *fixed pricing* may be used for Change Order Work. In fixed pricing the basis of payments or total price shall be agreed upon in writing between the parties to the Contract, and shall be established before the Work is done whenever feasible. The mark-ups set forth in D.1.3(c) shall be utilized by the parties as a guide in establishing fixed pricing, and will not be exceeded by City without adequate justification. Cost and price data relating to Change Orders shall be supplied by CM/GC to City upon request, but City shall be under no obligation to make such requests.

(3) In the event that unit pricing and fixed pricing are not utilized, then Change Order Work shall be performed on a *cost*

reimbursement basis for Direct Costs. Such Work shall be compensated on the basis of the actual, reasonable and allowable cost of labor, equipment, and material furnished on the Work performed. In addition, the following markups shall be added to the CM/GC's or Subcontractor's Direct Costs as full compensation for profit, Overhead and other indirect costs for Work directly performed with the CM/GC's or Subcontractor's own forces:

On Labor..... 10% On Equipment..... 5% On Materials..... 5%

When Change Order Work under D.1.3(c) is invoiced by an authorized Subcontractor at any level, each ascending tier Subcontractor or CM/GC will be allowed a supplemental mark-up of five (5) percent on each piece of subcontract Work covered by such Change Order .

Payments made to the CM/GC shall be complete compensation for Overhead, profit, and all costs that were incurred by the CM/GC or by other forces furnished by the CM/GC, including Subcontractors, for Change Order Work. City may establish a maximum cost for Change Order Work under this Section D.1.3(c), which shall not be exceeded for reimbursement without additional written authorization from City. CM/GC shall not be required to complete such Change Order Work without additional authorization.

D.1.4 Any necessary adjustment of Contract Time that may be required as a result of a Change Order must be agreed upon by the parties before the start of the Change Order Work unless City's Authorized Representative authorizes CM/GC in writing to start the Work before agreement on Contract Time adjustment. CM/GC shall submit any request for additional compensation (and additional Contract Time if CM/GC was authorized to start Work before an adjustment of Contract Time was approved) as soon as possible but no later than thirty (30) Days after receipt of the Change Order. If CM/GC's request for additional compensation or adjustment of Contract Time is not made within the thirty (30) day time limit, CM/GC's requests pertaining to that Change Order are barred. The thirty (30) day time limit for making requests shall not be extended for any reason, including without limitation CM/GC's claimed inability to determine the amount of additional compensation or adjustment of Contract Time, unless an extension is granted in writing by City. If the City's Authorized Representative denies CM/GC's request for additional compensation or adjustment of Contract Time, CM/GC may proceed to file a Claim under Section D.3, Claims Review Process. No other reimbursement, compensation, or payment will be made, except as provided in Section D.1.5 for impact claims.

D.1.5 If any Change Order Work under Section D.1.3 causes an increase or decrease in the CM/GC's cost of, or the Contract Time required for the performance of, any other part of the Work under this Contract, the CM/GC must submit a written request to the City's Authorized Representative, setting forth the nature and specific extent of the request, including all time and cost impacts against the Contract as soon as possible, but no later than thirty (30) Days after receipt of the Change Order by CM/GC.

The thirty (30) day time limit applies to claims of Subcontractors, suppliers, or manufacturers that may be affected by the Change Order and that request additional compensation or an extension of Contract Time to perform; CM/GC has responsibility for contacting its Subcontractors, suppliers, or manufacturers within the thirty (30) day time limit, and including their requests with CM/GC's requests. If the request involves Work to be completed by Subcontractors, or materials to be furnished by suppliers or manufacturers, such requests shall be submitted to the CM/GC in writing with full analysis and justification for the compensation and additional Contract Time requested. The CM/GC will analyze and evaluate the merits of the requests submitted by Subcontractors, suppliers, and manufacturers to CM/GC prior to including those requests and CM/GC's analysis and evaluation of those requests with CM/GC's requests for additional compensation or Contract Time that CM/GC submits to the City's Authorized Representative. Failure of Subcontractors, suppliers, manufacturers or others to submit their requests to CM/GC for inclusion with CM/GC's requests submitted to City's Authorized Representative within the time period and by the means described in this section shall constitute a waiver of these Subcontractor claims. The City's Authorized Representative and the City will not consider direct requests or claims from Subcontractors, suppliers, manufacturers or others not a party to this Contract. The consideration of such requests and claims under this section does not give any person, not a party to the Contract the right to bring a claim against the State of Oregon, whether in this claims process, in litigation, or in any dispute resolution process.

If the City's Authorized Representative denies the CM/GC's request for additional compensation or an extension of Contract Time, the CM/GC may proceed to file a Claim under Section D.3, Claims Review Process.

D.1.6 No request or Claim by the CM/GC for additional costs or an extension of Contract Time shall be allowed if made after receipt of final payment application under this Contract. CM/GC agrees to submit its final payment application within sixty (60) business days after Substantial Completion, unless written extension is granted by City. CM/GC shall not

delay final payment application for any reason, including without limitation nonpayment of Subcontractors, suppliers, manufacturers or others not a party to this Contract, or lack of resolution of a dispute with City or any other person of matters arising out of or relating to the Contract. If CM/GC fails to submit its final payment application within sixty (60) business days after Substantial Completion, and CM/GC has not obtained written extension by City, all requests or Claims for additional costs or an extension of Contract Time shall be waived.

D.1.7 It is understood that changes in the Work are inherent in construction of this type. The number of changes, the scope of those changes, and the effect they have on the progress of the original Work cannot be defined at this time. The CM/GC is notified that numerous changes may be required and that there will be no compensation made to the CM/GC directly related to the number of changes. Each change will be evaluated for extension of Contract Time and increase or decrease in compensation based on its own merit.

D.2 DELAYS

D.2.1 Delays in construction include "Avoidable Delays", which are defined in Section D.2.1.1, and "Unavoidable Delays", defined in Section D.2.1.2. Further, "Concurrent Delays" are defined in Section D.2.1.3 and "Offsetting Delays" defined in Section D.2.1.4.

(1) Avoidable Delays include any delays other than Unavoidable Delays, and include delays that otherwise would be considered Unavoidable Delays but that:

- (A) Could have been avoided by the exercise of care, prudence, foresight, and diligence on the part of the CM/GC or its Subcontractors.
- (B) Affect only a portion of the Work and do not necessarily prevent or delay the prosecution of other parts of the Work nor the completion of the whole Work within the Contract Time.
- (C) Do not impact activities on the accepted critical path schedule.
- (D) Are associated with the reasonable interference of other contractors engaged by the City that do not necessarily prevent the completion of the whole Work within the Contract Time.

(2) Unavoidable Delays include delays other than Avoidable Delays that are:

- (A) Caused by any actions of the City, City's Authorized Representative, or any other employee or agent of the City, or by separate contractor engaged by the City.
- (B) Caused by any site conditions which differ materially from what was represented in the Contract Documents or from conditions that would normally be expected to exist and be inherent to the construction activities defined in the Contract Documents. The CM/GC shall notify the City's Authorized Representative immediately of differing site conditions before the area has been disturbed. The City's Authorized Representative will investigate the area and make a determination as to whether or not the conditions differ materially from either the conditions stated in the Contract Documents or those which could reasonably be expected in execution of this particular Contract. If CM/GC and the City's Authorized Representative agree that a differing site condition exists, any additional compensation or additional Contract Time will be determined based on the process set forth in Section D.1.5 for Change Order Work. If the City's Authorized Representative disagrees that a differing site condition exists and denies CM/GC's request for additional compensation or Contract Time, CM/GC may proceed to file a Claim under Section D.3, Claims Review Process.
- (C) Caused by Force Majeure acts, events or occurrences that could not have been avoided by the exercise of care, prudence, foresight, and diligence on the part of the CM/GC or its Subcontractors.
- (D) Caused by adverse weather conditions. Any adverse weather conditions must be substantiated by documentary evidence that weather conditions were abnormal for the specific time period claimed, could not have been anticipated by the CM/GC, and adversely impacted the project in a manner that could not be avoided by rescheduling the Work or by implementing measures to protect against the weather so that the Work could proceed. A rain, windstorm, high water, or other natural phenomenon for the specific locality of the Work, which might reasonably have been anticipated from the previous 10-year historical records of the general locality of the Work, shall not be construed as abnormal. The parties agree that rainfall greater than the following levels cannot be reasonably anticipated:

- i. Daily rainfall equal to, or greater than, 0.50 inch during a month when the monthly rainfall exceeds the normal monthly average by twenty-five percent (25 %) or more.
- ii. daily rainfall equal to, or greater than, 0.75 inch at any time.

The Office of the Environmental Data Service of the National Oceanic and Atmospheric Administration of the U.S. Department of Commerce nearest the Project site shall be considered the official agency of record for weather information.

(3) Concurrent Delays occur when two Avoidable or two Unavoidable Delays occur within a time frame where all or part of their durations overlap. The cumulative effect of the overlapping delays results in a total impact to the Project duration less than or equal to the cumulative sum of the individual delays or greater than or equal to the longer of the two Delays.

(4) Offsetting Delays occur when an Avoidable and an Unavoidable Delays occur within a time frame where all or part of their durations overlap. In some cases, Offsetting Delays occur where overlapping delays are incurred by both the City and the CM/GC, where the period of overlapping time negates any impact to the Project from the delays during that time frame. The impact of the overlap is that the total impact of the delays is lessened to due to the delays happening at, to some extent, the same time and therefore the project is only impacted once. The overall impact of Offsetting Delays is equal or less than the impact of the longer of the two delays.

D.2.2 Except as otherwise provided in ORS 279C.315, CM/GC shall not be entitled to additional compensation or additional Contract Time for Avoidable Delays.

D.2.3 In the event of Unavoidable Delays, based on principles of equitable adjustment, CM/GC may be entitled to the following:

(1) CM/GC may be entitled to additional compensation or additional Contract Time, or both, for Unavoidable Delays described in Section D.2.1.2 (1) and (2).

(2) CM/GC may be entitled to additional Contract Time for Unavoidable Delays described in Section D.2.1.2(3) and (4).

(3) In the event of any requests for additional compensation or additional Contract Time, or both, as applicable, arising under this Section D.2.3 for Unavoidable Delays, other than requests for additional compensation or additional Contract Time for differing site conditions for which a review process is established under Section D.2.1.2 (2), CM/GC shall submit a written notification of the delay to the City's Authorized Representative within two (2) Days of the occurrence of the cause of the delay. This written notification shall state the cause of the potential delay, the project components impacted by the delay, and the anticipated additional Contract Time or the additional compensation, or both, as applicable, resulting from the delay. Within seven (7) Days after the cause of the delay has been mitigated, or in no case more than thirty (30) Days after the initial written notification, the CM/GC shall submit to the City's Authorized Representative, a complete and detailed request for additional compensation or additional Contract Time, or both, as applicable, resulting from the delay. If the City's Authorized Representative denies CM/GC's request for additional compensation or adjustment of Contract Time, the CM/GC may proceed to file a Claim under Section D.3, Claims Review Process.

(4) If CM/GC does not timely submit the notices required under this Section D.2., then unless otherwise prohibited by law, CM/GC's Claim shall be barred.

D.2.4 When submitting a request for compensation under D.2.3, CM/GC and the City shall take into account the cumulative impacts of Concurrent and Offsetting Delays that occurs within the same time frame the request for compensation covers.

D.2.5 All requests for compensation under this section shall require the CM/GC to submit a detailed Time Impact Analysis as outlined in the Specifications.

D.3 CLAIMS REVIEW PROCESS

D.3.1 All CM/GC Claims shall be referred to the City's Authorized Representative for review. CM/GC's Claims, including Claims for additional compensation or additional Contract Time, shall be submitted in writing by CM/GC to the City's Authorized Representative within five (5) business days after a denial of CM/GC's initial request for an adjustment of Contract terms, payment of money, extension of Contract Time or other relief, provided that such initial request has

been submitted in accordance with the requirements and within the time limits established in these General Conditions. Within twenty (20) business days after the initial Claim, CM/GC shall submit to the City's Authorized Representative, a complete and detailed description of the Claim (the "Detailed Notice") that includes all information required by Section D.3.2. Unless the Claim is made in accordance with these time requirements, it shall be waived.

D.3.2 The Detailed Notice of the Claim shall be submitted in writing by CM/GC and shall include a detailed, factual statement of the basis of the Claim, pertinent dates, Contract provisions which support or allow the Claim, reference to or copies of any documents which support the Claim, the dollar value of the Claim, and the Contract Time extension requested for the Claim. If the Claim involves Work to be completed by Subcontractors, the CM/GC will analyze and evaluate the merits of the Subcontractor claim prior to forwarding it and that analysis and evaluation to the City's Authorized Representative. The City's Authorized Representative and the City will not consider direct claims from Subs, suppliers, manufacturers, or others not a party to this Contract. CM/GC agrees that it will make no agreement, covenant, or assignment, nor will it commit any other act that will permit or assist any Subcontractor, supplier, manufacturer, or other to directly or indirectly make a claim against City.

D.3.3 The City's Authorized Representative will review all Claims and take one or more of the following preliminary actions within ten (10) business days of receipt of the Detailed Notice of a Claim: (1) request additional supporting information from the CM/GC; (2) inform the CM/GC and City in writing of the time required for adequate review and response; (3) reject the Claim in whole or in part and identify the reasons for rejection; (4) based on principles of equitable adjustment, recommend approval of all or part of the Claim; or (5) propose an alternate resolution.

D.3.4 The City's Authorized Representative's decision shall be final and binding on the CM/GC unless appealed by written notice to the City within fifteen (15) business days of receipt of the decision. The CM/GC must present written documentation supporting the Claim within fifteen (15) business days of the notice of appeal. After receiving the appeal documentation, the City shall review the materials and render a decision within twenty (20) business days after receiving the appeal documents.

D.3.5 The decision of the City shall be final and binding unless the CM/GC delivers to the City its requests for mediation, which shall be a non-binding process, within ten (10) business days of the date of the City's decision. The mediation process will be considered to have commenced as of the date the CM/GC delivers the request. Both parties acknowledge and agree that participation in mediation is a prerequisite to commencement of litigation of any disputes relating to the Contract. Both parties further agree to exercise their best efforts in good faith to resolve all disputes within forty (40) business days of the commencement of the mediation through the mediation process set forth herein.

In the event that a lawsuit must be filed within this forty (40) day period in order to preserve a cause of action, the parties agree that notwithstanding the filing, they shall proceed diligently with the mediation to its conclusion prior to actively prosecuting the lawsuit, and shall seek from the Court in which the lawsuit is pending such stays or extensions, including the filing of an answer, as may be necessary to facilitate the mediation process. Further, in the event settlements are reached on any issues through mediation, the parties agree to promptly submit the appropriate motions and orders documenting the settlement to the Court for its signature and filing.

D.3.6 The mediator shall be an individual mutually acceptable to both parties, but in the absence of agreement each party shall select a temporary mediator and the temporary mediators shall jointly select the permanent mediator. Each party shall pay its own costs for the time and effort involved in mediation. The cost of the mediator shall be split equally between the two parties. Both parties agree to exercise their best effort in good faith to resolve all disputes in mediation. Participation in mediation is a mandatory requirement of both the City and the CM/GC. The schedule, time and place for mediation will be mutually acceptable, or, failing mutual agreement, shall be as established by the mediator. The parties agree to comply with City's administrative rules governing the confidentiality of mediation, if any, and shall execute all necessary documents to give effect to such confidentiality rules. In any event, the parties shall not subpoena the mediator or otherwise require the mediator to produce records, notes or work product, or to testify in any future proceedings as to information disclosed or representations made in the course of mediation, except to the extent disclosure is required by law.

D.3.7 Unless otherwise directed by City's Authorized Representative, CM/GC shall proceed with the Work while any Claim of CM/GC is pending, including a Claim for additional compensation or additional Contract Time resulting from Change Order Work. Regardless of the review period or the final decision of the City's Authorized Representative, the CM/GC shall continue to diligently pursue the Work as identified in the Contract Documents. In no case is the CM/GC justified or allowed to cease Work without a written stop work order from the City or City's Authorized Representative.

SECTION E
PAYMENTS

E.1 SCHEDULE OF VALUES

The CM/GC shall submit, at least ten (10) business days prior to submission of its first application for progress payment, a schedule of values ("Schedule of Values") for the contracted Work, for the City's review and approval. This schedule will provide a breakdown of values for the contracted Work and will be the basis for progress payments. The breakdown will demonstrate reasonable, identifiable, and measurable components of the Work. Unless objected to by the City's Authorized Representative, this schedule shall be used as the basis for reviewing CM/GC's applications for payment. If objected to by City's Authorized Representative, CM/GC shall revise the schedule of values and resubmit the same for approval of City's Authorized Representative.

E.1.1 The Schedule of Values shall be of sufficient detail and organization to interface with the City's accounting and funding structure.

E.2 APPLICATIONS FOR PAYMENT

E.2.1 City shall make progress payments on the Contract monthly as Work progresses. Prior to the submission of each monthly Application for Payment, CM/GC shall submit and obtain City's approval of a progress schedule update. Payments shall be based upon estimates of Work completed, as indicated in the approved progress schedule update, and the Schedule of Values. All payments shall be approved by the City's Authorized Representative. A progress payment shall not be considered acceptance or approval of any Work or waiver of any defects therein. City shall pay to CM/GC interest on the progress payment, not including retainage, due the CM/GC. The interest shall commence thirty (30) Calendar Days after the receipt of invoice ("application for payment") from the CM/GC or fifteen (15) Calendar Days after the payment is approved by the City's Authorized Representative, whichever is the earlier date. The rate of interest shall be as provided under Oregon law. Notwithstanding the foregoing, in instances when an application for payment is filled out incorrectly, or when there is any defect or impropriety in any submitted application or when there is a good faith dispute, City shall so notify the CM/GC within ten (10) business days stating the reason or reasons the application for payment is defective or improper or the reasons for the dispute. A defective or improper application for payment, if corrected by the CM/GC within five (5) business days of being notified by the City, shall not cause a payment to be made later than specified in this section unless interest is also paid. Accrual of interest will be postponed when payment on the principal is delayed because of disagreement between the City and the CM/GC.

E.2.2 CM/GC shall submit to the City's Authorized Representative, an application for each payment and, if required, receipts or other vouchers showing payments for materials and labor, including payments to Subcontractors. Applications for payment shall include all information required by City or City's Authorized representative and shall be supplemented with all additional information requested before the request for payment will be processed. CM/GC shall include, in its application for payment, a schedule of the percentages of the various parts of the Work completed, based on the Schedule of Values which shall aggregate to the payment application total.

E.2.3 Generally, applications for payment will be accepted only for materials that have been installed. Under special conditions, applications for payment for stored materials will be accepted at City's sole discretion. Such a payment, if made, will be subject to the following conditions:

(1) The request for stored material shall be submitted at least twenty five (25) business days in advance of the application for payment on which it appears. Applications for payment shall be entertained for major equipment, components or expenditures only.

(2) The CM/GC shall submit applications for payment showing the quantity and cost of the material stored.

(3) The material shall be stored in a bonded warehouse and City's Authorized Representative shall be granted the right to access the material for the purpose of removal or inspection at any time during the Contract Period.

(4) The CM/GC shall name the City as co-insured on the insurance policy covering the full value of the property while in the care and custody of the CM/GC until it is installed. A certificate noting this coverage shall be issued to the City.

(5) Payments shall be made for materials only. The submitted amount of the application for payment shall be reduced by the cost of transportation and for the cost of an inspector to check the delivery at out of town storage sites. The cost of said inspection shall be borne solely by the CM/GC.

(6) Within fifty (50) Business Days of the application for payment, the CM/GC shall submit evidence of payment covering the material stored.

(7) Payment for stored materials shall in no way indicate acceptance of the materials or waive any rights under this Contract for the rejection of the Work or materials not in conformance with the Contract Documents.

(8) All required documentation must be submitted with the respective application for payment.

E.2.4 Notwithstanding other parts of this Contract, the City reserves the right to withhold all or part of a payment, or may nullify in whole or part any payment previously made, to such extent as may be necessary in the City's opinion to protect the City from loss including but not limited to:

(1) Work that is defective and not remedied, or that has been demonstrated or identified as failing to conform with the Contract Documents,

(2) third party claims or fines, including governing agency or regulatory entity, filed or evidence reasonably indicating that such claims will likely be filed unless security acceptable to the City is provided by the CM/GC;

(3) failure of the CM/GC to make payments properly to Subcontractors or for labor, materials or equipment (in which case City may issue checks made payable jointly to City and such unpaid persons under this provision, or directly to Subcontractors and suppliers at any level under Section C.3.2.1);

(4) reasonable evidence that the Work cannot be completed for the unpaid balance of the Contract Price;

(5) damage to the City or another contractor;

(6) reasonable evidence that the Work will not be completed within the Contract Time required by the Contract, and that the unpaid balance would not be adequate to cover actual or liquidated damages for the anticipated delay;

(7) failure to carry out the Work in accordance with the Contract Documents;

(8) failure to provide or obtain City's approval of a monthly progress schedule update;

(9) failure to maintain updated Record Documents; or

(10) Failure to provide certified payroll reports as required elsewhere in this Contract.

E.2.5 Subject to the provisions of the Contract Documents, the amount of each progress payment shall be computed as follows:

(1) Take that portion of the Contract Price properly allocable to completed Work as determined by multiplying the percentage completion of each portion of the Work by the share of the total Contract Price allocated to that portion of the Work in the Schedule of Values, less retainage as provided in Section E.5. Pending final determination of cost to the City of changes in the Work, amounts not in the dispute may be included even though the Contract Price has not yet been adjusted by Change Order;

(2) Add that portion of the Contract Price properly allocable to materials and equipment delivered and suitably stored at the site for subsequent incorporation in the completed construction (or, if approved in advance by the City pursuant to Section E.2.3, suitably stored off the site at a location agreed upon in writing), less retainage as provided in Section E.5;

(3) Subtract the aggregate of previous payments made by the City; and

(4) Subtract any amounts for which the City's Authorized Representative has withheld or nullified payment as provided in the Contract Documents.

E.2.6 CM/GC's applications for payment may not include requests for payment for portions of the Work for which the CM/GC does not intend to pay to a Subcontractor or material supplier.

E.2.7 The CM/GC warrants to City that title to all Work covered by an application for payment will pass to the City no later than the time of payment. The CM/GC further warrants that upon submittal of an application for payment all Work for which payments are received from the City shall be free and clear of liens, claims, security interests or encumbrances in favor of the CM/GC, Subcontractors, material suppliers, or other persons or entities making a claim by reason of having provided labor, materials and equipment relating to the Work.

E.2.8 If CM/GC disputes any determination by City's Authorized Representative with regard to any application for payment, CM/GC nevertheless shall continue to prosecute expeditiously the Work. No payment made hereunder shall be or be construed to be final acceptance or approval of that portion of the Work to which such partial payment relates or shall relieve CM/GC of any of its obligations hereunder.

E.3 PAYROLL CERTIFICATION REQUIREMENT

Payroll certification is required before payments are made on the Contract. Refer to Section C.2 for this information.

E.4 RESERVED

E.5 RETAINAGE

E.5.1 Retainage shall be withheld and released in accordance with ORS 279C.550 to 279C.580:

(1) City may reserve as retainage from any progress payment an amount not to exceed five percent (5%) of the payment. As Work progresses, City may reduce the amount of the retainage and may eliminate retainage on any remaining monthly Contract payments after 50 percent of the Work under the Contract is completed if, in the City's sole opinion, such Work is progressing satisfactorily. Elimination or reduction of retainage shall be allowed only upon written application by the CM/GC, which application shall include written approval of CM/GC's surety; except that when the Work is 97-1/2 percent completed the City may, at its discretion and without application by the CM/GC, reduce the retained amount to 100 percent of the value of the Work remaining to be done. Upon receipt of written application by the CM/GC, City shall respond in writing within a reasonable time.

(2) In accordance with ORS 279C.560 and any applicable administrative rules, CM/GC may request in writing:

(A) to be paid amounts which would otherwise have been retained from progress payments where CM/GC has deposited acceptable bonds and securities of equal value with City or in a custodial account or other mutually-agreed account satisfactory to City, with an approved bank or trust company to be held in lieu of the cash retainage for the benefit of City;

(B) that retainage be deposited in an interest bearing account, established through the State Treasurer for state agencies, in a bank, savings bank, trust company or savings association for the benefit of City, with earnings from such account accruing to the CM/GC; or

(C) that the City allow CM/GC to deposit a surety bond for the benefit of City, in a form acceptable to City, in lieu of all or a portion of funds retained, or to be retained. Such bond and any proceeds therefrom shall be made subject to all claims and liens in the manner and priority as set forth for retainage under

(D) Where the City has accepted the CM/GC's election of option (A) or (B), City may recover from CM/GC any additional costs incurred through such election by reducing CM/GC's final payment. Where the City has agreed to CM/GC's request for option (C), CM/GC shall accept like bonds from Subcontractors and suppliers on the project from which CM/GC has required retainages.

(3) The retainage held by City shall be included in and paid to the CM/GC as part of the final payment of the Contract Price. The City shall pay to CM/GC interest at the rate of one and one-half percent per month on the final payment due CM/GC, interest to commence thirty (30) Calendar Days after the Work under the Contract has been completed, accepted and invoiced in accordance with the terms of this Agreement. CM/GC shall notify City in writing when the CM/GC considers the Work complete and City shall, within fifteen (15) Calendar Days after receiving the written notice, either accept the Work or notify the CM/GC of Work yet to be performed on the Contract. If City does not within the time allowed notify the CM/GC of Work yet to be performed to fulfill contractual obligations, the interest provided by this subsection shall commence to run thirty (30) Calendar Days after the end of the 15-Day period.

(4) In accordance with the provisions of reference ORS 279C.560, City shall reduce the amount of the retainage if the CM/GC notifies the controller of the City that the CM/GC has deposited in an escrow account with a bank or trust company, in a manner authorized by the City's Authorized Representative, bonds and securities of equal value of a kind approved by the City's Authorized Representative.

E.5.2 As provided in subsections C.2.2 and C.2.3, retainage in the amount of 25% of amounts earned shall be withheld and released in accordance with ORS 279C.845(7) when the CM/GC fails to file certified statements as required by section C.2.1 shall be in addition to any retainage withheld as a part of this Section E.5.

E.6 FINAL PAYMENT

E.6.1 Upon completion of all the Work under this Contract, the CM/GC shall notify the City's Authorized Representative, in writing, that CM/GC has completed CM/GC's part of the Contract and shall request final payment. Upon receipt of such notice the City's Authorized Representative will inspect the Work, and if acceptable, submit to the City a recommendation as to acceptance of the completed Work and as to the final estimate of the amount due the CM/GC. If the Work is not acceptable, City will notify CM/GC within fifteen (15) Days of CM/GC's request for final payment. Upon approval of this final estimate by the City and compliance by the CM/GC with provisions in Section K. 3 AFFIDAVIT/RELEASE OF LIENS AND CLAIMS, and other provisions as may be applicable, the City shall pay to the CM/GC all monies due under the provisions of these Contract Documents.

E.6.2 Neither final payment nor any remaining retained percentage shall become due until the CM/GC submits to the City's Authorized Representative, (1) a notarized affidavit/release of liens and claims in a form satisfactory to City that states that payrolls, bills for materials and equipment, and other indebtedness connected with the Work for which the City or the City's property might be responsible or encumbered (less amounts withheld by City) have been paid or otherwise satisfied,(2) a certificate evidencing that insurance required by the Contract Documents to remain in force after final payment is currently in effect and will not be canceled or allowed to expire until at least thirty (30) Days' prior written notice has been given to the City, (3) a written statement that the CM/GC knows of no substantial reason that the insurance will not be renewable to cover the period required by the Contract Documents, (4) consent of surety, if any, to final payment and (5), if required by the City, other data establishing payment or satisfaction of obligations, such as receipts, releases and waivers of liens, claims, security interests or encumbrances arising out of the Contract, to the extent and in such form as may be designated by the City. If a Subcontractor refuses to furnish a release or waiver required by the City, the CM/GC may furnish a bond satisfactory to the City to indemnify the City against such lien. If such lien remains unsatisfied after payments are made, the CM/GC shall refund to the City all money that the City may be compelled to pay in discharging such lien, including all costs and reasonable attorneys' fees.

E.6.3 Acceptance of final payment by the CM/GC, a Subcontractor or material supplier shall constitute a waiver of claims by that payee except those previously made in writing and identified by that payee as unsettled at the time of final application for payment.

SECTION F
JOB SITE CONDITIONS

F.1 USE OF PREMISES

CM/GC shall confine equipment, storage of materials and operation of Work to the limits indicated by Contract Documents, law, ordinances, permits or directions of the City's Authorized Representative. CM/GC shall follow any and all instructions or requirements regarding the use of premises given by the City's Authorized Representative. CM/GC shall not use or disturb City's property, materials or documents except for the purpose of responding to City's request for proposal or invitation to bid or pursuant to completion of the Work under this Contract. CM/GC shall treat all documents as confidential and shall not disclose such documents without approval from City. Any unauthorized disclosure of documents or removal of City property will be deemed a substantial breach of this Contract. CM/GC shall bear sole responsibility for any liability including, but not limited to, attorneys' fees, resulting from any action or suit brought against City as a result of CM/GC's willful or negligent release of information, documents, or property contained in or on City property. City hereby deems all information, documents, and property contained in or on City property privileged and confidential.

F.2 PROTECTION OF WORKERS, PROPERTY, AND THE PUBLIC

- F.2.1 CM/GC shall maintain continuous and adequate protection of all of the Work from damage, and shall protect the City's Authorized Representative, City's workers, school staff, administrators, students, general public and property from injury or loss arising in connection with this Contract. CM/GC shall remedy acceptably to the City, any damage, injury, or loss, except such as may be directly due to errors in the Contract Documents or caused by authorized representatives or personnel of the City. CM/GC shall adequately protect adjacent property as provided by law and the Contract Documents. If any person suffers physical injury or property damage arising from the Work, regardless of the cause, the party shall immediately give notice of such injury or damage, whether or not insured, to City and CM/GC with sufficient detail to enable City and any other party affected to investigate the matter.
- F.2.2 CM/GC shall take all necessary precautions for the safety of all personnel on the job site, and shall comply with the Contract Documents and all applicable provisions of federal, state and municipal safety laws and building codes to prevent accidents or injury to persons on, about or adjacent to the premises where the Work is being performed. CM/GC shall erect and properly maintain at all times, as required by the conditions and progress of the Work, all necessary safeguards for protection of workers and the public against any hazards created by construction. CM/GC shall designate a responsible employee or associate on the Work site, whose duty shall be the prevention of accidents. The name and position of the person designated shall be reported to the City's Authorized Representative. The City's Authorized Representative has no responsibility for Work site safety. Work site safety is solely the responsibility of the CM/GC.
- F.2.3 CM/GC shall not enter upon private property without first obtaining permission from the property owner or its duly authorized representative. CM/GC shall be responsible for the preservation of all public and private property along and adjacent to the Work contemplated under the Contract and shall use every precaution necessary to prevent damage thereto. In the event the CM/GC damages any property, the CM/GC shall at once notify the property owner and make, or arrange to make, full restitution. CM/GC shall report, immediately in writing, to the City's Authorized Representative, all pertinent facts relating to such property damage and the ultimate disposition of the claim for damage.
- F.2.4 CM/GC is responsible for protection of adjacent work areas including impacts brought about by activities, equipment, labor, utilities, and materials on the site.
- F.2.5 CM/GC shall at all times direct its activities in such a manner as to minimize adverse effects on the environment. Handling of all materials will be conducted so no release will occur that may pollute or become hazardous.
- F.2.6 In an emergency affecting the safety of life or of the Work or of adjoining property, the CM/GC, without special instruction or authorization from the City's Authorized Representative, shall act reasonably to prevent threatened loss or injury, and shall so act, without appeal, if instructed by the City's Authorized Representative. Any compensation claimed by the CM/GC on account of emergency work shall be determined in accordance with Section D.

- F.2.7 CM/GC shall protect and preserve established benchmarks and monuments and shall not change locations of benchmark and monuments without City's or agency having jurisdiction's prior written approval. CM/GC shall replace any benchmark or monument that is lost or destroyed subsequent to proper notification of the City and with the City's approval at CM/GC's sole cost.
- F.2.8 Prior to the commencement of the Work, CM/GC shall review the Project site with the City in detail and identify the area of the Work, staging areas, connections or interfacing with existing structures and operations, and restrictions on the Work site area. CM/GC shall ensure that all work forces on the Project Site are instructed about the acceptable working and staging areas and restrictions on use of the site. CM/GC, with advance consent of the City, shall erect such barriers and devices as are necessary to restrict access within the Work site to authorized areas and to prevent unauthorized access to non-Work areas.
- F.2.9 Utility Locates: CM/GC will be responsible to locate existing utilities and underground facilities that are indicated in the Contract Documents or that are known or reasonably should be known to exist in the proximity to the Work. CM/GC shall provide timely notice and locate requests with any affected utility or through contact with appropriate notification centers before commencing excavation or demolition Work that CM/GC knows, or reasonably should know, is in proximity to such utilities or facilities. CM/GC assumes the sole risk and will be responsible for all delay and expense arising out of CM/GC's failure to do so.
- F.2.10 This Contract and all individual contracts and purchase orders incorporate by this reference City's safety policies current as of the date of commencement of Work, which have been or will be made available to CM/GC. CM/GC shall schedule and attend a preconstruction meeting with City to review compliance with City's CM/GC Safety and Hazard Notification Policy and City's Risk Management and Environmental Safety and Pollution Policy. CM/GC, as a condition to commencement of the Work, shall instruct all personnel of CM/GC and its subcontractors, prior to their performing any of the Work, of the elements of these policies with which the personnel will be required to comply.
- F.2.11 In addition to the policies identified above, CM/GC shall review with all subcontractors the methods, materials, tools, and equipment to be used to verify their compliance with all safety standards and laws and CM/GC shall comply with them, to ensure safe, hazard-free conditions for all persons visiting or working on the entire Project Site and City's adjoining facilities. CM/GC shall implement and maintain a safety program that is specifically adapted for the Project and complies with all applicable requirements of Oregon OSHA. CM/GC shall furnish a copy of the safety program to City before commencing Work.
- F.2.12 CM/GC shall maintain good housekeeping practices to reduce the risk of fire damage and shall make a fire extinguisher, fire blanket, and/or fire watch, as applicable, available at each location where cutting, braising, soldering, and/or welding is being performed or where there is an increased risk of fire.
- F.2.13 CM/GC shall ensure that all existing or operating systems, utilities, existing on-site services and access avenues are on and in operating condition before leaving the Project Site each day. If any system, utility, or access avenue is not operable, CM/GC shall notify City before CM/GC leaves the Project Site that day.

F.3 CUTTING AND PATCHING

- F.3.1 CM/GC shall be responsible for coordinating all cutting, fitting, or patching of the Work to make its several parts come together properly and fit to receive or be received by work of other CM/GCs or Subcontractors shown upon, or reasonably implied by, the Contract Documents.
- F.3.2 CM/GC shall be responsible for restoring all cut, fitted, or patched surfaces to an original condition; provided, however, that if a different condition is specified in the Contract Documents, then CM/GC shall be responsible for restoring such surfaces to the condition specified in the Contract Documents.
- F.3.3 CM/GC shall not endanger any Work performed by it or anyone else by cutting, excavating, or otherwise altering Work and shall not cut or alter Work of any other contractor except with consent of City.

F.4 CLEANING UP

The CM/GC shall be responsible to maintain a clean and orderly jobsite at all times in order to promote a safe and efficient work environment. Should the jobsite fall into a state of disorder, the City may order the CM/GC to, at its own expense, clean up and remove all refuse and unused materials of any kind resulting from the Work and bring the jobsite to a state of cleanliness and order deemed satisfactory by the City's Representative. If CM/GC fails to do so

within twenty-four (24) hours after written notification by the City, the work may be done by others and the cost charged to the CM/GC and deducted from payment due the CM/GC. Any directive by the City's Representative shall not relieve the CM/GC in any way or manner for the safety of the jobsite for construction workers or the public.

F.5 ENVIRONMENTAL CONTAMINATION

F.5.1 CM/GC will be held responsible for and shall indemnify, defend (with counsel of City's choice) and hold harmless City from and against any costs, expenses, damages, claims, and causes of action, (including attorney fees), or any of them, resulting from all spills, releases, discharges, leaks and disposal of environmental pollution, including storage, transportation, and handling during the performance of the Contract which occur as a result of, or are contributed by, the negligence or actions of CM/GC or its personnel, agents, or Subcontractors or any failure to perform in accordance with the Contract Documents (except to the extent otherwise void under ORS 30.140). Nothing in this section F.5.1 shall limit CM/GC's responsibility for obtaining insurance coverages required under Section G.3 of these General Conditions, and CM/GC shall take no action that would void or impair such coverages

(1) CM/GC agrees to promptly contain, minimize and dispose of such spills, releases, discharge or leaks to the satisfaction of City and proper regulatory agencies in a manner that complies with applicable federal, state, and local laws and regulations. Cleanup shall be at no cost to the City and be performed by properly qualified personnel.

(2) CM/GC shall obtain the City's written consent prior to bringing onto the Work site any (i) environmental pollutants or (ii) hazardous substances or materials, as defined in Section F.6.1. Notwithstanding such written consent from the City, the CM/GC, at all times, shall:

(A) properly handle, label, use and dispose of all environmental pollutants and hazardous substances or materials brought onto the Work site, in accordance with all applicable federal, state, or local statutes, rules, or ordinances;

(B) be responsible for any and all spills, releases, discharges, or leaks of (or from) environmental pollutants or hazardous substances or materials which CM/GC has brought onto the Work site; and

(C) promptly clean up, without cost to the City, such spills, releases, discharges, or leaks to the City's satisfaction and in compliance with all applicable federal, state, or local statutes, rules or ordinances.

(3) With respect to Hazardous Materials to be used during the course of the Work, the CM/GC will implement and enforce a program to inventory and properly store and secure all Hazardous Materials that may be used or present on the Project site, maintain available for inspection at the Project site all material safety data sheets, and comply with all regulations required by law for the storage, use, and disposal of Hazardous Materials. The program must provide for notification of all personnel of potential chemical hazards. Review of these hazards must be included in the CM/GC's safety training program.

F.5.2 CM/GC shall report all reportable quantity releases to applicable federal, state, and local regulatory and emergency response agencies. Reportable quantities are found in 40 CFR Part 302, Table 302.4 for hazardous substances and in OAR Chapter 340 Division 108 for all products addressed therein. Upon discovery, regardless of quantity, CM/GC must telephonically report all releases to the City. A written follow-up report shall be submitted to City within twenty four (24) hours of the telephonic report. Such written report shall contain, as a minimum:

(1) Description of items released (identity, quantity, manifest no., and all other documentation required by law.)

(2) Whether amount of items released is EPA/DEQ reportable, and, if so, when it was reported.

(3) Exact time and location of release, including a description of the area involved.

(4) Containment procedures initiated.

(5) Summary of communications about the release CM/GC has had with members of the press or State officials other than City.

(6) Description of cleanup procedures employed or to be employed at the site, including disposal location of spill residue.

(7) Personnel injuries, if any, resulting from, or aggravated by, the release.

F.6 ENVIRONMENTAL CLEAN-UP

F.6.1 Unless disposition of environmental pollution is specifically a part of this Contract, or was caused by the CM/GC (reference F.5 Environmental Contamination), CM/GC shall immediately notify City of any hazardous substance(s) which CM/GC discovers or encounters during performance of the Work required by this Contract. "Hazardous substance(s)" means any hazardous, toxic and radioactive materials and those substances defined as "hazardous substances," "hazardous materials," "hazardous wastes," "toxic substances," or other similar designations in any federal, state, or local law, regulation, or ordinance, including without limitation asbestos, polychlorinated biphenyl (PCB), or petroleum, and any substances, materials or wastes regulated in 40 CFR, Part 261 and defined as hazardous in 40 CFR S

In addition to notifying City of any hazardous substance(s) discovered or encountered, CM/GC shall immediately cease working in any particular area of the project where a hazardous substance(s) has been discovered or encountered if continued work in such area would present a risk or danger to the health or well-being of CM/GC's or any Subcontractor's work force.

F.6.2 Upon being notified by CM/GC of the presence of hazardous substance(s) on the project site, City shall arrange for the proper disposition of such hazardous substance(s).

F.6.3 Asbestos Abatement. The Work under this Contract may include removal and abatement of asbestos (and proper transportation and disposal). All such Work shall be performed in compliance with the plans and specifications if it is determined that hazardous materials need to be abated. This Work (if required) shall be performed by an asbestos abatement contractor licensed under ORS 468A.720 employing Oregon Certified Asbestos Workers and a Certified Asbestos Supervisor shall be on site at all times asbestos abatement Work is being performed. All federal, state and local laws, statutes, regulations, administrative rules, ordinances, standards, directives and other legal requirements, and all rules and regulations pertaining to the safe removal of asbestos, including but not limited to those of the Oregon Department of Environmental Quality (DEQ), the federal Environmental Protection Agency (EPA), and OSHA, and other authorities having jurisdiction, shall be complied with at all times. CM/GC shall provide City with air sampling records (including clearance sampling documentation) before the commencement of any construction or abatement activities as well as at completion of the asbestos abatement Work. CM/GC shall include these asbestos provisions and requirements in any subcontract(s) related to the asbestos abatement Work.

F.6.4 Lead and Other Hazardous Material Abatement. The Work under this Contract may also include removal and abatement (and proper transportation and disposal) of all other hazardous materials or substances (not covered by Section F.6.3) from the Project site as necessary for full legal compliance, including but not limited to lead. Proper identification, assessment, notifications, handling, testing, certifications, removal, transportation and disposal are the responsibility of CM/GC. All applicable federal, state and local laws, statutes, regulations, administrative rules, ordinances, standards, directives and other legal requirements shall be complied with at all times, including but not limited to those of DEQ, EPA and OSHA. All such Work shall be performed in compliance with the applicable plans and specifications being prepared by the Architect.

F.8 FORCE MAJEURE

A party to this Contract shall not be held responsible for delay or default due to Force Majeure acts, events or occurrences unless they could have been avoided by the exercise of reasonable care, prudence, foresight, and diligence by that party. The City may terminate this Contract upon written notice after determining that delay or default caused by Force Majeure acts, events or occurrences will reasonably prevent successful performance of the Contract.

SECTION G INDEMNITY, BONDING, AND INSURANCE

G.1 RESPONSIBILITY FOR DAMAGES / INDEMNITY

G.1.1 CM/GC shall be responsible for all damage to property, injury to persons, and loss, expense, inconvenience, and delay that may be caused by, or result from, the carrying out of the Work to be done under this Contract, or from any act, omission or neglect of the CM/GC, its Subcontractors, personnel, or agents.

G.1.2 To the fullest extent permitted by law, CM/GC shall indemnify, defend (with counsel approved by City) and hold harmless the City, City's Authorized Representative(s), City's third party consultants and contractors working on the Project Site, Architect/Engineer, Architect/Engineer's consultants, and their respective officers, directors, agents, employees, partners, members, stockholders and affiliated companies (collectively "Indemnitees") from and against all liabilities, damages, losses, claims, expenses (including reasonable attorney fees), demands and actions of any nature whatsoever which arise out of, result from or are related to,

(1) any damage, injury, loss, expense, inconvenience or delay described in this Section G.1.2 to the extent that the CM/GC could or should have reasonably prevented it,

(2) any accident or occurrence which happens or is alleged to have happened in or about the project site or any place where the Work is being performed, or in the vicinity of either, at any time prior to the time the Work is fully completed in all respects to the extent that the Contract could or should have reasonably prevented it,

(3) any failure of the CM/GC to observe or perform any duty or obligation under the Contract Documents which is to be observed or performed by the CM/GC, or any breach of any agreement, representation or warranty of the CM/GC contained in the Contract Documents or in any subcontract,

(4) the negligent acts or omissions of the CM/GC, a Subcontractor or anyone directly or indirectly employed by them or any one of them or anyone for whose acts they may be liable, regardless of whether or not such claim, damage, loss or expense is caused in part by a party indemnified hereunder (except to the extent otherwise void under ORS 30.140), and

(5) any lien filed upon the project or bond claim in connection with the Work. Such obligation shall not be construed to negate, abridge, or reduce other rights or obligations of indemnity which would otherwise exist as to a party or person described in this Section G.1.2.

G.1.3 In claims against any person or entity indemnified under this Section G.1.2 by an employee of the CM/GC, a Subcontractor, anyone directly or indirectly employed by them or anyone for whose acts they may be liable, the indemnification obligation under Section G.1.2 shall not be limited by a limitation on amount or type of damages, compensation or benefits payable by or for the CM/GC or a Subcontractor under workers' compensation acts, disability benefit acts or other employee benefit acts.

G.2 PERFORMANCE AND PAYMENT SECURITY; PUBLIC WORKS BOND

G.2.1 Prior to commencement of construction phase services and in any event not later than execution of the GMP Amendment, the CM/GC shall provide to the City a full Performance Bond and a full Payment Bond in the amount of the GMP Amendment.

If an Early Work Amendment is executed the CM/GC shall provide Performance and Payment Bonds in the amount of the Early Work Amendment. The CM/GC shall provide to the City additional or replacement bonds at the time of execution of any subsequent Early Work Amendment or GMP Amendment, in each case prior to execution of the Amendment and the supplying of labor or materials for the prosecution of the Work covered by the Amendment and in each case a sufficient amount so that the total bonded sum equals or exceeds the total Early Work Price or the GMP, as the case may be. In the event of a scope change, which increases the GMP, the CM/GC shall provide to the City an additional or supplemental bond in the amount of such increase prior to performance of the additional Work.

The CM/GC shall maintain the Performance and Payment Bonds in full force from Sureties licensed to do business in Oregon. The Parties understand and agree that the obligation of the CM/GC's Surety for the faithful performance of the Contract pursuant to the requirements of Oregon Revised Statutes 279C.375.

G.2.2 Bond forms furnished by the City and notarized by awarded CM/GC's surety company authorized to do business in Oregon are the only acceptable forms of performance and payment security, unless otherwise specified in the Contract Documents.

G.2.3 Pursuant to ORS 279C.605, any person claiming a right of action under ORS 279C.600 must file a notice of claim as provided in ORS 279C.605.

G.2.4 The CM/GC will:

(1) file a public works bond with the Construction Contractors Board pursuant to ORS 279C.836 before starting work on the Project, unless exempt under ORS 279C.836(2) (7) or (8).

(2) Include in every subcontract a provision requiring the Subcontractor to file a public works bond with the Construction Contractors Board pursuant to ORS 279C.836 before starting work on the Project, unless exempt under ORS 279C.836(2), (7) or (8).

G.3 INSURANCE

G.3.2. General Insurance Requirement. The Contractor shall purchase from and maintain in a company or companies lawfully authorized to do business in the State of Oregon such insurance as will protect the Contractor from claims set forth below which may arise out of or result from the Contractor's operations and completed operations under the Contract and for which the Contractor may be legally liable, whether such operations be by the Contractor or by a Subcontractor, or by anyone directly or indirectly employed by any of them, or by anyone for whose acts any of them may be liable:

- (1) Claims under workers' compensation, disability benefit, and other similar employee benefit acts that are applicable to the Work to be performed;
- (2) Claims for damages because of bodily injury, occupational sickness or disease, or death of the Contractor's employees;
- (3) Claims for damages because of bodily injury, sickness or disease, or death of any person other than the Contractor's employees;
- (4) Claims for damages insured by usual personal injury liability coverage and commercial general liability coverage (or its equivalent as approved in advance by the City);
- (5) Claims for damages, other than to the Work itself, because of injury to or destruction of tangible property, including loss of use resulting therefrom;
- (6) Claims for damages because of bodily injury, death of a person, or property damage arising out of ownership, maintenance, or use of a motor vehicle;
- (7) Claims for bodily injury or property damage arising out of completed operations;
- (8) Claims involving contractual liability insurance applicable to the Contractor's obligations under Section 107.06 of the General Conditions;
- (9) Claims for third-party injury and property damage (including without limitation clean-up costs) as a result of pollution conditions arising from the Contractor's operations or completed operations; and
- (10) Claims involving the Contractor's professional liability, solely to the extent that the Contractor accepts design or design/build responsibilities under the Contract

G.3.3 Required Coverage. Without waiver of any other requirement of the Contract Documents, the Contractor will provide, pay for, and maintain in full force and effect at all times during the performance of the Work until final acceptance of the Work or for such further duration as required, the following policies of insurance issued by a responsible carrier. All of the Contractor's insurance carriers shall be rated A VII or better by A.M. Best's rating service, unless otherwise approved by the City.

- (1) Workers' Compensation. Workers' compensation coverage sufficient to meet statutory liability limits.
- (2) Employer's Liability. The Contractor shall purchase and maintain employer's liability insurance in addition to its workers' compensation coverage with at least the minimum limits in C below.
- (3) Commercial General Liability. The Contractor shall purchase and maintain commercial general liability ("CGL") insurance on an occurrence basis, written on ISO Form CG 0001 (12/04 or later) or an equivalent form approved in advance by the Owner. CGL coverage shall include all major coverage categories including bodily injury, property damage, and products/completed operations coverage maintained for at least ~~six~~ **Ten** years following final payment. The CGL insurance will also include the following: (1) separation of insured; (2) incidental medical malpractice; and (3) per-project aggregate for premises operations.
- (4) Professional Liability/Errors and Omissions. To the extent that the Contractor accepts design or design/build responsibilities, the Contractor shall purchase and maintain professional liability/errors and omissions insurance or cause those Subcontractors providing design services do so.

(5) Automobile Liability. The Contractor shall purchase and maintain automobile liability insurance with coverage for owned, hired, and non-owned vehicles on ISO form CA 00 01 or an equivalent form approved in advance by the City. The automobile liability insurance shall include pollution liability coverage resulting from vehicle overturn and collision.

(6) Pollution Liability. The Contractor shall purchase a contractors' pollution liability policy. Coverage shall include third-party claims for bodily injury, property damage, and environmental damage resulting from pollution conditions caused during the performance of covered operations for both on-site and migrating from the job site. Such coverage shall include pollution conditions arising from covered operations including work performed by its Subcontractors and third-party claims against the Contractor alleging improper supervision of its Subcontractors.

(7) Commercial Umbrella/Excess Coverage. The Contractor shall purchase or maintain a commercial umbrella or excess liability policy to meet the minimum limits as described below in Section C. Commercial umbrella/excess liability coverage will include: (1) "Pay on behalf of" wording; (2) concurrency of effective dates with primary coverage; (3) punitive damages coverage (where not prohibited by law); (4) application of aggregate (where applicable) in primary coverage; (5) "care, custody, and control" coverage that follows the form for primary coverage; and (6) drop-down feature. Excess/umbrella coverage will be scheduled to the CGL, employee's liability, and automobile liability policies.

G.3.4 Limits. The insurance required by this exhibit shall be written for at least the limits of liability specified in this Section or required by law, whichever is greatest.

(1) Workers' Compensation. Statutory Limits

(2) Employer's Liability.

Each Accident:	\$ 1,000,000
Each Bodily Injury Disease:	\$ 1,000,000
Aggregate Bodily Injury Disease:	\$ 1,000,000

(3) Commercial General Liability.

Each Occurrence:	\$ 1,000,000
General Aggregate:	\$ 2,000,000
Product/Completed Operations:	\$ 2,000,000
Personal & Advertising Injury:\$	\$ 1,000,000
Fire Damage Limit:	\$ 100,000
Medical Expense Limit:	\$ 5,000

(4) Automobile Liability.

Combined Single Limit:	\$ 1,000,000
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(5) Pollution Liability.

Single Limit:	\$1,000,000
Aggregate:	\$1,000,000

(6) Commercial Umbrella/Excess Coverage.

Each Occurrence:	\$10,000,000
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G.3.5 Additional Insureds. The Contractor's third-party liability insurance policies shall include the City and its officers, employees, agents, volunteers, partners, successors, and assigns as additional insureds. The policy endorsement must extend premise operations and products/completed operations to the additional insureds. The additional insured

endorsement for the CGL insurance must be written on ISO Form CG 2010 (11/85), a CG 2037 (07/04) together with CG 2033 (07/04), or the equivalent; but shall not use the following forms: CG 2010 (10 93) or CG 2010 (03 94).

G.3.6 Joint Venture. If the Contractor is a joint venture, the joint venture shall be a named insured for the liability insurance policies.

G.3.7 Primary Coverage. The Contractor's insurance shall be primary insurance coverage and may not seek contribution from any insurance or self-insurance carried by the City or the Architect including any property damage coverage carried by the Owner. Contractor's insurance shall apply separately to each insured against whom a claim is made or suit is brought. The Contractor's insurance shall not include any cross-suit exclusion or preclude an additional insured party from asserting a claim as a third party.

G.3.8 Contractor's Failure to Maintain Insurance. If the Contractor for any reason fails to maintain required insurance coverage, such failure shall be deemed a material breach of the Contract and the City, at its sole discretion, may suspend or terminate the Contract pursuant to Section J of the General Conditions. The City may, but has no obligation to, purchase such required insurance, and without further notice to the Contractor, the City may deduct from the Contract Sum any premium costs advanced by the City for such insurance. Failure to maintain the insurance coverage required by this exhibit shall not waive the Contractor's obligations to the City.

G.3.9 Certificates of Insurance. The Contractor shall supply to the City Certificates of Insurance for the insurance policies described in this exhibit prior to the commencement of the Work and before bringing any equipment or construction personnel onto the Project site.

(1) Additional Certificates. To the extent that the Contractor's insurance coverages are required to remain in force after final payment and are reasonably available, an additional certificate evidencing continuation of such coverage shall be submitted with the final Application for Payment. Information concerning reduction of coverage on account of revised limits or claims paid under the general aggregate, or both, shall be furnished by the Contractor with reasonable promptness in accordance with the Contractor's information and belief.

(2) Prohibition Until Certificates Received. The City shall have the right, but not the obligation, to prohibit the Contractor and its Subcontractors from entering the Project site until the required certificates (or other competent evidence that insurance has been obtained in complete compliance with this exhibit) are received and approved by the City.

(3) Deductibles/Self-Insured Retentions. Payment of deductibles or self-insured retention is a Cost of the Work within the Guaranteed Maximum Price and does not justify a Change Order. Satisfaction of all self-insured retentions or deductibles will be the sole responsibility of the Contractor.

G.3.10 Subcontractor Insurance. The Contractor shall cause each Subcontractor to purchase and maintain in full force and effect policies of insurance as specified in this exhibit, except for coverage limits, which will be agreed upon between the City and the Contractor. The Contractor will be responsible for the Subcontractors' coverage if the Subcontractors fail to purchase and maintain the required insurance. When requested by the City, the Contractor will furnish copies of certificates of insurance establishing coverage for each Subcontractor.

G.3.11 Limitations on Coverage.

(1) No insurance provided by the Contractor under this exhibit will be required to indemnify the City, the Architect, or their employees or agents to the extent of liability for death or bodily injury to persons or damage to property caused in whole or in part by their own negligence, but will require indemnity to the extent of the fault of the Contractor or its agents, representatives, or Subcontractors.

(2) The obligations of the Contractor under this exhibit shall not extend to the liability of the Architect or its consultants for (1) the preparation or approval of maps, Drawings, opinions, reports, surveys, Change Orders, designs, or specifications, or (2) the giving or failure to give directions or instructions, to the extent that the directions, or failure to provide directions, are the cause of the injury or damage.

(3) By requiring insurance, the City does not represent that coverage and limits will necessarily be adequate to protect the Contractor. Insurance in effect or procured by the Contractor will not reduce or limit the Contractor's contractual obligations to indemnify and defend the City for claims or suits that result from or are connected with the performance of the Contract.

G.3.12. Property Insurance

(1) Builder's Risk.

Contractor shall obtain, at Contractor's expense, and keep in effect until final acceptance by the City, "all risk" Builder's Risk Insurance (including earthquake and flood) covering the real and personal property of others in the care, custody, and control of the Contractor. Coverage shall include theft and damage to building interiors, exterior, in transit and offsite storage. The minimum amount of coverage to be carried shall be equal to the full amount of the contract. Contractor shall be financially responsible for any deductible applied to loss. This insurance shall include City, the Contractor and its subcontractors as their interest may appear. (2) **Contractor's Responsibility.** Contractor must provide insurance for its own machinery, tools, equipment, or supplies that are not to become a part of the Project.

SECTION H SCHEDULE OF WORK

H.1 CONTRACT PERIOD

- H.1.1 Time is of the essence on this Contract. The CM/GC shall at all times carry on the Work diligently, without delay and punctually fulfill all requirements herein. CM/GC shall commence Work on the site within ten (10) business days of Notice to Proceed, unless directed otherwise.
- H.1.2 Unless specifically extended by Change Order, all Work shall be complete by the date contained in the Contract Documents. The City shall have the right to accelerate the completion date of the Work, which may require the use of overtime to the extent such overtime is not required to achieve Substantial Completion. Such accelerated Work schedule shall be an acceleration in performance of Work under Section D.1.2 (f) and shall be subject to the Change Order process of Section D.1. In the event that overtime or other acceleration is required to achieve the Substantial Completion Date in the Contract Documents, the CM/GC shall be responsible for the additional cost.
- H.1.3 The City shall not waive any rights under the Contract by permitting the CM/GC to continue or complete the Work or any part of it after the date described in Section H.1.2 above.

H.2 SCHEDULE

CM/GC shall provide by ten (10) business days before the pre-construction conference, a detailed master construction schedule for review and acceptance by the City. The submitted schedule must illustrate Work by significant project components, significant labor trades, long lead items, broken down by building and/or floor where applicable. Each schedule item shall account for no greater than 5 % of the monetary value of the project or 5 % of the available Contract Time. Schedules with activities of less than one day or valued at less than 1% of the Contract will be considered too detailed and will not be accepted. Schedules lacking adequate detail, or unreasonably detailed, will be rejected. Included within the schedule are the following: Notice to Proceed, any interim or phased work completions, Substantial Completion, and Final Completion. Schedules will be updated monthly and submitted with the monthly payment application. Acceptance of the Schedule by the City does not constitute agreement by the City, as to the CM/GC's sequencing, means, methods, or allocated Contract Time. Any positive difference between the CM/GC's scheduled completion and the Contract completion date is float owned by the City. City reserves the right to negotiate the float if it is deemed to be in City's best interest to do so. In no case shall the CM/GC make a request for additional compensation for delays if the Work is completed within the Contract Time but after CM/GC's scheduled completion.

H.3 PARTIAL OCCUPANCY OR USE

The City may occupy or use any completed or partially completed portion of the Work at any stage, provided such occupancy or use is consented to by public authorities having jurisdiction over the Work. Such partial occupancy or use may commence whether or not the portion is substantially complete, provided the City and CM/GC have reasonably accepted in writing the responsibilities assigned to each of them for payments, retainage, if any, security, insurance or self-insurance, maintenance, heat, utilities, and damage to the Work, and have agreed in writing concerning the period for correction of the Work and commencement of warranties required by the Contract Documents with respect to such portion of the Work. Approval by the CM/GC to partial occupancy or use shall not be unreasonably withheld. Immediately prior to such partial occupancy or use, the City and CM/GC shall jointly inspect the area to be occupied or portion of the Work to be used in order to determine and record the condition of the Work. Partial occupancy or use of a portion or portions of the Work shall not constitute acceptance of Work not complying with the requirements of the Contract Documents.

H.4 BENEFICIAL OCCUPANCY OR USE

The City may take possession of areas of the Project as a part of a scheduled, phased occupancy. Where such Beneficial Occupancy occurs, the CM/GC shall facilitate such occupancy, shall agree to work around occupied areas and shall conduct the balance of the construction of the Work in such a fashion to avoid impeding or otherwise obstructing the access to or activities conducted within the occupied space.

SECTION I CORRECTION OF WORK

I.1 CORRECTION OF WORK BEFORE FINAL PAYMENT

The CM/GC warrants to the City that materials and equipment furnished under the Contract will be of good quality and new unless otherwise required or permitted by the Contract Documents, that the Work will be free from defects, and that the Work will conform to the requirements of the Contract Documents. Work failing to conform to these requirements shall be deemed defective. CM/GC shall promptly remove from the premises and replace all defective materials and equipment as determined by the City's Authorized Representative, whether incorporated in the Work or not. Removal and replacement shall be without loss or expense to the City, and CM/GC shall bear the cost of repairing all Work destroyed or damaged by such removal or replacement. CM/GC shall be allowed a period of no longer than sixty (60) Calendar Days for completion of defective (punch list) work, unless otherwise agreed. At the end of that period, or earlier if requested by the CM/GC, City shall arrange for inspection of the Work by the Architect/Engineer. Should the Work not be complete, and all corrections made, the costs for all subsequent re-inspections shall be borne by the CM/GC. If CM/GC fails to complete the punch list work within the above time period, without affecting CM/GC's obligations City may perform such work and CM/GC shall reimburse City all costs of the same within twenty five (25) days after demand.

I.2 WARRANTY WORK

(1) Neither the final certificate of payment nor any provision of the Contract Documents shall relieve the CM/GC from responsibility for defective Work and, unless a longer period is specified, CM/GC shall correct all defects that appear in the Work within a period of one year from the date of issuance of the written notice of Substantial Completion by the City except for latent defects which will be remedied by the CM/GC at any time they become apparent.

The City shall give CM/GC notice of defects with reasonable promptness. CM/GC shall perform such warranty work within a reasonable time after City's demand. If CM/GC fails to complete the warranty work within such period as City determines reasonable, or at any time in the event of warranty work consisting of emergency repairs, without affecting CM/GC's obligations, City may perform such work and CM/GC shall reimburse City all costs of the same within thirty (30) Days after demand.

(2) This provision does not negate guarantees or warranties for periods longer than one year including without limitation such guarantees or warranties required by other sections of the Contract Documents for specific installations, materials, processes, equipment or fixtures.

(3) In addition to CM/GC's warranty, manufacturer's warranties shall pass to the City and shall not take effect until affected Work has been accepted in writing by the City's Authorized Representative.

(4) The one-year period for correction of Work shall be extended with respect to portions of Work performed after Substantial Completion by the period of time between Substantial Completion and the actual performance of the Work, and shall be extended by corrective Work performed by the CM/GC pursuant to this Section, as to the Work corrected. The CM/GC shall remove from the site portions of the Work which are not in accordance with the requirements of the Contract Documents and are neither corrected by the CM/GC nor accepted by the City.

(5) Nothing contained in this Section I.2 shall be construed to establish a period of limitation with respect to any obligations that the CM/GC has under the Contract Documents. Establishment of the period for correction of Work as described in this Section I.2 relates only to the specific contractual obligation of the CM/GC to correct the Work, and has no relationship to the time within which the obligation to comply with the Contract Documents may be sought to be enforced, nor to the time within which proceedings may be commenced to establish the CM/GC's liability with respect to such obligations.

(6) If the City prefers to accept Work which is not in accordance with the requirements of the Contract Documents, the

City may do so instead of requiring its removal and correction, in which case the Contract Price will be reduced as appropriate and equitable. Such adjustment shall be effected whether or not final payment has been made.

SECTION J
SUSPENSION AND/OR TERMINATION OF THE WORK

J.1 CITY'S RIGHT TO SUSPEND THE WORK

- J.1.1 The City and/or the City's Authorized Representative has the authority to suspend portions or all of the Work
- J.1.2 The City shall notify CM/GC and the CM/GC's Surety in writing of the effective date and time of the suspension and shall notify CM/GC and its surety in writing to resume Work.

J.2 CM/GC'S RESPONSIBILITIES

- J.2.1 During the period of the suspension, CM/GC is responsible to continue maintenance at the project just as if the Work were in progress. This includes, but is not limited to, protection of completed Work, maintenance of access, protection of stored materials, temporary facilities, and clean-up.
- J.2.2 When the Work is recommenced after the suspension, the CM/GC shall replace or renew any Work damaged during the suspension, remove any materials or facilities used as part of temporary maintenance, and complete the project in every respect as though its prosecution had been continuous and without suspension.

J.3 COMPENSATION FOR SUSPENSION

- J.3.1 Depending on the reason for suspension of the Work, the CM/GC or the City may be due compensation by the other party. If the suspension was required due to acts or omissions of CM/GC, the City may assess the CM/GC actual costs of the suspension in terms of administration, remedial work by the City's forces or another CM/GC to correct the problem associated with the suspension, rent of temporary facilities, and other actual costs related to the suspension. If the suspension was caused by acts or omissions of the City, the CM/GC shall be due compensation which shall be defined using Section D, Changes in Work. If the suspension was required through no fault of the CM/GC or the City, neither party owes the other for the impact.

J.4 CITY'S RIGHT TO TERMINATE CONTRACT

- J.4.1 The City may, without prejudice to any other right or remedy, and after giving CM/GC five business days' written notice and an opportunity to cure, terminate the Contract in whole or in part under the following conditions:
- (1) If CM/GC should voluntarily or involuntarily, seek protection under the United States Bankruptcy Code and CM/GC as debtor in-possession or the Trustee for the estate fails to assume the Contract within a reasonable time;
 - (2) If CM/GC should make a general assignment for the benefit of CM/GC's creditors;
 - (3) If a receiver should be appointed on account of CM/GC's insolvency;
 - (4) If CM/GC should repeatedly refuse or fail to supply an adequate number of skilled workers or proper materials to carry on the Work as required by the Contract Documents, or otherwise fail to perform the Work in a timely manner;
 - (5) If CM/GC should repeatedly fail to make prompt payment to Subcontractors or for material or labor, or should disregard laws, ordinances or the instructions of the City or its Authorized Representative; or
 - (6) If CM/GC is otherwise in material breach of any part of the Contract.
- J.4.2 At any time that any of the above occurs, City may exercise all rights and remedies available to City at law or in equity, and in addition, City may take possession of the premises and of all materials and appliances and finish the Work by whatever method it may deem expedient. In such case, the CM/GC shall not be entitled to receive further payment until the Work is completed. If the City's cost of finishing the Work exceeds the unpaid balance of the Contract Price, CM/GC shall pay the difference to the City.

J.5 TERMINATION FOR CONVENIENCE

- J.5.1 City may terminate the Contract in whole or in part whenever City determines that termination of the Contract is in the best interest of the public.

J.5.2 The City will provide the CM/GC with five (5) business days' prior written notice of a termination for public convenience. After such notice, the CM/GC shall provide the City with immediate and peaceful possession of the premises and materials located on and off the premises for which the CM/GC received progress payment under Section E. Compensation for Work terminated by the City under this provision will be according to Section E. In no circumstance shall CM/GC be entitled to lost profits for Work not performed due to termination.

J.6 ACTION UPON TERMINATION

J.6.1 Upon receiving a notice of termination, and except as directed otherwise by the City, CM/GC shall immediately cease placing further subcontracts or orders for materials, services, or facilities. In addition, unless assigned as provided in Section J.6.4, below, CM/GC shall terminate all subcontracts or orders to the extent they relate to the Work terminated and, with the prior written approval of the City, settle all outstanding liabilities and termination settlement proposals arising from the termination of subcontracts and orders.

J.6.2 As directed by the City, CM/GC shall upon termination transfer title and deliver to the City all Record Documents, information, and other property that, if the Contract had been completed, would have been required to be furnished to the City.

J.6.3. Upon receiving a notice of termination Contractor shall, prior to vacating the site, provide to City a detailed written assessment of any potentially unsafe conditions on site that may be a threat to health or human safety.

J.6.4 CM/GC shall assign to City each subcontract agreement for a portion of the Work provided that: (i.) Assignment is effective only after termination of this Contract by City for cause or stoppage of the Work by City, and only for those subcontract agreements which City accepts by notifying the subcontractor and CM/GC in writing; and (ii). Assignment is subject to the prior rights of the surety, if any, obligated under bond relating to this Contract. Upon such assignment, if the Work has been suspended for more than thirty (30) days, City shall equitably adjust subcontractor's compensation for increases in cost resulting from the suspension.

SECTION K CONTRACT CLOSE OUT

K.1 RECORD DOCUMENTS

As a condition of final payment (refer also to section E.6), CM/GC shall comply with the following: CM/GC shall provide to City's Authorized Representative, Record Documents of the entire project. Record Documents shall depict the project as constructed and shall reflect each and every change, modification, and deletion made during the construction. Record Documents are part of the Work and shall be provided prior to the City's issuance of final payment. Record Documents include all modifications to the Contract Documents unless otherwise directed.

K.2 OPERATION AND MAINTENANCE MANUALS

As part of the Work, CM/GC shall submit completed operation and maintenance manuals ("O & M Manuals") and asbuilts in electronic format (.PDF) and for review by the City's Authorized Representative prior to submission of any pay request for more than 75% of the Work. No payments beyond 75% will be made by the City until the O & M Manual have been received. The O & M Manual shall contain a complete set of all submittals, all product data as required by the specifications, training information, phone list of consultants, manufacturers, installer and suppliers, manufacturer's printed data, record and shop drawings, schematic diagrams of systems, appropriate equipment indices, warranties and bonds. The City's Authorized Representative shall review and return an electronic copy of the O & M Manual for any modifications or additions required. Prior to submission of its final pay request, CM/GC shall deliver three complete and approved bound paper copies of O & M Manuals and one electronic copy delivered either in CD or Flash Drive format to the City's Authorized Representative.

K.3 AFFIDAVIT/RELEASE OF LIENS AND CLAIMS

As a condition of final payment, the CM/GC shall submit to the City's Authorized Representative a notarized affidavit/release of liens and claims form, in a form satisfactory to City, which states that all Subcontractors and suppliers have been paid in full, all disputes with property Citys have been resolved, all obligations on the project have been satisfied, all monetary claims and indebtedness have been paid, and that, to the best of the CM/GC's knowledge, there are no claims of any kind outstanding against the project. The CM/GC shall indemnify, defend (with counsel of City's choice) and hold harmless the City from all claims for labor and materials finished under this Contract. The

CM/GC shall furnish complete and valid releases or waivers, satisfactory to the City, of all liens arising out of or filed in connection with the Work. CM/GC shall collect all affidavit and lien release documents to deliver to the City in a single consolidated package.

K.4 COMPLETION NOTICES

K.4.1 CM/GC shall provide City notice of both Substantial and Final Completion. The certificate of Substantial Completion shall state the date of Substantial Completion, the responsibilities of the City and CM/GC for security, maintenance, heat, utilities, damage to the Work and insurance, and the time within which the CM/GC shall finish all items on the punch list accompanying the Certificate. Both completion notices must be signed by the CM/GC and the City to be valid. The City shall provide the final signature on the notices. The notices shall take effect on the date they are signed by the City.

K.4.2 Substantial Completion of a facility with operating systems (e.g., mechanical, electrical, HVAC) shall be that degree of completion that has provided a minimum of thirty (30) continuous Days of successful, trouble-free operation with normal operational staffing experience and levels, which period shall begin after all performance and acceptance testing has been successfully demonstrated to the City's Authorized Representative. All equipment contained in the Work, plus all other components necessary to enable the City to operate the facility in the manner that was intended, shall be complete on the Substantial Completion date. The CM/GC may request that a punch list be prepared by the City's Authorized Representative with submission of the request for the Substantial Completion notice.

K.5 TRAINING

As part of the Work, and prior to submission of the request for final payment, the CM/GC shall schedule with the City's Authorized Representative, training sessions for all equipment and systems, as required in the individual specifications sections. CM/GC shall schedule training sessions at least ten (10) business days in advance of the date of training to allow City personnel adequate notice. The O & M Manual shall be used as a basis for training. Training shall be a formal session, held after the equipment and/or system is completely installed and operational in its normal operating environment.

K.6 EXTRA MATERIALS

As part of the Work, CM/GC shall provide spare parts, extra maintenance materials, and other materials or products in the quantities specified in the specifications, prior to final payment. Delivery point for extra materials shall be designated by the City's Authorized Representative.

K.7 ENVIRONMENTAL CLEAN-UP

As part of the Final Completion notice, or as a separate written notice submitted with or before the notice of Final Completion, the CM/GC shall notify the City that all environmental pollution clean-up which was performed as a part of this Contract has been disposed of in accordance with all applicable rules, regulations, laws, and statutes of all agencies having jurisdiction over such environmental pollution. The notice shall reaffirm the indemnification given under Section F.5.1 above.

K.8 CERTIFICATE OF OCCUPANCY

The CM/GC shall not be granted Final Completion or receive final payment if the City has not received an unconditioned certificate of occupancy from the appropriate state and/or local building officials, unless failure to obtain an unconditional certificate of occupancy is due to the fault or neglect of City.

K.9 OTHER CM/GC RESPONSIBILITIES

The CM/GC shall be responsible for returning to the City all items issued during construction such as keys, security passes, site admittance badges, and all other pertinent items. The CM/GC shall be responsible for notifying the appropriate utility companies to transfer utility charges from the CM/GC to the City. The utility transfer date shall not be before Substantial Completion and may not be until Final Completion, if the City does not take beneficial use of the facility and the CM/GC's forces continue with the Work.

K.10 SURVIVAL

All warranty and indemnification provisions of this Contract, and all of CM/GC's other obligations under this Contract

that are not fully performed by the time of Final Completion or termination, shall survive Final Completion or any termination of the Contract

SECTION L
LEGAL RELATIONS & RESPONSIBILITIES

L.1 LAWS TO BE OBSERVED

In compliance with ORS 279C.525, CM/GC shall comply with any and all enacted ordinances or regulations relating to environmental pollution and the preservation of natural resources that may affect the performance of the Contract. State law requires that solicitation documents for a public improvement contract make specific reference to federal, state, and local agencies that have enacted ordinances, rules, or regulations dealing with the prevention of environmental pollution or the preservation of natural resources that may affect the performance of this Contract. These agencies include, but are not limited to:

- L.1.1 Federal Agencies: Department of Agriculture, Forest Service, Soil and Water Conservation Service, Coast Guard, Department of Defense, Army Corps of Engineers, Department of Emergency, Federal Energy Regulatory Commission, Environmental Protection Agency, Department of Health and Human Services, Department of Housing and Urban Development, Solar Energy and Energy Conservation Bank, Department of Interior, Bureau of Land Management, Bureau of Indian Affairs, Bureau of Mines, Bureau of Reclamation, Geological Survey, Minerals Management Service, U.S. Fish and Wildlife Service, Department of Labor, Mine Safety and Health Administration, Occupation Safety and Health Administration, Department of Transportation, Federal Highway Administration, Water Resources Council.
- L.1.2 State Agencies: Department of Administrative Services, Department of Agriculture, Soil and Water Conservation Commission, Columbia River Gorge Commission, Department of Energy, Department of Environmental Quality, Department of Fish and Wildlife, Department of Forestry, Department of Geology and Mineral Industries, Department of Human Resources, Department of Consumer and Business Services, Land Conservation and Development Commission, Department of Parks and Recreation, Division of State Lands, Department of Water Resources.
- L.1.3 Local Agencies: City councils, county courts, county boards of commissioners, metropolitan service City councils, design commissions, historic preservation commissions, planning commissions, development review commissions, special City boards of directors, and other special Cities and special governmental agencies such as Tri-Met, urban renewal agencies, and Port Cities.
- L.1.4 Tribal Governments.

**Attachment C
Sample Contract**

CONSTRUCTION MANAGER/GENERAL CONTRACTOR ("CM/GC") CONTRACT

between

THE CITY OF SANDY, OREGON

and

FULL, LEGAL NAME OF CONTRACTOR

For 2020 Sanitary Sewer Rehabilitation for Inflow and Infiltration Reduction Project

This Construction Manager / General Contractor ("CM/GC") Contract ("Contract") is made by and between the City of Sandy, a partnership agency within the State of Oregon ("City" or "Agency") and Full, legal name of Contractor ("Contractor" or "CM/GC") to provide construction services for the Water Treatment Plant Expansion to 85MGD ("Project"), briefly described below:

The Project is briefly described as follows: _____.

The Engineer on this Project is: Leeway Engineering Solutions, LLC.

CONTRACTOR DATA

Contractor must submit a completed "Request for Taxpayer Identification Number and Certification" (Form W-9) with this signed Contract. Payment information will be reported to the Internal Revenue Service under the name and TIN or SSN, whichever is applicable, provided by Consultant. Contractor shall be responsible for all federal, state, and local taxes and any and all fees applicable to payments for Work under this Contract.

Business Name: Full, legal name of Contractor

Contractor Contact Person:

Address:

City, State, ZIP:

Business Telephone:

Facsimile:

Email:

Federal Tax Identification Number ("TIN") or Social Security Number ("SSN"):

Oregon CCB License Number:

Contractor certifies under penalty of perjury that Contractor is a:

- Sole Proprietor
- Corporation
- Limited Liability Company
- Partnership
- Other [describe: _____]

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ATTACHED EXHIBITS

Exhibit A - General Conditions to the Contract

Exhibit A1 – Supplementary Conditions to the Contract

Exhibit B - Request for Proposals (RFP) CM/GC Services

Exhibit C – Contractors Response to RFP for CM/GC Services (redlined to include any negotiated changes)

Exhibit D – Form of GMP Amendment

The City of Sandy (City) and CM/GC agree as set forth below:

1. DEFINITIONS

Except as expressly defined or modified below or elsewhere in the Contract Documents, all capitalized terms shall have the meanings set forth in the General Conditions attached as Exhibit A (the "General Conditions"). The terms below are expressly defined as follows:

- a. Affiliate.** Affiliate shall mean any subsidiary of CM/GC (defined below), and any other entity in which CM/GC has a financial interest or which has a financial interest in CM/GC (including without limitation parent companies, related businesses under the same holding company, or any other business controlled by, under common control with, or which controls CM/GC).
- b. Allowances.** Allowances shall mean funding reserved to address non-quantifiable scopes of work shown or inferred in the GMP Supporting Documents, together with such further allowances as may be developed by the parties as the Project progresses.
- c. Amendment.** Amendment shall mean a written modification of the Contract executed by both parties.
- d. Business Days.** Business Days shall mean every day except Saturday, Sunday, and the nine legal holidays recognized by the City: New Year's Day, Martin Luther King, Jr. Day, President's Day, Memorial Day, Independence Day, Labor Day, Veteran's Day, Thanksgiving Day and Christmas Day.
- e. CM/GC Construction manager / general contractor,** – means a person that provides construction manager/general contractor services to a contracting agency under a public improvement contract as specified in ORS 279C.332 (2).
- f. Construction manager/general contractor services.** Has the meaning set forth in ORS 279C.332 (3).
- g. Change Order.** Change Order shall mean a written modification of the Contract under Section D.1 of the General Conditions (including without limitation any agreed change to GMP), identified as a Change Order and executed by the City and CM/GC.
- h. Construction Documents.** Construction Documents are those documents that are used specifically for the construction of the Work and are a part of the Contract Documents.
- i. Construction Phase.** The Construction Phase shall mean the period commencing on the City's execution of a GMP Amendment or Early Work Amendment, together with the issuance by the City of a Notice to Proceed with any on-site construction.
- j. Construction Services.** Construction Services shall mean all of the Work other than the Preconstruction services.
- k. Contract Documents.** Contract Documents shall have the meaning given in Section A.1 of the General Conditions, as supplemented by paragraph 2.a. below.
- l. Early Work.** Early Work shall mean Construction Services authorized by Pre-GMP Amendment that the parties agree should be performed in advance of establishment of the entire GMP for the Work. Permissible Early Work shall be limited to: early procurement of materials and supplies; early release of bid or proposal packages for site development and related activities; and any other advance Work

related to critical components of the Project for which performance prior to establishment of the GMP will materially and positively affect the development of the completion of the Project. The City will only compensate the CM/GC for Early Work if it is authorized in an Early Work Amendment.

- m. Early Work Amendment.** Early Work Amendment shall mean an Amendment to the Contract executed by and between the parties to authorize Early Work prior to GMP.
- n. General Conditions Work.** General Conditions Work (“GC Work”) shall mean:

 - 1) that portion of the Work required to support construction operations that is not included within overhead or general expense but is called out as GC Work in Exhibit C, and
 - 2) any other specific categories of Work approved in writing by the City as forming a part of the GC Work. GC Work shall mean customary layout, clean up, supervision, and portions of the Work of a minor nature and not feasibly part of the subcontracted Work due to: exclusions by the Subcontractor not resolved through the process described in paragraph 11.c, undeveloped design owing to deviations in Work performed or materials delivered by Subcontractors or suppliers that do not represent defective or nonconforming Work, a breach or failure to perform by the Subcontractor or supplier, complexity of coordination of the Work, and other similar reasons typically providing cause for “pick-up” or GC Work under industry standards; provided, however, that:

 - i. the CM/GC has reasonably determined that doing such portion of the Work itself is in the best interests of City,
 - ii. such Work is identified as GC Work in monthly billings and
 - iii. CM/GC receives prior approval of the City as to the scope of such GC Work.
- o. Guaranteed Maximum Price (GMP).** GMP shall mean the Guaranteed Maximum Price of the Contract, as stated in dollars within the GMP Amendment(s), as determined in accordance with paragraph 6, and as it may be adjusted from time to time pursuant to the provisions of the Contract.
- p. GMP Amendment.** GMP Amendment shall mean an Amendment to the Contract, issued substantially in the form of Exhibit D executed by and between the parties, to establish the GMP and identify the GMP Supporting Documents for Construction Services.
- q. GMP Supporting Documents.** GMP Supporting Documents shall mean the documents referenced in a GMP Amendment as the basis for establishing a GMP. The GMP Supporting Documents shall expressly identify the Plans and Specifications, schedules, phasing plans, assumptions, qualifications, exclusions, conditions, allowances, unit prices, alternates and other pertinent information and documentation that form the basis for the proposed GMP.
- r. Preconstruction Phase.** The Preconstruction Phase shall mean the period commencing on the effective date of this CM/GC Contract and generally ending upon commencement of the Construction Phase; provided that if the City and CM/GC agree, the Construction Phase may commence before the Preconstruction Phase is completed, in which case both phases shall proceed concurrently, subject to the terms and conditions of the Contract Documents.
- s. Preconstruction services.** Preconstruction services shall mean all services described in paragraph 3.a. and as described in Exhibit B– RFP for CM/GC Services, Scope of Preconstruction Services, but

excluding any Early Work. Early Work shall be considered part of Construction Services.

t. Scope Change. Scope Change shall mean only:

- 1) Materially changed site conditions not reasonably inferable from information available to CM/GC at the time of execution of the GMP Amendment either through review of project documentation or examination of existing site conditions/reports, and
- 2) Material Work modifications (including additions, substitutions, and deletions), application of Allowances, and selection of alternates not originally included in the GMP, all as approved by the City under the Contract beyond that identified or inferable from the GMP Supporting Documents (but in the case of Allowance items, the GMP will increase only if the cost to City of the Allowance items exceeds the total amount of the Allowances).

2. CONTRACT DOCUMENTS

- a. Contract Documents.** City and the CM/GC agree to the terms of the Contract that are set forth in the Contract Documents. For purposes of this Project, the Contract Document referenced as "CM/GC Contract" in the General Conditions shall mean this Contract between the City and CM/GC. The Contract shall include all exhibits attached hereto, which by this reference are incorporated herein as well as any properly executed Amendments and Change Orders to this Contract. This Contract shall supersede any and all arrangements or agreements between the parties, whether written or otherwise.
- b. Effective Date.** The Contract shall become effective on the last date on which all parties have signed the Contract and City has issued a written directive for the CM/GC to proceed with Preconstruction services.
- c. The Contract; Order of Precedence.** Except as expressly otherwise provided herein, the order of precedence of the Contract Documents is established in Section A.3 of the General Conditions, if there are inconsistent or conflicting terms among the Contract Documents.

3. WORK OF THE CONTRACT

- a. Preconstruction services.** The CM/GC agrees to provide all of the services stated in Exhibit B-RFP for CM/GC Services, Scope of Preconstruction Services, on an ongoing basis in support of, and in conformance with, the time frames described herein as well as at the direction of the City and in cooperation with the Engineer and other designated Project consultants (the "Construction Principals").
- b. Construction Services.**
 - 1) Upon execution of an Early Work Amendment or GMP Amendment, the CM/GC shall commence with Construction Services as provided in the Contract, including without limitation providing and paying for all materials, tools, equipment, labor, jurisdictional approval as required for the Work, professional and non-professional services, and performing all other acts and supplying all other things necessary to fully and properly perform and complete the Work, as required by the Contract, to furnish to City a complete, fully functional Project, capable of being legally occupied and fully used for its intended purposes upon completion of the Contract (or, as to an Early Work Amendment, to furnish such Work as is described in the Early Work Amendment).

- 2) Notwithstanding any other references to Construction Services in this Agreement, the Contract shall include only Preconstruction services unless:
 - i. the parties execute a GMP Amendment or
 - ii. the parties execute an Early Work Amendment, defined below.
- 3) The parties may execute one or more Early Work Amendments identifying specific Construction Services that must be performed in advance of establishment of the GMP, without exceeding a time & expense budget with a not-to-exceed limit or a fixed price ("Early Work Price") to be stated in such Amendment, subject to all necessary City approvals as required.
 - i. If the Early Work Price is a time & expense budget, then CM/GC shall be obligated to perform the Early Work only to the extent that the Cost of Work therefore, together with the CM/GC Fee, does not exceed the Early Work Price; however
 - ii. if CM/GC performs Early Work under a fixed price, and incurs cost in excess of that fixed price, the CM/GC shall complete the Early Work and pay such excess cost without reimbursement.
 - iii. If one or more Early Work Amendments are executed, the CM/GC shall diligently continue to work toward development of a GMP Amendment acceptable to City, which shall incorporate the Early Work Amendments.
- 4) If City thereafter terminates the Contract prior to execution of a GMP Amendment, the provisions of Section J.5 of the General Conditions shall apply.
- 5) Prior to commencement of the Construction Phase, and in any event not later than mutual execution of the GMP Amendment, CM/GC shall provide to City a full performance bond and a payment security bond as required by Section G of the General Conditions in the amount of the GMP. If an Early Work Amendment is executed, CM/GC shall provide such bond in the amount of the Early Work Price under the Early Work Amendment. CM/GC shall provide to City additional or replacement bonds at the time of execution of any subsequent Early Work Amendment or GMP Amendment, in each case prior to execution of the Amendment and the supplying of any labor or materials for the prosecution of the Work covered by the Amendment, and in each case in a sufficient amount so that the total bonded sum equals or exceeds the total Early Work Price or the GMP, as the case may be. In the event of a Scope Change that increases the GMP, CM/GC shall provide to City an additional or supplemental bond in the amount of such increase prior to performance of the additional Work.

4. RELATIONSHIP AND ROLES OF THE PARTIES

- a. **Independent Contractor.** The CM/GC is an independent contractor and not an officer, employee, or agent of City as those terms are used in ORS 30.265.
- b. **Performance of Work.** The CM/GC covenants with City to:
 - 1) cooperate with the City's Authorized Representative(s), Construction Principals, agencies having jurisdiction,
 - 2) utilize the CM/GC's professional skill, efforts and judgment in furthering the interests of City;

- 3) to furnish efficient business administration and supervision;
 - 4) to furnish at all times an adequate supply of workers and materials; and
 - 5) to perform the Work in conformance with the terms and conditions of the Contract Documents and in a safe, expeditious and economical manner consistent with the interests of City.
- c. Design Consultants.** City has a separate contract with the Engineer related to the Project. Both the CM/GC and the Engineer shall be given direction by City through City's Authorized Representative(s). The CM/GC agrees to support City's efforts to create a collaborative and cooperative relationship among the CM/GC, Engineer, other Project consultants, and City's Authorized Representative(s).
- d. Forms and Procedures.** The City has developed or may develop procedures and forms for the administration and tracking of the Contract. The CM/GC agrees to abide by those procedures and use those forms.
- e. CM/GC's Project Staff.** The CM/GC's Project staff shall consist of the following personnel:
- 1) Project Manager: _____ (name, email, phone) shall be the CM/GC's Project Manager and will supervise and coordinate all Construction Phase and Preconstruction services of CM/GC and participate in all meetings throughout the Project term unless otherwise directed by City. CM/GC represents that the Project Manager, or designee approved by City, has authority to execute Change Orders and Contract Amendments on behalf of the CM/GC.
 - 2) Project Engineer and/or Assistant Project Manager: _____ (name, email, phone) shall be the CM/GC's Project Engineer and _____ (name, email, phone) shall be CM/GC's Assistant Project Manager.
 - 3) Job Superintendent: If Construction Services are requested and accepted by City, _____ (name, email, phone) shall be the CM/GC's on-site job superintendent throughout the Project term. In addition to the Construction Services, the Job Superintendent shall be an active part of the Preconstruction Services Project team.
- f. Key Persons.** The CM/GC's personnel identified in paragraph 4.e., and the key staff identified by name in CM/GC's Proposal to the RFP and accepted by City, shall be considered Key Persons and shall not be replaced during the Project without the prior written permission of City, which shall not be unreasonably withheld. If the CM/GC intends to substitute personnel, a request must be given to City at least thirty (30) Days (or such shorter period as permitted by City) prior to the intended time of substitution. When replacements have been approved by City, the CM/GC shall provide a transition period of at least ten (10) Business Days during which the original and replacement personnel shall be working on the Project concurrently; provided, however, that City shall be charged and pay for only the original or the replacement personnel, whichever is less expensive but not both, for the transition period. Once a replacement for any of these staff members is authorized, further replacement shall not occur without the prior written permission of City.
- g.** In the event that replacement of Key Persons is required during the course of the Project, the resume for subsequent staff members proposed shall be provided to the City for review and approval prior to their assignment to the Project. CM/GC shall not assign any person the City does not specifically approve of, such approval which shall not be unreasonably withheld by the City.

- h. Replacement staff shall be of equal or higher caliber in terms of experience and skills sets than those they are replacing.
- i. In the event that Key Persons are replaced during the Project, the City shall not incur additional cost for labor rates of replacement staff compared to the originally proposed staff members. Any labor expenses in excess of those proposed for the original Key Persons shall be the financial responsibility of the CM/GC.

5. DATE OF COMMENCEMENT; SUBSTANTIAL AND FINAL COMPLETION

- a. **Notice to Proceed.** If Construction Services are added to the Contract as set forth in paragraph 3.b., then a Notice to Proceed will be issued by City to begin the designated or full Construction Services (“Notice to Proceed”). A separate Notice to Proceed shall be issued for any and every Early Work Amendment and each of the two GMP Amendments.
- b. **Completion of Project.** The CM/GC shall achieve Substantial Completion of the entire Work not later than _____, 20__ and shall achieve Final Completion not later than _____ (__) calendar days after Substantial Completion. City and the CM/GC may agree to phased acceptance, in which case City shall have the right to take possession and acceptance of the Project in phases, and the CM/GC agrees that such partial acceptance shall not be grounds for adjustment of the GMP or the Substantial or Final Completion Dates.
- c. **[INTENTIONALLY OMITTED]**
- d. **Time is of the Essence.** All time limits stated in the Contract Documents are of the essence.
- e. **Time Extensions.** Notwithstanding provisions for Contract time extensions in Section D.2 of the General Conditions, City and CM/GC agree that timely completion of the Work is essential to the success of the Project, and that approval for time extension shall be granted only as a last resort.
- f. **Failure to Achieve Substantial Completion by Final Completion Date.** In the event CM/GC fails to obtain Substantial Completion by the date set for Final Completion in 5.b, subject to any time extensions granted by the City during the Project, City reserves the right to terminate this Contract for Cause and pursue any course of action deemed in the best interest of the City to complete the Project. Any and all costs incurred by the City, in addition to any actual damages accrued, under this clause shall be considered the financial responsibility of the CM/GC.
- g. **Delay in Final Completion.** City shall make payment of the balance due for any portion of the Work fully completed and accepted if Final Completion is materially delayed through no fault of Contractor or by issuance of Change Orders affecting final completion. In the event that final completion is not accomplished within thirty (30) calendar days after the date of Substantial Completion due to any fault of Contractor, City may withhold from the final payment 150 percent of the reasonable cost to complete the unfinished Work and to attain Final Completion. In the event Contractor fails to complete the Work necessary to attain Final Completion after forty five (45) days from Substantial Completion, City may, without waiving other remedies it may have, complete the Work and deduct the actual cost thereof from the funds withheld.

6. FEES, CONTRACT SUM AND GMP

- a. **Fees; Contract Sum; GMP.** City shall pay CM/GC the Preconstruction Fee described in paragraph 6.d. In addition, for each Early Work Amendment executed by CM/GC and City, City shall pay CM/GC, as

payment for the Early Work, an amount equal to the sum of the CM/GC Fee to the proportional extent attributable to the Early Work, the cost of any bonds and insurance applicable to the Early Work, and the actual cost of all Early Work completed and accepted by City, but not exceeding the Early Work Price.

- b. The GMP shall be determined in accordance with the formula set forth below and as described in this paragraph 6.

Preconstruction Fee (Becomes a not-to exceed amount)
+ CM/GC Fee (Is a fixed dollar amount, which is subject to adjustment in accordance with paragraph 6.f.)
Construction Fee (GMP Determination)
+ Cost of the Work (Becomes a total amount based on established pay items)
+ Bonds and Insurance (Estimated costs)
+ Risk/Contingency Items (An allowance not included in Cost of the Work)
= GMP

- c. The "Cost of the Work" is specifically defined in Article 8. Costs in excess of the GMP shall be paid by the CM/GC without reimbursement by City. Changes to the GMP shall only be authorized by Amendment or Change Order that includes any necessary City approvals

- d. **Preconstruction Fee.** The Preconstruction Fee shall be payable to CM/GC as a lump sum of \$_____ which shall cover coordination with the City and Engineer, constructability review, value engineering, cost estimating, development of GMP, and all other reconstruction services, as described in paragraph 3. If CM/GC's costs for provision of Preconstruction Phase Services exceed the maximum Preconstruction Fee, CM/GC shall absorb such additional costs without reimbursement from City. City shall pay the Preconstruction Fee on a percent-complete basis with each application for payment during the Preconstruction Phase. If the total actual Preconstruction Fee is less than the maximum Preconstruction Fee, the City shall retain the unused fee.

- e. **Preconstruction services provided after execution of the GMP Amendment:** If City and CM/GC execute a GMP Amendment, compensation for any ongoing preconstruction services that occur after execution of the GMP will be addressed in the GMP Amendment.

- f. **Establishment of CM/GC Fee; Converting the CM/GC Fee Percentage into a Fixed Amount; Adjustments to CM/GC Fee.**

- 1) The CM/GC Fee shall be a fixed fee, set forth in Exhibit C and the Cost of the Work subject to adjustment by change order that is based upon the Cost of the Work in any Early Work Amendment(s) and the GMP Amendment. In calculating the GMP, the Cost of the Work shall exclude the Preconstruction Costs, the CM/GC Fee itself and any other cost or charge which this CM/GC Contract states is not to be included in calculating the CM/GC Fee.

- i. The CM/GC Fee Components: The CM/GC Fee is inclusive of 1) profit; 2) general and administrative (G&A) costs; 3) home, branch and regional office overhead; and 4) other indirect and non-reimbursable costs as identified in Exhibit A, the General Conditions. The CM/GC Fee shall exclude costs for construction risk to perform the Work. Costs for Construction General Conditions not included in the CM/GC Fee shall be included in the Cost of the Work. Risk for construction that is allocated to the CM/GC shall be included in the agreed-upon Pay items that comprise the Cost of the Work.

No additional markup will be paid to the CM/GC for change order or force account work or for subcontracted labor or materials.

- 2) **Good Faith Negotiations** - The Agency and CM/GC shall negotiate the fixed lump sum amounts, estimated quantities, fixed unit prices, estimated cost reimbursable amounts, and all other aspects of the Work in good faith and shall establish a set of assumptions upon which all Work and unit prices are based.
- 3) **Amendment Pricing.** Once all components of the Work are agreed upon by the City and CM/GC, all Pay Item total costs (the Pay Item estimated quantity multiplied by the unit price) shall be rolled into one total amount, which becomes the Cost of the Work. The CM/GC Fee then becomes a fixed amount for the Work, subject to adjustment by Change Order in accordance with Article 7. The estimated actual reimbursable costs for any applicable bonds and insurance shall not be subject to mark-up.
- 4) In addition, if the Contract is terminated for any reason prior to full completion of the Work (including, without limitation, termination during or following performance of Early Work), the CM/GC Fee shall be limited to the total CM/GC Fee multiplied by the percentage of Work completed and accepted at the time of termination. The CM/GC Fee shall not be subject to adjustment for any other reason, including, without limitation, schedule extensions or adjustments, Project delays, unanticipated costs, or unforeseen conditions.

g. Determination of GMP.

- 1) CM/GC shall deliver to City a proposed GMP and GMP Supporting Documents at a time designated by City during the Preconstruction Phase. If any actual subcontract Offers are available at the time the GMP is being established, CM/GC shall use those subcontract Offers in establishing the GMP.
- 2) As the Plans and Specifications may not be developed to the stage of biddable design documents at the time the GMP proposal is prepared, the CM/GC shall provide in the GMP for further development of the Plans and Specifications by the Engineer that is consistent with the Contract Documents and reasonably inferable there from. Such further development does not include such things as changes in scope outside of the original intent of the design, fundamental system or process types, significant changes to types or quantities of building components that are inconsistent with the original design intent, quality of finishes or equipment, all of which, if required, shall be incorporated by Change Order or Amendment with a corresponding GMP adjustment.
- 3) The CM/GC shall include with its GMP proposal a written statement of its basis (the "GMP Supporting Documents"), which shall include:
 - i. A list of the Plans and Specifications, including all addenda thereto and the conditions of the Contract, which were used in preparation of the GMP proposal.
 - ii. A detailed list of allowances and contingencies, the allocated amount of the GMP as well as a statement of their basis, parameters and calculation methodology.
 - iii. A list of the clarifications, qualifications, exclusions, assumptions and any other material qualifiers used by the CM/GC in the preparation of the GMP proposal to supplement the information contained in the Plans and Specifications.
 - iv. The proposed GMP, including a statement of the estimated cost organized in a manner

acceptable to the City, allowances, contingency, and other items and the associated fees that comprise the GMP.

- v. The parties may agree to identify and carry contingency to reflect potential escalation of material and commodity prices during the course of construction as well as estimated risk costs for changes and differing site conditions.
- 4) The CM/GC shall meet with the City and Engineer to review the GMP proposal and the written statement of its basis. If the City or Engineer discovers any inconsistencies or inaccuracies in the information presented, they shall promptly notify the CM/GC, who shall make appropriate adjustments to the GMP proposal, its basis or both.
- 5) Prior to the City's acceptance of the CM/GC's GMP proposal and issuance of a Notice to Proceed, the CM/GC shall not incur any cost to be reimbursed as part of the Cost of the Work, except as specifically provided in an Early Work Amendment.
- 6) The City shall authorize and cause the Engineer to revise the Plans and Specifications to the extent necessary to reflect the agreed-upon assumptions and clarifications contained in the GMP Amendment. Such revised Plans and Specifications shall be furnished to the CM/GC in accordance with schedules agreed to by the City, Engineer and CM/GC. Prior to commencement of work, the CM/GC shall promptly notify the Engineer and City if such revised Plans and Specifications are inconsistent with the agreed-upon assumptions and clarifications.
- 7) The GMP shall include in the Estimated Cost of the Work only those taxes and/or governmental fees which are enacted at the time the GMP is established.
- 8) The Estimated Cost of the Work shall include the Project contingency, which is a sum established by the CM/GC and City for the City and CM/GC's mutually agreed upon use to cover additional development of Plans and Specifications and unanticipated costs and unforeseen conditions which are properly reimbursable as Cost of the Work but which are not the basis for a Change Order. For purposes of use of Project's contingency, unanticipated costs and unforeseen conditions include Work within the scope of the Project or any conditions that the parties reasonably should have anticipated might be encountered during the renovation of a site or of a building of similar nature, condition and age. The parties shall provide advance written notice to the other each time the parties propose to use the Project contingency, shall include in the notice the purposed purpose for such use, and shall seek the agreement and approval of the other prior to the contingency use, the approval of which shall not unreasonably be withheld by the other party.
 - i. The Project contingency shall not be utilized by any party to make changes to the Project that are inconsistent with Article 6. or should reasonably be incorporated into the Project via a Change Order.
- 9) The CM/GC shall work with the Engineer and City to identify and confirm components and systems not specifically shown but required for a complete, fully functional Project and sequencing to maintain continuous delivery of treated water. City will direct the Engineer to complete the final Construction Documents in accordance with the Project scope agreed upon by all parties at the time the GMP is established.
- 10) Notwithstanding the level of detail represented in the GMP Supporting Documents, the CM/GC shall represent and warrant, at the time that it submits the GMP that the GMP includes the entire cost of all components and systems required for a complete, fully functional facility consistent with

the design intent of the City and Engineer.

- 11) In developing the GMP, the CM/GC shall include and identify any allowances within the GMP as may be necessary to pay for undefined costs and conditions that are required for a complete, fully functional facility.
- h. Failure to Furnish an Acceptable GMP.** If the CM/GC does not furnish a GMP acceptable to City or if City determines at any time in its sole discretion that the parties may fail to reach a timely agreement on a GMP acceptable to City, City may terminate the Contract without liability, and the CM/GC shall not receive additional compensation beyond the Preconstruction Fee earned as of the date of the termination under the Contract and sums due under any Early Work Amendment. Termination under this provision shall proceed under Section J.5 of the General Conditions as a termination for City's convenience. CM/GC further agrees that City shall not be liable for any damages whether actual, consequential or otherwise for termination of the Contract under this provision.
- i. Acceptance of GMP.** Upon acceptance of the GMP by City, the parties shall execute a GMP Amendment for the relevant package to which the GMP relates.
- j. City Savings.** If the sum of the Preconstruction Fee, plus the CM/GC Fee, plus the actual and final Cost of the Work (the Contract Sum as defined in paragraph 6.a.), is less than the GMP, 100% of the savings shall accrue to the City.
- k. Allowance Work.**
- 1) CM/GC shall not perform any Allowance Work without prior written authorization by the City approving the Specifications for the Allowance Work and the price thereof.
 - 2) City shall be entitled to reallocate any Allowance line items that have not been fully expended to other line item Allowances that have been fully expended, without any resulting increase in the GMP.
 - 3) If the total cost of the Work associated with allowances exceeds the total Allowances amount within the GMP, CM/GC shall not perform any Allowance Work in excess of such amount until either (i) the parties agree that the additional Allowance Work will be performed within the then-current GMP or (ii) a GMP Amendment is executed to increase the GMP by the excess cost of the Allowance Work.
 - 4) If at the Final Completion of the Project, any portion of the Allowance funds remains unexpended, the GMP shall be reduced by a corresponding amount via a Change Order or Amendment.
 - 5) Allowances shall not be allowed to have costs charged against them for accounting purposes on the Project. CM/GC shall submit itemized estimates based on competitive bids or quotes for City review and approval for any and all Work covered by Allowances. Upon acceptance by the City, CM/GC will reallocate Allowance funding to general Cost of the Work budget line items.
- l. Reallocating Projected Cost Underruns after Bid (Offer) Buyout.** As soon as possible after the awarding of the Work to the primary Subcontractors, after review and approval by the City, CM/GC shall review projected costs and provide the City with a buy-out status report showing any projected cost over/under runs by contracting package, reconciling accepted Offers and other reasonably anticipated costs, to the cost estimate used by CM/GC to establish the GMP. CM/GC shall include

with its report any underlying documentation requested by City used to develop or support such report. CM/GC shall also consider the reduced risk associated with known subcontracting costs, and the impact that reduced risk has on the amount of the Project's Contingency. The parties shall negotiate in good faith to execute a budget revision transferring an appropriate portion of any projected cost over/under runs to/from the Project Contingency. Any unused contingency shall be returned to the City.

- 1) Over/under runs on bid packages and subcontracted scopes of work shall accrue or be funded from a buy-out contingency that will be jointly controlled by the City and CM/GC. Funding in the buy-out contingency shall not be allocated other than to portions of the Work until all Subcontractors are under contract, at which time any surplus shall accrue to the contingency for the Project subject to the requirements and limitation of use described herein.
- m. CM/GC's Sole Responsibility for Errors.** The CM/GC agrees that review or approval by Agency or its agents of the CM/GC's estimates, proposals, pricing, or any other information disclosed to Agency, including those under Early Work Amendment(s) or the GMP Amendment, shall not relieve CM/GC of its sole responsibility for any costs resulting from or arising out of defects or deficiencies in the CM/GC's estimates, proposals, pricing, or any other information disclosed to Agency.

7. CHANGES IN THE WORK

- a. Price Adjustments.** Adjustments to the Estimated Cost of the Work required by changes in the Work shall be determined by any of the methods listed in Section D of the General Conditions, except that, unless the adjustment is based upon fixed pricing or unit pricing:
- 1) The overhead and profit markup for the CM/GC shall be limited to the CM/GC Fee adjustment, if any, permitted under paragraph 6.f of this Agreement;
 - 2) The increase or decrease in the Estimated Cost of the Work, other than for subcontract Work, shall be calculated pursuant to Articles 8. and 9. of this Contract, instead of being based on CM/GC's Direct Costs as defined in the General Conditions; and
 - 3) In calculating adjustments to subcontracts, unless the parties agree otherwise, the change shall be limited to the Subcontractor's Direct Costs plus the supplemental markup provided in Section D of the General Conditions, and shall not be modified by Articles 8. and 9. of this Contract.
- b. Adjustments to GMP.** Notwithstanding any contrary language in the Contract Documents, adjustments to the GMP after execution of the GMP Amendment may be made only in the event of a Scope Change, and then only in accordance with the following procedure:
- 1) CM/GC shall review subsequent iterations of the Plans and Specifications as they are prepared to determine whether, in the opinion of CM/GC, they result in a Scope Change so that it can be determined if an adjustment to the GMP is warranted.
 - 2) Changes to the GMP shall be initiated by written notice by one party to the other. CM/GC shall deliver any such request to Engineer and City's Authorized Representative promptly after becoming aware of any Scope Change if, in CM/GC's opinion, it constitutes grounds for adjustment of the GMP. Any change request shall include a fully itemized proposal as to the appropriate GMP adjustment with respect to the Scope Change at issue.
 - 3) CM/GC shall submit its request as soon as possible, and CM/GC shall not be entitled to claim a GMP

increase unless CM/GC submitted a Change Order Request to City's Authorized Representative and to Engineer within the earlier of,

- i. ten (10) business days after CM/GC has received the information constituting the basis for the claim, or
 - ii. as to Work not yet bid or proposed, prior to submission of solicitations for such Work and as to Work already solicited, prior to commencement of the portion of the Work for which CM/GC intends to claim a Scope Change; and
 - iii. in any event, prior to CM/GC's signing of a Change Order for the Scope Change.
- 4) City may, at any time, submit a reduction of the GMP, which shall include City's basis for such request, which may include, for example, reduction of the Project's Contingency after further development of the Plans and Specifications that form the basis for the original GMP Amendment, and/or unused Allowances.
 - 5) CM/GC shall work with City and Engineer to reconcile all differences in its request within three (3) business days from the date of submission of the request. "Reconciled" means that the CM/GC, City and Engineer have verified that their assumptions about the various categories are the same, and that they have identified the reason for differences in the request and the City and/or Engineer's position. CM/GC shall submit the reconciled request to City, which submission shall be a condition to any CM/GC claim for a GMP increase.
 - 6) If the reconciled request is not acceptable to City, CM/GC agrees to work with the City and the Engineer to provide a request that is acceptable to City.
 - 7) CM/GC agrees to make all records, calculations, drawings and similar items relating to the request available to City and to allow Engineer and City access and opportunity to view such documents at CM/GC's offices. Upon City's reasonable notice, CM/GC shall deliver two copies of such documents to City and Engineer at any regular meeting or at the Site.
 - 8) GMP increases, if any, shall not exceed the increased Cost of the Work arising from the Scope Change (whether based on agreed fixed pricing, or the estimated Cost of the Work increase based on cost-reimbursable pricing), reconciled in accordance with the above provisions, as arising from the incident justifying the GMP increase, plus or minus the CM/GC Fee applicable to such change in the Cost of the Work.
 - 9) Except as provided in this paragraph 7.b., adjustments to the GMP shall be reconciled in accordance with Section D of the General Conditions.
- c. Execution by City.** Engineer has no authority to execute Change Orders or Amendments on behalf of City, and only duly authorized personnel of City may do so. However, as provided in the definitions for "City's Authorized Representative" and "Architect/Engineer" in Section A.1 of the General Conditions, City may, by written notice to the CM/GC, delegate some or all responsibilities of the City's Authorized Representative to the Architect/Engineer.
 - d. Continuation of Work.** CM/GC shall continue to prosecute the Work in a timely and diligent manner consistent with the regardless of the status, outcome or other issues associated with potential Change Orders or Amendments. In no way shall CM/GC impact or allow others, such as Subcontractors, to impact the Project Schedule due to pending, on-going or concluded change order

negotiations. Failure to do so shall be considered a material breach of the Contract on the part of the CM/GC and subject to recourse by the City.

8. COST OF THE WORK (To Be Reimbursed)

a. Cost of the Work. (The term "Cost of the Work" shall mean the following costs.) The Cost of the Work shall include only those items necessarily and reasonably incurred by CM/GC in the proper performance of the Work and specifically identified in this Article 8., and only to the extent that they are directly related to the Project.

b. Labor Costs.

- 1) Wages of construction workers directly employed by the CM/GC to perform the construction of the Work at the site.
- 2) Wages and salaries of the CM/GC's supervisory and administrative personnel
 - i. stationed at the site, or
 - ii. engaged at factories, workshops or on the road, in expediting the production or transportation of materials or equipment required for the Work with City, or otherwise engaged and off the site when specifically related to the Project, and
 - iii. under either clause (i) or (ii), only with City's prior written approval, and only for that portion of their time directly required for the Work.
- 3) Fringe benefit costs paid or incurred by the CM/GC for taxes, insurance, contributions, assessments and benefits required by law or collective bargaining contracts and, for personnel not covered by such contracts, customary benefits such as sick leave, medical and health benefits, holidays, vacations and pensions, provided such costs are based on wages and salaries included in the Cost of the Work under paragraphs 8.b.1) through 8.b.2).

c. Subcontract Costs.

- 1) CM/GC's actual payment to Subcontractors pursuant to CM/GC's contract with such Subcontractor for the Work on the Project. No amount paid by or payable to any such Subcontractor other than the fixed or cost reimbursement price of its subcontract shall be included in the Cost of the Work, unless otherwise approved in writing by City.

d. Costs of Materials and Equipment Incorporated in the Work or Stored On Site.

- 1) Costs, including transportation, of materials and equipment incorporated or to be incorporated in the completed Work.
- 2) Costs of materials in excess of those actually installed, but required to provide reasonable allowance for waste and for spoilage. Unused excess materials, if any, shall be delivered to City at the completion of the Work or, at City's option, shall be sold by the CM/GC. Any sale shall be commercially reasonable and CM/GC shall provide accounting for such a sale within fifteen (15) business days of the transaction. Net amounts realized, if any, from such sales shall be credited to City as a deduction from the CM/GC Fee.

e. Costs of Miscellaneous Equipment and Other Items; Equipment Rental Charges.

- 1) Costs, including transportation, installation, maintenance, dismantling and removal, of materials, supplies, temporary facilities, machinery, equipment, and hand tools not customarily owned by the construction workers, which are provided by the CM/GC at the site and fully consumed in the performance of the Work.
- 2) Rental charges for temporary facilities, machinery, equipment and hand tools not customarily owned by the construction workers, which are provided by the CM/GC at the site, whether rented from the CM/GC or others, and costs of transportation, installation, minor repairs and replacements, dismantling and removal thereof. Rates and quantities of equipment rented:
 - shall be according to industry standards,
 - shall not exceed 100% of the rental rates published from time to time in the Rental Rate Blue Book for Construction Equipment, prepared by Machinery Information Division of Primedia Information Incorporated in effect at the time of rental
 - shall not exceed acquisition costs, and
 - for individual items exceeding \$ 500.00, will be subject to City's prior approval.

CM/GC shall deliver to City a list of published rates from time to time at City's request. For all items rented or leased, the CM/GC shall charge City only the rental charge incurred by CM/GC with no additional administrative or other mark-up. CM/GC shall make efforts and use its best skills and judgment to procure equipment in the most expeditious and economical manner consistent with the interest of the City. Efforts shall include, but not be limited to, providing City with a rent/buy analysis so that City may elect for CM/GC to procure the item in lieu of rental if the facility at issue is expected to be rented for six months or longer. Such rent/buy analysis shall include, where available, a leasing rate commensurate with the expected term of rental of the facility at issue.

- 3) Costs of removal of debris from the site.
- 4) Cost of communication devices, postage and parcel delivery charges, and reasonable petty cash expenses of the site office, which are solely for the benefit of the Work.

f. Other Costs.

- 1) That portion of premiums for insurance directly attributable to the Contract for builders all/risk insurance, and payment, performance and public works bond premiums as required by Section G of the General Conditions (but excluding premiums for Subcontractor bonds unless authorized by City). CM/GC's charge to City for all bonds and insurance shall be limited to the CM/GC's verifiable costs for those items.
- 2) Sales, use or similar excise taxes imposed by a governmental authority which are directly related to the Work and for which the CM/GC is liable.
- 3) Fees and assessments for the building permit and for other permits, licenses and inspections for which the CM/GC is required by the Contract Documents to pay.
- 4) CM/GC deposits lost for causes other than the CM/GC's fault or negligence.
- 5) Costs of drawings, Specifications and other documents required to complete the Work, except as provided by City or Engineer.
- 6) Other costs incurred in the performance of the Work if and to the extent approved in advance in writing by City.

- g. Costs to Prevent Damage or Injury in Emergencies.** The Cost of the Work shall also include costs which are incurred by the CM/GC in taking action to prevent threatened damage, injury or loss in case of an emergency affecting the safety of persons and property.
- h. Costs For General Conditions Work.** CM/GC shall be paid on a lump-sum basis as payment for the GC Work, including all labor, materials, and direct and indirect costs thereof. The lump-sum amount for GC Work shall be established in each Early Work Amendment or the GMP Amendment, as applicable. To the extent any GC Work is otherwise described above in this Article 8., CM/GC's compensation for the same is included in the Cost for GC Work and shall not otherwise be charged as Cost of the Work. The Cost for GC Work, less 5% retainage thereon, shall be paid monthly on a percent complete basis of the scheduled Construction Phase, including any period of Early Work, commencing with the first progress billing after commencement of the scheduled Construction Phase or Early Work Period. However, no adjustment in the amount for General Conditions Work will be made if the actual construction period or Early Work period is shorter or longer than the number of months scheduled for the Construction Phase or Early Work period, unless such period is extended because of a City-requested delay.
- i.** Travel and subsistence expenses of the CM/GC shall be included in the costs for General Conditions.

9. COSTS EXCLUDED FROM COST OF WORK (Not To Be Reimbursed)

- a. Costs Excluded from Cost of Work.** The following shall not be included in the Cost of the Work unless specifically approved in writing by the City prior to approval of the GMP:

 - 1) Salaries and other compensation of the CM/GC's personnel stationed in offices other than the site office except as allowed under paragraphs 8.b.2) and 8.b.3).
 - 2) Office expenses of the CM/GC other than the site office.
 - 3) Any overhead and general expenses, except as may be expressly included in paragraph 8.
 - 4) CM/GC's capital expenses, including interest on the CM/GC's capital employed for the Work.
 - 5) Rental cost of machinery and equipment, except as provided in paragraph 8.e.2).
 - 6) Any cost associated with the Project not specifically and expressly described in paragraph 8.
 - 7) Costs due to the fault or negligence of the CM/GC, Subcontractors, suppliers, anyone directly or indirectly employed by any of them, or for whose acts any of them may be liable.
 - 8) The cost of correction of any repair Work, nonconforming or defective Work, or warranty Work.
 - 9) Merit, safety, or other incentive payments, bonuses or awards, or any expenses in connection therewith, except as provided in Article 8.
 - 10) Fines and penalties.
 - 11) Except for Early Work, the cost of Preconstruction services.
 - 12) The Cost of GC Work in excess of the lump-sum amount established for GC Work.
 - 13) Any costs in excess of the GMP.

14) Any equipment, vehicle, tool or other items the CM/GC retains ownership of beyond the Substantial Completion date of the Project.

10. DISCOUNTS, REBATES AND REFUNDS

- a. Discounts, Rebates and Refunds.** Cash discounts obtained on payments made by the CM/GC shall accrue to City. Trade discounts, rebates, refunds and net amounts received from sales of surplus materials and equipment shall accrue to City, and the CM/GC shall make provisions so that they can be secured.
- b. Amounts Credited to City.** Amounts which accrue to City in accordance with the provisions of paragraph 10.a. shall be credited to City as a deduction from the Cost of the Work.

11. SUBCONTRACTS AND OTHER CONTRACTS

a. General Subcontracting Requirements.

- 1) Other than Work performed pursuant to paragraphs 13.e. or 13.f. of this Agreement, CM/GC shall subcontract the Work to Subcontractors other than the CM/GC and its Affiliates. If CM/GC elects to bid on any Work, CM/GC shall inform City of its intention to do so prior to the bid package release date for public bidding for that Work.

b. CM/GC's Obligations under Subcontracts.

- 1) No use of a Subcontractor or supplier shall relieve the CM/GC of any of its obligations or liabilities under the Contract. Except as may expressly otherwise be provided in the Contract, the CM/GC shall be fully responsible and liable for the acts or omissions of all Subcontractors and suppliers including persons directly or indirectly employed by them. The CM/GC shall have sole responsibility for managing and coordinating the operations of its Subcontractors and suppliers, including the settlement of disputes with or between the CM/GC and any such Subcontractor or supplier.
- 2) The CM/GC shall include in each subcontract and require each Subcontractor to include in any lower tier subcontract, all provisions necessary to make all of the provisions of the Contract Documents, including the General Conditions, fully effective as applied to Subcontractors. CM/GC shall indemnify City for any additional cost based on a Subcontractor claim which results from the failure of CM/GC to incorporate the provisions of this Agreement in each subcontract. The CM/GC shall provide all necessary Plans, Specifications, and instructions to its suppliers and Subcontractors to enable them to properly perform their portions of the Work.
- 3) **Retainage from Subcontractors.** Except with the City's prior approval and as allowed under Oregon law, payments to Subcontractors shall be subject to retainage of no more than 5%. The City and the CM/GC shall agree upon a mutually acceptable procedure for review and approval of payments and retainage for Subcontractors.

c. Subcontractor Selection.

- 1) All Subcontractors performing Work must be, as legally required or appropriate for the Work they are performing, registered or licensed by the following before such Subcontractors commence Work and for the duration of the subcontract:
 - i. The Construction Contractors' Board in accordance with ORS 701.035 to 701.138;
 - ii. The State Board of Examiners for Engineering and Land Surveying in accordance with ORS 672.002 to 672.325;
 - iii. The State Board of Architect Examiners in accordance with ORS 671.010 to 671.220;
 - iv. The State Landscape Architect's Board in accordance with ORS 671.310 to 671.459; or
 - v. The State Landscape Contractor's Board in accordance with ORS 671.510 to 671.710.
- 2) These registration and licensing requirements shall also apply to employees of the CM/GC and it shall require and ensure that they are in compliance.
- 3) The CM/GC shall pay and comply with, and require Subcontractors to pay and comply with State

prevailing wage rates in effect at the time of execution of the first Early Work Amendment, or if no Early Work Amendment is executed, at the time the GMP Amendment is executed, as listed in the BOLI publication titled "Prevailing Wage Rates for Public Works Contracts in Oregon", and any amendments thereto. The higher of those rates shall be incorporated in the Contract and shall then apply throughout the remainder of the Project.

- 4) The CM/GC shall review all bids and shall work with bidders to clarify submitted bids, reduce exclusions, verify scope and quantities, and seek to minimize work subsequently awarded via the Change Order process.
- 5) Unless otherwise provided under this Article 11., the selection of all Subcontractors and suppliers shall be made by competitive bidding in a manner that will not encourage favoritism or substantially diminish competition. While not subject to the competitive procurement requirements of ORS Chapter 279C, the process shall conform to the procedures discussed herein, in general compliance with the open and competitive nature of public procurement, taking into account industry subcontracting practices.
- 6) CM/GC shall submit to City's Authorized Representative its proposed procurement documents for review and comment before they are issued for solicitation. CM/GC shall consider and respond to all City comments regarding any proposed Offer packages. As Offers are received, CM/GC shall submit to the City an Offer comparison in a mutually agreeable form together with any specific back-up documentation requested by City. The competitive process used to award subcontracts by the CM/GC may be monitored by the City's Authorized Representative; provided that such monitoring shall not excuse CM/GC from compliance with the subcontracting requirements of this Agreement. CM/GC shall cooperate in all respects with City's monitoring. The City's Authorized Representative shall be advised in advance of and be given the opportunity to be present at bid openings, and CM/GC shall provide him or her with a summary or abstract of all bids in form acceptable to the City's Authorized Representative, and copies of particular bids if requested, prior to CM/GC's selection of bids. Prior to opening bids, the CM/GC agrees to disclose in writing to City any financial interest it has in any such Subcontractor, supplier or other contracting party whenever such Subcontractor, supplier or contracting party intends to compete on any Project Work, directly or indirectly, including whether such party is an Affiliate of CM/GC.
- 7) The following minimum requirements apply to the Subcontract solicitation process:
For solicitations where the resulting subcontract estimated to exceed \$100,000:
 - i. Solicitations shall be advertised at least ten (10) business days prior to opening in the Daily Journal of Commerce. CM/GC also agrees to advertise in a local community newspaper in the area in which the Project is located, in order to allow for local participation in the solicitation process.
 - ii. Unless specific other prior arrangement has been made with the City representative, all bids will be written, and submitted to a specific location at a specific time. CM/GC shall time/date-stamp all bids as received. Subcontractors must be qualified to perform the Work for this Project by being appropriately registered with the State of Oregon Construction Contractors Board.
 - iii. If fewer than three (3) bids are submitted in response to any solicitation estimated to exceed \$100,000, (inclusive of any bid submitted by CM/GC), prior written approval by a City representative shall be required to accept a bid.
 - iv. City may at its sole discretion, require CM/GC to re-solicit for bids based on the same or

modified documents.

- v. The CM/GC shall document any and all discussions, questions and answers, modifications and responses to from any bidder and ensure that the same are distributed to all bidders, and City shall be entitled to inspect such documentation on request.
- vi. CM/GC shall determine the lowest responsive and responsible bid for each solicitation that meets CM/GC's reasonable performance standards for the components of the Work at issue; provided that if CM/GC determines it is unable to execute a suitable subcontract with such bidder, CM/GC may, with City's prior approval, execute a subcontract with the second-lowest Offeror pursuant to paragraph 11.c.9) below. CM/GC may alternatively utilize a solicitation method whereby both price and subcontractor qualifications are evaluated. In such case, the solicitation method and evaluation process must be documented in writing, must be competitive, fair and open, and must be prior approved by City. City reserves the right to approve such a method on a case by case basis.

For solicitations where the resulting subcontract estimated to be below \$100,000:

- i. Solicitations must be publically advertised in any or all of the following methods: electronically, in the Oregon Daily Journal of Commerce, or a local community newspaper.
- ii. Unless specific other prior arrangement has been made with the City representative, all bids will be written, and submitted to a specific location or email address at a specific time. Quotes may be sent and submitted electronically. CM/GC shall retain a record of the time and date all quotes are received. Subcontractors must be qualified to perform the Work for this Project by being appropriately registered with the State of Oregon Construction Contractors Board.
- iii. A minimum of three (3) written quotes must be solicited. CM/GC may consider price and other qualifications in awarding such subcontracts.

Generally:

- i. CM/GC may develop and implement a prequalification process in accordance with Oregon Revised Statutes for competitive bidding for particular solicitations, followed by selection of successful bids among those bidders that CM/GC determines meet the prequalification standards, with City's prior written approval of such prequalification process.
 - ii. The CM/GC shall comply, and require Subcontractor compliance, with the State of Oregon Bureau of Labor & Industries prevailing wage rate requirements. The wage rates that apply to this Project are described in paragraph C.1. of Exhibit A - General Conditions.
- 8) Under special circumstances and only with prior written authorization by City, Work may be subcontracted on other than a low price basis, including without limitation, through competitive negotiation. As a condition to its authorization, City may require CM/GC's agreement to establish and implement qualification and performance criteria for bidders, including a scoring system within requests for proposals. Examples include: where there are single fabricators of materials; special packaging requirements for Subcontractor Work; design-build work or, where an alternative contracting method can be demonstrated to clearly benefit City. Such alternative procurements may, at the sole determination of the City, be subject to the City's procurement policies.
- 9) When the Subcontractor selection process for a particular Work package will not be "competitive"

as provided for in paragraph 11.c.5., the process must meet the following requirements:

- i. The CM/GC must prepare and submit a written justification to the City explaining the project circumstances that support a non-competitive Subcontractor selection process for a particular Work package, including, but not limited to, Emergency circumstances, the CM/GC's need to utilize a key Subcontractor member of the CM/GC's project team consistent with the CM/GC's project proposal, the need to meet other specified Contract requirements, the continuation or expansion of an existing Subcontractor agreement that was awarded through a "competitive process" along with facts supporting the continuation or expansion of the Subcontractor agreement, or a "sole source" justification.
 - ii. For a "sole source" selection of a subcontractor to proceed, the Contracting Agency must evaluate the written justification provided by the CM/GC and must find that critical project efficiencies require utilization of labor, services or materials from one subcontractor; that technical compatibility issues on the project require labor, services or materials from one subcontractor; that particular labor, services or materials are needed as part of an experimental or pilot project or as part of an experimental or pilot aspect of the project; or that other project circumstances exist to support the conclusion that the labor, services or materials are available from only one subcontractor;
 - iii. If required by the City, the CM/GC must provide an independent cost estimate for the Work package that will be subject to the non-competitive process.
 - iv. The CM/GC must fully respond to all City questions or comments pertaining to a proposed or completed non-competitive selection process or associated Work package.
 - v. The City must approve the CM/GC's use of the non-competitive Subcontractor selection process prior to the CM/GC's pursuit of the non-competitive process.
- 10) A competitive selection process may be preceded by a publicly advertised subcontractor pre-qualification process, with only those subcontractors meeting the pre-qualification requirements being invited to participate in the later competitive process through which the CM/GC will select the subcontractor to perform the construction Work described in the selection process;
- 11) If the CM/GC or an Affiliate or subsidiary of the CM/GC will be included in the subcontractor selection process to perform particular construction Work on the project:
- i. the CM/GC must disclose that fact in the selection process documents and announcements.
- 12) CM/GC shall notify City in writing in advance before award of any proposed Subcontract, which notice shall include summaries in a form acceptable to City of all bidders received for the Subcontract at issue. City reserves the right to disapprove any proposed Subcontractors, suppliers and Subcontract or supply contract awards, based on legal standards of responsibility. City shall not unreasonably disapprove any proposed Subcontractor or supplier and increased costs due to City's disapproval shall be cause for an increase in the GMP. Notification shall be made with suitable time for review and comment/approval by the City before issuance of the Subcontract for execution.
- 13) The CM/GC shall notify the City in the event that it receives an objection or protest in response to subcontractor selection. The City must approve the CM/GC's proposed resolution to any such objections or protests, prior to the CM/GC implementing the resolution.

- 14) Briefings for Unsuccessful Subcontractors. Unsuccessful subcontractors will be allowed 60 days from the CM/GC's notice of award of a subcontract for a particular Work package to request, in writing, a post-selection meeting with the CM/GC and the City. The CM/GC shall hold such meetings within 45 days of the subcontractor's written request.
- 15) CM/GC's subcontracting records shall not be considered public records; provided, however, that City and other agencies of the State shall retain the right to inspect, audit and monitor the subcontracting process in order to protect the City's interests.

d. CM/GC Field Work.

- 1) The CM/GC or its Affiliate(s) may provide GC Work required to complete the Project with its own forces, without the necessity of subcontracting such Work.
- 2) Except as provided in paragraph 11..d.1), any other portion of the Work proposed to be performed by CM/GC or any Affiliate, including without limitation provision of any materials, equipment, or supplies, shall be subject to the provisions of paragraph 11..e.

e. Subcontracting by CM/GC.

- 1) Except to the extent otherwise approved in advance in writing by City's Authorized Representative, the CM/GC or its Affiliates may submit a bid in accordance with paragraph 11.c. to do Work with its own forces, provided at least 80% of the labor by such work unit is performed by employees of the CM/GC or such Affiliate. If CM/GC is selected to perform the Work, the overhead and markup paid to CM/GC shall be limited to its CM/GC Fee percentage and the markups applicable to Change Order Work or subcontracted Work set forth in the General Conditions shall not apply. The CM/GC shall clearly identify any Work for which it was the winning bidder in the supporting documentation and invoicing for payments so it can be easily determined that the Work was provided within CM/GC's bid price.
- 2) For those items for which the CM/GC or any of its subsidiaries intends to submit a bid, such intent must be publicly announced with the solicitation for bidders required by paragraph 11.c., and City notified in writing. All bids for this Work, including the CM/GC, shall be delivered to City and publicly opened by City at an announced time, date, and place. An appointed City representative will provide objective, independent review and opening of bids or proposals for the elements of Work on which CM/GC bids.
- 3) CM/GC or an Affiliate or subsidiary of the CM/GC may only perform elements of the construction Work without competition from subcontractors when:
 - i. The work is job-site GC Work, or
 - ii. The CM/GC proposed to self-perform certain elements of the Work in response to the City's CM/GC RFP and the City accepted these portions of the proposal in its contract negotiations with the CM/GC, or
 - iii. The CM/GC provides the City a detailed written proposal to self-perform the work, showing that such self-performance is cost effective, the City accepts the written proposal and the proposal is supported by at least one independent cost estimate prior to Work being included in the Contract.

- f. **Change of Subcontractors.** Once a subcontract has been accepted by the City and executed by the CM/GC and Subcontractor, CM/GC shall not terminate or substitute the Subcontractor without prior written approval of the City. In the event a change to the subcontract assignment is made, CM/GC shall initiate a new bid package consistent with this Agreement to procure a new Subcontractor.

12. ACCOUNTING RECORDS

- a. **Accounting; Audit Access.** The CM/GC shall keep full and detailed accounts and exercise such controls as may be necessary for proper financial management under the Contract; the accounting and control systems shall be satisfactory to City. City and City's representatives shall be afforded reasonable and regular access to the CM/GC's records, books, correspondence, instructions, drawings, receipts, subcontracts, purchase orders, vouchers, memoranda and other data relating to the Contract, and the CM/GC shall preserve these for a period of three years after final payment, or for such longer period as may be required by law.
- b. **Periodic and Final Audits.** City may, at its discretion, perform periodic audits of the Cost of the Work and any other reimbursable costs associated with the Project. City intends to conduct a final audit of reimbursable costs prior to the Contract closeout and final payment application approval. The CM/GC shall cooperate fully with City in the performance of such audits. Disputes over audit findings or conclusions shall be subject to the process set forth in paragraph 14.d.

13. PROGRESS PAYMENTS

- a. **Integration with General Conditions.** The requirements of this paragraph 13. and paragraph 14. are in addition to, and not in lieu of, the requirements of Section E of the General Conditions. In the event of conflict between the provisions of paragraph 13. and 14. and Section E, the provision more favorable to City shall control. Without limitation, the provisions of paragraph 13..c. and 13..d. shall control over the corresponding provisions of Section E.2.5 of the General Conditions.
- b. **Progress Payments.** Based upon applications for payment submitted pursuant to Section E of the General Conditions, City shall make progress payments on account of the Preconstruction Fee, Cost of the Work, and associated CM/GC Fee, less 5% retainage, to the CM/GC as provided below and elsewhere in the Contract Documents. A progress payment shall not be considered acceptance or approval of any Work or waiver of any defects therein. All progress payment requests shall include the forms designated or approved by the City stating that all of the Contractor's obligations to date relating to the Work have been paid. Reference Exhibit E, Progress Payment Waiver and Release.
- c. **Percentage of Completion.** Applications for payment shall show the percentage of completion of each portion of the Work as of the end of the period covered by the application for payment. The percentage of completion shall be the lesser of (i) the percentage of that portion of the Work which has actually been completed; or (ii) the percentage obtained by dividing (a) the expense that has actually been incurred by the CM/GC on account of that portion of the Work for which the CM/GC has made or intends to make actual payment prior to the next application for payment by (b) the share of the GMP allocated to that portion of the Work in the Schedule of Values.
- d. **Calculation of Payment.** Subject to other provisions of the Contract Documents, the amount of each progress payment shall be computed as follows:
 - 1) Take that portion of the GMP properly allocable to completed Work as determined by multiplying the percentage of completion of each portion of the Work based on the monthly progress schedule update by the share of the GMP allocated to that portion of the Work in the Schedule of Values.

Pending final determination of cost to the City of changes in the Work, amounts not in dispute shall be included. For the lump-sum General Conditions, the amount payable will be equal to the amount allocated to General Conditions multiplied by the overall percent complete for the Project;

- 2) Add that portion of the GMP properly allocable to materials and equipment delivered and suitably stored and otherwise in compliance with Section E.2.3 of the General Conditions;
- 3) Add the CM/GC's Fee. The portion of the CM/GC's Fee payable shall be an amount that bears the same ratio to CM/GC Fee as sum of the amounts in the two preceding Clauses bears to the estimated probable Cost of the Work described in paragraph 8..a., but in no event causing total CM/GC Fee payments to exceed the total CM/GC Fee;
- 4) Subtract the aggregate of previous payments made by and retained by the City;
- 5) Subtract the shortfall, if any, indicated by the documentation required to substantiate prior applications for payment, or resulting from errors subsequently discovered by the City in such documentation;
- 6) Subtract any amounts for which the City's Authorized Representative has withheld or denied payment as provided in the Contract Documents; and
- 7) Subtract 5% retainage on the entire progress payment.

14. FINAL PAYMENT

- a. **Final Payment Accounting.** CM/GC shall submit to City a final detailed accounting of the Cost of the Work together with CM/GC's final application for payment.
- b. **Calculation of Final Payment.** The amount of the final payment shall be calculated as follows:
- 1) Take the sum of the CM/GC Fee, plus the Preconstruction Fee, plus the actual Cost of the Work substantiated by the CM/GC's final accounting. Said sum shall not exceed the GMP.
 - 2) Subtract amounts, if any, for which the City's Authorized Representative withholds, in whole or in part, approval of payment.
 - 3) Subtract the aggregate of previous payments made by City to CM/GC. If the aggregate of previous payments made by City exceeds the amount due the CM/GC, the CM/GC shall reimburse the difference to City within 30 Days with interest at the rate applicable to City payments under the General Conditions.
- c. **Final Payment Review.** City or its accountants will review and report in writing on the CM/GC's final accounting within twenty (20) business days after delivery of the final accounting by the CM/GC. Based upon such Cost of the Work as City or City's accountants report to be substantiated by the CM/GC's final accounting, and provided the other conditions of the Contract have been met, the City's Authorized Representative will, within ten (10) business days after receipt of the written report of City's accountants, either issue to City an approval of CM/GC's final application for payment with a copy to the CM/GC or notify the CM/GC and City in writing of the City's Authorized Representative's reasons for withholding approval of any part of the application for payment, which disapproval shall include City's Authorized Representative's estimate of the amount that is due the CM/GC under the application for payment.
- d. **Payment Disputes.** If City's accountants report the Cost of the Work as substantiated by the CM/GC's final accounting to be less than claimed by the CM/GC or if City's Authorized Representative declines to approve any duly submitted payment request by CM/GC, the CM/GC shall be entitled to demand a review by the City's highest contracting authority of the disputed amount. Such demand shall be made by the CM/GC within twenty (20) business days after the CM/GC's receipt of a copy of the rejection of the application for payment; failure to demand additional review within this 20-Day period shall result in the substantiated amount reported by City's accountants becoming binding on the CM/GC. In addition, If City performs a subsequent audit of the Cost of the Work and determines any item therein to have been unsubstantiated or that CM/GC was otherwise overpaid, CM/GC shall have twenty (20) business days after delivery of request for reimbursement by City to demand additional review by City's highest contracting authority; failure to make such demand within this 20 Day period shall result in the requested reimbursement becoming unconditionally due and payable by CM/GC. If CM/GC timely submits a protest to the City's highest contracting authority, CM/GC's Claim shall be subject to the claims review process in Section D.3 of the General Conditions. Pending a final resolution, City shall pay the CM/GC the amount of the application for payment approved by the City's Authorized Representative.

15. **Effect of Payment.** Neither approval of an application for payment, a progress payment, release of retainage, final payment, or partial or entire use or occupancy of the Project by the City shall constitute acceptance of Work not conforming to the Contract Documents, a waiver of City's right to compel CM/GC to fix nonconforming Work or waiver of the right to assert overpayment.

16. TERMINATION OR SUSPENSION

- a. **City's Right to Terminate Prior to Execution of GMP Amendment.** Prior to execution by both parties of the GMP Amendment, the City may terminate the Contract at any time without cause. Upon such termination, the amount to be paid to the CM/GC shall not exceed the Preconstruction Fee payable to the date of termination, together with amounts payable for Early Work if an Early Work Amendment has been executed. If City terminates for convenience during the Preconstruction Phase, City shall be entitled to copies of, and shall have the right to use, all work products of CM/GC and its Subcontractors performed to the date of termination, and CM/GC shall deliver copies of the same to City on request.
- b. **City's Termination for Convenience after GMP Amendment.** After the GMP Amendment is executed by both parties, the Contract may be terminated by City without penalty for convenience pursuant to Section J.5 of the General Conditions in which case CM/GC shall be entitled to payment of the amount stated in paragraph 16.a., together with the actual Cost of the Work completed, plus the CM/GC's Fee prorated based on the actual Cost of the Work completed prior to the date of termination, but in any event not in excess of the GMP.
- c. **City's Termination for Cause.** In the event of termination of this Agreement by City for cause pursuant to Section J.4 of the General Conditions, the amount, if any, to be paid to the CM/GC after application of the General Conditions and City's rights at law shall not exceed the amount the CM/GC would be entitled to receive under paragraph 16.b. If a court or other dispute resolution body determines City's for-cause termination to be unlawful, the City's termination is to be deemed a termination for convenience under 16.b. to the greatest extent the law permits.
- d. **CM/GC Termination for Cause.** CM/GC acknowledges that disputes regarding payments and Change Orders may occur as part of the CM/GC process, and that City's declining to pay disputed amounts shall not be grounds for suspension of the Work or termination for cause by CM/GC. If CM/GC terminates the Contract for City's material breach, the amount to be paid to CM/GC shall not exceed the amount CM/GC would have been entitled to receive under paragraph 16. above through termination and demobilization from the Project, with the CM/GC Fee prorated based on the actual Cost of the Work through the date of termination.
- e. **Assignment of Subcontracts.** Each Subcontract and supply contract for any portion of the Work is hereby irrevocably assigned by the CM/GC to the City, provided that such assignment is effective only after termination of the Contract by the City, and only for those Subcontracts and supply contracts which the City accepts by notifying the Subcontractor/supplier and CM/GC in writing. For those Subcontracts and supply contracts accepted by City, if the Work has been suspended for more than twenty (20) business days, the Subcontractor's/supplier's compensation shall be equitably adjusted for increases in cost resulting from the suspension. CM/GC shall include a provision in each Subcontract and supply agreement whereby the Subcontractor/supplier acknowledges City's rights under this paragraph 17.e. With respect to any Subcontracts/supply contracts that are not accepted by City, the provisions of Section J.6.1 of the General Conditions shall apply.

17. REPRESENTATIONS, WARRANTIES AND CERTIFICATIONS

- a. **Representations and Warranties.** CM/GC represents and warrants to City as of the effective date of the Contract:
 - 1) it is qualified to do business as a licensed general contractor under the laws of the State of Oregon, and has all requisite corporate power and corporate authority to carry on its business as now being

conducted;

- 2) it has full corporate power and corporate authority to enter into and perform the Contract and to consummate the transactions contemplated hereby; CM/GC has duly and validly executed and delivered this Agreement to City and that the Contract constitutes the legal, valid and binding obligation of CM/GC, enforceable against CM/GC in accordance with its terms, except as enforceability may be limited or affected by applicable bankruptcy, insolvency, reorganization, moratorium or other similar laws affecting creditors' rights generally and by general principles of equity (regardless of whether enforceability is considered in a proceeding in equity or at law);
- 3) CM/GC's execution and delivery of this Agreement and the consummation of the transactions contemplated hereby will not conflict with or result in a material breach of any terms or provisions of, or constitute a material default under,
 - i. CM/GC's Articles of Incorporation or Bylaws;
 - ii. any note, bond, mortgage, indenture, license, lease, contract, commitment, agreement or other instrument or obligation to which CM/GC is a party or by which CM/GC may be bound; or
 - iii. any statute, order, writ, injunction, decree, rule or regulation applicable to CM/GC;
- 4) no material consent, approval, authorization, declaration or other order of, or registration or filing with, any court or regulatory authority or any third person is required for the valid execution, delivery and performance of the Contract by CM/GC or its consummation of the transactions contemplated hereby;
- 5) there is no action, proceeding, suit, investigation or inquiry pending that questions the validity of the Contract or that would prevent or hinder the consummation of the transactions contemplated hereby; and
- 6) the CM/GC's Project Manager identified in paragraph 4.e. is a duly appointed representative and has the authority to bind the CM/GC to any and all duties, obligations and liabilities under the Contract Documents and any Amendments thereto.

b. Tax Compliance Certification.

By signature on this Agreement, the undersigned hereby certifies under penalty of perjury that the undersigned is authorized to act on behalf of CM/GC and that CM/GC is, to the best of the undersigned's knowledge, not delinquent in the filing or payment of any Oregon income taxes, Oregon personal property taxes, Oregon municipal taxes, or Oregon real property taxes and that it has otherwise complied with all Oregon tax laws and all tax laws of those Oregon municipalities to which Engineer is subject.. For purposes of this certification, "taxes" includes a state tax imposed by ORS 401.792 to 401.816 and ORS chapters 118, 314, 316, 317, 318, 320, 321 and 323; the elderly rental assistance program under ORS 310.630 to 310.706, and local taxes administered by the Department of Revenue under ORS 305.620.

18. MISCELLANEOUS

- a. **Headings.** The headings used in this Agreement are solely for convenience of reference, are not part of the Contract and are not to be considered in construing or interpreting the Contract.

- b. Merger.** The Contract Documents constitute the entire Contract between the parties and supersedes any previous negotiations, agreements or other commitments between the Parties for this Project. No waiver, consent, modification or change of terms of the Contract shall bind either party unless in writing and signed by both parties. Such waiver, consent, modification or change, if made, shall be effective only in the specific instance and for the specific purpose given. There are no understandings, agreements, or representations, oral or written, not specified herein regarding the Contract. CM/GC, by signature of its representative, hereby acknowledges that it has read the Contract, understands it and agrees to be bound by its terms and conditions.

- c. Foreign Contractor.** The CM/GC shall be domiciled in or registered to do business in the State of Oregon. If the CM/GC is not domiciled in or registered to do business in the State of Oregon, CM/GC shall promptly provide to the Oregon Department of Revenue and the Secretary of State Corporation Division all information required by those agencies, or other regulatory bodies, relative to the resultant Contract. CM/GC shall maintain its legal capacity to perform the services set forth under the Contract.

- d. Recyclable Products.** The CM/GC shall use recyclable products to the maximum extent economically feasible in the performance of the Contract Work set forth in this document.

CM/GC has the power and authority to enter into and perform this Contract. The persons executing this Contract on behalf of CM/GC, have the actual authority to bind CM/GC to the terms of this Contract.

For the CM/GC

For the City

Insert Full, Legal name of the CM/GC

Signature

Jordan Wheeler, City Manager

Printed Name and Title

Date

Attachment D
Clean Water State Revolving Fund Forms and Requirements

The following attached CWSRF forms must be submitted with the proposal:

- BC 4 – Sworn Statement of Compliance
- BC 5 – Prevailing Wage Agreement
- BC 6 – List of Contacted DBE Businesses
- BC 7 – Certification of Independent Price Determinations
- BC 8 – Fair Share Objectives, Six Good Faith Efforts, Contract Administration and Contract Language
- BC 9 – Certification Regarding Lobbying Activities
- BC 10 – Disclosure of Lobbying Activities
- BC 11 – Certification of Non-segregated Facilities
- BC 13 – Debarment and Suspension
- BC 11 – Certification of Non-segregated Facilities
- BC 12 – Non-discrimination in Employment Notice to Labor unions or Other Organizations of Workers
- BC 14 – Contractors compliance statement (EO 11246)



State of Oregon
Department of
Environmental
Quality

State of Oregon Department of Environmental Quality

Sworn Statement of Compliance

Contact: [Regional Project Officer](#)

Sworn Statement of Compliance with Small, Women and Minority Business Utilization Requirements

To be eligible for award of this contract, each bidder must execute, and submit, as part of their proposal, and together with their bid, the following certification relating to SBE/WBE/MBE participation. The certification below shall be deemed a part of the resulting contract.

The bidder has taken the following affirmative steps in awarding subcontracts:

- (1) Include qualified small, minority and women's businesses on solicitation lists
- (2) Insure that small, minority and women's businesses are solicited whenever they are potential sources
- (3) Divide total requirements, when economically feasible, into smaller tasks or quantities to permit maximum participation of small, minority and women's businesses
- (4) Use the services and assistance of the Small Business Administration and the Minority Business Development Agency of the U.S. Department of Commerce as appropriate.

Contract # _____

Contract Title: _____

Name of Company: _____

Signature of Authorized Official _____ Date _____

Name and Title of Signer _____

Alternative formats

DEQ can provide documents in an alternate format or in a language other than English upon request. Call DEQ at 800-452-4011 or email deqinfo@deq.state.or.us.



State of Oregon Department of Environmental Quality

Prevailing Wage Agreement

Contact: **Regional Project Officer**

The loan recipient, prime contractor and subcontractors all must initial and sign this form.

- The prime contractor copy must be submitted as part of the bid/proposal to the loan recipient.
- A copy of this form signed by the loan recipient and the prime contractor must be submitted with the contract copy to DEQ.
- The prime contractor must obtain a signed copy of this form from each subcontractor and retain them in the prime contractor's contract file.

The undersigned understands that this public works project is funded in whole or in part by the Clean Water State Revolving Fund and is subject to the prevailing wage requirements of Oregon's Bureau of Labor and Industry and the requirements of the Davis-Bacon Act.

_____ The undersigned agrees that, notwithstanding any other provision of law, all laborers and mechanics employed on the project must be paid wages at rates not less than those prevailing on projects of a similar character in the locality, as determined by the United States Secretary of Labor, or the Commissioner of the Oregon Bureau of Labor and Industries, whichever is higher, per ORS 279C.838; OAR 839-025-0035(2).

When a public works project is subject to both the state and federal prevailing wage rate laws, contractors and subcontractors must pay the higher of either the state or federal prevailing wage rates for the type of work being performed, per ORS 279C.838; OAR 839-025-0035(2).

Davis Bacon (federal law) for Point Source Projects

_____ Davis-Bacon applies to all **treatment works construction projects** for the entirety of the construction activities financed by a CWSRF loan through the completion of construction, no matter when construction commences.

_____ The Loan Agreement includes specific Davis-Bacon terms and conditions contract language that must be passed through to the prime contractor and all subcontractors in their contracts over \$2,000.

_____ The Secretary of Labor's determination, regarding the prevailing wages applicable in the state of Oregon, are located at: <http://www.wdol.gov/> The prevailing wages are those in effect at the time of contract award. Wages obtained through this web link should be printed at the time of contract award and included in procurement documents and all contracts resulting from the procurements.

_____ The loan recipient or the prime contractor on behalf of the loan recipient maintains on-going wage information as a requirement of the Clean Water State Revolving Fund loan for a project subject to Davis-Bacon. The program suggests using the [wage matrix](#). You may find the [instructions](#) helpful.

_____ The loan recipient conducts a wage interview at 30 percent, 60 percent and 90 percent completion, with a representative group of workers during the project construction. The loan recipient must conduct additional interviews if there is any reason to suspect a contractor or their subcontractor is at risk for

violating wage requirements. As provided in 29 CFR 5.6(a)(6), all interviews must be conducted in confidence. The loan recipient must use [Standard Form 1445](#) to memorialize the interviews.

Oregon Bureau of Labor and Industry (state law)

_____ Bureau of Labor and Industry prevailing wage rates apply to projects over \$50,000. Oregon prevailing wage rate regulations require every contractor or subcontractor employing workers on a public works project must pay to such workers no less than the applicable prevailing rate of wage for each trade or occupation, as determined by the commissioner, in which the workers are employed, per OAR 839-025-0035.

_____ The wage rates identified by the Commissioner of the Oregon Bureau of Labor and Industry are available [online](#).

_____ The prevailing wage rates in effect at the time the bid specifications are first advertised are the Oregon wage rates that apply for the duration of the project. Prevailing wages obtained through the Bureau of Labor and Industry websites must be included in the bid solicitation and incorporated in all contracts resulting from the procurements.

_____ All contractors and subcontractors shall file, with the Construction Contractors Board, a \$30,000 public works bond with a corporate surety authorized to do business in this state, per ORS 279C.836. The bond must provide that the contractor or subcontractor will pay claims ordered by Bureau of Labor and Industry to workers performing labor upon public works projects. It must be filed before starting work on a contract or subcontract for the project.

Payroll/Certified Statement (form WH-38)

Form WH-38 may be used by contractors for reporting their payroll as required by ORS 279C.845 on public works projects subject to the Prevailing Wage Rate Law. This form has not been officially approved by the United States Department of Labor, however it is designed to meet the requirements of the federal Davis-Bacon Act as well. Prevailing wage rate [forms](#) are available online.

Signature

Date

Title

Company

Alternative formats

DEQ can provide documents in an alternate format or in a language other than English upon request. Call DEQ at 800-452-4011 or email deqinfo@deq.state.or.us



State of Oregon Department of Environmental Quality
**List of Contacted Disadvantaged
Business Enterprises**

Contact: [Regional Project Officer](#)

Name of Business	Certification #	Contact Person	Phone Number	Date of Contact	Reason for Non-participation

Name of Business	Certification #	Contact Person	Phone Number	Date of Contact	Reason for Non-participation

List of Disadvantaged Businesses Contacted

Page 2

Alternative formats

Documents can be provided upon request in an alternate format for individuals with disabilities or in a language other than English for people with limited English skills. To request a document in another format or language, call DEQ in Portland at 503-229-5696, or toll-free in Oregon at 1-800-452-4011, ext. 5696; or email deqinfo@deq.state.or.us.

List of Disadvantaged Businesses Contacted



State of Oregon Department of Environmental Quality

Certificate of Independent Price Determination

Contact: [Regional Project Officer](#)

The prime contractor must:

- Sign and submit this form as part of the bid/proposal to the loan recipient
- Include a signed copy in their contract
- Retain a signed copy of this form from each subcontractor

Bidder's Name: _____

Address: _____

a. The bid offeror certifies that:

1. The prices in this offer have been arrived at independently without, for the purpose of restricting competition, any consultation, communication or agreement with any other offeror or competitor relating to:
 - i. Those prices
 - ii. Intention to submit an offer
 - iii. Methods or factors used to calculate the prices offered
2. The prices in this offer have not been and will not be knowingly disclosed by the offeror, directly or indirectly, to any other offeror or competitor before bid opening (in the case of a sealed bid solicitation) or contract award (in the case of a negotiated solicitation) unless otherwise required by law
3. No attempt has been or will be made by the offeror to induce any other concern to submit or not to submit an offer for the purpose of restricting competition.

b. Each signature on the offer is considered to be a certification by the signatory that the signatory:

1. Is the person in the offeror's organization responsible for determining the prices being offered in this bid or proposal, and that the signatory has not participated and will not participate in any action contrary to subparagraphs (a)(1) through (a)(3) above; or
2. Has been authorized, in writing, to act as agent for the following principals in certifying that those principals have not participated, and will not participate, in any action contrary to subparagraphs (a)(1) through (a)(3) above;
3. As an authorized agent, certifies that the principals named below have not participated, and will not participate, in any action contrary to subparagraph (a)(1) through (a)(3) above; and

4. As an agent, has not personally participated, and will not participate, in any action contrary to subparagraphs (a)(1) through (a)(3) above.
5. If the offeror deletes or modifies subparagraph (a)(2) above, the offeror must furnish with its offer a signed statement setting forth in detail the circumstances of the disclosure.

Insert full name of person(s) in the offeror's organization responsible for determining the prices offered in this bid or proposal, and the title of his or her position in the offeror's organization:

Full Name of Person(s) in the Offeror's Organization	Title	Date
_____	_____	_____
_____	_____	_____
_____	_____	_____

Signature of Prime Contractor _____

Alternative formats

DEQ can provide documents in an alternate format or in a language other than English upon request. Call DEQ at 800-452-4011 or email deqinfo@deq.state.or.us.



State of Oregon Department of Environmental Quality

Six Good Faith Efforts, Contract Administration and Contract Language

[Regional Project Officer](#)

This form must be completed by the loan recipient, prime contractor and any subcontractor who will further subcontract on the Clean Water State Revolving Fund project within the scope of the loan. All boxes in this attachment must be initialed and the bottom signed.

- One completed attachment for the prime contractor must be submitted as part of the bid/proposal to the loan recipient.
- One completed attachment for each subcontractor who will further subcontract must be submitted before the contract award.
- A copy of those must be included in the contract copy to DEQ, along with one attachment initialed and signed by the loan recipient.

DBE certification

All Minority Business Enterprises and Woman Business Enterprises must be certified by Oregon's [Office of Minority, Women and Emerging Small Businesses](#) or by the state in which they are located. This office administers the Disadvantaged Business Enterprise, Minority Business Enterprise/Women Business Enterprise, and Emerging Small Business programs.

Six Good-Faith Efforts

The good-faith efforts are required methods to ensure that all DBEs have the opportunity to compete for procurements funded by the Clean Water State Revolving Fund. The loan recipient and their prime contractor are required to:

1. Ensure DBEs are made aware of contracting opportunities to the fullest extent practicable through outreach and recruitment activities. For Indian tribal, state and local government recipients, this will include placing DBEs on solicitation lists and soliciting them whenever they're potential sources.
2. Make information on forthcoming opportunities available to DBEs and arrange time frames for contracts and establish delivery schedules, where the requirements permit, in a way that encourages and facilitates participation by DBEs in the competitive process. This includes, whenever possible, posting solicitations for bids or proposals for a minimum of 30 calendar days before the bid or proposal closing date.
3. Consider in the contracting process whether firms competing for large contracts could subcontract with DBEs. For Indian tribal, state and local government recipients, this will include dividing total requirements when economically feasible into smaller tasks or quantities to permit maximum participation by DBEs in the competitive process.
4. Encourage contracting with a consortium of DBEs when a contract is too large for one of these firms to handle individually.

BC8

5. Use the services and assistance of the federal Small Business Administration, Minority Business Development Agency of the U.S. Department of Commerce, and the state Office of Minority, Women and Emerging Small Business.
6. If the prime contractor awards subcontracts, require the prime contractor to take steps one through five above.
7. **Native American provisions 40 CFR, Section 33.304**
The recipient agrees to comply with the contract administration provisions of 40 CFR, Section 33.304. Any recipient, whether or not Native American, of an EPA financial assistance agreement for the benefit of Native Americans, is required to solicit and recruit Indian organizations and Indian-owned economic enterprises and give them preference in the award process prior to undertaking the six good faith efforts. If the efforts to solicit and recruit Indian organizations and Indian-owned economic enterprises is not successful, then the recipient must follow the six good faith efforts.

Contract administration

_____ The Loan Recipient must require its prime contractor to employ the six good faith efforts even if the prime contractor has achieved its fair share objectives.

_____ If a DBE subcontractor fails to complete work under the subcontract for any reason, the Loan Recipient must require the prime contractor to employ the six good faith efforts if soliciting a replacement subcontractor.

_____ The Loan Recipient must require its prime contractor to pay its subcontractor for satisfactory performance no more than 30 days from the prime contractor's receipt of payment from the Loan Recipient.

_____ The Loan Recipient must require written notification from its prime contractor prior to any termination of a DBE subcontractor for convenience by the prime contractor.

_____ Specific contract language

All contracts between the Loan Recipient and prime contractor, and prime contractor and subcontractors must include the following statement required by 40 CFR Part 33:

"The contractor shall not discriminate on the basis of race, color, national origin or sex in the performance of this contract. The contractor shall carry out applicable requirements of 40 CFR part 33 in the award and administration of contracts awarded under EPA financial assistance agreements. Failure by the contractor to carry out these requirements is a material breach of this contract which may result in the termination of this contract or other legally available remedies."

BC8

The undersigned has initialed the items above and understands the resulting responsibility for each item.

Signature

Date

Title

Company

Accessibility

Alternative formats DEQ can provide documents in an alternate format or in a language other than English upon request. Call DEQ at 800-452-4011 or email deqinfo@deq.state.or.us.



State of Oregon Department of Environmental Quality
Certification Regarding Lobbying Activities

Contact: [Regional Project Officer](#)
503-229-LOAN

This form must be signed by the prime contractor and submitted by the loan recipient by the time the contract is award. A copy must be included in the contract copy to DEQ. The prime contractor must obtain a signed copy of this form from each subcontractor, and retain them in the prime contractor's contract file.

The undersigned certifies, to the best of his or her knowledge and belief, that:

- (1) No Federal appropriated funds have been paid or will be paid, by or on behalf of the undersigned, to any person for influencing or attempting to influence an officer or employee of any agency, a Member of Congress, an officer or employee of Congress, or an employee of a Member of Congress in connection with the awarding of any Federal contract, the making of any Federal grant, the making of any Federal loan, the entering into of any cooperative agreement, and the extension, continuation, renewal, amendment, or modification of any Federal contract, grant, loan, or cooperative agreement.
- (2) If any funds other than Federal appropriated funds have been paid or will be paid to any person for influencing or attempting to influence an officer or employee of any agency, a Member of Congress, an officer or employee of Congress, or an employee of a Member of Congress in connection with this Federal Contract, grant, loan, or cooperative agreement, the undersigned shall complete and submit Standard Form LLL, "Disclosure of Lobbying Activities," in accordance with its instructions.
- (3) The undersigned shall require that the language of this certification be included in the award documents for all sub-awards at all tiers (including subcontracts, subgrants, and contracts under grants, loans, and cooperative agreements) and that all sub-recipients shall certify and disclose accordingly.

This certification is a material representation of fact upon which reliance was placed when this transaction was made or entered into. Submission of this certification is a prerequisite for making or entering into this transaction imposed by *Section 1352, Title 31, U.S. Code*. Any person who fails to file the required certification shall be subject to a civil penalty of not less than \$10,000 and not more than \$100,000 for each such failure.

Signature

Date

Alternative formats

DEQ can provide documents in an alternate format or in a language other than English upon request. Call DEQ at 800-452-4011 or email deqinfo@deq.state.or.us.

DISCLOSURE OF LOBBYING ACTIVITIES

Complete this form to disclose lobbying activities pursuant to 31 U.S.C. 1352
(See reverse for public burden disclosure.)

<p>1. Type of Federal Action:</p> <p><input type="checkbox"/> a. contract <input type="checkbox"/> b. grant <input type="checkbox"/> c. cooperative agreement <input type="checkbox"/> d. loan <input type="checkbox"/> e. loan guarantee <input type="checkbox"/> f. loan insurance</p>	<p>2. Status of Federal Action:</p> <p><input type="checkbox"/> a. bid/offer/application <input type="checkbox"/> b. initial award <input type="checkbox"/> c. post-award</p>	<p>3. Report Type:</p> <p><input type="checkbox"/> a. initial filing <input type="checkbox"/> b. material change</p> <p>For Material Change Only: year _____ quarter _____ date of last report _____</p>
<p>4. Name and Address of Reporting Entity:</p> <p><input type="checkbox"/> Prime <input type="checkbox"/> Subawardee Tier _____, if known:</p> <p>Congressional District, if known:</p>	<p>5. If Reporting Entity in No. 4 is a Subawardee, Enter Name and Address of Prime:</p> <p>Congressional District, if known:</p>	
<p>6. Federal Department/Agency:</p>	<p>7. Federal Program Name/Description:</p> <p>CFDA Number, if applicable: _____</p>	
<p>8. Federal Action Number, if known:</p>	<p>9. Award Amount, if known:</p> <p>\$ _____</p>	
<p>10. a. Name and Address of Lobbying Registrant (if individual, last name, first name, MI):</p>	<p>b. Individuals Performing Services (including address if different from No. 10a) (last name, first name, MI):</p>	
<p>11. Information requested through this form is authorized by title 31 U.S.C. section 1352. This disclosure of lobbying activities is a material representation of fact upon which reliance was placed by the tier above when this transaction was made or entered into. This disclosure is required pursuant to 31 U.S.C. 1352. This information will be reported to the Congress semi-annually and will be available for public inspection. Any person who fails to file the required disclosure shall be subject to a civil penalty of not less than \$10,000 and not more than \$100,000 for each such failure.</p>	<p>Signature: _____ Print Name: _____ Title: _____ Telephone No.: _____ Date: _____</p>	
<p>Federal Use Only:</p>		<p>Authorized for Local Reproduction Standard Form LLL (Rev. 7-97)</p>

INSTRUCTIONS FOR COMPLETION OF SF-LLL, DISCLOSURE OF LOBBYING ACTIVITIES

This disclosure form shall be completed by the reporting entity, whether subawardee or prime Federal recipient, at the initiation or receipt of a covered Federal action, or a material change to a previous filing, pursuant to title 31 U.S.C. section 1352. The filing of a form is required for each payment or agreement to make payment to any lobbying entity for influencing or attempting to influence an officer or employee of any agency, a Member of Congress, an officer or employee of Congress, or an employee of a Member of Congress in connection with a covered Federal action. Complete all items that apply for both the initial filing and material change report. Refer to the implementing guidance published by the Office of Management and Budget for additional information.

1. Identify the type of covered Federal action for which lobbying activity is and/or has been secured to influence the outcome of a covered Federal action.
2. Identify the status of the covered Federal action.
3. Identify the appropriate classification of this report. If this is a followup report caused by a material change to the information previously reported, enter the year and quarter in which the change occurred. Enter the date of the last previously submitted report by this reporting entity for this covered Federal action.
4. Enter the full name, address, city, State and zip code of the reporting entity. Include Congressional District, if known. Check the appropriate classification of the reporting entity that designates if it is, or expects to be, a prime or subaward recipient. Identify the tier of the subawardee, e.g., the first subawardee of the prime is the 1st tier. Subawards include but are not limited to subcontracts, subgrants and contract awards under grants.
5. If the organization filing the report in item 4 checks "Subawardee," then enter the full name, address, city, State and zip code of the prime Federal recipient. Include Congressional District, if known.
6. Enter the name of the Federal agency making the award or loan commitment. Include at least one organizational level below agency name, if known. For example, Department of Transportation, United States Coast Guard.
7. Enter the Federal program name or description for the covered Federal action (item 1). If known, enter the full Catalog of Federal Domestic Assistance (CFDA) number for grants, cooperative agreements, loans, and loan commitments.
8. Enter the most appropriate Federal identifying number available for the Federal action identified in item 1 (e.g., Request for Proposal (RFP) number; Invitation for Bid (IFB) number; grant announcement number; the contract, grant, or loan award number; the application/proposal control number assigned by the Federal agency). Include prefixes, e.g., "RFP-DE-90-001."
9. For a covered Federal action where there has been an award or loan commitment by the Federal agency, enter the Federal amount of the award/loan commitment for the prime entity identified in item 4 or 5.
10. (a) Enter the full name, address, city, State and zip code of the lobbying registrant under the Lobbying Disclosure Act of 1995 engaged by the reporting entity identified in item 4 to influence the covered Federal action.

(b) Enter the full names of the individual(s) performing services, and include full address if different from 10 (a). Enter Last Name, First Name, and Middle Initial (MI).
11. The certifying official shall sign and date the form, print his/her name, title, and telephone number.

According to the Paperwork Reduction Act, as amended, no persons are required to respond to a collection of information unless it displays a valid OMB Control Number. The valid OMB control number for this information collection is OMB No. 0348-0046. Public reporting burden for this collection of information is estimated to average 10 minutes per response, including time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the collection of information. Send comments regarding the burden estimate or any other aspect of this collection of information, including suggestions for reducing this burden, to the Office of Management and Budget, Paperwork Reduction Project (0348-0046), Washington, DC 20503.



State of Oregon Department of Environmental Quality
Certification of Non-Segregated Facilities

Contact: [Regional Project Officer](#)
503-229-LOAN

This form must be signed by the prime contractor and submitted by the time of contract award from the Loan Recipient. A copy must be included in the contract copy to DEQ. The prime contractor must obtain a signed copy of this form from each subcontractor, and retain them in the prime contractor's contract file.

Applicable to federally-funded construction contracts and related subcontracts exceeding \$10,000 which are not exempt from the Equal Opportunity clause.

The federally-assisted construction contractor certifies that he does not maintain or provide for his employees any segregated facilities at any of his establishments, and that he does not permit his employees to perform their services at any location, under his control, where segregated facilities are maintained. The federally-assisted construction contractor certifies further that he will not maintain or provide for his employees any segregated facilities at any of his establishments, and that he will not permit his employees to perform their services at any location, under his control, where segregated facilities are maintained. The federally-assisted construction contractor agrees that a breach of this certification is a violation of the Equal Opportunity Clause in this contract.

As used in this certification, the term "segregated facilities" means any waiting rooms, work areas, rest rooms and wash rooms, restaurants and other eating areas, time clocks, locker rooms and other storage or dressing areas, parking lots, drinking fountains, recreation or entertainment areas, transportation, and housing facilities provided for employees which are segregated by explicit directive or are, in fact, segregated on the basis of race, creed, color, or national origin, because of habit, local custom, or otherwise. The federally-assisted construction contractor agrees that (except where he has obtained identical certifications from proposed contractors for specific time periods) he will obtain identical certifications from proposed subcontractors prior to the award of subcontracts exceeding \$10,000 which are not exempt from the provisions of the Equal Opportunity Clause, and that he will retain a copy of such certification.

Signature

Date

Name and Title of signer (please type)

Alternative formats

DEQ can provide documents in an alternate format or in a language other than English upon request. Call DEQ at 800-452-4011 or email deqinfo@deq.state.or.us.



State of Oregon Department of Environmental Quality
Non-discrimination in Employment

Notice to Labor Unions or Other Organizations of Workers

Contact: Regional Project Officer

503-229-LOAN

The CWSRF loan recipient must provide this notice to the contractor and subcontractor(s) advising the labor union or workers' representative of the contractor's commitments under Executive Order No. 11246. The contractor will send a signed notice to each labor union or representative of workers with which he has a collective bargaining agreement or other contract or understanding, and shall post copies of the notice in conspicuous places available to employees and applicants for employment.

TO: _____
NAME OF UNION OR ORGANIZATION OF WORKERS

The undersigned currently holds contract(s) with _____
NAME OF LOAN RECIPIENT

Using funds or credit of the U.S. government, or one or more subcontractors with a prime contractor holding such contracts.

You are advised that under the provisions of the above contract(s) or subcontract(s) and in accordance with Section 202 of Executive Order 11246 dated Sept. 24, 1965, as amended, the undersigned is obliged not to discriminate against any employee or applicant for employment because of race, color, religion, sex or national origin. This obligation not to discriminate in employment includes, but is not limited to, the following:

- EMPLOYMENT, UPGRADING, TRANSFER OR DEMOTION
- RECRUITMENT OR RECRUITMENT ADVERTISING
- RATES OF PAY OR OTHER FORMS OF COMPENSATION
- SELECTION FOR TRAINING INCLUDING APPRENTICESHIP, LAYOFF OR TERMINATION

This notice is furnished to you pursuant to the provisions of the above contract(s) or subcontract(s) and Executive Order #11246.

CONTRACTOR OR SUBCONTRACTOR(S)

DATE

Alternative formats

DEQ can provide documents in an alternate format or in a language other than English upon request. Call DEQ at 800-452-4011 or email deqinfo@deq.state.or.us



State of Oregon Department of Environmental Quality
**Debarment and Suspension for
 Loan Recipient and all Contracts
 of \$25,000 or more**

Contact: [Regional Project Officer](#) or call 503-229-LOAN

The recipient must complete, sign and submit this to the DEQ project officer before the loan project contract is awarded, along with a System for Award Management report for each contractor and subcontractor proposed to perform work within the scope of the loan. **Every contractor paid under this loan agreement with a contract equal to or greater than \$25,000, including professional services, must be registered on the [System for Award Management](#).** Award approval by DEQ is contingent on *none* of the contractors and subcontractors being excluded on the System for Award Management.

The recipient and all subsequent prime and subcontractors must fully comply with Subpart C of 2 Code of Federal Regulations Part 180 and 2 CFR Part 1532, entitled “Responsibilities of Participants Regarding Transactions (Doing Business with Other Persons).” The following contractors and subcontractors are proposed to perform work within the scope of the loan agreement. Use additional pages if necessary.

Loan recipient:

Loan number:

Project:

Contractor name and mailing address	Phone number and email address	DUNS and CAGE number codes for contracts equal to or greater than \$25,000	Contract \$ Amount

 Signature of Authorized Loan Recipient Representative

 Date

 Name and Title of Authorized Representative (type or print clearly)

Alternative formats

DEQ can provide documents in an alternate format or in a language other than English upon request. Call DEQ at 800-452-4011 or email deqinfo@deq.state.or.us



State of Oregon Department of Environmental Quality
Contractor's Compliance Statement
Executive Order #11246

Contact: [Regional Project Officer](#)
503-229-LOAN

This form must be signed by the prime contractor and submitted by the time of contract award from the Loan Recipient. A copy must be included in the contract copy to DEQ.

Date _____

This statement relates to a proposed contract with _____

(Name of CWSRF loan recipient)

who expects to finance the contract with assistance from the Environmental Protection Agency. I am the undersigned bidder or prospective contractor. I represent that:

I have I have not participated in a previous contract or subcontract subject to *Executive Order 11246* of September 24, 1965 (regarding equal employment opportunity) or a preceding similar Executive Order. I agree to comply with all the provisions of this Executive Order and the rules, regulations, and relevant orders of the Secretary of Labor. (*41 CFR 60-1.4(b); 41 CFR 60 1.7 (b)*)

Signature

Date

Name and Title of signer (please type)

Alternative formats

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Staff Report

Meeting Date: March 1, 2021
From Shelley Denison, Associate Planner
SUBJECT: 20-028 The Views SUB TREE FSH PD

BACKGROUND:

These documents are for the continued hearing on The Views Planned Development that was first heard by the City Council on February 16. In addition to the staff report and exhibits, this continued hearing includes two documents, one with staff responses and one with applicant responses, to questions and comments raised by Councilors Hokanson and Exner.

Overview of Development Proposal

The applicant, Even Better Homes, Inc., is proposing to subdivide and develop a Planned Development (PD) on the subject properties adjacent to Vista Loop Drive, north of Highway 26. These properties total 32.87 acres. Both parcels are zoned SFR, Single Family Residential. The applicant proposes constructing 120 single family dwellings (32 attached dwellings and 88 detached dwellings) and 39 multi-family dwellings on two lots.

A Planned Development is a specific kind of development which allows for integrating different kinds of land uses. In this case, the applicant is proposing using mixed housing types with recreational amenities. Additionally, in a Planned Development application, the applicant can request that certain code requirements be waived in order to provide flexible site planning, a mixture of densities, and other objectives as detailed in Chapter 17.64, while still meeting the intent of the code.

A section of the subject site falls within the Flood and Slope Hazard (FSH) area, which has specific code requirements prohibiting development. The City hopes to avoid adverse impacts from flooding, erosion, landslides, and degradation of water within the FSH area. As part of the development, the applicant is also requesting tree removal. According to calculations based on the site acreage, the applicant is required to retain a minimum of 99 trees at 11 inches DBH or greater. The applicant is proposing to retain 212 trees. No trees are proposed to be removed within the FSH area.

Underlying Zone (SFR) Density Calculation

Staff has been asked by a number of individuals, including a few Councilors, what the possible density of dwelling units would be if an applicant were to present a subdivision application within the limitations of the base zoning district, which is Single Family

Residential, or SFR. This question is difficult to answer because there is a difference between what is *conceptually* allowed and what would actually be *pragmatic* to build. The former is based simply on the calculation found in Chapter 17.30 while the latter would require a site planning process to determine how much land would be used for public right-of-way and dedication. Because of this, we can only refer to the conceptual calculation, which can be found in findings 22 through 26 of the staff report. Those calculations show an allowable range of 63 to 159 dwelling units.

LIST OF ATTACHMENTS/EXHIBITS:

- Council Questions and Staff Responses
- Council Questions and Applicant Responses
- Staff Report (from 2/16/21 meeting)
- Updated Exhibit List
- Exhibits A - SSSS

The Views PD



City Council 3/1/2021

Request

The applicant is requesting the following:

- Planned Development
- Zone map amendment
- Subdivision
- Special Variances
- FSH Overlay
- Tree removal

History

- January 2019: Applicant begins discussion with City staff
- May 29, 2019: Pre-application conference
- June/July 2020: Application materials submitted and application deemed complete
- September 2020: Parks and Trails Advisory Board meeting
- November 23, 2020: First Planning Commission hearing
- December 16, 2020: Second Planning Commission hearing
- February 16, 2021: City Council hearing; continuance granted
- March 1, 2021: City Council hearing
- March 15, 2021: End of 120-day clock extension; final order must be signed

Additional Exhibits Since 2/16 Meeting

- Parks and Trails Advisory Board Minutes from 9/23/2020 and 10/14/2020
- Letter extending 120-day clock
- Questions from Councilors with staff and applicant responses

Possible Motions

- Motion Option A: Approve the requested application with conditions and findings as recommended by the Planning Commission.
- Motion Option B: Approve the application with conditions and findings determined by the City Council. If you select this option, staff recommends to have the final order with the full conditions list come back before the City Council for consideration.
- Motion Option C: Deny the application based on code criteria that you find are not satisfied.
- Motion Option D: Ask the applicant to revise the proposal, extend the 120-day clock, and come back before the City Council at a future date with a revised proposal.
- Motion Option E: Continue the hearing to a future City Council date to continue Council dialogue prior to issuing a decision.

Question/Comment	Staff Response
<p>Paragraph 23 Please keep the units consistent. Acres and square feet were interchanged in the same paragraph and the subsequent calculations.</p>	<p>Noted</p>
<p>Paragraph 26 I find this statement either irrelevant or unsubstantiated. If it is relevant, then I would like to understand what sections of the code would apply, what additional approvals would be required. In other words, if this is a real concern please state why. In fact I think that if the applicant requests more than 25% increase to the density, that additional criteria is called out in Section 17.64.40 to include " is outstanding in planned land use and design, and provides exceptional advantages in living conditions and amenities not found in similar developments constructed under regular zoning." That might have been relevant here.</p>	<p>Finding 26 was for informational purposes, and the density bonus is not applicable to this application. You are correct that 17.64.40 would be an appropriate review criteria if an applicant is requesting a density bonus as part of a PD process.</p>
<p>Paragraph 32 In regards to "Staff does not find how any vegetation would be hazardous to the public considering the area is not open to the public", areas in the FSH may not be open to the public now, but I assume they will be accessed when residents move in. Hazardous trees should be required to be removed as part of the development regardless of whether they are currently open to the public. Kids will go into the woods - let's plan on making them as safe as possible.</p>	<p>Common areas will be owned and maintained by an HOA so the HOA is tasked with monitoring the safety of that area.</p>
<p>Paragraph 35 Is this comment boilerplate or is there something I should be aware of. I thought Paragraph 33 stated there would be no development within the area.</p>	<p>We like to be as comprehensive as possible in the staff report by acknowledging key code sections, even if the application does not require a thorough analysis of them.</p>
<p>Paragraph 41 See paragraph 32.</p>	<p>This finding is detailing the requirements for protecting vegetation and trees in the FSH.</p>
<p>Paragraph 43 Not sure what this is supposed to mean when it states "does not qualify." The calculations used in 17.30 take into account the density transfer provisions specified in 17.60.100. That is where the 1.5 in the formula comes from.</p>	<p>Agree that this is awkwardly worded. Because the net site area x 5.8 is less than the unrestricted site area x 5.8 x 1.5, the applicant doesn't qualify for a density transfer under 17.60.</p>
<p>Paragraph 48(a) If the PD were denied, would the process for the developer/landowner be to pursue a zoning change to R1 in order to allow row houses and attached/zero lot line dwellings? And to be clear, those structures are not allowed as a conditional use under SFR.</p>	<p>If they wanted to change the zoning designation to R-1, it would be processed as a Type IV Zone Change application.</p>
<p>Paragraph 48(b) and 48(c) How do these lot sizes and frontages compare to other (if any) PDs that were overlaid on SFR? Overlaid on other zones? What is the story of the 15,000 sq ft lot?</p>	<p>An answer to the first two questions would require entering new evidence into the record. It is important to note that no new PDs have been built in Sandy in about a decade. Staff is unsure what the question regarding the story of the 15,000 sq ft lot means and therefore has no response to this question.</p>

Why would we allow this? Setbacks are a key element of quality of life. (I will note that in the application there is additional details stating why certain setbacks are requested - I would think these details are pertinent to the discussion and staff recommendation.) Essentially what would the development look like if these setbacks were denied? How would the quality of life for the residents be degraded?

The applicant needs to respond to this.

Paragraph 48(f)

Does the planning department have any concern with this?

Typically, long block lengths aren't particularly pedestrian friendly, but staff recognizes that a street layout on this site necessitates a longer block length.

Paragraph 50

How is it in the city's best interest to allow private ownership of open spaces? Is this a deviation from code or up to the developer?

Completely up to the developer.

I agree with the applicant's attorney that the rule of intent sections (or recitals in a contract) are not generally binding - unless someone writes in a clause that explicitly references them (similar to how an exhibit would be referenced in a contract). Therefore I believe that the criteria are laid out in the intent section (17.64.00). If we don't want it to be interpreted this way, then planning should propose a change to the code. Regarding the specific intent statements:

It would appear that only IV, VI, VII, and VIII might apply to this application? Did the applicant offer any justification or statements regarding meeting any of these intents? (Required in 17.64.90(C.1))

In regards to (IV) Promote flexibility in site planning and architectural design, placement, and clustering of structures:

This intent can only be meaningful in a PD where there are multiple zones within the PD. Otherwise the applicant would not need the PD.

In regards to (VII) Provide usable and suitable recreation facilities and public or common facilities:

What constitutes a recreation facility? And how should "public" be interpreted? Does this mean deeded to the city or just unfenced? Is it open to all public or just homeowners?

In regards to (VIII) Allow coordination of architectural styles, building forms and relationships:

I see no evidence that there is any coordination above what is required by "Sandy Style." Am I missing something?

So what is the compelling motivation to grant a PD and undermine the comp plan and the current zoning? Based on the Q&A responses of the Planning

Paragraph 56(h)

Please note that the paragraph number (g) and (h) appear to be random in this section.

In regards to the HOA, how will the multi-family (I assume rentals?) be factored into the HOA membership? Simply identifying an HOA does not address the "detailed statement outlining... responsibilities, and assurances."

Section 17.64.00 is a statement of intent that includes a list of nine goals. However, it is clear from the rest of Chapter 17.64 that a PD project is not expected to achieve all of the goals. For example, Section 19.64.00.A states that a PD is intended to "Refine and implement village development patterns designated "V" on the Comprehensive Plan Map," but Section 19.64.20 expressly states that "Planned Developments are allowed in all zones." Because not all zones are designated "V" on the comprehensive plan map, it would not be possible for a PD to comply with Section 17.64.00.A in a zone that is not designated "V." In other words, the City can give full effect to Section 17.64.020 only by interpreting Section 17.64.00 as a list of non-cumulative goals that a PD is excepted to achieve. This conclusion is reinforced by Section 17.64.060, which lists the allowed uses in all residential and commercial zones, not just those identified by a "V" on the comprehensive plan. Finally, the approval criteria in Section 17.64.100.C requires the PD to "assure consistency with the Intent of this chapter." By requiring the applicant to demonstrate that the PD meets one or more of the goals listed in the Intent section, the Council can ensure that the purposes of the PD chapter are met.

The owner of the apartment(s) will be a member of the HOA. Details of their membership percentages shall be established by the bylaws of the HOA.

Paragraph 56(i) What is the plan for long-term buffer/screening from Johnson RV?	The applicant needs to respond to this.
Paragraph 57 Why grant the sidewalk variance? If this was outside of a PD, standard SFR, would we grant the variance?	Such a variance application request would be allowable under an SFR subdivision.
Paragraph 58 How/why are children safer with only one sidewalk? How would this not be materially detrimental to the public welfare? Are there other requirements/regulations driving this that have a higher priority? If not it would appear this clause has not been met.	The applicant needs to respond to this.
Paragraph 59 How will a meandering walkway on Vista Loop enable or hinder bike traffic? With all of the on-street parking on Vista Loop today, will bikers be inclined to hop on a sidewalk? In regards to elimination of the sidewalk on Highway 26 (Is this really eliminated or is it just a portion? Paragraph 71 identifies it as in), this seems to conflict with a number of points in the code including: 17.84.30 PEDESTRIAN AND BICYCLIST REQUIREMENTS, Paragraphs (A), (B), and (E) 17.100.280 BICYCLE ROUTES	The applicant needs to respond to this.
Paragraph 71 Help me understand where the sidewalk is being requested to be eliminated on Hwy 26.	It is not. There is a sidewalk proposed at the top of slope. See plan set.
Paragraph 74 Will the streets allow Transit buses and school buses reasonable passage and turnaround areas?	The Transit Director did not provide comments to the contrary. All asphalt widths are consistent with the development code and TSP.
Paragraph 75 Was the traffic studied on winter weekends? Section 17.84.50 states "Analysis of other time periods may be required for uses that generate their highest traffic volumes at other times of the day or on weekends. I think we can all recognize that peak traffic will occur on Saturday and Sunday afternoons throughout the winter and summer months as people come down the mountain.	The applicant needs to respond to this.

<p>Paragraph 96 I don't understand the formula. What is meant by the four single family homes? Is something missing? I was expecting numbers matching the type of units being proposed. Do the max units factor into this calculation?</p> <p>This choice to pay in lieu of dedication is at the city's discretion 17.64.50(C). Why was this selected? The staff report states that it was the decision of the applicant.</p>	<p>The "four" in the staff report is a typo. It should read "For the 120 single family homes..." Staff generally believes that a fee-in-lieu is preferable to dedication of parkland because it allows for more City discretion in park development. The fee-in-lieu was also recommended by the Parks and Trails Advisory Board.</p>
<p>Paragraph 98 and 99 If the HOA fails, the residents next to the open spaces will be responsible for significant maintenance. And the two large apartment complexes will have little to no responsibility. Seems both unfair and more importantly, unlikely to be well maintained. We need a way to make sure that corporate entities owning and managing the apartments are also on the hook.</p>	<p>The applicant needs to respond to this.</p>
<p>Paragraph 107 Will these open/park/recreation areas be public or HOA members only? (Does this matter? Is it ok to have private facilities and meet the POS requirements?) Will on street or off street parking be provided?</p>	<p>Public per the PD code section in the municipal code. These lands will not be POS as that zoning designation is only reserved for land owned by the City of Sandy.</p>
<p>Paragraph 128 Does this require resolution prior to approval or approval with conditions? Can one of the conditions be a future Planning Commission determination?</p>	<p>This was a relic from the Planning Commission staff report. PC did recommend pedestrian access (but not a street stub) through lots 91 and 92.</p>
<p>Paragraph 153 See prior comment about danger trees in the FSH.</p>	<p>See previous response.</p>
<p>Paragraph 156 If the meandering path is allowed, will street lights be sufficient to provide safe pedestrian passage?</p>	<p>The Public Works Director will review street lighting during construction plan review which comes after Planning approval/denial.</p>
<p>Section 1 General Project Description Paragraph 2 cites 122 lots and 168 total units. I thought this was updated? Was the application revised?</p>	<p>The total being proposed is 122 lots with 159 dwelling units. If the staff report mentions 168 dwelling units, it is a typo.</p>

The applicant states: "The proposal includes a mixture of housing types and densities; a request for variations to setbacks to promote flexibility in site planning; conservation of natural features by not platting any lots within the FSH or restricted development areas and restricting development within restricted development areas to only permitted uses (trail construction, removal and planting native plants); an array of recreational amenities for the use and enjoyment of residents of The Views; and interesting and functional building designs intended to create a high quality and diverse residential neighborhood."

Specific analysis follows:

"The proposal includes a mixture of housing types and densities; a request for variations to setbacks to promote flexibility in site planning; "

I find this to be irrelevant since Intent (C) and (D) only have meaning above and beyond the rest of the code if the PD contains mixed zoning.

"conservation of natural features by not platting any lots within the FSH or restricted development areas and restricting development within restricted development areas to only permitted uses (trail construction, removal and planting native plants);"

These restrictions and development opportunities are identical within PD or the SFR. Again, no justification for the PD.

"an array of recreational amenities for the use and enjoyment of residents of The Views"

The applicant needs to respond to this.

The staff report identifies specific locations that the developer asks to not establish sidewalks - please locate these areas.

The applicant needs to respond to this.

Is vista loop scheduled for any surfacing upgrades (without development)?

Cannot answer this as it would necessitate new evidence into the record.

Compare the max. units in the underlying zoners to the PD densities.

See findings 22 through 26 in Chapter 17.30 of the staff report.

How many lots will be smaller than the 7500 sq ft?

In addition to the 32 attached single family homes, 75 detached single family home lots are less than 7,500 sq ft

How many lots over 10,000 sq. ft.?

In addition to the 2 multi family lots, 8 detached single family home lots are greater than 10,000 sq ft

There are 5 lots between 7,500 sq ft and 10,000 sq ft

The Views - Applicant Responses to Councilor Hokanson's and Councilor Exner's Questions

Question/Comment	Applicant Responses
<p>Paragraph 23 Please keep the units consistent. Acres and square feet were interchanged in the same paragraph and the subsequent calculations.</p>	<p>This question was answered by City staff.</p>
<p>Paragraph 26 I find this statement either irrelevant or unsubstantiated. If it is relevant, then I would like to understand what sections of the code would apply, what additional approvals would be required. In other words, if this is a real concern please state why. In fact I think that if the applicant requests more than 25% increase to the density, that additional criteria is called out in Section 17.64.40 to include "is outstanding in planned land use and design, and provides exceptional advantages in living conditions and amenities not found in similar developments constructed under regular zoning." That might have been relevant here.</p>	<p>This question was answered by City staff.</p>
<p>Paragraph 32 In regards to "Staff does not find how any vegetation would be hazardous to the public considering the area is not open to the public", areas in the FSH may not be open to the public now, but I assume they will be accessed when residents move in. Hazardous trees should be required to be removed as part of the development regardless of whether they are currently open to the public. Kids will go into the woods - let's plan on making them as safe as possible.</p>	<p>This question was answered by City staff.</p>
<p>Paragraph 35 Is this comment boilerplate or is there something I should be aware of. I thought Paragraph 33 stated there would be no development within the area.</p>	<p>This question was answered by City staff.</p>
<p>Paragraph 41 See paragraph 32.</p>	<p>This question was answered by City staff.</p>
<p>Paragraph 43 Not sure what this is supposed to mean when it states "does not qualify." The calculations used in 17.30 take into account the density transfer provisions specified in 17.60.100. That is where the 1.5 in the formula comes from.</p>	<p>This question was answered by City staff.</p>
<p>Paragraph 48(a) If the PD were denied, would the process for the developer/landowner be to pursue a zoning change to R1 in order to allow row houses and attached/zero lot line dwellings? And to be clear, those structures are not allowed as a conditional use under SFR.</p>	<p>This question was answered by City staff.</p>

<p>Paragraph 48(b) and 48(c) How do these lot sizes and frontages compare to other (if any) PDs that were overlaid on SFR? Overlaid on other zones?</p> <p>What is the story of the 15,000 sq ft lot?</p>	<p>The majority of this question was answered by City staff. To elaborate on the question about Lot 62 containing over 16,000 square feet - As shown on submitted plans, the topography and shape of the property with the road layout resulted in a larger lot in this location. Because of these constraints further division of this lot is not possible.</p>
<p>Paragraph 48(d) and 48(e) Why would we allow this? Setbacks are a key element of quality of life. (I will note that in the application there is additional details stating why certain setbacks are requested - I would think these details are pertinent to the discussion and staff recommendation.) Essentially what would the development look like if these setbacks were denied? How would the quality of life for the residents be degraded?</p>	<p><i>48(d) As detailed in the project narrative and project plans, the applicant proposes reducing the interior side yard setback on all lots to five feet and the rear yard setbacks on certain lots. These variations are requested to provide greater flexibility in building design and placement. The applicant believes the physical constraints of the site and amenities offered as part of the PD warrant an extra degree of flexibility in placing homes on these lots and selecting home designs. These deviations are allowed by the PD because even though the density is the same as the base zone, the trade off is between flexible design through different lot dimensions and sizes and the provision of increased open space and amenities.</i></p>
<p>Paragraph 48(f) Does the planning department have any concern with this?</p>	<p>This question was answered by City staff.</p>
<p>Paragraph 50 How is it in the city's best interest to allow private ownership of open spaces? Is this a deviation from code or up to the developer?</p>	<p>As permitted by Section 17.86.50 the applicant proposes a Homeowner's Association to own and maintain all open space areas. Exhibit Z of the record from the Parks Board recommends the city collect a fee in lieu of parkland dedication.</p>

Paragraph 54

I agree with the applicant's attorney that the rule of intent sections (or recitals in a contract) are not generally binding - unless someone writes in a clause that explicitly references them (similar to how an exhibit would be referenced in a contract). Therefore I believe that the criteria are laid out in the intent section (17.64.00). If we don't want it to be interpreted this way, then planning should propose a change to the code. Regarding the specific intent statements:

It would appear that only IV, VI, VII, and VIII might apply to this application? Did the applicant offer any justification or statements regarding meeting any of these intents? (Required in 17.64.90(C.1))

In regards to (IV) Promote flexibility in site planning and architectural design, placement, and clustering of structures:

This intent can only be meaningful in a PD where there are multiple zones within the PD. Otherwise the applicant would not need the PD.

In regards to (VII) Provide usable and suitable recreation facilities and public or common facilities:

What constitutes a recreation facility? And how should "public" be interpreted? Does this mean deeded to the city or just unfenced? Is it open to all public or just homeowners?

In regards to (VIII) Allow coordination of architectural styles, building forms and relationships:

I see no evidence that there is any coordination above what is required by "Sandy Style." Am I missing something?

So what is the compelling motivation to grant a PD and undermine the comp plan and the current zoning? Based on the Q&A responses of the Planning Commission, it would appear that they had significant reservations about many aspects of this PD.

Paragraph 56(h)

Please note that the paragraph number (g) and (h) appear to be random in this section.

In regards to the HOA, how will the multi-family (I assume rentals?) be factored into the HOA membership? Simply identifying an HOA does not address the "detailed statement outlining... responsibilities, and assurances."

This question was answered by City staff.

This question was answered by City staff.

<p>Paragraph 56(i) What is the plan for long-term buffer/screening from Johnson RV?</p>	<p>The submitted Landscape Plan Sheet L-2 shows landscaping between these two uses.</p>
<p>Paragraph 57 Why grant the sidewalk variance? If this was outside of a PD, standard SFR, would we grant the variance?</p>	<p>This question was answered by City staff.</p>
<p>Paragraph 58 How/why are children safer with only one sidewalk? How would this not be materially detrimental to the public welfare? Are there other requirements/regulations driving this that have a higher priority? If not it would appear this clause has not been met.</p>	<p>As detailed in the narrative with this request, the applicant believes these facilities will provide a more pleasant and unique pedestrian experience for the residents and visitors of the Planned Development. The proposed amenities are more than adequate to serve pedestrian volumes anticipated to use these facilities and the needs of this neighborhood. In addition, also noted in the narrative, the applicant believes these facilities will enhance the pedestrian experience for residents and visitors of the development and will have no affect on adjoining properties. There is no evidence in the record from the City's Traffic Consultant, City Engineer and or Public Works noting any danger to pedestrians, let alone children and meandering sidewalks place pedestrians further away from busy street.</p>
<p>Paragraph 59 How will a meandering walkway on Vista Loop enable or hinder bike traffic? With all of the on-street parking on Vista Loop today, will bikers be inclined to hop on a sidewalk? In regards to elimination of the sidewalk on Highway 26 (Is this really eliminated or is it just a portion? Paragraph 71 identifies it as in), this seems to conflict with a number of points in the code including: 17.84.30 PEDESTRIAN AND BICYCLIST REQUIREMENTS, Paragraphs (A), (B), and (E) 17.100.280 BICYCLE ROUTES</p>	<p>As detailed in the narrative with this request, the intent of the proposed meandering sidewalks is to create an enhanced pedestrian environment for residents and visitors walking within and between the Upper and Lower Views portions of the development. As shown on submitted plans, a sidewalk is proposed at the top of the bank along the Highway 26 frontage. There is no evidence in the record the proposal will hinder bicyclists. The applicant can work with Public Works on the specific design of these facilities.</p>
<p>Paragraph 71 Help me understand where the sidewalk is being requested to be eliminated on Hwy 26.</p>	<p>This question was answered by City staff.</p>
<p>Paragraph 74 Will the streets allow Transit buses and school buses reasonable passage and turnaround areas?</p>	<p>This question was answered by City staff.</p>

<p>Paragraph 75 Was the traffic studied on winter weekends? Section 17.84.50 states "Analysis of other time periods may be required for uses that generate their highest traffic volumes at other times of the day or on weekends. I think we can all recognize that peak traffic will occur on Saturday and Sunday afternoons throughout the winter and summer months as people come down the mountain.</p>	<p>The peak hourly volumes of traffic generators are described by the Institute of Transportation Engineer's Trip Generation Manual. For residential uses, the peak hours of traffic generation coincide with the weekday morning and evening peak hours, which were reported and analyzed in the traffic study. Weekend volumes for residential uses do not exhibit strong hourly peaks and are therefore not reported in the ITE Trip Generation Manual. Since the land use does not generate its highest traffic volumes "at other times of the day or on weekends" (i.e. outside the periods analyzed), no change to the analysis is required per 17.84.50. It should also be noted that the traffic study used the analysis procedures required in ODOT's Analysis Procedures Manual. These procedures include a specific methodology for addressing seasonal variations in traffic. Specifically, ODOT defines the "design hour" as the "30th-highest hour" of the year. This ensures that the volumes analyzed represent conditions during the peak travel season for Highway 26. The proposed use is the relevant standard to satisfy this standard, not non-use peak traffic. The recognition of weekend traffic is not in the record and is not relevant to the proposed use under this standard.</p>
<p>Paragraph 96 I don't understand the formula. What is meant by the four single family homes? Is something missing? I was expecting numbers matching the type of units being proposed. Do the max units factor into this calculation?</p> <p>This choice to pay in lieu of dedication is at the city's discretion 17.64.50(C). Why was this selected? The staff report states that it was</p>	<p>This question was answered by City staff.</p>
<p>Paragraph 98 and 99 If the HOA fails, the residents next to the open spaces will be responsible for significant maintenance. And the two large apartment complexes will have little to no responsibility. Seems both unfair and more importantly, unlikely to be well maintained. We need a way to make sure that corporate entities owning and managing the apartments are also on the hook.</p>	<p>There is no substantial evidence in the record that the HOA is likely to fail. The SDC requires the use of an HOA and state law has a comprehensive set of requirements for HOAs</p>
<p>Paragraph 107 Will these open/park/recreation areas be public or HOA members only? (Does this matter? Is it ok to have private facilities and meet the POS requirements?) Will on street or off street parking be provided?</p>	<p>This question was answered by City staff.</p>
<p>Paragraph 128 Does this require resolution prior to approval or approval with conditions? Can one of the conditions be a future Planning Commission determination?</p>	<p>This question was answered by City staff.</p>

<p>Paragraph 153 See prior comment about danger trees in the FSH.</p>	<p>This question was answered by City staff.</p>
<p>Paragraph 156 If the meandering path is allowed, will street lights be sufficient to provide safe pedestrian passage?</p>	<p>This question was answered by City staff.</p>
<p>Section 1 General Project Description Paragraph 2 cites 122 lots and 168 total units. I thought this was updated? Was the application revised?</p>	<p>This question was answered by City staff.</p>

Section 17.64.00

The applicant states: "The proposal includes a mixture of housing types and densities; a request for variations to setbacks to promote flexibility in site planning; conservation of natural features by not platting any lots within the FSH or restricted development areas and restricting development within restricted development areas to only permitted uses (trail construction, removal and planting native plants); an array of recreational amenities for the use and enjoyment of residents of The Views; and interesting and functional building designs intended to create a high quality and diverse residential neighborhood."

Specific analysis follows:

"The proposal includes a mixture of housing types and densities; a request for variations to setbacks to promote flexibility in site planning; "

I find this to be irrelevant since Intent (C) and (D) only have meaning above and beyond the rest of the code if the PD contains mixed zoning.

"conservation of natural features by not platting any lots within the FSH or restricted development areas and restricting development within restricted development areas to only permitted uses (trail construction, removal and planting native plants);"

These restrictions and development opportunities are identical within PD or the SFR. Again, no justification for the PD.

"an array of recreational amenities for the use and enjoyment of residents of The Views"

I would like to have these amenities clearly articulated as I think the whole of the PD hinges on this. Has the applicant achieved something that could not have been achieved without a PD?

The staff report identifies specific locations that the developer asks to not establish sidewalks - please locate these areas.

Is vista loop scheduled for any surfacing upgrades (without

The submitted Landscape Plans identify the location of proposed recreational amenities. These amenities include play structures, a half-court basketball court, a viewpoint plaza, and trails within the private open spaces in the Lower Views and a half-court basketball court, play structure, tot lot, dog park, and sidewalk system in the Upper Views. As detailed in the narrative and staff report the area of open space is 36 percent of the total site area. This area exceeds Planned Development requirements (25 percent) by 11 percent. As shown on submitted architectural plans, proposed structures are designed to meeting or exceed code requirements.

As shown on submitted plans and detailed in the project narrative and staff report, sidewalks are proposed along all streets except the south side of The Views Drive from the intersection of The Views Drive and Vista Loop Drive to the alley.

This question was answered by City staff.

Compare the max. units in the underlying zoners to the PD densities.	159 units are allowed in the SFR district; no density bonus requested. Staff Report finding 25, page 9. The application proposes 159 units; a density bonus is not requested. Staff report 11th slide; staff report findings 16 and 26, pages 7 and 9, respectively. Staff report at page 13 omits discussion of SDC 17.64.40.C. allowing Planned Development density bonus because density bonus is not requested. The applicant deleted 9 units representing the density bonus from the application at the December 16, 2020 Planning Commission hearing; Exhibit HH, draft Planning Commission minutes at page 2.
How many lots will be smaller than the 7500 ft sq.?	75 single family detached lots are smaller than 7500sf (out of 88 single family detached lots). Staff Report finding 48, page 12.
How many lots over 10,000 ft sq.?	Submitted plans show there are 10 lots over 10,000 sq. ft. (8 lots for single family detached dwellings and 2 lots for multi-family dwellings)

CITY COUNCIL STAFF REPORT

TYPE IV DECISION

DATE: February 8, 2021

FILE NO.: 20-028 SUB/VAR/TREE/FSH/PD/ZC

PROJECT NAME: The Views PD

APPLICANT: Mac Even, Even Better Homes

OWNERS: Brad Picking, John Knapp

LEGAL DESCRIPTION: 25E 19, Tax Lots 200 and 500

The above-referenced proposal was reviewed concurrently as a Type IV planned development, subdivision, zoning map amendment, special variance, Flood and Slope Hazard (FSH) overlay review, and tree removal permit. The following Findings of Fact are adopted supporting approval of the plan in accordance with Chapter 17 of the Sandy Municipal Code.

EXHIBITS:

Applicant's Submittals:

- A. Land Use Application
- B. Project Narrative
- C. Supplemental Narrative for Special Variance
- D. Civil Plan Set
 - Sheet 1 – Cover Sheet and Preliminary Plat Map
 - Sheet 2 – Preliminary Plat Map: The Lower Views
 - Sheet 3 – Preliminary Plat Map: The Upper Views
 - Sheet 4 – Topographic Survey
 - Sheet 5 – Topographic Survey: The Upper Views
 - Sheet 6 – Tree Retention and Protection Plan
 - Sheet 7 – Tree Inventory List
 - Sheet 8 – Building Setbacks: The Lower Views
 - Sheet 9 – Building Setbacks: The Upper Views
 - Sheet 10 – Parking Analysis and Future Street Plan
 - Sheet 11 – Block and Street Dimensions
 - Sheet 12 – Street and Utility Plan: The Lower Views
 - Sheet 13 – Street and Utility Plan: The Upper Views
 - Sheet 14 – Grading and Erosion Control Plan: The Lower Views
 - Sheet 15 – Grading and Erosion Control Plan: The Upper Views

- Sheet 16 – Sanitary Sewer Plan and Profile of Site
 - Sheet 17 – Sanitary Sewer Plan and Profile of Site: The Lower Views
 - Sheet 18 – Sanitary Sewer Plan and Profile of Site: The Upper Views
- E. Preliminary Storm Drainage Report
- F. Traffic Impact Study
- G. Arborist Report
- H. Wetland Determination Report
- I. Geotechnical Report
- J. Architectural Plans Booklet
- K. The Views Proposed Homes
- L. The Views Concept Plan
- M. Lower Views Concept Plan
- N. Upper Views Concept Plan
- O. Plant Key
- P. Plant Palette
- Q. DSL Wetland Concurrence
- R. Sound Wall Plans

Agency Comments:

- S. John Replinger, Traffic Engineer (September 14, 2020)
- T. Hassan Ibrahim, City Engineer (September 14, 2020)
- U. Sandy Fire Marshall (September 15, 2020)
- V. SandyNet (September 16, 2020)
- W. ODOT (September 17, 2020)
- X. Sandy Area Metro (September 21, 2020)
- Y. Public Works Director (November 6, 2020)
- Z. Parks & Trail Advisory Board (November 19, 2020)
- AA. John Replinger, Traffic Engineer (November 30, 2020)

Additional Documents from Staff:

- BB. Pre-application Notes from May 29, 2019
- CC. Staff Report from November 23, 2020 PC Meeting
- DD. PowerPoint Presentation from November 23, 2020 PC Meeting
- EE. Minutes from November 23, 2020 PC Meeting
- FF. Staff Report from December 16, 2020 PC Meeting
- GG. PowerPoint Presentation from December 16, 2020 PC Meeting
- HH. Minutes from December 16, 2020 PC Meeting

Additional Submission Items from the Applicant:

- II. Email from Michael Robinson (September 23, 2020)
- JJ. Memo from Tracy Brown (November 22, 2020)
- KK. Email from Michael Robinson (November 28, 2020)
- LL. Supplemental Memo (December 9, 2020)
- MM. Responses to Staff Report Questions (December 9, 2020)
- NN. Sewer Capacity Letter from Ray Moore, PE (December 9, 2020)
- OO. Sewer Capacity Letter from Michael Pinney, PE (December 9, 2020)
- PP. Right Turn Lane Memo from Michael Ard, PE (December 9, 2020)

- QQ. ODOT Slip Lane Removal Plans (December 9, 2020)
- RR. Revised Materials Response from Tracy Brown (January 19, 2021)
- SS. Revised Proposal (January 19, 2021)
- TT. Revised Density Calcs (January 19, 2021)

Public Comments:

- UU. Bonnie Eichel (October 2, 2020)
- VV. Jerry Carlson (October 29, 2020)
- WW. John and Linda Bartmettler (October 29, 2020)
- XX. Dustin and Bonnie Bettencourt (November 3, 2020)
- YY. Georgina Sutherland (November 3, 2020)
- ZZ. Gerald and Judith Dittbenner (November 5, 2020)
- AAA. Tony and Kim Turin (November 6, 2020)
- BBB. John and Christine Andrade (November 7, 2020)
- CCC. Todd Springer (November 8, 2020)
- DDD. John Eskridge (November 9, 2020)
- EEE. Dan and Janine Walton (November 19, 2020)
- FFF. Ed Dewart (November 20, 2020)
- GGG. G. Manley (November 20, 2020)
- HHH. Bonnie and Robert Eichel (November 20, 2020)
- III. Georgina Sutherland (November 20, 2020)
- JJJ. Jason and Mary Dyami (November 24, 2020)
- KKK. Chris Anderson and Jason Shuler (December 7, 2020)
- LLL. Kristina Molina (December 9, 2020)
- MMM. John Andrade (December 10, 2020)
- NNN. Pamela Kim York (December 14, 2020)
- OOO. Tom Orth (December 14, 2020)
- PPP. Gerald Dittbenner (December 14, 2020)
- QQQ. John and Christin Andrade (December 14, 2020)
- RRR. Robert and Bonnie Eichel (December 14, 2020)
- SSS. Brad Picking (December 14, 2020)
- TTT. Buzz Ortiz (December 14, 2020)
- UUU. Dustin and Bonnie Bettencourt (December 14, 2020)
- VVV. John R Eskridge and Lisa Hull (December 15, 2020)
- WWW. John Bartmettler (December 15, 2020)
- XXX. Valerie Walberg (December 15, 2020)
- YYY. Lisa Hull (December 15, 2020)
- ZZZ. Ed Elm (December 17, 2020)

FINDINGS OF FACT

General Overview

1. These findings are based on the applicant's submittals received on June 26, 2020, July 29, 2020, October 28, 2020, November 22, 2020, and December 9, 2020. Staff deemed the application incomplete on July 24, 2020. The applicant submitted additional materials on July 29, 2020. The application was deemed complete on August 5, 2020 and initially a 120-

day deadline of December 3, 2020 was established. However, it was later determined this application included a comprehensive plan map amendment and therefore the 120-day deadline was determined to not apply. The applicant extended the 120-day deadline by 56 days (the time between September 28 and November 23). With the new applicant submissions received on October 28, 2020 it was determined a comprehensive plan map amendment is no longer needed. The revised 120-day deadline for this application was January 28, 2021, but as explained in this document the applicant has extended the 120-day clock to March 1, 2021 (Exhibit GG).

2. This report is based upon the exhibits listed in this document, as well as agency comments and public testimony. This code analysis is based on the code that was in effect at the time of the application submission on June 26, 2020 and therefore the code modifications with File No. 20-023 DCA do not apply.
3. The subject site is approximately 32.87 acres. The site is located east and west of the eastern end of Vista Loop Drive, east of Highway 26.
4. The parcel has a Comprehensive Plan Map designation of Low Density Residential and a Zoning Map designation of SFR, Single Family Residential.
5. The applicant, Even Better Homes, requests a Type IV combined planned development review to include both conceptual and development plan reviews. A planned development is a specific kind of development which allows for integrating different kinds of land uses. In this case, the applicant is proposing using mixed housing types along with recreational amenities. Additionally, in a planned development application, the applicant can request that certain code requirements be waived in order to provide outstanding design elements while still meeting the intent of the code. The site is divided into two sections: the “Lower Views” on the east side of the site and the “Upper Views” on the west side of the site.
6. The applicant is proposing a 122 lot development with 120 single family home lots and 2 multi-family home lots to accommodate a total of 39 multi-family units. Additionally, the applicant is proposing open space and stormwater detention tracts. The detailed acreage with associated tract letters is as follows:

Tract Letter	Purpose	Acres
Lower Views		
A	Private active open space	1.10
B	Private active open space	0.25
C	Private active open space	0.23
D	Private open space	0.13
E	Private active open space	0.28
F	Private drive	0.06
G	Private drive	0.04
H	Private drive	0.04
I	Private open space	1.66
J	Public stormwater detention pond	0.32

K	Private open space	5.56
L	Private open space	1.03
P	Private open space	0.03
Upper Views		
M	Private active open space	0.92
N	Private active open space	0.75
O	Public stormwater detention pond	0.39

7. Notification of the proposed application was originally mailed to affected agencies on September 8, 2020 and to affected property owners within 500 feet of the subject property on September 8, 2020 for the originally scheduled public hearing on September 28, 2020. A legal notice was submitted to the Sandy Post on September 8, 2020 to be published on September 16, 2020 informing residents of the public hearings.
8. On September 23, 2020 the applicant's attorney, Michael Robinson with Schwabe Williamson and Wyatt, requested The Views PD agenda item to be removed from the September 28 Planning Commission meeting and instead included on the November 23 Planning Commission meeting agenda. The request was largely made so the applicant could revise some of their proposal as reflected in the exhibits.
9. On September 24, 2020 staff mailed a notice to affected property owners within 500 of the subject property stating that the public hearing scheduled for September 28, 2020 was postponed to November 23, 2020.
10. On October 21, 2020 staff mailed a notice to affected property owners within 500 of the subject sites reminding people of the November 23, 2020 public hearing. On November 2, 2020 staff submitted a legal notice to the Sandy Post to be published on November 11, 2020 informing residents of the Planning Commission public hearing.
11. On November 2, 2020 staff provided DLCD with a revised Plan Amendment (PAPA) notice.
12. Agency comments were received from the City Transportation Engineer, City Engineer, Public Works, SandyNet, Public Works, ODOT, the Parks and Trails Advisory Board, Fire District No. 72, and Sandy Area Metro.
13. At publication of the City Council staff report on February 8, 2021 there were 32 written comments from the public that were entered into the record. These can be found in Exhibits UU through ZZZ.
14. Public comments against the proposed development included the following themes:
 - I. Development encroaching into the Flood Slope Hazard (FSH) overlay
 - II. Concerns for capacity of fire, police, and public utilities
 - III. Increased traffic on already busy streets
 - IV. Removal of wild animal habitat

- V. Significant increase in housing density
- VI. Changing the character of the area
- VII. Lowering the value of the land for existing property owners
- VIII. Lack of amenities for future residents
- IX. Safety walking along streets

15. Public comments for the proposed development included the following themes:

- I. Increased public revenue
- II. The proposed development is by a local developer rather than an “outside” developer

16. This application was reviewed by the Planning Commission on November 23, 2020. At that meeting, the Commission granted a continuance as requested by a resident. This application was again reviewed by the Planning Commission on December 16, 2020.

17. On November 28, 2020, the applicant granted an extension of the 120-day application review period (clock) by 32 days. This 120-day clock extension modified the 120-day deadline from January 28, 2021 to March 1, 2021. This clock extension was to accommodate the City Council hearing for this application on February 16, 2021.

18. On December 9, 2020, the applicant submitted additional information related specifically to the following: Applicant responses to staff questions (Exhibit MM); Engineering memos related to sanitary sewer capacity (Exhibits NN and OO); and an Engineering memo related to the ODOT-requested right turn lane from Highway 26 onto Vista Loop Drive (Exhibit PP). The applicant also provided an explanatory cover memo (Exhibit LL) and an ODOT document related to the closure of the slip lane from Highway 26 to Vista Loop Drive (Exhibit QQ).

Planning Commission Recommendation

19. On December 16, 2020 the Planning Commission reconvened to continue the public hearing for The Views PD. After hearing additional input from staff, the applicant, and the public, the Planning Commission made the following motion:

Motion: Motion to recommend that the City Council approve or deny the application after full consideration of the Planning Commission’s issues, concerns, and recommendations below.

Moved By: Commissioner Mayton

Seconded By: Commissioner Maclean-Wenzel

Yes votes: All Ayes

No votes: None

Abstentions: None

The Planning Commission was asked a series of questions in order to provide recommendations on specific requests included in this application. The questions and their votes are in the following table.

Question for PC Review	Yes	No
Does the Planning Commission recommend exceeding the maximum density for the base zone by six (6) percent? To allow this density increase the Planning Commission, and ultimately the City Council, needs to find that the Planned Development is outstanding in planned land use and design, and provides exceptional advantages in living conditions and amenities not found in similar developments constructed under regular zoning.	N/A as density increase is no longer being requested.	
Does the Planning Commission recommend permitting row houses in the SFR zoning district?	5	2
Does the Planning Commission recommend permitting multi-family housing in the SFR zoning district?	4	3
Does the Planning Commission recommend allowing lot sizes less than 7,500 square feet?	3	4
Does the Planning Commission recommend allowing a minimum average lot width less than 60 feet?	3	4
Does the Planning Commission recommend allowing interior side yard setbacks at 5 feet, when the typical standard is 7.5 feet?	3	4
Does the Planning Commission recommend reducing the rear yard setbacks from 20 feet to 10 feet for lots 47-56 in the Lower Views and 20 feet to 15 feet for lots 84-86 and 88-102 in the Upper Views?	3	4
Does the Planning Commission recommend allowing block lengths at 691 feet on The Views Drive from Vista Loop Drive to Bonnie Street; at 665 feet on the north side of Bonnie Street; and at 805 feet on Knapp Street from Vista Loop Drive to Ortiz Street?	7	0
Does the Planning Commission recommend approval of the request to provide meandering walkways within private open space tracts rather than a traditional sidewalk/planter strip in the public right-of-way with the condition that the tracts maintain a minimum width of 15 feet to accommodate a 5 foot wide walkway with an average of 5 foot wide planter strips on either side?	7	0
Does the Planning Commission recommend approval of the request to not provide a sidewalk on the south side of The Views Drive with the condition that Tract E on the north side of The Views Drive be designed as proposed (i.e. approximately 19 feet wide with 5 feet wide of planting space on either side of the meandering walkway to accommodate street trees on both sides of the walkway)?	7	0
Does the Planning Commission recommend approval of the request to not provide front doors facing Highway 26 and instead allow the lot line abutting Highway 26 to be considered the rear yard so the sound wall can be 6 feet in height?	7	0
Does the Planning Commission recommend phasing this development in two distinct phases as proposed by the applicant?	7	0
Does the Planning Commission recommend to not require a right turn lane at the intersection of Vista Loop Drive and Highway 26, consistent with the City's traffic engineer and staff's recommendation?	6	1
Does the Planning Commission recommend the proposed future street layout north of Ortiz Street as proposed by the applicant?	0	7

Question for PC Review	Yes	No
Does the Planning Commission recommend a pedestrian connection to the north in the vicinity of where Knapp Street intersects with Ortiz Street?	7	0
Does the Planning Commission recommend that additional vegetation is planted between the sound wall and the sidewalk along Highway 26 to make it more pedestrian friendly and to soften the large concrete wall?	6	1
Does the Planning Commission have any additional recommendations related to maintenance of the open space owned by a proposed Homeowner's Association (HOA)?	6	1

Other comments and possible conditions recommended by the Planning Commission included the following:

- Right turn lane from Highway 26 to Vista Loop Drive should be installed by ODOT.
- Research a maintenance agreement option in lieu of the proposed Homeowners Association (HOA).
- Require a sight line analysis to determine if the apartments proposed in the Lower Views (Lot 72) will obstruct any views of Mt. Hood for existing residents in the area.

20. At the Planning Commission meeting, Tracy Brown and Mac Even gave applicant testimony. Chris Anderson, Cassidy Moore, Buzz Ortiz, and Lindsey Sawyer gave proponent testimony. Jason Dyami, Lisa Hull, John Barmettler, and Todd Springer gave opponent testimony. John Andrade gave neutral testimony. A summary of their testimony is included in the Planning Commission meeting minutes (Exhibits EE and HH).

17.26 – Zoning District Amendments

21. This chapter outlines the requirements for zoning district amendments. In accordance with Section 17.64.70, “When a Planned Development project has been approved, the official Zoning Map shall be amended by ordinance to denote the new ‘PD’ Planned Development overlay designation. Such an amendment is a ministerial act, and Chapter 17.26, Zoning District Amendments, shall not apply when the map is amended to denote a PD overlay.”

17.30 – Zoning Districts

22. The subject site is zoned SFR, single family residential.

23. The total gross acreage for the entire property is 32.87 acres. After removal of the right-of-way and proposed stormwater tracts, the net site area (NSA) for the subject property is reduced to 27.475 net acres. Additionally, the site also contains a restricted development area of 279,768 square feet. When this is subtracted from the net site area, the resulting unrestricted site area (USA) is 21.03 acres.

24. The underlying zoning district allows a minimum of 3 and a maximum of 5.8 dwelling units per net acre of unrestricted site area. Minimum density = $21.03 \times 3 = 63.03$, rounded down to 63 units. Maximum density is the lesser of the two following formulas: $NSA \times 5.8$ or $USA \times 5.8 \times 1.5$ (maximum allowable density transfer based on Chapter 17.60).

- I. $27.475 \times 5.8 = 159.11$, rounded to 159 units

II. $21.03 \times 5.8 \times 1.5 = 182.787$, rounded to 183 units

25. As a result of these calculations, the density range for the subject property is a minimum of 63 units and a maximum of 159 units.
26. It is important to note that density bonuses are allowed in Planned Developments. This means that the applicant could apply for more than 159 dwelling units even given the underlying zoning designation of Single Family Residential. However, the applicant is not applying for such a density bonus.

17.34– Single Family Residential (SFR)

27. Section 17.34.30 contains the development standards for this zone. The applicant is requesting multiple modifications to these development standards as part of the PD process. The applicant is also requesting uses that are not traditionally allowed in the subject zoning district. The requested modifications are outlined in the review of Chapter 17.64 below.
28. Section 17.34.40(A) requires that water service be connected to all dwellings in the proposed subdivision. Section 17.34.40(B) requires that all proposed dwelling units be connected to sanitary sewer service. Section 17.34.40(C) requires that the location of any real improvements to the property must provide for a future street network to be developed. Section 17.34.40(D) requires that all dwelling units must have frontage or approved access to public streets. The applicant proposes to meet all of these requirements. Each new residence constructed in the subdivision will gain access from a public street. However, six lots are proposed to gain access from three separate private drives connected to a public street.
29. Section 17.34.50(B) requires that lots with 40 feet or less of street frontage shall be accessed by a rear alley or shared private driveway. All of the attached single family homes have less than 40 feet of street frontage but are accessed by a rear alley. Many of the detached single family home lots do not have 40 feet of street frontage, but this is a modification being requested by the applicant as part of the PD process as reviewed in Chapter 17.64 below.

17.56 – Hillside Development

30. The applicant submitted a Geotechnical Report (Exhibit I) showing that the subject site contains a small area of slope in the Lower Views exceeding 25 percent. **All recommendations in the conclusions and recommendations section of the Geotechnical Report (Exhibit I) shall be conditions for development.**

17.60 – Flood and Slope Hazard (FSH) Overlay District

31. Section 17.60.00 specifies the intent of the Flood and Slope Hazard (FSH) Overlay District, which is to promote the public health, safety and general welfare by minimizing public and private adverse impacts from flooding, erosion, landslides or degradation of water quality consistent with Statewide Planning Goal 6 (Air, Land and Water Resources Quality) and Goal 7 (Areas Subject to Natural Disasters and Hazards) and the Sandy Comprehensive Plan (SCP). **A violation of the provisions set forth in Chapter 17.60, FSH, (e.g. tree removal without permit authorization or native vegetation removal) may result in a fine as specified in Section 17.06.80.**

32. Section 17.60.20 contains permitted uses in the FSH overlay district and Section 17.60.40 contains the FSH review procedures. The applicant is not proposing any development within the FSH overlay district. **Any future development within the FSH overlay district shall require separate permit review. The applicant shall install tree protection fencing at the outer edge of the FSH overlay district prior to grading to ensure no development occurs within the FSH overlay area.** The submitted Tree Plan (Exhibit D, Sheet C6) states: “All dead or dying trees or vegetation that is hazardous to the public may be removed in accordance with Section 17.60.20.” However, the applicant did not provide any additional information regarding the potential location of dead or dying trees or vegetation that is hazardous to the public. Staff does not find how any vegetation would be hazardous to the public considering the area is not open to the public. **The applicant shall not remove any living or dead trees or vegetation that is hazardous to the public from the FSH area without applying for an FSH review for their removal.** The grading plan does not indicate any grading will take place in the FSH overlay area, so staff assumes the applicant is not proposing to grade within the FSH. **The applicant shall not perform any grading activities or cut or fill in the FSH overlay area without applying for an FSH review for the grading/cut and fill.** The code does not allow removal of native vegetation from the FSH overlay nor does it allow planting non-native vegetation in the FSH overlay. **The applicant shall not remove any native vegetation from the FSH overlay area. The applicant shall not plant any non-native vegetation in the FSH overlay area.**
33. Section 17.60.30 outlines required setbacks for development around FSH areas. According to the topographic survey submitted with the application dated June 24, 2020 (Exhibit D, Sheets C4 and C5), no development is proposed within any of the required setback areas.
34. Section 17.60.50 contains requirements for special reports, including a hydrology and soils report, a grading plan, and a native vegetation report. The applicant submitted a Grading Plan (Exhibit D, Sheets C14 and C15) and a Wetland Delineation Report by Schott and Associates, LLC dated February 17, 2020 (Exhibit H) as well as DSL concurrence for the wetland report (Exhibit Q). The applicant did not submit a native vegetation report. The Director may exempt Type II permit applications from one or more of these reports where impacts are minimal, and the exemption is consistent with the purpose of the FSH overlay zone as stated in Section 17.60.00.
35. Section 17.60.60 contains approval standards and conditions for development in the restricted development areas of the FSH overlay district. The applicant’s narrative (Exhibit B) did not address any of the criteria in Section 17.60.60.
36. Section 17.60.60(A.1) pertains to cumulative impacts and states “Limited development within the FSH overlay district, including planned vegetation removal, grading, construction, utilities, roads and the proposed use(s) of the site will not measurably decrease water quantity or quality in affected streams or wetlands below conditions existing at the time the development application was submitted.” The applicant submitted a wetland delineation report along with concurrence from DSL (Exhibits H and Q) for tax lot 200. The wetland report identifies two wetlands and two streams on tax lot 200; one wetland and one stream are located in proposed Tract K and one wetland and one stream are located in proposed Tract L.

37. Section 17.60.60(A.2) pertains to impervious surface area and states, “Impervious surface area within restricted development areas shall be the minimum necessary to achieve development objectives consistent with the purposes of this chapter.” **No impervious surfaces shall be located within the restricted development area.**
38. Section 17.60.60(A.3) pertains to construction materials and methods and states, “Construction materials and methods shall be consistent with the recommendations of special reports, or third-party review of special reports.” **Future construction or development within the FSH overlay district shall require separate FSH review.**
39. Section 17.60.60(A.4) pertains to cuts and fills and states “Cuts and fills shall be the minimum necessary to ensure slope stability, consistent with the recommendations of special reports, or third-party review of special reports.” The grading plan does not show any proposed grading within the FSH overlay area. **Future grading or other development activity within the FSH overlay district shall require separate FSH review.**
40. Section 17.60.60(A.5) pertains to minimizing wetland and stream impacts and states “Development on the site shall maintain the quantity and quality of surface and groundwater flows to locally significant wetlands or streams regulated by the FSH Overlay District.” The applicant is proposing to add additional stormwater to the outflow in Tract L. **The applicant shall update the Geotech Report or submit an addendum to the Geotech Report that provides analysis of the new stormwater discharge.**
41. Section 17.60.60(A.6) pertains to minimizing loss of native vegetation and states “Development on the site shall minimize the loss of native vegetation. Where such vegetation is lost as a result of development within restricted development areas, it shall be replaced on-site on a 2:1 basis according to type and area. Two native trees of at least 1.5-inch caliper shall replace each tree removed. Disturbed understory and groundcover shall be replaced by native understory and groundcover species that effectively covers the disturbed area.” The applicant is not proposing to remove any trees from the FSH overlay area nor is the applicant proposing to remove any native vegetation from the FSH overlay area. To better protect the vegetation within the FSH overlay area, **the applicant shall install tree protection fencing at the outer edge of the FSH overlay district. The applicant shall not damage or remove any native vegetation within the FSH overlay district. The applicant shall replace any disturbed understory or groundcover with native understory or groundcover species that effectively cover the disturbed area. The applicant shall retain a qualified arborist on-site for any work done within the critical root zone (1 foot per 1 inch DBH) of retention trees including those within the FSH area to ensure minimum impact to trees and native vegetation.**
42. Section 17.60.90 discusses water quality treatment facilities. The proposed detention ponds (Tracts J and O) are not located within the mapped FSH overlay area.
43. Section 17.60.100 contains density transfer provisions. Due to the density calculation from Chapter 17.30, this site does not qualify for density transfer under Chapter 17.60.

17.64 – Planned Developments

44. Chapter 17.64 contains regulations related to Planned Developments.

45. In accordance with Section 17.64.70, “When a Planned Development project has been approved, the official Zoning Map shall be amended by ordinance to denote the new ‘PD’ Planned Development overlay designation. Such an amendment is a ministerial act, and Chapter 17.26, Zoning District Amendments, shall not apply when the map is amended to denote a PD overlay.”

46. Section 17.64.10 allows for combined review of a Conceptual Development Plan and a Detailed Development Plan. This section requires city approval of both conceptual and detailed development plans and allows for “combined review” of both types of plans. This application is for both conceptual and detailed development plan approval as provided in Section 17.64.10(A). The applicant has met all application requirements for concept and detailed development plan review, as evidenced by the finding that the application was deemed complete on August 5, 2020.

47. The Sandy Development Code does not contain specific language identifying the process for completing a combined review, but rather details the specifics of individual conceptual and detailed reviews.

48. Section 17.64.30(A) states that dimensional and/or quantitative standards of the Sandy Development Code may be varied through the PD review process. The Development Services Director advised the applicant to prepare a detailed list of “modifications” to SDC standards. The applicant believes that the unique nature of the site and amenities offered as part of the PD application warrant this flexibility. The applicant is requesting the following modifications to the development code:

- a. Section 17.34.10 lists permitted uses in the Single Family Residential zoning district. The applicant is proposing row houses and multi-family dwellings which are not listed as permitted outright uses. However, these uses are allowed in an approved PD.
- b. Section 17.34.30 requires lot sizes in the Single Family Residential zoning district to be at least 7,500 square feet. The applicant is proposing a variety of lot sizes: Of the single family detached lots, the applicant is proposing 50 lots between 3,400 and 4,999 square feet; 13 lots between 5,000 and 5,999 square feet; 12 lots between 6,000 and 7,499 square feet, and 13 lots greater than 7,500 square feet. Of the lots greater than 7,500 square feet, one is greater than 15,000 square feet, which is the maximum lot size allowed under Section 17.100.220(B) without needing to arrange lots to allow further subdivision. The single family attached lots range in size from 2,160 to 2,695 square feet.
- c. Section 17.34.30 requires a minimum average lot width to be 60 ft. The applicant is requesting a waiver to this requirement. Given that many lots do not meet the 7,500 square foot requirement, the applicant argues that this requirement is not possible to meet.

- d. Section 17.34.30 requires interior yard setbacks of 7.5 feet. The applicant is requesting that this be reduced to five (5) feet on all lots.
 - e. Section 17.34.30 requires that rear yard setbacks be 20 feet. The applicant is requesting that this be reduced to 10 feet for lots 47-56 in the Lower Views and 15 feet for lots 84-86 and 88-102 in the Upper Views.
 - f. Section 17.100.120 requires a 400 foot maximum block length. The applicant is requesting three variances to this: a 691 foot block length on The Views Drive from Vista Loop Drive to Bonnie Street; a 665 foot block length on the north side of Bonnie Street; and an 805 foot block length on Knapp Street from Vista Loop Drive to Ortiz Street. According to the applicant, these block lengths are necessary to accommodate for the site layout.
49. Section 17.64.30(B) allows for a planned development to be established on any parcel of land, or on more than one parcel of land if those parcels are abutting. The subject property contains two abutting parcels. Per the definition of abutting in Chapter 17.10 of the Development Code: “Two or more lots joined by a common boundary line or point. For the purposes of this definition, no boundary line shall be deemed interrupted by a road, street, alley or public way, it being the intent of this definition to treat property lying on the opposite sides of a road, street, alley or public way as having a common boundary line or point.”
50. Section 17.64.50, Open Space, requires that a minimum of 25 percent of the site be used as open space. The site is 32.87 acres; thus, the minimum open space dedication is 25 percent of 32.87 acres, or 8.25 acres. The applicant proposes 11.92 acres of total open space, including 8.25 acres of natural area open space and 3.68 acres of active recreation area. Rather than dedicating the open space to the City, the applicant proposes establishing a homeowner’s association to own and maintain the open space areas as permitted by Section 17.86.50. **All private open space tracts shall have a note on the plat that states these tracts cannot be developed. The natural area open space tracts (Tracts I, K, and L) shall also be protected by a conservation easement or similar method.**
51. Section 17.64.60 describes allowed uses through the PD process. These uses include uses permitted in the underlying zoning district, as well as single-family detached, single-family attached dwellings (i.e. row houses), and multi-family dwellings, as proposed by the applicant.
52. Sections 17.64.70-90 are procedural in nature. Approval of The Views PD would result in an amendment to the Sandy Zoning Map, indicating that a PD has been approved on this SFR zoned land. The applicant and City have complied with all procedural requirements for conceptual PD approval, as discussed under Section 17.64.10, above.
53. The proposed public utility layout is provided solely to comply with the planned development submission requirements in Section 17.64.90(B)2. of the Sandy Municipal Code (SMC). **Approval of the land use application does not connote approval of the public improvement plans (which may be submitted and reviewed later) and shall not be considered as such.**

54. Section 17.64.100 sets forth Planned Development approval criteria. There are two relevant criteria: (a) consistency with the intent of the PD Chapter, as found in Section 17.64.00; and (b) compliance with the general provisions, development standards and application provisions of Chapter 17.64, Planned Developments.

The “Intent” of the PD chapter is described in nine purpose statements. Staff does not interpret each of these statements as individual standards that must be met; rather, staff views these statements as goals that should be achieved through the PD review process. The purpose statements are as follows:

- I. Refine and implement village development patterns designated “V” on the Comprehensive Plan Map.
- II. Allow the relocation of zones within designated villages, provided that the overall intent of the village designation is maintained.
- III. Allow a mixture of densities between base zones within the planned development.
- IV. Promote flexibility in site planning and architectural design, placement, and clustering of structures.
- V. Provide for efficient use of public facilities and energy.
- VI. Encourage the conservation of natural features.
- VII. Provide usable and suitable recreation facilities and public or common facilities.
- VIII. Allow coordination of architectural styles, building forms and relationships.
- IX. Promote attractive and functional business environments in non-residential zones, which are compatible with surrounding development.

The proposal includes a mix of densities in the form of single family detached residences, row homes, and multi-family housing. In addition, the proposal includes three open space natural areas in the lower views, as well as multiple recreational areas in the form of private park-like spaces and wider pedestrian areas. As indicated by the proposed homes (Exhibit K), the project includes two different townhome designs and 10 different single family home designs.

55. Sections 17.64.110-120(A) specifies graphic and narrative requirements and procedures for review of detailed development plans. All graphic requirements are met in the maps, figures, tables, and appendices provided with this application. Staff found the application complete on August 5, 2020. The applicant has elected to submit a combined conceptual and detailed planned development application, thus providing the public, Planning Commission, and the City Council with a complete understanding of exactly what is proposed in this application.

56. Section 17.64.120(B) specifies additional items that must be addressed in the detailed development plan. In addition to the narrative requirements specified for a Conceptual Development Plan, the Detailed Development Plan narrative shall also include:

Proposals for setbacks or building envelopes, lot areas where land division is anticipated, and number of parking spaces to be provided (in ratio to gross floor area or number of units).

- g. All of the items required by this section are included with the application package as shown on the Preliminary Plats and Building Setbacks and Parking Analysis sheets (Exhibit D).

Detailed statement outlining timing, responsibilities, and assurances for all public and non-public improvements such as irrigation, private roads and drives, landscape, and maintenance.

- h. All open space and landscape areas will be commonly owned and maintained by a Homeowner's Association. Individual homeowners will be responsible for the lot area abutting adjacent public streets.

Statement addressing compatibility of proposed development to adjacent land uses relating to such items as architectural character, building type, and height of proposed structures.

- i. The Lower Views shares a common boundary with a commercial business (Johnson RV), a large lot residential property in the city limits, and vacant properties outside the UGB. The Upper Views shares a common boundary with large lot residential and vacant properties and a multi-family development all within the city limits.

Statement describing project phasing, if proposed. Phases shall be:

- *Substantially and functionally self-contained and self-sustaining with regard to access, parking, utilities, open spaces, and similar physical features; capable of substantial occupancy, operation, and maintenance upon completion of construction and development.*
 - *Properly related to other services of the community as a whole and to those facilities and services yet to be provided.*
 - *Provided with such temporary or permanent transitional features, buffers, or protective areas as may be required to prevent damage or detriment to any completed phases and to adjoining properties not in the Planned Development.*
- j. The applicant is proposing two phases. The Lower Views would be phase one and the Upper Views would be phase two. Each development site is generally independent of the other. The proposed phasing of The Views PD is discussed in further detail in Chapter 17.100 of this document.

17.66 – Adjustments & Variances

57. The applicant is requesting the following two Type III Special Variances:

- Special Variance to Section 17.84.30(A) to not provide a sidewalk on multiple street frontages.
- Special Variance to Section 17.82.20(A and B) to not have the front doors of the proposed lots adjacent to Highway 26 face Highway 26 with direct pedestrian connection from the front doors to the Highway 26 sidewalk.

58. To be granted a Type III Special Variance, the applicant must meet one of the following criteria in Section 17.66.80:

- A. The unique nature of the proposed development is such that:
 - 1. The intent and purpose of the regulations and of the provisions to be waived will not be violated; and
 - 2. Authorization of the special variance will not be materially detrimental to the public welfare and will not be injurious to other property in the area when compared with the effects of development otherwise permitted.
- B. The variance approved is the minimum variance needed to permit practical compliance with a requirement of another law or regulation.
- C. When restoration or replacement of a nonconforming development is necessary due to damage by fire, flood, or other casual or natural disaster, the restoration or replacement will decrease the degree of the previous noncompliance to the greatest extent possible.

59. SIDEWALK ELIMINATION

Chapter 17.84 requires sidewalk and planter strips to be included with development. The applicant is requesting that this requirement be eliminated on the south side of The Views Drive from Vista Loop Drive to the alley and on the majority of the Highway 26 frontage. In addition, the applicant is proposing pedestrian walkways within private open space tracts rather than a traditional sidewalk in the public right-of-way along the south side of Vista Loop Drive, the north side of The Views Drive, and the south side of Bonnie Street.

South side of The Views Drive

Section 17.84.30(A) requires sidewalks to be provided on both sides of the street. On a local street, such as The Views Drive, the sidewalk is required to be a minimum of 5 feet in width separated from the curb by a minimum 5 foot wide planter strip. The requested variance to not provide a sidewalk on the south side of The View Drive does not meet the intent and purpose of this regulation. However, the applicant is proposing a wider pedestrian zone along the north side of The Views Drive, which includes a meandering walkway within an approximately 19-foot wide private open space tract (Tract E). This allows for trees to be planted on both sides of the path, creating an allée-like feel and enhancing the pedestrian environment and contributing to a more outstanding design than would be included in a typical subdivision. Thus, **Planning Commission recommends City Council approve the Special Variance request to not provide a sidewalk on the south side of The Views Drive with the condition that Tract E be designed as proposed (i.e. approximately 19 feet wide with sufficient planting space of at least 5 feet on either side of the meandering walkway to accommodate street trees on both sides of the walkway) and add a note to the plat indicating that Tract E cannot be developed.**

Walkways in private tracts along The Views Drive, Vista Loop Drive, and Bonnie Street

The applicant is proposing to include pedestrian amenities in the form of a meandering walkway located within a private open space tract rather than the traditional sidewalk in a public right-of-way on the following street frontages: the south side of Vista Loop Drive, the north side of The Views Drive, and the south side of Bonnie Street. The meandering walkways meet the intent of having a sidewalk and planter strip, provided sufficient space is provided for planting and the walkways are covered by a pedestrian easement. **Planning Commission recommends the City Council approve the requested special variance to provide meandering walkways within private open space tracts rather than a**

traditional sidewalk/planter strip in the public right-of-way with the condition that the tracts maintain a minimum width of 15 feet to accommodate a 5 foot wide walkway with an average of 5 foot wide planter strips on either side as well as a minimum width of 16 feet on Vista Loop Drive for a 6 foot sidewalk and 5 foot planter strips as Vista Loop Drive is a collector. The applicant shall include a pedestrian easement and a note on the final plat indicating that the meandering walkway tracts are not developable. Staff also recommends a condition that the meandering walkways in the open space tracts remain the responsibility of the homeowner's association. Consistent with sidewalks along street frontages, Planning Commission recommends a plat note or restrictive covenant be recorded that if the homeowner's association dissolves the responsibility to maintain and repair the meandering walkways and associated landscaping including street trees and groundcover shall shift to the adjacent property owners.

60. FRONT DOORS NOT FACING AND CONNECTED TO A TRANSIT STREET

The requirement of building entrances oriented to transit streets, such as Highway 26, is to provide a pleasant and enjoyable pedestrian experience by connecting activities within a structure to the adjacent sidewalk where transit amenities are located. The applicant requests a special variance to Chapter 17.82.20 to allow the front door of the future homes constructed on Lots 99 and 103-121 to face the internal local street network instead of Highway 26, a designated transit street. The applicant is also proposing a sound wall along Highway 26. This variance request is essentially asking that the front lot line be along the internal street network rather than Highway 26 and that the proposed sound wall can be 6 feet in height, which would be allowed if the Highway 26 lot line is the rear lot line. Though the section of Highway 26 along the subject property is currently in a 65 mph speed zone, it will eventually become urbanized and the speed limit will be reduced. Staff recognizes that proposed Lots 99 and 103-121 will not be allowed to take access from the highway and thus, that all garages and street parking will be located in the internal local street network. While the applicant could design the houses to have two front doors, staff recognizes that the front doors facing Highway 26 would essentially be false front doors, which is not the intent of the code. Thus, **Planning Commission recommends that the City Council approve the applicant's requested variance to not provide front doors facing Highway 26 with direct pedestrian connection from the front door to Highway 26 as required by Chapter 17.82. If approved, this variance request would establish Knapp Street as the front lot line for Lots 103-121 and Ortiz Street as the front lot line for Lot 99. Planning Commission recommends condition additional architectural, landscaping, and/or design features to enhance the appearance of the proposed sound wall from the Highway 26 right-of-way.**

61. Approval of a variance shall be effective for a 2-year period from the date of approval, unless substantial construction has taken place. The Planning Commission (Type III) may grant a 1-year extension if the applicant requests such an extension prior to expiration of the initial time limit. The variance approvals shall be consistent with the approved timelines for the subdivision phases.

17.74 – Accessory Development

62. Section 17.74.40 specifies, among other things, fence and wall height in front, side and rear yards. Walls in residential zones shall not exceed 4 feet in height in the front yard, 8 feet in

height in rear and side yards abutting other lots, and 6 feet in height in side and rear yards abutting a street. The proposal includes a sound wall along Highway 26, a retaining wall along the south side of The Views Drive, and a retaining wall along the north side of Lot 72. The sound wall along Highway 26 is proposed to be a 6 foot tall wall. The applicant is requesting a Special Variance to allow the front lot line for Lots 103-121 to be on Knapp Street and the front lot line for Lot 99 to be on Ortiz Street rather than Highway 26, which is reviewed in Chapter 17.66 of this document. If approved, the property line along Highway 26 would be the rear property line for Lots 103-121 and the side property line for Lot 99, both of which would permit a 6 foot tall wall.

63. The applicant proposes using a Verti-Crete wall system for the sound wall along Highway 26 in the Upper Views (Exhibit R). The wall panels have a ledge stone finish on both sides and the posts are Ashlar finished. The applicant proposes installing a six-foot tall wall. The posts are 20 inches by 20 inches. The posts and panels come to the site in a concrete gray color and are stained in the field after the wall is installed. The applicant proposes staining the wall "Nutmeg," which is a warm-toned brown. **Planning Commission recommends that additional vegetation is planted between the sound wall and the sidewalk to make it more pedestrian friendly and to soften the large concrete wall.**

17.80 – Additional Setbacks on Collector and Arterial Streets

64. Chapter 17.80 requires all residential structures to be setback at least 20 feet on collector and arterial streets. This applies to front, rear, and side yards. Vista Loop Drive is identified in the City's Transportation System Plan as a collector street. Highway 26 is a major arterial. As shown on the Block and Street Dimensions plan (Exhibit D, Sheets C8 and C9), it appears that all setbacks on lots adjacent to Vista Loop Drive and Highway 26 meet this requirement.

17.82 – Special Setbacks on Transit Streets

64. Section 17.82.20(A) requires that all residential dwellings shall have their primary entrances oriented toward a transit street rather than a parking area, or if not adjacent to a transit street, toward a public right-of-way or private walkway which leads to a transit street. A transit street is defined as a street designated as a collector or arterial. The Upper Views is located adjacent to Highway 26, a major arterial, and Vista Loop Drive, a collector. The lot for the multi-family structure in the Upper Views is proposed to be located adjacent to Vista Loop Drive. **Adherence to this code section for the future multi-family units will be determined in a future design review process.**
65. Twenty (20) single family homes (lots 99 and 103-121) are proposed adjacent to Highway 26. Because a substantial grade separation exists between the subject property and Highway 26 over a majority of the property, the applicant does not propose orienting these structures toward the highway but rather orienting these homes toward the internal street. The applicant is requesting a special variance to not have the front doors of the proposed houses along Highway 26 face Highway 26 with a direct pedestrian connection to the highway. The variance request is reviewed in Chapter 17.66 of this document.
66. Section 17.82.20(B) requires that dwellings shall have a primary entrance connecting directly between the transit street and building interior and outlines requirements for the pedestrian route. The applicant is requesting a special variance to not have the front doors of the

proposed houses along Highway 26 face Highway 26 with a direct pedestrian connection to the highway. The variance request is reviewed in Chapter 17.66 of this document.

Adherence to this code section for the future multi-family units will be determined in a future design review process.

67. Section 17.82.20(C) requires that primary dwelling entrances shall be architecturally emphasized and visible from the transit street and shall include a covered porch at least 5 feet in depth. **The adherence to this code section for the future multi-family units will be determined in a future design review process.**

17.84 – Improvements Required with Development

68. Section 17.84.20(A)(1) requires that all improvements shall be installed concurrently with development or be financially guaranteed. **All lots in the proposed subdivision will be required to install public and franchise utility improvements or financially guarantee these improvements prior to final plat approval. All ADA ramps shall be designed and inspected by the design engineer and constructed by the applicant to meet the most current PROWAG requirements.**
69. Section 17.84.30(A)(1) requires that all proposed sidewalks on the local streets will be five feet wide as required by the development code and separated from curbs by a tree planting area that is a minimum of five feet in width. All sidewalks on the internal streets in the Upper Views are proposed to be five feet wide separated from curbs by a landscape strip as required. All sidewalks in the Lower Views are also proposed to be five feet wide with the exception of a six-foot sidewalk proposed on the north side of The Views Drive entrance road from Vista Loop Drive to the proposed alley. The sidewalk is designed to connect to a six-foot meandering sidewalk constructed in front of the proposed row houses. A planned development modification as discussed in Section 17.64.30 has been proposed to modify the typical street section by shifting the road alignment to the southern edge of the right-of-way in order to allow for the construction of a meandering six-foot walkway in this location. The applicant is requesting a special variance to not provide sidewalks on some local street frontages. The special variance request is discussed in Chapter 17.66 of this document. **Planning Commission recommends a condition that the meandering walkways in the open space tracts remain the responsibility of the homeowner's association. Consistent with sidewalks along street frontages, Planning Commission recommends a plat note or restrictive covenant be recorded that if the homeowner's association dissolves the responsibility to maintain and repair the meandering walkways and associated landscaping including street trees and groundcover shall shift to the adjacent property owners.**
70. As required by Section 17.84.30(A)(2), six-foot sidewalks are proposed to be constructed along arterial and collector streets. As shown on the submitted plans (Exhibit D) all sidewalks adjacent to Vista Loop Drive, a collector street, are proposed to be six-feet wide. Unlike a typical street section, the sidewalk/walkway along Vista Loop Drive is proposed to meander along the road rather than be parallel to this road. Rather than provide sidewalks in the public right-of-way, the applicant is proposing six-foot-wide walkways in Tracts M and N adjacent to Vista Loop Drive. The applicant's request to not provide sidewalks on the

Vista Loop Drive frontage is a special variance. The special variance request is discussed in Chapter 17.66 of this document.

71. The applicant proposes a six foot wide sidewalk along the Highway 26 frontage of the site. The proposed sidewalk will be located adjacent to the proposed sound wall at the top of the slope.
72. In relation to Sections 17.84.30(B), 17.84.30(C), 17.84.30(D), and 17.84.30(E), the applicant is proposing sidewalk alternatives in multiple locations in the form of meandering pathways in private tracts.
73. Per the Public Works Director, **the applicant shall improve all public street frontages (including the Highway 26 right-of-way, and the street frontage of all tracts) in conformance with the requirements of 17.84.30 and 17.84.50.** The subject property contains frontage along Highway 26. The applicant's plan set shows a six-foot sidewalk is proposed to be constructed at the top of the bank along the site's entire highway frontage. The applicant's Engineer corresponded by email with the City's Public Works Director and an ODOT representative regarding if a curb will be required along the highway frontage. The Public Works Director indicated the decision on a curb is up to ODOT as they have authority over Highway 26. The ODOT representative stated that construction of a curb is not required along Highway 26 and construction of a sidewalk at the top of the bank is acceptable. With this, staff recommends the following condition: **Improvements adjacent to the site's Highway 26 frontage shall consist of a six-foot wide sidewalk constructed at the top of the bank, lighting, and street trees only as approved and permitted by ODOT.** The applicant requested Special Variance approval to only construct a curb on the south side of The Views Drive from the intersection of The Views Drive with Vista Loop Drive to the alley in the Lower Views.
74. Section 17.84.40(A) requires that the developer construct adequate public transit facilities. Per Exhibit X, **the proposed development will require a concrete bus shelter pad and a green bench (Fairweather model PL-3, powder-coated RAL6028). The required pad size is 7' x 9.5' and should be located at the northernmost corner of The View Drive and Vista Loop Drive. Engineering specifications are available from the Transit Department.**
75. Section 17.84.50 outlines the requirements for providing a traffic study. The applicant included a Traffic Impact Study (TIS) with the application (Exhibit F). The study did not identify any required mitigation. According to the traffic study, the proposed development would produce 109 peak AM trips, 136 peak PM trips, and 1,564 total daily trips. The findings from the City Transportation Engineer (Exhibit S) are expressly incorporated by reference into this document.
76. According to the TIS, the study intersections currently operate acceptably and are projected to continue to operate acceptably under year 2022 traffic conditions either with or without the addition of site trips from the proposed development. No queuing-related mitigations are necessary or recommended in conjunction with the proposed development. Based on the crash data, the study intersections are currently operating acceptably with respect to safety.

Based on the warrant analysis, no new traffic signals or turn lanes are recommended. ODOT states (Exhibit W) that the applicant shall provide additional space on Highway 26 to accommodate westbound right turning movements from Highway 26 onto Vista Loop Drive. Ard Engineering explains in the letter from October 27, 2020 the following:

“In addition to the lack of a clear standard used to justify a request for improvements on Highway 26, it should be noted that a recent improvement has already been undertaken at the request of the Oregon Department of Transportation in anticipation of supporting residential development within the subject property. The prior configuration of the intersection of Highway 26 at Vista Loop Drive included a westbound slip lane which allowed vehicles to turn onto Vista Loop Drive at high speeds. At the request of ODOT, this slip lane was removed and the then-existing shoulder was widened by 6.75 feet immediately east of Vista Loop Drive (Exhibit QQ).

This improvement project was required as part of a lot partition and residential development. The condition of approval carried onto both the approval for the Timber Valley Subdivision, and the Johnson RV expansion that occurred on another piece of the partitioned property. Since the condition was applied to both the residential development and the Johnson RV property, the first one to develop ultimately had to make the improvements. When Johnson RV constructed their parking lot expansion, they were required to bond for the street improvements and were required to complete the improvements by October 31, 2018. As a result, the conditioned improvements for Highway 26 at Vista Loop Drive were completed approximately 2 years ago. Notably, the Timber Valley Subdivision was approved on property that is now The Views. Accordingly, the completed mitigation was specifically intended to support residential development on the subject property.

Since warrants are not met for intersection improvements at Highway 26 and Vista Loop Drive in conjunction with the proposed development and recent improvements at the intersection were specifically intended to support both development of the Johnson RV parking lot expansion and the residential development within what is now The Views property, it does not appear to be either appropriate or proportional to request a second round of intersection improvements in association with the current residential development proposal. Accordingly, we request that there be no condition of approval requiring further widening or improvements on Highway 26 at Vista Loop Drive.”

Additionally, the City’s traffic engineer provided further comment on November 30, 2020 (Exhibit AA) reiterating the lack of data required to warrant a dedicated right turn lane. Ard Engineering provided an additional memo on December 9, 2020 reiterating that traffic data does not show a need for a right turn lane (Exhibit PP). Staff and the City’s traffic engineer agree with this analysis completed by Ard Engineering and do not recommend a condition associated with the right turning movement as requested by ODOT.

77. Intersection sight distance was evaluated for the proposed points of access along SE Vista Loop Drive. Based on the analysis it is projected that adequate site distance can be achieved for all access locations with clearing of vegetation from the roadside. No other sight distance mitigations are necessary or recommended.

78. The proposed development does not include any long straight street segments and is thus not required to follow the standards in Sections 17.84.50(C)(1) or (2).
79. Section 17.84.50(C)(3) requires that cul-de-sacs should generally not exceed 400 feet in length nor serve more than 20 dwelling units. Two cul-de-sacs are proposed in the Lower Views and a single cul-de-sac is proposed in the Upper Views. All three proposed cul-de-sacs are less than 400 feet in length. Additionally, none of the cul-de-sacs will serve more than 12 lots.
80. Section 17.84.50(D) requires that development sites shall be provided with access from a public street improved to City standards. All homes will gain access from a public street or a public alley improved to city standards or a private drive accessed from a public street. No off-site improvements have been identified or are warranted with the construction of this subdivision.
81. Section 17.84.50(E) requires that public streets installed concurrent with development of a site shall be extended through the site to the edge of the adjacent property. Temporary dead-ends created by this requirement to extend street improvements to the edge of the adjacent properties may be installed without turn-arounds, subject to the approval of the Fire Marshal. The proposed street layout results in one temporary dead-end street at the East end of the Lower Views. This street end includes sufficient room to accommodate fire equipment to turn around. The only existing street to be extended is Ortiz Street in the Upper Views, which is proposed to be located directly across Vista Loop Drive from the existing street. The applicant submitted a future street plan (Exhibit D, Sheet C10); however, it details the area north of Ortiz Street as future apartments and does not consider this area to lend itself to a traditional subdivision.
82. Section 17.84.50(F) requires that no street names shall be used that will duplicate or be confused with names of existing streets. The application includes proposed street names as shown on submitted plans (Exhibit D). **The applicant shall clarify if the street is intended to be named “The View Drive” or “The Views Drive” as both of these names are used on the application materials. All street names are subject to change prior to recording of the plat.**
83. Proposed streets meet the requirements of 17.84.50(H). The future street plan (Exhibit D, Sheet 1) shows that the proposed development will facilitate and not preclude development on adjacent properties, except with the possibility of the property north of Ortiz Street (i.e. Tax Map 25E18DC, Tax Lots 1000 and 1100). This is discussed in more detail in the subdivision approval criteria in Chapter 17.100 of this document. All proposed streets comply with the grade standards, centerline radii standards, and TSP-based right-of-way improvement widths with the exception of the portion of The Views Drive from the intersection with Vista Loop Drive to approximately the public alley which is proposed to be 31 feet wide. The applicant is requesting a reduction of the right-of-way in this location in order to shift the road to the south to construct a wider sidewalk on the north side of this street within a private landscaped tract. All proposed streets are designed to intersect at right angles with the intersecting street and comply with the requirements of Section

17.94.50.(H)(5). No private streets, with the exception of private drives, are proposed in the development.

84. The applicant has submitted a turning diagram demonstrating that there should be sufficient room for a 22 foot long vehicle to back out of a driveway (with an adjacent parked car in the driveway) and into the public alley with cars parked on the opposite side of the alley in a single motion without any conflict. **The garage face setback from the alley shall meet or exceed that shown in the turning diagram.**
85. **The various streets and public alleys shall include a minimum four-foot wide utility and sign easement on both sides to provide enough room for street name, traffic control and regulatory signage and utility pedestals, fire hydrants, water meters, etc.**
86. The plans detail all street intersections provide at least 50 foot tangents as required per 17.84.50(H)(5)(C). **The vertical design grade for landing at all the Tee intersections where controlled with “Stop” signs shall be no greater than 8 percent for a minimum of 50 feet or two car lengths.**
87. Section 17.84.60 outlines the requirements of public facility extensions. The applicant submitted a utility plan (Exhibit D, Sheets 12 and 13) which shows the location of proposed public water, sanitary sewer, and stormwater drainage facilities. Broadband fiber service will be detailed with construction plans. No private utilities are proposed. **All public sanitary sewer and waterline mains are to be a minimum of 8 inches in diameter and storm drains are to be a minimum of 12 inches in diameter. These shall be extended to the plat boundaries where practical to provide future connections to adjoining properties. All utilities are extended to the plat boundary for future connections.**
88. According to the applicant’s supplemental memos regarding sanitary sewer capacity dated December 9, 2020 (Exhibits NN and OO), both the applicant and the city engineer anticipate adequate sewer capacity to accommodate new development:
- “New commercial/residential loads are minor by comparison to the [infiltration and inflow] impact, and adding additional development has a nearly negligible impact on the system loading” (Exhibit NN).
- Additionally, the applicant suggests that SDC credits associated with the development will assist in paying for the City’s existing plans to update the sanitary sewer system.
89. Franchise utilities will be provided to all lots within the proposed subdivision as required in Section 17.84.80. The location of these utilities will be identified on construction plans and installed or guaranteed prior to final plat approval. The applicant does not anticipate extending franchise utilities beyond the site. All franchise utilities other than streetlights will be installed underground. The developer will make all necessary arrangements with franchise utility providers. The developer will install underground conduit for street lighting.
90. Section 17.84.90 outlines requirements for land for public purposes. The only public easements anticipated with this development are public pedestrian access easements located

over sidewalks not located within a public right-of-way, trails within the private open space tracts, and the recreation area tracts. Eight-foot wide public utility easements will be provided along all lots adjacent to street rights-of-way for future franchise utility installations. **All easements and dedications shall be identified on the final plat as required.**

91. Section 17.84.100 outlines the requirements for mail delivery facilities. **The location and type of mail delivery facilities shall be coordinated with the City Public Works Director and the Post Office as part of the construction plan process.**
92. **SandyNet shall receive a set of PGE utility plans to design and return a SandyNet broadband deployment plan.**
93. There are two private storm drain lines crossing the proposed right-of-way of The Views Drive. These storm lines serve private developments to the south of the site. Private utility facilities serving single sites are not permitted in public rights-of-way. When the land use application for the private development south of the site was processed the City identified that the location of these lines would present a conflict if a public right-of-way was ever dedicated across these private lines. Staff believes there are three options available: 1) relocate these lines outside the public right-of-way; 2) Replace the existing lines with materials conforming to City standards or demonstrate that the pipeline materials comply with and were installed in conformance with City standards and dedicate these improvements as public; or, 3) Have the owner of the adjacent site served by these lines apply for a revocable permit to place private drainage facilities in a public right-of-way. **Since the exact location relative to proposed improvements in the right-of-way is unknown at this time the City will determine the most suitable option during construction plan review.**
94. **The proposed public sidewalks located outside of the street right-of-way shall provide lighting levels in conformance with City standards.**
95. **An ODOT Permit to Occupy or Perform Operations Upon a State Highway shall be obtained for all work in the State highway right-of-way.** When the total value of improvements within the ODOT right-of-way is estimated to be \$100,000 or more, an agreement with ODOT is required to address the ownership, maintenance, and operations of any improvements or alterations made in highway right-of-way. An Intergovernmental Agreement (IGA) is required for agreements involving local governments and a Cooperative Improvement Agreement (CIA) is required for private sector agreements. The agreement shall address the project standards that must be followed, compliance with ORS 276.071, which includes State of Oregon prevailing wage requirements, and any other ODOT requirements for project construction, including costs for ODOT staff time for project approvals, inspection, and completion.

17.86 – Parkland and Open Space

96. The applicant intends to pay a fee in lieu of parkland dedication as outlined in the requirements of Chapter 17.86. Section 17.86.10(2) contains the calculation requirements for parkland dedication. The formula is acres = proposed units x (persons/unit) x 0.0043. For the four single family homes, acres = 120 x 3 x 0.0043 = 1.548 acres. For the proposed

development of 39 multi-family units, acres = $39 \times 2 \times 0.0043 = 0.3354$ acres. Combined, this totals 1.89 acres.

97. The applicant proposes paying a fee in lieu of parkland dedication. Based on 1.88 acres the parks fee in-lieu shall be \$455,490 based on the City's current fee schedule if this payment is not deferred and paid prior to final plat approval, and \$500,850 if half of the payment is deferred. If deferred, one-half of this amount (\$250,425) is required to be paid prior to final plat approval with the other half (\$250,425) evenly split and paid with each building permit. Because two of the lots are proposed to contain multi-family dwellings at a later date, the applicant requests the parks fee for these units be paid with the building permit for these units rather than at the time of final plat approval. If this proposal is accepted the amount of cash-in-lieu to be paid with the final plat would be based on the area of parkland required for the single family units which is 1.55 acres. This results in the following amounts $1.55 \times \$241,000 = \$373,550$ if paid prior to Final plat approval and $1.55 \times \$265,000 = \$410,750$ if one-half of the payment is deferred. The fee associated with the multi-family units $0.34 \times \$265,000 = \$90,100$ would be paid with the building permit for these units if that is the ultimate decision of the City Council.
98. As explained in the findings for Chapter 17.64, maintenance for the dedicated open space areas will be the responsibility of a Homeowners Association. **The applicant shall submit a draft agreement between the City and the HOA detailing the minimum maintenance requirements and responsibilities including a means for the City to remedy any failure to meet the agreed-upon standards. The agreement shall be finalized and recorded prior to plat approval and referenced on the face of the plat. Consistent with sidewalks along street frontages, staff recommends a plat note or restrictive covenant be recorded that if the homeowner's association dissolves the responsibility to maintain and repair the meandering walkways and associated landscaping including street trees and groundcover shall shift to the adjacent property owners.**
99. Per Section 17.86.50(5), in the event that any private owner of open space fails to maintain it according to the standards of the Sandy Municipal Code, the City of Sandy, following reasonable notice, may demand that the deficiency of maintenance be corrected, and may enter the open space for maintenance purposes. **All costs thereby incurred by the City shall be charged to those persons having the primary responsibility for maintenance of the open space.**

17.90 – Design Standards

100. Chapter 17.90 contains design standards for development based on type and zone. **All future buildings shall adhere to the design standards in Chapter 17.90.** Single family residences and row homes will be reviewed at building permit and multi-family buildings will be reviewed with a future design review application.

17.92 – Landscaping and Screening

101. Section 17.92.10 contains general provisions for landscaping. As previously determined by the Planning Commission, the City's tree protection standards in this section do not apply to residential subdivisions. Per Section 17.92.10(L), **all landscaping shall be continually maintained, including necessary watering, weeding, pruning, and replacing.**

102. Section 17.92.30 specifies that street trees shall be chosen from the City-approved list. As required by Section 17.92.30, the development of the subdivision requires medium trees spaced 30 feet on center along street frontages. The applicant did not submit a separate street tree plan but the conceptual plan (Exhibit L) details street trees along all of the proposed streets, except Highway 26. **The applicant shall update the street tree plan to detail street trees along Highway 26.** A majority of the streets include both street trees and trees in the front yards of the private property, which creates an allée of trees. The Landscape/Conceptual Plan (Exhibits L, M, and N) identifies tree species, size, and quantities of trees. The landscape/conceptual plan does not show much variety in tree species; for example, both sides of the entire length of Bonnie Street are proposed to have Japanese styrax. Staff would like to see more diversity in street tree species in general and within each block. **The applicant shall update the plan set to detail a minimum of two (2) different tree species per block face for staff review and approval.** In addition, the applicant is proposing red maples along The Views Drive, public alleys, and cul-de-sacs. Due to concerns with Asian Longhorn Beetle and Emerald Ash Borer, staff are not recommending maples or ashes at this time. **The applicant shall update the plant palette to detail an alternate species for the red maple that is not a maple or an ash.**
103. The applicant is proposing to mass grade the buildable portion of the site. This will remove top soil and heavily compact the soil. In order to maximize the success of the required street trees, **the applicant shall aerate the planter strips and other areas proposed to contain trees to a depth of 3 feet prior to planting street trees. The applicant shall either aerate the planter strip soil at the subdivision stage and install fencing around the planter strips to protect the soil from compaction or shall aerate the soil at the individual home construction phase.**
104. **If the plan set changes in a way that affects the number of street trees (e.g., driveway locations), the applicant shall submit an updated street tree plan for staff review and approval. Street trees are required to be a minimum caliper of 1.5-inches measured 6 inches from grade and shall be planted per the City of Sandy standard planting detail. Trees shall be planted, staked, and the planter strip shall be graded and backfilled as necessary, and bark mulch, vegetation, or other approved material installed prior to occupancy. Tree ties shall be loosely tied twine and shall be removed after one growing season (or a maximum of 1 year).**
105. Section 17.92.40 specifies that landscaping shall be irrigated, either with a manual or automatic system, to sustain viable plant life. The proposal includes numerous private tracts with landscaping. The applicant did not submit an irrigation plan nor did the applicant address Section 17.92.40 in the narrative. **The applicant shall submit an irrigation plan.**
106. Section 17.92.50 contains standards related to types and sizes of plant materials. The applicant submitted a plant key (Exhibit O) and landscape plans (Exhibits L, M, and N) that detail plant sizes in compliance with this section. Section 17.92.50(B) encourages the use of native plants or plants acclimatized to the PNW. The applicant is proposing two species of *Prunus* that are nuisance species: *Prunus laurocerasus* 'Otto Luyken' and *Prunus lusitanica*. **The applicant shall update the plant palette to include two alternate species**

to replace the nuisance *Prunus* species. Chapter 17.60 requires that any plants planted in the FSH overlay area are native. **The Landscape Plan shall detail native plants for all vegetation planted in the FSH overlay area and native or PNW acclimatized pollinator friendly species for all vegetation planted in the recreation tracts and private walkway tracts.** Staff recommends the following native or PNW acclimatized pollinator species:

- Trees: *Rhamnus purshiana*, *Prunus virginiana*, *Amelanchier alnifolia*, *Malus floribunda*
- Shrubs: *Ceanothus spp.*, *Berberis aquifolium*, *Perovskia atriplicifolia*, *Solidago canadensis*, *Helenium autumnale*, *Agastache foeniculum*
- Groundcover: *Eschscholzia californica*, *Madia elegans*, *Symphotrichum subspicatum*

107. The applicant submitted a conceptual plan that details extensive landscaping in the proposed private open space tracts and stormwater tracts. The inclusion of the recreation area tracts and the wider, more pedestrian friendly walkways with an allée of trees are two elements that set this planned development apart from a typical subdivision. On the streets where the meandering walkways with allées of trees are not proposed, the applicant is detailing additional trees planted in the front yards of houses to continue the allée feel. In addition, the proposal details trees in the rear yards of Lots 103-121, which will help buffer the noise from the highway, and trees in the public alley and private drives. **The applicant shall install landscaping in the private open space tracts, front yards, rear yards, public alleys, and private drives as detailed on the submitted conceptual plan and in accordance with the requirements for the updated landscape plan.** The applicant is proposing three natural area open space tracts, one of which will have a trail, which is a permitted use in otherwise undeveloped open space. The applicant is also proposing four recreation area tracts, which are proposed to contain sports courts and/or playground equipment. **The applicant shall install the proposed sports courts and playground equipment per the conceptual plan and prior to recording the plat of the associated phase. The applicant shall submit details on the sports courts and playground equipment to staff for review and approval.**

108. Section 17.92.130 contains standards for a performance bond. The applicant has the option to defer the installation of street trees and/or landscaping for weather-related reasons. Staff recommends the applicant utilize this option rather than install trees and landscaping during the dry summer months. Consistent with the warranty period in Section 17.92.140, staff recommends a two-year maintenance and warranty period for street trees based on the standard establishment period of a tree. **If the applicant chooses to postpone street tree and/or landscaping installation, the applicant shall post a performance bond equal to 120 percent of the cost of the street trees/landscaping, assuring installation within 6 months. The cost of the street trees shall be based on the average of three estimates from three landscaping contractors; the estimates shall include as separate items all materials, labor, and other costs of the required action, including a two-year maintenance and warranty period.**

109. **Landscaping requirements for the multi-family units will be addressed with a subsequent design review application.**

17.98 – Parking, Loading, and Access Requirements

110. Section 17.98.10(M) requires that the developer provide a Residential Parking Analysis Plan. This plan identifying the location of parking is included in Exhibit D, Sheet 10.

111. Section 17.98.20(A) requires that each single family dwelling unit is required to provide at least two off-street parking spaces. **Compliance with this requirement will be evaluated during building plan review. Parking for the proposed multi-family units will be evaluated as part of a future design review application.** Section 17.98.60 has specifications for parking lot design and size of parking spaces. No lots are proposed to gain access from an arterial or collector street (Section 17.98.80).

112. Section 17.98.100 has specifications for driveways. **The minimum driveway width for a single-family dwelling shall be 10 feet and the maximum driveway approach within the public right-of-way shall be 24 feet wide measured at the bottom of the curb transition.** Shared driveway approaches may be required for adjacent lots in cul-de-sacs in order to maximize room for street trees and minimize conflicts with utility facilities (power and telecom pedestals, fire hydrants, streetlights, meter boxes, etc.). As shown on the applicant's submittal (Exhibit D), allowing each cul-de-sac lot to be accessed by a separate driveway complies with the requirements of this section. Additionally, all driveways will meet vertical clearance, slope, and vision clearance requirements. All driveways appear to meet these criteria, but this will be verified at time of building permit submission and prior to excavation for the footings. Per Section 17.98.100(G), **the sum of the width of all driveway approaches within the bulb of a cul-de-sac as measured in Section 17.98.100(B) shall not exceed fifty percent of the circumference of the cul-de-sac bulb.** The applicant submitted additional analysis (Exhibit FF) showing that cul-de-sacs in the development comply with this standard. This requirement is satisfied. Per Section 17.98.100(I), **driveways shall taper to match the driveway approach width to prevent stormwater sheet flow from traversing sidewalks.**

113. Section 17.98.110 outlines the requirements for vision clearance. **The requirements of this section will be considered in placing landscaping in these areas with construction of homes and will be evaluated with a future design review application for the multi-family units.**

114. Section 17.98.130 requires that all parking and vehicular maneuvering areas shall be paved with asphalt or concrete. As required by Section 17.98.130, **all parking, driveway and maneuvering areas shall be constructed of asphalt, concrete, or other approved material.**

115. Section 17.98.200 contains requirements for providing on-street parking spaces for new residential development. Per Section 17.98.200, one on-street parking space at least 22 feet in length has been identified within 300 feet of each lot as required. Exhibit D, Sheet 10 shows that a minimum of 120 on-street parking spaces have been identified in compliance with this standard. No parking courts are proposed by the applicant.

17.100 – Land Division

116. Submittal of preliminary utility plans is solely to satisfy the requirements of Section 17.100.60. **Preliminary plat approval does not connote utility or public improvement plan approval which will be reviewed and approved separately upon submittal of public improvement construction plans.**
117. A pre-application conference was held with the City on May 29, 2019 per Section 17.100.60(A). The pre-app notes are attached as Exhibit BB.
118. As required by Section 17.100.60(E), the proposed subdivision is designed to be consistent with the density, setback, design standards, and dimensional standards in the SFR zoning district with the exception of the requests as part of the Planned Development. Dimensional and/or quantitative variations to development standards are permitted as part of the PD process per Section 17.64.30(A). See findings for Chapter 17.64 in this document.
119. Section 17.100.60(E)(2) requires subdivisions to be consistent with the design standards set forth in the chapter. Consistency with design standards in this chapter are discussed under each subsection below. Conditions of approval can be adopted where necessary to bring the proposal into compliance with applicable standards.
120. Section 17.100.60(E)(3) requires the proposed street pattern to be connected and consistent with the Comprehensive Plan or official street plan for the City of Sandy. Given the requirements in Section 17.100.100(E), the site specific conditions of the subject property, particularly the location of the FSH overlay area, limits construction of an interconnected street system. The only existing street to be extended is Ortiz Street in the Upper Views, which is proposed to be located directly across Vista Loop Drive from the existing street. The applicant submitted a future street plan (Exhibit D, Sheet C10); however, it details the area north of Ortiz Street as future apartments and does not consider this area to lend itself to a traditional subdivision.
121. Section 17.100.60(E)(4) requires that adequate public facilities are available or can be provided to serve the proposed subdivision. All public utilities including water, sanitary sewer and stormwater are available or will be constructed by the applicant to serve the subdivision. As detailed on the submitted plans and because of the depth of the existing sewer line in Vista Loop, eleven lots in the Lower Views (Lots 39-46 and 61-63) and five lots (Lots 96-100) in the Upper Views will require installation of individual grinder sump systems to pump sanitary waste from these dwellings to a gravity sewer line.
122. Section 17.100.60(E)(5) requires all proposed improvements to meet City standards through the completion of conditions as listed within this document and as detailed within these findings. The detailed review of proposed improvements is contained in this document.
123. Section 17.100.60(E)(6) strives to ensure that a phasing plan, if requested, can be carried out in a manner that meets the objectives of the above criteria and provides necessary public improvements for each phase as it develops. The applicant proposes building The Lower Views as Phase 1 and The Upper Views as Phase 2.

124. Section 17.100.80 provides standards for denial of a development application due to physical land constraints. A significant portion of the Lower Views is affected by the FSH overlay identified by the City of Sandy. The applicant does not propose any development within this area. A Geotechnical Evaluation (Exhibit I) for the property is included with the application package. Except for the areas designated as open space, all areas of the Lower Views and all of the Upper Views property are suitable for development and do not pose any issues due to flooding.
125. The subject property abuts Highway 26 and notification of the proposal was sent to ODOT as required by Section 17.100.90. ODOT's comments are included as Exhibit W. One of ODOT's comments reads as follows: "The proposed land use notice is to construct 128 single family residential units and 48 [sic] multi-family units within the vicinity of the US 26/Vista Loop Drive intersection. The "Upper Views" site is located adjacent to the highway. ODOT has review the Traffic Impact Study prepared by Ard Engineering for the development. The development will increase the number of vehicles turning right onto Vista Loop Drive from the highway. The posted speed on the highway is 55 mph and vehicles making this turning movement must to slow down significantly to safely make the turn. Due to the high speed of through traffic, increasing the number of vehicles turning from the through lane onto Vista Loop Drive is a safety concern. In order to separate the right turning vehicles from the through movement, ODOT recommends that the city require the applicant to provide space for right turning vehicles to utilize while turning right onto Vista Loop Drive." After additional discussion with the City Transportation Engineer, prior to conditioning additional asphalt area for turning movements, he recommends the applicant's transportation engineer provides further analysis to be reviewed by ODOT and the City of Sandy. This analysis by Ard Engineering is contained in Exhibit F and explained in further detail in Chapter 17.84 of this document.
126. As required by Section 17.100.100(A), a traffic impact study prepared in compliance with the City standards was submitted with the application (Exhibit F). This study does not identify any issues requiring mitigation by the applicant. The findings from the City Transportation Engineer (Exhibit S) are expressly incorporated by reference into this document. None of the special traffic generators listed in Section 17.100.100(B) are located near the subject site.
127. While Section 17.100.100(C) calls for a rectangular grid pattern, due to topographic constraints in the Lower Views and existing infrastructure in the Upper Views (Highway 26 and Vista Loop Drive) the site does not lend itself to creating a rectangular gridded street pattern.
128. Section 17.100.100(E) requires applicants to provide a future street plan within a 400 foot radius of the subject property(ies). Given the requirements in Section 17.100.100(E), the site specific conditions of the subject property, particularly the location of the FSH overlay area, limits construction of an interconnected street system. The only existing street to be extended is Ortiz Street in the Upper Views, which is proposed to be located directly across Vista Loop Drive from the existing street. The applicant submitted a future street plan (Exhibit D, Sheet C10); however, it details the area north of Ortiz Street as future

apartments and does not consider this area to lend itself to a traditional subdivision. **The Planning Commission needs to determine if an additional street stub or pedestrian access shall be extended north (i.e. in the location of Lots 91 and 92).**

129. Section 17.100.120(A) requires blocks to have sufficient width to provide for two tiers of lots at appropriate depths. However, exceptions to the block width shall be allowed for blocks that are adjacent to arterial streets or natural features. All blocks within the proposed subdivision have sufficient width to provide for two tiers of lots as required in Section 17.100.120(A), with the exception of blocks along Highway 26 and blocks adjacent to the FSH overlay district. The unique character of the site does not lend itself to creating blocks with two tiers due to the existing location of Highway 26 and the FSH overlay area.
130. Section 17.100.120(B) requires that blocks fronting local streets shall not exceed 400 feet in length, although blocks may exceed 400 feet if approved as part of a Planned Development. Due to site specific and topographic conditions, all streets do not comply with the 400 foot block length standard. The applicant is requesting an exception to this standard as part of the Planned Development request as identified in Chapter 17.64 of this document.
131. Section 17.100.120(D) requires that in any block over 600 feet in length, a pedestrian and bicycle accessway with a minimum improved surface of 10 feet within a 15-foot right-of-way or tract shall be provided through the middle of the block. The applicant proposes establishing a ten foot wide sidewalk within a 15-foot wide pedestrian access easement in the middle of Knapp Street to provide a sidewalk connection from this street to Vista Loop Drive. In order to provide sufficient room for landscaping, **the walkway shall be shifted to one side of the 15 foot wide pedestrian access easement to accommodate a landscaping strip that is at least 5 feet in width with trees.**
132. As required by Section 17.100.130, eight-foot wide public utility easements will be included along all property lines abutting a public right-of-way. Eight foot wide public utility easements shall be included along all property lines abutting a public right-of-way. Only public pedestrian access easements will be needed to allow public access along some of the sidewalks located within private tracts. Staff does not believe that any other easements for public utility purposes are required but will verify this during construction plan review. **Preliminary plat approval does not connote utility or public improvement plan approval including easement locations which will be reviewed and approved separately upon submittal of public improvement construction plans.**
133. Section 17.100.140 requires that public alleys shall have a minimum width of 20 feet. A 28-foot wide paved alley within a 29-foot public right-of-way is proposed in the Lower Views. This alley is designed to provide access to the 32 single family detached dwellings abutting this right-of-way. The proposed alley width is designed to accommodate public parking on the south side of the alley. The proposed alley widths include Type C vertical curb with 7 inch exposure per the street sections diagram.
134. Section 17.100.150 outlines requirements for residential shared private drives. A shared private drive is intended to provide access to a maximum of two dwelling units. One of the following two criteria must be met: Direct access to a local street is not possible due to

physical aspects of the site including size, shape, or natural features; or the construction of a local street is determined to be unnecessary. As shown on submitted plans the Lower Views includes three private drives serving two lots each. These private drives are proposed due to the topographic constraints with the subject property. The design of the lots should be such that a shared access easement and maintenance agreement shall be established between the two units served by a shared private drive, public utility easements shall be provided where necessary in accordance with Section 17.100.130, and shared private drives shall be fully improved with an all weather surface (e.g. concrete, asphalt, permeable pavers) in conformance with city standards. The pavement width shall be 20 feet, and parking shall not be permitted along shared private drives at any time and shall be signed and identified accordingly. The proposed three private drives in the Lower Views are designed to serve only two lots each as permitted. **A shared access easement and maintenance agreement shall be established for each private drive as part of the Final Plat.** Public utility easements will be accommodated along these private drives as necessary to serve these lots. As shown on submitted plans each private drive is proposed to include a 20-foot wide all weather surface within a 21-foot wide tract and shall be posted “no parking.”

135. Section 17.100.170 outlines requirements for flag lots. Lots 103 and 104 are proposed as flag lots. Both lots contain a minimum 15 feet of street frontage as required.
136. Section 17.100.180(A) requires that intersections are designed with right angles. All streets in the proposed subdivision have been designed to intersect at right angles to the opposing street as required.
137. All streets in the proposed subdivision have a minimum curve radius as required by Section 17.100.180(B).
138. **A lighting plan shall be coordinated with PGE and the City as part of the construction plan process and prior to installation of any fixtures as required by Section 17.100.210.**
139. All lots in the proposed subdivision have been designed so that no foreseeable difficulties due to topography or other conditions will exist in securing building permits on these lots as required by Section 17.100.220(A).
140. Section 17.100.220(B) requires that the lot dimensions shall comply with the minimum standards of the Development Code. When lots are more than double the minimum lot size required for the zoning district, the applicant may be required to arrange such lots to allow further subdivision and the opening of future streets to serve such potential lots. As allowed by Chapter 17.64 for Planned Developments, the applicant has proposed modifications to the minimum lot size and dimension standards specified in the Single Family Residential zone. Only Lot 62 (16,694 square feet) is proposed to contain more than double the minimum lot size (7,500 square feet) in the SFR zone. Due to its location and topographic constraints no further division of this lot is possible and therefore staff supports the proposed square footage of Lot 62.
141. Section 17.100.220 states that all new lots shall have at least 20 feet of street frontage. All lots in the proposed subdivision contain at least 20 feet of frontage along a public street with

the exception of one flag lot and the six lots that are proposed to be accessed by three private drives.

142. Only Lots 99 and 103-121 are designed to have frontage on both an internal local street (Knapp Street) and Highway 26. This configuration is unavoidable because of the location of Highway 26 and limitations for access to this roadway and is thus allowed as required by Section 17.100.220(D).
143. The applicant shall install all water lines and fire hydrants in compliance with the applicable standards in Section 17.100.230, which lists requirements for water facilities.
144. The applicant intends to install sanitary sewer lines in compliance with applicable standards in Section 17.100.240. As noted above, because of the depth of the existing sanitary sewer in Vista Loop, 11 lots in the Lower Views (Lots 39-46 and 61-63) and five lots (Lots 96-100) in the Upper Views will require installation of a grinder sump system installed at each of these dwellings to pump sanitary sewer waste from these dwellings to a gravity sanitary sewer line in the development.
145. Section 17.100.250(A) details requirements for stormwater detention and treatment. A stormwater water quality and detention facility is proposed to be located in the eastern portion of the Lower Views and the western area of the Upper Views as shown on submitted plans. These facilities have been sized and located to accommodate public stormwater generated by the subdivision. A stormwater report (Exhibit E) is included with this application as required. Stormwater calculations are found to meet the water quality/quantity criteria as stated in the City of Sandy Development Code 13.18 Standards and the 2016 City of Portland Stormwater Management Manual Standards that were adopted by reference into the Sandy Development Code. **However, a detailed final report stamped by a licensed professional shall be submitted for review with the final construction plans.**
146. **The detention ponds shall be constructed to meet the requirements of the 2016 City of Portland Stormwater Management Manual for landscaping Section 2.4.1 and escape route Section 2.30. The access to the detention ponds shall be paved of an all-weather surface to a minimum of 12-foot in width per the 2016 City of Portland Stormwater Management Manual.**
147. Section 17.100.260 states that all subdivisions shall be required to install underground utilities. **The applicant shall install utilities underground with individual service to each lot.**
148. Section 17.100.270 requires that sidewalks shall be installed on both sides of a public street and in any special pedestrian way within the subdivision. Sidewalks will be installed on both sides of all streets with the exception that a sidewalk is proposed to be constructed on only the north side of The View Drive from its intersection with Vista Loop Drive to the proposed public alley. The applicant is proposing this design to allow the road surface to be shifted to the south side of the public right-of-way to construct a six-foot sidewalk within a widened landscaped buffer. The applicant believes this design will provide a more aesthetically pleasing and desirable environment for pedestrians walking between the upper

and lower parts of the development. The roadway width in this location will be 28 feet wide in compliance with city standards.

149. Planter strips will be provided along all frontages as required in Section 17.100.290. Street trees in accordance with City standards will be provided in these areas. **The applicant shall provide a revised street tree plan with alternative species as explained in Chapter 17.92 of this document.**
150. Grass seeding shall be completed as required by Section 17.100.300. Grass seeding will be completed as required by this section. The submitted erosion control plan (Exhibit D) provides additional details to address erosion control concerns. **A separate Grading and Erosion Control Permit will be required prior to any site grading.**

17.102 – Urban Forestry

151. Section 17.102.20 contains information on the applicability of Urban Forestry regulations. An Arborist Report by Todd Prager of Teragan & Associates (ASCA Registered Consulting Arborist #597, ISA Board Certified Master Arborist, WE-6723B, ISA Qualified Tree Risk Assessor) is included as Exhibit G. The arborist inventoried approximately 530 trees. The inventory is included in Exhibit D, Sheet 6 and the proposed retention trees are shown in Exhibit D, Sheet 7.
152. The property contains 32.87 acres requiring retention of 99 trees 11 inches and greater DBH ($32.87 \times 3 = 98.61$). The submitted Tree Retention Plan (Exhibit D Sheets C6 and C7) identifies 219 trees that will be retained. Of the 219 trees proposed for retention, 105 are 11 inches DBH or greater and in good condition as required. Five (5) of the proposed retention trees are nuisance species: Tree #149 is an English holly and Trees #223, 224, 225, and 227 are sweet cherries. In addition, 76 of the 105 trees (72 percent) are conifer species as preferred by Section 17.102.50(4). The applicant submitted a supplemental Tree Protection Plan and Table prepared by the project arborist that details an additional seven (7) retention trees within the FSH overlay district that weren't previously inventoried that meet retention tree standards and aren't nuisance species. With these additional seven retention trees, the applicant is proposing to retain 101 trees that meet the retention standards and aren't nuisance species.
153. No trees are proposed to be removed within the FSH overlay area. **The applicant shall not remove any trees from the FSH overlay area.**
154. The Arborist Report (Exhibit G) provides recommendations for protection of retained trees including identification of the recommended tree protection zone for these trees. The requirements of Section 17.102.50(B) will be complied with prior to any grading or tree removal on the site. Per the Pacific Northwest International Society of Arboriculture (ISA), the ISA defines the critical root zone (CRZ) as "an area equal to a 1-foot radius from the base of the tree's trunk for each 1 inch of the tree's diameter at 4.5 feet above grade (referred to as diameter at breast height)." Often the drip-line is used to estimate a tree's CRZ; however, it should be noted that a tree's roots typically extend well beyond its drip-line. In addition, trees continue to grow, and roots continue to extend. Thus, a proactive approach to tree protection would take into consideration the fact that the tree and its root

zone will continue to grow. The submitted arborist report details a root protection zone radius of 1 foot per 1 inch DBH and a minimum construction setback radius of 0.5 feet per 1 inch DBH. **The applicant shall install tree protection fencing at the critical root zone of 1 foot per 1 inch DBH to protect the 101 retention trees on the subject property as well as all trees on adjacent properties. The tree protection fencing shall be 6 foot tall chain link or no-jump horse fencing and the applicant shall affix a laminated sign (minimum 8.5 inches by 11 inches) to the tree protection fencing indicating that the area behind the fence is a tree retention area and that the fence shall not be removed or relocated. No construction activity shall occur within the tree protection zone, including, but not limited to, dumping or storage of materials such as building supplies, soil, waste items, equipment, or parked vehicles. The applicant shall request an inspection of tree protection measures prior to any tree removal, grading, or other construction activity on the site. Up to 25 percent of the area between the minimum root protection zone of 0.5 feet per 1-inch DBH and the critical root zone of 1 foot per 1 inch DBH may be able to be impacted without compromising the tree, provided the work is monitored by a qualified arborist. The applicant shall retain an arborist on site to monitor any construction activity within the critical root protection zones of the retention trees or trees on adjacent properties that have critical root protection zones that would be impacted by development activity on the subject property. The applicant shall submit a post-construction report prepared by the project arborist or other TRAQ qualified arborist to ensure none of the retention trees were damaged during construction.**

To ensure protection of the required retention trees, **the applicant shall record a tree protection covenant specifying protection of all retention trees, including trees in the FSH Overlay per the recommendations of the applicant's arborist report of 1 foot per 1 inch DBH. The tree protection covenant shall specify limiting removal of the retention trees without submittal of an Arborist's Report and City approval. This document shall include a sketch identifying the required retention trees and a 1 foot per 1 inch DBH radius critical root zone around each tree consistent with the applicant's arborist report. All trees marked for retention shall be retained and protected during construction regardless of desired or proposed building plans; plans for future houses on the proposed lots within the subdivision shall be modified to not encroach on retention trees and associated tree protection fencing.**

155. The arborist report contains additional recommendations related to tree protection, directional felling, stump removal, tree crown protection, monitoring of new grove edges, and sediment fencing. **The applicant shall follow the recommendations outlined in the arborist report related to tree protection, directional felling, stump removal, tree crown protection, monitoring of new grove edges, and sediment fencing.**

15.30 – Dark Sky

156. Chapter 15.30 contains the City of Sandy's Dark Sky Ordinance. The applicant will need to install street lights along all street frontages wherever street lighting is determined necessary. **The locations of these fixtures shall be reviewed in detail with construction plans. Full cut-off lighting shall be required. Lights shall not exceed 4,125 Kelvins or 591 nanometers in order to minimize negative impacts on wildlife and human health.**

15.44 – Erosion Control

157. The applicant submitted a Geotechnical Report (Exhibit I) prepared by Redmond Geotechnical Services dated May 15, 2020. **The applicant shall retain appropriate professional geotechnical services for observation of construction of earthwork and grading activities. The grading setbacks, drainage, and terracing shall comply with the Oregon Structural Specialty Code (OSSC) requirements and the geotechnical report recommendations and conclusions as indicated in the report. When the grading is completed, the applicant shall submit a final report by the Geotechnical Engineer to the City stating that adequate inspections and testing have been performed on the lots and all of the work is in compliance with the above noted report and the OSSC. Site grading should not in any way impede, impound or inundate the adjoining properties.**
158. **All the work within the public right-of-way and within the paved area should comply with American Public Works Association (APWA) and City requirements as amended. The applicant shall submit a grading and erosion control permit and request an inspection of installed devices prior to any additional grading onsite.** The grading and erosion control plan shall include a re-vegetation plan for all areas disturbed during construction of the subdivision. **All erosion control and grading shall comply with Section 15.44 of the Municipal Code. The proposed subdivision is greater than one acre which typically requires approval of a DEQ 1200-C Permit. The applicant shall submit confirmation from DEQ if a 1200-C Permit will not be required.**
159. Section 15.44.50 contains requirements for maintenance of a site including re-vegetation of all graded areas. **The applicant’s Erosion Control Plan shall be designed in accordance with the standards of Section 15.44.50.**
160. Development at both the Zion Meadows subdivision and the remodel of the Pioneer Building (former Sandy High School) have sparked unintended rodent issues in the surrounding neighborhoods. Prior to development of the site, **the applicant shall have a licensed pest control agent evaluate the site to determine if pest eradication is needed.**

POSSIBLE MOTIONS

City Council has a number of options for potential motions. Council’s decision should be based on the findings in this staff report, all exhibits, staff presentation, relevant municipal code sections, Planning Commission recommendations (pages 6-8 of this document), and testimony from the applicant and citizens. Decisions on Planned Developments are unique as they tend to be more discretionary than other, more objective land use decisions. Ultimately, the authority to approve or deny this application lies with City Council.

- 1) Motion Option A: Approve the requested application with conditions and findings as recommended by the Planning Commission. If you select this option, please also make a motion to either have Mayor Pulliam review the final order as drafted by staff or have the final order with the full conditions list come back before the City Council for consideration.

- 2) Motion Option B: Approve the application with conditions and findings determined by the City Council. If you select this option, staff recommends to have the final order with the full conditions list come back before the City Council for consideration.
- 3) Motion Option C: Deny the application based on code criteria that you find are not satisfied.
- 4) Motion Option D: Ask the applicant to revise the proposal, extend the 120-day clock, and come back before the City Council at a future date with a revised proposal. If you select this option, staff prefers not to determine the continuance date at this time.
- 5) Motion Option E: Continue the hearing to a future City Council date to continue Council dialogue prior to issuing a decision. If you select this option, staff prefers you choose a date for the continuance on February 16, 2021 so that additional public notice and legal notice is not required.

The Views PD Exhibits (20-028 SUB/TREE/FSH/PD)

Applicant's Submittals	EXHIBITS	
	A	Land Use Application
	B	Project Narrative
	C	Supplemental Narrative for Special Variance
	D	Civil Plan Set
	E	Preliminary Storm Drainage Report
	F	Traffic Impact Study
	G	Arborist Report
	H	Wetland Determination Report
	I	Geotechnical Report
	J	Architectural Plans Booklet
	K	The Views Proposed Homes
	L	The Views Concept Plan
	M	Lower Views Concept Plan
	N	Upper Views Concept Plan
	O	Plant Key
	P	Plant Palette
	Q	DSL Wetland Concurrence
	R	Sound Wall Plans
Agency Comments	S	John Replinger, Traffic Engineer (September 14, 2020)
	T	Hassan Ibrahim, City Engineer (September 15, 2020)
	U	Sandy Fire Marshal (September 15, 2020)

	V	SandyNet (September 16, 2020)
	W	ODOT (September 17, 2020)
	X	Sandy Area Metro (September 21, 2020)
	Y	Public Works Director (November 6, 2020)
	Z	Parks & Trail Advisory Board (November 20, 2020)
	AA	John Replinger, Traffic engineer (November, 30, 2020)
Additional Documents from Staff:	BB	Pre-Application Notes from May 29, 2019
	CC	Staff Report from November 23, 2020 PC Meeting
	DD	PowerPoint Presentation from November 23, 2020 PC Meeting
	EE	Minutes from November 23, 2020 PC Meeting
	FF	Staff Report from December 16, 2020 PC Meeting
	GG	PowerPoint Presentation from December 16, 2020 PC Meeting
	HH	Minutes from December 16, 2020 PC Meeting
Applicant:	II	Email from Michael Robinson (September 23, 2020)
	JJ	Memo from Tracy Brown (November 22, 2020)
	KK	Email from Michael Robinson (November 28, 2020)
	LL	Supplemental Memo (December 9, 2020)
	MM	Responses to staff Report Questions (December 9, 2020)
	NN	Sewer Capacity Letter from Ray Moore, PE (December 9, 2020)
	OO	Sewer Capacity Letter from Michael Pinney, PE (December 9, 2020)
	PP	Right Turn Lane Memo from Micahel Ard, PE (December 9, 2020)
	QQ	ODOT Slip Lane Removal Plans (December 9, 2020)
	RR	Revised Materials Response (January 19, 2021)
	SS	Revised Proposal (January 19, 2021)

	TT	Revised Density Calcs (January 19, 2021)
Public Comments	UU	Bonnie Eichel (October 2, 2020)
	VV	Jerry Carlson (October 29, 2020)
	WW	John & Linda Bartmettler (Ocotber 29, 2020)
	XX	Dustin & Bonnie Bettencourt (November 3, 2020)
	YY	Georgina Sutherland (November 3, 2020)
	ZZ	Gerald & Judith Dittbenner (November 5, 2020)
	AAA	Tony & Kim Turin (November 6, 2020)
	BBB	John & Christine Andrade (November 7, 2020)
	CCC	Todd Springer (November 8, 2020)
	DDD	John R Eskridge (November 9, 2020)
	EEE	Dan & Janine Walton (November 19, 2020)
	FFF	Ed Dewart (November 20, 2020)
	GGG	G. Manley (November 20, 2020)
	HHH	Bonnie & Robert Eichel (November 20, 2020)
	III	Georgina Sutherland (November 20, 2020)
	JJJ	Jason & Mary Dyami (November 24, 2020)
	KKK	Chris Anderson and Jason Shuler (December 7, 2020)
	LLL	Kristina Molina (December 9, 2020)
	MMM	John Andrade (December 10, 2020)
	NNN	Pamela Kim York (December 14, 2020)
	OOO	Tom Orth (December 14, 2020)
	PPP	Gerald Dittbenner (December 14, 2020)
	QQQ	John and Christina Andrade (December 14, 2020)

	RRR	Robert & Bonnie Eichel (December 14, 2020)
	SSS	Brad Picking (December 14, 2020)
	TTT	Buzz Ortiz (December 14, 2020)
	UUU	Dustin & Bonnie Bettencourt (December 14, 2020)
	VVV	John R Eskridge & Lisa Hull (December 15, 2020)
	WWW	John Barmettler (December 15, 2020)
	XXX	Valerie Walberg (December 15, 2020)
	YYY	Lisa Hull (December 15, 2020)
	ZZZ	Ed Elm (December 17, 2020)
	AAAA	Robert Eichel (February 9, 2021)
	BBBB	Jerry Carlson (February 9, 2021)
	CCCC	Georgina Sutherland (February 9, 2021)
	DDDD	Dan & Janine Walton (February 13, 2021)
	EEEE	John & Christine Andrade (February 14, 2021)
	FFFF	Gerald R. & Jusith A. Dittbenner (February 15, 2021)
	GGGG	Sue Gabriel (February 16, 2021)
	HHHH	Valerie Walberg (February 16, 2021)
	IIII	Bonnie & Robert Eichel (February 16, 2021)
	JJJJ	Bonnie & Robert Eichel (February 16, 2021) #2
	KKKK	Steve Flowry (February 16, 2021)
	LLLL	Ed Dewart (February 16, 2021)
	MMMM	John & Christine Andrade (February 16, 2021)
Additional Exhibits	NNNN	Parks and Trails Advisory Board Minutes - Sept-Oct 2020
	OOOO	Staff Report from February 16, 2021 CC Meeting
	PPPP	Letter extending 120-day period (February 17, 2021)

	QQQQ	City Council Questions with Applicant Responses (February 25, 2021)
	RRRR	City Council Questions with Staff Responses (February 25, 2021)
	SSSS	Questions from Councilor Walker (March 1, 2021)

EXHIBIT A



General Land Use Application

1 page

Name of Project:	THE VIEWS PLANNED DEVELOPMENT
Location or Address:	VISTA LOOP DRIVE

Map & Tax Lot #	T: 2S	R: 5E	Section: 19	Tax Lot (s): 200 & 500
----------------------------	--------------	--------------	--------------------	----------------------------------

Request: 122 LOT PLANNED DEVELOPMENT

I am the (check one) owner lessee of the property listed above, and the statements and information contained herein are in all respects true, complete and correct to the best of my knowledge and belief.

Applicant (if different than owner) MAC EVEN (EVEN BETTER HOMES, INC.)	Owner Bradford Picking
Address P.O. Box 2021	Address 77-6516 Alii dr #9 Kailua-Kona HI 96740
City/State/Zip GRESHAM, OR 97030	City/State/Zip
Email mac@evenbetterhomes.com	Email janzberry12@gmail.com
Phone 503-348-5602	Phone 503-807-4376
Signature	Signature <i>Brad Picking</i>

Staff Use Only

File #:	Date:	Fee\$:	Planner:
Type of review: Type I <input type="checkbox"/> Type II <input type="checkbox"/> Type III <input type="checkbox"/> Type IV <input type="checkbox"/>			
Has applicant attended a pre-app? Yes <input type="checkbox"/> No <input type="checkbox"/> If yes, date of pre-app meeting:			

Development Services Department, 39250 Pioneer Blvd, Sandy, OR 97055, 503.489.2160



General Land Use Application

1 page

Name of Project:	THE VIEWS PLANNED DEVELOPMENT
Location or Address:	VISTA LOOP DRIVE

Map & Tax Lot #	T: 2S	R: 5E	Section: 19	Tax Lot (s): 200 & 500
----------------------------	--------------	--------------	--------------------	----------------------------------

Request: 122 LOT PLANNED DEVELOPMENT

I am the (check one) owner lessee of the property listed above, and the statements and information contained herein are in all respects true, complete and correct to the best of my knowledge and belief.

Applicant (if different than owner) MAC EVEN (EVEN BETTER HOMES, INC.)	Owner John Knapp
Address P.O. Box 2021	Address PO Box 1360
City/State/Zip GRESHAM, OR 97030	City/State/Zip Sandy OR 97055
Email mac@evenbetterhomes.com	Email skylinechristmastrees@gmail.com
Phone 503-348-5602	Phone 503-819-4037
Signature	Signature <i>John Knapp</i>

Staff Use Only

File #:	Date:	Fee\$:	Planner:
Type of review:	Type I <input type="checkbox"/>	Type II <input type="checkbox"/>	Type III <input type="checkbox"/> Type IV <input type="checkbox"/>
Has applicant attended a pre-app? Yes <input type="checkbox"/> No <input type="checkbox"/> If yes, date of pre-app meeting:			

Development Services Department, 39250 Pioneer Blvd, Sandy, OR 97055, 503.489.2160

EXHIBIT B

Project Narrative
For

The Views Planned Development
SE Vista Loop Drive
Sandy, Oregon 97055



Prepared by Tracy Brown Planning Consultants, LLC
June 2020

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Project Details

Project Location: East and west of the eastern end of Vista Loop Drive,
east of Highway 26

Legal Description: Map 25E 19, Tax Lots 200 and 500

Zoning District SFR, Single Family Residential

Site Size: Tax Lot 200 - 23.318 acres (41717 SE Vista Loop Drive)
Tax Lot 500 - 9.552 acres (No site address)
Total Site 32.87 acres (1,431,813 sq. ft.)

Applicant

Mac Even
Even Better Homes, Inc.
P.O. Box 2021
Gresham, OR. 97030
Phone: 503-348-5602
Email: mac@evenbetterhomes.com

Representative:

Civil Engineer / Surveyor
Ray Moore, P.E., P.L.S.
All County Surveyors & Planners, Inc.
P.O. Box 955
Sandy, OR 97055
Phone: 503-668-3151
Fax: 503-668-4730
Email: ray@allcountysurveyors.com

Consultant Team:

Planning
Tracy Brown
Tracy Brown Planning Consultants, LLC
17075 Fir Drive
Sandy, OR 97055
Phone: 503-781-0453
Email: tbrownplan@gmail.com

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Geotechnical Engineer

Daniel M. Redmond, P.E., G.E.
Redmond Geotechnical Services, LLC
P.O. Box 20547
Portland, Oregon 97294
Phone: 503-285-0598
Fax: 503-286-7176
Cell: 503-545-9055

Email: RedmondGeotechnicalServices@gmail.com

Traffic Engineer

Mike Ard
Ard Engineering
21370 SW Langer Farms Parkway, Suite 142
Sherwood, OR 97140
Phone: 503-537-8511
Email: mike.ard@gmail.com

Wetland Consultant

Kim Biafora
Schott & Associates
21018 NE Highway 99E
Aurora, OR. 97002
Phone: 503-678-6007
Email: kim@schottandassociates.com

Arborist

Todd Praeger
Teragan & Associates
3145 Westview Circle
Lake Oswego, OR. 97034
Phone: 971-295-4835
Email: todd@teragan.com

Landscape Architect

Mears Design Group
Troy Mears
P.O. Box 23338
Portland, OR 97281
Phone: 503-601-4516
Email: troym@mearsdesigngroup.com

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I. General Project Description

The project site consists of two parcels located at Township 2 South, Range 5 East, Section 19, tax lots 200 and 500. The property contains a total area 32.87 acres and contains an existing single family home and accessory structures.

Both parcels are zoned SFR, Single Family Residential. The applicant proposes constructing a 122 lot planned development in order to build 120 single family dwellings and 48 multi-family dwellings on two separate lots. The following dwelling unit types are proposed: 32 single family attached dwellings (Lots 1 - 32), 88 single family detached dwellings (Lots 33 - 71 and 73 - 121), and 48 multi-family dwellings (24 units each on Lots 72 and 122).

The two parcels proposed for this project are abutting each other and separated only by Vista Loop Drive. Tax lot 200 referred to in this application as the “Lower Views” shares a common property line with the existing Johnson RV recreational vehicle business. This property contains about 23.32 acres and is proposed to gain access by construction of a local street (“The Views Drive”) intersecting Vista Loop Drive. Two existing home and a barn currently located on this property will be removed following land use approval. The portion of the property proposed as buildable contains gentle to moderate slopes. A considerable portion of the rest of the property falls within the FSH Overlay with slopes greater than 25 percent. The Lower Views is proposed to contain three housing types: 32 units single family attached dwellings, 39 single family detached dwellings, and one lot to contain 24 multi-family dwelling units. The Lower Views is also proposed to include a wide variety of amenities including play structures, a half-court basketball court, a viewpoint plaza, and trails within the private open spaces.

Tax lot 500 referred to as the “Upper Views” is located directly across Vista Loop Drive from the Lower Views. This property contains about 9.55 acres and is bordered on one side by Vista Loop Drive and the other by Highway 26. The property is gently sloping with about 40 feet of elevation difference between the South and north property lines. The Upper Views is proposed to contain two housing types: 49 detached single family dwelling units and one lot to contain 24 multi-family dwelling units. Additional features proposed in the Upper Views include a half-court basketball court, play structure, tot lot, dog park, and sidewalk system.

A pre-application conference was held with the City to review the project on May 29, 2019. Based on input received at this meeting modifications were made to the project layout.

II. Application Approval Requests

The applicant requests the following approvals with this application:

- Type IV Combined Planned Development Review to include both Conceptual and Development Plan reviews;

III. Items Submitted With This Application

Exhibit A - Land Use Application

Exhibit B - Notification List and Mailing Labels

Exhibit C - Pre-application Notes

Exhibit D - Project Narrative

Exhibit E - Architectural Plans Booklet

Exhibit F - Storm Drainage Report

Exhibit G - Traffic Impact Analysis

Exhibit H - Arborist Report

Exhibit I - Geotechnical Report

Exhibit J - DSL Wetland Delineation Concurrence

Exhibit K - Civil Plans (*under separate cover*)

- Sheet C1 - Cover Sheet
- Sheet C2 - Preliminary Plat - The Lower Views
- Sheet C3 - Preliminary Plat - The Upper Views
- Sheet C4 - Topographic Survey - The Lower Views
- Sheet C5 - Topographic Survey - The Upper Views
- Sheet C6 - Tree Retention and Protection Plan
- Sheet C7 - Tree Inventory List
- Sheet C8 - Building Setbacks - The Lower Views
- Sheet C9 - Building Setbacks - The Upper Views
- Sheet C10 - Parking Analysis and Future Street Plan
- Sheet C11 - Block and Street Dimensions
- Sheet C12 - Street and Utility Plan - The Lower Views
- Sheet C13 - Street and Utility Plan - The Upper Views
- Sheet C14 - Grading and Erosion Control Plan - The Lower Views
- Sheet C15 - Grading and Erosion Control Plan - The Upper Views
- Sheet C16 - Sanitary Sewer Plan and Profile - Offsite
- Sheet C17 - Sanitary Sewer Plan and Profile - The Lower Views
- Sheet C18 - Sanitary Sewer Plan and Profile - The Upper Views

Exhibit L - Landscape Concept Plans (*under separate cover*)

- Sheet L1 - Overall Concept Plan
- Sheet L2 - Lower Views Concept Plan
- Sheet L3 - Upper Views Concept Plan

Exhibit M - Architectural Plans Display Sheet (*under separate cover*)

IV. Review of Applicable Approval Criteria

Development applications are required to meet development standards set forth in the City of Sandy Development Code. This section addresses all applicable review criteria. Pertinent code provisions are cited below in regular text followed by a

response describing how the proposal complies with this standard in *italics*. The following code chapters have been reviewed in this narrative:

- | Chapter | Title |
|----------------|---|
| 17.30 | - Zoning District |
| 17.34 | - Single Family Residential (SFR) |
| 17.56 | - Hillside Development |
| 17.60 | - Flood and Slope Hazard Overlay |
| 17.64 | - Planned Development |
| 17.80 | - Additional Setbacks on Collector and Arterial Streets |
| 17.82 | - Special Setbacks on Transit Streets |
| 17.84 | - Improvements Required with Development |
| 17.86 | - Parkland and Open Space |
| 17.90 | - Design Standards |
| 17.92 | - Landscaping and Screening |
| 17.98 | - Parking, Loading, and Access Requirements |
| 17.100 | - Land Division |
| 17.102 | - Urban Forestry |
| 15.30 | - Dark Sky Ordinance |

CHAPTER 17.30 - ZONING DISTRICTS
17.30.20 - RESIDENTIAL DENSITY CALCULATION PROCEDURE

The number of dwelling units permitted on a parcel of land is calculated after the determination of the net site area and the acreage of any restricted development areas (as defined by Chapter 17.60). Limited density transfers are permitted from restricted development areas to unrestricted areas consistent with the provisions of the Flood and Slope Hazard Area Overlay District, Chapter 17.60.

Response: The applicant proposes developing a 122 lot Planned Development and subdivision to include 120 lots to accommodate single-family dwellings and two lots to accommodate 48 multi-family units for a total of 168 dwelling units. In addition, the proposal includes three private drives (Tracts F, G, and H), two public stormwater detention and water quality facilities (Tracts J and O), eight private open space tracts to be maintained by a Homeowner’s Associations (Tracts A - E, I, K, L) in the Lower Views and two private open space tracts (Tracts M,N) in the Upper Views. The table to the right provides a list of all proposed tracts and the proposed purpose and area of each.

Tract Number	Purpose	Area (sq. ft.)	Acres
Lower Views			
A	Private Active Open Space	49,686	1.14
B	Private Active Open Space	10,782	0.25
C	Private Active Open Space	9,895	0.23
D	Private Open Space	5,791	0.13
E	Private Active Open Space	11,985	0.28
F	Private Drive	2,820	0.06
G	Private Drive	1,883	0.04
H	Private Drive	1,716	0.04
I	Private Open Space	72,119	1.66
J	Public Stormwater Detention Pond	13,954	0.32
K	Private Open Space	240,970	5.53
L	Private Open Space	45,051	1.03
Upper Views			
M	Private Active Open Space	39,940	0.92
N	Private Active Open Space	32,655	0.75
O	Public Stormwater Detention Pond	16,839	0.39

The subject property contains a gross site area of 32.87 acres. After deducting public rights-of-way (4.73 acres) and

stormwater tracts (0.707 acres) proposed to be dedicated to the City, the net site area (NSA) is 27.433 acres. Because the subject property contains restricted development areas (RDA) as defined by Chapter 17.60 these areas are also deducted from the net site area to determine the unrestricted site area (USA). The formula used in this calculation is: NSA - RDA = USA.

The subject property contains 279,768 square feet (6.423 acres) of restricted development area (RDA). Subtracting this area from the net site area (NSA) results in an unrestricted site area (USA) containing 21.010 acres.

The SFR zone allows a minimum of 3 and a maximum of 5.8 units per net acre. The minimum density is calculated by multiplying the USA x the required minimum density (21.010 acres x 3 = 63.03 units round down to **63 units**)

The maximum density is determined by using the lesser number of units in the following two formulas.

a. NSA (in acres) x Maximum Density of Zoning District (units/acre).

(27.433 acres x 5.8 units/acre = 159.11 (rounded to 159 units))

or,

b. USA (in acres) x Maximum Density of Zoning District (units/acre) x 1.5 (maximum allowable density transfer based on Chapter 17.60)

(21.01 x acres x 5.8 units/acre x 1.5 density transfer = 182.787 (rounded to 183 units))

As a result of these calculations the density range for the subject property is a minimum of 63 units and a maximum of 159 dwelling units.

As discussed in more detail below, Chapter 17.64, Planned Developments, Section 17.64.40(C), allows the density to be increased by up to 25% of the number of dwelling units upon a finding that the Planned Development is outstanding in planned land use and design, and provides exceptional advantages in living conditions and amenities not found in similar developments constructed under regular zoning.

Multiplying the maximum density above by 25% results in 39.75 (rounded to 40 dwellings units) additional dwelling units. With this provision, the maximum density for the subject property can be increased to **199 dwelling units** (159 maximum allowed x .25 = 40. 159 + 40 units = 199 maximum as allowed by Chapter 17.64). **The applicant proposes constructing 168 dwelling units, nine units more than allowed by Chapter 17.30 and 31 units fewer than allowed by Chapter 17.64.** This represents an increase in the number of units by six percent over the maximum allowed by Chapter 17.30. The details of this request is discussed in Chapter 17.64 below.

CHAPTER 17.34 - SINGLE-FAMILY RESIDENTIAL (SFR)

17.34.00 - INTENT

The district is intended to implement the Low Density Residential Comprehensive Plan designation by providing for low-density residential development in specific areas of the city. The purpose of this district is to allow limited development of property while not precluding more dense future development, as urban services become available. Density shall not be less than 3 or more than 5.8 units per net acre.

Response: *As discussed in Chapter 17.30 above, the proposal to construct 168 units exceeds the density range allowed in the SFR zone but is less than the maximum number of units (199 units) permitted by Chapter 17.64 as discussed below. The proposed planned development represents an overall density of 6.12 units per net acre.*

17.34.10 - PERMITTED USES

A. Primary Uses Permitted Outright:

1. Single detached dwelling subject to design standards in Chapter 17.90;
Response: *The applicant proposes constructing 32 single family attached dwellings, 88 single family detached dwellings, 48 multi-family dwelling units. All of the proposed housing types are allowed as part of a Planned Development application per Section 17.64.60(A)(2) below.*

17.34.30 - DEVELOPMENT STANDARDS

Response: *As shown on the plan set, a number lots in the proposal do not contain at least 7,500 square feet, are at least 60 feet wide, and provide minimum setbacks required by this section. As discussed in Section 17.64.30(A) below, the proposal includes a request to vary these development standards that are dimensional and/or quantitative as allowed by this section. Required off-street parking is shown in the plan set and is reviewed in Chapter 17.98 below.*

17.34.40 - MINIMUM REQUIREMENTS

A. Must connect to municipal water.

Response: The applicant proposes extending water service to serve all dwellings in the development.

B. Must connect to municipal sewer if service is currently within 200 feet of the site. Sites more than 200 feet from municipal sewer, may be approved to connect to an alternative disposal system provided all of the following are satisfied:

1. A county septic permit is secured and a copy is provided to the city;
2. The property owner executes a waiver of remonstrance to a local improvement district and/or signs a deed restriction agreeing to complete improvements, including but not limited, to curbs, sidewalks, sanitary sewer, water, storm sewer or other improvements which directly benefit the property;

3. The minimum size of the property is one acre or is a pre-existing buildable lot, as determined by the city;
4. Site consists of a buildable parcel(s) created through dividing property in the city, which is less than five acres in size.

Response: The existing dwelling is currently served by a septic system. This system will be decommissioned in accordance with applicable regulations and the applicant will provide proof of the decommissioned system with construction documents.

- C. The location of any real improvements to the property must provide for a future street network to be developed.

Response: A new street network will be constructed to serve each dwelling as required.

- D. Must have frontage or approved access to public streets.

Response: Each new residence constructed in the subdivision will gain access from a public street however six lots will gain access from three separate private drives connected to a public street.

17.34.50 - ADDITIONAL REQUIREMENTS

- A. Design review as specified in Chapter 17.90 is required for all uses.

Response: The Residential Design Standard of Section 17.90.150, are applicable to residential development. The applicant is not proposing to submit for design review of the proposed multi-family structures on Lots 72 and 122 at this time.

- B. Lots with 40 feet or less of street frontage shall be accessed by a rear alley or a shared private driveway.

Response: All proposed lots contain greater than 40 feet of street frontage except six lots proposed to be accessed by private drives (Lots 41, 42, 57, 58, 61 and 62), two flag lots (Lots 103, 104), and all attached dwelling units (Lots 1-32) which will be accessed by a rear alley.

CHAPTER 17.56 - HILLSIDE DEVELOPMENT

17.56.00 - INTENT

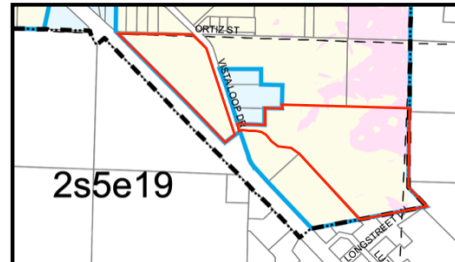
The intent of this chapter is to comply with Statewide Planning Goal 7 (Natural Hazards) by minimizing seismic and landslide hazards, and soil erosion associated with development on steep or unstable slopes. Development may be permitted on potentially hazardous areas, provided that the recommendations of approved studies are implemented as conditions of building permit or land use approval.

17.56.10 - APPLICABILITY

These regulations shall apply to any parcel with slopes greater than twenty-five percent (25%) as shown on the Hillside Development Overlay District Map or with slope hazards mapped by the Department of Geology and Mineral Industries

(DOGAMI). This chapter shall apply only to activities and uses that require a building, grading, tree removal and/or land use permit.

Response: As shown on the figure to the right from the City's Hillside Overlay District Map and as shown on the Existing Conditions Plan submitted with this application, a small area of the Lower Views contains slopes greater than 25 percent.



A. General. No person shall develop property in areas designated by SDC

17.56.10, without first demonstrating compliance with this chapter.

1. As a condition of permit issuance or land use approval, the applicant shall agree to implement the recommendations of approved studies and to allow all inspections to be conducted.
2. Where a bond, letter of credit or other guarantee is required, the permit shall not be issued until the bond or guarantee has been obtained and approved.

Response: A Geotechnical Report has been included with this application.

B. Exemptions:

1. An activity or use that avoids slopes of 25% or greater, DOGAMI slope hazard areas, natural drainageways and potentially hazardous analysis areas as defined in Section 17.56.30.A.

Response: As shown on the submitted plans only limited development is proposed on slopes 25 percent or greater. No development is proposed on DOGAMI slope hazard areas, natural drainageways, or hazardous analysis areas.

CHAPTER 17.60 - FLOOD AND SLOPE HAZARD (FSH) OVERLAY

17.60.10 - INTERPRETATION AND MAPPING

The Director has the ultimate responsibility for maintaining the FSH Overlay District on the City of Sandy Zoning Map, determining on-site measuring methods, and otherwise interpreting the provisions of this chapter. Technical terms used in this chapter are defined in Chapter 17.10, Definitions. This chapter does not regulate development on lots or parcels entirely outside the FSH Overlay District.

A. FSH Overlay District. The only areas subject to the restrictions and prohibitions of the FSH overlay district are those indicated on the City of Sandy Zoning Map on file in the Planning Department. This chapter does not regulate lots or parcels entirely outside the FSH Overlay District.

Response: As shown on the city's Zoning Map and submitted plans, a portion of the Lower Views is encumbered by the FSH Overlay District. No development is proposed to occur within any part of this overlay.

B. **Development Approval Required.** No development shall occur within the FSH overlay district without first obtaining City approval under the provisions of this chapter. The Director shall notify the Oregon Division of State Lands whenever any inventoried wetland is proposed for development, in accordance with ORS 227.350. In riverine situations, the Director shall notify adjacent communities and the State Coordinating Office prior to any alteration or relocation of a watercourse, and submit copies of such notification to the administrator.

Response: *As shown on submitted plans, no portion of any lot is proposed to be platted within the FSH overlay district.*

C. **Applicant Responsibilities.** The applicant for alteration or development within the FSH overlay district shall be responsible for preparing a survey of the entire site, based on site specific field surveys or Corps of Engineers data that precisely maps and delineates the following areas:

1. The name, location and dimensions of affected streams or rivers, and the tops of their respective banks.

Response: *No rivers or streams are located on the subject property. As noted in the section above, no development is proposed within the FSH overlay district on the subject property.*

2. 100-year floodplain and floodway boundaries and elevations as determined by the June 17, 2008 FIS for Clackamas County and Incorporated Areas.

Response: *The Lower Views contains a small wetland/drainage as shown on submitted plans.*

3. The City of Sandy FSH overlay district boundary as depicted on the City of Sandy FSH Map.

4. The water quality and slope setback area(s) as defined in Section 17.60.30.

5. The size and location of locally significant wetlands shall be determined based on the City of Sandy Locally Significant Wetland Inventory (2002) unless modified by a wetland delineation approved by the Oregon Division of State Lands and submitted to the City. Wetland delineations that have formal concurrence from the Division of State Lands shall be valid for the period specified in that agency's administrative rules.

6. Steep slope areas where the slope of the land is 25% or greater within the FSH overlay district boundary.

7. The area enclosed by a continuous line, measured 25 feet horizontally, parallel to and upland from the top of a steep slope area, where the top of the steep slope is within the FSH overlay district boundary.

8. Existing public rights-of-way, structures, roads and utilities.

9. Natural vegetation, including trees or tree clusters and understory within the FSH Overlay District boundary.

10. Existing and proposed contours at 2-foot intervals.

Response: All of this information is included on submitted plans. A portion of the Lower Views is encumbered by the FSH Overlay and a wetland has been delineated on this property as well. An existing storm drainage pipe and outfall is located within the delineated wetland area that will remain. No development is proposed in the FSH Overlay as shown on submitted plans.

17.60.20 - PERMITTED USES AND ACTIVITIES

A. **Restricted Development Areas.** Restricted development areas within the FSH overlay district as shown on the City of Sandy Zoning Map include:

1. Slopes of 25% or greater that (a) encompass at least 1,000 square feet and (b) have an elevation differential of at least 10 feet.
2. Protected water features, including locally significant wetlands, wetland mitigation areas approved by the Division of State Lands, and perennial streams.
3. Required setback areas as defined in section 17.60.30.

Response: As shown on submitted plans portion of the Lower Views is located within a restricted development area.

B. **Permitted Uses.** Permitted uses within restricted development areas are limited to the following:

Response: The only uses proposed within any restricted development area are permitted uses: trail construction, removal of non-native plants, and planting native plants.

C. **Platting of New Lots.** No new lot shall be platted or approved for development that is exclusively in restricted development areas as defined in subsection 17.60.20.A.

Response: No portion of any lot is proposed to be platted within the FSH overlay or restricted development area.

17.60.30 - REQUIRED SETBACK AREAS

A. **Required Setbacks.** The required special setback(s) shall be:

1. 70 feet from the top of bank of Tickle Creek;
3. 25 feet around the edge of any mapped locally significant wetland; and
4. 25 feet from the top of any 25% slope break where the slope break occurs within the FSH overlay district as mapped by the city.

Response: The Topographic Survey submitted with the application includes this information as applicable. No development is proposed within any of these areas.

B. **Minimize Impacts.** Natural vegetation shall be preserved and enhanced and excavation minimized within required water quality setback areas.

Response: No disturbance or development is proposed within water quality setback areas on the subject property.

17.60.40 - REVIEW PROCEDURES

Review of development requests within the FSH Overlay District shall occur subject to the following procedures. Unless otherwise indicated below, the Director may approve Type I permits over the counter or following a field check. Type II and III development applications shall be reviewed to ensure consistency with Section 17.60.60-70. Section 17.60.50 special reports shall also be required, unless specifically exempted by the Director.

Response: As noted above, no development is proposed within the FSH Overlay District and no special reports have been identified by the Director.

17.60.80 - NOTIFICATION TO OTHER ENTITIES AND RECORD KEEPING

- A. Whenever a watercourse is to be altered or relocated, notification shall be sent to Clackamas County and DLCD prior to such alteration or relocation of a watercourse, and submit evidence of such notification to the Federal Insurance Administrator through appropriate notification means (i.e. submittal of a Letter of Map Revision (LOMR)), and assure that the flood carrying capacity of the altered or relocated portion of said watercourse is maintained.
- B. Base Flood Elevations may increase or decrease resulting from physical changes affecting flooding conditions. As soon as practicable, but not later than six months after the date such information becomes available, the Director shall notify the Federal Insurance Administrator of the changes by submitting technical or scientific data in accordance with Volume 44 Code of Federal Regulations Section 65.3. Such a submission is necessary so that upon confirmation of those physical changes affecting flooding conditions, risk premium rates and floodplain management requirements will be based upon current data.
- C. Notify the Federal Insurance Administrator in writing of acquisition by means of annexation, incorporation or otherwise, of additional areas of jurisdiction.
- D. Obtain and maintain the following for public inspection and make available as needed:
 1. Obtain and record the actual elevation (in relation to the mean sea level) of the lowest floor (including basements) of all new or substantially improved structures, and whether or not the structure contains a basement.
 2. For all new or substantially improved floodproofed structures:
 - a. Verify and record the actual elevation (in relation to mean sea level), and
 - b. Maintain the floodproofing certifications required in Section 17.60.70(F).
 3. Obtain and maintain certification for flood openings when certification is required under Section 17.60.70(E)(5).

Response: As noted above, no development is proposed within the FSH Overlay District

17.60.90 - WATER QUALITY TREATMENT FACILITIES

Tickle Creek, the Sandy River and associated natural drainage ways are vital to Sandy's recreationally based economy and to the quality of life of Sandy residents. Placement of water quality facilities shall be limited as follows:

- A. The water quality facility shall not be constructed in restricted development areas, except where necessary to serve approved development within restricted development areas (e.g., a road) and where no reasonable alternative exists in buildable areas of the site.
- B. Where the approval authority determines that a more efficient and effective regional site exists within the sub-basin, the water quality facility may be constructed off-site.

Response: *The proposed water quality facilities on Tract J and O are located outside the FSH overlay.*

17.60.100 - DENSITY TRANSFER PROVISIONS

Residential density transfer may be approved subject to the following:

- A. Required Setback Areas. Density may be transferred from restricted development areas (i.e., steep slopes, protected water features and required setbacks) to buildable portions of the site.

Response: *As detailed in Chapter 17.30 above, the density for the site does not allow a density transfer per Chapter 17.60.*

- B. Density Maximum. The maximum gross density for the buildable area of the site shall not exceed 150% of the maximum density allowed by the underlying zoning district for that buildable area.

Response: *As detailed in Chapter 17.30 above, the maximum density is based on the lesser of the two methods of calculating density. As a result, the maximum density permitted is 159. The applicant proposes increasing the density by nine units to 168 units as discussed in Chapter 17.64.*

- C. Housing Types Not Permitted in Underlying Zoning District. Housing types not permitted in the underlying zoning district may only be approved through the PD (planned development) or SAP (specific area plan) process.

Response: *The applicant proposes constructing 32 single-family attached dwellings and two multi-family buildings to include 24 units each. Both of these dwelling types are not otherwise allowed in the SFR zoning district however they are through the PD approval process as discussed in Chapter 17.64 below.*

- D. Transfer Area. Transfer of density may only occur within the same property and/or to properties contiguous to the primary property. The terms “primary property” identify the legal lot from which density is to be transferred to “secondary property(s)”. Further development or land use action on the primary or secondary properties shall be reviewed together in the same application.

Response: *As noted above the proposal is not permitted to transfer density per the provisions of Chapter 17.30.*

CHAPTER 17.64 - PLANNED DEVELOPMENT

17.64.00 - INTENT

The Planned Development regulations are intended to:

- A. Refine and implement village development patterns designated “V” on the Comprehensive Plan Map.
- B. Allow the relocation of zones within designated villages, provided that the overall intent of the village designation is maintained.
- C. Allow a mixture of densities between base zones within the planned development.
- D. Promote flexibility in site planning and architectural design, placement, and clustering of structures.
- E. Provide for efficient use of public facilities and energy.
- F. Encourage the conservation of natural features.
- G. Provide usable and suitable recreation facilities and public or common facilities.
- H. Allow coordination of architectural styles, building forms and relationships.
- I. Promote attractive and functional business environments in non-residential zones, which are compatibility with surrounding development.

Response: The proposed Planned Development is intended to further the intent of this chapter. The proposal includes a mixture of housing types and densities; a request for variations to setbacks to promote flexibility in site planning; conservation of natural features by not platting any lots within the FSH or restricted development areas and restricting development within restricted development areas to only permitted uses (trail construction, removal and planting native plants); an array of recreational amenities for the use and enjoyment of residents of The Views; and interesting and functional building designs intended to create a high quality and diverse residential neighborhood.

17.64.10 - GENERAL PROVISIONS

- A. Combined Review. The procedures of this chapter require review of both a Conceptual Development Plan and a Detailed Development Plan. Requests may be made sequentially or for a combined review. In the event of a combined review, the Planning Commission shall forward a recommendation regarding the plans to the City Council, and the City Council shall make a final decision approving, approving with conditions or denying the application.

Response: The submitted application requests a combined review of both Conceptual and Detailed Development Plans.

- B. Development Permit Issuance. Development permits are only issued following approval of a Detailed Development Plan.

Response: The applicant is aware of this requirement.

17.64.20 - AREAS OF APPLICATION

Planned developments are allowed in all zones.

Response: *The subject property is zoned Single Family Residential Zone and a Planning Development is proposed as permitted in all zones.*

17.64.30 - DEVELOPMENT STANDARDS

A. Variation from Development Code Standards Generally. The development standards of the base zone, overlay zone or planned development overlay apply unless they are superseded by the standards of this chapter, or are modified during a Planned Development review. The Planned Development and Specific Area Plan review processes allow modification of development code standards that are dimensional and/or quantitative, however a base zone's minimum density is not eligible for modification under any circumstances, including a modification under Chapter 17.66.

Response: *Due to the unique physical characteristics of the site including extensive restricted development areas, the applicant is requesting several variations to Development Standards with the application. The majority of these items have been proposed in order to provide additional flexibility in designing and placing homes on the lots. The applicant believes the requested variations are the minimum necessary for a successful project.*

1. *Minimum Lot Size - The SFR zone requires lots for single family dwellings to contain a minimum of 7,500 sq. ft. Because of the unique physical aspects of the subject property including large areas in the Lower restricted by the FSH Overlay and the location of existing transportation facilities (Vista Loop Drive and Highway 26) impacting the Upper Views, compliance with the minimum lot size standard is challenging and still allow the project to be financially successful. For this reason the proposal includes a variety of lots sizes. The proposed Planned Development includes four lot categories for the 88 single-family detached lots: 50 lots (3,400 - 4,999 sq. ft.), 13 lots (5,000 - 5,999 sq. ft.), 12 lots (6,000 - 7,499 sq. ft.) and 13 lots (7,500 sq. ft. and greater). The proposed single family attached lots range in size from 2,160 sq. ft. - 2,695 sq. ft. Each category of lot is intended to provide an opportunity to construct a different housing product type.*
2. *Minimum Average Lot Width (60 ft.) - Lower Views Lots - 1-39, 65, and 68-70. Upper Views Lots - all except Lots 73, 83, 87, 99, 100, and 121. This variation is requested to provide flexibility in the design and placement of homes. The applicant believes the unique nature of the site and amenities offered as part of the PD application warrant an extra degree of flexibility in site design and home design selection this request provides.*
3. *Interior Side Yard Setbacks - The applicant proposes reducing the interior side yard setback on all lots to five feet. This variation is requested to provide greater flexibility in building design and placement. The applicant believes the unique nature of the site and amenities offered as part of the*

PD warrant an extra degree of flexibility in placing homes on these lots and selecting home designs.

4. *Rear yard setbacks - All lots will provide a 20 foot rear yard setback with the exception a 10 foot setback is proposed for Lots 47 - 56 abutting the public open space in the Lower Views and a 15 foot rear setbacks is proposed for Lot 84 - 86 and Lots 88 - 102 in the Upper Views. This variation is requested to provide greater flexibility in building design and placement. The applicant believes the unique nature of the site and amenities offered as part of the PD warrant an extra degree of flexibility in placing homes on these lots and selecting home designs.*
5. *Maximum Block Length - Due to the unique physical characteristics of the Lower Views (steep slope, restricted development areas) and the Upper Views (Vista Loop Drive and Highway 26) compliance with the 400 foot maximum block length standard in Section 17.100.120 is not possible. For this reason the applicant is requesting a variation to this standard as part of the PD process. The specific streets segments requested included: The Views Drive from Vista Loop Drive to Bonnie Street, north side of Bonnie Street, and Knapp Street from Ortiz Street to Vista Loop. The Lower Views is contained by steep slopes and restricted development making street connectivity and block lengths impossible. Because of the location of Highway 26 and Vista Loop Drive the Upper Views street design is logical given these constraints.*
6. *Eliminate sidewalk/planter - The applicant also requests approval to eliminate the requirement to construct a sidewalk and planter along the following street frontages: south side of The Views Drive from Vista Loop Drive to the alley and the majority of the Highway 26 frontage. The details and reasons for this request is explained in Chapter 17.84 below.*

B. Minimum Site Area. A planned development may be established on any parcel of land, or on more than one parcel of land if those parcels are abutting.

Response: *The subject property contains two abutting parcels totaling 32.87 acres in compliance with this section.*

17.64.40 - DENSITY CALCULATION

The maximum number of allowable dwelling units shall be the sum of densities allowed by the underlying zone(s) unless an increase is authorized as otherwise allowed in this chapter.

A. Residential Zones. The calculation is based on a determination of gross site area and the acreage of any restricted development areas (as defined by Chapter 17.60). A specific determination of density shall be made pursuant to Chapter 17.30. When a PD is located in more than one "R" zone, the total

allowed number of units is the sum of the number of units allowed by each zone. The dwelling units may be placed without regard to zone boundaries.

Response: *The subject property contains only property zoned Single Family Residential. As reviewed in Chapter 17.30 above, the density range for the property is a minimum of 63 units and a maximum of 159 units. The applicant to increase the maximum density by nine units to 168 units.*

- C. Increase in Density. An increase in density of up to 25% of the number of dwelling units may be permitted upon a finding that the Planned Development is outstanding in planned land use and design, and provides exceptional advantages in living conditions and amenities not found in similar developments constructed under regular zoning.

Response: *As noted above the maximum density allowed by the SFR and Chapter 17.30 is 159 units and the applicant proposes 168 units. The applicant proposes increasing density as permitted by this section by nine units, an increase of six percent. The applicant believes the proposed density increase is justified given the unique nature of the property and the amenities offered with this proposal. As detailed on submitted plans, 19.5 percent (6.42 acres) of the 32.87 acre property is contained within restricted development areas and the Planned Development proposal includes the designation of 36.3 percent (11.92 acres) of the site as open space. In addition, no part of any lot will be platted within the FSH or a restricted development area. Other features of the proposal include a mix of housing types and densities; a request to vary development standards to promote flexibility in site planning; an innovative townhouse design exceeding the residential design standards including a two car rear-loaded detached garage and open courtyard; and constructing an array of recreational amenities for the use and enjoyment of the residents of the Planned Development. As a package the applicant believes there is sufficient justification to find that the Planned Development is outstanding in planned land use and design and provides exceptional advantages in living conditions and amenities not found in similar developments constructed in the SFR zone in order to justify this request.*

- D. Density Transfer. A transfer of density may be allowed by the Planning Commission when consistent with the review criteria of Chapter 17.64.100 C. Density may be transferred across zone district boundaries.

Response: *The subject property is located in the SFR zoning district only and a density transfer is not requested.*

17.64.50 - OPEN SPACE AND PARKLAND

All Planned Developments shall provide a minimum percentage of the total area in open space as specified below. In addition to required open space, all Planned Developments that include residential housing shall also provide a required parkland dedication as specified in Chapter 17.86.

- A. Residential Zones. A minimum of 25% of the total site area.

Response: This section requires the Planned Development proposal to provide 25 percent of the total site area in open space. The subject property contains 32.87 acres requiring 8.22 acres of open space. As shown on submitted plans, the proposal includes 11.92 acres of open space with 10.25 acres in the Lower Views (8.22 acres within FSH Overlay restricted development areas, 1.9 acres of active open space, and 0.13 acres of additional open space) and 1.67 acres in the Upper Views. The proposed 11.92 acres of open space represents 36 percent of the total site area in compliance with this section.

B. Commercial or Industrial Zones. A minimum of 15% of the total tract area.

Response: This section is not applicable.

C. Payment in Lieu of Dedication. At the city's discretion only, the city may accept payment of a fee in lieu of land dedication. The amount of the fee in lieu of land dedication (in dollars per acre) shall set by City Council Resolution or determined by a current land appraisal. The City may also allow open space land donation requirements to be fulfilled on another parcel.

Response: The applicant does not propose dedicating any open spaces areas to the city, instead these areas will be held as private open space to be owned and maintained by a homeowner's association.

D. The following factors shall be used in the choice of whether to accept land or cash in lieu:

- a. The topography, geology, access to, parcel size, and location of land to be dedicated;
- b. Potential adverse/beneficial effects on environmentally sensitive areas;
- c. Compatibility with the Parks Master Plan, Public Facilities element of the Comprehensive Plan, and the City of Sandy Capital Improvements Program in effect at the time of dedication;
- d. Availability of previously acquired property; and
- e. The feasibility of dedication.

Response: As noted above, the applicant does not propose dedicating any park or open spaces areas to the city.

E. The types of open space that may be provided are as follows:

- a. Natural Areas: areas of undisturbed vegetation, steep slopes, stream corridors, wetlands, wildlife habitat areas or areas replanted with native vegetation after construction.
- b. Greenways: linear green belts linking residential areas with other open space areas. These greenways may contain bicycle paths or footpaths. Connecting greenways between residences and recreational areas are encouraged.

Response: As shown on submitted plans, the proposed 11.92 acres of open space includes 8.22 acres within FSH Overlay restricted development areas.

F. Dedication Procedures. Open space as part of Planned Development application shall be dedicated according to the requirements of Section 17.86.50.

Response: The applicant does not propose dedicating any open space to the City of Sandy. Instead the applicant proposes establishing a homeowner's association to own and maintain these areas as permitted by Section 17.86.50.

17.64.60 - ALLOWED USES

A. Residential Districts:

1. Uses permitted in the underlying district
2. Housing types may include, but are not limited to, single family dwellings, duplexes, row houses, clustered dwelling units, multiple family dwellings, or manufactured dwellings.
3. Related commercial uses as part of the development
4. Related community service uses as part of the development
5. Accessory buildings and uses

Response: The proposed PD includes 88 lots to accommodate single-family detached dwellings, 32 lots for single-family attached dwellings, and two lots to allow construction of up to 48 multi-family dwellings in the future. A variety dwelling types have been proposed to provide diverse housing choices to accommodate a range of income levels.

17.64.70 - OFFICIAL ZONING MAP

When a Planned Development project has been approved, the official Zoning Map shall be amended by ordinance to denote the new "PD" Planned Development overlay designation. Such an amendment is a ministerial act, and Chapter 17.26, Zoning District Amendments, shall not apply when the map is amended to denote a PD overlay.

Response: The applicant understands the City will complete a zone change as a ministerial act to denote a "PD", Planned Development Overlay designation on the property during the approval process. Since no parkland is proposed to be dedicated to the city a Zoning District Amendment is not required with this application.

17.64.80 - CONCEPTUAL DEVELOPMENT PLAN PROCEDURE

A. The Planning Commission shall review the Conceptual Development Plan at a public hearing and forward a recommendation for approval, approval with modifications, or denial of the application to the City Council for consideration.

Response: The applicant is aware of the review process for this application.

B. The City Council shall review the recommendation at a public hearing and take action based on the Planning Commission recommendation. The City Council may approve, approve with modifications, or deny the application. Approval of the Conceptual Development Plan shall be limited to the tentative acceptability of the land uses proposed and their interrelationships and shall

not be construed to endorse precise locations of uses nor engineering feasibility.

Response: *The applicant requests the proposal be approved as presented.*

- C. If an affirmative decision is made, the City Council shall adopt findings that specify how the application has or has not complied with this chapter's standards, as well as any other relevant standards, and approve the request by an ordinance that amends the Zoning Map.

Response: *The applicant is aware the Council will need to adopt findings stating how the proposal complies with relevant code standards and approving the proposal.*

- D. Within 12 months of approval of the Conceptual Development Plan, the applicant shall file a Detailed Development Plan. The Detailed Development Plan shall incorporate any modification or condition required by approval of the Conceptual Development Plan.

Response: *The applicant has submitted an application for a combined review of both Conceptual and Detailed Development Plans.*

17.64.90 - CONCEPTUAL DEVELOPMENT PLAN APPLICATION

A Conceptual Development Plan is intended as a general guide to land use, transportation and utility placement within a planned development. A Conceptual Development Plan application requires significantly less detail than a Detailed Development Plan.

- A. Application Requirements. An application for Conceptual Development Plan review shall be made on forms provided by the Director. The person filing the application must be the owner or a person having an interest in the land to be included in the Planned Development. If the Planned Development is to include land in more than one ownership, the application must be submitted jointly by all of the owners or persons having an interest in each of the separately owned properties to be included.

The application shall be accompanied by the following:

- 20 copies of the required narrative.
- 20 sets of full-scaled black line drawings of the conceptual development plan graphic(s) drawn at a typical engineering scale.
- One set of plans reduced to 8 1/2" by 11" sheets of paper. Graphics and related names/numbers must be legible on this sheet size.
- List and mailing labels of all affected property owners within 300 feet.
- List of all proposed deviations from City development standards.

Response: *All of the items required by this section are included with the application package.*

- B. Additional Submittals. A Conceptual Development Plan shall include the following information where applicable:

1. Existing land use map (typically a topographic map that extends at least 300 feet beyond the site). The map shall include building footprints and make a distinction between single-family, multi-family, commercial and industrial uses, as well as other significant features such as roads, drainage ways, parks and schools.

Response: *The proposal includes a future street plan containing the items in this section.*

2. Site plan(s) and other graphics drawn to scale. The site plan(s) shall contain the following:
 - a) Title sheet, date, north arrow, and legend
 - b) Existing site conditions including contours at 10-foot intervals, watercourses, floodplains and natural features.
 - c) Boundary of the proposed Planned Development and any interior boundaries related to proposed development phases or land divisions.
 - d) General location of existing and proposed land uses, including residential densities and non-residential building types. An indication of approximate building envelopes may be required where necessary to evaluate building relationships.
 - e) General location and size of areas to be conveyed, dedicated, or reserved as common open spaces, public parks, recreational areas, school sites, and similar public and semi-public uses.
 - f) Existing and proposed general circulation system including collector and arterial streets and major points of access to public rights-of-way and adjacent property. Notations of proposed ownership (public or private) should be included where appropriate.
 - g) General pedestrian and bicycle circulation system, including its interrelationship with the motor vehicular system and indicating proposed treatments at existing or potential points of conflict.
 - h) Existing and proposed utility systems including sanitary sewer, water, storm sewer, and drainage ways.
 - i) Sufficient information on land areas within at least 300 ft. of the subject property to indicate their relationships with the proposed development including land uses, lot lines, circulation systems (including potential for connectivity of streets and pedestrian ways), public facilities, and unique natural features of the landscape.

The Director may waive any of the above requirements or require additional information when deemed necessary to properly evaluate the proposed Planned Development.

Response: *All of the items in this section have been submitted as detailed in the pre-application conference for this project.*

- C. Narrative Requirements for a Conceptual Development Plan. A written statement shall be provided, including the following information:

1. Statement of objectives to be achieved by the Planned Development. This statement should indicate:

- A description of the character of the proposed development.
- The rationale behind the design assumptions and choices made.
- The rationale behind any design change to an existing Village and reasons why the proposal is superior.
- A discussion indicating how the application meets the review criteria in 17.64.100 below.

Response: *The submitted narrative describes the character of the proposed development, the rationale for the proposed design, and discusses how the proposal complies with the review criteria in Section 17.64.100 below. The subject property is not located within a Village designation.*

2. Statement of intentions with regard to future sale or lease of all or portions of the Planned Development.

Response: *Single family dwellings will be constructed on all lots by the applicant and offered for sale with the exception that two lots are proposed to contain multi-family structures to offer units for rent.*

3. Quantitative data for the following, where appropriate:

- Total number and type of dwelling units
- Parcel size(s)
- Proposed lot coverage of buildings and structures where known
- Gross densities per acre
- Total amount of open space (lands not designated for buildings or vehicle parking and maneuvering areas)
- Total amount of nonresidential construction

Response: *The details of this section are shown in table below.*

Total number and type of dwelling units	88 - single family detached 32 - single family attached 48 - multi-family on two lots
Parcel size(s)	Tax Lot 200 - 23.318 acres Tax Lot 500 - 9.552 acres Total Site - 32.87 acres (1,431,813 sq. ft.)
Proposed lot coverage of buildings and structures where known	Unrestricted site area = 21.01 acres
Gross densities per acre	5.11 units/acre (168 units/32.87 acres)
Total amount of open space (lands not designated for buildings or vehicle parking and maneuvering areas)	11.92 acres
Total amount of nonresidential construction	None

4. General statement of intentions concerning timing, responsibilities, and assurances for all public and non-public improvements, such as parks, open space improvements, pedestrian connections, irrigation, private roads and drives, landscape, and maintenance.

Response: *The applicant intends to complete necessary improvements following land use approval. The applicant hopes to begin constructing public improvements in the Spring/Summer 2021 and complete improvement in the Fall 2021.*

5. Description of how the Planned Development contributes to the completion and connectivity of the pedestrian and vehicular circulation system.

Response: *The location of the Planned Development does not provide a significant contribution towards the completion and connectivity of a pedestrian and vehicular circulation system. Primary contributing features include new sidewalks along a portion of Vista Loop Drive and sidewalks along the local street in the Upper Views to connect to a future sidewalk along Highway 26 and trails within proceed open space areas.*

17.64.100 - CONCEPTUAL DEVELOPMENT PLAN REVIEW PROCESS

- A. Acceptance of Application. The Director shall review the application in accordance with Chapter 17.18 - Processing Applications.

Response: *The Director will need to process the application in conformance with the requirements of Chapter 17.18.*

- B. Staff Evaluation. The Director shall prepare a report that evaluates whether the Conceptual Development Plan complies with the review criteria below. The report shall also include a recommendation for approval or denial and, if needed, a list of conditions for the Planning Commission to consider if an approval is granted.

Response: *The Director will prepare a staff report for the Planning Commission and Council to consider.*

- C. Review Criteria for Conceptual Development Plan. Requests for approval of a Conceptual Development Plan shall be reviewed to:

1. Assure consistency with the Intent of this chapter;

Response: *The intent statements in Chapter 17.64 relevant to the proposed PD include:*

D. Allow a mixture of densities between base zones within the planned development.

E. Promote flexibility in site planning and architectural design, placement, and clustering of structures.

F. Provide for efficient use of public facilities and energy.

G. Encourage the conservation of natural features.

H. Provide usable and suitable recreation facilities and public or common facilities.

- I. Allow coordination of architectural styles, building forms and relationships.

The proposal includes lots proposed to contain three housing types: 88 single-family detached, 32 single-family attached dwellings, and two lots to contain 48 multi-family structures. As shown on the submitted architectural renderings, the proposal includes a range of building designs as well. The proposed townhouse design is unique to the city in that all of these homes includes a rear-loaded detached two-car garage and a courtyard between the garage and the back of the home.

The proposed PD encourages the conservation of natural features by exceeding the 25 percent open space requirement. The proposal includes 36 percent (11.92 acres) of the total site area as open space, including 8.22 of within the FSH Overlay. All of these areas will be held in perpetuity and maintained by a homeowners association.

The proposal also includes 1,490 linear feet of trails located within these natural open space areas. Additional amenities tot lots, play structures, dog park, two half-court basketball courts, and a Mt. Hood viewing plaza.

2. Assure compliance with the General Provisions, Development Standards and Application provisions of this chapter; and
Response: As reviewed in this document the proposal generally complies with all provisions and development standards. As detailed in this document the applicant proposes several variations to these standards as permitted by Section 17.64.30(A). The proposed variations are justified given the unique physical characteristics of the site and the amenities provided.
3. When located in a Village, assure consistency with the appropriate Comprehensive Plan policies for Village designations.
Response: The proposal is not located within a designated Village.

17.64.110 - DETAILED DEVELOPMENT PLAN PROCEDURE

- A. If the Detailed Development Plan will involve the subdivision of land, the applicant shall prepare and submit a tentative subdivision plat along with the Detailed Development Plan to be considered at the same time.
Response: The proposed Detailed Development Plan also involves a subdivision application. All materials required for this application have been submitted.
- B. The Planning Commission shall review the Detailed Development Plan at a public hearing and may approve, approve with modifications or deny the application.
Response: The applicant understands the proposal will be reviewed by both the Planning Commission and City Council because the application a Combined

review application of both the Conceptual and Detailed Development Plans has been requested.

17.64.120 - DETAILED DEVELOPMENT PLAN APPLICATION

A Detailed Development Plan is intended as a master plan for land use, transportation and utility placement within a planned development. A Detailed Development Plan application follows an approved Conceptual Development Plan or both applications may be submitted simultaneously. Where land divisions are proposed, the Detailed Development Plan shall be combined with a Tentative Subdivision Plat application according the requirements of Chapter 17.100. An application for a Detailed Development Plan shall be reviewed in accordance with the following procedures:

Response: *The proposal includes sufficient detail to address the requirements of this section.*

A. Application Requirements. An application filed for a Detailed Development Plan shall follow the requirements specified for a Conceptual Development Plan as listed above and shall also include the following:

1. Graphic Requirements

a) Topographic contours at two-foot intervals for slopes under 15 percent and at five-foot intervals for slopes at or greater than 15 percent. A grading plan is required to show how runoff or surface water from the subject property will be managed, including ultimate disposal of surface waters.

Response: *Two foot contour intervals are provided over the entire site as required as shown on submitted plans.*

b) Location and floor area of existing and proposed structures and other improvements, including maximum heights, building types, gross density per acre (for residential developments).

Response: *The plan set shows proposed building setbacks for all lots. The other information required by this section is included in this narrative and as shown in the architectural plan booklet submitted with the application package.*

c) Detailed utility plan indicating how sanitary sewer, water, storm sewer, and drainage systems will function.

Response: *A detailed utility plan is included for both the Lower and Upper Views areas.*

d) Location of existing utilities, including existing fire hydrants, overhead utility lines in the abutting right of way, easements and walkways.

Response: *All existing utilities are shown as required.*

e) Typical elevations of buildings and structures (which may be submitted on additional sheets) sufficient to indicate the architectural intent and character of the proposed development.

Response: *Architectural renderings are provided on both a full sheet and in a booklet format. These drawings show the general design elements for a number of homes proposed for the site including details of the proposed townhome units.*

f) Landscape plan drawn to scale showing location of existing trees and vegetation proposed to be removed from or to be retained on the site, location and design of proposed landscaped areas, quantities, varieties, quantities, and sizes of trees and plant materials to be planted, other landscape features including walks and fences, and irrigation systems required to maintain plant materials.

Response: *A Landscape Plan has been provided showing concept planning for all proposed site amenities and plantings.*

g) Circulation plan showing street, driveway, parking area, service area, loading area, pedestrian way and bikeway improvements, their dimensions and connectivity to surrounding parcels, existing and proposed streets.

Response: *The submitted Preliminary Plat sheets and the Future Street Plan include this information.*

h) Location and dimensions of all areas to be conveyed, dedicated, or reserved as common open spaces, public parks, recreational areas, school sites, and similar public and semipublic areas.

Response: *The only areas proposed to be conveyed to the city are two public stormwater facilities and all public rights-of-way. All open space areas are proposed to be conveyed to and maintained by a homeowner's association established for the project as shown on submitted plans.*

i) Exterior lighting plan indicating the location, size, height, typical design, material, and method and direction of illumination.

Response: *The project will include street lighting. The requirements of this section will be provided with construction plans.*

j) Concurrent Design Review graphic elements.

Response: *The application package includes architectural renderings and landscape design graphics detailing amenities proposed with this development.*

B. Narrative Requirements for a Detailed Development Plan. In addition to the narrative requirements specified for a Conceptual Development Plan, the Detailed Development Plan narrative shall also include:

1. Proposals for setbacks or building envelopes, lot areas where land division is anticipated, and number of parking spaces to be provided (in ratio to gross floor area or number of units)

Response: *All of the items required by this section are included with the application package as shown on the Preliminary Plats and Building Setbacks and Parking Analysis sheets.*

2. Detailed statement outlining timing, responsibilities, and assurances for all public and non-public improvements such as irrigation, private roads and drives, landscape, and maintenance.

Response: *All open space and landscape areas will be commonly owned and maintain by a Homeowner's Association. Individual homeowners will be responsible for the lot area abutting adjacent public streets.*

3. Statement addressing compatibility of proposed development to adjacent land uses relating to such items as architectural character, building type, and height of proposed structures.

Response: *The Lower Views shares a common boundary with a commercial business (Johnson RV), a large lot residential property in the city limits, and vacant properties outside the UGB. The Upper Views shares a common boundary with large lot residential and vacant properties and a multi-family development all within the city limits. The proposal is generally compatible with these uses in terms of architectural character, building type, and height of proposed structures.*

4. Statement describing project phasing, if proposed. Phases shall be:

- a) Substantially and functionally self-contained and self-sustaining with regard to access, parking, utilities, open spaces, and similar physical features; capable of substantial occupancy, operation, and maintenance upon completion of construction and development.

Response: *The applicant has not determined if the Lower Views and Upper Views will be constructed in a single phase or two separate phases. The applicant prefers having the flexibility of developing and platting the Upper and Lower Views as separate phases if it is deemed necessary based on construction timing and economic factors. Each development site is generally independent of the other and should have no problem being developed and platted separately.*

- b) Properly related to other services of the community as a whole and to those facilities and services yet to be provided.

Response: *The location and configuration of the Lower and Upper Views require the extension of sanitary sewer and water service independent of the other phase.*

- c) Provided with such temporary or permanent transitional features, buffers, or protective areas as may be required to prevent damage or

detriment to any completed phases and to adjoining properties not in the Planned Development.

Response: *The location of the Lower and Upper Views properties are separate and independent of each other and can be developed without any transitional features, buffer, or protective areas to prevent damage to the other phase.*

5. Statement of “substantial compliance” with the Conceptual Development Plan.

Response: *The applicant has requested a Combined Review of both the Conceptual and Detailed Development Plans.*

17.64.140 - EFFECTIVE PERIOD OF APPROVAL

- A. Conceptual Development Plan. Approval of a Conceptual Development Plan shall be valid for a 12-month period from the date of approval, with possible six-month extension(s) when requested in writing and granted by the Director for good cause.

Response: *The applicant is aware of the timeline stated in this section. The proposal includes a combined review of both the Conceptual and Detailed Development Plans.*

- B. Detailed Development Plan.

1. Approval of a Detailed Development Plan shall be valid for a 24-month period from the date of approval, with possible six-month extension(s) when requested in writing and granted by the Director for good cause.

Response: *The applicant is aware of the timeline stated in this section.*

2. When a Detailed Development Plan is submitted and approved for a single phase, 24-month periods are allowed for submission of each subsequent phase. If the applicant has not begun construction within this time frame, all approvals shall expire.

Response: *The applicant is aware of the timeline stated in this section.*

3. When shown that conditions have not changed, the Commission may extend the approval for two additional years at its discretion and without a public hearing.

Response: *The applicant is aware of this section.*

4. Total elapsed time for submission of Detailed Plans for all phases of a Planned Development shall not exceed ten years from the date of Conceptual Development Plan approval (or the initial Detailed Development Plan approval in the case of a concurrent application), including extensions.

Response: *The applicant is aware of the timeline stated in this section.*

CHAPTER 17.80 - ADDITIONAL SETBACKS ON COLLECTOR AND ARTERIAL STREETS

17.80.00 - INTENT

The requirement of additional special setbacks for development on arterial or collector is intended to provide better light, air and vision on more heavily traveled streets. The additional setback, on substandard streets, will protect collector and arterial streets and permit the eventual widening of streets.

Response: Vista Loop Drive is identified in the City's Transportation System Plan as a collector street. Highway 26 is a major arterial.

17.80.10 - APPLICABILITY

These regulations apply to all collector and arterial streets as identified in the latest adopted Sandy Transportation System Plan (TSP). The Central Business District (C-1) is exempt from Chapter 17.80 regulations.

Response: Vista Loop Drive is identified in the City's Transportation System Plan as a collector street. Highway 26 is a major arterial.

17.80.20 - SPECIFIC SETBACKS

Any structure located on streets listed above or identified in the Transportation System Plan as arterials or collectors shall have a minimum setback of 20 feet measured from the property line. This applies to applicable front, rear and side yards.

Response: All structures adjacent to Vista Loop Drive and Highway 26 will be setback at least 20 feet from the property line abutting these streets.

CHAPTER 17.82 - SPECIAL SETBACKS ON TRANSIT STREETS

17.82.00 - INTENT

The intent is to provide for convenient, direct, and accessible pedestrian access to and from public sidewalks and transit facilities; provide a safe, pleasant and enjoyable pedestrian experience by connecting activities within a structure to the adjacent sidewalk and/or transit street; and, promote the use of pedestrian, bicycle, and transit modes of transportation.

17.82.10 - APPLICABILITY

This chapter applies to all residential development located adjacent to a transit street. A transit street is defined as any street designated as a collector or arterial, unless otherwise designated in the Transit System Plan.

Response: The Upper Views is located adjacent to Highway 26, a major arterial and Vista Loop Drive is designation a collector in the City's Transportation System Plan.

17.82.20 - BUILDING ORIENTATION

A. All residential dwellings shall have their primary entrances oriented toward a transit street rather than a parking area, or if not adjacent to a transit street, toward a public right-of-way or private walkway which leads to a transit street.

Response: The lot for the multi-family structure in the Upper Views is proposed to be located adjacent to Vista Loop Drive and 20 single family residences are proposed adjacent to Highway 26. Although the details of the apartment design has not been submitted with this application, the applicant anticipates providing entrances oriented to Vista Loop Drive on this structure. Because a substantial grade separation exists between the subject property and Highway 26 over a majority of the property, the applicant does not propose orienting these structures towards the highway but rather orienting these homes towards the internal street. The applicant proposes constructing a decorative sound reducing wall along the back of these homes to soften the noise impact from this facility as shown on the Landscape Concept Plan.

- B. Dwellings shall have a primary entrance connecting directly between the street and building interior. A clearly marked, convenient, safe and lighted pedestrian route shall be provided to the entrance, from the transit street. The pedestrian route shall consist of materials such as concrete, asphalt, stone, brick, permeable pavers, or other materials as approved by the Director. The pedestrian path shall be permanently affixed to the ground with gravel subsurface or a comparable subsurface as approved by the Director.

Response: As noted in Subsection A above, only the proposed future apartment building will be located along and oriented towards Vista Loop Drive. The details of this design will be reviewed during a subsequent design review application.

- C. Primary dwelling entrances shall be architecturally emphasized and visible from the street and shall include a covered porch at least 5 feet in depth.

Response: The details of the design for the proposed apartment building will be determined during a subsequent design review application for this structure.

- D. If the site has frontage on more than one transit street, the dwelling shall provide one main entrance oriented to a transit street or to a corner where two transit streets intersect.

Response: The Upper Views portion of the property technically contains frontage on two transit streets (Vista Loop Drive and Highway 26). Due to the grade separation between the property and Highway 26 and speeds along this road, only the proposed apartment building adjacent to Vista Loop Drive will be oriented to this street. The details of this design will be included with a future design review application.

CHAPTER 17.84 - IMPROVEMENTS REQUIRED WITH DEVELOPMENT

17.84.20 - TIMING OF IMPROVEMENTS

- A. All improvements required by the standards in this chapter shall be installed concurrently with development, as follows:

1. Where a land division is proposed, each proposed lot shall have required public and franchise utility improvements installed or financially guaranteed in accordance with the provisions of Chapter 17 prior to approval of the final plat.

Response: *All lots in the proposed development will install public and franchise utility improvements or financially guaranteed these improvements prior to final plat approval.*

2. Where a land division is not proposed, the site shall have required public and franchise utility improvements installed or financially guaranteed in accordance with the provisions of Chapter 17 prior to temporary or final occupancy of structures.

Response: *This section is not applicable because a land division is proposed.*

- B. Where specific approval for a phasing plan has been granted for a planned development and/or subdivision, improvements may similarly be phased in accordance with that plan.

Response: *The applicant requests the flexibility to construct the Lower Views and Upper Views as two separate phases if it deemed necessary or desirable.*

17.84.30 - PEDESTRIAN AND BICYCLIST REQUIREMENTS

- A. Sidewalks shall be required along both sides of all arterial, collector, and local streets, as follows:

1. Sidewalks shall be a minimum of 5 ft. wide on local streets. The sidewalks shall be separated from curbs by a tree planting area that provides separation between sidewalk and curb, unless modified in accordance with Subsection 3 below.

Response: *All sidewalks on the internal streets in the Upper Views are proposed to be five feet wide separated from curbs by a landscape strip as required. All sidewalks in the Lower Views are also proposed to be five feet wide with the exception a six-foot sidewalk is proposed on the North side of The Views entrance road from Vista Loop Drive to the proposed alley. This sidewalk is designed to connect to a six-foot meandering sidewalk constructed in front of the proposed row homes. A Planned Development variation as discussed in Section 17.64.30 has been proposed to modify the typical street section by shifting the road alignment to southern edge of the right-of-way in order to allow for the construction of a meandering six foot walkway in this location. The applicant is proposing this design because he believes it will create a more aesthetically pleasing pedestrian experience for residents of The Views to walk between the upper and lower parts of the development. This design is also increases the area on the north side of this road to plant additional landscape materials, further enhancing this design. The applicant has also proposed the Homeowner's Association established for the development be responsible for maintaining this area because as the entrance to the Lower*

Views he is concerned maintenance of a planter strip along the south side of this road would not receive the same level of care he prefers.

2. Sidewalks along arterial and collector streets shall be separated from curbs with a planting area, except as necessary to continue an existing curb-tight sidewalk. The planting area shall be landscaped with trees and plant materials approved by the City. The sidewalks shall be a minimum of 6 ft. wide.

Response: *As shown on submitted plans all sidewalks adjacent to Vista Loop Drive are proposed to be six-feet wide. This sidewalk is proposed to meander along the road rather than be parallel to this road as is typical. The applicant does not propose constructing a six foot sidewalk along the majority of the Highway 26 frontage because an internal street with sidewalks is proposed to be constructed parallel the highway and he feels a facility along the highway would be redundant. In addition, the applicant believes a sidewalk in this location is unnecessary given the location of the subject property and a sidewalk along the highway is unsafe and would be unpleasant for pedestrians to use. Instead, the applicant proposes constructing a sidewalk connection off the end of the cul-de-sac to the highway right-of-way to facilitate a connection to a sidewalk constructed on the property west if the city chooses to require this facility with development of this property in the future. The applicant believes this proposal is superior to requiring construction of a sidewalk either at the highway grade or at the top of the bank and along the back of the lots abutting Highway 26.*

3. Sidewalk improvements shall be made according to city standards, unless the city determines that the public benefit in the particular case does not warrant imposing a severe adverse impact to a natural or other significant feature such as requiring removal of a mature tree, requiring undue grading, or requiring modification to an existing building. Any exceptions to the standards shall generally be in the following order.
 - a) Narrow landscape strips
 - b) Narrow sidewalk or portion of sidewalk to no less than 4 feet in width
 - c) Eliminate landscape strips
 - d) Narrow on-street improvements by eliminating on-street parking
 - e) Eliminate sidewalks

Response: *As discussed above, the applicant proposes constructing a sidewalk and planter strip on the North side of The View Drive only. The right-of-way in this area is proposed to be narrowed and shifted to the southern edge of the right-of-way to allow for the construction of a six-foot meandering sidewalk on the North side only. This facility will be contained within a widened private tract maintained by the homeowners association. The purpose of this facility is to create a more appealing and pleasant pedestrian experience for residents and visitors of The Views to travel between the Upper and Lower Views.*

In addition as noted above, the applicant does not propose constructing a sidewalk along Highway 26 but instead this facility is proposed to be located on the internal street constructed in the Upper Views parallel to the highway.

4. The timing of the installation of sidewalks shall be as follows:
 - a) Sidewalks and planted areas along arterial and collector streets shall be installed with street improvements, or with development of the site if street improvements are deferred.
 - b) Sidewalks along local streets shall be installed in conjunction with development of the site, generally with building permits, except as noted in (c) below.
 - c) Where sidewalks on local streets abut common areas, drainageways, or other publicly owned or semi-publicly owned areas, the sidewalks and planted areas shall be installed with street improvements.

Response: *The applicant intends constructing all sidewalk improvements as required by this section. The applicant is open to the city deciding which of these improvements will need to be completed prior to final plat approval. Sidewalks along the local streets will be constructed at the time of home construction.*

- B. Safe and convenient pedestrian and bicyclist facilities that strive to minimize travel distance to the extent practicable shall be provided in conjunction with new development within and between new subdivisions, planned developments, commercial developments, industrial areas, residential areas, public transit stops, school transit stops, and neighborhood activity centers such as schools and parks, as follows:

1. For the purposes of this section, “safe and convenient” means pedestrian and bicyclist facilities that: are reasonably free from hazards which would interfere with or discourage travel for short trips; provide a direct route of travel between destinations; and meet the travel needs of pedestrians and bicyclists considering destination and length of trip.

Response: *The majority of bicycle and pedestrian facilities are located along streets. The Upper Views also includes a widened mid-block sidewalk providing a connection between the sidewalk along Vista Loop and Knapp Street. All facilities are intended to be “safe and convenient” to encourage pedestrian use.*

2. To meet the intent of “B” above, right-of-ways connecting cul-de-sacs or passing through unusually long or oddly shaped blocks shall be a minimum of 15 ft. wide with 8 feet of pavement.

Response: *The proposed facility specified above will require a minimum 15 foot wide easement and construction of an eight-foot wide paved sidewalk or as required by the city.*

3. 12 feet wide pathways shall be provided in areas with high bicycle volumes or multiple use by bicyclists, pedestrians, and joggers.

Response: *There are no high volume pathways in this development.*

4. Pathways and sidewalks shall be encouraged in new developments by clustering buildings or constructing convenient pedestrian ways. Pedestrian walkways shall be provided in accordance with the following standards:
 - a) The pedestrian circulation system shall be at least five feet in width and shall connect the sidewalk on each abutting street to the main entrance of the primary structure on the site to minimize out of direction pedestrian travel.
 - b) Walkways at least five feet in width shall be provided to connect the pedestrian circulation system with existing or planned pedestrian facilities which abut the site but are not adjacent to the streets abutting the site.
 - c) Walkways shall be as direct as possible and avoid unnecessary meandering.

Response: *The requirements of this section have been satisfied with the applicant's proposal.*

- d) Walkway/driveway crossings shall be minimized. Internal parking lot design shall maintain ease of access for pedestrians from abutting streets, pedestrian facilities, and transit stops.
- e) With the exception of walkway/driveway crossings, walkways shall be separated from vehicle parking or vehicle maneuvering areas by grade, different paving material, painted crosshatching or landscaping. They shall be constructed in accordance with the sidewalk standards adopted by the City. (This provision does not require a separated walkway system to collect drivers and passengers from cars that have parked on site unless an unusual parking lot hazard exists).
- f) Pedestrian amenities such as covered walk-ways, awnings, visual corridors and benches will be encouraged. For every two benches provided, the minimum parking requirements will be reduced by one, up to a maximum of four benches per site. Benches shall have direct access to the circulation system.

Response: *The majority of the requirements of these sections are not applicable to the proposed subdivision. A street crossing feature on Bonnie Street is proposed to connect the viewpoint plaza with the sidewalk on the West side of this street.*

- C. Where a development site is traversed by or adjacent to a future trail linkage identified within the Transportation System Plan, improvement of the trail linkage shall occur concurrent with development. Dedication of the trail to the City shall be provided in accordance with 17.84.80.

Response: *No trails are identified in the City's Transportation System Plan are located on the subject property.*

- D. To provide for orderly development of an effective pedestrian network, pedestrian facilities installed concurrent with development of a site shall be extended through the site to the edge of adjacent property(ies).
Response: *All sidewalks will be extended to the edge of the subject property as required.*
- E. To ensure improved access between a development site and an existing developed facility such as a commercial center, school, park, or trail system, the Planning Commission or Director may require off-site pedestrian facility improvements concurrent with development.
Response: *No off-site pedestrian improvements have been identified.*

17.84.40 - TRANSIT AND SCHOOL BUS TRANSIT REQUIREMENTS

- A. Development sites located along existing or planned transit routes shall, where appropriate, incorporate bus pull-outs and/or shelters into the site design. These improvements shall be installed in accordance with the guidelines and standards of the transit agency. School bus pull-outs and/or shelters may also be required, where appropriate, as a condition of approval for a residential development of greater than 50 dwelling units where a school bus pick-up point is anticipated to serve a large number of children.
Response: *The proposal includes greater than 50 dwelling units. During the pre-application conference the city Transit Manager requested a transit amenity be constructed along Vista Loop Drive. This facility will be shown with construction plans.*
- B. New developments at or near existing or planned transit or school bus transit stops shall design development sites to provide safe, convenient access to the transit system, as follows:
1. Commercial and civic use developments shall provide a prominent entrance oriented towards arterial and collector streets, with front setbacks reduced as much as possible to provide access for pedestrians, bicycles, and transit.
 2. All developments shall provide safe, convenient pedestrian walkways between the buildings and the transit stop, in accordance with the provisions of 17.84.30 B.
Response: *The proposed residential subdivision complies with the requirements of this section.*

17.84.50 - STREET REQUIREMENTS

- A. Traffic evaluations may be required of all development proposals in accordance with the following:
1. A proposal establishing the scope of the traffic evaluation shall be submitted for review to the City Engineer. The evaluation requirements shall reflect the magnitude of the project in accordance with accepted

traffic engineering practices. Large projects should assess all nearby key intersections. Once the scope of the traffic evaluation has been approved, the applicant shall present the results with and an overall site development proposal. If required by the City Engineer, such evaluations shall be signed by a Licensed Professional Civil Engineer or Licensed Professional Traffic Engineer licensed in the State of Oregon.

2. If the traffic evaluation identifies level-of-service conditions less than the minimum standard established in the Transportation System Plan, improvements and funding strategies mitigating the problem shall be considered concurrent with a development proposal.

Response: *A Traffic Impact Study is included with this application as requested by the City. This study does not identify any required mitigation.*

- B. Location of new arterial streets shall conform to the Transportation System Plan in accordance with the following:

1. Arterial streets should generally be spaced in one-mile intervals.
2. Traffic signals should generally not be spaced closer than 1500 ft. for reasonable traffic progression.

Response: *No new arterial streets are required as part of this project.*

- C. Local streets shall be designed to discourage through traffic. NOTE: for the purposes of this section, “through traffic” means the traffic traveling through an area that does not have a local origination or destination. To discourage through traffic and excessive vehicle speeds the following street design characteristics shall be considered, as well as other designs intended to discourage traffic:

1. Straight segments of local streets should be kept to less than a quarter mile in length. As practical, local streets should include traffic calming features, and design features such as curves and “T” intersections while maintaining pedestrian connectivity.
2. Local streets should typically intersect in “T” configurations rather than 4-way intersections to minimize conflicts and discourage through traffic. Adjacent “T” intersections shall maintain a minimum of 150 ft. between the nearest edges of the 2 rights-of-way.

Response: *The proposed street design is dependent on the location of Vista Loop Drive and Highway 26 in the Upper Views and topographic considerations in the Lower Views. No street segments greater than a quarter mile in length are proposed and all intersections are a minimum of 150 feet apart. The proposal complies with the requirements of this section.*

3. Cul-de-sacs should generally not exceed 400 ft. in length nor serve more than 20 dwelling units, except in cases where existing topography, wetlands, or drainage systems or other existing features necessitate a

longer cul-de-sac in order to provide adequate access to an area. Cul-de-sacs longer than 400 feet or developments with only one access point may be required to provide an alternative access for emergency vehicle use only, install fire prevention sprinklers, or provide other mitigating measures, determined by the City.

Response: *Due to topographic constraints, two cul-de-sacs are proposed in the Lower Views and because of the location of Highway 26, a single cul-de-sac is proposed in the Upper Views. All of these cul-de-sacs are less than 400 feet in length. In the Lower Views, five lots are proposed to have frontage on the Mt. Hood Court cul-de-sac and two lots will be accessed from a private drive at the end of this cul-de-sac for a total of seven lots served by this cul-de-sac. The other cul-de-sac in the Lower Views will provide direct access to eight lots and four additional lots served by two private drives for a total of 12 lots served. The single cul-de-sac in the Upper Views is proposed to serve 11 lots. The proposal complies with this section.*

D. Development sites shall be provided with access from a public street improved to City standards in accordance with the following:

1. Where a development site abuts an existing public street not improved to City standards, the abutting street shall be improved to City standards along the full frontage of the property concurrent with development.

Response: *All homes will gain access from a public street or a public alley improved to city standards in compliance with this section or a private drive accessed from a public street.*

2. Half-street improvements are considered the minimum required improvement. Three quarter-street or full-street improvements shall be required where traffic volumes generated by the development are such that a half-street improvement would cause safety and/or capacity problems. Such a determination shall be made by the City Engineer.

Response: *All new streets are proposed as full street improvements with the exception of Vista Loop Drive abutting the Upper Views.*

3. To ensure improved access to a development site consistent with policies on orderly urbanization and extension of public facilities the Planning Commission or Director may require off-site improvements concurrent with development. Off-site improvement requirements upon the site developer shall be reasonably related to the anticipated impacts of the development.

Response: *No off-site improvements have been identified or are warranted with construction of this subdivision.*

4. Reimbursement agreements for 3/4 street improvements (i.e., curb face to curb face) may be requested by the developer per Chapter 12 of the SMC.

Response: *Except for the section of The Views Drive from the intersection of Vista Loop Drive to the alley no 3/4 streets are proposed.*

5. A ½ street improvement includes curb and pavement 2 feet beyond the center line of the right-of-way. A ¾ street improvement includes curbs on both sides of the side and full pavement between curb faces.

Response: *As noted above only the frontage adjacent to Vista Loop Drive will require 1/2 street improvements and the sidewalk/planter is proposed to be eliminated on the South side of The Views Drive.*

- E. As necessary to provide for orderly development of adjacent properties, public streets installed concurrent with development of a site shall be extended through the site to the edge of the adjacent property(ies) in accordance with the following:

1. Temporary dead-ends created by this requirement to extend street improvements to the edge of adjacent properties may be installed without turn-arounds, subject to the approval of the Fire Marshal.
2. In order to assure the eventual continuation or completion of the street, reserve strips may be required.

Response: *The proposed street layout results in one temporary dead-end street at the East end of the Lower Views. This street end includes sufficient room to accommodate fire equipment to turn around. A secondary fire access to the Lower Views is provided by an easement through the Johnson RV site. If this easement is deemed by the Fire Marshall to be insufficient or an alternative secondary access cannot be obtained, some of the homes in the Lower Views may require installation of fire sprinklers.*

- F. Where required by the Planning Commission or Director, public street improvements may be required through a development site to provide for the logical extension of an existing street network or to connect a site with a nearby neighborhood activity center, such as a school or park. Where this creates a land division incidental to the development, a land partition shall be completed concurrent with the development.

Response: *The applicant does not anticipate any public street improvements will be required beyond the site boundaries. No such improvements were identified at the pre-application conference.*

- G. Except for extensions of existing streets, no street names shall be used that will duplicate or be confused with names of existing streets. Street names and numbers shall conform to the established pattern in the surrounding area and be subject to approval of the Director.

Response: *The application includes proposed street names as shown on submitted plans.*

- H. Location, grades, alignment, and widths for all public streets shall be considered in relation to existing and planned streets, topographical conditions, public convenience and safety, and proposed land use. Where topographical conditions present special circumstances, exceptions to these

standards may be granted by the City Engineer provided the safety and capacity of the street network is not adversely affected. The following standards shall apply:

1. Location of streets in a development shall not preclude development of adjacent properties. Streets shall conform to planned street extensions identified in the Transportation Plan and/or provide for continuation of the existing street network in the surrounding area.

Response: *A future street plan is included with this application. This plan shows that the proposal will facilitate and not preclude development on adjacent properties. No roads identified on the TSP are shown on the subject property.*

2. Grades shall not exceed 6 percent on arterial streets, 10 percent on collector streets, and 15 percent on local streets.

Response: *As shown on submitted plans all streets in the proposed development are local streets and all street grades are less than the maximum allowed by this section. The steepest grade is 11 percent for the Mt. Hood Court cul-de-sac. No other street grade is greater than eight percent (east end of Bonnie Street) with most other streets at about two percent grade.*

3. As far as practical, arterial streets and collector streets shall be extended in alignment with existing streets by continuation of the street centerline. When staggered street alignments resulting in "T" intersections are unavoidable, they shall leave a minimum of 150 ft. between the nearest edges of the two rights-of-way.

Response: *No arterial or collector streets are required to be extended with this application.*

4. Centerline radii of curves shall not be less than 500 ft. on arterial streets, 300 ft. on collector streets, and 100 ft. on local streets.

Response: *All proposed streets in the subdivision are designed in compliance with this standard.*

5. Streets shall be designed to intersect at angles as near as practicable to right angles and shall comply with the following:
 - a) The intersection of an arterial or collector street with another arterial or collector street shall have a minimum of 100 ft. of straight (tangent) alignment perpendicular to the intersection.
 - b) The intersection of a local street with another street shall have a minimum of 50 ft. of straight (tangent) alignment perpendicular to the intersection.
 - c) Where right angle intersections are not possible, exceptions can be granted by the City Engineer provided that intersections not at right angles have a minimum corner radius of 20 ft. along the right-of-way lines of the acute angle.

- d) Intersections with arterial streets shall have a minimum curb corner radius of 20 ft. All other intersections shall have a minimum curb corner radius of 10 ft.

Response: *All proposed streets are designed to intersect at a right angle with the intersecting street and comply with the requirements of this section.*

6. Right-of-way and improvement widths shall be as specified by the Transportation System Plan. Exceptions to those specifications may be approved by the City Engineer to deal with specific unique physical constraints of the site.

Response: *All right-of-way widths are proposed to be 50 feet wide with the exception of the portion of The View Drive from the intersection with Vista Loop Drive to about the public alley which is proposed to be 31 feet wide. The applicant is requesting a reduction of the right-of-way in this location in order to shift the road to the South to construct a wider sidewalk on the North side of this street within a private landscaped tract.*

- J. Private streets may be considered within a development site provided all the following conditions are met:

Response: *No private streets are proposed.*

17.84.60 - PUBLIC FACILITY EXTENSIONS

- A. All development sites shall be provided with public water, sanitary sewer, broadband (fiber), and storm drainage.

Response: *The submitted Utility Plan shows the location of proposed public water, sanitary sewer, and stormwater drainage facilities. Broadband fiber service will be detailed in construction plans.*

- B. Where necessary to serve property as specified in "A" above, required public facility installations shall be constructed concurrent with development.

Response: *All of the utilities identified above will be constructed concurrent with each phase of the development.*

- C. Off-site public facility extensions necessary to fully serve a development site and adjacent properties shall be constructed concurrent with development.

Response: *The applicant will extend all utilities as necessary to serve the development as required by this section.*

- D. As necessary to provide for orderly development of adjacent properties, public facilities installed concurrent with development of a site shall be extended through the site to the edge of adjacent property(ies).

Response: *As shown on submitted Utility Plans, all public facilities are proposed to be extended through the site to edge of adjacent properties.*

E. Private on-site sanitary sewer and storm drainage facilities may be considered provided all the following conditions exist:

Response: No private utilities are proposed.

17.84.70 - PUBLIC IMPROVEMENT PROCEDURES

Response: The applicant is aware of and intends to comply with the requirements of this section.

17.84.80 - FRANCHISE UTILITY INSTALLATIONS

These standards are intended to supplement, not replace or supersede, requirements contained within individual franchise agreements the City has with providers of electrical power, telephone, cable television, and natural gas services (hereinafter referred to as “franchise utilities”).

A. Where a land division is proposed, the developer shall provide franchise utilities to the development site. Each lot created within a subdivision shall have an individual service available or financially guaranteed prior to approval of the final plat.

Response: Franchise utilities will be provided to all lots within the proposed development as required. The location of these utilities will be identified on construction plans and installed or guaranteed prior to final plat approval.

B. Where necessary, in the judgment of the Director, to provide for orderly development of adjacent properties, franchise utilities shall be extended through the site to the edge of adjacent property(ies), whether or not the development involves a land division.

Response: The applicant does not anticipate extending franchise utilities beyond the site.

C. The developer shall have the option of choosing whether or not to provide natural gas or cable television service to the development site, providing all of the following conditions exist:

1. Extension of franchise utilities through the site is not necessary for the future orderly development of adjacent property(ies);
2. The development site remains in one ownership and land division does not occur (with the exception of land divisions that may occur under the provisions of 17.84.50 F above); and
3. The development is non-residential.

Response: The applicant anticipates installing natural gas and cable television service as required.

D. Where a land division is not proposed, the site shall have franchise utilities required by this section provided in accordance with the provisions of 17.84.70 prior to occupancy of structures.

Response: A land division is proposed and this section is not applicable.

E. All franchise utility distribution facilities installed to serve new development shall be placed underground except as provided below. The following facilities may be installed aboveground:

1. Poles for street lights and traffic signals, pedestals for police and fire system communications and alarms, pad mounted transformers, pedestals, pedestal mounted terminal boxes and meter cabinets, concealed ducts, substations, or facilities used to carry voltage higher than 35,000 volts;
2. Overhead utility distribution lines may be permitted upon approval of the City Engineer when unusual terrain, soil, or other conditions make underground installation impracticable. Location of such overhead utilities shall follow rear or side lot lines wherever feasible.

Response: *All franchise utilities will be installed underground with the exception of street lights as allowed by this section.*

F. The developer shall be responsible for making necessary arrangements with franchise utility providers for provision of plans, timing of installation, and payment for services installed. Plans for franchise utility installations shall be submitted concurrent with plan submittal for public improvements to facilitate review by the City Engineer.

Response: *The developer will make all the necessary arrangements with franchise utility providers as required by this section.*

G. The developer shall be responsible for installation of underground conduit for street lighting along all public streets improved in conjunction with the development in accordance with the following:

1. The developer shall coordinate with the City Engineer to determine the location of future street light poles. The street light plan shall be designed to provide illumination meeting standards set by the City Engineer.
2. The developer shall make arrangements with the serving electric utility for trenching prior to installation of underground conduit for street lighting.

Response: *The developer will install underground conduit for street lighting in accordance with the requirements of this section.*

17.84.90 - LAND FOR PUBLIC PURPOSES

A. Easements for public sanitary sewer, water, storm drain, pedestrian and bicycle facilities shall be provided whenever these facilities are located outside a public right-of-way in accordance with the following:

1. When located between adjacent lots, easements shall be provided on one side of a lot line.
2. The minimum easement width for a single utility is 15 ft. The minimum easement width for two adjacent utilities is 20 ft. The easement width shall be centered on the utility to the greatest extent practicable. Wider easements may be required for unusually deep facilities.

Response: *The only public easements anticipated with this development are public pedestrian access easements located over sidewalks not located within a public right-of-way.*

- B. Public utility easements with a minimum width of 5 feet shall be provided adjacent to all street rights-of-way for franchise utility installations.

Response: *Despite the language in this section, eight foot wide public utility easements will be provided along all lots adjacent to street rights-of-way for future franchise utility installations.*

- C. Where a development site is traversed by a drainageway or water course, a drainage way dedication shall be provided to the City.

Response: *No public dedication for the purposes in this section are anticipated.*

- D. Where a development is traversed by, or adjacent to, a future trail linkage identified within the Transportation System Plan, dedications of suitable width to accommodate the trail linkage shall be provided. This width shall be determined by the City Engineer, considering the type of trail facility involved.

Response: *No future trails are identified in the TSP or other adopted plans on the subject property.*

- E. Where existing rights-of-way and/or easements within or adjacent to development sites are nonexistent or of insufficient width, dedications may be required. The need for and widths of those dedications shall be determined by the City Engineer.

Response: *The only existing right-of-ways adjacent to the development are Vista Loop Drive and Highway 26. No additional dedication is required for these roads.*

- F. Where easement or dedications are required in conjunction with land divisions, they shall be recorded on the plat. Where a development does not include a land division, easements and/or dedications shall be recorded on standard document forms provided by the City Engineer.

Response: *All easements and dedications will be identified on the plat as required.*

17.84.100 - MAIL DELIVERY FACILITIES

Response: *The location and type of mail delivery facilities will be coordinated with the City Engineer and the Post Office as part of the construction plan process.*

CHAPTER 17.86 - PARKLAND and OPEN SPACE

17.86.00 - INTENT

The availability of parkland and open space is a critical element in maintaining and improving the quality of life in Sandy. Land that features trees, grass and vegetation provides not only an aesthetically pleasing landscape but also buffers incompatible uses, and preserves sensitive environmental features and important resources. Parks and open space, together with support facilities, also help to meet the active and passive recreational needs of the population of Sandy. This chapter implements policies of Goal 8 of the Comprehensive Plan and the Parks Master Plan by outlining provisions for parks and open space in the City of Sandy.

Response: *The City's adopted Parks Master Plan does not show any parks or trails on the subject property.*

17.86.10 - MINIMUM PARKLAND DEDICATION REQUIREMENTS

Parkland Dedication: New residential subdivisions, planned developments, multi-family or manufactured home park developments shall be required to provide parkland to serve existing and future residents of those developments.

Response: *The proposed residential subdivision is subject to the provisions of this chapter.*

1. The required parkland shall be dedicated as a condition of approval for the following:
 - a. Tentative plat for a subdivision or partition;
 - b. Planned Development conceptual or detailed development plan;
 - c. Design review for a multi-family development or manufactured home park; and
 - d. Replat or amendment of any site plan for multi-family development or manufactured home park where dedication has not previously been made or where the density of the development involved will be increased.

Response: *No public parkland has been identified on the tentative plat.*

2. Calculation of Required Dedication: The required parkland acreage to be dedicated is based on a calculation of the following formula rounded to the nearest 1/100 (0.00) of an acre:

Required parkland dedication (acres) = (proposed units) x (persons/unit) x 0.0043 (per person park land dedication factor)

Response: *The proposed 120 single family units and 48 multi-family units results in the following formal: 120 (proposed s.f. units) x 3 (persons/unit) x 0.0043 (per person park land dedication factor) = 1.548 rounded to 1.55 acres plus 48 (proposed m.f. units) x 2 (persons/unit) x 0.0043 (per person park land dedication factor) = 0.4128 rounded to 0.41 acres. The total required parkland is then 1.55 + 0.41 = 1.96 acres.*

17.86.20 - MINIMUM PARKLAND STANDARDS

Land required or proposed for parkland dedication shall be contained within a continuous unit and must be suitable for active use as a neighborhood or mini-park, based on the following criteria:

Response: The applicant does not propose dedicating any parkland with this development.

17.86.40 - CASH IN LIEU OF DEDICATION

At the city’s discretion only, the city may accept payment of a fee in lieu of land dedication. The city may require payment in lieu of land when the park land to be dedicated is less than 3 acres. A payment in lieu of land dedication is separate from Park Systems Development Charges, and is not eligible for a credit of Park Systems Development Charges. The amount of the fee in lieu of land dedication (in dollars per acre) shall be set by City Council Resolution, and it shall be based on the typical market value of developed property (finished lots) in Sandy net of related development costs.

Response: The applicant proposes paying a fee in lieu of parkland dedication. The amount of this fee will be \$472,360 based on the City’s current fee schedule if this payment is not deferred and paid prior to final plat approval and \$519,400 if it is deferred based on 1.96 acres of parkland as calculated in Section 17.86.10(2) above. If deferred one-half of this amount (\$259,700) is required to be paid prior to final plat approval with the other half (\$259,700) evenly split and paid with each building permit. Because two of the lots are proposed to contain multi-family dwellings at a later date, the applicant requests the parks fee for these units be paid with the building permit for these units rather than at the time of final plat approval. If this proposal is accepted the amount of cash-in-lieu to be paid with the final plat would be based on the area of parkland required for the single family units which is 1.55 acres. This results in the following amounts $1.55 \times \$241,000 = \$373,550$ if paid prior to Final plat approval and $1.55 \times \$265,000 = \$410,750$ if one-half is deferred. The fee associated with the multi-family units $0.41 \times \$241,000 = \$98,810$ would be paid with the building permit for these units.

17.86.50 - MINIMUM STANDARDS FOR OPEN SPACE DEDICATION

The applicant through a subdivision or design review process may propose the designation and protection of open space areas as part of that process. This open space will not, however, be counted toward the parkland dedication requirement of Sections 17.86.10 through 17.86.40.

1. The types of open space that may be provided are as follows:
 - a. Natural Areas: areas of undisturbed vegetation, steep slopes, stream corridors, wetlands, wildlife habitat areas or areas replanted with native vegetation after construction.
 - b. Greenways: linear green belts linking residential areas with other open space areas. These greenways may contain bicycle paths or footpaths. Connecting greenways between residences and recreational areas are encouraged.

Response: *The proposal includes the designation of 11.92 acres of private open space to be owned and maintained by a Homeowner's Association. This includes 8.22 acres of natural areas, 3.57 acres of active open space, and 0.13 acres of additional open space.*

2. A subdivision or design review application proposing designation of open space shall include the following information as part of this application:
 - a. Designate the boundaries of all open space areas; and
 - b. Specify the manner in which the open space shall be perpetuated, maintained, and administered; and
 - c. Provide for public access to trails included in the Park Master Plan, including but not limited to the Tickle Creek Path.

Response: *All of this information is provided. The applicant proposes maintaining all open space areas by forming a homeowner's association.*

3. Dedication of open space may occur concurrently with development of the project. At the discretion of the city, for development that will be phased, the open space may be set aside in totality and/or dedicated in conjunction with the first phase of the development or incrementally set aside and dedicated in proportion to the development occurring in each phase.

Response: *The applicant intends that all open space areas will be owned and maintained by a homeowner's association.*

4. Open space areas shall be maintained so that the use and enjoyment thereof is not diminished or destroyed. Open space areas may be owned, preserved, and maintained by any of the following mechanisms or combinations thereof:
 - a. Dedication to the City of Sandy or an appropriate public agency approved by the City, if there is a public agency willing to accept the dedication. Prior to acceptance of proposed open space, the City may require the developer to submit a Phase I Environmental Site Assessment completed by a qualified professional according to American Society of Testing and Materials (ASTM) standards (ASTM E 1527). The results of this study shall indicate a clean environmental record.
 - b. Common ownership by a homeowner's association that assumes full responsibility for its maintenance;
 - c. Dedication of development rights to an appropriate public agency with ownership remaining with the developer or homeowner's association. Maintenance responsibility will remain with the property owner; and/or
 - d. Deed-restricted private ownership preventing development and/or subsequent subdivision and providing for maintenance responsibilities.

Response: *As noted above, all open space areas will be owned and maintained by a homeowner's association as permitted by this section. The applicant feels this is the best ownership entity to ensure maintenance of these areas in perpetuity.*

5. In the event that any private owner of open space fails to maintain it according to the standards of this Code, the City of Sandy, following reasonable notice, may demand that the deficiency of maintenance be corrected, and may enter the open space for maintenance purposes. All costs thereby incurred by the City shall be charged to those persons having the primary responsibility for maintenance of the open space.

Response: *The applicant does not anticipate this section being applicable.*

CHAPTER 17.92 - LANDSCAPING AND SCREENING GENERAL STANDARDS - ALL ZONES

Response: This chapter has limited applicability to subdivisions so only those applicable sections are reviewed in this submittal.

17.92.10 - GENERAL PROVISIONS

- A. Where landscaping is required by this Code, detailed planting plans shall be submitted for review with development applications. No development may commence until the Director or Planning Commission has determined the plans comply with the purposes clause and specific standards in this chapter. All required landscaping and related improvements shall be completed or financially guaranteed prior to the issuance of a Certificate of Occupancy.
- B. Appropriate care and maintenance of landscaping onsite and landscaping in the adjacent public right-of-way is the right and responsibility of the property owner, unless City ordinances specify otherwise for general public and safety reasons. If street trees or other plant materials do not survive or are removed, materials shall be replaced in kind within 6 months.
- C. Significant plant and tree specimens should be preserved to the greatest extent practicable and integrated into the design of a development. Trees of 25-inches or greater circumference measured at a height of 4-1/2 ft. above grade are considered significant. Plants to be saved and methods of protection shall be indicated on the detailed planting plan submitted for approval. Existing trees may be considered preserved if no cutting, filling, or compaction of the soil takes place between the trunk of the tree and the area 5-ft. outside the tree's drip line. Trees to be retained shall be protected from damage during construction by a construction fence located 5 ft. outside the dripline.

Response: *As previously determined by the Planning Commission, the City's tree protection standards in this section do not apply to residential subdivisions. The regulations of Chapter 17.102, Urban Forestry relevant to this proposal are reviewed below.*

17.92.20 - MINIMUM IMPROVEMENTS - LANDSCAPING AND SCREENING

Response: The Single Family Residential zone is not listed in this section requiring compliance with minimum landscaping requirements. Landscaping requirements for the multi-family units will be addressed with a subsequent design review application.

CHAPTER 17.98 - PARKING, LOADING, AND ACCESS REQUIREMENTS

17.98.10 - GENERAL PROVISIONS

- M. Residential Parking Analysis Plan. A Residential Parking Analysis Plan shall be required for all new residential planned developments, subdivisions, and partitions to include a site plan depicting all of the following:
- a. Location and dimension of required parking spaces as specified in Section 17.98.200.
 - b. Location of areas where parking is not permitted as specified in Sections 17.98.200(A)(3) and (5).
 - c. Location and design of parking courts (if applicable).

Response: A Residential Parking Analysis Plan as required by this section is included in the plan set.

17.98.80 - ACCESS TO ARTERIAL AND COLLECTOR STREETS

Response: No lots are proposed to gain access from an arterial or collector street.

17.98.90 - ACCESS TO UNIMPROVED STREETS

Response: All streets proposed in the subdivision will be improved to city standards.

17.98.100 - DRIVEWAYS

- A. A driveway to an off-street parking area shall be improved from the public roadway to the parking area a minimum width of 20 feet for a two-way drive or 12 feet for a one-way drive but in either case not less than the full width of the standard approach for the first 20 feet of the driveway.

Response: All lots will have a standard 24 foot wide curb cut and driveway approach.

- B. A driveway for a single-family dwelling shall have a minimum width of 10 feet.
- Response: All lots single family detached lots will have a standard 24 foot wide curb cut and driveway approach. All single family attached lots will have an approximately 18 foot wide curb cut.*

- C. A driveway for a two-family dwelling shall have a minimum width of 20 feet. A driveway approach must be constructed in accordance with applicable city standards and the entire driveway must be paved with asphalt or concrete.

Response: All of the proposed lots will be constructed with a single family dwellings or multi-family dwelling. This section is not applicable.

D. Driveways, aisles, turnaround areas and ramps shall have a minimum vertical clearance of twelve feet for their entire length and width but such clearance may be reduced in parking structures.

Response: All driveways will be designed in compliance with this standard.

E. No driveway shall traverse a slope in excess of 15 percent at any point along the driveway length.

Response: All driveways will be designed in compliance with this standard.

F. The location and design of the driveway shall provide for unobstructed sight per the vision clearance requirements. Requests for exceptions to these requirements will be evaluated by the City Engineer considering the physical limitations of the lot and safety impacts to vehicular, bicycle, and pedestrian traffic.

Response: All driveways will be designed in compliance with this standard.

17.98.110 - VISION CLEARANCE

A. Except within the Central Business District, vision clearance areas shall be provided at intersections of all streets and at intersections of driveways and alleys with streets to promote pedestrian, bicycle, and vehicular safety. The extent of vision clearance to be provided shall be determined from standards in Chapter 17.74 and taking into account functional classification of the streets involved, type of traffic control present at the intersection, and designated speed for the streets.

Response: The subject property is located in the SFR zone requiring compliance with this section. The requirements of this section will be considered in placing landscaping in these areas with construction of homes.

B. Traffic control devices, streetlights, and utility installations meeting approval by the City Engineer are permitted within vision clearance areas.

Response: The exceptions contained in this section will be considered in the design and placement of these structures.

17.98.200 - RESIDENTIAL ON-STREET PARKING REQUIREMENTS

A. Residential On-Street Parking Requirements. Residential on-street parking shall conform to the following standards:

1. In addition to required off-street parking, all new residential planned developments, subdivisions and partitions shall provide one (1) on-street parking space within 200 feet of each dwelling except as provided in Section 17.98.200(A)(6) below.

2. The location of residential on-street parking shall be reviewed for compliance with this section through submittal of a Residential Parking Analysis Plan as required in Section 17.98.10(M).

3. Residential on-street parking shall not obstruct required clear vision areas and shall not violate any local or state laws.
4. Parallel residential on-street parking spaces shall be 22 feet minimum in length.
5. Residential on-street parking shall be measured along the curb from the outside edge of a driveway wing or curb cut. Parking spaces must be set back a minimum of 15 feet from an intersection and may not be located within 10 feet of a fire hydrant.

Response: *A Residential On-Street Parking Analysis designed in compliance with the requirements of this section is included with the application package. The proposed 71 single family dwellings in the Lower Views require 71 on-street parking spaces. One on-street parking space at least 22 feet in length has been identified within 300 feet of each of the 71 lots. An additional 66 on-street parking spaces have also been identified in the Lower Views as shown on the Parking Plan. The 49 lots in the Upper Views require 49 on-street parking spaces. As shown on submitted plans, 50 on-street parking spaces can be provided. The proposed plan complies with this standard.*

6. Portions of residential on-street parking required by this section may be provided in parking courts that are interspersed throughout a development when the following standards are met:

Response: *No parking courts are proposed.*

CHAPTER 17.100 - LAND DIVISION

17.100.20 - LAND DIVISION CLASSIFICATION - TYPE I, II OR III PROCEDURES

C. Type II Land Division (Major Partition or Subdivision). A major partition or subdivision shall be a Type II procedure when a street is extended, satisfactory street conditions exist and the resulting parcels/lots comply with the standards of the zoning district and this chapter. Satisfactory street conditions exist when the Director determines one of the following:

1. Existing streets are stubbed to the property boundaries and are linked by the land division.
2. An existing street or a new proposed street need not continue beyond the land division in order to complete an appropriate street system or to provide access to adjacent property.
3. The proposed street layout is consistent with a street pattern adopted as part of the Comprehensive Plan or an officially adopted City street plan.

Response: *The proposal will be processed as a Planned Development. This process allows a degree of flexibility and variation of design standards. All of the proposed variations are discussed in more detail in Chapter 17.64 above. The Planned Development requires the application to be processed as a Type IV quasi-judicial review.*

17.100.60 - SUBDIVISIONS

Approval of a subdivision is required for a land division of 4 or more parcels in a calendar year. A two-step procedure is required for subdivision approval: (1) tentative plat review and approval; and (2) final plat review and approval.

Response: *The proposal is a 122 lot Planned Development and subdivision.*

A. Preapplication Conference. The applicant for a subdivision shall participate in a preapplication conference with city staff to discuss procedures for approval, applicable state and local requirements, objectives and policies of the Sandy Comprehensive Plan, and the availability of services.

Response: *A pre-application conference was held with the city on May 29, 2019.*

B. Application Requirements for a Tentative Plat. Subdivision applications shall be made on forms provided by the planning department and shall be accompanied by:

Response: *All of the items required by this section are included with the submittal.*

E. Approval Criteria. The Director or Planning Commission shall review the tentative plat for the subdivision based on the classification procedure (Type II or III) set forth in Section 17.12 and the following approval criteria:

1. The proposed subdivision is consistent with the density, setback and dimensional standards of the base zoning district, unless modified by a Planned Development approval.

Response: *As reviewed in the narrative above, variations to development standards as permitted as part of the Planned Development process. The proposed 168 dwelling units count is consistent with the increase in density provisions approved through the PD process. As detailed in Chapter 17.64, the applicant has proposed several variations to development standards as permitted by this chapter.*

2. The proposed subdivision is consistent with the design standards set forth in this chapter.

Response: *Except as noted in Chapter 17.64 as approved through the Planned Development process, the proposal generally complies with the design standards in this chapter.*

3. The proposed street pattern is connected and consistent with the Comprehensive Plan or official street plan for the City of Sandy.

Response: *As illustrated on the submitted Future Street Plan, the proposed street system is consistent with the City's Transportation System Plan and Comprehensive Plan. Due to topographic constraints on the Lower Views and the location of Vista Loop Drive and Highway 26 on the Upper Views, street connectivity around the entire development is not possible.*

4. Adequate public facilities are available or can be provided to serve the proposed subdivision.

Response: *The City of Sandy has indicated that all public facilities have capacity to serve the proposed subdivision. As detailed on submitted plans, because of the depth of the existing sewer line in Vista Loop, eleven lots in the Lower Views (Lots 39-46 and 61-63) and five lots (Lots 96-100) in the Upper Views will require installation of individual grinder sump systems to pump sanitary waste from these dwellings to a gravity sewer line.*

5. All proposed improvements meet City standards.

Response: *With the exception of variations as identified in Chapter 17.64, Planned Developments above, all improvements in the proposed development are designed in compliance with City standards.*

6. The phasing plan, if requested, can be carried out in a manner that meets the objectives of the above criteria and provides necessary public improvements for each phase as it develops.

Response: *The applicant requests flexibility in developing the Lower and Upper Views as two separate phases as necessary.*

17.100.80 - CHARACTER OF THE LAND

Land which the Director or the Planning Commission finds to be unsuitable for development due to flooding, improper drainage, steep slopes, rock formations, adverse earth formations or topography, utility easements, or other features which will reasonably be harmful to the safety, health, and general welfare of the present or future inhabitants of the partition or subdivision and the surrounding areas, shall not be developed unless adequate methods are formulated by the subdivider and approved by the Director or the Planning Commission to solve the problems created by the unsuitable land conditions.

Response: *A significant portion of the Lower Views is affected by the FSH overlay identified by the City of Sandy. The applicant does not propose any development within this area. A Geotechnical Evaluation for the property is included with the application package. Except for the areas designated as open space, all areas of the Lower Views and all of the Upper Views property are suitable for development and do not pose any issues due to flooding, etc as stated in this section.*

17.100.90 - ACCESS CONTROL GUIDELINES AND COORDINATION

- A. Notice and coordination with ODOT required. The city will coordinate and notify ODOT regarding all proposals for new or modified public and private accesses on to Highways 26 and 211.

Response: *The project Transportation Engineer coordinated the scope of the submitted Traffic Study regarding Highway 26 with ODOT. No direct access to Highway 26 is proposed and a VNAR is likely to be required along this roadway.*

17.100.100 - STREETS GENERALLY

- A. Transportation Impact Studies. Transportation impact studies may be required by the city engineer to assist the city to evaluate the impact of development proposals, determine reasonable and prudent transportation facility improvements and justify modifications to the design standards. Such studies will be prepared in accordance with the following:
1. A proposal established with the scope of the transportation impact study shall be coordinated with, and agreed to, by the city engineer. The study requirements shall reflect the magnitude of the project in accordance with accepted transportation planning and engineering practices. A professional civil or traffic engineer registered in the State of Oregon shall prepare such studies.
 2. If the study identifies level-of-service conditions less than the minimum standards established in the Sandy Transportation System Plan, improvements and funding strategies mitigating the problem shall be considered as part of the land use decision for the proposal.
Response: A traffic impact study prepared in compliance with city and ODOT standards by a Transportation Engineer is included with the application package. This study does not identify any issues requiring mitigation by the applicant.
- B. Topography and Arrangement. All streets shall be properly related to special traffic generators such as industries, business districts, schools, and shopping centers and to the pattern of existing and proposed land uses.
Response: None of special traffic generators listed in this section are located near the subject property. All existing and proposed residential uses have been considered in development of the proposed street pattern. A future street plan included with this application shows how streets could be extended beyond the subject property in the future.
- C. Street Spacing. Street layout shall generally use a rectangular grid pattern with modifications as appropriate to adapt to topography or natural conditions.
Response: Due to topographic constraints in the Lower Views and existing infrastructure in the Upper Views (Highway 26 and Vista Loop Drive) the site does not lend itself to creating a rectangular gridded street pattern.
- D. Future Street Plan. Future street plans are conceptual plans, street extensions and connections on acreage adjacent to land divisions. They assure access for future development and promote a logical, connected pattern of streets. It is in the interest of the city to promote a logical, connected pattern of streets. All applications for land divisions shall provide a future street plan that shows the pattern of existing and proposed future streets within the boundaries of the proposed land divisions, proposed connections to abutting properties, and extension of streets to adjacent parcels within a 400 foot radius of the study area where development may practically occur.

Response: A future street plan designed in compliance with the requirements of this section is included as part of the application package. This plan provides assurances that access for future development promotes a logical and connected pattern of streets.

- E. **Connections.** Except as permitted under Exemptions, all streets, alleys and pedestrian walkways shall connect to other streets within the development and to existing and planned streets outside the development and to undeveloped properties which have no future street plan. Streets shall terminate at other streets or at parks, schools or other public land within a neighborhood.

Where practicable, local roads shall align and connect with other roads when crossing collectors and arterials.

Proposed streets or street extensions shall be located to provide direct access to existing or planned transit stops, and existing or planned neighborhood activity centers, such as schools, shopping areas and parks.

Response: The site specific conditions of the subject property limits construction of an interconnected street system. The only existing street to be extended is Ortiz Street in the Upper Views which proposed to be located directly across Vista Loop Drive from this existing street.

17.100.120 - BLOCKS AND ACCESSWAYS

- A. **Blocks.** Blocks shall have sufficient width to provide for two tiers of lots at appropriate depths. However, exceptions to the block width shall be allowed for blocks that are adjacent to arterial streets or natural features.

Response: The unique character of the site does not lend itself to creating blocks with two tiers.

- B. **Residential Blocks.** Blocks fronting local streets shall not exceed 400 feet in length, unless topographic, natural resource, or other similar physical conditions justify longer blocks. Blocks may exceed 400 feet if approved as part of a Planned Development, Specific Area Plan, adjustment or variance.

Response: As reviewed in Chapter 17.64 above, due to site specific and topographic conditions, all streets do not comply with the 400 foot block length standard. The applicant has requested a variation to this dimensional standard as permitted by Section 17.64.0(A).

- D. **Pedestrian and Bicycle Access Way Requirements.** In any block in a residential or commercial district over 600 feet in length, a pedestrian and bicycle accessway with a minimum improved surface of 10 feet within a 15-foot right-of-way or tract shall be provided through the middle of the block. To enhance public convenience and mobility, such accessways may be required to connect to cul-de-sacs, or between streets and other public or semipublic lands or through greenway systems.

***Response:** The applicant proposes establishing a ten foot wide sidewalk with a 15-foot wide pedestrian access easement in the middle of Knapp Street to provide a sidewalk connection from this street to Vista Loop Drive.*

17.100.130 - EASEMENTS

A minimum eight (8) foot public utility easement shall be required along property lines abutting a right-of-way for all lots within a partition or subdivision. Where a partition or subdivision is traversed by a watercourse, drainage way, channel or stream, the land division shall provide a stormwater easement or drainage right-of-way conforming substantially with the lines of such watercourse, and such further width as determined needed for water quality and quantity protection.

***Response:** Eight foot wide public utility easements will be included along all property lines abutting a public right-of-way. Only public pedestrian access easements will be needed to allow public access along some of the sidewalks located within private tracts. No other easements for public utility purposes are required.*

17.100.140 - PUBLIC ALLEYS

***Response:** A 28-foot wide paved alley within a 29-foot public right-of-way is proposed in the Lower Views. This alley is designed to provide access to the 32 single family detached dwellings abutting this right-of-way. The proposed alley width is designed to accommodate public parking on the South side of this facility.*

17.100.150 - RESIDENTIAL SHARED PRIVATE DRIVES

A shared private drive is intended to provide access to a maximum of two (2) dwelling units.

A. Criteria for Approval

Shared private drives may be approved by the Director when one or more of the following conditions exist:

1. Direct access to a local street is not possible due to physical aspects of the site including size, shape, or natural features.
2. The construction of a local street is determined to be unnecessary.

***Response:** As shown on submitted plans the Lower Views includes three private drives serving two lots each. These private drives are proposed due to the topographic constraints with the subject property.*

B. Design

1. A shared private drive constructed to city standards shall not serve more than two (2) dwelling units.
2. A shared access easement and maintenance agreement shall be established between the two units served by a shared private drive. The language of the easement and maintenance agreement shall be subject to approval by the Director.

3. Public utility easements shall be provided where necessary in accordance with Section 17.100.130.
4. Shared private drives shall be fully improved with an all weather surface (e.g. concrete, asphalt, permeable pavers) in conformance with city standards. The pavement width shall be 20 feet.
5. Parking shall not be permitted along shared private drives at any time and shall be signed and identified accordingly.

***Response:** The proposed three private drives in the Lower Views are designed to serve only two lots each as permitted. A shared access easement and maintenance agreement will be established for each private drive as part of the Final Plat. Public utility easements will be accommodated along these private drives as necessary to serve these lots. As shown on submitted plans each private drive is proposed to include a 20-foot wide all weather surface within a 21-foot wide tract and will be posted "no parking". The proposal complies with this standard.*

17.100.160 - PUBLIC ACCESS LANES

***Response:** No public access lanes are proposed in this development*

17.100.170 - FLAG LOTS

Flag lots can be created where it can be shown that no other street access is possible to achieve the requested land division. The flag lot shall have a minimum street frontage of 15 feet for its accessway. The following dimensional requirements shall apply to flag lots:

- A. Setbacks applicable to the underlying zoning district shall apply to the flag lot.
- B. The access strip (pole) may not be counted toward the lot size requirements.

***Response:** Lots 103 and 104 are proposed as flag lots. Both lots contain a minimum 15-feet of street frontage as required.*

17.100.180 - INTERSECTIONS

- A. Intersections. Streets shall be laid out so as to intersect as nearly as possible at right angles. A proposed intersection of two new streets at an angle of less than 75 degrees shall not be acceptable. No more than two streets shall intersect at any one point unless specifically approved by the City Engineer. The city engineer may require left turn lanes, signals, special crosswalks, curb extensions and other intersection elements justified by a traffic study or necessary to comply with the Development Code.

***Response:** All streets in the proposed subdivision have been designed to intersect at right angles to the opposing street as required.*

- B. Curve Radius. All local and neighborhood collector streets shall have a minimum curve radius (at intersections of rights-of-way) of 20 feet, unless otherwise approved by the City Engineer. When a local or neighborhood collector enters on to a collector or arterial street, the curve radius shall be a minimum of 30 feet, unless otherwise approved by the City Engineer.

Response: *All streets in the proposed subdivision have a minimum curve radius as required by this section.*

17.100.190 - STREET SIGNS

The subdivider shall pay the cost of street signs prior to the issuance of a Certificate of Substantial Completion. The City shall install all street signs and upon completion will bill the developer for costs associated with installation. In addition, the subdivider may be required to pay for any traffic safety devices related to the development. The City Engineer shall specify the type and location of the street signs and/or traffic safety devices.

Response: *The applicant understands it will be his responsibility to pay the cost of street signs and the city will install these signs.*

17.100.200 - STREET SURFACING

Public streets, including alleys, within the development shall be improved in accordance with the requirements of the City or the standards of the Oregon State Highway Department. An overlay of asphalt concrete, or material approved by the City Engineer, shall be placed on all streets within the development. Where required, speed humps shall be constructed in conformance with the City's standards and specifications.

Response: *All streets in the proposed subdivision will be improved in accordance with City standards.*

17.100.210 - STREET LIGHTING

A complete lighting system (including, but not limited to: conduits, wiring, bases, poles, arms, and fixtures) shall be the financial responsibility of the subdivider on all cul-de-sacs, local streets, and neighborhood collector streets. The subdivider will be responsible for providing the arterial street lighting system in those cases where the subdivider is required to improve an arterial street. Standards and specifications for street lighting shall be coordinated with the utility and any lighting district, as appropriate.

Response: *The applicant is aware of the requirements of this section. A lighting plan will be coordinated with PGE and the city prior to installation of these fixtures.*

17.100.220 - LOT DESIGN

A. The lot arrangement shall be such that there will be no foreseeable difficulties, for reason of topography or other conditions, in securing building permits to build on all lots in compliance with the Development Code.

Response: *All of the lots in the proposed subdivision have been designed so that no foreseeable difficulties due to topography or other conditions will exist in securing building permits on these lots. A Geotechnical Evaluation report is included with this application.*

- B. The lot dimensions shall comply with the minimum standards of the Development Code. When lots are more than double the minimum lot size required for the zoning district, the subdivider may be required to arrange such lots to allow further subdivision and the opening of future streets to serve such potential lots.

Response: *As allowed by Chapter 17.64 for Planned Developments, the applicant has proposed modifications to the minimum lot size and dimension standards specified in the Single Family Residential zone. Only Lot 62 (16,694 square feet) is proposed to contain more than double the minimum lot size (7,500 square feet) in the SFR zone. Due to its location and topographic constraints no further division of this lot is possible.*

- C. The lot or parcel width at the front building line shall meet the requirements of the Development Code and shall abut a public street other than an alley for a width of at least 20 feet. A street frontage of not less than 15 feet is acceptable in the case of a flag lot division resulting from the division of an unusually deep land parcel which is of a size to warrant division into not more than two parcels.

Response: *All lots in the proposed subdivision contain at least 20 feet of frontage along a public street with the exception of one flag lot and the six lots are proposed to be accessed by three private drives.*

- D. Double frontage lots shall be avoided except where necessary to provide separation of residential developments from arterial streets or to overcome specific disadvantages of topography or orientation.

Response: *Only Lots 103-121 are designed to have frontage on both an internal local street (Knapp Street) and Highway 26. This configuration is unavoidable because of the location of Highway 26 and limitations for access to this roadway.*

- E. Lots shall avoid deriving access from major or minor arterials. When driveway access from major or minor arterials may be necessary for several adjoining lots, the Director or the Planning Commission may require that such lots be served by a common access drive in order to limit possible traffic hazards on such streets. Where possible, driveways should be designed and arranged to avoid requiring vehicles to back into traffic on minor or major arterials.

Response: *No lots are proposed to gain access from an arterial street.*

17.100.230 - WATER FACILITIES

Water lines and fire hydrants serving the subdivision or partition, and connecting the development to City mains, shall be installed to provide adequate water pressure to serve present and future consumer demand. The materials, sizes, and locations of water mains, valves, service laterals, meter boxes and other required appurtenances shall be in accordance with the standards of the Fire District, the City, and the State.

If the city requires the subdivider to install water lines in excess of eight inches, the city may participate in the oversizing costs. Any oversizing agreements shall be approved by the city manager based upon council policy and dependent on budget constraints. If required water mains will directly serve property outside the subdivision, the city may enter into an agreement with the subdivider setting forth methods for reimbursement for the proportionate share of the cost.

Response: *The applicant intends to install all water lines and fire hydrants in compliance with applicable standards.*

17.100.240 - SANITARY SEWERS

Sanitary sewers shall be installed to serve the subdivision and to connect the subdivision to existing mains. Design of sanitary sewers shall take into account the capacity and grade to allow for desirable extension beyond the subdivision.

If required sewer facilities will directly serve property outside the subdivision, the city may enter into an agreement with the subdivider setting forth methods for reimbursement by nonparticipating landowners for the proportionate share of the cost of construction.

Response: *The applicant intends to install sanitary sewer lines in compliance with applicable standards. As noted above, because of the depth of the existing sewer in Vista Loop, 11 lots in the Lower Views (Lots 39-46 and 61-63) and five lots (Lots 96-100) in the Upper Views will require installation of a grinder sump system installed at each of these dwellings to pump sanitary waste from these dwellings to a gravity sewer line in the development.*

17.100.250 - SURFACE DRAINAGE AND STORM SEWER SYSTEM

A. Drainage facilities shall be provided within the subdivision and to connect with off-site drainage ways or storm sewers. Capacity, grade and materials shall be by a design approved by the city engineer. Design of drainage within the subdivision shall take into account the location, capacity and grade necessary to maintain unrestricted flow from areas draining through the subdivision and to allow extension of the system to serve such areas.

Response: *A stormwater water quality and detention facility is proposed to be located in the eastern portion of the Lower Views and the western area of the Upper Views as shown on submitted plans. These facility's have been sized and located to accommodate public stormwater generated by the subdivision. A stormwater report is included with this application as required.*

B. In addition to normal drainage design and construction, provisions shall be taken to handle any drainage from preexisting subsurface drain tile. It shall be the design engineer's duty to investigate the location of drain tile and its relation to public improvements and building construction.

Response: *No subsurface drain tiles are known to exist on the site.*

- C. The roof and site drainage from each lot shall be discharged to either curb face outlets (if minor quantity), to a public storm drain or to a natural acceptable drainage way if adjacent to the lot.

Response: All roof and site drainage will be discharged to curb face outlets or another approved system as required.

17.100.260 - UNDERGROUND UTILITIES

All subdivisions or major partitions shall be required to install underground utilities (including, but not limited to, electrical and telephone wiring). The utilities shall be installed pursuant to the requirements of the utility company.

Response: The applicant intends to install all utilities underground as required.

17.100.270 - SIDEWALKS

Sidewalks shall be installed on both sides of a public street and in any special pedestrian way within the subdivision.

Response: Sidewalks will be installed of both sides of all streets with the exception as detailed above a sidewalk is proposed to be constructed on only the North side of The View Drive from its intersection with Vista Loop Drive to the proposed public alley. The applicant is proposing this design to allow the road surface to be shifted to the South side of the public right-of-way to construct a six-foot sidewalk within a widened landscaped buffer. The applicant believes this design will provide a more aesthetically pleasing and desirable environment for pedestrians walking between the upper and lower parts of the development. The roadway width in this location will be 28 feet in compliance with city standards.

17.100.280 - BICYCLE ROUTES

If appropriate to the extension of a system of bicycle routes, existing or planned, the Director or the Planning Commission may require the installation of bicycle lanes within streets. Separate bicycle access ways may be required to reduce walking or cycling distance when no feasible street connection is available.

Response: No bicycle routes are existing, planned, or proposed on the subject property. The applicant is aware that street improvements on Vista Loop Drive may require completion of a bicycle lane along this frontage.

17.100.290 - STREET TREES

Where planting strips are provided in the public right-of-way, a master street tree plan shall be submitted and approved by the Director. The street tree plan shall provide street trees approximately every 30' on center for all lots.

Response: Planter strips will be provided along all frontages as required. Street trees in accordance with City standards will be provided in these areas.

17.100.300 - EROSION CONTROL

Grass seed planting shall take place prior to September 30th on all lots upon which a dwelling has not been started but the ground cover has been disturbed. The seeds shall be of an annual rye grass variety and shall be sown at not less than four pounds to each 1000 square feet of land area.

Response: Grass seeding will be completed as required by this section. The submitted erosion control plan provides additional details to address erosion control concerns.

17.100.310 - REQUIRED IMPROVEMENTS

The following improvements shall be installed at no expense to the city, consistent with the design standards of Chapter 17.84, except as otherwise provided in relation to oversizing.

- A. Drainage facilities
- B. Lot, street and perimeter monumentation
- C. Mailbox delivery units
- D. Sanitary sewers
- E. Sidewalks
- F. Street lights
- G. Street name signs
- H. Street trees
- I. Streets
- J. Traffic signs
- K. Underground communication lines, including broadband (fiber), telephone, and cable. Franchise agreements will dictate whether telephone and cable lines are required.
- L. Underground power lines
- M. Water distribution lines and fire hydrants

Response: All improvements specified in this section will be installed by the developer at no expense to the City of Sandy consistent with the design standards of Chapter 17.84 and applicable standards.

CHAPTER 17.102 - URBAN FORESTRY

17.102.20 - APPLICABILITY

This chapter applies only to properties within the Sandy Urban Growth Boundary that are greater than one acre including contiguous parcels under the same ownership.

- A. General: No person shall cut, harvest, or remove trees 11 inches DBH or greater without first obtaining a permit and demonstrating compliance with this chapter.
 - 1. As a condition of permit issuance, the applicant shall agree to implement required provisions of this chapter and to allow all inspections to be conducted.
 - 2. Tree removal is subject to the provisions of Chapter 15.44, Erosion Control, Chapter 17.56, Hillside Development, and Chapter 17.60 Flood and Slope Hazard.

Response: The subject property contains 32.87 and the standards of this chapter are applicable to the proposed Planned Development. The applicant intends removing some of the trees on the property to accommodate development of a residential subdivision. The proposed tree

removal and protection plan has been designed in accordance with the standards of this chapter and the provisions in Chapters 15.44, 17.56, and 17.60 as applicable.

17.102.50 - TREE RETENTION AND PROTECTION REQUIREMENTS

- A. Tree Retention: The landowner is responsible for retention and protection of trees required to be retained as specified below:
1. At least three trees 11 inches DBH or greater are to be retained for every one-acre of contiguous ownership.
 2. Retained trees can be located anywhere on the site at the landowner's discretion before the harvest begins. Clusters of trees are encouraged.
 3. Trees proposed for retention shall be healthy and likely to grow to maturity, and be located to minimize the potential for blow-down following the harvest.
 4. If possible, at least two of the required trees per acre must be of conifer species.
 5. Trees within the required protected setback areas may be counted towards the tree retention standard if they meet these requirements.

Response: As shown on the submitted plan set, the majority of trees on the subject property are located within the FSH Overlay portion of the Lower Views. The subject property contains 32.87 acres requiring retention of 99 trees, 11 inches and greater DBH ($32.87 \times 3 = 98.61$ rounded up to 99 trees) and in good condition. The submitted plan indicates that 212 trees are proposed to be retained, at least 99 of these are over 11-inches DBH and in good condition as required. In addition as detailed in the Arborist report 69 of the 99 these trees (70%) are conifer species as preferred by subsection 4 above. No trees are proposed to be removed within the FSH Overlay area.

- B. Tree Protection Area: Except as otherwise determined by the Planning Director, all tree protection measures set forth in this section shall be instituted prior to any development activities and removed only after completion of all construction activity. Tree protection measures are required for land disturbing activities including but not limited to tree removal, clearing, grading, excavation, or demolition work.
1. Trees identified for retention shall be marked with yellow flagging tape and protected by protective barrier fencing placed no less than 10 horizontal feet from the outside edge of the trunk.
 2. Required fencing shall be a minimum of six feet tall supported with metal posts placed no farther than ten feet apart installed flush with the initial undisturbed grade.
 3. No construction activity shall occur within the tree protection zone, including, but not limited to dumping or storage of materials such as building supplies, soil, waste items, equipment, or parked vehicles.

Response: As shown on the submitted Tree Retention and Protection plan the majority of retained trees are not proposed to be retained on any lot or within any area proposed for development. The submitted Arborist report contains additional recommendations for tree protection.

17.102.60 - TREE REPLANTING REQUIREMENTS

1. All areas with exposed soils resulting from tree removal shall be replanted with a ground cover of native species within 30 days of harvest during the active growing season, or by June 1st of the following spring.
2. All areas with exposed soils resulting from tree removal occurring between October 1 and March 31 shall also be covered with straw to minimize erosion.
3. Removal of hazard trees as defined shall be replanted with two native trees of quality nursery stock for every tree removed.
4. Tree Removal allowed within the FSH Overlay District shall be replanted with two native trees of quality nursery stock for every tree removed.
5. Tree Removal not associated with a development plan must be replanted following the provisions of OAR Chapter 629, Division 610, Section 020-060

Response: The requirements of this section as applicable will be completed with construction of subdivision improvements.

17.102.70 - VARIANCES

Response: The submitted plan is designed in compliance with the standards in this chapter and a variance to these standards is not requested or required.

CHAPTER 15.30 - DARK SKY ORDINANCE

15.30.000 - PURPOSE

The purpose of the Sandy Dark Sky Ordinance is to regulate outdoor lighting in order to reduce or prevent light pollution. This means to the extent reasonably possible the reduction or prevention of glare and light trespass, the conservation of energy, and promotion of safety and security. (Ord. 2002-11)

15.30.030 - EXEMPTIONS AND EXCEPTIONS

D. Full cutoff street lighting, which is part of a federal, state, or municipal installation.

15.30.060 - GENERAL STANDARDS

D. All outdoor lighting systems shall be designed and operated so that the area 10 feet beyond the property line of the premises receives no more than .25 (one quarter) of a foot-candle of light from the premises lighting system.

Response: The applicant understands the requirements of this chapter. A detailed lighting plan will be submitted with construction plans following land use approval.

V. Conclusion

The applicant proposes constructing a 122 lot Planned Development to include 120 lots intended for single family dwellings with 32 lots of these for single family attached dwellings and 88 lots for single family detached dwellings. Lot sizes vary from large view lots to smaller lots to accommodate more moderate homes. In addition, two lots are proposed to construct 48 multi-family units at a later date. The project is divided into the “Lower Views” east of Vista Loop Drive and the “the Upper Views” located across Vista Loop Drive to the West. The two parts of the development will be connected by a sidewalk system and will share all project amenities. Thirty-six percent (11.92 acres) of the total lot area of the Planned Development is proposed to be designated private open space with 8.22 acres of this open space within FSH Overlay restricted development areas.

The project has been designed to provide residents The Views with a wide array of amenities including tot lots and play structures, half-court basketball courts, and a dog park. In addition, a trail system is proposed to be constructed within natural areas of the Lower Views and a Mt. Hood viewpoint plaza is also proposed to be constructed in a central location for all to enjoy. All of these amenities are intended for the use and pleasure of the resident’s of the Planned Development and will be owned and maintained by a Homeowner’s Association formed for this purpose. The Concept Plan for the development prepared by a Landscape Architect illustrates these amenities in addition to other notable features including a decorative sound wall to be constructed along Highway 26, a development entry sign, meandering sidewalks and footpaths, and extensive landscaping. Also as shown on this plan, a “Welcome to Sandy” monument sign is proposed to be constructed by the applicant along Highway 26 at the East end of the Upper Views .

As reviewed in this narrative and shown on submitted plans and studies including the submitted Traffic Impact Analysis, Geotechnical Report, Arborist Report, The Views Planned Development complies with all applicable standards with the exception of code variations as discussed in Section 17.64.30 above. Given these facts the applicant respectfully requests this application be approved as submitted.

EXHIBIT C

The Views Planned Development File No. 20-028 Special Variance Request and Narrative

Request: The applicant requests two special variances with this application as detailed below.

1. Special Variance to Section 17.84.30(A) to not construct sidewalk improvements adjacent to a single street frontage and to construct a meandering sidewalk design along three street segments;
2. Special Variance to Section 17.82.20(A) and (B) to not orient the front doors of homes constructed on lots adjacent to Highway 26 towards the internal street rather than the highway.

CHAPTER 17.66 - ADJUSTMENTS AND VARIANCES

17.66.80 TYPE III SPECIAL VARIANCES

The Planning Commission may grant a special variance waiving a specified provision under the Type III procedure if it finds that the provision is unreasonable and unwarranted due to the specific nature of the proposed development. In submitting an application for a Type III Special Variance, the proposed development explanation shall provide facts and evidence sufficient to enable the Planning Commission to make findings in compliance with the criteria set forth in this section while avoiding conflict with the Comprehensive Plan.

Special Variance No. 1

The applicant requests a Special Variance to Section 17.84.30(A) to not construct a sidewalk along the South side of The Views Drive from Vista Loop Drive to the alley and to construct meandering sidewalks within a private tract along the north side of The Views Drive and the west side of Bonnie Street in The Lower Views and along Vista Loop Drive in The Upper Views.

One of the following sets of criteria shall be applied as appropriate.

- A. The unique nature of the proposed development is such that:
 1. The intent and purpose of the regulations and of the provisions to be waived will not be violated; and
Response: *Section 17.84.30(A) requires sidewalks to be constructed along both sides of all arterial, collector, and local streets according to city standards. As noted above, the applicant proposes constructing a sidewalk only on the north side of The Views Drive from Vista Loop Drive to the alley. City standards require a five foot wide sidewalk along both sides of a local street. The applicant proposes constructing a six-foot wide meandering sidewalk within a privately landscaped on the north side of this street only.*

This facility will be located within Tract E, a private tract owned and maintained by the Homeowner's Association. The intent of this proposal is to create an enhanced pedestrian environment for residents and visitors walking between the Upper and Lower Views portions of the development. A similar meandering sidewalk configuration is proposed along Vista Loop Drive in The Upper Views and the West side of Bonnie Street in The Lower Views. The applicant believes these facilities will provide a more pleasant and unique pedestrian experience for the residents and visitors of the Planned Development. The proposed amenities are more than adequate to serve pedestrian volumes anticipated to use these facilities and the needs of this neighborhood. Approval of this request will not violate the intent and purpose of these regulations as an enhanced sidewalk will be constructed in these locations. The proposal complies with this criteria.

2. Authorization of the special variance will not be materially detrimental to the public welfare and will not be injurious to other property in the area when compared with the effects of development otherwise permitted.

***Response:** The proposed variance to eliminate a sidewalk along the south side of The Views Drive and to construct meandering sidewalks along three street segments will not be detrimental to the public welfare or will they be injurious to other property in the area. On the contrary, the applicant believes these facilities will enhance the pedestrian experience for residents and visitors of the development and will have no affect on adjoining properties. The proposal complies with this criteria.*

- B. The variance approved is the minimum variance needed to permit practical compliance with a requirement of another law or regulation.

***Response:** The requested Special Variance is the minimum needed to facilitate creation of the intended character and design of the proposed Planned Development. The proposal complies with this criteria.*

- C. When restoration or replacement of a nonconforming development is necessary due to damage by fire, flood, or other casual or natural disaster, the restoration or replacement will decrease the degree of the previous noncompliance to the greatest extent possible.

***Response:** The proposal does not involve nonconforming development.*

Special Variance No. 2

The applicant requests a special Variance to Sections 17.82.20(A) and (B) to orient the front doors of homes constructed on the lots adjacent to Highway 26 towards the internal street rather than to Highway 26.

- A. The unique nature of the proposed development is such that:

1. The intent and purpose of the regulations and of the provisions to be waived will not be violated; and

Response: Section 17.82.20(A) specifies that all residential dwellings shall have their primary entrances oriented toward a transit street or toward a public right-of-way or private walkway which leads to a transit street. Section 17.82.20(B) requires that “dwellings shall have a primary entrance connecting directly between the street and building interior.” A transit street is defined as any collector or arterial street. The site has frontage on both Highway 26, an arterial and Vista Loop Drive, a collector street. The applicant proposes orienting the front door of homes abutting Highway 26 (Lots 99 and 103 - 121) towards the internal street rather than highway. The reason for this request is because there is a signification grade separating the elevation of these lots and the highway. In addition, because of concerns of increased sound levels from the highway traffic adversely affecting homes constructed adjacent to this road, a six-foot tall sound wall will be constructed at the back of these lots. This facility will essentially block access to the transit street and the sidewalk proposed to be constructed at the top of this bank. As contained in Chapter 17.82, this chapter “is to provide for convenient, direct, and accessible pedestrian access to and from public sidewalks and transit facilities”. Given vehicle speeds along Highway 26 and site specific constraints it is highly unlikely a transit stop or boarding will ever be allowed along this portion of the Highway 26. As such, orienting homes towards this road and requiring constructing of a sidewalk connection is not warranted and should not be required. Given these factors, compliance with these standards is not practical. The unique site conditions described in this review warrants approval of a Special Variance as the proposal does not violate the intent and purpose of these regulations.

2. Authorization of the special variance will not be materially detrimental to the public welfare and will not be injurious to other property in the area when compared with the effects of development otherwise permitted.

Response: The requested variance to this standard will have no effect on the public welfare or other properties in the area. The proposal includes front doors of homes constructed on these lots facing the internal street and a sidewalk connecting to a sidewalk along this facility. The proposal complies with this criteria.

- B. The variance approved is the minimum variance needed to permit practical compliance with a requirement of another law or regulation.

Response: The requested variance is the minimum variance needed to permit practical compliance with this regulation.

- C. When restoration or replacement of a nonconforming development is necessary due to damage by fire, flood, or other casual or natural disaster, the restoration or replacement will decrease the degree of the previous noncompliance to the greatest extent possible.

Response: The proposal does not involve nonconforming development.

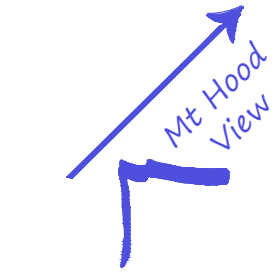
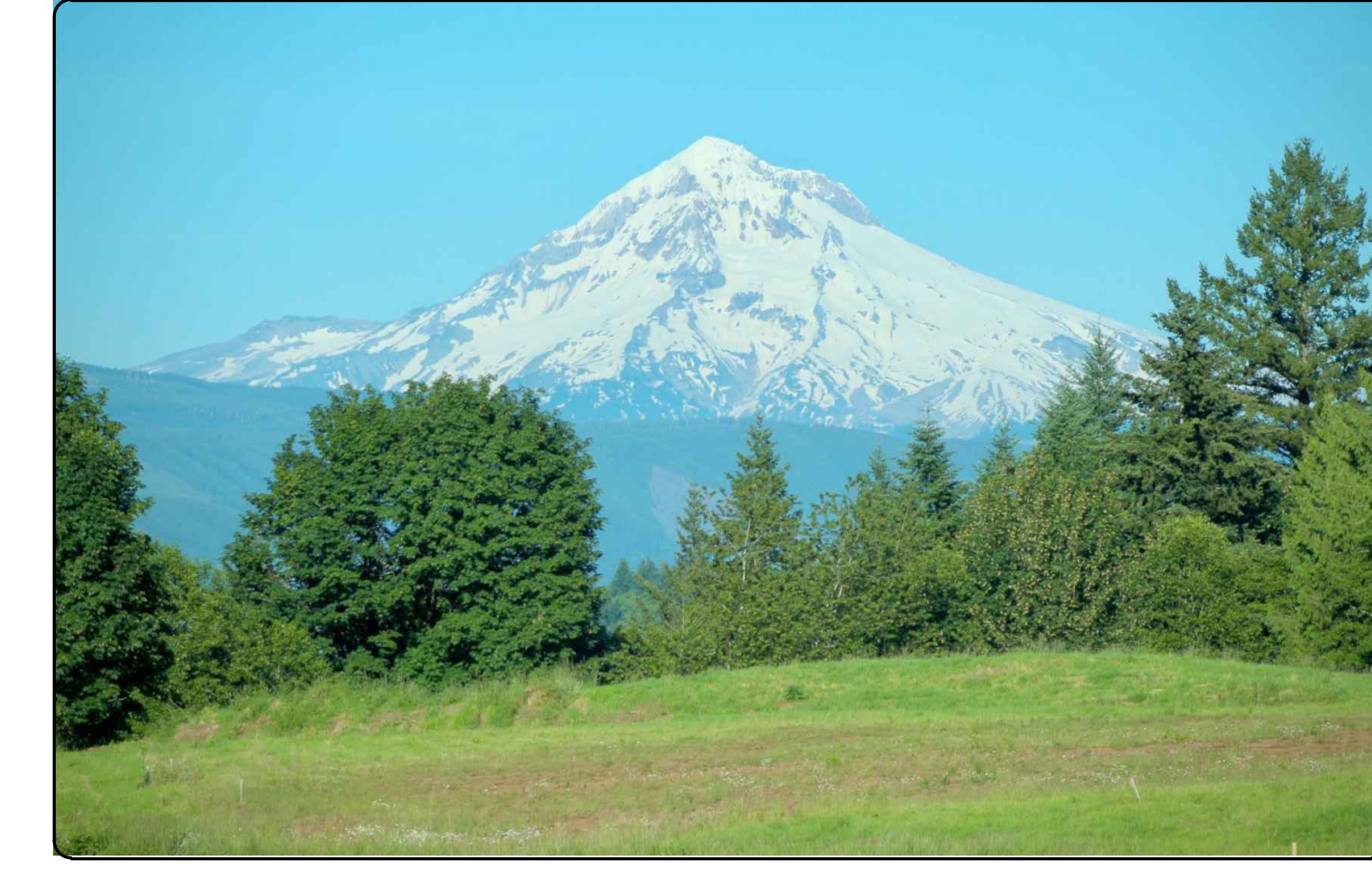
THE VIEWS

A SANDY OREGON PLANNED DEVELOPMENT

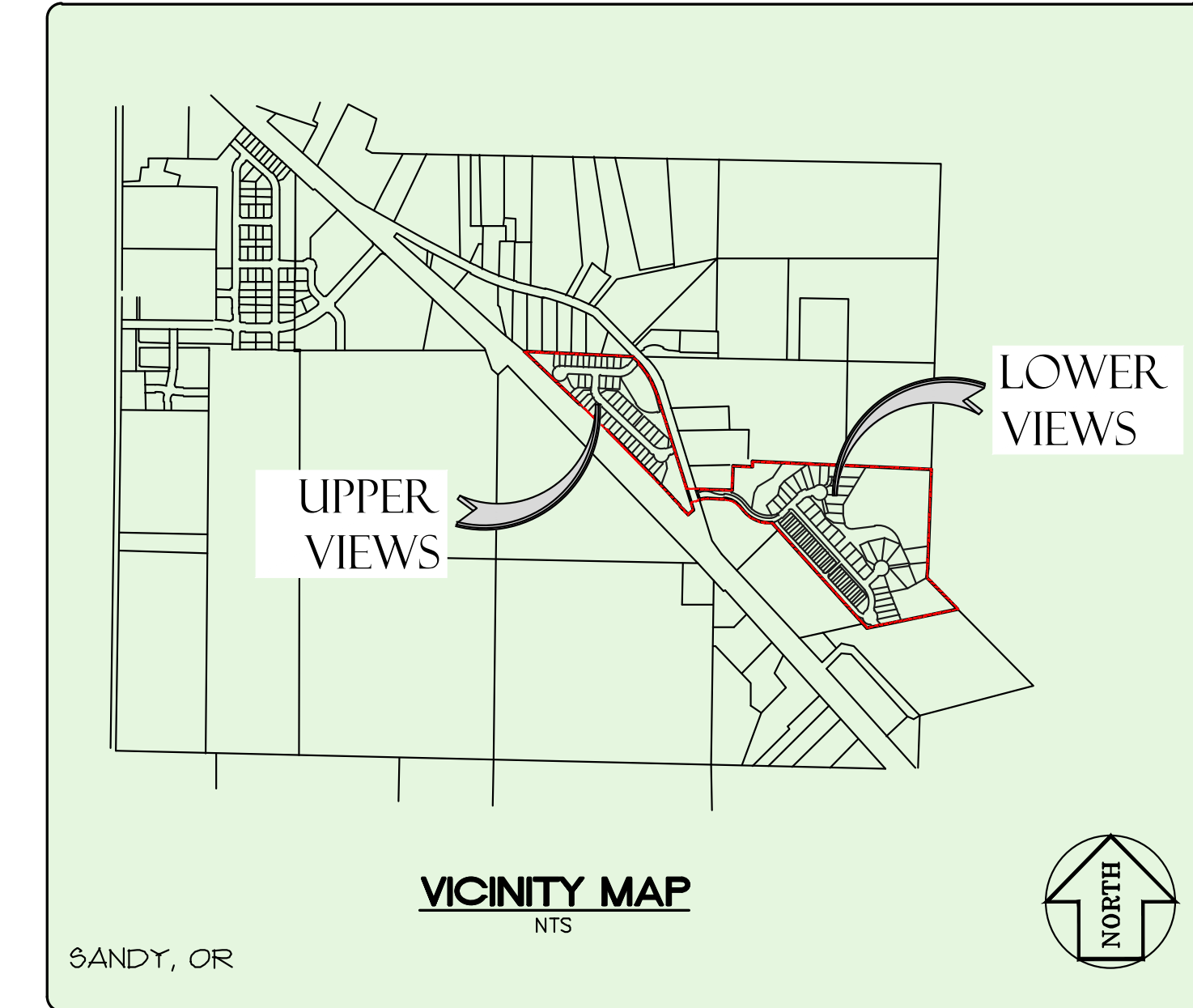
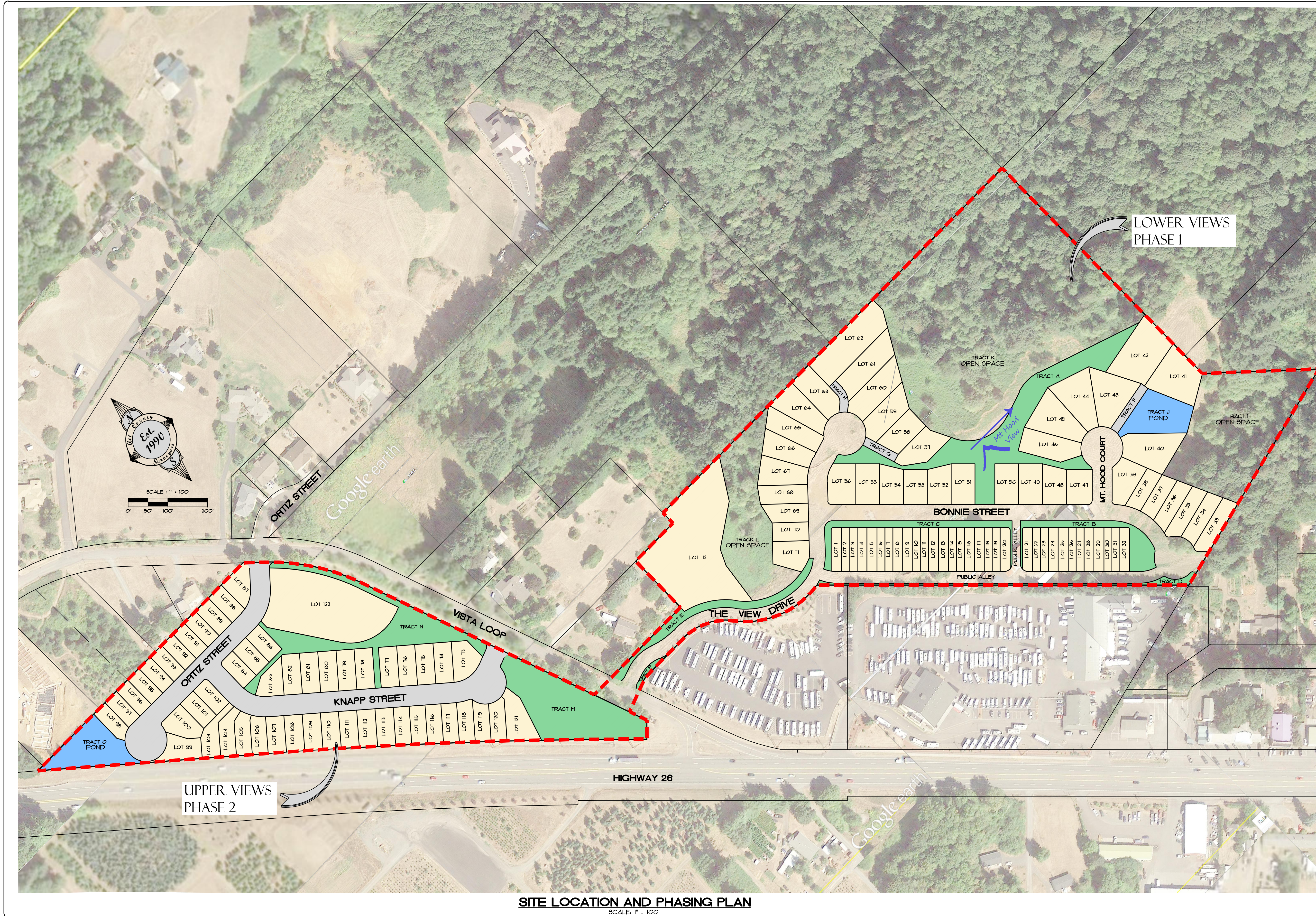
(122 MIXED RESIDENTIAL LOTS)

JUNE 2020
UPDATED OCTOBER 2020

EXHIBIT D



SHEET	16
OF	16
DATE	10-17-20
SCALE	AS SHOWN
PROJECT	THE VIEWS PD
LOCATION	4177 HIGHWAY 26, SANDY, OR 97055
DESIGNED BY	SEVEN BETTER HOMES, INC.
CHECKED BY	SEVEN BETTER HOMES, INC.
DATE	10-17-20
SCALE	AS SHOWN
PROJECT	THE VIEWS PD
LOCATION	4177 HIGHWAY 26, SANDY, OR 97055



SHEET INDEX

C1	COVER SHEET
C2	PRELIMINARY PLAT MAP - THE LOWER VIEWS
C3	PRELIMINARY PLAT MAP - THE UPPER VIEWS
C4	TOPOGRAPHIC SURVEY - THE LOWER VIEWS
C5	TOPOGRAPHIC SURVEY - THE UPPER VIEWS
C6	TREE RETENTION AND PROTECTION PLAN
C7	TREE INVENTORY LIST
C8	BUILDING SETBACKS - THE LOWER VIEWS
C9	BUILDING SETBACKS - THE UPPER VIEWS
C10	PARKING ANALYSIS AND FUTURE STREET PLAN
C11	BLOCK AND STREET DIMENSIONS
C12	STREET AND UTILITY PLAN - THE LOWER VIEWS
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C14	GRADING AND EROSION CONTROL PLANS - THE LOWER VIEWS
C15	GRADING AND EROSION CONTROL PLANS - THE UPPER VIEWS
C16	SANITARY SEWER PLAN AND PROFILE - OFF SITE
C17	SANITARY SEWER PLAN AND PROFILE - THE LOWER VIEWS
C18	SANITARY SEWER PLAN AND PROFILE - THE UPPER VIEWS

DENSITY CALCULATIONS:

Property	Total Site Area	Acres
Lower Views (Picking Property)	1,015,748 SF	23.318
Public ROW	127,048 SF	2.917
Public Detention Pond Tracts	13,954 SF	0.320
Open Space and Private Tracts	853,696 SF	19.440
Total Lot Area	421,267 SF	9.671
Upper Views (Knapp Property)	426,066 SF	9.552
Public ROW	77,991 SF	1.789
Public Detention Pond Tracts	16,899 SF	0.387
Open Space and Private Tracts	328,176 SF	7.460
Total Lot Area	248,701 SF	5.709

Area Information	Area	Acres
Total Site Area	1,481,813 SF	32.870
Public ROW	204,980 SF	4.706
Public Detention Pond Tracts	30,793 SF	0.707
Net Site Area (NSA)	1,246,040 SF	27.457
Restricted Development Area (RDA)	279,768 SF	6.423
Unrestricted Site Area (USA)	966,272 SF	21.035
Total Open Space and Private Tracts	526,073 SF	11.919
Total Lot Area	669,967 SF	15.238

Density Calculations (Based on SFR Zoning)

Minimum Density	3 units/acre
Maximum Density	5.8 units/acre
Minimum Required Units = USA x min density	63 units
Maximum Allowed (the lesser of the two numbers)	159 units
A. NSA x max density	159 units
B. USA x max density x 1.5	188.0 units
PD Density Increase per 17.64 AC	25%
Additional Density Allowed	46 units
MAXIMUM DENSITY ALLOWED	199 units

Open Space Calculations	Area	Acres
Minimum 25% open space required	357,953 SF	8.22
Proposed private open space - Natural Area	359,491 SF	8.25
Proposed private open space - Active Area	160,161 SF	3.68
Total proposed private open space	519,652 SF	11.93
Total proposed private open space %	36%	

<p>SITE INFORMATION:</p> <p>THE UPPER VIEWS: OWNER: KRAFT ADDRESS: 5E VISTA LOOP DRIVE, SANDY OR TAX LOT 5002 MAP 29 9E 19 AREA: 9.552 ACRES (416,066 SF) ZONING: SFR</p> <p>THE LOWER VIEWS: OWNER: PICKING ADDRESS: 4177 HIGHWAY 26, SANDY OR TAX LOT 5001 MAP 29 9E 19 AREA: 23.318 ACRES (1,015,748 SF) ZONING: SFR</p>	<p>PROJECT TEAM:</p> <p>CLIENT: SEVEN BETTER HOMES, INC. ATTN: MIKE EVEN PO BOX 3021 GRESHAM, OR 97030 (503) 348-5600</p> <p>ENGINEER/SURVEYOR: ALL COUNTY SURVEYORS & PLANNERS, INC. ATTN: DAN REDMOND, PE, PLS TILLY HENDERSON, EIT PO BOX 985 SANDY, OR 97055 PHONE: (503) 668-3181</p>	<p>TRAFFIC ENGINEER: ARD ENGINEERING ATTN: MIKE ARD, PE 2132 28 LAMBER FARMS PARKWAY, SUITE 142, SHERBOOD, OR 97140 PHONE: (503) 862-6960</p> <p>GEOTECHNICAL ENGINEER: REDMOND GEOTECHNICAL SERVICES ATTN: DAN REDMOND, GE PO BOX 20541 PORTLAND, OR 97204 PHONE: (503) 862-0598</p>	<p>PLANNER: TRACT BROUW PLANNING CONSULTANTS, LLC ATTN: TRACY BROUW 17075 FIR DRIVE SANDY, OR 97055 PHONE: (503) 781-0483</p> <p>ARCHITECT: DESIGN PROVIDENCE LLC ATTN: RAY MOORE, PE, PLS 12042 SE SUNNYSIDE ROAD CLACKAMAS, OR 97015 PHONE: (503) 760-0446</p>	<p>LANDSCAPE ARCHITECT: FEARS DESIGN GROUP, LLC ATTN: TROY FEARS PO BOX 23338 PORTLAND, OR 97201 PHONE: (503) 601-4516</p> <p>ARBORIST: TERAGAN & ASSOCIATES, INC. ATTN: TODD FRAGER ARCA RESIDENTIAL CONSULTING ARBORIST #591 3145 WESTVIEW CIRCLE LAKE OSWEGO, OR 97034 PHONE: (503) 756-4838</p>	<p>WETLANDS: SCHOTT & ASSOCIATES, INC. ATTN: JODI REED 21018 OREGON 99E PO BOX 989 AUBORA, OR 97002 PHONE: (503) 618-4001</p>
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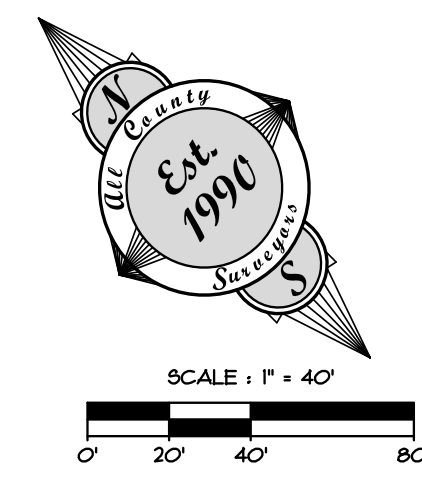
PROPOSAL:

THE PROPOSED PD WILL CREATE A TOTAL OF 122 NEW RESIDENTIAL LOTS AND COVER 11 ACRES OF OPEN SPACE. THE PROPOSED DENSITY WILL BE 168 UNITS PER ACRE, WHICH IS A 28% INCREASE TO THE MAXIMUM BASE DENSITY. 25% IS ALLOWED PER 17.64 AC. THE UNITS WILL BE A MIX OF SINGLE FAMILY DETACHED LARGE AND SMALL LOTS, SINGLE FAMILY ATTACHED, AND MULTIFAMILY. SEE THE FOLLOWING LOT BREAKDOWN:

SINGLE FAMILY DETACHED LOTS:	MULTIFAMILY LOTS:
50 LOTS (3,400 SF TO 4,999 SF)	2 LOTS (43,003 SF AND 53,185 SF)
13 LOTS (5,000 SF TO 5,999 SF)	EACH LOT WILL ALLOW 24 DWELLING UNITS FOR A TOTAL OF 48 UNITS.
12 LOTS (6,000 SF TO 7,499 SF)	
13 LOTS (7,500 SF TO 11,000 SF)	
TOTAL OF 88 SINGLE FAMILY DETACHED LOTS	
SINGLE FAMILY ATTACHED LOTS (ROW HOUSES)	THE PROPOSED DENSITY OF 168 UNITS FALLS BETWEEN THE MIN CALCULATED 63 UNITS AND THE MAXIMUM 199 UNITS.
32 LOTS (2,640 SF TO 2,699 SF)	

SEVEN BETTER HOMES, INC.
11400 E. EVERETT
GRESHAM, OR 97030
sevenbetterhomes.com
PHONE: (503) 348-5600

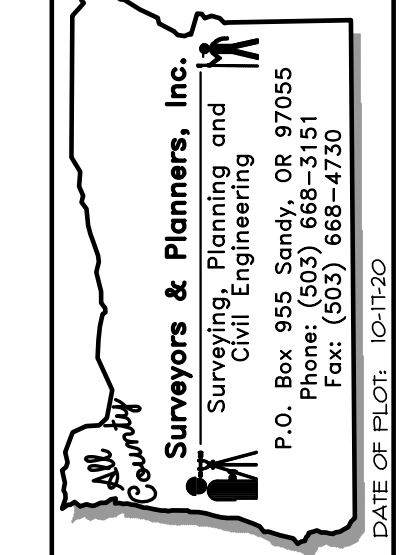
THE VIEWS



PRELIMINARY PLAT MAP - THE LOWER VIEWS
SCALE 1" = 40'

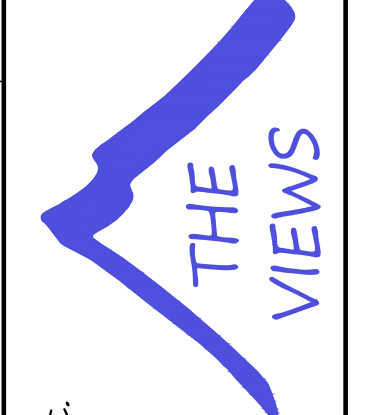
DATE	NO.	REVISION	SHEET
			C2
DATE	NO.	REVISION	OF
			18
DESIGNED	BY	DATE	
DRAWN	BY	DATE	
CHECKED	BY	DATE	
APPROVED	BY	DATE	

SCALE: N/A
 DATE: 10-17-20
 FILE: 19-071-PLANNING-R40
 SECTION: TWP. RANGE
 IN. 3E
 35



PROJECT: THE VIEWS PD
 PRELIMINARY PLAT MAP -
 THE LOWER VIEWS
 LOCATION: 4177 HIGHWAY 28, SANDY, OR 97055

EVER BETTER HOMES, INC.
 10000 N. GRESHAM AVE. SUITE 100
 GRESHAM, OR 97030
 PHONE: (503) 346-9400





PRELIMINARY PLAT MAP - THE UPPER VIEWS
SCALE: 1" = 40'

DATE	NO.	REVISION	SHEET
			C3
DATE	NO.	REVISION	OF
			18
DESIGNED	BY	DATE	
DRAWN	BY	DATE	
CHECKED	BY	DATE	
APPROVED	BY	DATE	

SCALE: N/A
DATE: 10-17-20
FILE: 19-071-PLANNING-RWD
SECTION: 35
TWP: 3E
RANGE: 3E

PROJECT: **THE VIEWS PD**
PRELIMINARY PLAT MAP -
THE UPPER VIEWS
LOCATION: 4177 HIGHWAY 26, SANDY, OR 97055

THE VIEWS

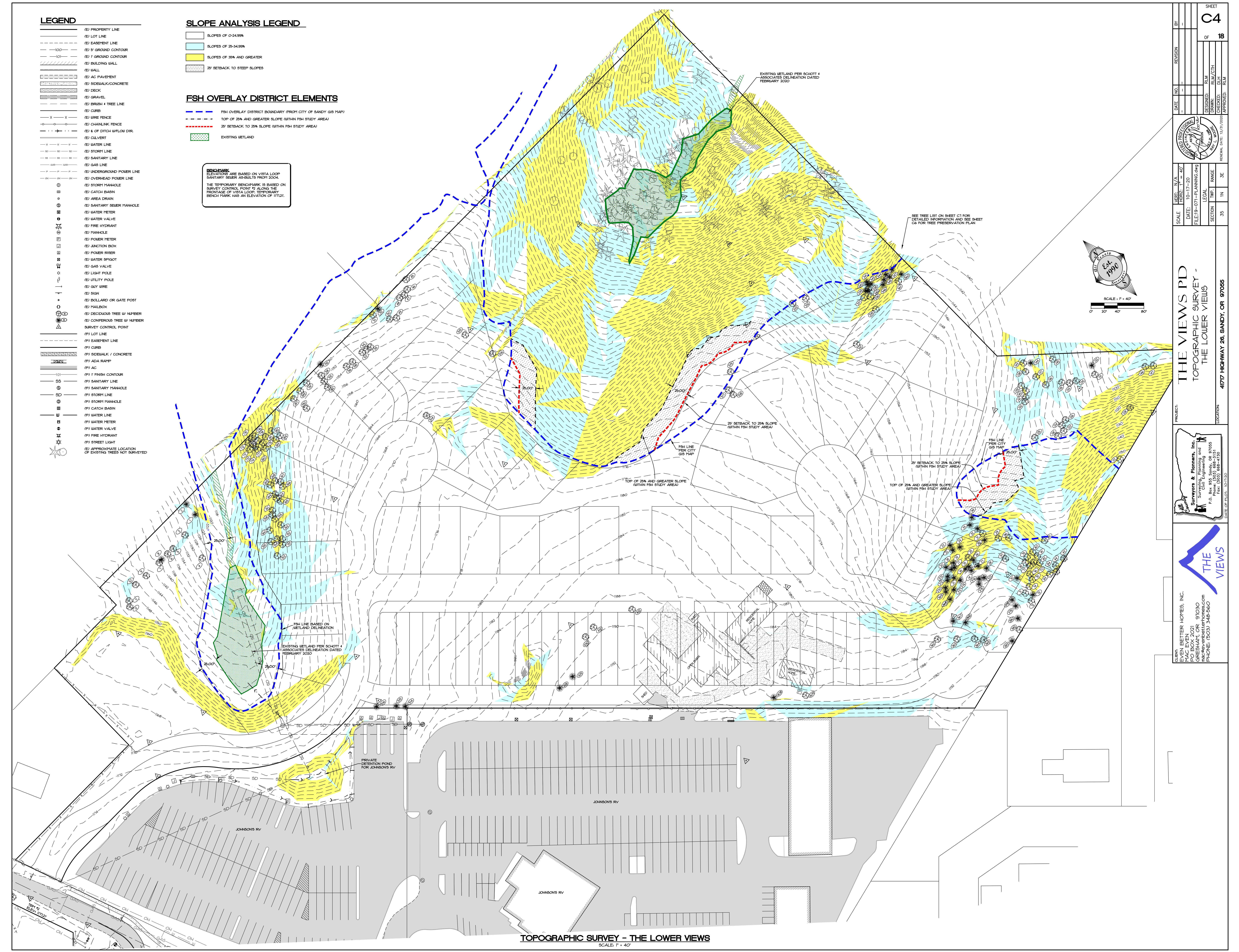
EVER BETTER HOMES, INC.
11425 NE 11TH AVE, SUITE 100
GRESHAM, OR 97030
PHONE: (503) 346-9600

Surveyors & Planners, Inc.
Civil Engineering
11425 NE 11TH AVE, SUITE 100
GRESHAM, OR 97030
PHONE: (503) 346-9600

- LEGEND**
- (E) PROPERTY LINE
 - (E) LOT LINE
 - (E) EASEMENT LINE
 - (E) 1/2" GROUND CONTOUR
 - (E) 1" GROUND CONTOUR
 - (E) BUILDING WALL
 - (E) AC PAVEMENT
 - (E) SOBRAG/CONCRETE
 - (E) DECK
 - (E) GRAVEL
 - (E) BRUSH & TREE LINE
 - (E) CURB
 - (E) WIRE FENCE
 - (E) CHAINLINK FENCE
 - (E) 4" OF DITCH BELOW DIR
 - (E) CULVERT
 - (E) WATER LINE
 - (E) STORM LINE
 - (E) SANITARY LINE
 - (E) GAS LINE
 - (E) UNDERGROUND POWER LINE
 - (E) OVERHEAD POWER LINE
 - (E) STORM MANHOLE
 - (E) CATCH BASIN
 - (E) AREA DRAIN
 - (E) SANITARY SEWER MANHOLE
 - (E) WATER METER
 - (E) WATER VALVE
 - (E) FIRE HYDRANT
 - (E) MANHOLE
 - (E) POWER METER
 - (E) JUNCTION BOX
 - (E) POWER RISER
 - (E) WATER SPRIGOT
 - (E) GAS VALVE
 - (E) LIGHT POLE
 - (E) UTILITY POLE
 - (E) GUY WIRE
 - (E) SIGN
 - (E) ROLLARD OR GATE PORT
 - (E) MAILBOX
 - (E) DECIDUOUS TREE W/ NUMBER
 - (E) CONIFEROUS TREE W/ NUMBER
 - (E) SURVEY CONTROL POINT
 - (E) 1" LINE
 - (E) EASEMENT LINE
 - (E) CURB
 - (E) SIDEWALK / CONCRETE
 - (E) ADA RAMP
 - (E) AC
 - (E) 1" FINISH CONTOUR
 - (E) SANITARY LINE
 - (E) SANITARY MANHOLE
 - (E) STORM LINE
 - (E) STORM MANHOLE
 - (E) CATCH BASIN
 - (E) WATER LINE
 - (E) WATER METER
 - (E) WATER VALVE
 - (E) FIRE HYDRANT
 - (E) STREET LIGHT
 - (E) APPROXIMATE LOCATION OF EXISTING TREES NOT SURVEYED

- SLOPE ANALYSIS LEGEND**
- SLOPED OF 0-24.99%
 - SLOPED OF 25-34.99%
 - SLOPED OF 35% AND GREATER
 - 20' SETBACK TO STEEP SLOPES
- FSH OVERLAY DISTRICT ELEMENTS**
- FSH OVERLAY DISTRICT BOUNDARY (FROM CITY OF SANDY GIS MAP)
 - TOP OF 20% AND GREATER SLOPE (WITHIN FISH STUDY AREA)
 - 20' SETBACK TO 20% SLOPE (WITHIN FISH STUDY AREA)
 - EXISTING WETLAND

BENCHMARKS
ELEVATIONS ARE BASED ON VISTA LOOP SANITARY SEWER AS-BUILTS FROM 2004.
THE TEMPORARY BENCHMARK IS BASED ON SURVEY CONTROL POINT #2 ALONG THE FRONTAGE OF VISTA LOOP. TEMPORARY BENCHMARK HAD AN ELEVATION OF 1111.7.



TOPOGRAPHIC SURVEY - THE LOWER VIEWS
SCALE: 1" = 40'

DATE	NO.	REGION	SHEET
10-17-20	18		C4
SCALE	DATE	FILE	SECTION
N/A	10-17-20	10-17-20-PLANNING-RD	35
DATE	LEGAL	SECTION	TWP
10-17-20			3E
DATE	LEGAL	SECTION	TWP
10-17-20			3E

THE VIEWS PD
TOPOGRAPHIC SURVEY -
THE LOWER VIEWS
4177 HIGHWAY 28, SANDY, OR 97055

THE VIEWS
INC.
EVEN BETTER HOPE'S, INC.
PLACE EVEN
GRESHAM, OR 97030
PHONE: 503-346-8600

Surveyors & Planners, Inc.
Civil Engineering
P.O. Box 1533, 464 S. 3rd St.
P.O. Box 1533, 464 S. 3rd St.
Phone: (503) 464-4133
Fax: (503) 464-4252
DATE OF PLOT: 10/17/20

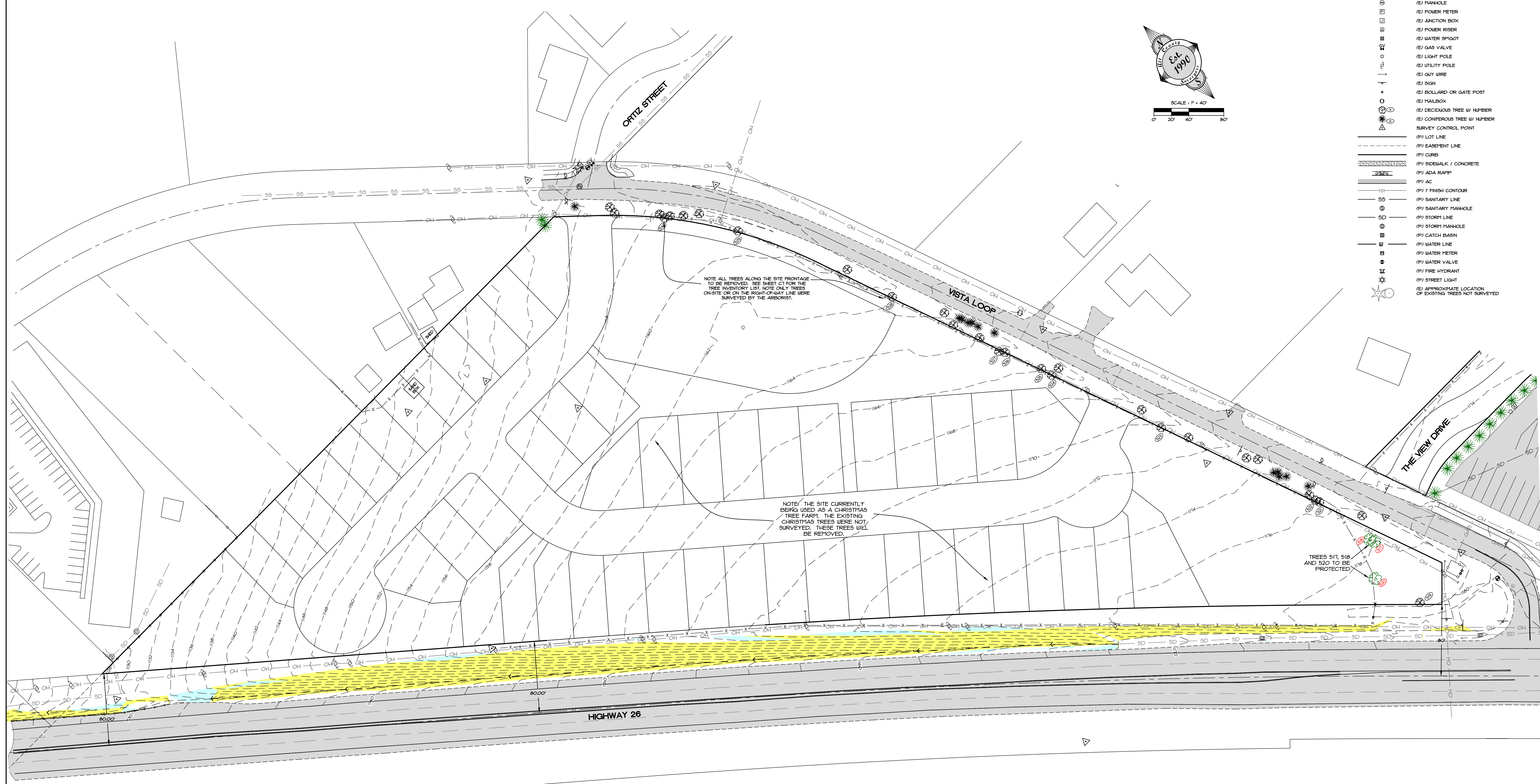
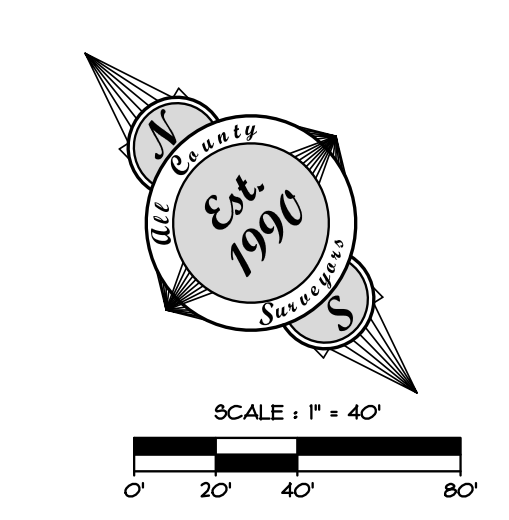
SLOPE ANALYSIS LEGEND

- SLOPES OF 0-24.99%
- SLOPES OF 25-34.99%
- SLOPES OF 35% AND GREATER

BENCHMARK
ELEVATIONS ARE BASED ON VISTA LOOP
SANITARY SEWER AS BUILT FROM 2004.
THE TEMPORARY BENCHMARK IS BASED ON
SANITARY CONTROL POINT 25 ALONG THE
FRONTAGE OF VISTA LOOP. TEMPORARY
BENCHMARK HAS AN ELEVATION OF 111.01.

LEGEND

- (D) PROPERTY LINE
- (D) LOT LINE
- (D) EASEMENT LINE
- (D) GROUND CONTOUR
- (D) BUILDING WALL
- (D) WALL
- (D) AC PAVEMENT
- (D) SIDEWALK/CONCRETE
- (D) DECK
- (D) GRAVEL
- (D) BRUSH & TREE LINE
- (D) CURB
- (D) WIRE FENCE
- (D) CHAIN LINK FENCE
- (D) 6" OR DITCH W/FLY/NO DNR
- (D) CULVERT
- (D) WATER LINE
- (D) STORM LINE
- (D) SANITARY LINE
- (D) GAS LINE
- (D) UNDERGROUND POWER LINE
- (D) OVERHEAD POWER LINE
- (D) STORM MANHOLE
- (D) CATCH BASIN
- (D) AREAL DRAIN
- (D) SANITARY SEWER MANHOLE
- (D) WATER METER
- (D) WATER VALVE
- (D) FIRE HYDRANT
- (D) MANHOLE
- (D) POWER METER
- (D) JUNCTION BOX
- (D) POWER RISER
- (D) WATER SPIGOT
- (D) GAS VALVE
- (D) LIGHT POLE
- (D) UTILITY POLE
- (D) GUY WIRE
- (D) SIGN
- (D) BOLLARD OR GATE POST
- (D) MAILBOX
- (D) DECIDUOUS TREE W/ NUMBER
- (D) CONIFEROUS TREE W/ NUMBER
- (D) SURVEY CONTROL POINT
- (D) LOT LINE
- (D) EASEMENT LINE
- (D) CURB
- (D) SIDEWALK / CONCRETE
- (D) ADA RAMP
- (D) AC
- (D) F FRESH CONTOUR
- (D) SANITARY LINE
- (D) SANITARY MANHOLE
- (D) STORM LINE
- (D) STORM MANHOLE
- (D) CATCH BASIN
- (D) WATER LINE
- (D) WATER METER
- (D) WATER VALVE
- (D) FIRE HYDRANT
- (D) STREET LIGHT
- (D) APPROXIMATE LOCATION OF EXISTING TREES NOT SURVEYED



TOPOGRAPHIC SURVEY - THE UPPER VIEWS
SCALE: 1" = 40'

NOTE: ALL TREES ALONG THE SITE FRONTAGE TO BE REMOVED. SEE SHEET C1 FOR THE TREE INVENTORY LIST. NOT ONLY TREES ON SITE OR ON THE RIGHT-OF-WAY LINE WERE SURVEYED BY THE ARCHITECT.

NOTE: THE SITE CURRENTLY BEING USED AS A CHRISTMAS TREE FARM. THE EXISTING CHRISTMAS TREES WERE NOT SURVEYED. THESE TREES WILL BE REMOVED.

TREES 911, 918 AND 920 TO BE PROTECTED

LEGEND

- (E) PROPERTY LINE
- (E) LOT LINE
- (E) EASEMENT LINE
- (E) 1' GROUND CONTOUR
- (E) 2' GROUND CONTOUR
- (E) BUILDING WALL
- (E) WALL
- (E) AC PAVEMENT
- (E) SOBBAL/CONCRETE
- (E) DECK
- (E) GRAVEL
- (E) BRUSH + TREE LINE
- (E) CURB
- (E) WIRE FENCE
- (E) CHAINLINK FENCE
- (E) 4' OF DITCH BFLOW DIR
- (E) CULVERT
- (E) WATER LINE
- (E) STORM LINE
- (E) SANITARY LINE
- (E) GAS LINE
- (E) UNDERGROUND POWER LINE
- (E) OVERHEAD POWER LINE
- (E) STORM MANHOLE
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- (E) WATER METER
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- (E) GAS VALVE
- (E) LIGHT POLE
- (E) UTILITY POLE
- (E) GUY WIRE
- (E) SIGN
- (E) ROLLARD OR GATE PORT
- (E) MAILBOX
- (E) DECIDUOUS TREE W/ NUMBER
- (E) CONIFEROUS TREE W/ NUMBER
- (E) CONTROL POINT
- (E) LOT LINE
- (E) EASEMENT LINE
- (E) CURB
- (E) SIDEWALK / CONCRETE
- (E) AC
- (E) ADA RAMP
- (E) FINISH CONTOUR
- (E) SANITARY LINE
- (E) SANITARY MANHOLE
- (E) STORM LINE
- (E) STORM MANHOLE
- (E) CATCH BASIN
- (E) WATER LINE
- (E) WATER METER
- (E) WATER VALVE
- (E) FIRE HYDRANT
- (E) STREET LIGHT
- (E) APPROXIMATE LOCATION OF EXISTING TREES NOT SURVEYED

FSH OVERLAY DISTRICT ELEMENTS

- FSH OVERLAY DISTRICT BOUNDARY FROM CITY OF SANDY GIS MAP
- TOP OF 20% AND GREATER SLOPE (WITHIN FISH STUDY AREA)
- 30' SETBACK TO 20% SLOPE WITHIN FISH STUDY AREA
- RESTRICTED DEVELOPMENT AREA WITHIN FISH TOTAL AREA - 278,368 SF
- EXISTING WETLAND
- DECIDUOUS TREE TO BE REMOVED
- CONIFEROUS TREE TO BE REMOVED
- DECIDUOUS TREE TO BE SAVED
- CONIFEROUS TREE TO BE SAVED



TREE RETENTION AND PROTECTION PLAN
SCALE: 1" = 40'

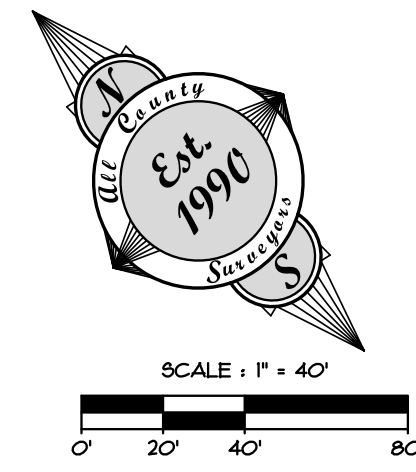
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10-17-20	11		
10-17-20	12		
10-17-20	13		
10-17-20	14		
10-17-20	15		
10-17-20	16		
10-17-20	17		
10-17-20	18		

THE VIEWS PD
TREE RETENTION AND PROTECTION PLAN
4177 HIGHWAY 28, SANDY, OR 97055

Survivors & Planners, Inc.
Civil Engineering
P.O. Box 1533, Sandy, OR 97055
Phone: (503) 348-2800
Fax: (503) 348-2728

THE VIEWS

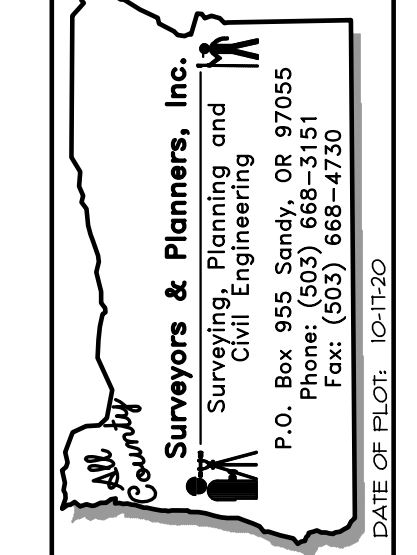
EVER BETTER HOMES, INC.
10000 N. GRESHAM AVE. SUITE 100
GRESHAM, OR 97030
PHONE: (503) 348-2800



BUILDING SETBACKS - THE LOWER VIEWS
SCALE: 1" = 40'

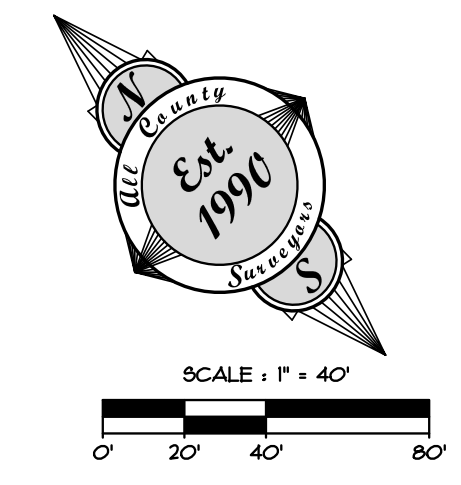
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FILE	19-071-PLANNING-R40		
SECTION	LEGAL		
TWP.	RANGE		
35	3E		

THE VIEWS PD
BUILDING SETBACKS - THE LOWER VIEWS
4177 HIGHWAY 28, SANDY, OR 97055



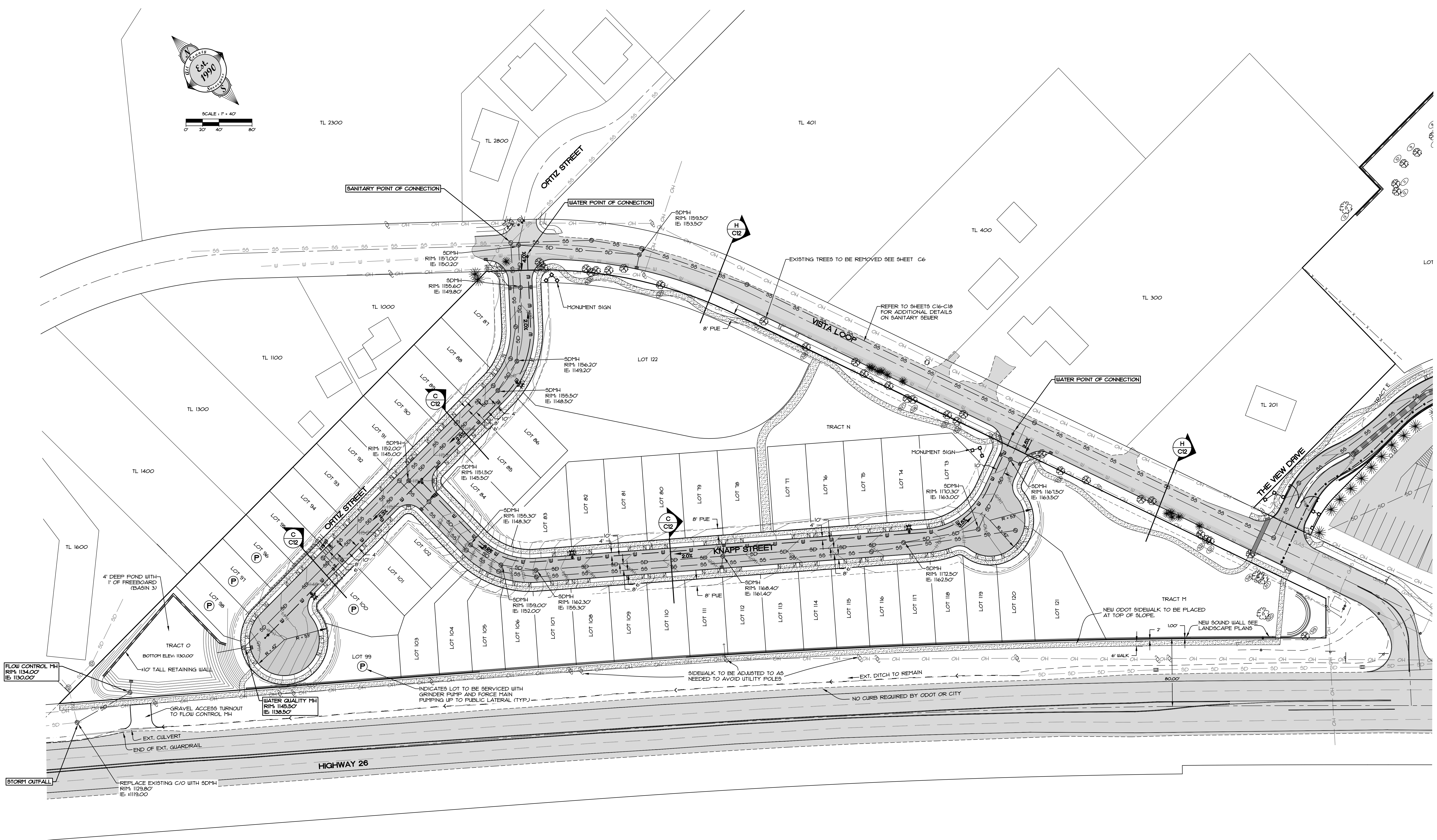
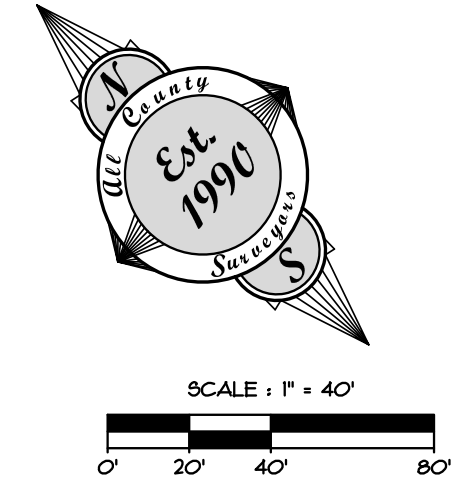
THE VIEWS
EVEN BETTER HOMES, INC.
1642 EVENING
GRESHAM, OR 97030
theviewshomes.com
PHONE: (503) 348-8600

PROJECT: THE VIEWS PD BUILDING SETBACKS - THE LOWER VIEWS
LOCATION: 4177 HIGHWAY 28, SANDY, OR 97055
DATE OF PLOT: 10/17/20
DESIGNED: RLM
DRAWN: RLM/ACTH
CHECKED: RLM
APPROVED: RLM
GENERAL DATE: 10/17/2020



PRELIMINARY PLAT MAP - THE UPPER VIEWS
SCALE: 1" = 40'

		SHEET C9 OF 18
SCALE: N/A DATE: 10-17-20 FILE: 19-071-PLANNING-R40	SECTION: 35 TWP: 3E RANGE: 3E	REGION: 18 COUNTY: 18 CITY: 18 ZONE: 18
THE VIEWS PD BUILDING SETBACKS - THE UPPER VIEWS 4177 HIGHWAY 26, SANDY, OR 97055		
EVEN BETTER HOMES, INC. 16425 EVEN HOLLOW GRESHAM, OR 97030 503-658-8800 www.evenbetterhomes.com		



DATE	NO.	REVISION	SHEET
10-17-20	1		C13
DESIGNED	BY	DATE	18
DRAWN	BY	DATE	
CHECKED	BY	DATE	
APPROVED	BY	DATE	

PROJECT: THE VIEWS PD STREET AND UTILITY PLAN - THE UPPER VIEWS

LOCATION: 4177 HIGHWAY 26, SANDY, OR 97055

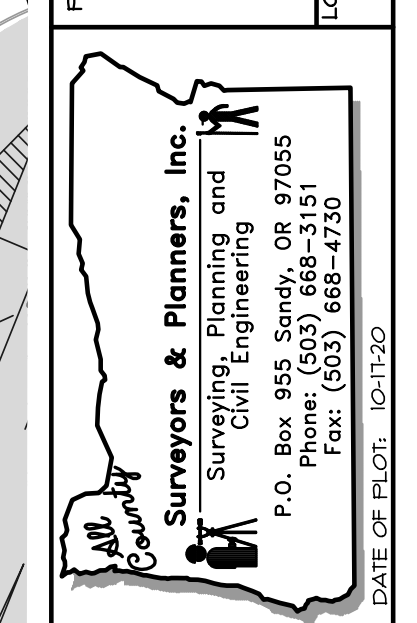
SCALE: AS SHOWN

DATE: 10-17-20

FILE: P-071-PRE-DESIGN-0

SECTION: TWP. RANGE

LEGAL: 35 1N 3E



EVEN BETTER HOMES, INC.

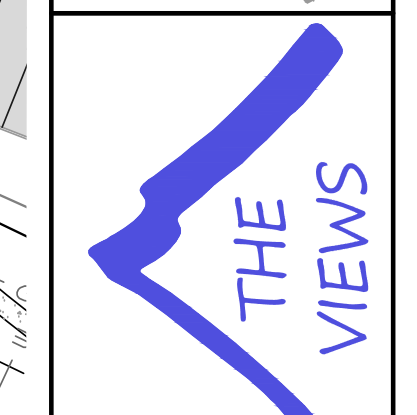
PLACE EVEN HOME

GRESHAM, OR 97030

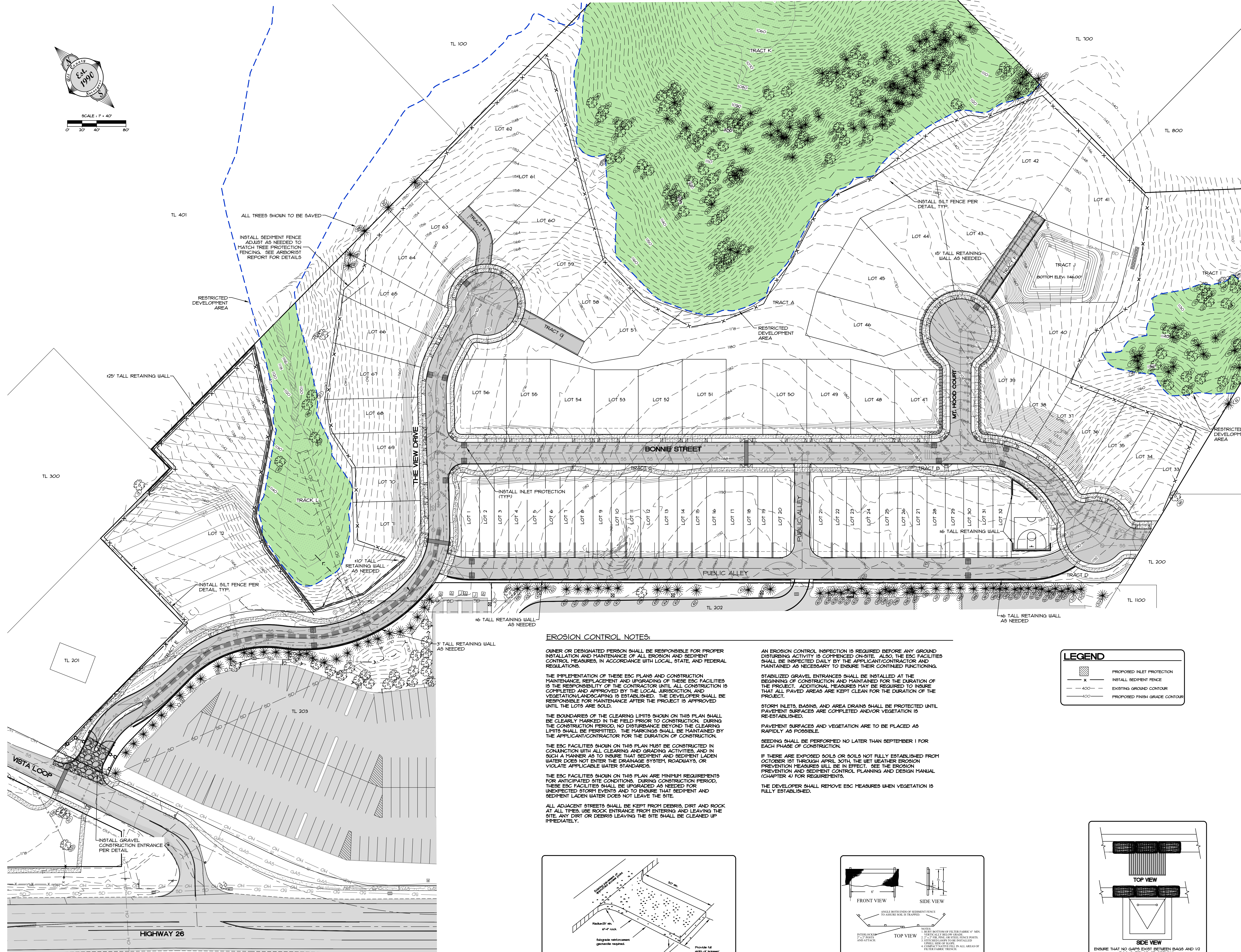
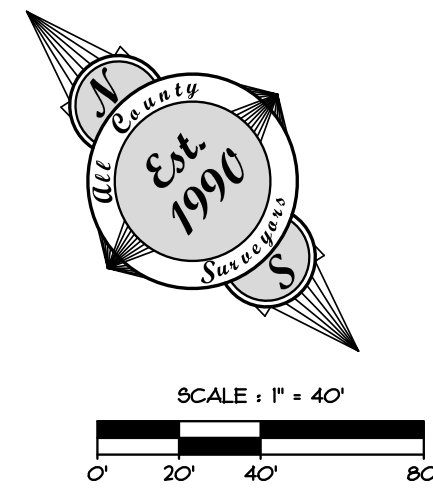
www.evenhomes.com

PHONE: (503) 348-9262

DATE OF PLOT: 10/13/20



PRELIMINARY
NOT FOR
CONSTRUCTION



EROSION CONTROL NOTES:

OWNER OR DESIGNATED PERSON SHALL BE RESPONSIBLE FOR PROPER INSTALLATION AND MAINTENANCE OF ALL EROSION AND SEDIMENT CONTROL MEASURES IN ACCORDANCE WITH LOCAL, STATE, AND FEDERAL REGULATIONS.

THE IMPLEMENTATION OF THESE ESC PLANS AND CONSTRUCTION MAINTENANCE, REPAIRS AND UPGRADES OF THESE ESC FACILITIES IS THE RESPONSIBILITY OF THE CONTRACTOR UNTIL ALL CONSTRUCTION IS COMPLETED AND APPROVED BY THE LOCAL JURISDICTION, AND VEGETATION/LANDSCAPING IS ESTABLISHED. THE DEVELOPER SHALL BE RESPONSIBLE FOR MAINTENANCE AFTER THE PROJECT IS APPROVED UNTIL THE LOTS ARE SOLD.

THE BOUNDARIES OF THE CLEARING LIMITS SHOWN ON THIS PLAN SHALL BE CLEARLY MARKED IN THE FIELD PRIOR TO CONSTRUCTION. DURING THE CONSTRUCTION PERIOD, NO DISTURBANCE BEYOND THE CLEARING LIMITS SHALL BE PERMITTED. THE MARKINGS SHALL BE MAINTAINED BY THE APPLICANT/CONTRACTOR FOR THE DURATION OF CONSTRUCTION.

THE ESC FACILITIES SHOWN ON THIS PLAN MUST BE CONSTRUCTED IN CONJUNCTION WITH ALL CLEARING AND GRADING ACTIVITIES, AND IN SUCH A MANNER AS TO INSURE THAT SEDIMENT AND SEDIMENT LADEN WATER DOES NOT ENTER THE DRAINAGE SYSTEM, ROADWAYS, OR VIOLATE APPLICABLE WATER STANDARDS.

THE ESC FACILITIES SHOWN ON THIS PLAN ARE MINIMUM REQUIREMENTS FOR ANTICIPATED SITE CONDITIONS. DURING CONSTRUCTION PERIOD, THESE ESC FACILITIES SHALL BE UPGRADED AS NEEDED FOR UNEXPECTED STORM EVENTS AND TO ENSURE THAT SEDIMENT AND SEDIMENT LADEN WATER DOES NOT LEAVE THE SITE.

ALL ADJACENT STREETS SHALL BE KEPT FROM DEBRIS, DIRT AND ROCK AT ALL TIMES. USE ROCK ENTRANCE FROM ENTERING AND LEAVING THE SITE. ANY DIRT OR DEBRIS LEAVING THE SITE SHALL BE CLEANED UP IMMEDIATELY.

AN EROSION CONTROL INSPECTION IS REQUIRED BEFORE ANY GROUND DISTURBING ACTIVITY IS COMPLETED ON-SITE. ALSO, THE ESC FACILITIES SHALL BE INSPECTED DAILY BY THE APPLICANT/CONTRACTOR AND MAINTAINED AS NECESSARY TO ENSURE THEIR CONTINUED FUNCTIONING.

STABILIZED GRAVEL ENTRANCES SHALL BE INSTALLED AT THE BEGINNING OF CONSTRUCTION AND MAINTAINED FOR THE DURATION OF THE PROJECT. ADDITIONAL MEASURES MAY BE REQUIRED TO INSURE THAT ALL PAVED AREAS ARE KEPT CLEAN FOR THE DURATION OF THE PROJECT.

STORM INLETS, BASINS, AND AREA DRAINS SHALL BE PROTECTED UNTIL PAVEMENT SURFACES ARE COMPLETED AND/OR VEGETATION IS RE-ESTABLISHED.

PAVEMENT SURFACES AND VEGETATION ARE TO BE PLACED AS RAPIDLY AS POSSIBLE.

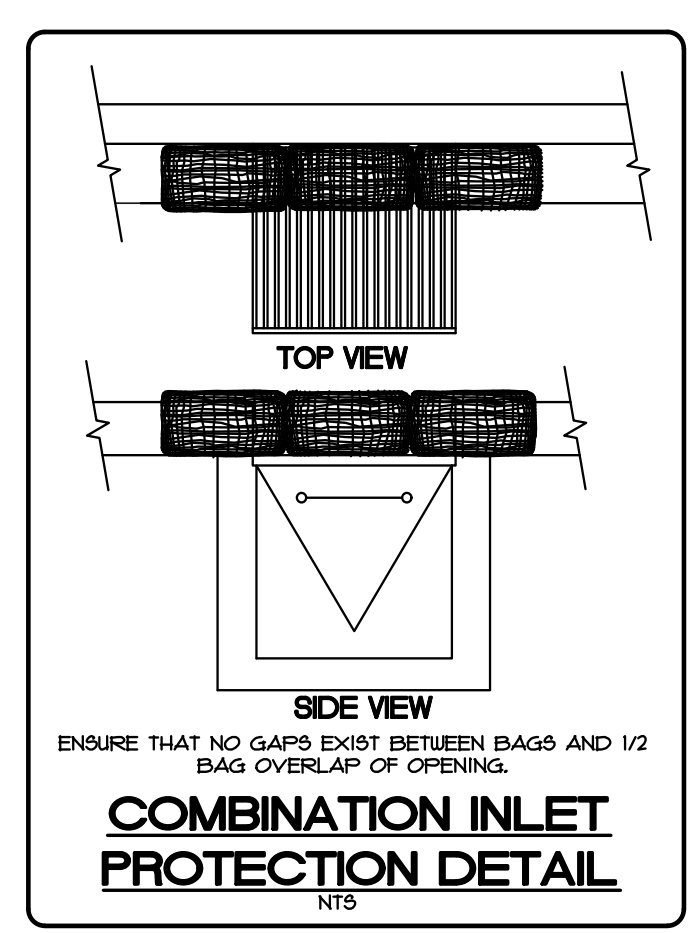
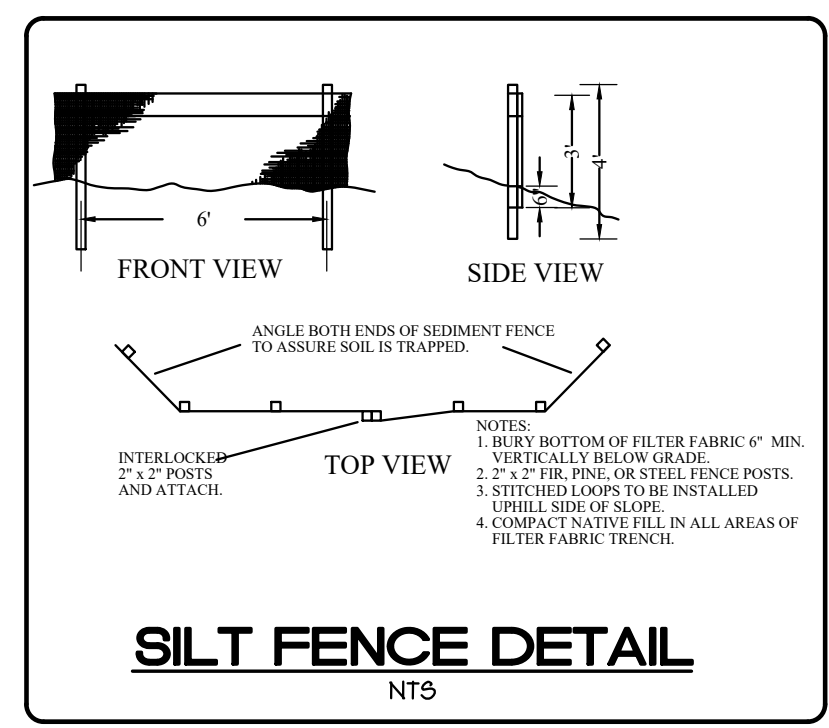
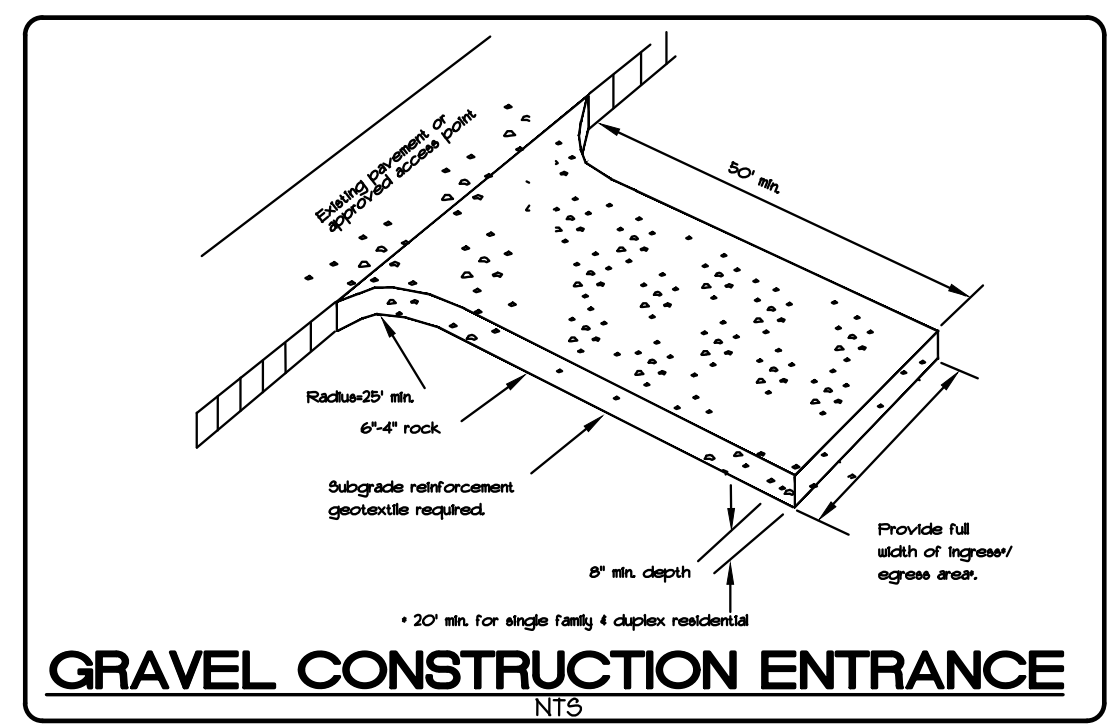
SEEDING SHALL BE PERFORMED NO LATER THAN SEPTEMBER 1 FOR EACH PHASE OF CONSTRUCTION.

IF THERE ARE EXPOSED SOILS OR SOILS NOT FULLY ESTABLISHED FROM OCTOBER 1ST THROUGH APRIL 30TH, THE LET WEATHER EROSION PREVENTION MEASURES WILL BE IN EFFECT. SEE THE EROSION PREVENTION AND SEDIMENT CONTROL, PLANNING AND DESIGN MANUAL (CHAPTER 4) FOR REQUIREMENTS.

THE DEVELOPER SHALL REMOVE ESC MEASURES WHEN VEGETATION IS FULLY ESTABLISHED.

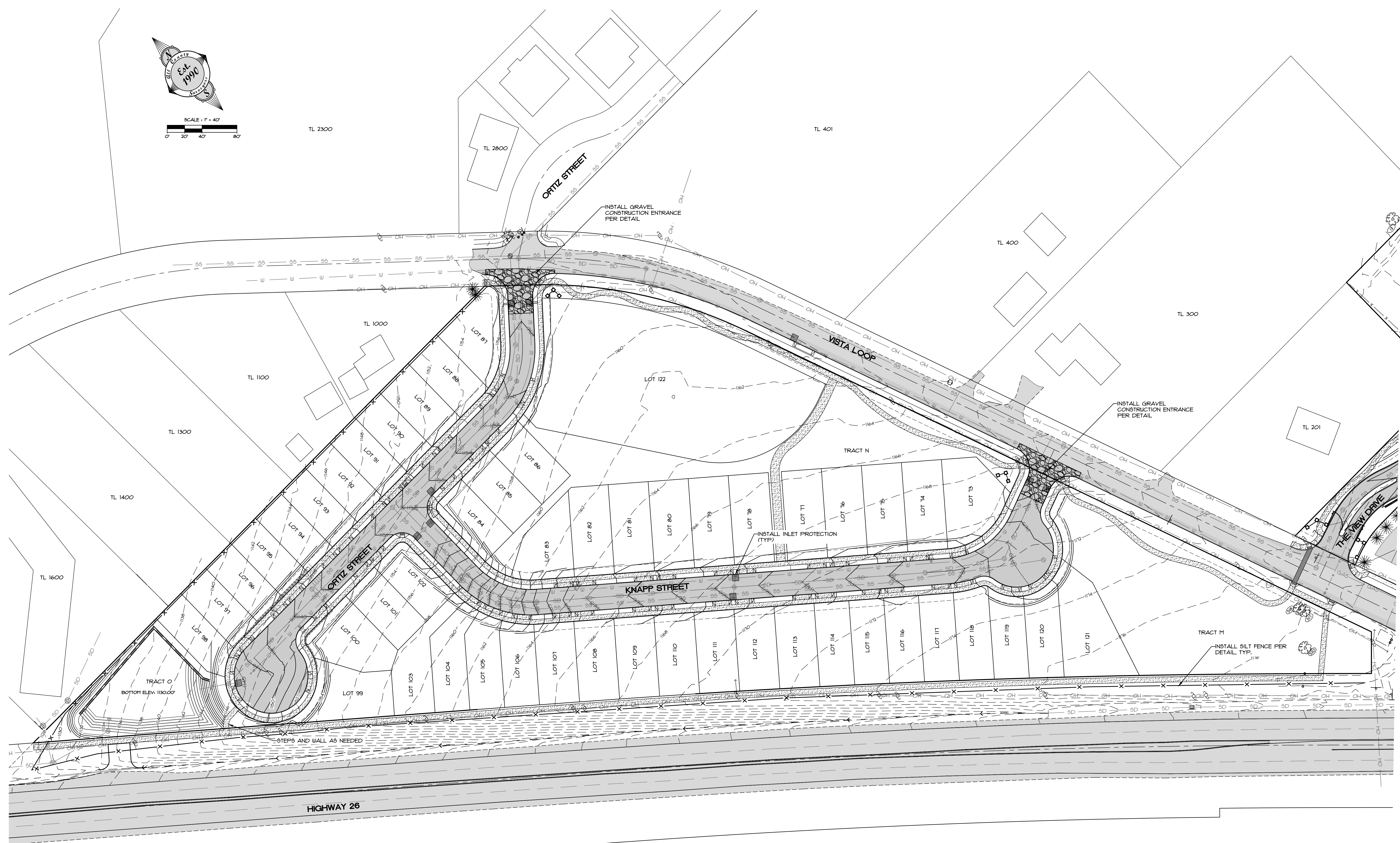
LEGEND

	PROPOSED INLET PROTECTION
	INSTALL SEDIMENT FENCE
	EXISTING GROUND CONTOUR
	PROPOSED FINISH GRADE CONTOUR



**PRELIMINARY
NOT FOR
CONSTRUCTION**

SHEET		C14	
OF		18	
DATE	NO.	REGION	
DESIGNED	BY	DATE	
DRAWN	BY	DATE	
CHECKED	BY	DATE	
APPROVED	BY	DATE	
SCALE	N/A	40	
DATE	10-17-20	FILE #	10-071-PRE-DESIGN-0
SECTION	TWP	RANGE	LEGAL
35	1N	3E	
PROJECT: THE VIEWS PD			
GRADING AND EROSION CONTROL PLANS - THE LOWER VIEWS			
LOCATION: 4177 HIGHWAY 26, SANDY, OR 97055			



EROSION CONTROL NOTES:

OWNER OR DESIGNATED PERSON SHALL BE RESPONSIBLE FOR PROPER INSTALLATION AND MAINTENANCE OF ALL EROSION AND SEDIMENT CONTROL MEASURES, IN ACCORDANCE WITH LOCAL, STATE, AND FEDERAL REGULATIONS.

THE IMPLEMENTATION OF THESE EROSION CONTROL PLANS AND CONSTRUCTION MAINTENANCE, REPLACEMENT AND UPGRADING OF THESE ESC FACILITIES IS THE RESPONSIBILITY OF THE CONTRACTOR UNTIL ALL CONSTRUCTION IS COMPLETED AND APPROVED BY THE LOCAL, STATE, AND FEDERAL AGENCIES. THE CONTRACTOR SHALL BE RESPONSIBLE FOR MAINTENANCE AFTER THE PROJECT IS APPROVED UNTIL THE LOTS ARE SOLD.

THE BOUNDARIES OF THE CLEARING LIMITS SHOWN ON THIS PLAN SHALL BE CLEARLY MARKED IN THE FIELD PRIOR TO CONSTRUCTION. DURING THE CONSTRUCTION PERIOD, NO DISTURBANCE BEYOND THE CLEARING LIMITS SHALL BE PERMITTED. THE MARKINGS SHALL BE MAINTAINED BY THE APPLICANT/CONTRACTOR FOR THE DURATION OF CONSTRUCTION.

THE ESC FACILITIES SHOWN ON THIS PLAN MUST BE CONSTRUCTED IN CONJUNCTION WITH ALL CLEARING AND GRADING ACTIVITIES, AND IN SUCH A MANNER AS TO INSURE THAT SEDIMENT AND SEDIMENT LADEN WATER DOES NOT ENTER THE DRAINAGE SYSTEM, ROADWAYS, OR VIOLATE APPLICABLE WATER STANDARDS.

THE ESC FACILITIES SHOWN ON THIS PLAN ARE MINIMUM REQUIREMENTS FOR ANTICIPATED SITE CONDITIONS. DURING CONSTRUCTION PERIOD, THESE ESC FACILITIES SHALL BE UPGRADED AS NEEDED FOR UNEXPECTED STORM EVENTS AND TO ENSURE THAT SEDIMENT AND SEDIMENT LADEN WATER DOES NOT LEAVE THE SITE.

ALL ADJACENT STREETS SHALL BE KEPT FROM DEBRIS, DIRT AND ROCK AT ALL TIMES. USE ROCK ENTRANCE FROM ENTERING AND LEAVING THE SITE. ANY DIRT OR DEBRIS LEAVING THE SITE SHALL BE CLEANED UP IMMEDIATELY.

AN EROSION CONTROL INSPECTION IS REQUIRED BEFORE ANY GROUND DISTURBING ACTIVITY IS COMMENCED ON-SITE. ALSO, THE ESC FACILITIES SHALL BE INSPECTED DAILY BY THE APPLICANT/CONTRACTOR AND MAINTAINED AS NECESSARY TO INSURE THEIR CONTINUED FUNCTIONING.

STABILIZED GRAVEL ENTRANCES SHALL BE INSTALLED AT THE BEGINNING OF CONSTRUCTION AND MAINTAINED FOR THE DURATION OF THE PROJECT. ADDITIONAL MEASURES MAY BE REQUIRED TO INSURE THAT ALL PAVED AREAS ARE KEPT CLEAN FOR THE DURATION OF THE PROJECT.

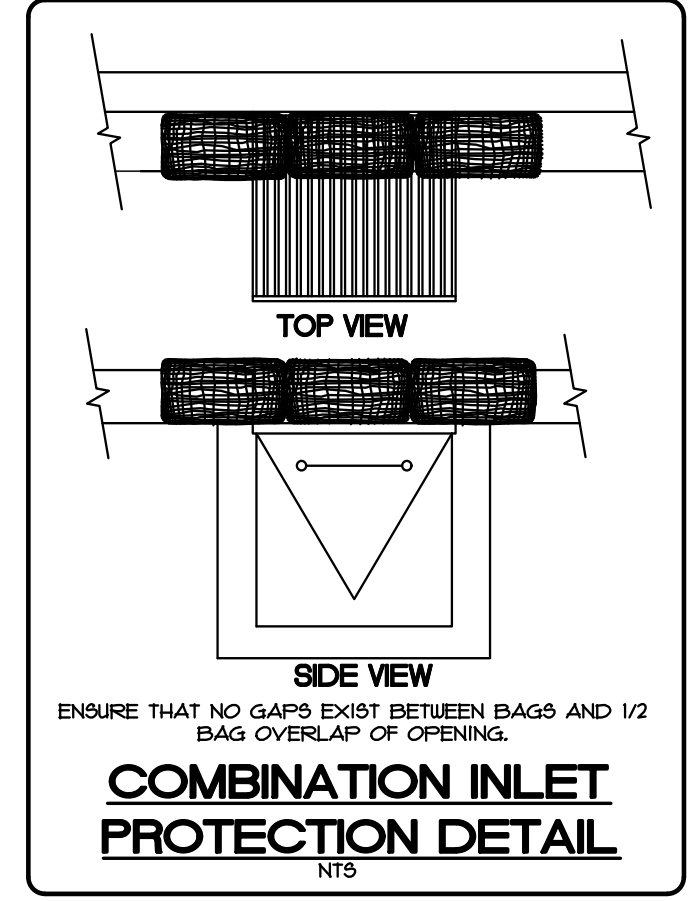
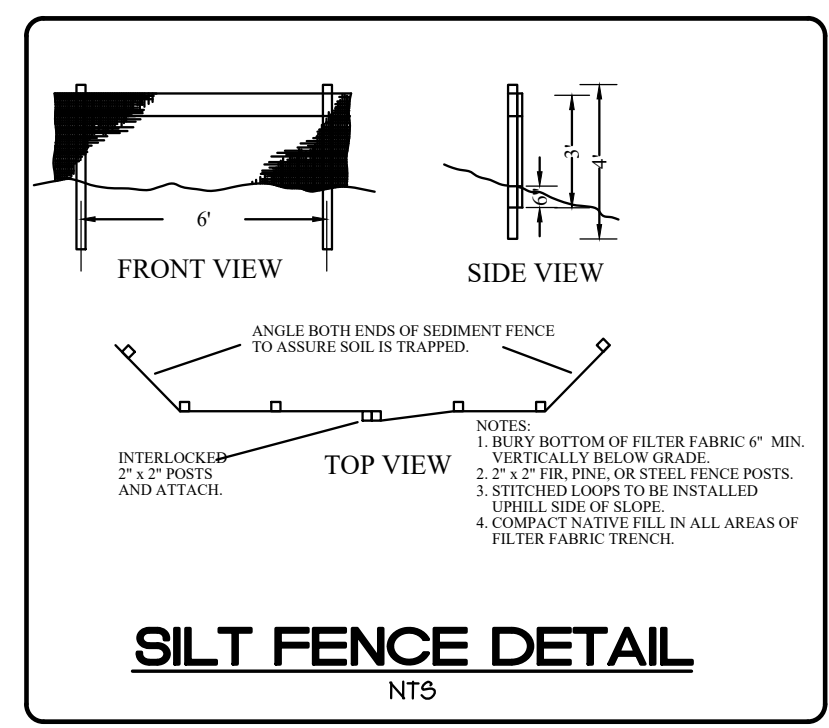
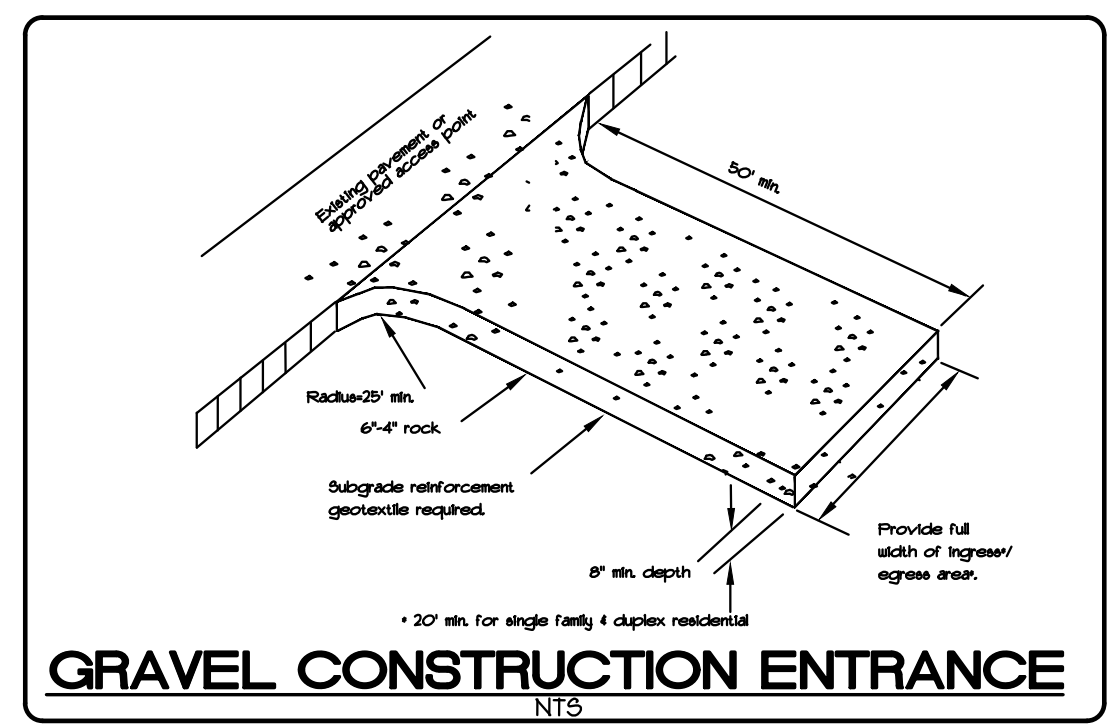
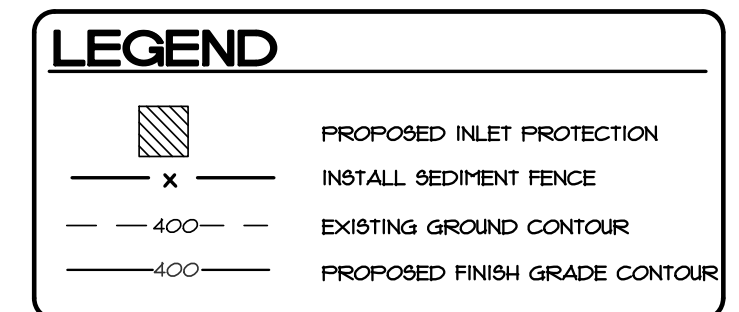
STORM INLETS, BASINS, AND AREA DRAINS SHALL BE PROTECTED UNTIL PAVEMENT SURFACES ARE COMPLETED AND/OR VEGETATION IS RE-ESTABLISHED.

PAVEMENT SURFACES AND VEGETATION ARE TO BE PLACED AS RAPIDLY AS POSSIBLE.

SEEDING SHALL BE PERFORMED NO LATER THAN SEPTEMBER 1 FOR EACH PHASE OF CONSTRUCTION.

IF THERE ARE EXPOSED SOILS OR SOILS NOT FULLY ESTABLISHED FROM OCTOBER 1ST THROUGH APRIL 30TH, THE LET WEATHER EROSION PREVENTION MEASURES WILL BE IN EFFECT. SEE THE EROSION PREVENTION AND SEDIMENT CONTROL PLANNING AND DESIGN MANUAL (CHAPTER 4) FOR REQUIREMENTS.

THE DEVELOPER SHALL REMOVE ESC MEASURES WHEN VEGETATION IS FULLY ESTABLISHED.



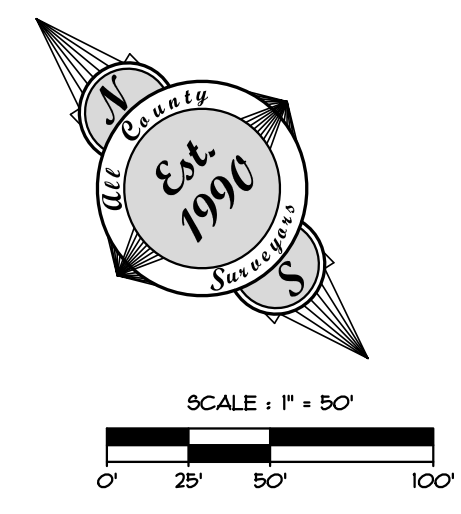
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10-17-20	4		
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10-17-20	15		
10-17-20	16		
10-17-20	17		
10-17-20	18		
10-17-20	19		
10-17-20	20		

PROJECT: THE VIEWS PD
 GRADING AND EROSION CONTROL PLANS - THE UPPER VIEWS
 LOCATION: 4177 HIGHWAY 26, SANDY, OR 97055

Surveys & Planners, Inc.
 Civil Engineering
 1000 NE Oregon Street, Suite 200
 Portland, OR 97232
 Phone: (503) 466-2222
 Fax: (503) 466-2222

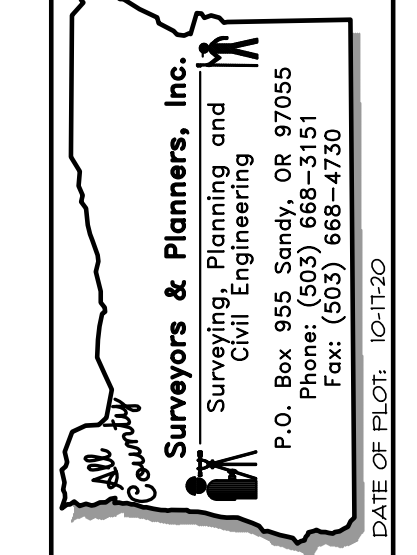
THE VIEWS
 INC.
 97030
 503-466-2222
 503-466-2222

**PRELIMINARY
 NOT FOR
 CONSTRUCTION**

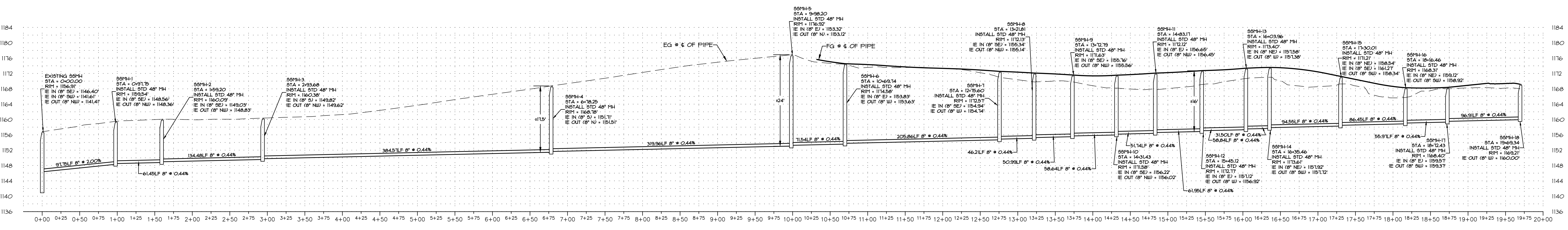


DATE	NO.	REVISION	SHEET
10-17-20	1		C16
DESIGNED	BY	DATE	OF
DRAWN	BY	DATE	18
CHECKED	BY	DATE	
APPROVED	BY	DATE	

PROJECT: THE VIEWS PD
 SANITARY SEWER PLAN AND PROFILE -
 OFF SITE
 LOCATION: 4177 HIGHWAY 26, SANDY, OR 97055

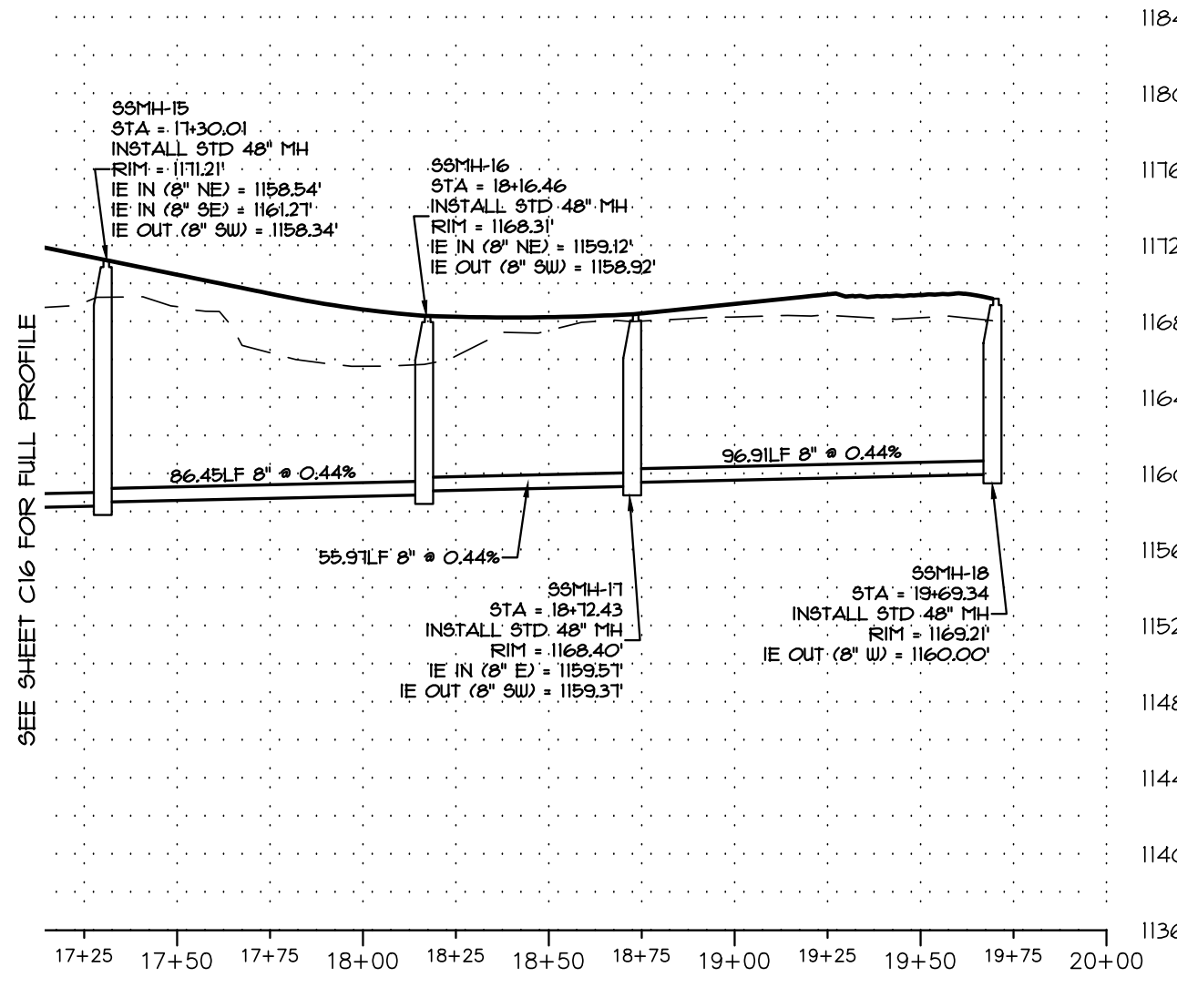
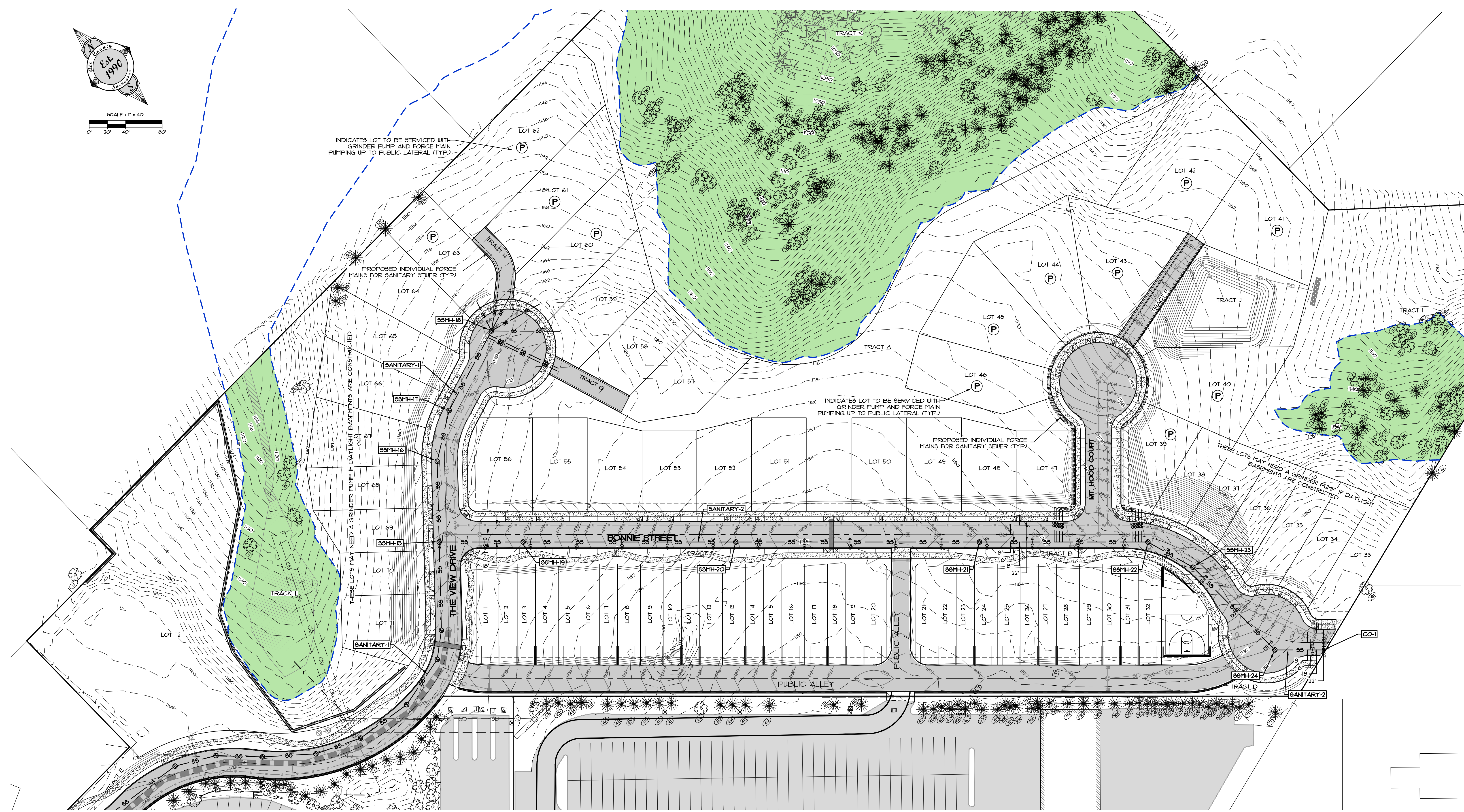
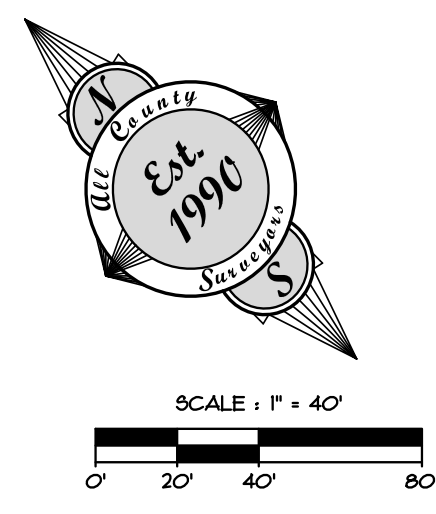


EVEN BETTER HOPIES, INC.
 9100
 GRESHAM, OR 97030
 PHONE: (503) 346-9600

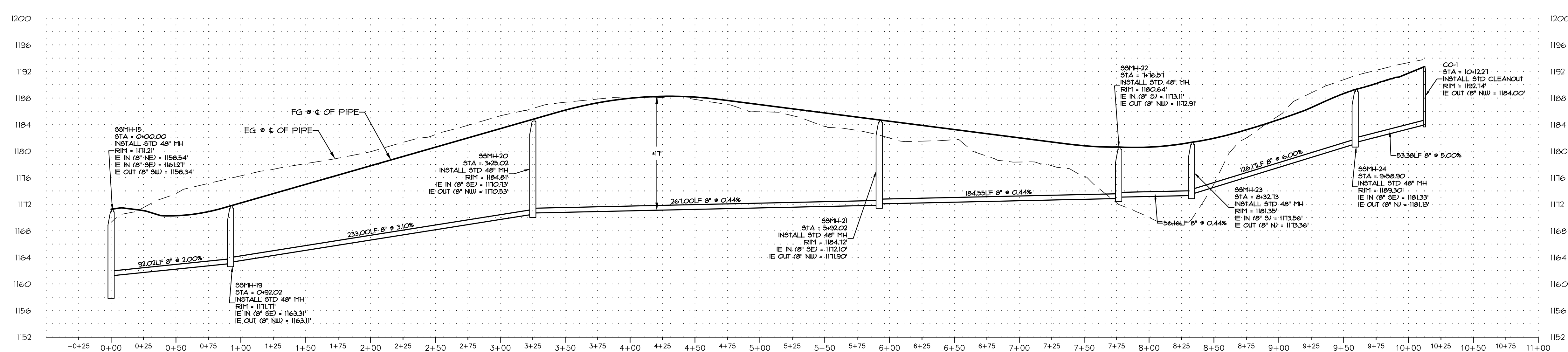


SANITARY-1 PROFILE
 HORIZ. 1" = 50'
 VERT. 1" = 10'

PRELIMINARY
 NOT FOR
 CONSTRUCTION



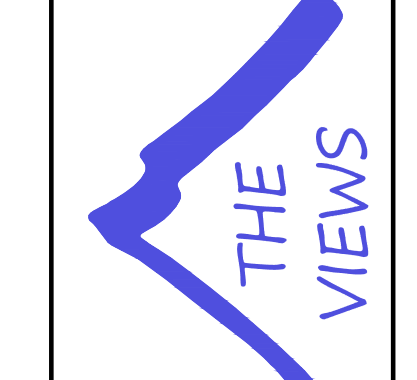
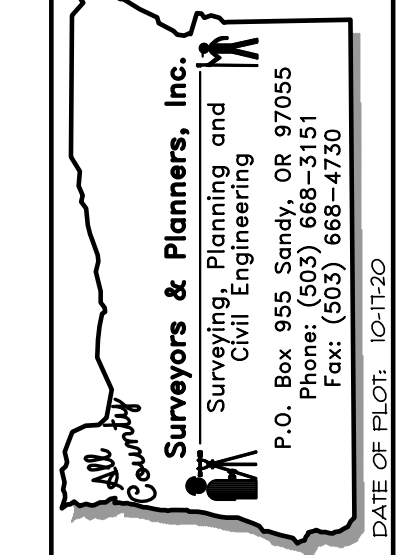
SANITARY-1 PROFILE
HORIZ. 1" = 50'
VERT. 1" = 10'



SANITARY-2 PROFILE
HORIZ. 1" = 40'
VERT. 1" = 8'

DATE	10-17-20
SCALE	1" = 40'
FILE NO.	10-17-20
SECTION	35
TWP.	1N
RANGE	3E
DESIGNED BY	BLM
DRAWN BY	BLM
CHECKED BY	BLM
APPROVED BY	BLM
DATE	12/17/2020
SHEET NO.	18
PROJECT	THE VIEWS PD

THE VIEWS PD
SANITARY SEWER PLAN AND PROFILE -
THE LOWER VIEWS
4177 HIGHWAY 28, SANDY, OR 97055



THE VIEWS PD
SANITARY SEWER PLAN AND PROFILE -
THE LOWER VIEWS
4177 HIGHWAY 28, SANDY, OR 97055

**PRELIMINARY
NOT FOR
CONSTRUCTION**

EXHIBIT E

Preliminary Storm Drainage Report For: The Views PD



June 24, 2020

Prepared By:

All County Surveyors and Planners, Inc.
Ray L. Moore, P.E., P.L.S.
P.O. Box 955
Sandy, Oregon 97055
Phone: 503-668-3151
Job #19-071

Prepared For:

Even Better Homes, Inc.
Mac Even
PO Box 2021
Gresham, OR 97030
Phone: 503-348-5602



RENEWAL DATE: 12/31/2020

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Detention Sizing Results	4
Water Quality Design	7
Conclusion	7
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Developed Conditions Map	Appendix B
Basin 1 Analysis, Data, and Detention Pond Design	Appendix C
Basin 2 Analysis, Data, and Detention Pond Design	Appendix D
Basin 3 Analysis, Data, and Detention Pond Design	Appendix E
Standard Formulas, Coefficients, and Values	Appendix F
Water Quality Manhole Details	Appendix G

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Project Summary

Purpose

The purpose of this analysis is to

1. Describe existing and proposed site conditions.
2. Provide detention calculations for the 2-yr, 5-yr, 10-yr, and 25-yr storm events.
3. Provide water quality calculations.

Project Location and Description

The Views PD is split into two sections, The Upper Views and The Lower Views. The Upper views site is the Knapp property located between Highway 26 and Vista Loop Road. It is Tax Lot 500 and is approximately 9.5 acres. This site is currently be used as a Christmas tree farm with grass ground cover. There are no structures on the site. The land is generally sloped to the north and west with an average slope of about 7%.

The Lower Views is the Picking property located behind Johnson RV. It is Tax Lot 200 and is approximately 23.3 acres. This site has a home and outbuildings. The land slopes to the North and East. There are steep slopes, 25% and greater, on the Eastern and Northern portions of the site with a FSH overlay. The site is heavily forested on the steep unbuildable ground. The area of the proposed development is currently a grass hay field and has been that way for over 30 years. See the Existing Conditions Map in Appendix A.

Proposed Improvements

The proposed 122 lot planned development will consist of 120 single-family residential lots ranging from 2,100 sf to 17,000 sf. The project will also include two multi-family lots ranging in size from 43,003 sf to 53,185 sf. The site improvements will include streets, curbs, sidewalks, utilities, trails and private park areas. New storm sewer pipes, manholes, and catch basins will be installed to convey storm water to a public detention systems. Due to the site topography, three separate detention systems will be required.

Detention System #1 will serve the Westerly half of the Lower Views. System #1 will detain all of the area shown on the Developed Conditions Map in Appendix B. The detention will be provided in a tank under the new public road. Due to grade limitations the apartment site on Lot 72 will provide its own detention and water quality system at time of development. Lots 61 and 62 are also too low to drain to the detention tank. These two lots will provide lot-level detention and water quality systems at the time of building construction.

Detention System #2 will serve the Easterly half of the Lower Views. System #2 will detain all of the area shown on the Developed Conditions Map in Appendix B. The detention will be provided in an open pond located in Tract J along the Easterly side of the site.

Detention System #3 will serve all of the lots on the Upper Views including the future apartment site. The detention will be provided in an open pond located in Tract O at the Northwest corner of the site. The discharge from the pond will be into an existing storm system in the ODOT right-of-way. Upstream and downstream analyses will be performed as needed at the time of final engineering.

The following calculations will demonstrate that the total post-developed release rates from all of the design storm events will not exceed the pre-developed rates as required by the code.

Hydrograph Parameters

Rainfall

The rainfall distribution numbers were taken from the City of Sandy Stormwater Website (<http://www.ci.sandy.or.us/Stormwater/>)

Storm Recurrence Interval	Rainfall (inches)
2 year	3.50
5 year	4.50
10 year	4.80
25 year	5.50

Soils

The soil data for this site is from *Soil Survey of Clackamas County, Oregon* published by the United States Department of Agriculture (USDA). The post-development soil is assumed to be the same as pre-development.

Soil Type: 15B, Cazadero silty clay loam. Hydrologic Group "C"

Areas

Pre-developed area calculations are based on Existing Conditions Map in Appendix A. Post-developed area calculations are based on proposed designs of streets, curbs, and walkways and the proposed homes as shown on Developed Conditions Map in Appendix B.

Basin 1		Basin 2		Basin 3	
Pre-Developed		Pre-Developed		Pre-Developed	
Total Area	5.497 ac	Total Area	4.928 ac	Total Area	10.456 ac
Impervious Area	0.025 ac	Impervious Area	0.337 ac	Impervious Area	0.317 ac
Pervious Area	5.472 ac	Pervious Area	4.591 ac	Pervious Area	10.139 ac
Post-Developed		Post-Developed		Post-Developed	
Total Area	5.497 ac	Total Area	4.928 ac	Total Area	10.456 ac
Impervious Area	3.756 ac	Impervious Area	2.946 ac	Impervious Area	5.546 ac
Pervious Area	1.741 ac	Pervious Area	1.982 ac	Pervious Area	4.910 ac

Curve Numbers

Curve Numbers are taken from the 2016 City of Portland Stormwater Management Manual.

Description	CN	Land Use Description
Pre-Developed	76	Woods-grass combination (orchard or tree farm) "Fair Condition"
Post-Developed Pervious Areas	74	Lawns "Good Condition"
Impervious Areas	98	Buildings, AC, Sidewalks, etc.

Time of Concentration

The times of concentrations (T_c), were calculated using the equations and spreadsheets in the attached Appendices.

Basin 1 (See Appendix C)	
Pre-Developed	28.2 minutes
Post-Developed	5 minutes (assumed)

Basin 2 (See Appendix D)	
Pre-Developed	25.2 minutes
Post-Developed	5 minutes (assumed)

Basin 3 (See Appendix E)	
Pre-Developed	34.4 minutes
Post-Developed	5 minutes (assumed)

Detention Sizing Results

Hydrographs for the drainage basins were determined using a spreadsheet based on the King County, Washington Hydrograph Program, version 4.21B, which uses the Santa Barbara Urban Hydrograph (SBUH) method. The Post-Development flows were routed through the detention facilities and flow control structures were designed to release the water at the Pre-Developed rates for the 2-year, 5-year, 10-year, and 25-year storm events per the City of Sandy public Works Design Standards.

Detention System 1 (Sizing Results)

The detention facility for Basin 1 is proposed to be a **6-foot diameter tank 474.6 feet long with a capacity of 13,419 cubic feet**. The orifices in the flow control manhole were designed to release the Post-Development Peak-Q's at or below the Pre-Developed Peak-Q's.

See Appendix C for more information and the detailed analysis.

Basin 1, Detention Tank 1				
Recurrence Interval (years)	Pre-Developed Outflow (cfs)	Developed Outflow (cfs)	Proposed Release Rates (cfs)	Reduction in outflow from Pre-Developed to Proposed
25	2.84	6.67	2.84	0%
10	2.20	5.67	1.96	11%
5	1.93	5.25	1.61	16%
2	1.10	3.87	1.10	0%

Orifice Table		
Detention Tank 1 (Basin 1)		
Orifice	Dia. (inches)	Height (feet)
Bottom	4.29	0
Top	6.36	4.30

A Weir could be used for the top orifice in the flow control structure. See Rectangular, Sharp Crested Weir Calculations in the detailed analysis.

Detention System 2 (Sizing Results)

The detention facility for Basin 2 is proposed to be a 4-deep detention pond. **The required storage volume is 9,029-cubic feet. This can be contained in a 4-foot deep pond with a bottom area of 1,225 square feet.** The orifices in the flow control manhole were designed to release the Post-Development Peak-Q's at or below the Pre-Developed Peak-Q's.

See Appendix D for more information and the detailed analysis.

Basin 2, Detention Pond 2				
Recurrence Interval (years)	Pre-Developed Outflow (cfs)	Developed Outflow (cfs)	Proposed Release Rates (cfs)	Reduction in outflow from Pre-Developed to Proposed
25	2.83	5.66	2.83	0%
10	2.22	4.78	2.22	0%
5	1.97	4.41	1.82	8%
2	1.18	3.19	1.18	0%

Orifice Table		
Detention Pond 2 (Basin 2)		
Orifice	Dia. (inches)	Height (feet)
Bottom	4.88	0
Top	7.64	3.24

A Weir could be used for the top orifice in the flow control structure. See Rectangular, Sharp Crested Weir Calculations in the detailed analysis.

Detention System 3 (Sizing Results)

The detention facility for Basin 2 is proposed to be a 4-deep detention pond. **The required storage volume is 19,983-cubic feet. This can be contained in a 4-foot deep pond with a bottom area of 4,173 square feet.** The orifices in the flow control manhole were designed to release the Post-Development Peak-Q's at or below the Pre-Developed Peak-Q's.

See Appendix E for more information and the detailed analysis.

Basin 3, Detention Pond 3				
Recurrence Interval (years)	Pre-Developed Outflow (cfs)	Developed Outflow (cfs)	Proposed Release Rates (cfs)	Reduction in outflow from Pre-Developed to Proposed
25	5.06	11.49	5.06	0%
10	3.93	9.62	3.93	0%
5	3.46	8.84	3.23	7%
2	2.02	6.31	2.02	0%

Orifice Table		
Detention Pond 3 (Basin 3)		
Orifice	Dia. (inches)	Height (feet)
Bottom	6.12	0
Top	9.60	2.94

A Weir could be used for the top orifice in the flow control structure. See Rectangular, Sharp Crested Weir Calculations in the detailed analysis.

Water Quality Design

CDS Storm Water Treatment Device

Three CDS manholes by Contech Stormwater Solutions were designed for water quality for this site, one for each drainage basin, see details in Appendix F). The developed impervious area includes AC pavement, sidewalks, and roofs.

The flow (Q) from this runoff was calculated using the rational method ($Q=CIA$) where:

Q = flow (cfs)

C = runoff coefficient = 0.90 for Pavement and Roofs

I = Intensity = 0.2 inches per hour (City of Sandy Water Quality Storm for an "on-line facility")

A = Impervious Area

Basin 1

$$Q = (0.90) \times (0.2) \times (3.756) = 0.68 \text{ cfs}$$

Basin 2

$$Q = (0.90) \times (0.2) \times (2.946) = 0.53 \text{ cfs}$$

Basin 3

$$Q = (0.90) \times (0.2) \times (5.546) = 1.00 \text{ cfs}$$

The Contech Stormwater Solutions Treatment Device Model CDS2015-4-C has a treatment capacity of 0.7 cfs. Therefore, this manhole will work for Basins 1 and 2. A CDS2015-5-C will be needed to treat Basin 3.

Conclusion

In accordance with the City of Sandy requirements, on-site detention has been designed to maintain existing downstream storm water runoff characteristics and a water quality system has been designed to provide adequate treatment. These calculations demonstrate that the detention and water quality systems are more than adequately sized for the proposed development. Detailed calculations will be completed with the final engineering plans as needed.

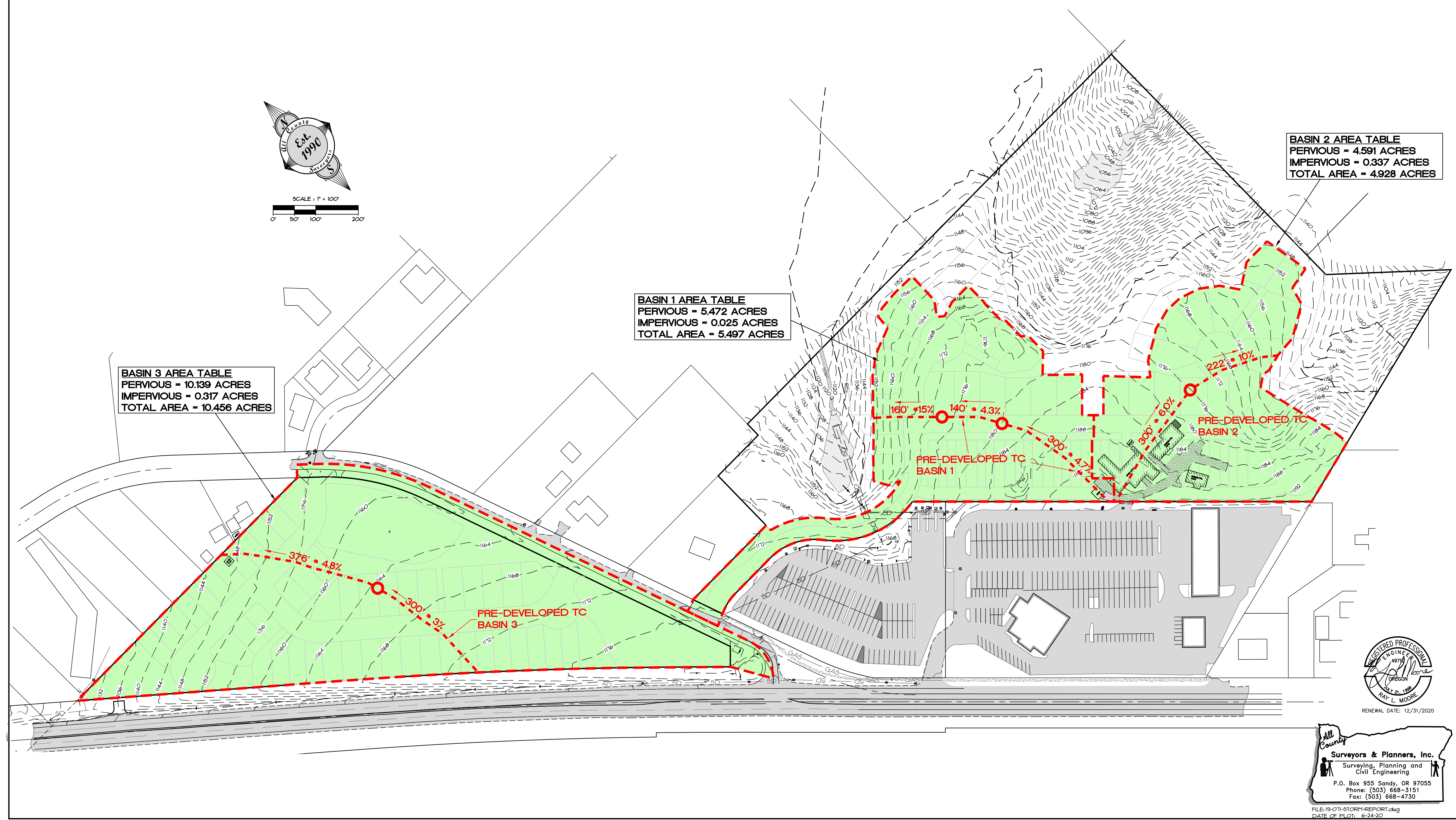
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Appendix A
Existing Conditions Map

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THE VIEWS

EXISTING CONDITIONS MAP



BASIN 3 AREA TABLE
 PERVIOUS = 10.139 ACRES
 IMPERVIOUS = 0.317 ACRES
 TOTAL AREA = 10.456 ACRES

BASIN 1 AREA TABLE
 PERVIOUS = 5.472 ACRES
 IMPERVIOUS = 0.025 ACRES
 TOTAL AREA = 5.497 ACRES

BASIN 2 AREA TABLE
 PERVIOUS = 4.591 ACRES
 IMPERVIOUS = 0.337 ACRES
 TOTAL AREA = 4.928 ACRES



All County
Surveyors & Planners, Inc.
 Surveying, Planning and
 Civil Engineering
 P.O. Box 955 Sandy, OR 97055
 Phone: (503) 668-3151
 Fax: (503) 668-4739
FILE: 19-071-SUPP-REPORT.dwg
 DATE OF PLOT: 6-24-20

Appendix B
Developed Conditions Map

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THE VIEWS

DEVELOPED CONDITIONS MAP

BASIN 3 AREA TABLE
 TOTAL AREA = 10.456 ACRES
 PERVIOUS = 4.910 ACRES
 IMPERVIOUS = 5.546 ACRES
 IMPERVIOUS AREA BREAKDOWN

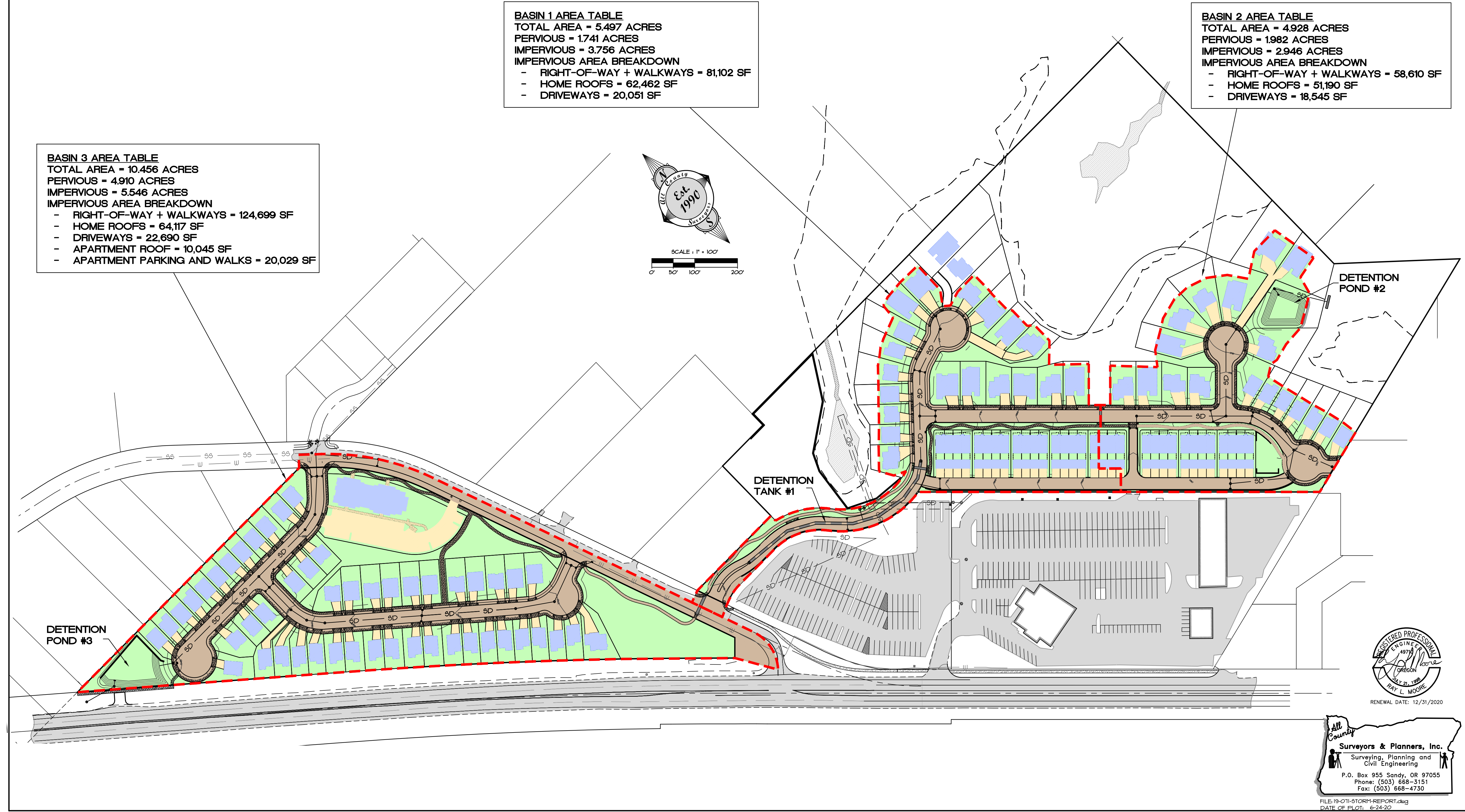
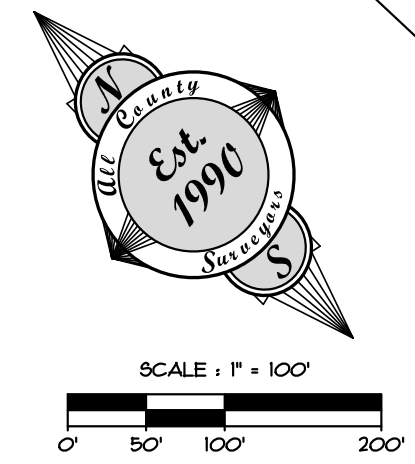
- RIGHT-OF-WAY + WALKWAYS = 124,699 SF
- HOME ROOFS = 64,117 SF
- DRIVEWAYS = 22,690 SF
- APARTMENT ROOF = 10,045 SF
- APARTMENT PARKING AND WALKS = 20,029 SF

BASIN 1 AREA TABLE
 TOTAL AREA = 5.497 ACRES
 PERVIOUS = 1.741 ACRES
 IMPERVIOUS = 3.756 ACRES
 IMPERVIOUS AREA BREAKDOWN

- RIGHT-OF-WAY + WALKWAYS = 81,102 SF
- HOME ROOFS = 62,462 SF
- DRIVEWAYS = 20,051 SF

BASIN 2 AREA TABLE
 TOTAL AREA = 4.928 ACRES
 PERVIOUS = 1.982 ACRES
 IMPERVIOUS = 2.946 ACRES
 IMPERVIOUS AREA BREAKDOWN

- RIGHT-OF-WAY + WALKWAYS = 58,610 SF
- HOME ROOFS = 51,190 SF
- DRIVEWAYS = 18,545 SF



All County
Surveyors & Planners, Inc.
 Surveying, Planning and
 Civil Engineering
 P.O. Box 955 Sandy, OR 97055
 Phone: (503) 668-3151
 Fax: (503) 668-4739

FILE: 19-071-SURF-REPORT.dwg
 DATE OF PLOT: 6-24-20

Appendix C

Basin 1 Analysis, Data, and Detention Pond Design

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PRE-DEVELOPED - TIME OF CONCENTRATION CALCULATIONS

Job # 19-071
Date: 6/24/2020

28.2 = Total Tc (min)

Overland Flow (max 300' total)

				total	
Tc =	26.6			26.6	= travel time for less than 300' (min)
Ns =	0.24				= Manning's coefficient (<u>sheet flow</u>)
L =	300			300	= flow length (ft)
P2 =	2.7				= 2-year, 24 hour rainfall (in)
So =	4.70%				= slope of the land (%)

Shallow Concentrated Flow (after initial 300')

				total	
T =	1.0	0.6		1.6	= travel time for sheet flow (min)
L =	140	160		300	= flow length (ft)
So =	4.30%	15.00%			= slope of the land (%)
k =	11	11			= time of concentration velocity factor (ft/s)

Flow in Swales

				total	
Tc =	0.00			0.0	= travel time in swale (min)
A =	6.00				= area of flow (sf)
R =	0.59				= hydraulic radius (ft)
Ls =	4.12				= side slope wet (ft)
Q =	3.12				= quantity of flow (ft ³ /sec)
V =	0.52				= velocity
L =	0			0	= flow length (ft)
Ve =	1				= vertical distance of side
Ho =	4				= horizontal distance of side
Bw =	24				= base width of swale (in)
D =	12				= depth of flow ESTIMATE (in)
S =	1.00%				= slope of the swale (%)
n =	0.2				= Manning's coefficient (<u>channel</u>)

Flow in Gutters

				total	
Tc =	0.0			0.0	= travel time in gutter (min)
fps =	0.02				= average velocity of flow (ft/sec)
T =	0.0				= calculated width of flow in the gutter (ft)
Qc =	0.00				= quantity of flow (as calculated Q=CIA) (ft ³ /sec)
C =	0.90				= runoff coefficient for rational method (paved=0.9)
I =	2.75				= rainfall intensity (assume 5 min tc)
W =	18.00				= width of pavement draining to CB
S =	8.00%				= street longitudinal slope (%)
Sx =	2.50%				= street cross slope (%)
n =	0.016				= Manning's coefficient (<u>pavement</u> = 0.016)
L =	0.0			0	= length of flow and drainage basin (ft)

Flow in Pipes

				total	
Tc =	0.0			0.0	= travel time in pipe (min)
V =	10.15				= calculated velocity pipe full (ft/sec)
Q =	7.96				= quantity of flow (ft ³ /sec)
n =	0.013				= Manning's coefficient (<u>pipe</u>)
D =	12				= pipe diameter (in)
S =	5.00%				= slope of pipe (%)
L =	0.0			0	= length of pipe (ft)

Project Name: The Views - Basin 1 Tank
Hydrograph Analysis Summary

Job # 19-071
 Date: 6/24/2020

Rainfall (year)	Rainfall (inches)
2	3.50
5	4.50
10	4.80
25	5.50
100	0.00

Pre-Developed	
Pervious	
Area =	5.472 acres
CN =	76 na
Impervious	
Area =	0.025 acres
CN =	98 na
Tc =	28.2 min
Total A =	5.497 acres

Developed	
Pervious	
Area =	1.741 acres
CN =	74 na
Impervious	
Area =	3.756 acres
CN =	98 na
Tc =	5 min
Total A =	5.497 acres

Note: The hydrographs shown are based on the S.C.S. Type - 1A, 24 hour storm using the SBUH method based on the King County Model.

Pre-Developed Hydrographs						
Year	=====>	2	5	10	25	100
Qpeak	cfs =>	1.10	1.93	2.20	2.84	0.00
Volume	cf =>	27,335	42,577	47,398	58,984	-
Tpeak	min =>	480	480	480	480	10
Tpeak	hr =>	8.00	8.00	8.00	8.00	0.17
Hydrograph Name=>		2	5	10	25	100
Time (min)	Time (hr)	Hyd (cfs)	Hyd (cfs)	Hyd (cfs)	Hyd (cfs)	Hyd (cfs)
0	0.00	0.00	0.00	0.00	0.00	0.00
10	0.17	0.00	0.00	0.00	0.00	0.00
20	0.33	0.00	0.00	0.00	0.00	0.00
30	0.50	0.00	0.00	0.00	0.00	0.00
40	0.67	0.00	0.00	0.00	0.00	0.00
50	0.83	0.00	0.00	0.00	0.00	0.00
60	1.00	0.00	0.00	0.00	0.00	0.00
70	1.17	0.00	0.00	0.00	0.00	0.00
80	1.33	0.00	0.00	0.00	0.00	0.00
90	1.50	0.00	0.00	0.00	0.00	0.00
100	1.67	0.00	0.00	0.00	0.00	0.00
110	1.83	0.00	0.00	0.00	0.00	0.00
120	2.00	0.00	0.00	0.00	0.00	0.00
130	2.17	0.00	0.00	0.00	0.00	0.00
140	2.33	0.00	0.00	0.00	0.00	0.00
150	2.50	0.00	0.00	0.00	0.00	0.00
160	2.67	0.00	0.00	0.00	0.00	0.00
170	2.83	0.00	0.00	0.00	0.00	0.00
180	3.00	0.00	0.00	0.00	0.00	0.00
190	3.17	0.00	0.00	0.00	0.00	0.00
200	3.33	0.00	0.00	0.00	0.00	0.00
210	3.50	0.00	0.00	0.00	0.00	0.00
220	3.67	0.00	0.00	0.00	0.00	0.00
230	3.83	0.00	0.00	0.00	0.00	0.00
240	4.00	0.00	0.00	0.00	0.01	0.00
250	4.17	0.00	0.00	0.00	0.01	0.00
260	4.33	0.00	0.00	0.00	0.03	0.00
270	4.50	0.00	0.00	0.01	0.04	0.00
280	4.67	0.00	0.01	0.02	0.07	0.00
290	4.83	0.00	0.01	0.03	0.09	0.00
300	5.00	0.00	0.03	0.05	0.12	0.00
310	5.17	0.00	0.04	0.07	0.16	0.00
320	5.33	0.00	0.06	0.10	0.19	0.00
330	5.50	0.01	0.09	0.12	0.22	0.00
340	5.67	0.01	0.11	0.15	0.25	0.00
350	5.83	0.02	0.13	0.18	0.30	0.00
360	6.00	0.03	0.17	0.22	0.34	0.00
370	6.17	0.05	0.20	0.25	0.39	0.00
380	6.33	0.07	0.23	0.28	0.43	0.00
390	6.50	0.09	0.26	0.32	0.47	0.00
400	6.67	0.10	0.28	0.35	0.50	0.00
410	6.83	0.13	0.34	0.40	0.58	0.00
420	7.00	0.17	0.41	0.48	0.68	0.00
430	7.17	0.21	0.47	0.55	0.77	0.00
440	7.33	0.27	0.56	0.66	0.90	0.00
450	7.50	0.34	0.68	0.80	1.08	0.00
460	7.67	0.49	0.94	1.09	1.44	0.00
470	7.83	0.84	1.53	1.75	2.28	0.00
480	8.00	1.10	1.93	2.20	2.84	0.00
490	8.17	1.08	1.87	2.12	2.72	0.00
500	8.33	0.99	1.68	1.90	2.43	0.00
510	8.50	0.90	1.50	1.70	2.16	0.00

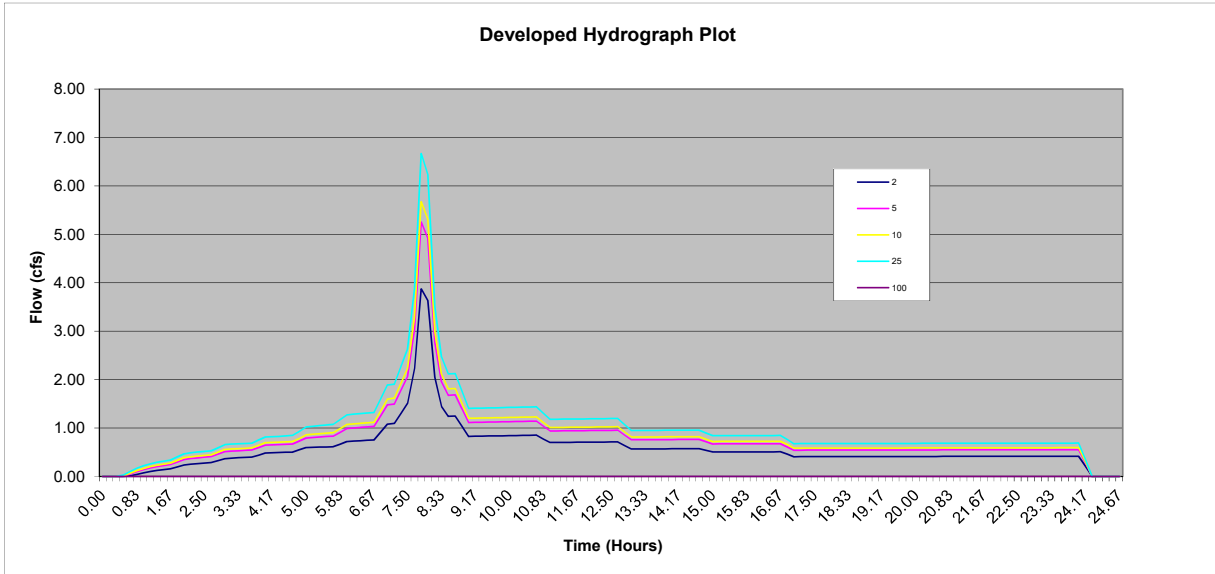
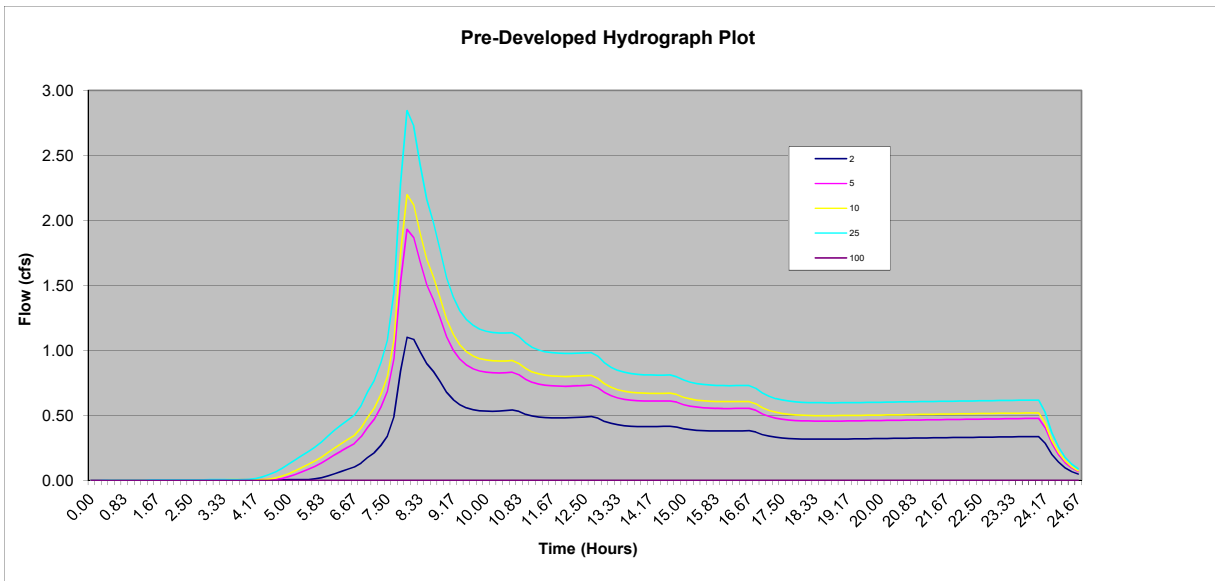
Developed Hydrographs						
Year	=====>	2	5	10	25	100
Qpeak	cfs =>	3.87	5.25	5.67	6.67	0.00
Volume	cf =>	52,353	70,577	76,133	89,219	-
Tpeak	min =>	470	470	470	470	10
Tpeak	hr =>	7.83	7.83	7.83	7.83	0.17
Hydrograph Name=>		2	5	10	25	100
Time (min)	Time (hr)	Hyd (cfs)	Hyd (cfs)	Hyd (cfs)	Hyd (cfs)	Hyd (cfs)
0	0.00	0.00	0.00	0.00	0.00	0.00
10	0.17	0.00	0.00	0.00	0.00	0.00
20	0.33	0.00	0.00	0.00	0.00	0.00
30	0.50	0.00	0.01	0.01	0.03	0.00
40	0.67	0.01	0.05	0.06	0.10	0.00
50	0.83	0.04	0.10	0.12	0.17	0.00
60	1.00	0.07	0.14	0.16	0.22	0.00
70	1.17	0.10	0.18	0.20	0.26	0.00
80	1.33	0.12	0.20	0.23	0.29	0.00
90	1.50	0.14	0.23	0.25	0.32	0.00
100	1.67	0.16	0.25	0.27	0.34	0.00
110	1.83	0.20	0.30	0.33	0.40	0.00
120	2.00	0.24	0.35	0.39	0.47	0.00
130	2.17	0.25	0.37	0.41	0.49	0.00
140	2.33	0.27	0.38	0.42	0.50	0.00
150	2.50	0.28	0.40	0.43	0.52	0.00
160	2.67	0.29	0.41	0.44	0.53	0.00
170	2.83	0.33	0.46	0.50	0.59	0.00
180	3.00	0.37	0.51	0.56	0.66	0.00
190	3.17	0.38	0.52	0.57	0.67	0.00
200	3.33	0.39	0.53	0.57	0.68	0.00
210	3.50	0.40	0.54	0.58	0.68	0.00
220	3.67	0.40	0.55	0.59	0.69	0.00
230	3.83	0.44	0.60	0.64	0.75	0.00
240	4.00	0.48	0.65	0.70	0.82	0.00
250	4.17	0.49	0.66	0.71	0.82	0.00
260	4.33	0.49	0.66	0.71	0.83	0.00
270	4.50	0.50	0.66	0.71	0.84	0.00
280	4.67	0.50	0.67	0.72	0.85	0.00
290	4.83	0.55	0.73	0.79	0.94	0.00
300	5.00	0.60	0.79	0.86	1.02	0.00
310	5.17	0.60	0.80	0.87	1.04	0.00
320	5.33	0.61	0.81	0.88	1.05	0.00
330	5.50	0.61	0.83	0.90	1.06	0.00
340	5.67	0.61	0.84	0.91	1.07	0.00
350	5.83	0.66	0.91	0.99	1.17	0.00
360	6.00	0.72	0.99	1.07	1.27	0.00
370	6.17	0.73	1.00	1.09	1.29	0.00
380	6.33	0.74	1.01	1.10	1.30	0.00
390	6.50	0.75	1.02	1.11	1.31	0.00
400	6.67	0.75	1.03	1.12	1.32	0.00
410	6.83	0.92	1.25	1.36	1.60	0.00
420	7.00	1.08	1.48	1.60	1.89	0.00
430	7.17	1.09	1.49	1.62	1.91	0.00
440	7.33	1.30	1.78	1.92	2.27	0.00
450	7.50	1.52	2.07	2.24	2.64	0.00
460	7.67	2.24	3.04	3.29	3.87	0.00
470	7.83	3.87	5.25	5.67	6.67	0.00
480	8.00	3.63	4.91	5.30	6.23	0.00
490	8.17	2.05	2.77	2.99	3.51	0.00
500	8.33	1.45	1.95	2.11	2.47	0.00
510	8.50	1.24	1.68	1.81	2.12	0.00

Pre-Developed Hydrographs							Developed Hydrographs				
Year	=====	2	5	10	25	100	2	5	10	25	100
Qpeak	cfs =>	1.10	1.93	2.20	2.84	0.00	3.87	5.25	5.67	6.67	0.00
Volume	cf =>	27,335	42,577	47,398	58,984	-	52,353	70,577	76,133	89,219	-
Tpeak	min =>	480	480	480	480	10	470	470	470	470	10
Tpeak	hr =>	8.00	8.00	8.00	8.00	0.17	7.83	7.83	7.83	7.83	0.17
Hydrograph Name=>		2	5	10	25	100	2	5	10	25	100
Time	Time	Hyd	Hyd	Hyd	Hyd	Hyd	Hyd	Hyd	Hyd	Hyd	Hyd
(min)	(hr)	(cfs)	(cfs)	(cfs)	(cfs)	(cfs)	(cfs)	(cfs)	(cfs)	(cfs)	(cfs)
520	8.67	0.84	1.39	1.56	1.98	0.00	1.25	1.68	1.82	2.13	0.00
530	8.83	0.76	1.25	1.41	1.78	0.00	1.04	1.40	1.51	1.77	0.00
540	9.00	0.68	1.10	1.24	1.56	0.00	0.83	1.11	1.20	1.41	0.00
550	9.17	0.62	1.00	1.12	1.41	0.00	0.83	1.12	1.20	1.41	0.00
560	9.33	0.58	0.93	1.04	1.31	0.00	0.83	1.12	1.21	1.41	0.00
570	9.50	0.56	0.89	0.99	1.24	0.00	0.84	1.12	1.21	1.42	0.00
580	9.67	0.54	0.86	0.96	1.19	0.00	0.84	1.13	1.21	1.42	0.00
590	9.83	0.53	0.84	0.94	1.16	0.00	0.84	1.13	1.22	1.42	0.00
600	10.00	0.53	0.83	0.92	1.15	0.00	0.84	1.13	1.22	1.43	0.00
610	10.17	0.53	0.83	0.92	1.14	0.00	0.85	1.13	1.22	1.43	0.00
620	10.33	0.53	0.83	0.92	1.13	0.00	0.85	1.14	1.23	1.43	0.00
630	10.50	0.54	0.83	0.92	1.13	0.00	0.85	1.14	1.23	1.43	0.00
640	10.67	0.54	0.83	0.92	1.13	0.00	0.85	1.14	1.23	1.44	0.00
650	10.83	0.53	0.81	0.90	1.11	0.00	0.78	1.04	1.12	1.31	0.00
660	11.00	0.51	0.78	0.86	1.06	0.00	0.70	0.94	1.01	1.18	0.00
670	11.17	0.49	0.75	0.83	1.02	0.00	0.70	0.94	1.01	1.18	0.00
680	11.33	0.49	0.74	0.82	1.00	0.00	0.70	0.94	1.01	1.18	0.00
690	11.50	0.48	0.73	0.81	0.99	0.00	0.71	0.94	1.02	1.19	0.00
700	11.67	0.48	0.73	0.80	0.98	0.00	0.71	0.95	1.02	1.19	0.00
710	11.83	0.48	0.72	0.80	0.98	0.00	0.71	0.95	1.02	1.19	0.00
720	12.00	0.48	0.72	0.80	0.98	0.00	0.71	0.95	1.02	1.19	0.00
730	12.17	0.48	0.72	0.80	0.98	0.00	0.71	0.95	1.02	1.19	0.00
740	12.33	0.48	0.73	0.80	0.98	0.00	0.71	0.95	1.02	1.19	0.00
750	12.50	0.49	0.73	0.80	0.98	0.00	0.71	0.95	1.02	1.19	0.00
760	12.67	0.49	0.73	0.81	0.98	0.00	0.71	0.95	1.03	1.20	0.00
770	12.83	0.48	0.71	0.78	0.95	0.00	0.64	0.86	0.92	1.07	0.00
780	13.00	0.45	0.68	0.74	0.90	0.00	0.57	0.76	0.81	0.95	0.00
790	13.17	0.44	0.65	0.72	0.87	0.00	0.57	0.76	0.82	0.95	0.00
800	13.33	0.43	0.63	0.70	0.85	0.00	0.57	0.76	0.82	0.95	0.00
810	13.50	0.42	0.62	0.69	0.83	0.00	0.57	0.76	0.82	0.95	0.00
820	13.67	0.42	0.62	0.68	0.82	0.00	0.57	0.76	0.82	0.95	0.00
830	13.83	0.41	0.61	0.67	0.82	0.00	0.57	0.76	0.82	0.95	0.00
840	14.00	0.41	0.61	0.67	0.81	0.00	0.57	0.76	0.82	0.95	0.00
850	14.17	0.41	0.61	0.67	0.81	0.00	0.57	0.76	0.82	0.95	0.00
860	14.33	0.41	0.61	0.67	0.81	0.00	0.57	0.76	0.82	0.96	0.00
870	14.50	0.41	0.61	0.67	0.81	0.00	0.57	0.76	0.82	0.96	0.00
880	14.67	0.42	0.61	0.67	0.81	0.00	0.57	0.76	0.82	0.96	0.00
890	14.83	0.41	0.60	0.66	0.80	0.00	0.54	0.72	0.77	0.90	0.00
900	15.00	0.40	0.58	0.64	0.77	0.00	0.50	0.67	0.72	0.84	0.00
910	15.17	0.39	0.57	0.63	0.76	0.00	0.51	0.67	0.72	0.84	0.00
920	15.33	0.38	0.56	0.62	0.74	0.00	0.51	0.67	0.72	0.84	0.00
930	15.50	0.38	0.56	0.61	0.74	0.00	0.51	0.67	0.72	0.84	0.00
940	15.67	0.38	0.55	0.61	0.73	0.00	0.51	0.67	0.72	0.84	0.00
950	15.83	0.38	0.55	0.61	0.73	0.00	0.51	0.67	0.73	0.84	0.00
960	16.00	0.38	0.55	0.60	0.73	0.00	0.51	0.68	0.73	0.84	0.00
970	16.17	0.38	0.55	0.60	0.73	0.00	0.51	0.68	0.73	0.84	0.00
980	16.33	0.38	0.55	0.60	0.73	0.00	0.51	0.68	0.73	0.85	0.00
990	16.50	0.38	0.55	0.61	0.73	0.00	0.51	0.68	0.73	0.85	0.00
1000	16.67	0.38	0.55	0.61	0.73	0.00	0.51	0.68	0.73	0.85	0.00
1010	16.83	0.37	0.54	0.59	0.71	0.00	0.46	0.61	0.66	0.76	0.00
1020	17.00	0.35	0.51	0.56	0.67	0.00	0.41	0.54	0.58	0.68	0.00
1030	17.17	0.34	0.49	0.54	0.65	0.00	0.41	0.54	0.58	0.68	0.00
1040	17.33	0.33	0.48	0.52	0.63	0.00	0.41	0.54	0.58	0.68	0.00
1050	17.50	0.32	0.47	0.51	0.62	0.00	0.41	0.54	0.58	0.68	0.00
1060	17.67	0.32	0.46	0.51	0.61	0.00	0.41	0.54	0.58	0.68	0.00
1070	17.83	0.32	0.46	0.50	0.60	0.00	0.41	0.54	0.58	0.68	0.00
1080	18.00	0.32	0.46	0.50	0.60	0.00	0.41	0.54	0.59	0.68	0.00
1090	18.17	0.32	0.46	0.50	0.60	0.00	0.41	0.54	0.59	0.68	0.00
1100	18.33	0.32	0.46	0.50	0.60	0.00	0.41	0.55	0.59	0.68	0.00
1110	18.50	0.32	0.45	0.50	0.60	0.00	0.41	0.55	0.59	0.68	0.00
1120	18.67	0.32	0.45	0.50	0.60	0.00	0.41	0.55	0.59	0.68	0.00
1130	18.83	0.32	0.46	0.50	0.60	0.00	0.41	0.55	0.59	0.68	0.00
1140	19.00	0.32	0.46	0.50	0.60	0.00	0.41	0.55	0.59	0.68	0.00
1150	19.17	0.32	0.46	0.50	0.60	0.00	0.41	0.55	0.59	0.68	0.00
1160	19.33	0.32	0.46	0.50	0.60	0.00	0.41	0.55	0.59	0.68	0.00
1170	19.50	0.32	0.46	0.50	0.60	0.00	0.41	0.55	0.59	0.68	0.00
1180	19.67	0.32	0.46	0.50	0.60	0.00	0.41	0.55	0.59	0.68	0.00
1190	19.83	0.32	0.46	0.50	0.60	0.00	0.41	0.55	0.59	0.68	0.00
1200	20.00	0.32	0.46	0.50	0.60	0.00	0.41	0.55	0.59	0.68	0.00
1210	20.17	0.32	0.46	0.50	0.60	0.00	0.41	0.55	0.59	0.68	0.00

Pre-Developed Hydrographs							Developed Hydrographs				
Year	=====	2	5	10	25	100	2	5	10	25	100
Qpeak	cfs =>	1.10	1.93	2.20	2.84	0.00	3.87	5.25	5.67	6.67	0.00
Volume	cf =>	27,335	42,577	47,398	58,984	-	52,353	70,577	76,133	89,219	-
Tpeak	min =>	480	480	480	480	10	470	470	470	470	10
Tpeak	hr =>	8.00	8.00	8.00	8.00	0.17	7.83	7.83	7.83	7.83	0.17
Hydrograph Name=>		2	5	10	25	100	2	5	10	25	100
Time	Time	Hyd	Hyd	Hyd	Hyd	Hyd	Hyd	Hyd	Hyd	Hyd	Hyd
(min)	(hr)	(cfs)	(cfs)	(cfs)	(cfs)	(cfs)	(cfs)	(cfs)	(cfs)	(cfs)	(cfs)
1220	20.33	0.32	0.46	0.50	0.60	0.00	0.41	0.55	0.59	0.68	0.00
1230	20.50	0.32	0.46	0.50	0.60	0.00	0.41	0.55	0.59	0.68	0.00
1240	20.67	0.32	0.46	0.50	0.60	0.00	0.41	0.55	0.59	0.68	0.00
1250	20.83	0.32	0.46	0.51	0.60	0.00	0.41	0.55	0.59	0.68	0.00
1260	21.00	0.32	0.46	0.51	0.60	0.00	0.41	0.55	0.59	0.68	0.00
1270	21.17	0.33	0.46	0.51	0.61	0.00	0.41	0.55	0.59	0.69	0.00
1280	21.33	0.33	0.47	0.51	0.61	0.00	0.42	0.55	0.59	0.69	0.00
1290	21.50	0.33	0.47	0.51	0.61	0.00	0.42	0.55	0.59	0.69	0.00
1300	21.67	0.33	0.47	0.51	0.61	0.00	0.42	0.55	0.59	0.69	0.00
1310	21.83	0.33	0.47	0.51	0.61	0.00	0.42	0.55	0.59	0.69	0.00
1320	22.00	0.33	0.47	0.51	0.61	0.00	0.42	0.55	0.59	0.69	0.00
1330	22.17	0.33	0.47	0.51	0.61	0.00	0.42	0.55	0.59	0.69	0.00
1340	22.33	0.33	0.47	0.51	0.61	0.00	0.42	0.55	0.59	0.69	0.00
1350	22.50	0.33	0.47	0.51	0.61	0.00	0.42	0.55	0.59	0.69	0.00
1360	22.67	0.33	0.47	0.51	0.61	0.00	0.42	0.55	0.59	0.69	0.00
1370	22.83	0.33	0.47	0.51	0.61	0.00	0.42	0.55	0.59	0.69	0.00
1380	23.00	0.33	0.47	0.51	0.61	0.00	0.42	0.55	0.59	0.69	0.00
1390	23.17	0.33	0.47	0.52	0.61	0.00	0.42	0.55	0.59	0.69	0.00
1400	23.33	0.33	0.47	0.52	0.61	0.00	0.42	0.55	0.59	0.69	0.00
1410	23.50	0.33	0.47	0.52	0.61	0.00	0.42	0.55	0.59	0.69	0.00
1420	23.67	0.34	0.47	0.52	0.62	0.00	0.42	0.55	0.59	0.69	0.00
1430	23.83	0.34	0.48	0.52	0.62	0.00	0.42	0.55	0.59	0.69	0.00
1440	24.00	0.34	0.48	0.52	0.62	0.00	0.42	0.55	0.59	0.69	0.00
1450	24.17	0.29	0.40	0.44	0.52	0.00	0.21	0.28	0.30	0.34	0.00
1460	24.33	0.20	0.28	0.31	0.37	0.00	0.00	0.00	0.00	0.00	0.00
1470	24.50	0.14	0.20	0.22	0.26	0.00	0.00	0.00	0.00	0.00	0.00
1480	24.67	0.10	0.14	0.15	0.18	0.00	0.00	0.00	0.00	0.00	0.00
1490	24.67	0.07	0.10	0.11	0.12	0.00	0.00	0.00	0.00	0.00	0.00
1500	24.67	0.05	0.07	0.07	0.09	0.00	0.00	0.00	0.00	0.00	0.00

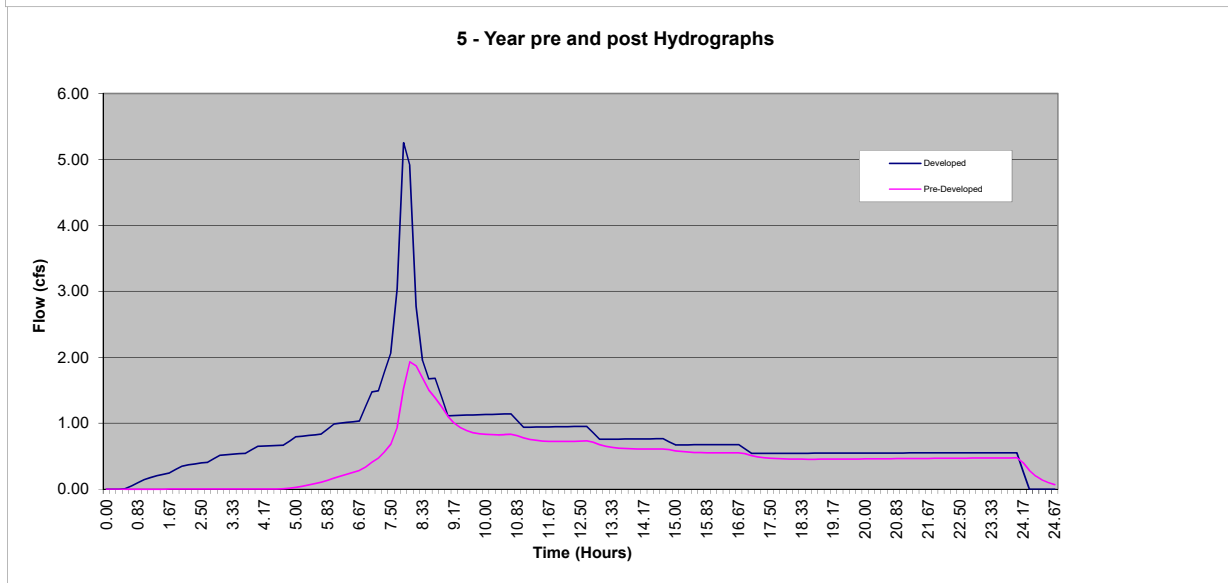
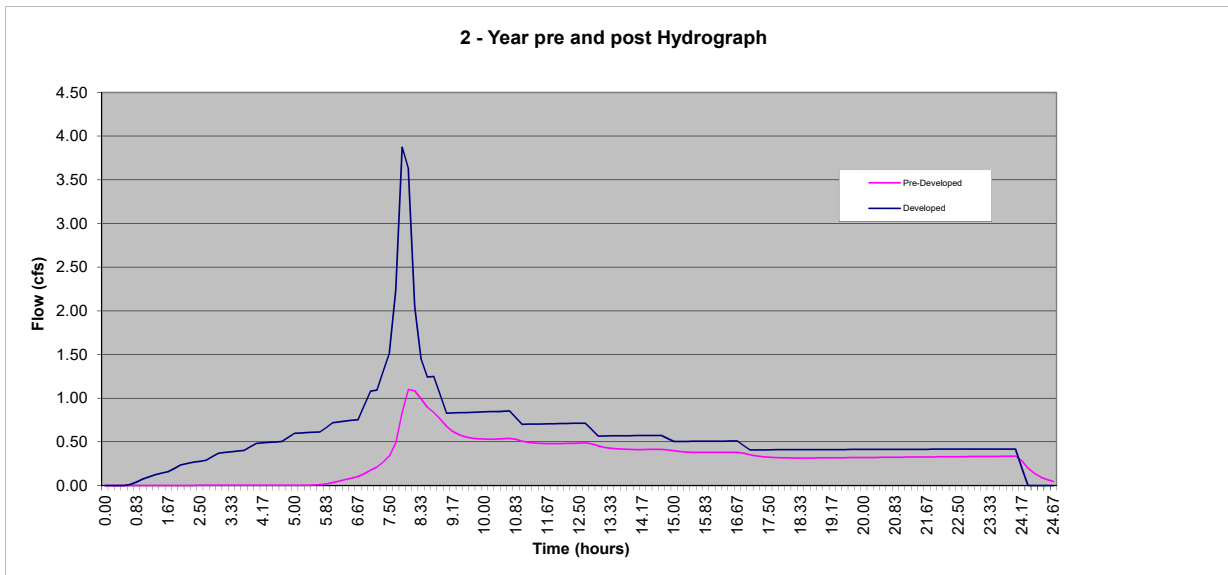
Pre-Developed Hydrographs						
Year	=====	2	5	10	25	100
Qpeak	cfs =>	1.10	1.93	2.20	2.84	0.00
Volume	cf =>	27,335	42,577	47,398	58,984	-
Tpeak	min =>	480	480	480	480	10
Tpeak	hr =>	8.00	8.00	8.00	8.00	0.17
Hydrograph Name=>		2	5	10	25	100
Time	Time	Hyd	Hyd	Hyd	Hyd	Hyd
(min)	(hr)	(cfs)	(cfs)	(cfs)	(cfs)	(cfs)

Developed Hydrographs					
	2	5	10	25	100
Qpeak	3.87	5.25	5.67	6.67	0.00
Volume	52,353	70,577	76,133	89,219	-
Tpeak	470	470	470	470	10
Tpeak	7.83	7.83	7.83	7.83	0.17
Hydrograph Name=>	2	5	10	25	100
Time	Hyd	Hyd	Hyd	Hyd	Hyd
(min)	(cfs)	(cfs)	(cfs)	(cfs)	(cfs)



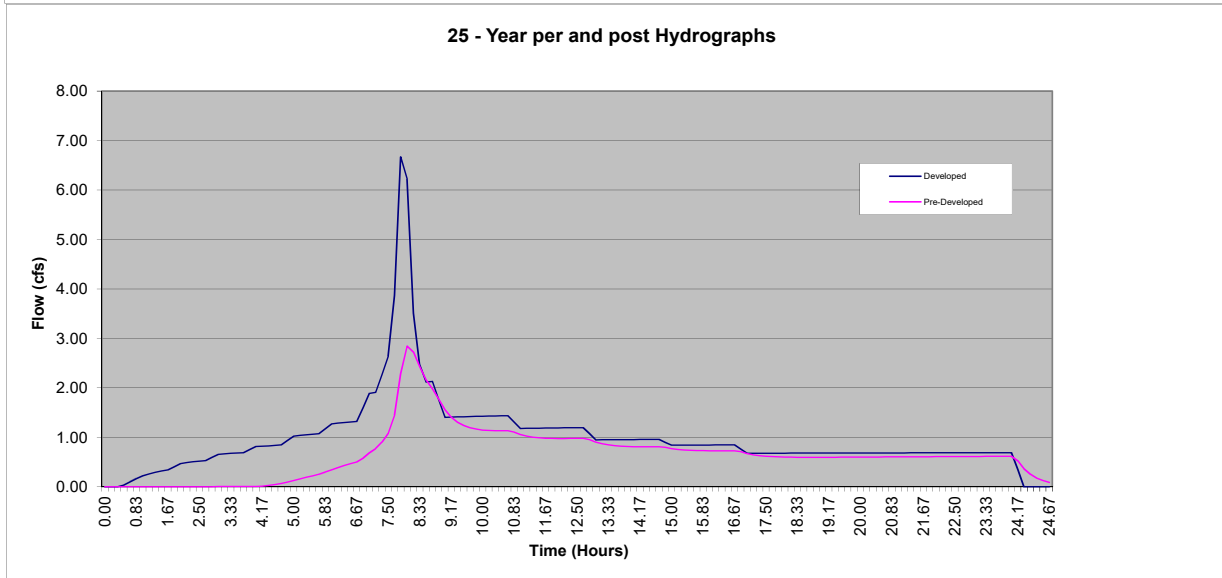
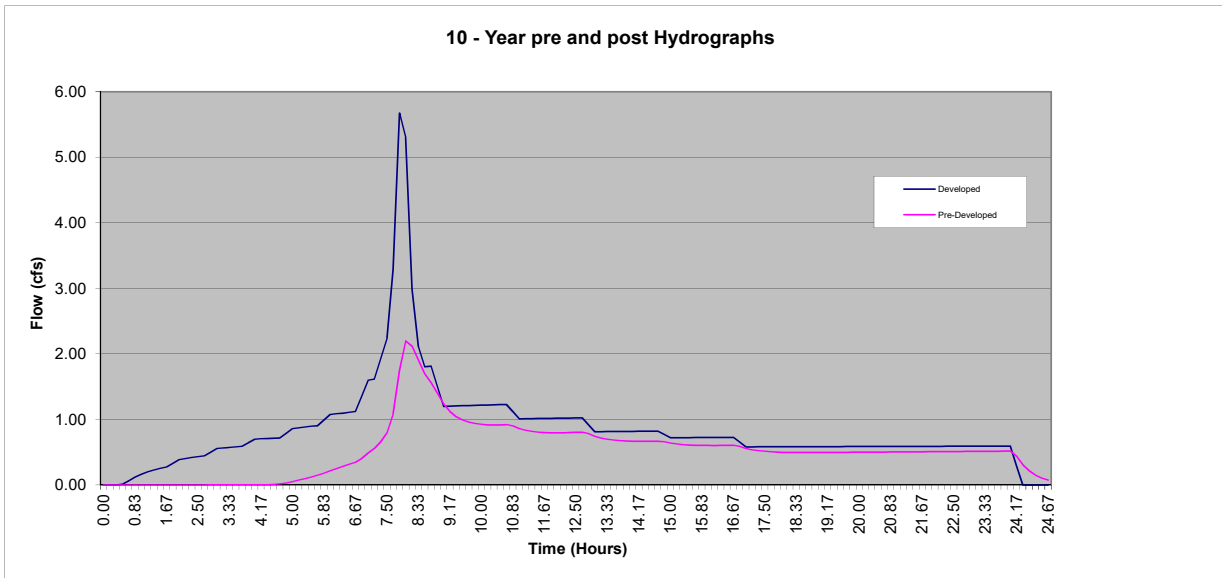
Pre-Developed Hydrographs						
Year	=====	2	5	10	25	100
Qpeak	cfs =>	1.10	1.93	2.20	2.84	0.00
Volume	cf =>	27,335	42,577	47,398	58,984	-
Tpeak	min =>	480	480	480	480	10
Tpeak	hr =>	8.00	8.00	8.00	8.00	0.17
Hydrograph Name=>		2	5	10	25	100
Time	Time	Hyd	Hyd	Hyd	Hyd	Hyd
(min)	(hr)	(cfs)	(cfs)	(cfs)	(cfs)	(cfs)

Developed Hydrographs					
	2	5	10	25	100
Qpeak	3.87	5.25	5.67	6.67	0.00
Volume	52,353	70,577	76,133	89,219	-
Tpeak	470	470	470	470	10
Tpeak	7.83	7.83	7.83	7.83	0.17
Hydrograph Name=>	2	5	10	25	100
Time	Hyd	Hyd	Hyd	Hyd	Hyd
(min)	(cfs)	(cfs)	(cfs)	(cfs)	(cfs)



Pre-Developed Hydrographs						
Year	=====	2	5	10	25	100
Qpeak	cfs =>	1.10	1.93	2.20	2.84	0.00
Volume	cf =>	27,335	42,577	47,398	58,984	-
Tpeak	min =>	480	480	480	480	10
Tpeak	hr =>	8.00	8.00	8.00	8.00	0.17
Hydrograph Name=>		2	5	10	25	100
Time	Time	Hyd	Hyd	Hyd	Hyd	Hyd
(min)	(hr)	(cfs)	(cfs)	(cfs)	(cfs)	(cfs)

Developed Hydrographs					
	2	5	10	25	100
Qpeak	3.87	5.25	5.67	6.67	0.00
Volume	52,353	70,577	76,133	89,219	-
Tpeak	470	470	470	470	10
Tpeak	7.83	7.83	7.83	7.83	0.17
Hydrograph Name=>	2	5	10	25	100
Time	Hyd	Hyd	Hyd	Hyd	Hyd
(min)	(cfs)	(cfs)	(cfs)	(cfs)	(cfs)



Project Name: The Views - Basin 1 Tank
Detention System Summary

Job # 19-071
 Date: 6/24/2020

Note: The detention system design is based on the King County Model "Facility Design Routine".

1) Detention Facility Design Input:

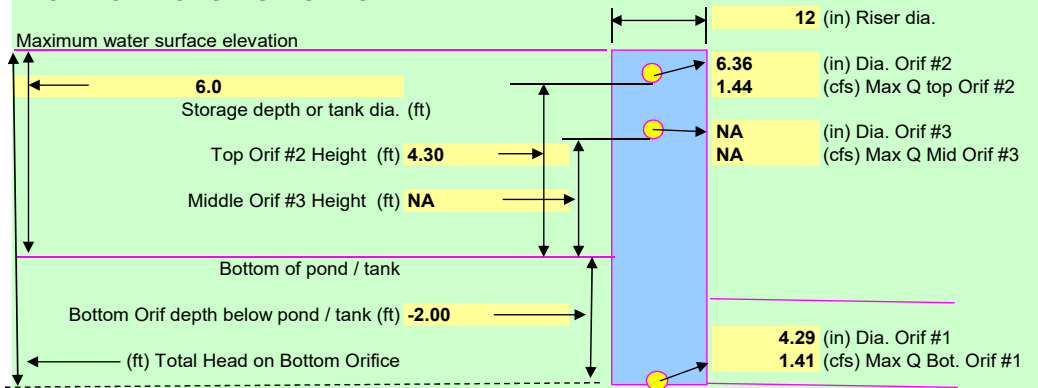
2) Type of facility:	DETENTION TANK	
3) Pond side slopes:	3 NA	
4) Tank Diameter:	6 ft	
5) Vertical permeability	0 min/in	
6) Number of orifices:	2	
7) Riser dia. =>	12 in	
8) Orifice coefficient	0.62 (typically 0.62)	
9) IE - bottom orifice:	-2 ft (distance below bottom of pond - Negative #)	
10) Max Q Bottom Orif. #1	1.41 cfs	
11) Top Orif #2 Height =	4.295 ft	
12) Max Q Mid Orif. #3	0.00 cfs	Orifice not being used
13) Mid Orif #3 Height =	0.00 ft	Orifice not being used

Detention Facility Design Results:

Performance year	Developed Inflow cfs	Pre-Developed Outflow cfs	Actual Outflow cfs	Peak Stage ft	Storage cf
100	0	0	0	0	-
25	6.67	2.84	2.85	6.00	13,419
10	5.67	2.20	1.96	4.67	11,199
5	5.25	1.93	1.61	4.40	10,542
2	3.87	1.10	1.10	2.88	6,354
Required Storage =====					13,419

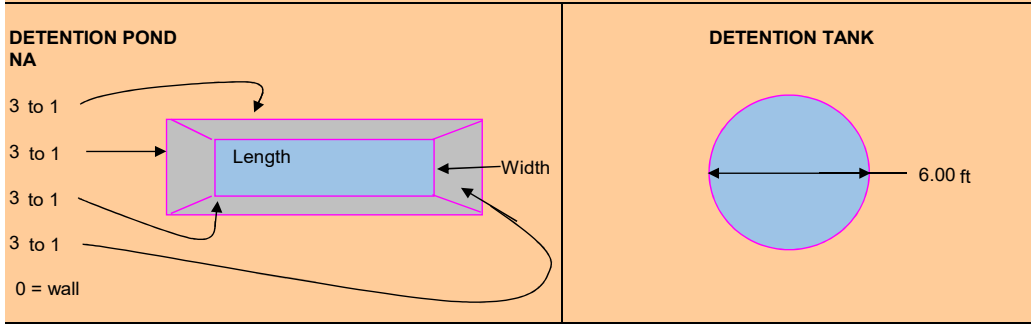
	Bottom Orif.	Middle Orif.	Top Orif.	Optional Weir Design (for top orifice)
Total Q =	1.41	0.00	1.44	0.87 La (ft)
Head (ft) =	8.00	0.00	1.71	100.02 < deg.
Dist. from bottom of pond (ft) =	-2.00	NA	4.30	Weir is an option
Orif. Dia. (in) =	4.29	0.00	6.36	

FLOW CONTROL STRUCTURE SCHEMATIC



Project Name: The Views - Basin 1 Tank
 Detention Facility Type
 Job # 19-071
 Date: 6/24/2020

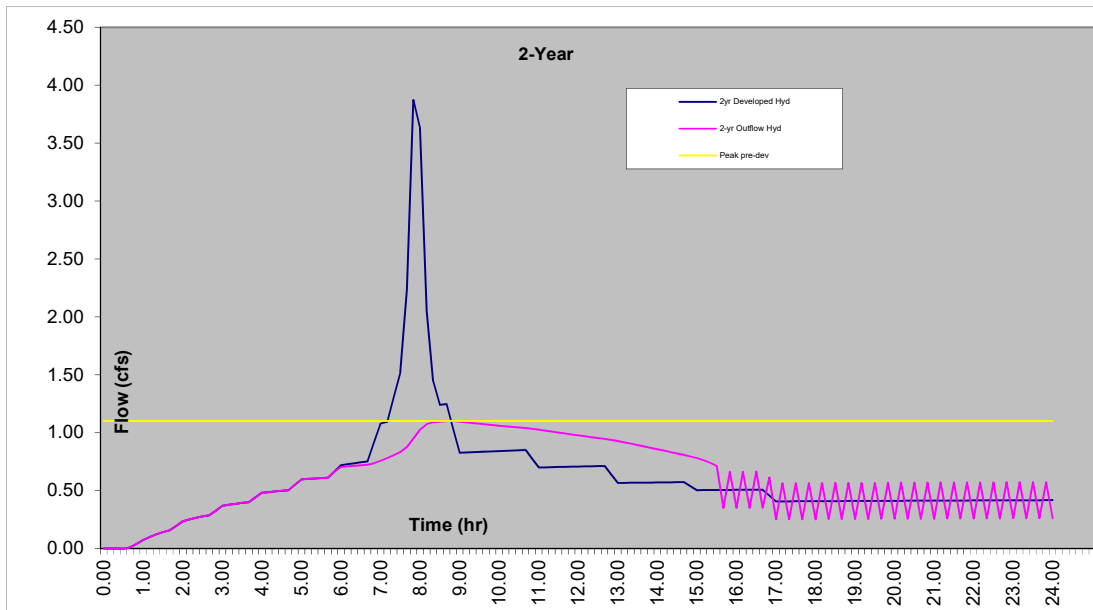
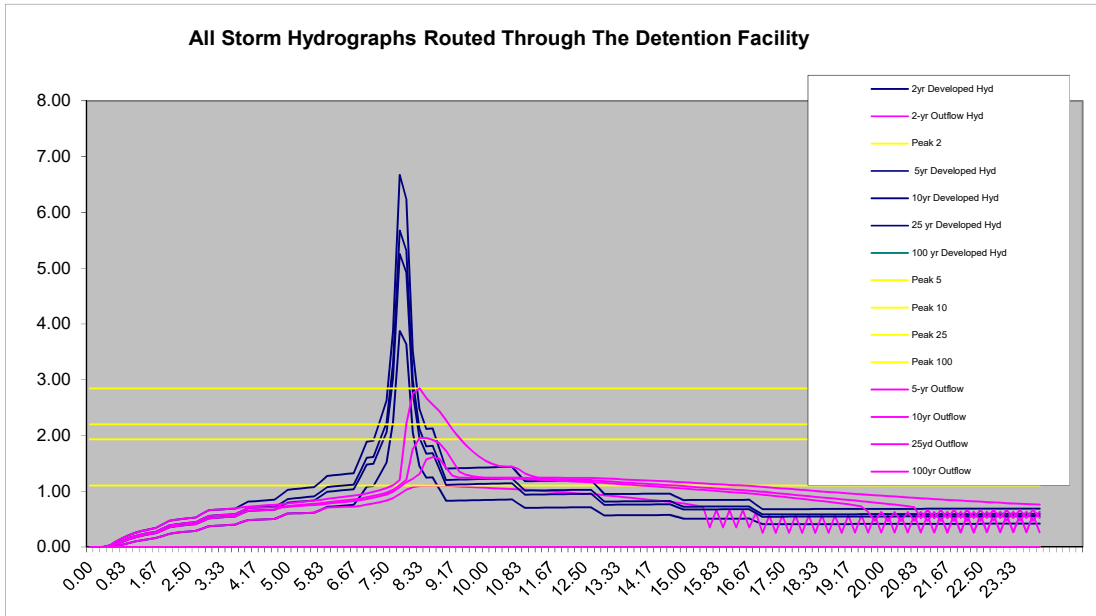
Detention Facility Type:
DETENTION TANK
 L = NA ft
 W = NA ft
 D = 6.0 ft
 Tank Vol. = 13,419 cf

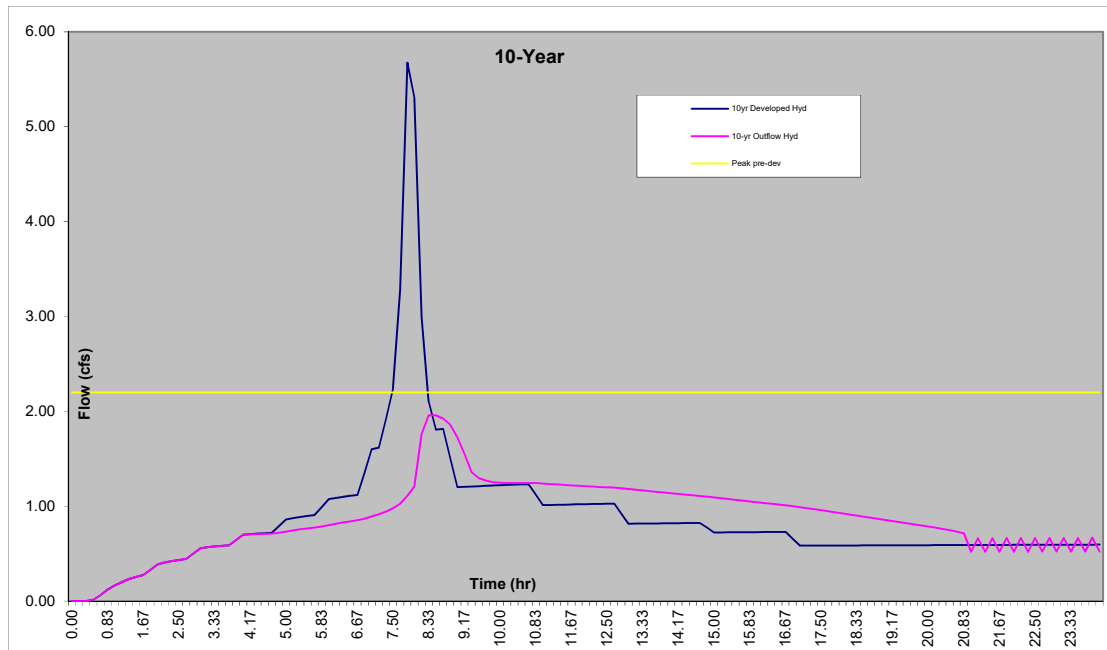
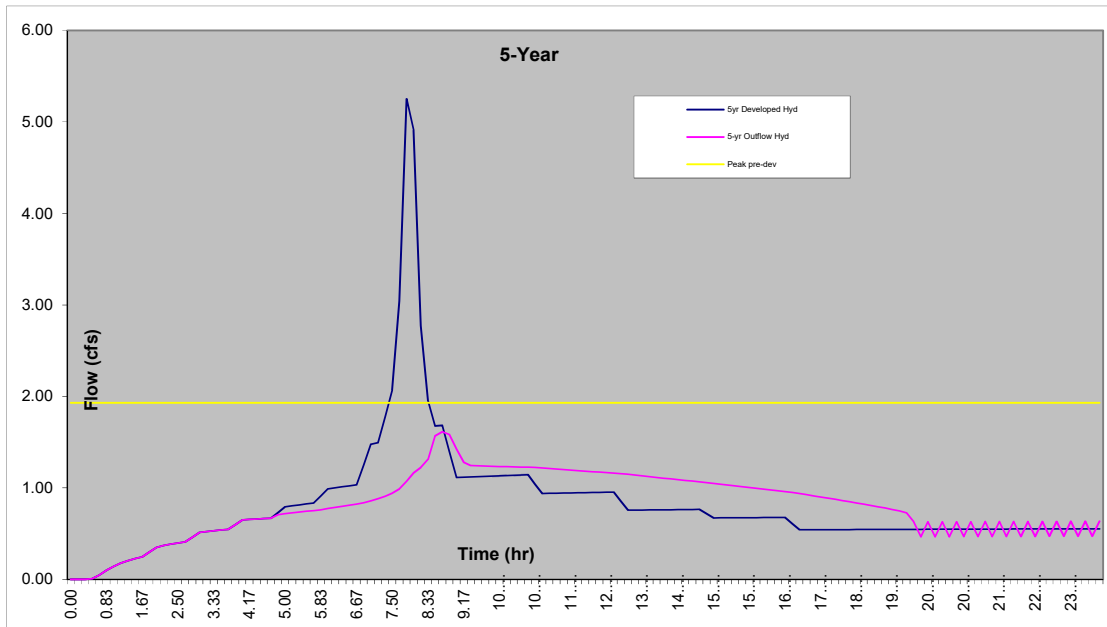


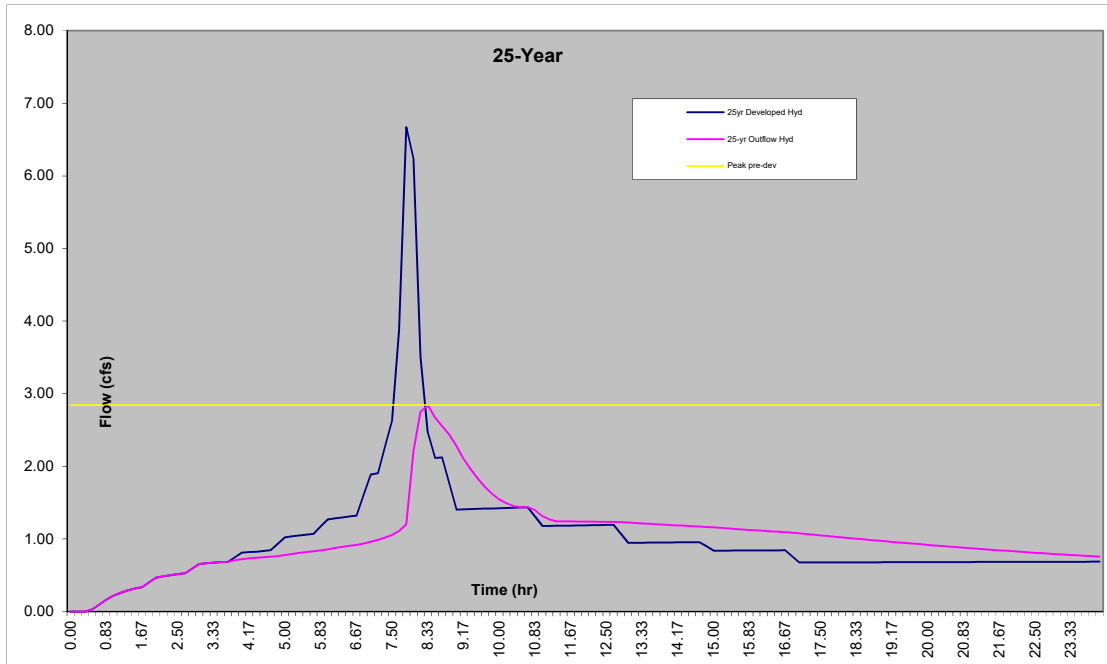
USER DEFINED POND NA
 Pond Geometry

Stage (ft)	Area (sf)
0	NA
1	NA
2	NA
3	NA
4	NA
5	NA
6	NA
7	NA
8	NA
9	NA
10	NA
11	NA
12	NA
13	NA
14	NA
15	NA

The diagram shows a trapezoidal cross-section with a top width labeled 'Stage 1' and a bottom width labeled 'Stage 0'.



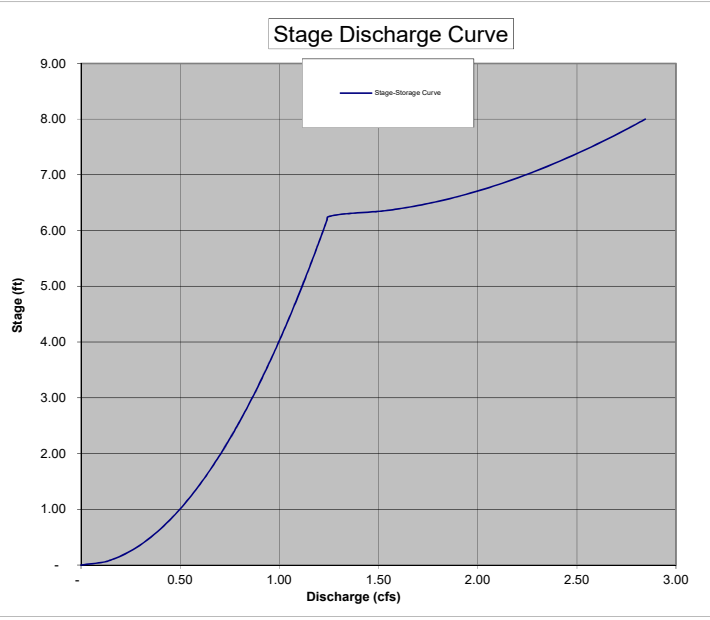
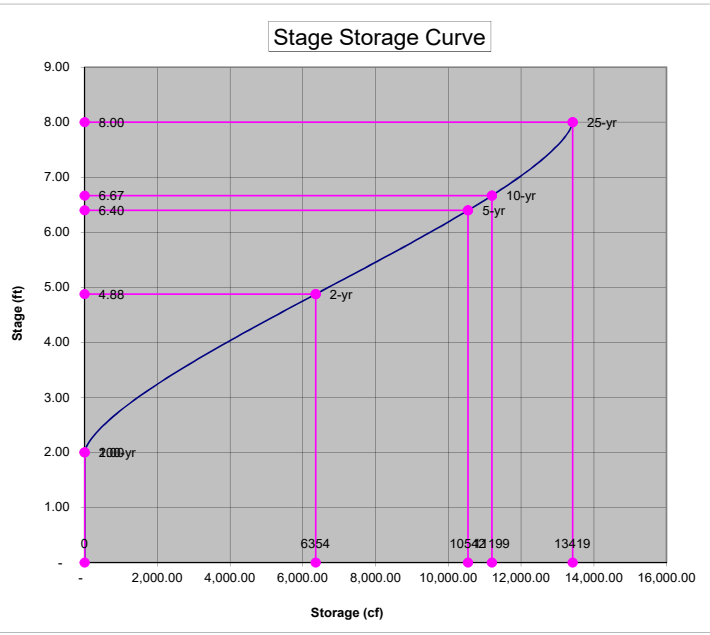




Project Name: The Views - Basin 1 Tank
Stage Storage Summary

Job # 19-071
 Date: 6/24/2020

Stage ft	Storage cf	Discharge cfs
-	-	-
0.05	-	0.11
0.10	-	0.16
0.15	-	0.19
0.20	-	0.22
0.25	-	0.25
0.30	-	0.27
0.35	-	0.29
0.40	-	0.32
0.45	-	0.33
0.50	-	0.35
0.55	-	0.37
0.60	-	0.39
0.65	-	0.40
0.70	-	0.42
0.75	-	0.43
0.80	-	0.45
0.85	-	0.46
0.90	-	0.47
0.95	-	0.49
1.00	-	0.50
1.05	-	0.51
1.10	-	0.52
1.15	-	0.53
1.20	-	0.55
1.25	-	0.56
1.30	-	0.57
1.35	-	0.58
1.40	-	0.59
1.45	-	0.60
1.50	-	0.61
1.55	-	0.62
1.60	-	0.63
1.65	-	0.64
1.70	-	0.65
1.75	-	0.66
1.80	-	0.67
1.85	-	0.68
1.90	-	0.69
1.95	-	0.70
2.00	-	0.71
2.05	17.29	0.71
2.10	48.77	0.72
2.15	89.37	0.73
2.20	137.25	0.74
2.25	191.32	0.75
2.30	250.84	0.76
2.35	315.28	0.76
2.40	384.20	0.77
2.45	457.24	0.78
2.50	534.11	0.79
2.55	614.57	0.80
2.60	698.38	0.80
2.65	785.37	0.81
2.70	875.34	0.82
2.75	968.15	0.83
2.80	1,063.65	0.83
2.85	1,161.71	0.84
2.90	1,262.20	0.85
2.95	1,365.03	0.86
3.00	1,470.08	0.86
3.05	1,577.25	0.87
3.10	1,686.45	0.88
3.15	1,797.59	0.88
3.20	1,910.59	0.89



Stage ft	Storage cf	Discharge cfs
3.25	2,025.38	0.90
3.30	2,141.86	0.91
3.35	2,259.98	0.91
3.40	2,379.66	0.92
3.45	2,500.84	0.93
3.50	2,623.45	0.93
3.55	2,747.43	0.94
3.60	2,872.72	0.95
3.65	2,999.27	0.95
3.70	3,127.01	0.96
3.75	3,255.89	0.97
3.80	3,385.85	0.97
3.85	3,516.86	0.98
3.90	3,648.85	0.98
3.95	3,781.77	0.99
4.00	3,915.58	1.00
4.05	4,050.23	1.00
4.10	4,185.67	1.01
4.15	4,321.86	1.02
4.20	4,458.75	1.02
4.25	4,596.30	1.03
4.30	4,734.46	1.03
4.35	4,873.19	1.04
4.40	5,012.44	1.05
4.45	5,152.18	1.05
4.50	5,292.36	1.06
4.55	5,432.95	1.06
4.60	5,573.89	1.07
4.65	5,715.15	1.07
4.70	5,856.70	1.08
4.75	5,998.48	1.09
4.80	6,140.45	1.09
4.85	6,282.59	1.10
4.90	6,424.85	1.10
4.95	6,567.18	1.11
5.00	6,709.56	1.11
5.05	6,851.93	1.12
5.10	6,994.27	1.13
5.15	7,136.52	1.13
5.20	7,278.66	1.14
5.25	7,420.64	1.14
5.30	7,562.42	1.15
5.35	7,703.96	1.15
5.40	7,845.22	1.16
5.45	7,986.17	1.16
5.50	8,126.75	1.17
5.55	8,266.93	1.17
5.60	8,406.67	1.18
5.65	8,545.93	1.18
5.70	8,684.66	1.19
5.75	8,822.81	1.20
5.80	8,960.36	1.20
5.85	9,097.25	1.21
5.90	9,233.44	1.21
5.95	9,368.88	1.22
6.00	9,503.53	1.22

Project Name: The Views - Basin 1 Tank
Rectangular, Sharp Crested Weir Calculations

Job # 19-071
 Date: 6/24/2020

Weir Equation: $Q = C(L-0.2H)H^{3/2}$

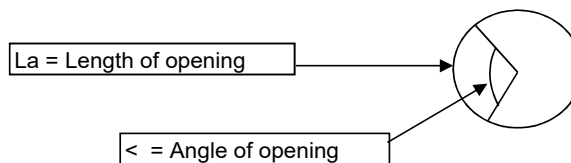
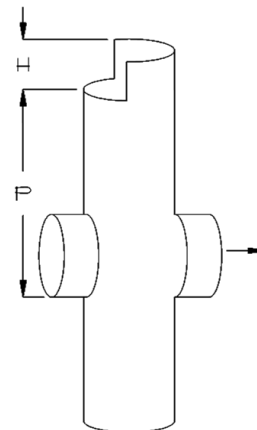
- Q = Flow over weir (cfs)
- C = $3.27 + 0.40 H/P$ (ft)
- L = Adjusted length of weir ($L_a - 0.1H \times 2$) this is to account for side constraints
- L_a = Actual length of weir along pipes interior circumference (ft)
- H = Distance from bottom of weir to maximum head (ft)
- P = Distance from bottom of weir to outfall invert elevation (ft)
- D = Inside riser pipe diameter (in)
- \angle = Angle of opening for weir (maximum 180 degrees)

Given:

Q	1.44	cfs
H	1.71	ft
P	6.30	ft
D	12	in

Find:

C	3.38	ft
L	0.53	ft
L_a	0.87	ft
\angle	100	degrees



Appendix D

Basin 2 Analysis, Data, and Detention Pond Design

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Project Name: The Views - Basin 2 Pond
PRE-DEVELOPED - TIME OF CONCENTRATION CALCULATIONS

Job # 19-071
 Date: 6/24/2020

25.2 = Total Tc (min)

Overland Flow (max 300' total)

		total	
Tc =	24.1	24.1	= travel time for less than 300' (min)
Ns =	0.24		= Manning's coefficient (<u>sheet flow</u>)
L =	300	300	= flow length (ft)
P2 =	2.7		= 2-year, 24 hour rainfall (in)
So =	6.00%		= slope of the land (%)

Shallow Concentrated Flow (after initial 300')

		total	
T =	1.1	1.1	= travel time for sheet flow (min)
L =	222	222	= flow length (ft)
So =	10.00%		= slope of the land (%)
k =	11		= time of concentration velocity factor (ft/s)

Flow in Swales

		total	
Tc =	0.00	0.0	= travel time in swale (min)
A =	6.00		= area of flow (sf)
R =	0.59		= hydraulic radius (ft)
Ls =	4.12		= side slope wet (ft)
Q =	3.12		= quantity of flow (ft ³ /sec)
V =	0.52		= velocity
L =	0	0	= flow length (ft)
Ve =	1		= vertical distance of side
Ho =	4		= horizontal distance of side
Bw =	24		= base width of swale (in)
D =	12		= depth of flow ESTIMATE (in)
S =	1.00%		= slope of the swale (%)
n =	0.2		= Manning's coefficient (<u>channel</u>)

Flow in Gutters

		total	
Tc =	0.0	0.0	= travel time in gutter (min)
fps =	0.02		= average velocity of flow (ft/sec)
T =	0.0		= calculated width of flow in the gutter (ft)
Qc =	0.00		= quantity of flow (as calculated Q=CIA) (ft ³ /sec)
C =	0.90		= runoff coefficient for rational method (paved=0.9)
I =	2.75		= rainfall intensity (assume 5 min tc)
W =	18.00		= width of pavement draining to CB
S =	8.00%		= street longitudinal slope (%)
Sx =	2.50%		= street cross slope (%)
n =	0.016		= Manning's coefficient (<u>pavement</u> = 0.016)
L =	0.0	0	= length of flow and drainage basin (ft)

Flow in Pipes

		total	
Tc =	0.0	0.0	= travel time in pipe (min)
V =	10.15		= calculated velocity pipe full (ft/sec)
Q =	7.96		= quantity of flow (ft ³ /sec)
n =	0.013		= Manning's coefficient (<u>pipe</u>)
D =	12		= pipe diameter (in)
S =	5.00%		= slope of pipe (%)
L =	0.0	0	= length of pipe (ft)

Project Name: The Views - Basin 2 Pond
Hydrograph Analysis Summary

Job # 19-071
 Date: 6/24/2020

Rainfall (year)	Rainfall (inches)
2	3.50
5	4.50
10	4.80
25	5.50
100	0.00

Pre-Developed	
Pervious	
Area =	4.591 acres
CN =	76 na
Impervious	
Area =	0.337 acres
CN =	98 na
Tc =	25.2 min
Total A =	4.928 acres

Developed	
Pervious	
Area =	1.982 acres
CN =	74 na
Impervious	
Area =	2.946 acres
CN =	98 na
Tc =	5 min
Total A =	4.928 acres

Note: The hydrographs shown are based on the S.C.S. Type - 1A, 24 hour storm using the SBUH method based on the King County Model.

Pre-Developed Hydrographs						
Year	=====	2	5	10	25	100
Qpeak	cfs =>	1.18	1.97	2.22	2.83	0.00
Volume	cf =>	26,694	40,632	45,022	55,549	-
Tpeak	min =>	480	480	480	480	10
Tpeak	hr =>	8.00	8.00	8.00	8.00	0.17
Hydrograph Name=>		2	5	10	25	100
Time (min)	Time (hr)	Hyd (cfs)	Hyd (cfs)	Hyd (cfs)	Hyd (cfs)	Hyd (cfs)
0	0.00	0.00	0.00	0.00	0.00	0.00
10	0.17	0.00	0.00	0.00	0.00	0.00
20	0.33	0.00	0.00	0.00	0.00	0.00
30	0.50	0.00	0.00	0.00	0.00	0.00
40	0.67	0.00	0.00	0.00	0.00	0.00
50	0.83	0.00	0.00	0.00	0.01	0.00
60	1.00	0.00	0.01	0.01	0.01	0.00
70	1.17	0.01	0.01	0.01	0.02	0.00
80	1.33	0.01	0.01	0.01	0.02	0.00
90	1.50	0.01	0.02	0.02	0.02	0.00
100	1.67	0.01	0.02	0.02	0.02	0.00
110	1.83	0.01	0.02	0.02	0.03	0.00
120	2.00	0.02	0.02	0.03	0.03	0.00
130	2.17	0.02	0.03	0.03	0.04	0.00
140	2.33	0.02	0.03	0.03	0.04	0.00
150	2.50	0.02	0.03	0.03	0.04	0.00
160	2.67	0.02	0.03	0.04	0.04	0.00
170	2.83	0.03	0.04	0.04	0.05	0.00
180	3.00	0.03	0.04	0.04	0.05	0.00
190	3.17	0.03	0.04	0.05	0.05	0.00
200	3.33	0.03	0.04	0.05	0.06	0.00
210	3.50	0.03	0.05	0.05	0.06	0.00
220	3.67	0.03	0.05	0.05	0.06	0.00
230	3.83	0.04	0.05	0.05	0.06	0.00
240	4.00	0.04	0.05	0.06	0.07	0.00
250	4.17	0.04	0.05	0.06	0.08	0.00
260	4.33	0.04	0.06	0.06	0.09	0.00
270	4.50	0.04	0.06	0.06	0.11	0.00
280	4.67	0.04	0.06	0.07	0.13	0.00
290	4.83	0.05	0.07	0.09	0.15	0.00
300	5.00	0.05	0.08	0.11	0.19	0.00
310	5.17	0.05	0.10	0.13	0.22	0.00
320	5.33	0.05	0.12	0.16	0.25	0.00
330	5.50	0.05	0.14	0.18	0.28	0.00
340	5.67	0.06	0.16	0.20	0.30	0.00
350	5.83	0.07	0.19	0.23	0.34	0.00
360	6.00	0.09	0.22	0.27	0.39	0.00
370	6.17	0.10	0.25	0.30	0.43	0.00
380	6.33	0.12	0.27	0.33	0.46	0.00
390	6.50	0.13	0.30	0.36	0.50	0.00
400	6.67	0.15	0.32	0.38	0.53	0.00
410	6.83	0.18	0.37	0.44	0.60	0.00
420	7.00	0.22	0.45	0.52	0.70	0.00
430	7.17	0.26	0.51	0.59	0.79	0.00
440	7.33	0.32	0.60	0.69	0.92	0.00
450	7.50	0.39	0.72	0.82	1.09	0.00
460	7.67	0.55	0.98	1.12	1.45	0.00
470	7.83	0.93	1.58	1.79	2.30	0.00
480	8.00	1.18	1.97	2.22	2.83	0.00
490	8.17	1.13	1.86	2.09	2.65	0.00
500	8.33	1.00	1.63	1.83	2.32	0.00
510	8.50	0.89	1.43	1.61	2.02	0.00

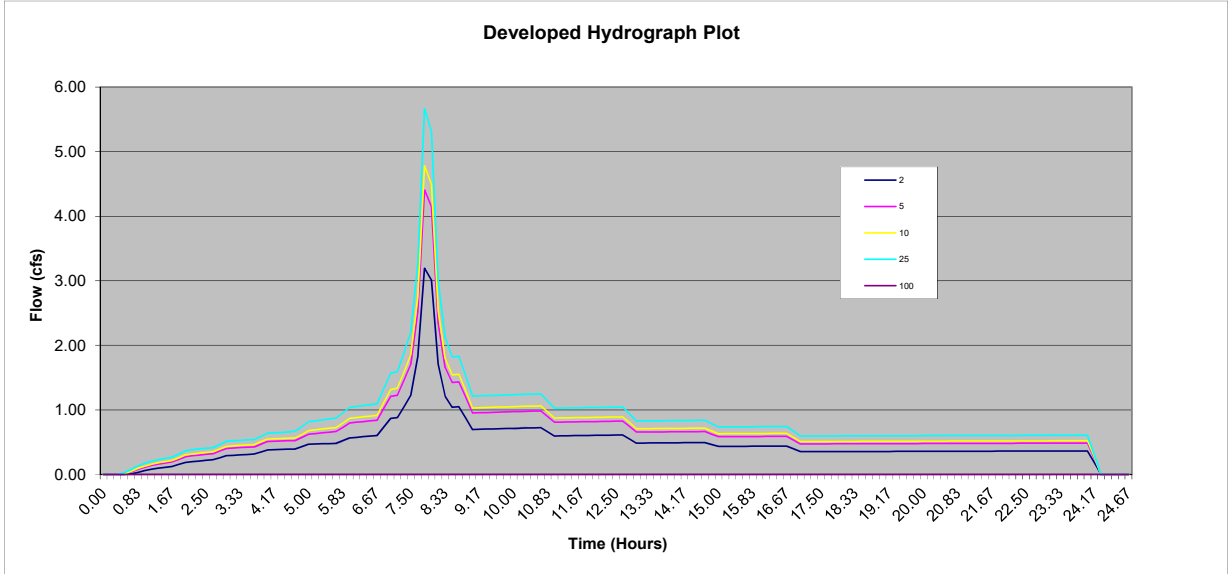
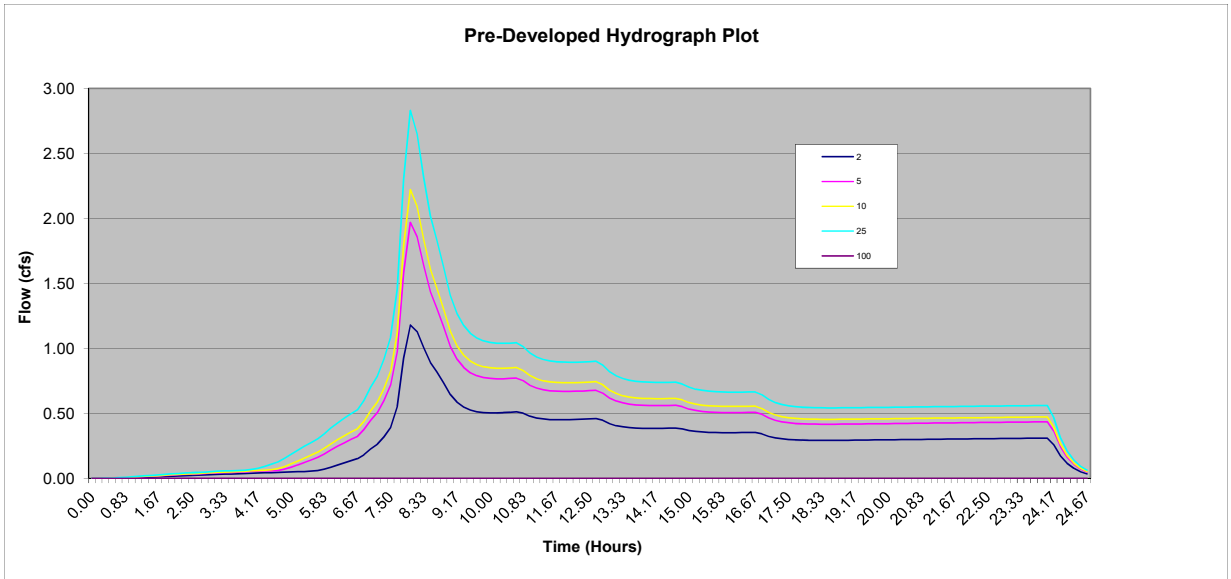
Developed Hydrographs					
	2	5	10	25	100
Qpeak	3.19	4.41	4.78	5.66	0.00
Volume	43,836	59,768	64,648	76,172	-
Tpeak	470	470	470	470	10
Tpeak	7.83	7.83	7.83	7.83	0.17
Hydrograph Name=>	2	5	10	25	100
Time (min)	Hyd (cfs)	Hyd (cfs)	Hyd (cfs)	Hyd (cfs)	Hyd (cfs)
0	0.00	0.00	0.00	0.00	0.00
10	0.00	0.00	0.00	0.00	0.00
20	0.00	0.00	0.00	0.00	0.00
30	0.00	0.01	0.01	0.02	0.00
40	0.01	0.04	0.05	0.08	0.00
50	0.03	0.08	0.09	0.13	0.00
60	0.06	0.11	0.13	0.17	0.00
70	0.08	0.14	0.16	0.20	0.00
80	0.10	0.16	0.18	0.23	0.00
90	0.11	0.18	0.20	0.25	0.00
100	0.13	0.19	0.22	0.27	0.00
110	0.15	0.23	0.26	0.32	0.00
120	0.19	0.28	0.30	0.37	0.00
130	0.20	0.29	0.32	0.38	0.00
140	0.21	0.30	0.33	0.40	0.00
150	0.22	0.31	0.34	0.41	0.00
160	0.23	0.32	0.35	0.41	0.00
170	0.26	0.36	0.39	0.46	0.00
180	0.29	0.40	0.44	0.52	0.00
190	0.30	0.41	0.44	0.52	0.00
200	0.30	0.42	0.45	0.53	0.00
210	0.31	0.42	0.46	0.54	0.00
220	0.32	0.43	0.46	0.54	0.00
230	0.35	0.47	0.51	0.59	0.00
240	0.38	0.51	0.55	0.64	0.00
250	0.38	0.51	0.55	0.64	0.00
260	0.39	0.52	0.56	0.65	0.00
270	0.39	0.52	0.56	0.66	0.00
280	0.39	0.52	0.56	0.67	0.00
290	0.43	0.57	0.62	0.74	0.00
300	0.47	0.62	0.68	0.82	0.00
310	0.47	0.63	0.69	0.83	0.00
320	0.48	0.64	0.70	0.85	0.00
330	0.48	0.66	0.72	0.86	0.00
340	0.48	0.67	0.73	0.87	0.00
350	0.52	0.73	0.80	0.95	0.00
360	0.57	0.80	0.87	1.04	0.00
370	0.58	0.81	0.88	1.05	0.00
380	0.58	0.82	0.89	1.07	0.00
390	0.59	0.83	0.90	1.08	0.00
400	0.60	0.84	0.92	1.09	0.00
410	0.73	1.02	1.11	1.33	0.00
420	0.87	1.21	1.32	1.57	0.00
430	0.88	1.23	1.34	1.59	0.00
440	1.06	1.47	1.60	1.90	0.00
450	1.24	1.72	1.86	2.22	0.00
460	1.83	2.53	2.75	3.27	0.00
470	3.19	4.41	4.78	5.66	0.00
480	3.01	4.14	4.49	5.31	0.00
490	1.71	2.35	2.55	3.01	0.00
500	1.21	1.66	1.79	2.12	0.00
510	1.04	1.43	1.54	1.82	0.00

Pre-Developed Hydrographs							Developed Hydrographs					
Year	=====>	2	5	10	25	100	2	5	10	25	100	
Qpeak	cfs =>	1.18	1.97	2.22	2.83	0.00	3.19	4.41	4.78	5.66	0.00	
Volume	cf =>	26,694	40,632	45,022	55,549	-	43,836	59,768	64,648	76,172	-	
Tpeak	min =>	480	480	480	480	10	470	470	470	470	10	
Tpeak	hr =>	8.00	8.00	8.00	8.00	0.17	7.83	7.83	7.83	7.83	0.17	
Hydrograph Name=>		2	5	10	25	100	2	5	10	25	100	
Time	Time	Hyd	Hyd	Hyd	Hyd	Hyd	Hyd	Hyd	Hyd	Hyd	Hyd	
(min)	(hr)	(cfs)	(cfs)	(cfs)	(cfs)	(cfs)	(cfs)	(cfs)	(cfs)	(cfs)	(cfs)	
520	8.67	0.82	1.31	1.46	1.83	0.00	1.05	1.43	1.55	1.83	0.00	
530	8.83	0.74	1.17	1.30	1.63	0.00	0.87	1.19	1.29	1.52	0.00	
540	9.00	0.64	1.02	1.13	1.41	0.00	0.70	0.95	1.03	1.21	0.00	
550	9.17	0.59	0.92	1.02	1.27	0.00	0.70	0.96	1.03	1.22	0.00	
560	9.33	0.55	0.85	0.95	1.18	0.00	0.70	0.96	1.04	1.22	0.00	
570	9.50	0.53	0.81	0.90	1.12	0.00	0.71	0.96	1.04	1.22	0.00	
580	9.67	0.51	0.79	0.88	1.08	0.00	0.71	0.97	1.04	1.23	0.00	
590	9.83	0.51	0.77	0.86	1.06	0.00	0.71	0.97	1.05	1.23	0.00	
600	10.00	0.50	0.77	0.85	1.05	0.00	0.71	0.97	1.05	1.24	0.00	
610	10.17	0.50	0.77	0.85	1.04	0.00	0.72	0.98	1.05	1.24	0.00	
620	10.33	0.50	0.77	0.85	1.04	0.00	0.72	0.98	1.06	1.24	0.00	
630	10.50	0.51	0.77	0.85	1.04	0.00	0.72	0.98	1.06	1.25	0.00	
640	10.67	0.51	0.77	0.85	1.04	0.00	0.72	0.98	1.06	1.25	0.00	
650	10.83	0.50	0.75	0.83	1.01	0.00	0.66	0.90	0.97	1.14	0.00	
660	11.00	0.48	0.72	0.79	0.97	0.00	0.60	0.81	0.87	1.03	0.00	
670	11.17	0.46	0.69	0.77	0.93	0.00	0.60	0.81	0.88	1.03	0.00	
680	11.33	0.46	0.68	0.75	0.91	0.00	0.60	0.81	0.88	1.03	0.00	
690	11.50	0.45	0.67	0.74	0.90	0.00	0.60	0.81	0.88	1.03	0.00	
700	11.67	0.45	0.67	0.74	0.90	0.00	0.60	0.82	0.88	1.03	0.00	
710	11.83	0.45	0.67	0.73	0.89	0.00	0.60	0.82	0.88	1.04	0.00	
720	12.00	0.45	0.67	0.73	0.89	0.00	0.61	0.82	0.88	1.04	0.00	
730	12.17	0.45	0.67	0.74	0.89	0.00	0.61	0.82	0.89	1.04	0.00	
740	12.33	0.45	0.67	0.74	0.89	0.00	0.61	0.82	0.89	1.04	0.00	
750	12.50	0.46	0.67	0.74	0.90	0.00	0.61	0.82	0.89	1.04	0.00	
760	12.67	0.46	0.68	0.74	0.90	0.00	0.61	0.83	0.89	1.04	0.00	
770	12.83	0.45	0.66	0.72	0.87	0.00	0.55	0.74	0.80	0.94	0.00	
780	13.00	0.42	0.62	0.68	0.82	0.00	0.49	0.66	0.71	0.83	0.00	
790	13.17	0.41	0.59	0.65	0.79	0.00	0.49	0.66	0.71	0.83	0.00	
800	13.33	0.40	0.58	0.64	0.77	0.00	0.49	0.66	0.71	0.83	0.00	
810	13.50	0.39	0.57	0.62	0.75	0.00	0.49	0.66	0.71	0.83	0.00	
820	13.67	0.39	0.56	0.62	0.75	0.00	0.49	0.66	0.71	0.83	0.00	
830	13.83	0.38	0.56	0.61	0.74	0.00	0.49	0.66	0.71	0.83	0.00	
840	14.00	0.38	0.56	0.61	0.74	0.00	0.49	0.66	0.71	0.83	0.00	
850	14.17	0.38	0.56	0.61	0.74	0.00	0.49	0.66	0.71	0.84	0.00	
860	14.33	0.38	0.56	0.61	0.74	0.00	0.49	0.66	0.72	0.84	0.00	
870	14.50	0.39	0.56	0.61	0.74	0.00	0.49	0.66	0.72	0.84	0.00	
880	14.67	0.39	0.56	0.61	0.74	0.00	0.49	0.67	0.72	0.84	0.00	
890	14.83	0.38	0.55	0.60	0.72	0.00	0.46	0.63	0.67	0.79	0.00	
900	15.00	0.37	0.53	0.58	0.70	0.00	0.43	0.58	0.63	0.74	0.00	
910	15.17	0.36	0.52	0.57	0.69	0.00	0.44	0.59	0.63	0.74	0.00	
920	15.33	0.36	0.51	0.56	0.68	0.00	0.44	0.59	0.63	0.74	0.00	
930	15.50	0.35	0.51	0.56	0.67	0.00	0.44	0.59	0.63	0.74	0.00	
940	15.67	0.35	0.51	0.55	0.67	0.00	0.44	0.59	0.63	0.74	0.00	
950	15.83	0.35	0.51	0.55	0.66	0.00	0.44	0.59	0.63	0.74	0.00	
960	16.00	0.35	0.51	0.55	0.66	0.00	0.44	0.59	0.63	0.74	0.00	
970	16.17	0.35	0.51	0.55	0.66	0.00	0.44	0.59	0.63	0.74	0.00	
980	16.33	0.35	0.51	0.55	0.66	0.00	0.44	0.59	0.64	0.74	0.00	
990	16.50	0.35	0.51	0.55	0.66	0.00	0.44	0.59	0.64	0.74	0.00	
1000	16.67	0.35	0.51	0.55	0.66	0.00	0.44	0.59	0.64	0.74	0.00	
1010	16.83	0.34	0.49	0.54	0.64	0.00	0.40	0.53	0.57	0.67	0.00	
1020	17.00	0.32	0.46	0.51	0.61	0.00	0.35	0.47	0.51	0.60	0.00	
1030	17.17	0.31	0.45	0.49	0.58	0.00	0.35	0.47	0.51	0.60	0.00	
1040	17.33	0.30	0.43	0.47	0.57	0.00	0.35	0.47	0.51	0.60	0.00	
1050	17.50	0.30	0.43	0.47	0.56	0.00	0.35	0.47	0.51	0.60	0.00	
1060	17.67	0.29	0.42	0.46	0.55	0.00	0.35	0.47	0.51	0.60	0.00	
1070	17.83	0.29	0.42	0.46	0.55	0.00	0.35	0.48	0.51	0.60	0.00	
1080	18.00	0.29	0.42	0.45	0.54	0.00	0.35	0.48	0.51	0.60	0.00	
1090	18.17	0.29	0.42	0.45	0.54	0.00	0.35	0.48	0.51	0.60	0.00	
1100	18.33	0.29	0.42	0.45	0.54	0.00	0.36	0.48	0.51	0.60	0.00	
1110	18.50	0.29	0.42	0.45	0.54	0.00	0.36	0.48	0.51	0.60	0.00	
1120	18.67	0.29	0.42	0.45	0.54	0.00	0.36	0.48	0.51	0.60	0.00	
1130	18.83	0.29	0.42	0.45	0.54	0.00	0.36	0.48	0.51	0.60	0.00	
1140	19.00	0.29	0.42	0.45	0.54	0.00	0.36	0.48	0.51	0.60	0.00	
1150	19.17	0.29	0.42	0.45	0.54	0.00	0.36	0.48	0.51	0.60	0.00	
1160	19.33	0.29	0.42	0.46	0.54	0.00	0.36	0.48	0.51	0.60	0.00	
1170	19.50	0.29	0.42	0.46	0.54	0.00	0.36	0.48	0.51	0.60	0.00	
1180	19.67	0.29	0.42	0.46	0.54	0.00	0.36	0.48	0.52	0.60	0.00	
1190	19.83	0.30	0.42	0.46	0.54	0.00	0.36	0.48	0.52	0.60	0.00	
1200	20.00	0.30	0.42	0.46	0.55	0.00	0.36	0.48	0.52	0.60	0.00	
1210	20.17	0.30	0.42	0.46	0.55	0.00	0.36	0.48	0.52	0.60	0.00	

Pre-Developed Hydrographs							Developed Hydrographs					
Year	=====>	2	5	10	25	100	2	5	10	25	100	
Qpeak	cfs =>	1.18	1.97	2.22	2.83	0.00	3.19	4.41	4.78	5.66	0.00	
Volume	cf =>	26,694	40,632	45,022	55,549	-	43,836	59,768	64,648	76,172	-	
Tpeak	min =>	480	480	480	480	10	470	470	470	470	10	
Tpeak	hr =>	8.00	8.00	8.00	8.00	0.17	7.83	7.83	7.83	7.83	0.17	
Hydrograph Name=>		2	5	10	25	100	2	5	10	25	100	
Time	Time	Hyd	Hyd	Hyd	Hyd	Hyd	Hyd	Hyd	Hyd	Hyd	Hyd	
(min)	(hr)	(cfs)	(cfs)	(cfs)	(cfs)	(cfs)	(cfs)	(cfs)	(cfs)	(cfs)	(cfs)	
1220	20.33	0.30	0.42	0.46	0.55	0.00	0.36	0.48	0.52	0.60	0.00	
1230	20.50	0.30	0.42	0.46	0.55	0.00	0.36	0.48	0.52	0.60	0.00	
1240	20.67	0.30	0.42	0.46	0.55	0.00	0.36	0.48	0.52	0.60	0.00	
1250	20.83	0.30	0.42	0.46	0.55	0.00	0.36	0.48	0.52	0.60	0.00	
1260	21.00	0.30	0.42	0.46	0.55	0.00	0.36	0.48	0.52	0.60	0.00	
1270	21.17	0.30	0.42	0.46	0.55	0.00	0.36	0.48	0.52	0.60	0.00	
1280	21.33	0.30	0.42	0.46	0.55	0.00	0.36	0.48	0.52	0.60	0.00	
1290	21.50	0.30	0.43	0.46	0.55	0.00	0.36	0.48	0.52	0.60	0.00	
1300	21.67	0.30	0.43	0.46	0.55	0.00	0.36	0.48	0.52	0.60	0.00	
1310	21.83	0.30	0.43	0.46	0.55	0.00	0.36	0.48	0.52	0.60	0.00	
1320	22.00	0.30	0.43	0.46	0.55	0.00	0.36	0.48	0.52	0.60	0.00	
1330	22.17	0.30	0.43	0.47	0.55	0.00	0.36	0.48	0.52	0.61	0.00	
1340	22.33	0.30	0.43	0.47	0.55	0.00	0.36	0.48	0.52	0.61	0.00	
1350	22.50	0.30	0.43	0.47	0.55	0.00	0.36	0.48	0.52	0.61	0.00	
1360	22.67	0.30	0.43	0.47	0.56	0.00	0.36	0.48	0.52	0.61	0.00	
1370	22.83	0.31	0.43	0.47	0.56	0.00	0.36	0.48	0.52	0.61	0.00	
1380	23.00	0.31	0.43	0.47	0.56	0.00	0.36	0.48	0.52	0.61	0.00	
1390	23.17	0.31	0.43	0.47	0.56	0.00	0.36	0.48	0.52	0.61	0.00	
1400	23.33	0.31	0.43	0.47	0.56	0.00	0.36	0.48	0.52	0.61	0.00	
1410	23.50	0.31	0.43	0.47	0.56	0.00	0.36	0.49	0.52	0.61	0.00	
1420	23.67	0.31	0.43	0.47	0.56	0.00	0.36	0.49	0.52	0.61	0.00	
1430	23.83	0.31	0.43	0.47	0.56	0.00	0.36	0.49	0.52	0.61	0.00	
1440	24.00	0.31	0.43	0.47	0.56	0.00	0.36	0.49	0.52	0.61	0.00	
1450	24.17	0.26	0.36	0.39	0.47	0.00	0.18	0.24	0.26	0.30	0.00	
1460	24.33	0.17	0.24	0.26	0.31	0.00	0.00	0.00	0.00	0.00	0.00	
1470	24.50	0.12	0.16	0.18	0.21	0.00	0.00	0.00	0.00	0.00	0.00	
1480	24.67	0.08	0.11	0.12	0.14	0.00	0.00	0.00	0.00	0.00	0.00	
1490	24.67	0.05	0.07	0.08	0.09	0.00	0.00	0.00	0.00	0.00	0.00	
1500	24.67	0.03	0.05	0.05	0.06	0.00	0.00	0.00	0.00	0.00	0.00	

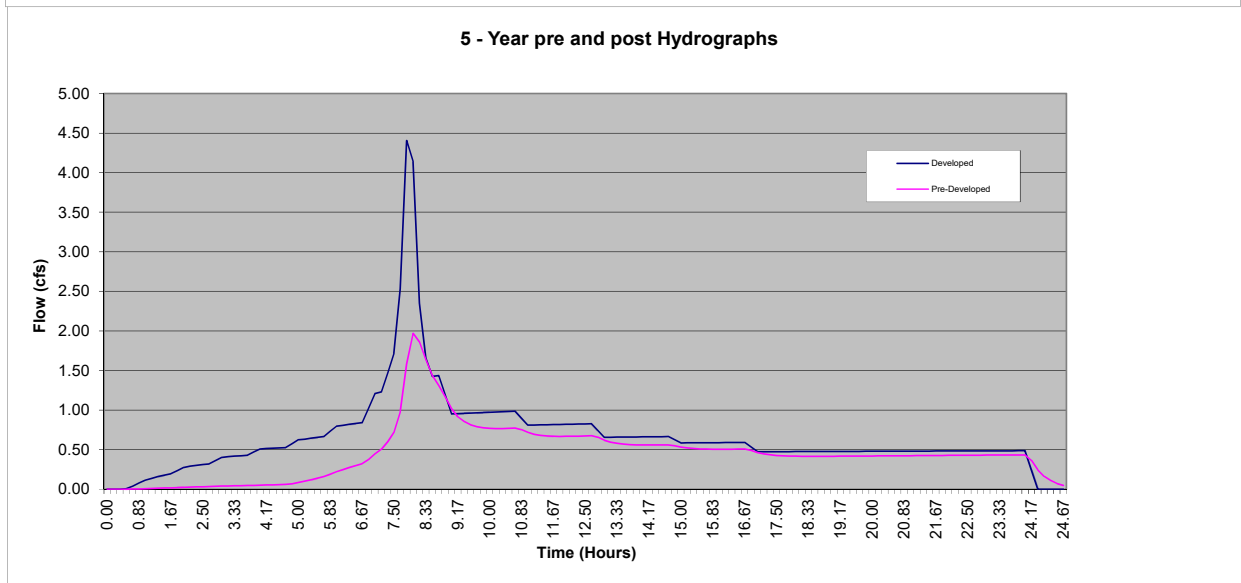
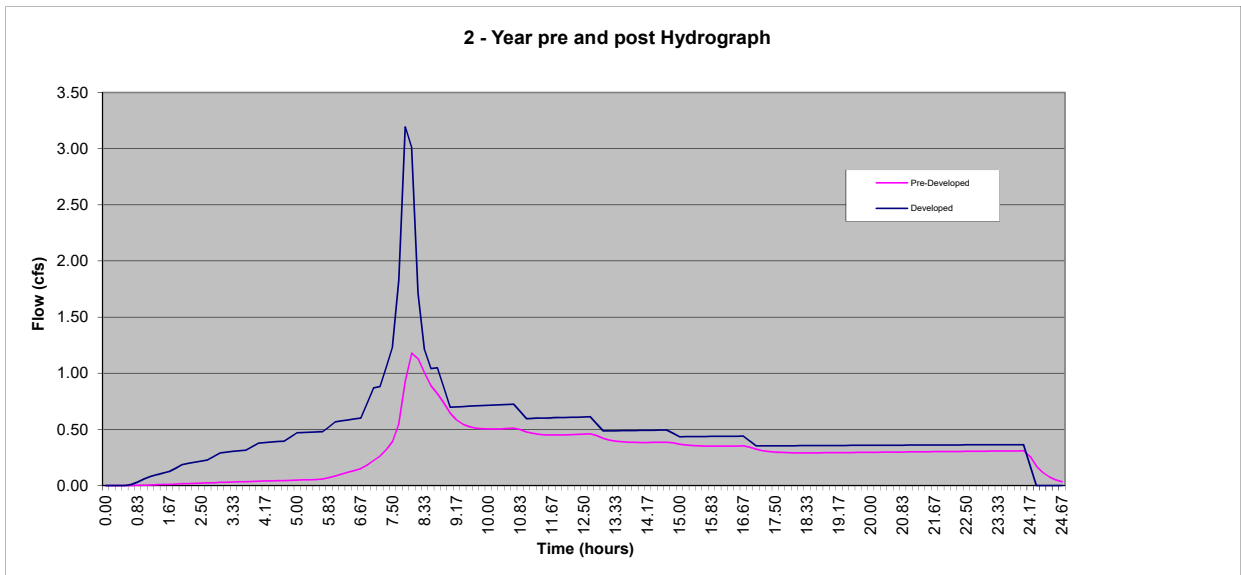
Pre-Developed Hydrographs						
Year	=====	2	5	10	25	100
Qpeak	cfs =>	1.18	1.97	2.22	2.83	0.00
Volume	cf =>	26,694	40,632	45,022	55,549	-
Tpeak	min =>	480	480	480	480	10
Tpeak	hr =>	8.00	8.00	8.00	8.00	0.17
Hydrograph Name=>		2	5	10	25	100
Time	Time	Hyd	Hyd	Hyd	Hyd	Hyd
(min)	(hr)	(cfs)	(cfs)	(cfs)	(cfs)	(cfs)

Developed Hydrographs					
	2	5	10	25	100
Qpeak	3.19	4.41	4.78	5.66	0.00
Volume	43,836	59,768	64,648	76,172	-
Tpeak	470	470	470	470	10
Tpeak	7.83	7.83	7.83	7.83	0.17
Hydrograph Name=>	2	5	10	25	100
Time	Hyd	Hyd	Hyd	Hyd	Hyd
(min)	(cfs)	(cfs)	(cfs)	(cfs)	(cfs)



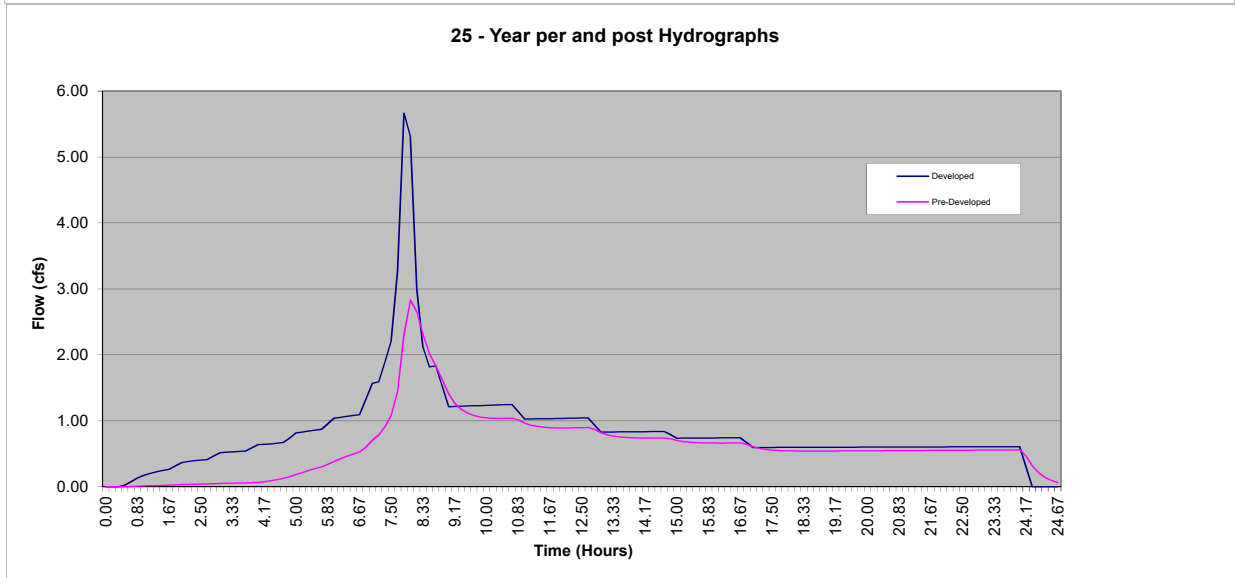
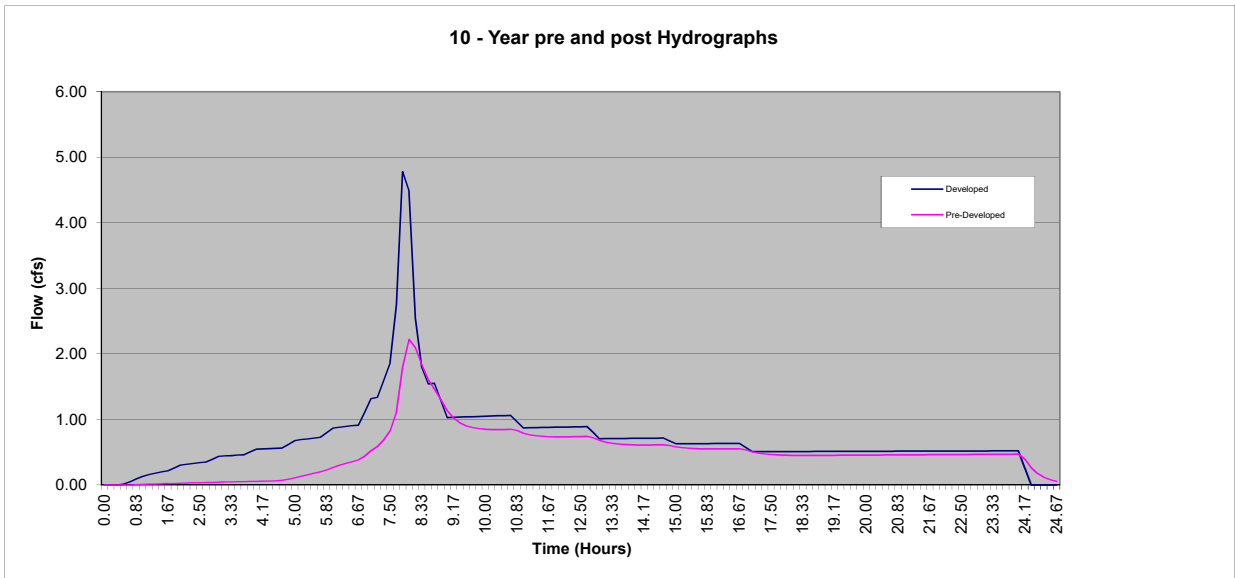
Pre-Developed Hydrographs						
Year	=====>	2	5	10	25	100
Qpeak	cfs =>	1.18	1.97	2.22	2.83	0.00
Volume	cf =>	26,694	40,632	45,022	55,549	-
Tpeak	min =>	480	480	480	480	10
Tpeak	hr =>	8.00	8.00	8.00	8.00	0.17
Hydrograph Name=>		2	5	10	25	100
Time	Time	Hyd	Hyd	Hyd	Hyd	Hyd
(min)	(hr)	(cfs)	(cfs)	(cfs)	(cfs)	(cfs)

Developed Hydrographs					
	2	5	10	25	100
Qpeak	3.19	4.41	4.78	5.66	0.00
Volume	43,836	59,768	64,648	76,172	-
Tpeak	470	470	470	470	10
Tpeak	7.83	7.83	7.83	7.83	0.17
Hydrograph Name=>	2	5	10	25	100
Time	Hyd	Hyd	Hyd	Hyd	Hyd
(min)	(cfs)	(cfs)	(cfs)	(cfs)	(cfs)



Pre-Developed Hydrographs						
Year	=====>	2	5	10	25	100
Qpeak	cfs =>	1.18	1.97	2.22	2.83	0.00
Volume	cf =>	26,694	40,632	45,022	55,549	-
Tpeak	min =>	480	480	480	480	10
Tpeak	hr =>	8.00	8.00	8.00	8.00	0.17
Hydrograph Name=>		2	5	10	25	100
Time	Time	Hyd	Hyd	Hyd	Hyd	Hyd
(min)	(hr)	(cfs)	(cfs)	(cfs)	(cfs)	(cfs)

Developed Hydrographs					
	2	5	10	25	100
Qpeak	3.19	4.41	4.78	5.66	0.00
Volume	43,836	59,768	64,648	76,172	-
Tpeak	470	470	470	470	10
Tpeak	7.83	7.83	7.83	7.83	0.17
Hydrograph Name=>	2	5	10	25	100
Time	Hyd	Hyd	Hyd	Hyd	Hyd
(min)	(cfs)	(cfs)	(cfs)	(cfs)	(cfs)



Project Name: The Views - Basin 2 Pond
Detention System Summary

Job # 19-071
 Date: 6/24/2020

Note: The detention system design is based on the King County Model "Facility Design Routine".

1) Detention Facility Design Input:

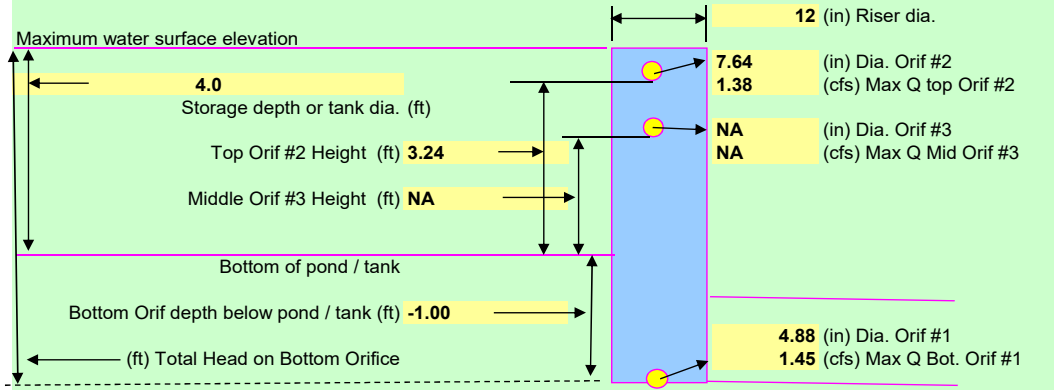
2) Type of facility:	DETENTION POND	
3) Pond side slopes:	3 to 1	
4) Pond storage depth:	4 ft (from bottom of pond to overflow)	
5) Vertical permeability:	0 min/in	
6) Number of orifices:	2	
7) Riser dia. =>	12 in	
8) Orifice coefficient:	0.62 (typically 0.62)	
9) IE - bottom orifice:	-1 ft (distance below bottom of pond - Negative #)	
10) Max Q Bottom Orif. #1	1.45 cfs	
11) Top Orif #2 Height =	3.24 ft	
12) Max Q Mid Orif. #3	0.00 cfs	Orifice not being used
13) Mid Orif #3 Height =	0.00 ft	Orifice not being used

Detention Facility Design Results:

Performance year	Developed Inflow cfs	Pre-Developed Outflow cfs	Actual Outflow cfs	Peak Stage ft	Storage cf
100	0	0	0	0	-
25	5.66	2.83	2.83	4.00	9,029
10	4.78	2.22	2.22	3.52	7,449
5	4.41	1.97	1.82	3.33	6,851
2	3.19	1.18	1.18	2.32	4,127
Required Storage =====					9,029

	Bottom Orif.	Middle Orif.	Top Orif.	Optional Weir Design (for top orifice)
Total Q =	1.45	0.00	1.38	0.93 La (ft)
Head (ft) =	5.00	0.00	0.76	106.37 < deg.
Dist. from bottom of pond (ft) =	-1.00	NA	3.24	Weir is an option
Orif. Dia. (in) =	4.88	0.00	7.64	

FLOW CONTROL STRUCTURE SCHEMATIC



Project Name: The Views - Basin 2 Pond

Detention Facility Type

Job #

19-071

Date:

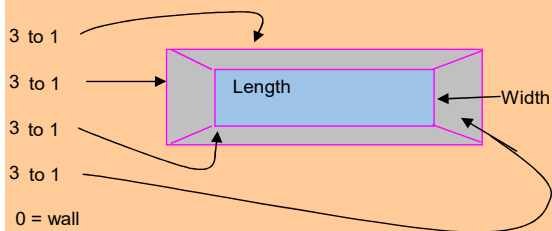
6/24/2020

Detention Facility Type:

DETENTION POND

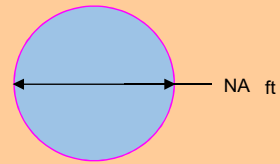
L = 35.0 ft
 W = 35.0 ft
 D = 4.0 ft
 Pond Area = 1,225 sf

DETENTION POND



DETENTION TANK

NA



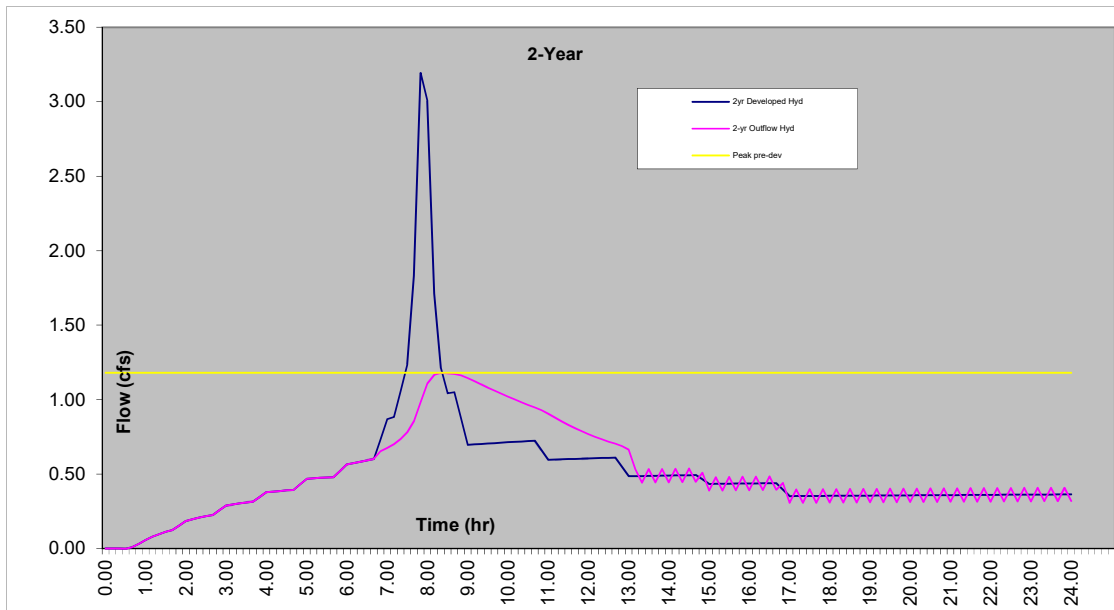
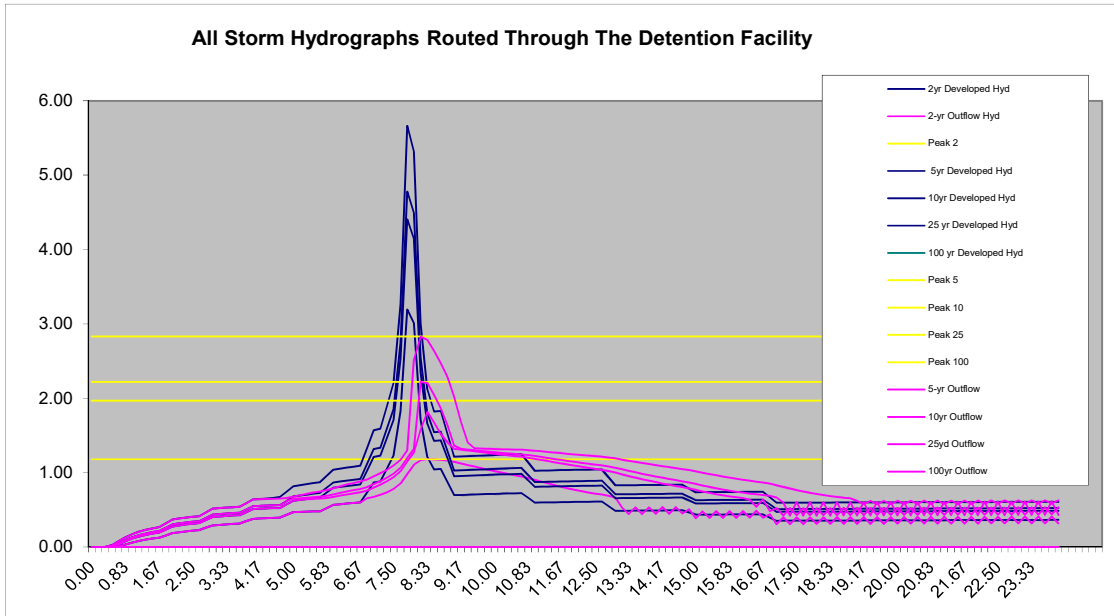
USER DEFINED POND

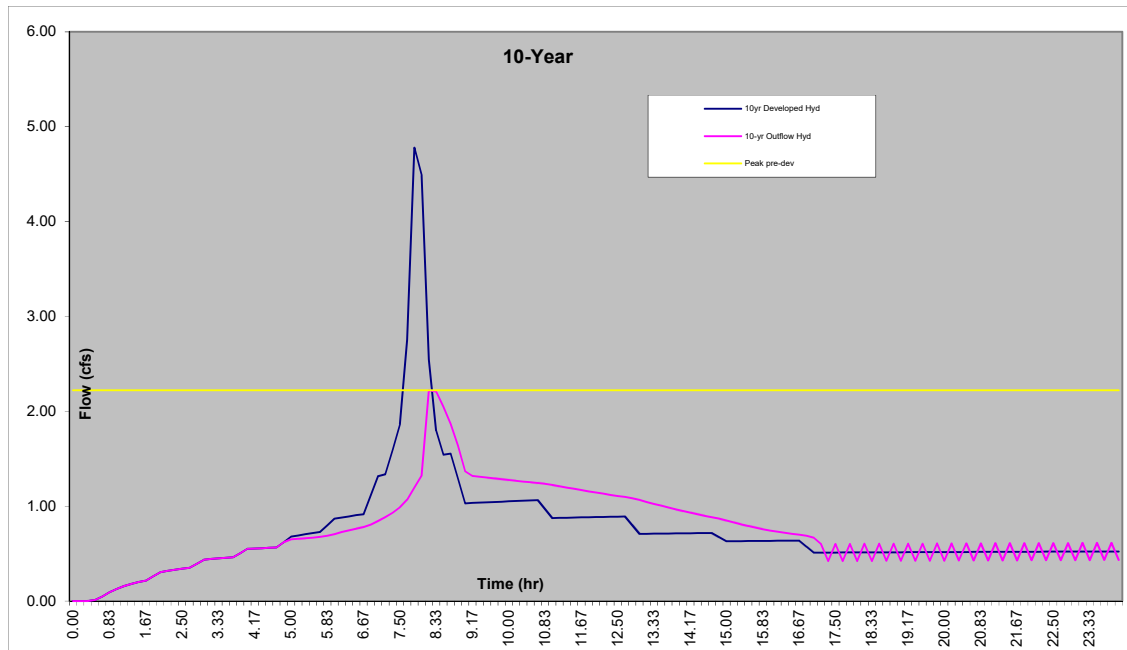
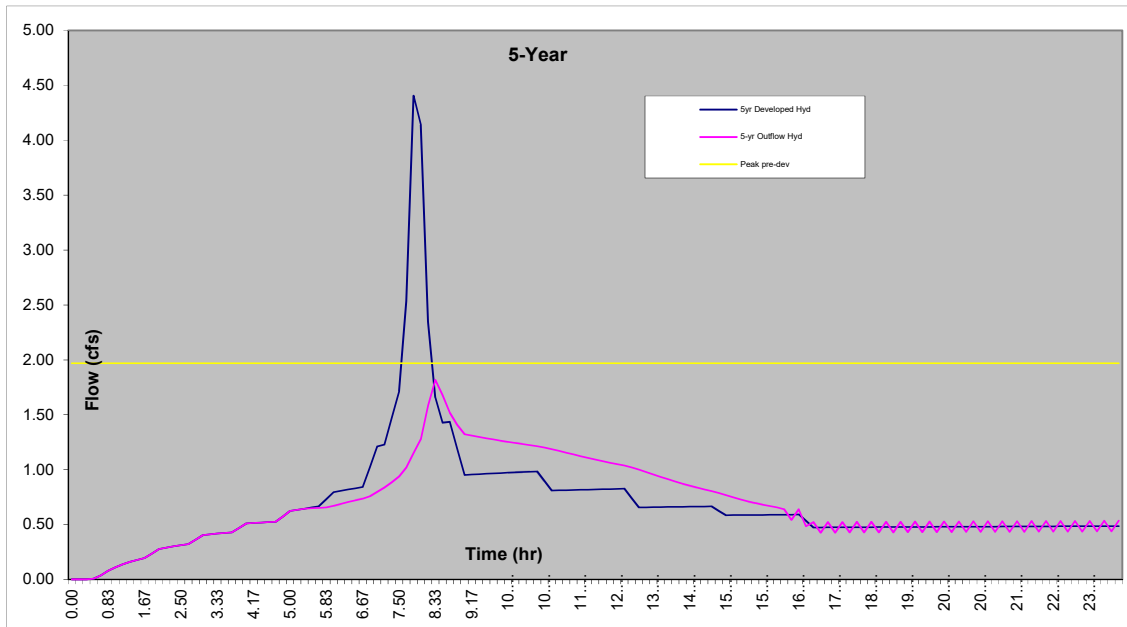
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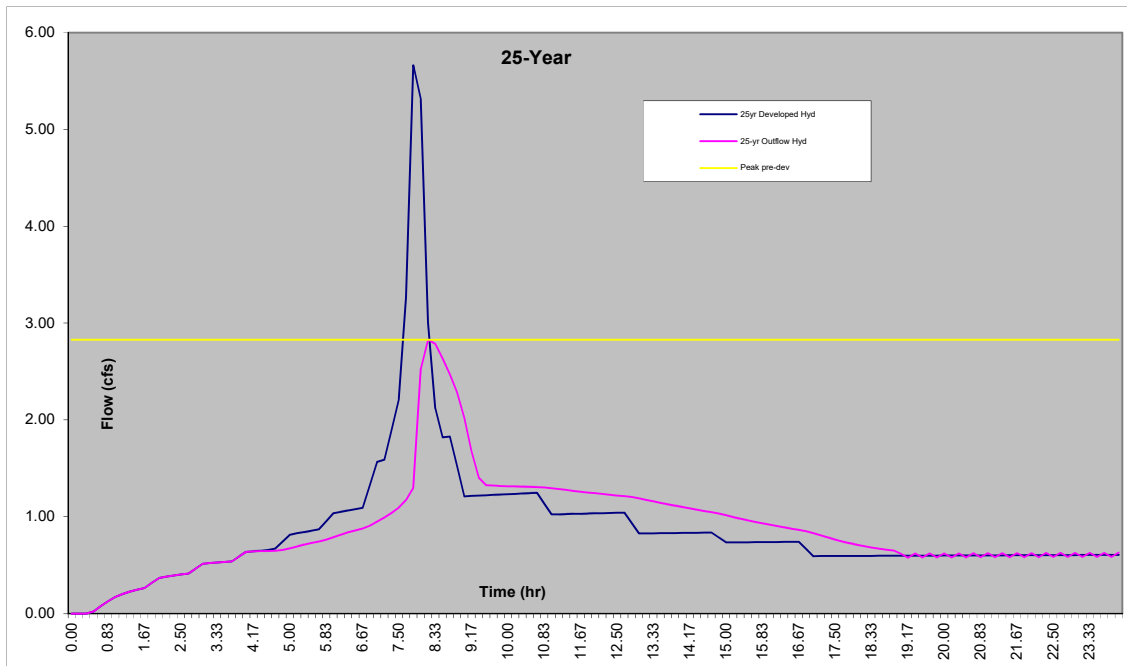
Pond Geometry

Stage (ft)	Area (sf)
0	NA
1	NA
2	NA
3	NA
4	NA
5	NA
6	NA
7	NA
8	NA
9	NA
10	NA
11	NA
12	NA
13	NA
14	NA
15	NA





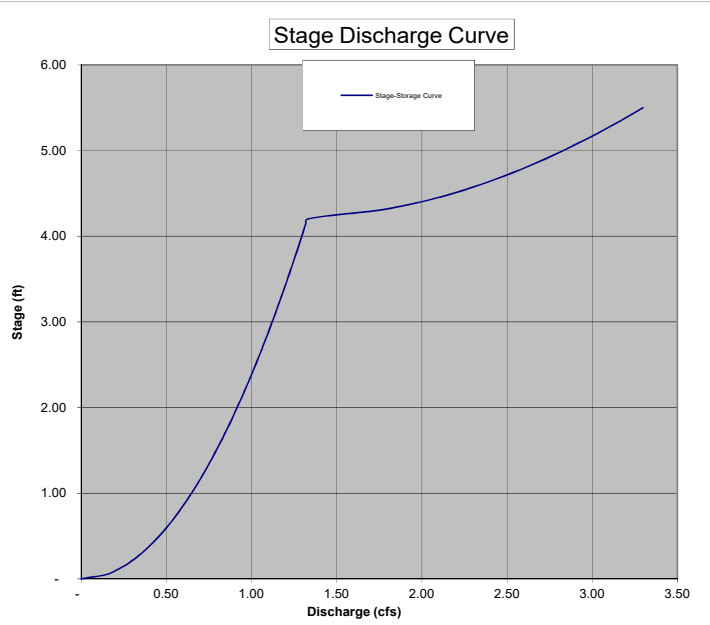
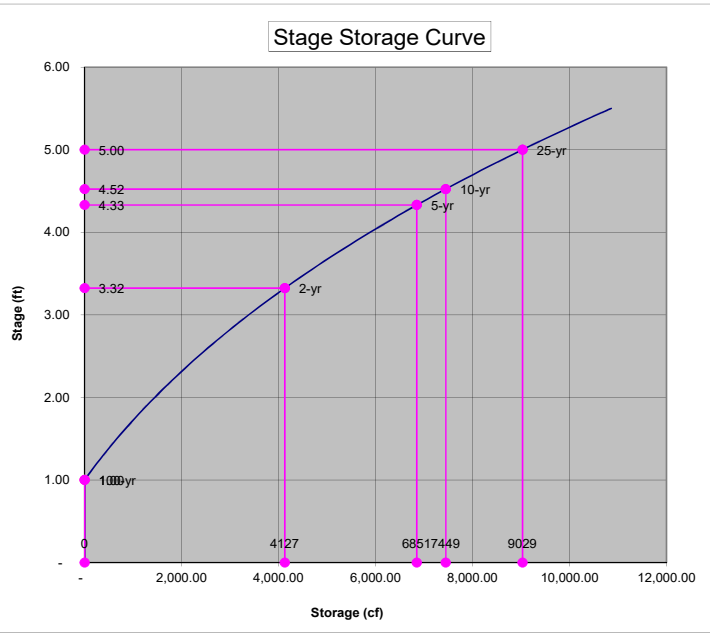




Project Name: The Views - Basin 2 Pond
Stage Storage Summary

Job # 19-071
 Date: 6/24/2020

Stage ft	Storage cf	Discharge cfs
-	-	-
0.05	-	0.14
0.10	-	0.20
0.15	-	0.25
0.20	-	0.29
0.25	-	0.32
0.30	-	0.35
0.35	-	0.38
0.40	-	0.41
0.45	-	0.43
0.50	-	0.46
0.55	-	0.48
0.60	-	0.50
0.65	-	0.52
0.70	-	0.54
0.75	-	0.56
0.80	-	0.58
0.85	-	0.60
0.90	-	0.61
0.95	-	0.63
1.00	-	0.65
1.05	61.78	0.66
1.10	124.63	0.68
1.15	188.54	0.69
1.20	253.52	0.71
1.25	319.60	0.72
1.30	386.77	0.74
1.35	455.04	0.75
1.40	524.43	0.77
1.45	594.93	0.78
1.50	666.57	0.79
1.55	739.35	0.81
1.60	813.28	0.82
1.65	888.37	0.83
1.70	964.62	0.84
1.75	1,042.05	0.86
1.80	1,120.67	0.87
1.85	1,200.47	0.88
1.90	1,281.49	0.89
1.95	1,363.71	0.90
2.00	1,447.15	0.92
2.05	1,531.83	0.93
2.10	1,617.74	0.94
2.15	1,704.90	0.95
2.20	1,793.32	0.96
2.25	1,883.01	0.97
2.30	1,973.97	0.98
2.35	2,066.21	0.99
2.40	2,159.75	1.00
2.45	2,254.59	1.01
2.50	2,350.74	1.02
2.55	2,448.21	1.03
2.60	2,547.01	1.04
2.65	2,647.15	1.05
2.70	2,748.63	1.06
2.75	2,851.47	1.07
2.80	2,955.68	1.08
2.85	3,061.26	1.09
2.90	3,168.22	1.10
2.95	3,276.58	1.11
3.00	3,386.33	1.12
3.05	3,497.50	1.13
3.10	3,610.08	1.14
3.15	3,724.10	1.15
3.20	3,839.55	1.16



Stage ft	Storage cf	Discharge cfs
3.25	3,956.44	1.17
3.30	4,074.79	1.18
3.35	4,194.61	1.19
3.40	4,315.90	1.19
3.45	4,438.67	1.20
3.50	4,562.93	1.21
3.55	4,688.69	1.22
3.60	4,815.96	1.23
3.65	4,944.75	1.24
3.70	5,075.07	1.25
3.75	5,206.92	1.25
3.80	5,340.32	1.26
3.85	5,475.27	1.27
3.90	5,611.78	1.28
3.95	5,749.87	1.29
4.00	5,889.54	1.30
4.05	6,030.79	1.30
4.10	6,173.65	1.31
4.15	6,318.11	1.32
4.20	6,464.19	1.33
4.25	6,611.90	1.49
4.30	6,761.24	1.73
4.35	6,912.23	1.88
4.40	7,064.87	1.99
4.45	7,219.17	2.09
4.50	7,375.15	2.18
4.55	7,532.80	2.26
4.60	7,692.14	2.34
4.65	7,853.18	2.41
4.70	8,015.93	2.48
4.75	8,180.39	2.54
4.80	8,346.58	2.61
4.85	8,514.50	2.66
4.90	8,684.17	2.72
4.95	8,855.58	2.78
5.00	9,028.76	2.83

**Project Name: The Views - Basin 2 Pond
Rectangular, Sharp Crested Weir Calculations**

Job # 19-071
Date: 6/24/2020

Weir Equation: $Q = C(L-0.2H)H^{3/2}$

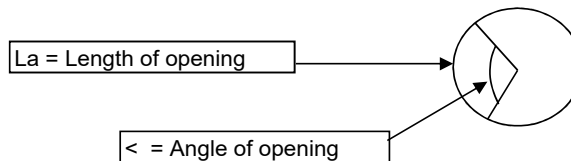
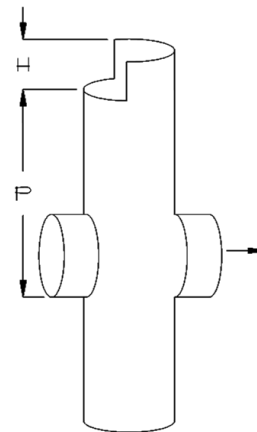
- Q = Flow over weir (cfs)
- C = $3.27 + 0.40 H/P$ (ft)
- L = Adjusted length of weir ($L_a - 0.1H \times 2$) this is to account for side constraints
- L_a = Actual length of weir along pipes interior circumference (ft)
- H = Distance from bottom of weir to maximum head (ft)
- P = Distance from bottom of weir to outfall invert elevation (ft)
- D = Inside riser pipe diameter (in)
- < = Angle of opening for weir (maximum 180 degrees)

Given:

Q	1.38	cfs
H	0.76	ft
P	4.24	ft
D	12	in

Find:

C	3.34	ft
L	0.78	ft
L _a	0.93	ft
<	106	degrees



Appendix E

Basin 3 Analysis, Data, and Detention Pond Design

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Project Name: The Views - Basin 3 Pond
PRE-DEVELOPED - TIME OF CONCENTRATION CALCULATIONS

Job # 19-071
 Date: 6/24/2020

34.4 = Total Tc (min)

Overland Flow (max 300' total)

		total		
Tc =	31.8		31.8	= travel time for less than 300' (min)
Ns =	0.24			= Manning's coefficient (sheet flow)
L =	300		300	= flow length (ft)
P2 =	2.7			= 2-year, 24 hour rainfall (in)
So =	3.00%			= slope of the land (%)

Shallow Concentrated Flow (after initial 300')

		total		
T =	2.6		2.6	= travel time for sheet flow (min)
L =	376		376	= flow length (ft)
So =	4.80%			= slope of the land (%)
k =	11			= time of concentration velocity factor (ft/s)

Flow in Swales

		total		
Tc =	0.00		0.0	= travel time in swale (min)
A =	6.00			= area of flow (sf)
R =	0.59			= hydraulic radius (ft)
Ls =	4.12			= side slope wet (ft)
Q =	3.12			= quantity of flow (ft ³ /sec)
V =	0.52			= velocity
L =	0		0	= flow length (ft)
Ve =	1			= vertical distance of side
Ho =	4			= horizontal distance of side
Bw =	24			= base width of swale (in)
D =	12			= depth of flow ESTIMATE (in)
S =	1.00%			= slope of the swale (%)
n =	0.2			= Manning's coefficient (channel)

Flow in Gutters

		total		
Tc =	0.0		0.0	= travel time in gutter (min)
fps =	0.02			= average velocity of flow (ft/sec)
T =	0.0			= calculated width of flow in the gutter (ft)
Qc =	0.00			= quantity of flow (as calculated Q=CIA) (ft ³ /sec)
C =	0.90			= runoff coefficient for rational method (paved=0.9)
I =	2.75			= rainfall intensity (assume 5 min tc)
W =	18.00			= width of pavement draining to CB
S =	8.00%			= street longitudinal slope (%)
Sx =	2.50%			= street cross slope (%)
n =	0.016			= Manning's coefficient (pavement = 0.016)
L =	0.0		0	= length of flow and drainage basin (ft)

Flow in Pipes

		total		
Tc =	0.0		0.0	= travel time in pipe (min)
V =	10.15			= calculated velocity pipe full (ft/sec)
Q =	7.96			= quantity of flow (ft ³ /sec)
n =	0.013			= Manning's coefficient (pipe)
D =	12			= pipe diameter (in)
S =	5.00%			= slope of pipe (%)
L =	0.0		0	= length of pipe (ft)

Project Name: The Views - Basin 3 Pond
Hydrograph Analysis Summary

Job # 19-071
 Date: 6/24/2020

Rainfall (year)	Rainfall (inches)
2	3.50
5	4.50
10	4.80
25	5.50
100	0.00

Pre-Developed	
Pervious	
Area =	10.139 acres
CN =	76 na
Impervious	
Area =	0.317 acres
CN =	98 na
Tc =	34.4 min
Total A =	10.456 acres

Developed	
Pervious	
Area =	4.91 acres
CN =	74 na
Impervious	
Area =	5.546 acres
CN =	98 na
Tc =	5 min
Total A =	10.456 acres

Note: The hydrographs shown are based on the S.C.S. Type - 1A, 24 hour storm using the SBUH method based on the King County Model.

Pre-Developed Hydrographs						
Year	=====	2	5	10	25	100
Qpeak	cfs =>	2.02	3.46	3.93	5.06	0.00
Volume	cf =>	53,749	82,927	92,142	114,265	-
Tpeak	min =>	490	480	480	480	10
Tpeak	hr =>	8.17	8.00	8.00	8.00	0.17
Hydrograph Name=>		2	5	10	25	100
Time (min)	Time (hr)	Hyd (cfs)	Hyd (cfs)	Hyd (cfs)	Hyd (cfs)	Hyd (cfs)
0	0.00	0.00	0.00	0.00	0.00	0.00
10	0.17	0.00	0.00	0.00	0.00	0.00
20	0.33	0.00	0.00	0.00	0.00	0.00
30	0.50	0.00	0.00	0.00	0.00	0.00
40	0.67	0.00	0.00	0.00	0.00	0.00
50	0.83	0.00	0.00	0.00	0.01	0.00
60	1.00	0.00	0.01	0.01	0.01	0.00
70	1.17	0.00	0.01	0.01	0.01	0.00
80	1.33	0.01	0.01	0.01	0.02	0.00
90	1.50	0.01	0.01	0.01	0.02	0.00
100	1.67	0.01	0.01	0.02	0.02	0.00
110	1.83	0.01	0.02	0.02	0.02	0.00
120	2.00	0.01	0.02	0.02	0.03	0.00
130	2.17	0.02	0.02	0.03	0.03	0.00
140	2.33	0.02	0.03	0.03	0.03	0.00
150	2.50	0.02	0.03	0.03	0.04	0.00
160	2.67	0.02	0.03	0.03	0.04	0.00
170	2.83	0.02	0.03	0.03	0.04	0.00
180	3.00	0.02	0.03	0.04	0.05	0.00
190	3.17	0.03	0.04	0.04	0.05	0.00
200	3.33	0.03	0.04	0.04	0.05	0.00
210	3.50	0.03	0.04	0.04	0.05	0.00
220	3.67	0.03	0.04	0.05	0.05	0.00
230	3.83	0.03	0.04	0.05	0.06	0.00
240	4.00	0.03	0.05	0.05	0.06	0.00
250	4.17	0.04	0.05	0.05	0.07	0.00
260	4.33	0.04	0.05	0.06	0.10	0.00
270	4.50	0.04	0.05	0.06	0.13	0.00
280	4.67	0.04	0.06	0.08	0.16	0.00
290	4.83	0.04	0.07	0.10	0.21	0.00
300	5.00	0.04	0.09	0.14	0.27	0.00
310	5.17	0.05	0.12	0.18	0.33	0.00
320	5.33	0.05	0.16	0.22	0.39	0.00
330	5.50	0.05	0.20	0.27	0.45	0.00
340	5.67	0.06	0.24	0.31	0.51	0.00
350	5.83	0.08	0.29	0.37	0.58	0.00
360	6.00	0.10	0.34	0.43	0.67	0.00
370	6.17	0.13	0.40	0.50	0.75	0.00
380	6.33	0.16	0.45	0.56	0.83	0.00
390	6.50	0.19	0.51	0.62	0.90	0.00
400	6.67	0.23	0.56	0.68	0.97	0.00
410	6.83	0.28	0.65	0.78	1.10	0.00
420	7.00	0.35	0.78	0.92	1.28	0.00
430	7.17	0.42	0.89	1.05	1.45	0.00
440	7.33	0.52	1.06	1.24	1.69	0.00
450	7.50	0.65	1.28	1.49	1.99	0.00
460	7.67	0.92	1.72	1.99	2.63	0.00
470	7.83	1.53	2.72	3.11	4.05	0.00
480	8.00	2.00	3.46	3.93	5.06	0.00
490	8.17	2.02	3.43	3.89	4.98	0.00
500	8.33	1.89	3.18	3.59	4.58	0.00
510	8.50	1.75	2.91	3.28	4.17	0.00

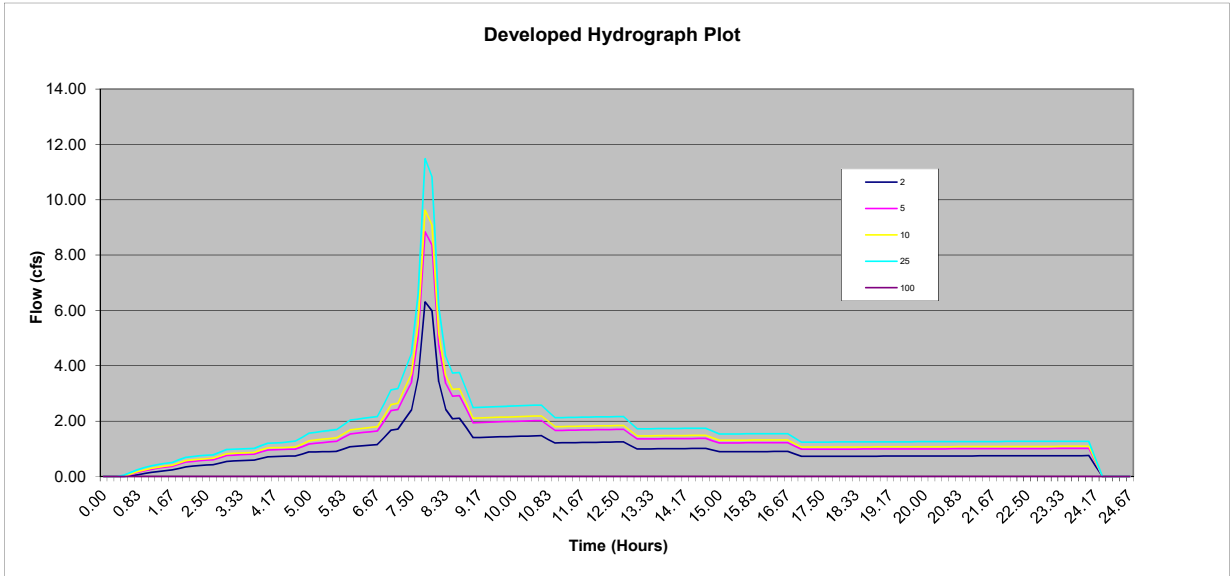
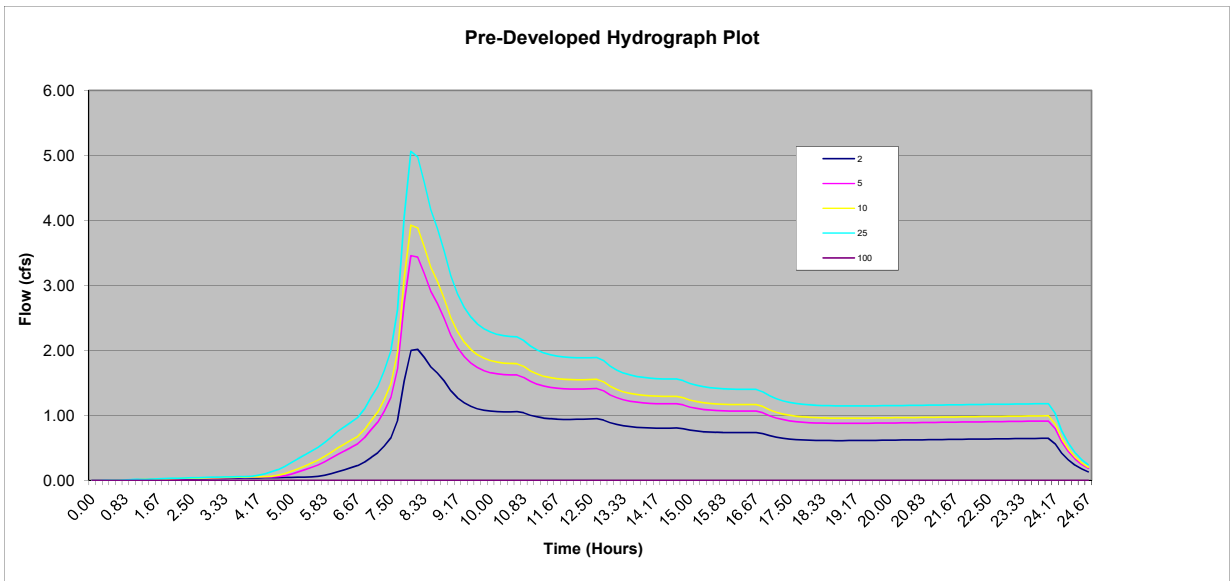
Developed Hydrographs					
	2	5	10	25	100
Qpeak	6.31	8.84	9.62	11.49	0.00
Volume	87,826	120,952	131,137	155,242	-
Tpeak	470	470	470	470	10
Tpeak	7.83	7.83	7.83	7.83	0.17
Hydrograph Name=>	2	5	10	25	100
Time (min)	Hyd (cfs)	Hyd (cfs)	Hyd (cfs)	Hyd (cfs)	Hyd (cfs)
0	0.00	0.00	0.00	0.00	0.00
10	0.00	0.00	0.00	0.00	0.00
20	0.00	0.00	0.00	0.00	0.00
30	0.00	0.01	0.02	0.05	0.00
40	0.02	0.07	0.09	0.15	0.00
50	0.06	0.15	0.18	0.25	0.00
60	0.11	0.21	0.24	0.32	0.00
70	0.15	0.26	0.30	0.38	0.00
80	0.18	0.30	0.34	0.43	0.00
90	0.21	0.34	0.38	0.47	0.00
100	0.24	0.37	0.41	0.50	0.00
110	0.29	0.44	0.49	0.60	0.00
120	0.35	0.52	0.57	0.69	0.00
130	0.37	0.55	0.60	0.72	0.00
140	0.39	0.57	0.62	0.74	0.00
150	0.41	0.59	0.64	0.76	0.00
160	0.43	0.60	0.66	0.78	0.00
170	0.49	0.68	0.74	0.88	0.00
180	0.54	0.76	0.82	0.97	0.00
190	0.56	0.77	0.84	0.98	0.00
200	0.57	0.79	0.85	1.00	0.00
210	0.58	0.80	0.86	1.01	0.00
220	0.59	0.81	0.87	1.02	0.00
230	0.65	0.88	0.95	1.11	0.00
240	0.71	0.96	1.03	1.20	0.00
250	0.72	0.97	1.04	1.21	0.00
260	0.73	0.98	1.05	1.22	0.00
270	0.74	0.98	1.06	1.25	0.00
280	0.74	0.99	1.06	1.28	0.00
290	0.81	1.08	1.17	1.42	0.00
300	0.88	1.18	1.29	1.56	0.00
310	0.89	1.20	1.32	1.60	0.00
320	0.89	1.22	1.34	1.63	0.00
330	0.90	1.25	1.37	1.66	0.00
340	0.90	1.27	1.40	1.69	0.00
350	0.98	1.40	1.54	1.86	0.00
360	1.07	1.53	1.68	2.03	0.00
370	1.09	1.56	1.71	2.07	0.00
380	1.11	1.59	1.74	2.10	0.00
390	1.13	1.62	1.77	2.13	0.00
400	1.15	1.64	1.80	2.16	0.00
410	1.41	2.01	2.19	2.64	0.00
420	1.67	2.38	2.60	3.13	0.00
430	1.71	2.42	2.65	3.18	0.00
440	2.06	2.91	3.17	3.81	0.00
450	2.41	3.41	3.71	4.45	0.00
460	3.59	5.06	5.51	6.59	0.00
470	6.31	8.84	9.62	11.49	0.00
480	5.97	8.34	9.07	10.81	0.00
490	3.42	4.76	5.17	6.14	0.00
500	2.42	3.36	3.65	4.34	0.00
510	2.09	2.90	3.15	3.73	0.00

Pre-Developed Hydrographs							Developed Hydrographs					
Year	=====>	2	5	10	25	100	2	5	10	25	100	
Qpeak	cfs =>	2.02	3.46	3.93	5.06	0.00	6.31	8.84	9.62	11.49	0.00	
Volume	cf =>	53,749	82,927	92,142	114,265	-	87,826	120,952	131,137	155,242	-	
Tpeak	min =>	490	480	480	480	10	470	470	470	470	10	
Tpeak	hr =>	8.17	8.00	8.00	8.00	0.17	7.83	7.83	7.83	7.83	0.17	
Hydrograph Name=>		2	5	10	25	100	2	5	10	25	100	
Time	Time	Hyd	Hyd	Hyd	Hyd	Hyd	Hyd	Hyd	Hyd	Hyd	Hyd	
(min)	(hr)	(cfs)	(cfs)	(cfs)	(cfs)	(cfs)	(cfs)	(cfs)	(cfs)	(cfs)	(cfs)	
520	8.67	1.65	2.72	3.06	3.87	0.00	2.11	2.92	3.17	3.76	0.00	
530	8.83	1.53	2.49	2.80	3.53	0.00	1.76	2.43	2.64	3.13	0.00	
540	9.00	1.38	2.23	2.50	3.15	0.00	1.40	1.94	2.11	2.49	0.00	
550	9.17	1.27	2.04	2.29	2.87	0.00	1.41	1.95	2.11	2.50	0.00	
560	9.33	1.19	1.90	2.13	2.66	0.00	1.42	1.96	2.12	2.51	0.00	
570	9.50	1.14	1.81	2.01	2.51	0.00	1.43	1.97	2.13	2.52	0.00	
580	9.67	1.10	1.74	1.93	2.41	0.00	1.43	1.97	2.14	2.53	0.00	
590	9.83	1.08	1.69	1.88	2.33	0.00	1.44	1.98	2.15	2.54	0.00	
600	10.00	1.06	1.66	1.84	2.28	0.00	1.45	1.99	2.16	2.55	0.00	
610	10.17	1.05	1.64	1.82	2.25	0.00	1.45	2.00	2.16	2.56	0.00	
620	10.33	1.05	1.62	1.80	2.22	0.00	1.46	2.01	2.17	2.57	0.00	
630	10.50	1.05	1.62	1.79	2.21	0.00	1.47	2.01	2.18	2.57	0.00	
640	10.67	1.06	1.62	1.79	2.21	0.00	1.47	2.02	2.19	2.58	0.00	
650	10.83	1.04	1.58	1.75	2.15	0.00	1.34	1.84	1.99	2.35	0.00	
660	11.00	1.00	1.52	1.68	2.07	0.00	1.21	1.66	1.80	2.12	0.00	
670	11.17	0.97	1.48	1.64	2.01	0.00	1.22	1.67	1.80	2.13	0.00	
680	11.33	0.96	1.45	1.60	1.96	0.00	1.22	1.67	1.81	2.13	0.00	
690	11.50	0.95	1.43	1.58	1.93	0.00	1.22	1.68	1.81	2.14	0.00	
700	11.67	0.94	1.42	1.56	1.91	0.00	1.23	1.68	1.82	2.14	0.00	
710	11.83	0.94	1.41	1.55	1.90	0.00	1.23	1.68	1.82	2.15	0.00	
720	12.00	0.94	1.40	1.55	1.89	0.00	1.24	1.69	1.83	2.15	0.00	
730	12.17	0.94	1.40	1.55	1.88	0.00	1.24	1.69	1.83	2.16	0.00	
740	12.33	0.94	1.40	1.55	1.88	0.00	1.24	1.70	1.84	2.16	0.00	
750	12.50	0.94	1.41	1.55	1.88	0.00	1.25	1.70	1.84	2.16	0.00	
760	12.67	0.95	1.41	1.55	1.89	0.00	1.25	1.70	1.84	2.17	0.00	
770	12.83	0.93	1.38	1.52	1.84	0.00	1.12	1.53	1.65	1.95	0.00	
780	13.00	0.89	1.32	1.45	1.76	0.00	0.99	1.35	1.46	1.72	0.00	
790	13.17	0.86	1.27	1.40	1.70	0.00	1.00	1.36	1.47	1.72	0.00	
800	13.33	0.84	1.24	1.36	1.65	0.00	1.00	1.36	1.47	1.73	0.00	
810	13.50	0.82	1.22	1.34	1.62	0.00	1.00	1.36	1.47	1.73	0.00	
820	13.67	0.81	1.20	1.32	1.60	0.00	1.00	1.36	1.47	1.73	0.00	
830	13.83	0.81	1.19	1.31	1.58	0.00	1.00	1.37	1.48	1.73	0.00	
840	14.00	0.80	1.18	1.30	1.57	0.00	1.01	1.37	1.48	1.74	0.00	
850	14.17	0.80	1.18	1.29	1.56	0.00	1.01	1.37	1.48	1.74	0.00	
860	14.33	0.80	1.18	1.29	1.56	0.00	1.01	1.37	1.48	1.74	0.00	
870	14.50	0.80	1.18	1.29	1.56	0.00	1.01	1.37	1.48	1.74	0.00	
880	14.67	0.80	1.18	1.29	1.56	0.00	1.01	1.38	1.49	1.74	0.00	
890	14.83	0.79	1.16	1.27	1.53	0.00	0.95	1.29	1.40	1.64	0.00	
900	15.00	0.77	1.13	1.24	1.49	0.00	0.89	1.21	1.31	1.53	0.00	
910	15.17	0.76	1.11	1.21	1.46	0.00	0.89	1.21	1.31	1.54	0.00	
920	15.33	0.75	1.09	1.20	1.44	0.00	0.89	1.21	1.31	1.54	0.00	
930	15.50	0.74	1.08	1.18	1.42	0.00	0.90	1.22	1.31	1.54	0.00	
940	15.67	0.74	1.07	1.17	1.41	0.00	0.90	1.22	1.31	1.54	0.00	
950	15.83	0.73	1.07	1.17	1.41	0.00	0.90	1.22	1.32	1.54	0.00	
960	16.00	0.73	1.06	1.17	1.40	0.00	0.90	1.22	1.32	1.54	0.00	
970	16.17	0.73	1.06	1.16	1.40	0.00	0.90	1.22	1.32	1.54	0.00	
980	16.33	0.73	1.06	1.16	1.40	0.00	0.90	1.22	1.32	1.55	0.00	
990	16.50	0.73	1.06	1.16	1.40	0.00	0.90	1.22	1.32	1.55	0.00	
1000	16.67	0.73	1.06	1.16	1.40	0.00	0.91	1.23	1.32	1.55	0.00	
1010	16.83	0.72	1.04	1.14	1.36	0.00	0.82	1.10	1.19	1.40	0.00	
1020	17.00	0.69	0.99	1.08	1.30	0.00	0.73	0.98	1.06	1.24	0.00	
1030	17.17	0.66	0.96	1.05	1.26	0.00	0.73	0.98	1.06	1.24	0.00	
1040	17.33	0.65	0.93	1.02	1.22	0.00	0.73	0.98	1.06	1.24	0.00	
1050	17.50	0.63	0.91	1.00	1.20	0.00	0.73	0.99	1.06	1.24	0.00	
1060	17.67	0.63	0.90	0.99	1.18	0.00	0.73	0.99	1.06	1.25	0.00	
1070	17.83	0.62	0.89	0.98	1.17	0.00	0.73	0.99	1.06	1.25	0.00	
1080	18.00	0.62	0.89	0.97	1.16	0.00	0.73	0.99	1.07	1.25	0.00	
1090	18.17	0.61	0.88	0.96	1.15	0.00	0.73	0.99	1.07	1.25	0.00	
1100	18.33	0.61	0.88	0.96	1.15	0.00	0.73	0.99	1.07	1.25	0.00	
1110	18.50	0.61	0.88	0.96	1.15	0.00	0.73	0.99	1.07	1.25	0.00	
1120	18.67	0.61	0.88	0.96	1.14	0.00	0.73	0.99	1.07	1.25	0.00	
1130	18.83	0.61	0.87	0.96	1.14	0.00	0.73	0.99	1.07	1.25	0.00	
1140	19.00	0.61	0.88	0.96	1.14	0.00	0.74	0.99	1.07	1.25	0.00	
1150	19.17	0.61	0.88	0.96	1.14	0.00	0.74	0.99	1.07	1.25	0.00	
1160	19.33	0.61	0.88	0.96	1.14	0.00	0.74	0.99	1.07	1.25	0.00	
1170	19.50	0.61	0.88	0.96	1.14	0.00	0.74	0.99	1.07	1.25	0.00	
1180	19.67	0.61	0.88	0.96	1.15	0.00	0.74	1.00	1.07	1.25	0.00	
1190	19.83	0.61	0.88	0.96	1.15	0.00	0.74	1.00	1.07	1.26	0.00	
1200	20.00	0.62	0.88	0.96	1.15	0.00	0.74	1.00	1.07	1.26	0.00	
1210	20.17	0.62	0.88	0.96	1.15	0.00	0.74	1.00	1.08	1.26	0.00	

Pre-Developed Hydrographs							Developed Hydrographs				
Year	=====>	2	5	10	25	100	2	5	10	25	100
Qpeak	cfs =>	2.02	3.46	3.93	5.06	0.00	6.31	8.84	9.62	11.49	0.00
Volume	cf =>	53,749	82,927	92,142	114,265	-	87,826	120,952	131,137	155,242	-
Tpeak	min =>	490	480	480	480	10	470	470	470	470	10
Tpeak	hr =>	8.17	8.00	8.00	8.00	0.17	7.83	7.83	7.83	7.83	0.17
Hydrograph Name=>		2	5	10	25	100	2	5	10	25	100
Time	Time	Hyd	Hyd	Hyd	Hyd	Hyd	Hyd	Hyd	Hyd	Hyd	Hyd
(min)	(hr)	(cfs)	(cfs)	(cfs)	(cfs)	(cfs)	(cfs)	(cfs)	(cfs)	(cfs)	(cfs)
1220	20.33	0.62	0.88	0.96	1.15	0.00	0.74	1.00	1.08	1.26	0.00
1230	20.50	0.62	0.88	0.96	1.15	0.00	0.74	1.00	1.08	1.26	0.00
1240	20.67	0.62	0.89	0.97	1.15	0.00	0.74	1.00	1.08	1.26	0.00
1250	20.83	0.62	0.89	0.97	1.15	0.00	0.74	1.00	1.08	1.26	0.00
1260	21.00	0.62	0.89	0.97	1.16	0.00	0.74	1.00	1.08	1.26	0.00
1270	21.17	0.62	0.89	0.97	1.16	0.00	0.74	1.00	1.08	1.26	0.00
1280	21.33	0.63	0.89	0.97	1.16	0.00	0.74	1.00	1.08	1.26	0.00
1290	21.50	0.63	0.89	0.97	1.16	0.00	0.75	1.00	1.08	1.26	0.00
1300	21.67	0.63	0.89	0.97	1.16	0.00	0.75	1.00	1.08	1.26	0.00
1310	21.83	0.63	0.89	0.97	1.16	0.00	0.75	1.00	1.08	1.26	0.00
1320	22.00	0.63	0.90	0.98	1.16	0.00	0.75	1.01	1.08	1.27	0.00
1330	22.17	0.63	0.90	0.98	1.16	0.00	0.75	1.01	1.08	1.27	0.00
1340	22.33	0.63	0.90	0.98	1.17	0.00	0.75	1.01	1.08	1.27	0.00
1350	22.50	0.63	0.90	0.98	1.17	0.00	0.75	1.01	1.09	1.27	0.00
1360	22.67	0.64	0.90	0.98	1.17	0.00	0.75	1.01	1.09	1.27	0.00
1370	22.83	0.64	0.90	0.98	1.17	0.00	0.75	1.01	1.09	1.27	0.00
1380	23.00	0.64	0.90	0.98	1.17	0.00	0.75	1.01	1.09	1.27	0.00
1390	23.17	0.64	0.90	0.98	1.17	0.00	0.75	1.01	1.09	1.27	0.00
1400	23.33	0.64	0.91	0.99	1.17	0.00	0.75	1.01	1.09	1.27	0.00
1410	23.50	0.64	0.91	0.99	1.17	0.00	0.75	1.01	1.09	1.27	0.00
1420	23.67	0.64	0.91	0.99	1.18	0.00	0.75	1.01	1.09	1.27	0.00
1430	23.83	0.64	0.91	0.99	1.18	0.00	0.75	1.01	1.09	1.27	0.00
1440	24.00	0.65	0.91	0.99	1.18	0.00	0.75	1.01	1.09	1.27	0.00
1450	24.17	0.56	0.80	0.87	1.03	0.00	0.38	0.51	0.55	0.64	0.00
1460	24.33	0.42	0.59	0.65	0.77	0.00	0.00	0.00	0.00	0.00	0.00
1470	24.50	0.31	0.44	0.48	0.57	0.00	0.00	0.00	0.00	0.00	0.00
1480	24.67	0.23	0.33	0.36	0.43	0.00	0.00	0.00	0.00	0.00	0.00
1490	24.67	0.17	0.25	0.27	0.32	0.00	0.00	0.00	0.00	0.00	0.00
1500	24.67	0.13	0.18	0.20	0.24	0.00	0.00	0.00	0.00	0.00	0.00

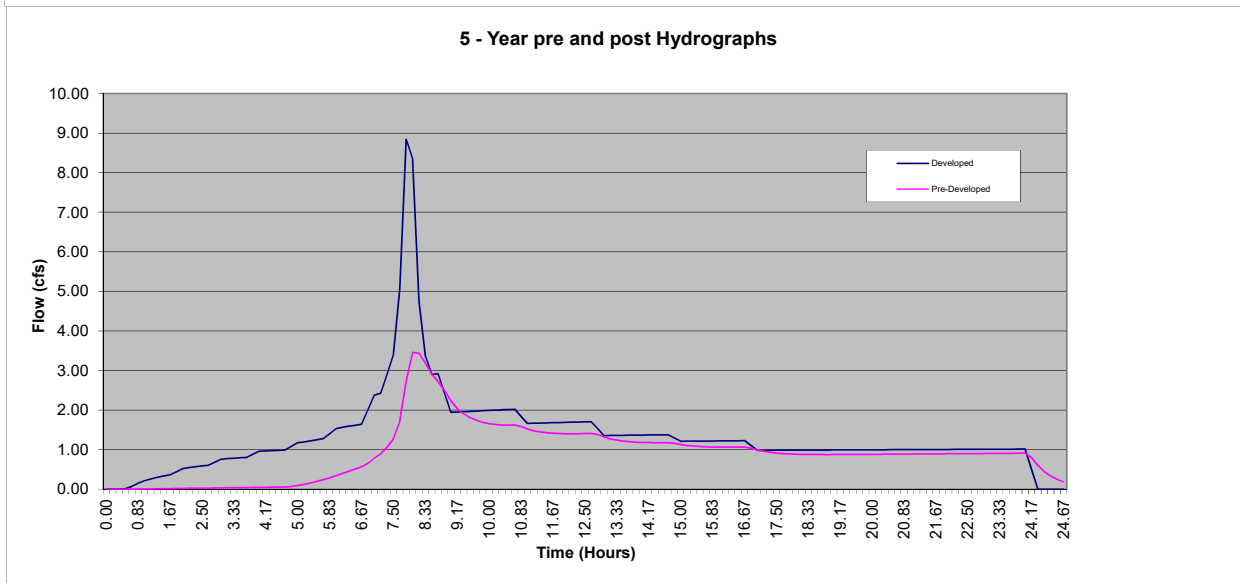
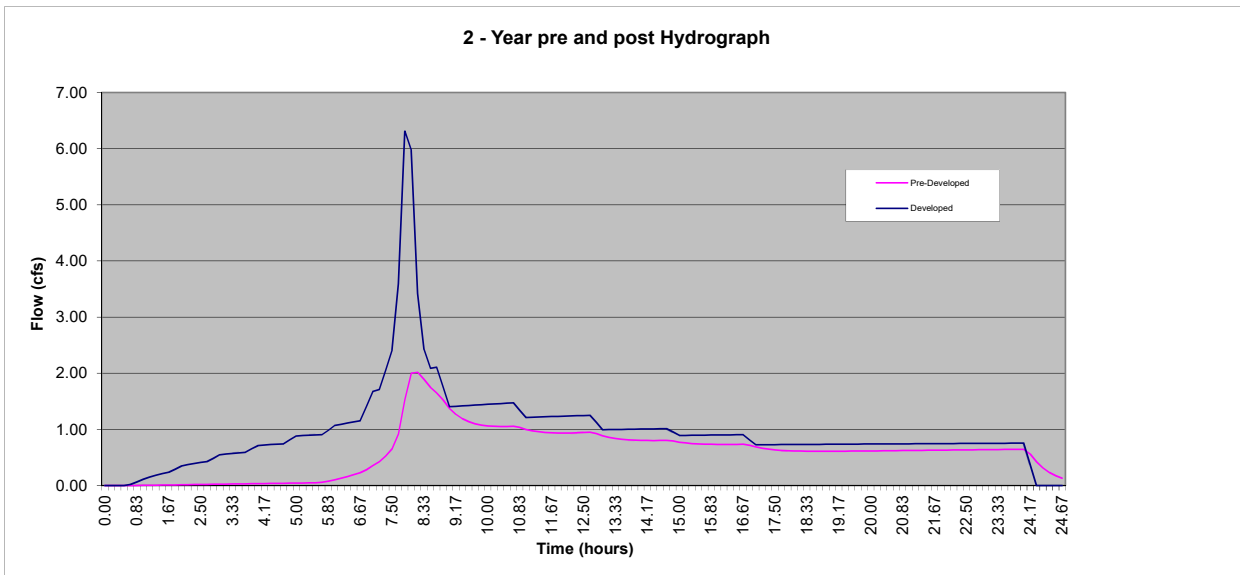
Pre-Developed Hydrographs						
Year	=====	2	5	10	25	100
Qpeak	cfs =>	2.02	3.46	3.93	5.06	0.00
Volume	cf =>	53,749	82,927	92,142	114,265	-
Tpeak	min =>	490	480	480	480	10
Tpeak	hr =>	8.17	8.00	8.00	8.00	0.17
Hydrograph Name=>		2	5	10	25	100
Time	Time	Hyd	Hyd	Hyd	Hyd	Hyd
(min)	(hr)	(cfs)	(cfs)	(cfs)	(cfs)	(cfs)

Developed Hydrographs					
	2	5	10	25	100
Qpeak	6.31	8.84	9.62	11.49	0.00
Volume	87,826	120,952	131,137	155,242	-
Tpeak	470	470	470	470	10
Tpeak	7.83	7.83	7.83	7.83	0.17
Hydrograph Name=>	2	5	10	25	100
Time	Hyd	Hyd	Hyd	Hyd	Hyd
(min)	(cfs)	(cfs)	(cfs)	(cfs)	(cfs)



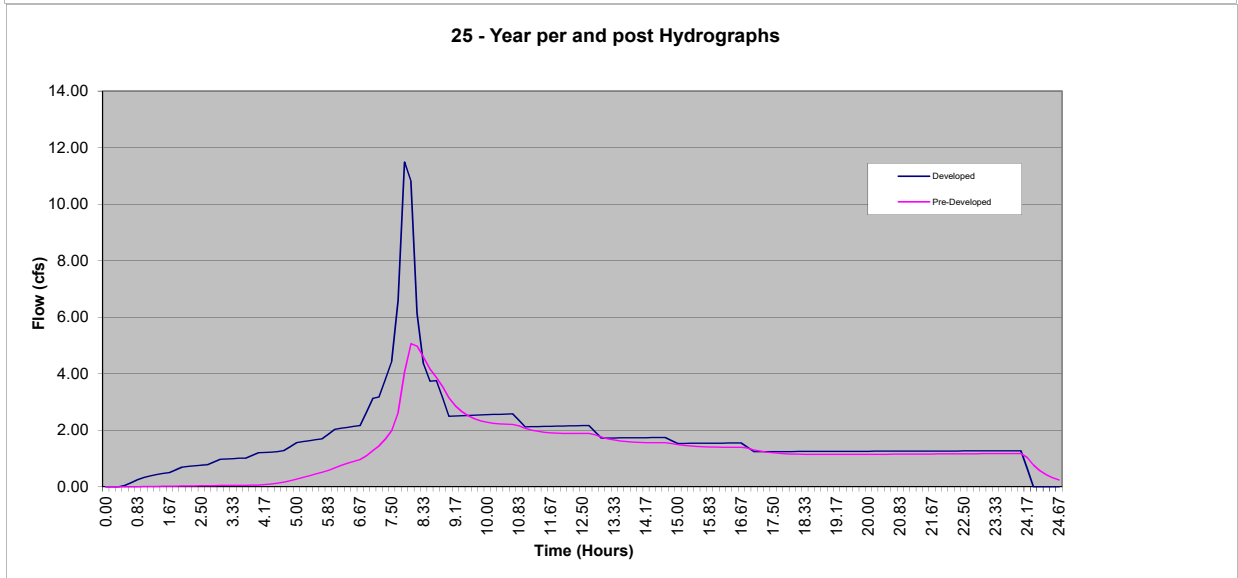
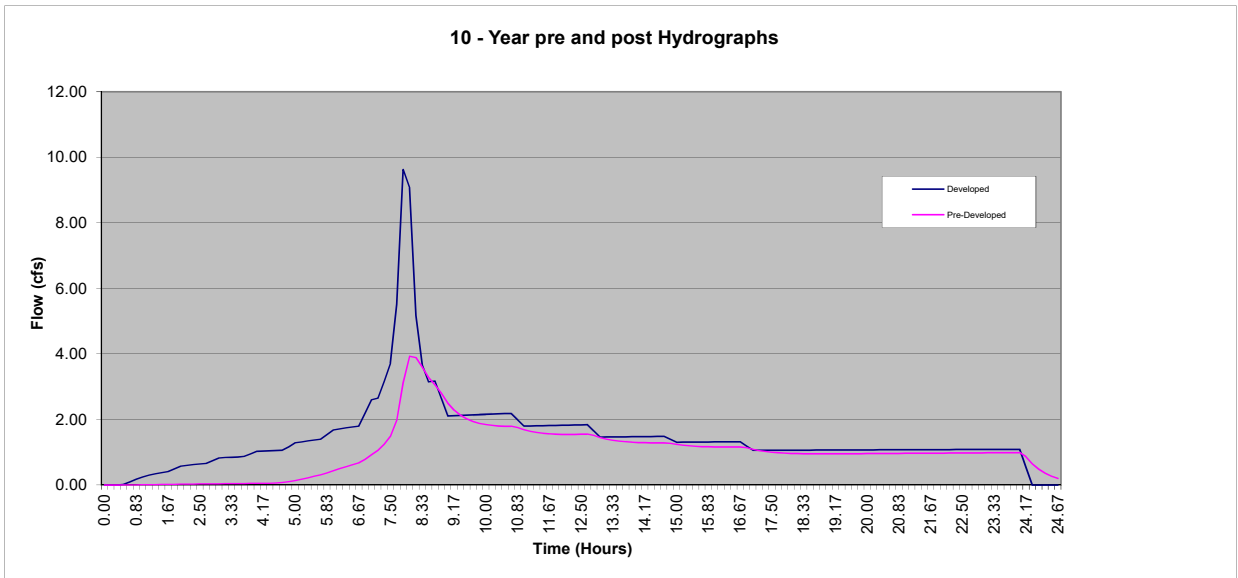
Pre-Developed Hydrographs						
Year	=====>	2	5	10	25	100
Qpeak	cfs =>	2.02	3.46	3.93	5.06	0.00
Volume	cf =>	53,749	82,927	92,142	114,265	-
Tpeak	min =>	490	480	480	480	10
Tpeak	hr =>	8.17	8.00	8.00	8.00	0.17
Hydrograph Name=>		2	5	10	25	100
Time	Time	Hyd	Hyd	Hyd	Hyd	Hyd
(min)	(hr)	(cfs)	(cfs)	(cfs)	(cfs)	(cfs)

Developed Hydrographs					
	2	5	10	25	100
Qpeak	6.31	8.84	9.62	11.49	0.00
Volume	87,826	120,952	131,137	155,242	-
Tpeak	470	470	470	470	10
Tpeak	7.83	7.83	7.83	7.83	0.17
Hydrograph Name=>	2	5	10	25	100
Time	Hyd	Hyd	Hyd	Hyd	Hyd
(min)	(cfs)	(cfs)	(cfs)	(cfs)	(cfs)



Pre-Developed Hydrographs						
Year	=====>	2	5	10	25	100
Qpeak	cfs =>	2.02	3.46	3.93	5.06	0.00
Volume	cf =>	53,749	82,927	92,142	114,265	-
Tpeak	min =>	490	480	480	480	10
Tpeak	hr =>	8.17	8.00	8.00	8.00	0.17
Hydrograph Name=>		2	5	10	25	100
Time	Time	Hyd	Hyd	Hyd	Hyd	Hyd
(min)	(hr)	(cfs)	(cfs)	(cfs)	(cfs)	(cfs)

Developed Hydrographs					
	2	5	10	25	100
Qpeak	6.31	8.84	9.62	11.49	0.00
Volume	87,826	120,952	131,137	155,242	-
Tpeak	470	470	470	470	10
Tpeak	7.83	7.83	7.83	7.83	0.17
Hydrograph Name=>	2	5	10	25	100
Time	Hyd	Hyd	Hyd	Hyd	Hyd
(min)	(cfs)	(cfs)	(cfs)	(cfs)	(cfs)



Project Name: The Views - Basin 3 Pond
Detention System Summary

Job # 19-071
 Date: 6/24/2020

Note: The detention system design is based on the King County Model "Facility Design Routine".

1) Detention Facility Design Input:

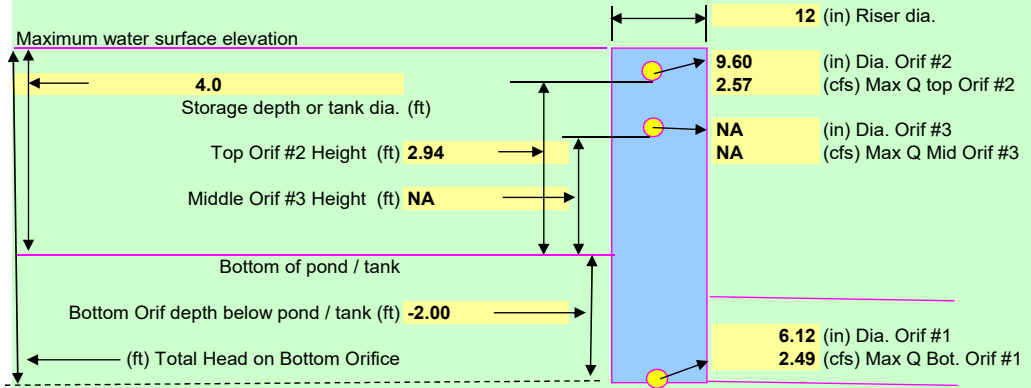
2) Type of facility:	DETENTION POND	
3) Pond side slopes:	3 to 1	
4) Pond storage depth:	4 ft (from bottom of pond to overflow)	
5) Vertical permeability:	0 min/in	
6) Number of orifices:	2	
7) Riser dia. =>	12 in	
8) Orifice coefficient:	0.62 (typically 0.62)	
9) IE - bottom orifice:	-2 ft (distance below bottom of pond - Negative #)	
10) Max Q Bottom Orif. #1	2.49 cfs	
11) Top Orif #2 Height =	2.94 ft	
12) Max Q Mid Orif. #3	0.00 cfs	Orifice not being used
13) Mid Orif #3 Height =	0.00 ft	Orifice not being used

Detention Facility Design Results:

Performance year	Developed Inflow cfs	Pre-Developed Outflow cfs	Actual Outflow cfs	Peak Stage ft	Storage cf
100	0	0	0	0	-
25	11.49	5.06	5.06	4.00	19,983
10	9.62	3.93	3.93	3.34	16,198
5	8.84	3.46	3.23	3.08	14,785
2	6.31	2.02	2.02	1.93	8,785
			Required Storage	====:	19,983

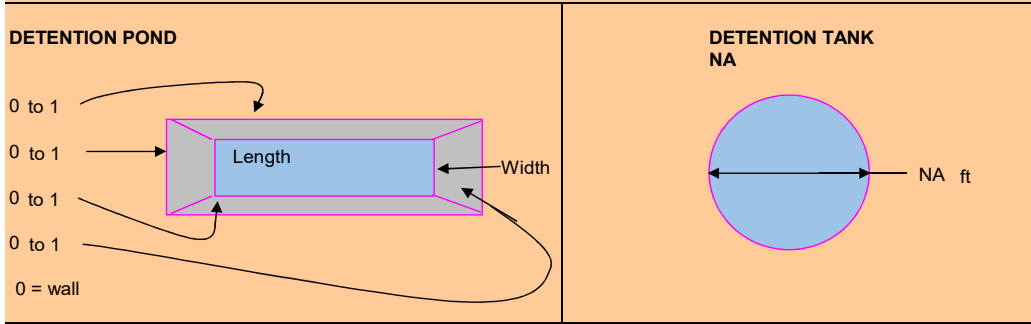
	Bottom Orif.	Middle Orif.	Top Orif.	Optional Weir Design (for top orifice)
Total Q =	2.49	0.00	2.57	1.13 La (ft)
Head (ft) =	6.00	0.00	1.06	129.13 < deg.
Dist. from bottom of pond (ft) =	-2.00	NA	2.94	Weir is an option
Orif. Dia. (in) =	6.12	0.00	9.60	

FLOW CONTROL STRUCTURE SCHEMATIC



Project Name: The Views - Basin 3 Pond
 Detention Facility Type
 Job # 19-071
 Date: 6/24/2020

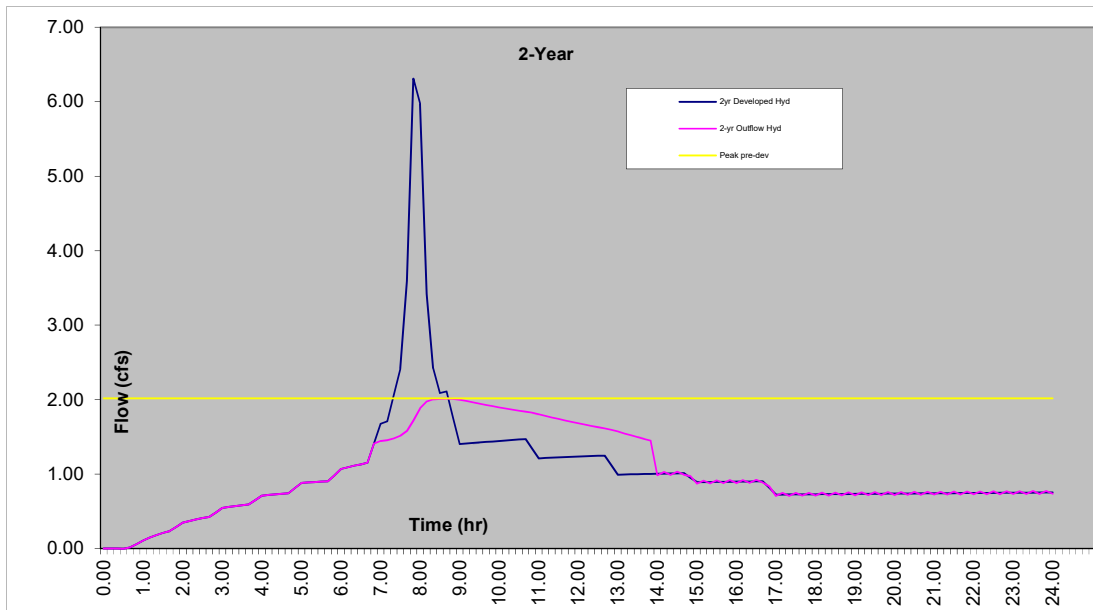
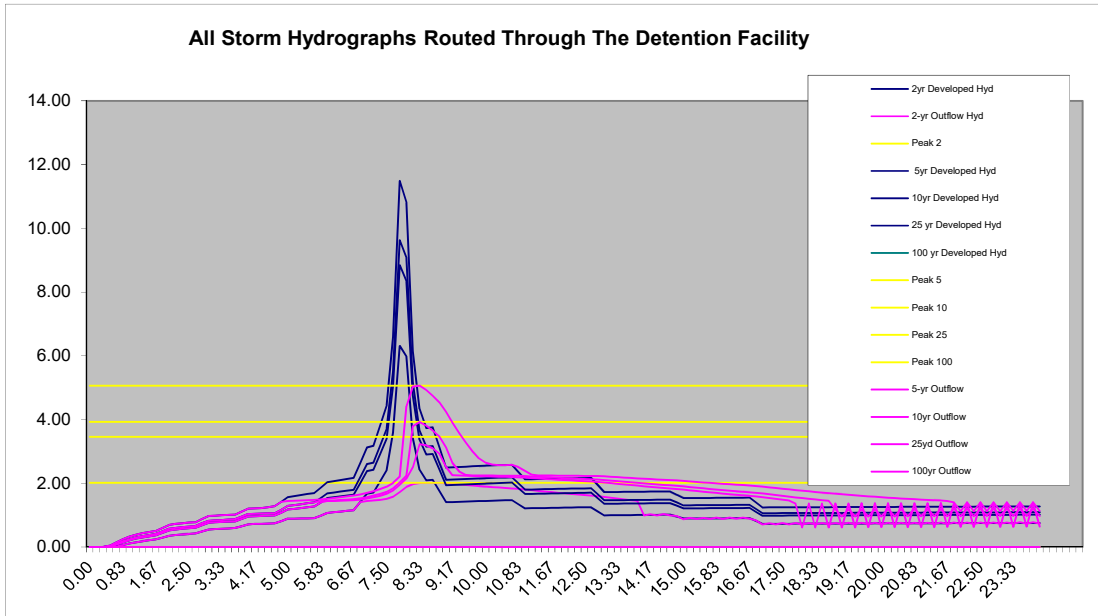
Detention Facility Type:
DETENTION POND
 L = 64.6 ft
 W = 64.6 ft
 D = 4.0 ft
 Pond Area = 4,173 sf

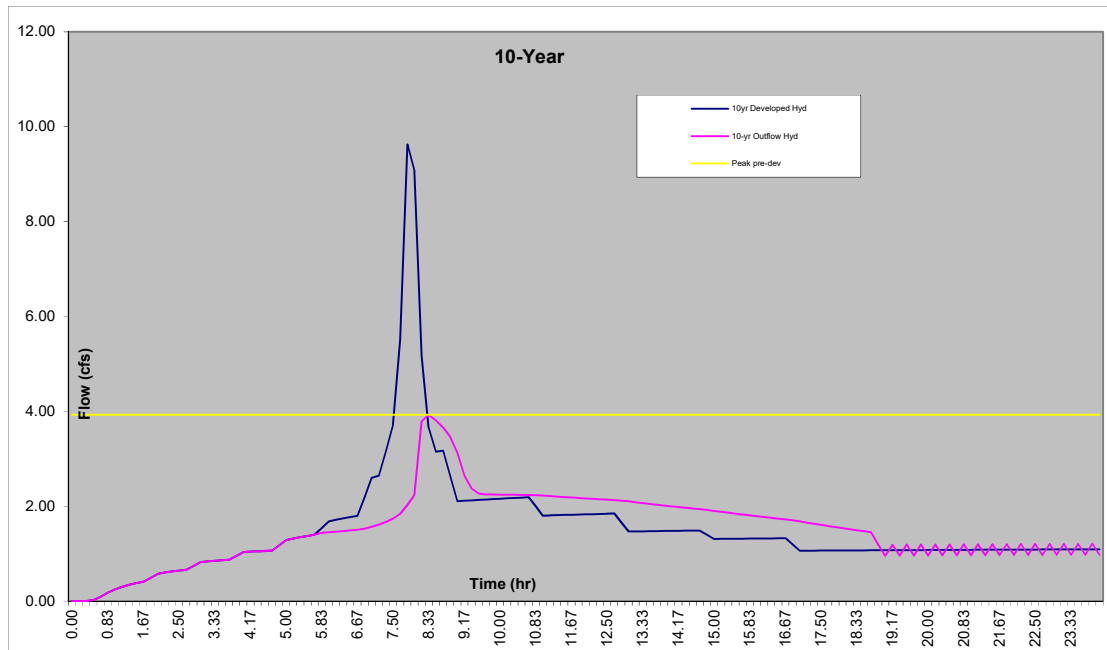
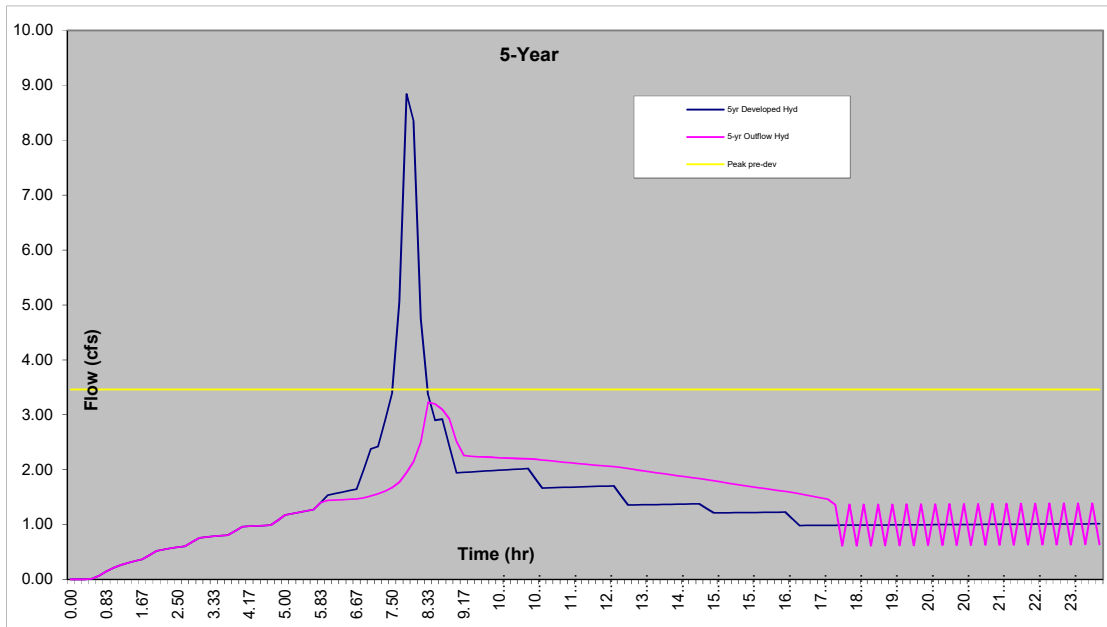


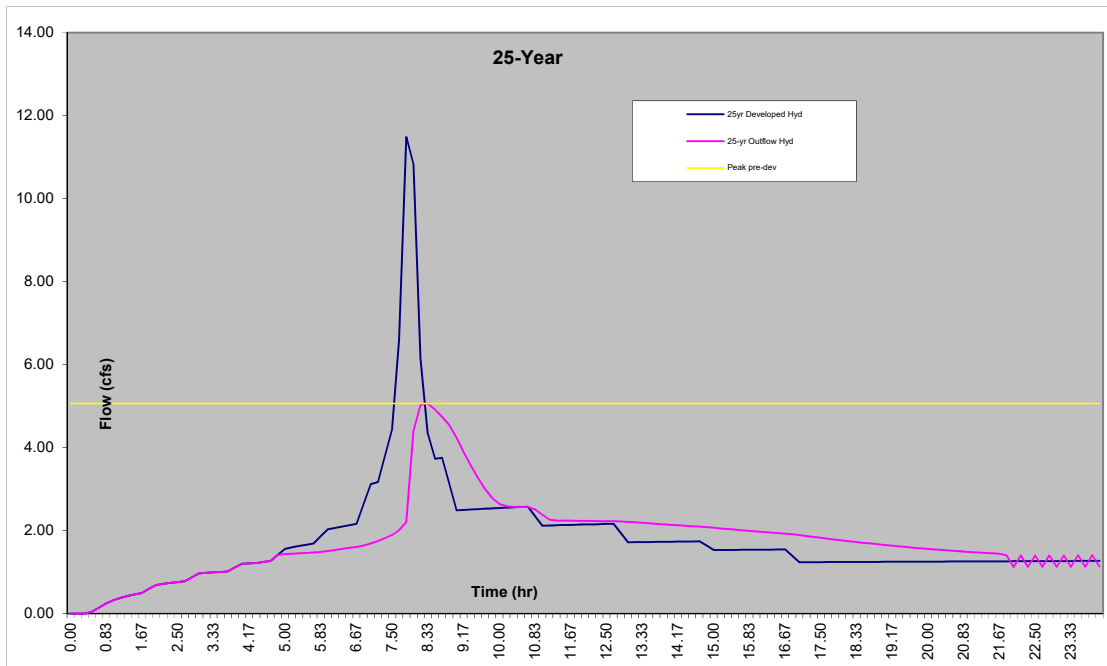
USER DEFINED POND
 NA
 Pond Geometry

Stage (ft)	Area (sf)
0	NA
1	NA
2	NA
3	NA
4	NA
5	NA
6	NA
7	NA
8	NA
9	NA
10	NA
11	NA
12	NA
13	NA
14	NA
15	NA

Stage 1
 Stage 0



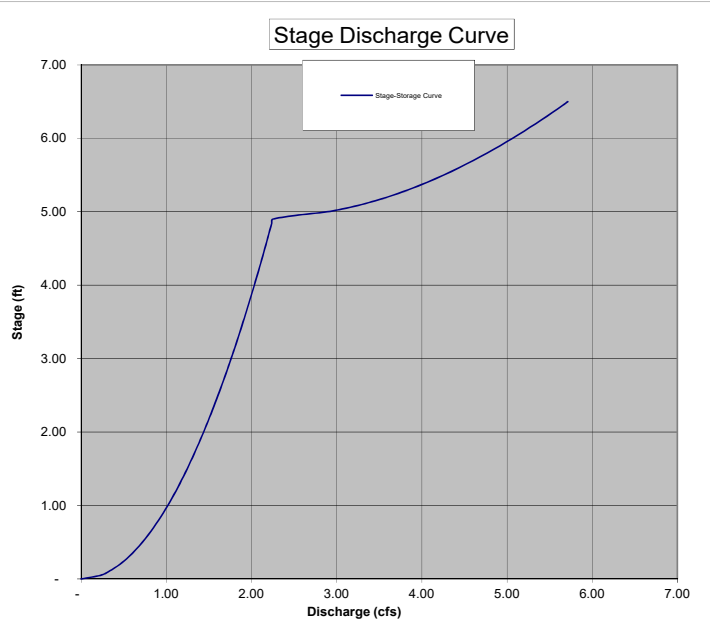
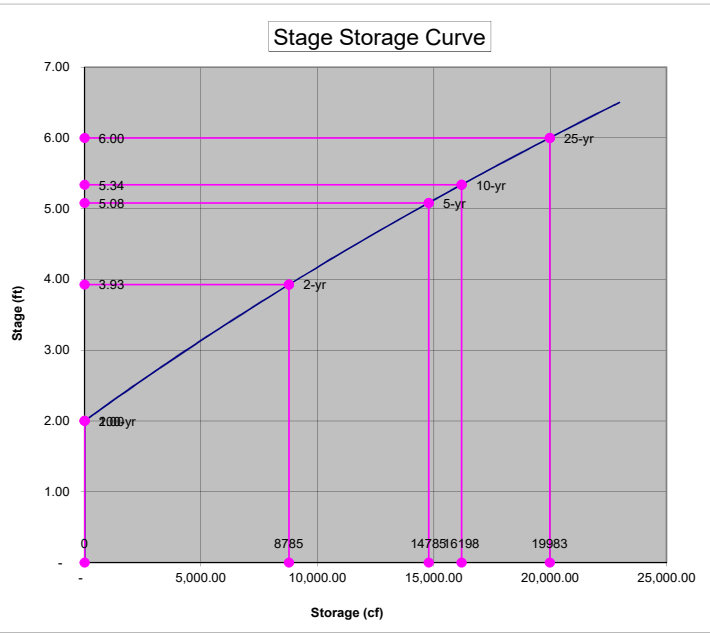




Project Name: The Views - Basin 3 Pond
Stage Storage Summary

Job # 19-071
 Date: 6/24/2020

Stage ft	Storage cf	Discharge cfs
-	-	-
0.05	-	0.23
0.10	-	0.32
0.15	-	0.39
0.20	-	0.45
0.25	-	0.51
0.30	-	0.56
0.35	-	0.60
0.40	-	0.64
0.45	-	0.68
0.50	-	0.72
0.55	-	0.75
0.60	-	0.79
0.65	-	0.82
0.70	-	0.85
0.75	-	0.88
0.80	-	0.91
0.85	-	0.94
0.90	-	0.96
0.95	-	0.99
1.00	-	1.02
1.05	-	1.04
1.10	-	1.07
1.15	-	1.09
1.20	-	1.11
1.25	-	1.14
1.30	-	1.16
1.35	-	1.18
1.40	-	1.20
1.45	-	1.22
1.50	-	1.25
1.55	-	1.27
1.60	-	1.29
1.65	-	1.31
1.70	-	1.33
1.75	-	1.34
1.80	-	1.36
1.85	-	1.38
1.90	-	1.40
1.95	-	1.42
2.00	-	1.44
2.05	209.12	1.46
2.10	419.21	1.47
2.15	630.27	1.49
2.20	842.31	1.51
2.25	1,055.32	1.52
2.30	1,269.32	1.54
2.35	1,484.30	1.56
2.40	1,700.26	1.57
2.45	1,917.21	1.59
2.50	2,135.15	1.61
2.55	2,354.09	1.62
2.60	2,574.01	1.64
2.65	2,794.93	1.65
2.70	3,016.85	1.67
2.75	3,239.77	1.69
2.80	3,463.69	1.70
2.85	3,688.62	1.72
2.90	3,914.55	1.73
2.95	4,141.50	1.75
3.00	4,369.45	1.76
3.05	4,598.42	1.78
3.10	4,828.41	1.79
3.15	5,059.41	1.80
3.20	5,291.44	1.82



Stage ft	Storage cf	Discharge cfs
3.25	5,524.48	1.83
3.30	5,758.56	1.85
3.35	5,993.66	1.86
3.40	6,229.79	1.87
3.45	6,466.95	1.89
3.50	6,705.15	1.90
3.55	6,944.38	1.92
3.60	7,184.65	1.93
3.65	7,425.96	1.94
3.70	7,668.32	1.96
3.75	7,911.72	1.97
3.80	8,156.17	1.98
3.85	8,401.67	1.99
3.90	8,648.22	2.01
3.95	8,895.82	2.02
4.00	9,144.48	2.03
4.05	9,394.20	2.05
4.10	9,644.99	2.06
4.15	9,896.83	2.07
4.20	10,149.74	2.08
4.25	10,403.72	2.10
4.30	10,658.77	2.11
4.35	10,914.89	2.12
4.40	11,172.09	2.13
4.45	11,430.36	2.14
4.50	11,689.71	2.16
4.55	11,950.15	2.17
4.60	12,211.67	2.18
4.65	12,474.27	2.19
4.70	12,737.96	2.20
4.75	13,002.74	2.22
4.80	13,268.62	2.23
4.85	13,535.59	2.24
4.90	13,803.65	2.25
4.95	14,072.82	2.51
5.00	14,343.09	2.89
5.05	14,614.46	3.11
5.10	14,886.94	3.30
5.15	15,160.53	3.45
5.20	15,435.22	3.59
5.25	15,711.03	3.72
5.30	15,987.96	3.84
5.35	16,266.00	3.95
5.40	16,545.17	4.06
5.45	16,825.45	4.16
5.50	17,106.86	4.25
5.55	17,389.39	4.35
5.60	17,673.06	4.44
5.65	17,957.85	4.52
5.70	18,243.78	4.61
5.75	18,530.85	4.69
5.80	18,819.05	4.77
5.85	19,108.39	4.84
5.90	19,398.87	4.92
5.95	19,690.50	4.99
6.00	19,983.27	5.06

**Project Name: The Views - Basin 3 Pond
Rectangular, Sharp Crested Weir Calculations**

Job # 19-071
Date: 6/24/2020

Weir Equation: $Q = C(L-0.2H)H^{3/2}$

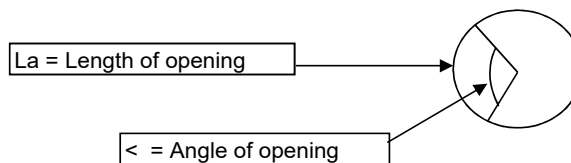
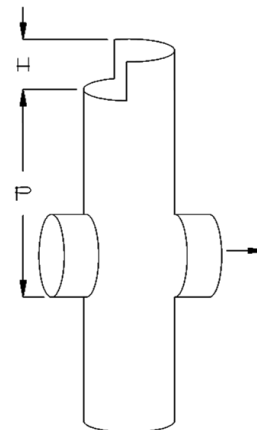
- Q = Flow over weir (cfs)
- C = $3.27 + 0.40 H/P$ (ft)
- L = Adjusted length of weir ($L_a - 0.1H \times 2$) this is to account for side constraints
- L_a = Actual length of weir along pipes interior circumference (ft)
- H = Distance from bottom of weir to maximum head (ft)
- P = Distance from bottom of weir to outfall invert elevation (ft)
- D = Inside riser pipe diameter (in)
- < = Angle of opening for weir (maximum 180 degrees)

Given:

Q	2.57	cfs
H	1.06	ft
P	4.94	ft
D	12	in

Find:

C	3.36	ft
L	0.91	ft
L _a	1.13	ft
<	129	degrees



Appendix F

Standard Formulas, Coefficients, and Values

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COEFFICIENTS

Ns = = Manning's coefficient (sheet flow)
n values are for sheet flow only

Design Value

- 0.011 Concrete or asphalt
- 0.010 Bare soil
- 0.020 Graveled surface
- 0.020 Bare clay - loam (eroded)
- 0.150 Grass (short prairie)
- 0.240 Grass (dense lawn)
- 0.410 Grass (bermuda)
- 0.400 Woods (light underbrush)
- 0.800 Woods (dense underbrush)

k = = time of concentration velocity factor (ft/s)

Design Value

- 3 Forest with heavy ground cover and meadows (n=0.10)
- 5 Brushy ground with some trees (n=0.060)
- 8 Fallow or cultivation (n=0.040)
- 9 High grass (n=0.035)
- 11 Short grass, pasture or lawns (n=0.030)
- 13 Nearly bare ground (n=0.025)
- 27 Paved and gravel areas (n=0.012)

n = = Manning's coefficient (channel)

Design Value

CONSTRUCTED CHANNELS

A. Earth, straight and uniform

- 0.018 Earth (straight and uniform)
- 0.025 Gravel (straight and uniform)
- 0.027 Grass (with weeds)

B. Earth, winding and sluggish

- 0.025 Earth (no vegetation)
- 0.030 Grass (some weeds)
- 0.035 Dense weeds (deep channel)
- 0.030 Earth (rubble bottom and sides)
- 0.035 Stony bottom and weedy banks
- 0.040 Cobble bottom with clean sides

C. Rock lined

- 0.035 Smooth and uniform
- 0.040 Jagged and irregular

D. Channels not maintained (weeds and brush uncut)

- 0.050 Dense weeds (high as flow depth)
- 0.050 Clean bottom (brush on sides)
- 0.100 Dense brush (high stage)
- 0.200 Water quality swales (mowed regularly)

NATURAL STREAMS

- 0.029 Clean (straight no pools)
- 0.035 Clean (straight no pools with weeds and stones)
- 0.039 Clean (winding pools)
- 0.042 Clean (winding pools weeds and stones)
- 0.052 Clean (winding pools weeds and large stones)
- 0.065 Weedy (sluggish with deep pools)
- 0.112 Very weedy (sluggish with deep pools)

Standard formulas used for the Time of Concentration Calculations

Overland Flow (max 300' total)

$$\frac{(0.42)[(N_s)(L)]^{0.8}}{(P_2)^{0.5}(S_0)^{0.4}}$$

Tc	= time of concentration for less than 300' of travel (minutes)
Ns	= sheet flow Manning's effective roughness coefficient
L	= flow length (ft)
P2	= 2-year, 24 hour rainfall (in)
So	= slope of hydraulic grade line (land slope, ft/ft)

Shallow Concentrated Flow (after initial 300')

$$T = \frac{L}{(60)(k\sqrt{S_0})}$$

T	= travel time for sheet flow (min)
L	= flow length (ft)
So	= slope of hydraulic grade line (land slope, ft/ft)
k	= time of concentration velocity factor (ft/s)

Flow in Swales

Q = (1.486/n) x A x R^{2/3} x S^{1/2} (Manning's Equation)

Tc	= time of concentration for gutter flow (minutes)
A	= area of flow (sf)
R	= hydraulic radius (ft)
LS	= side slope
Q	= quantity of flow (ft ³ /sec)
V	= average velocity of flow (ft/sec)
L	= length of flow
Ve	= vertical length of side slope
Ho	= horizontal length of side slope
Bw	= base width (in)
D	= depth (in)
S	= slope (ft/ft)
n	= Manning's n

Flow in gutters

$$V = \frac{1.12}{n} (S)^{0.5} (S_x)^{.67} (T)^{0.67}$$

Tc	= time of concentration for gutter flow (minutes)
V	= average velocity of flow (ft/sec)
Q	= quantity of flow (ft ³ /sec)
S	= street longitudinal slope (ft/ft)
Sx	= street cross slope (ft/ft)
T	= total width of flow in the gutter (ft)
n	= sheet flow Manning's (pavement = 0.018)
L	= Length of flow (ft)

Flow in pipes

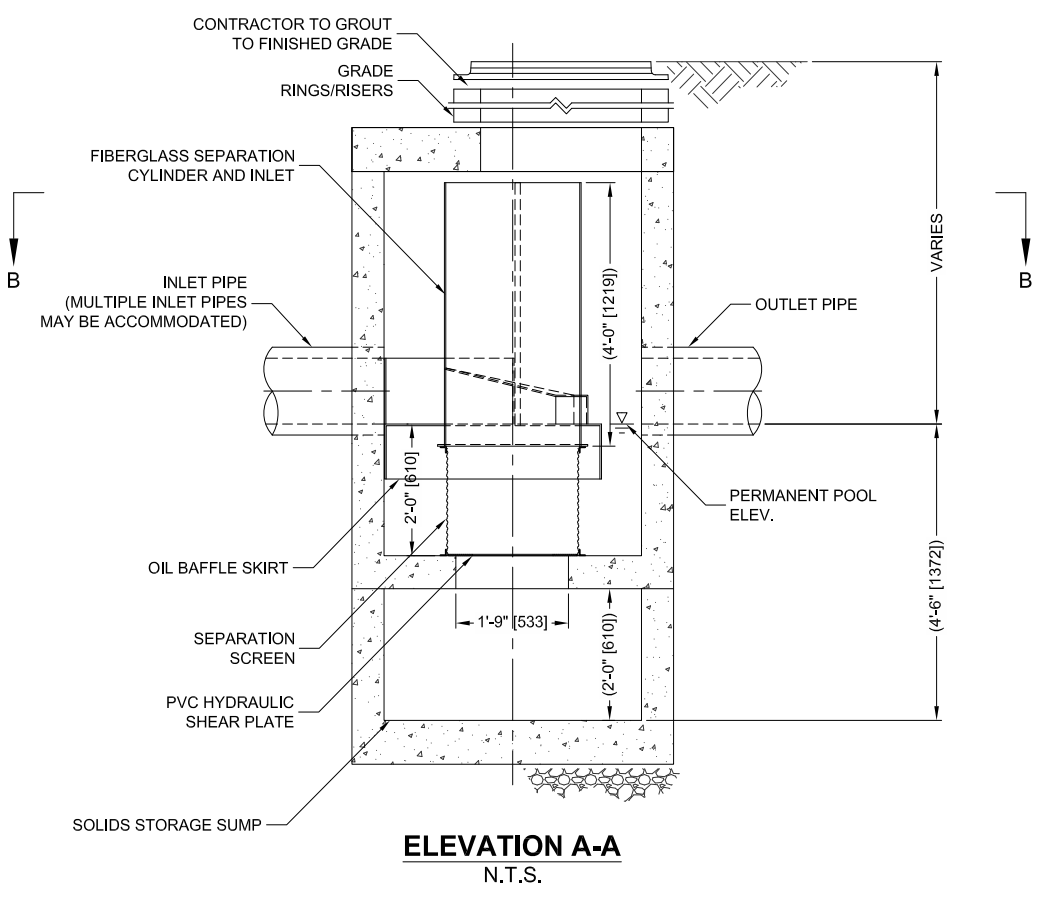
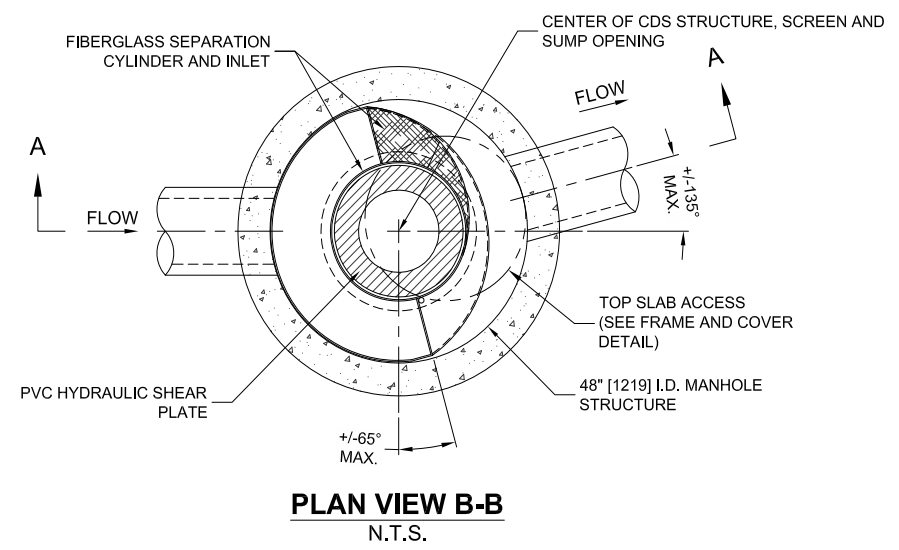
Mannings Equation

Tc	= time of concentration in pipe (minutes)
V	= calculated velocity pipe full (ft/sec)
Q	= quantity of flow (ft ³ /sec)
n	= Manning's n
D	= pipe Diameter (in)
S	= slope (ft/ft)
L	= length of pipe

Appendix G
Water Quality Manhole Details

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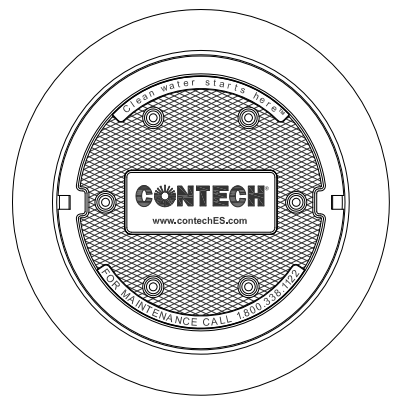
CDS2015-4-C DESIGN NOTES

CDS2015-4-C RATED TREATMENT CAPACITY IS 0.7 CFS [19.8 L/s], OR PER LOCAL REGULATIONS. MAXIMUM HYDRAULIC INTERNAL BYPASS CAPACITY IS 10.0 CFS [283 L/s]. IF THE SITE CONDITIONS EXCEED 10.0 [283 L/s] CFS, AN UPSTREAM BYPASS STRUCTURE IS REQUIRED.

THE STANDARD CDS2015-4-C CONFIGURATION IS SHOWN. ALTERNATE CONFIGURATIONS ARE AVAILABLE AND ARE LISTED BELOW. SOME CONFIGURATIONS MAY BE COMBINED TO SUIT SITE REQUIREMENTS.

CONFIGURATION DESCRIPTION

GRATED INLET ONLY (NO INLET PIPE)
GRATED INLET WITH INLET PIPE OR PIPES
CURB INLET ONLY (NO INLET PIPE)
CURB INLET WITH INLET PIPE OR PIPES
SEPARATE OIL BAFFLE (SINGLE INLET PIPE REQUIRED FOR THIS CONFIGURATION)
SEDIMENT WEIR FOR NJDEP / NJCAT CONFORMING UNITS



SITE SPECIFIC DATA REQUIREMENTS

STRUCTURE ID			
WATER QUALITY FLOW RATE (CFS OR L/s)	*		
PEAK FLOW RATE (CFS OR L/s)	*		
RETURN PERIOD OF PEAK FLOW (YRS)	*		
SCREEN APERTURE (2400 OR 4700)	*		
PIPE DATA:	I.E.	MATERIAL	DIAMETER
INLET PIPE 1	*	*	*
INLET PIPE 2	*	*	*
OUTLET PIPE	*	*	*
RIM ELEVATION			*
ANTI-FLOTATION BALLAST	WIDTH	HEIGHT	
	*	*	
NOTES/SPECIAL REQUIREMENTS:			
* PER ENGINEER OF RECORD			

GENERAL NOTES

- CONTECH TO PROVIDE ALL MATERIALS UNLESS NOTED OTHERWISE.
- FOR SITE SPECIFIC DRAWINGS WITH DETAILED STRUCTURE DIMENSIONS AND WEIGHT, PLEASE CONTACT YOUR CONTECH ENGINEERED SOLUTIONS LLC REPRESENTATIVE. www.contechES.com
- CDS WATER QUALITY STRUCTURE SHALL BE IN ACCORDANCE WITH ALL DESIGN DATA AND INFORMATION CONTAINED IN THIS DRAWING. CONTRACTOR TO CONFIRM STRUCTURE MEETS REQUIREMENTS OF PROJECT.
- STRUCTURE SHALL MEET AASHTO HS20 LOAD RATING, ASSUMING EARTH COVER OF 0' - 2', AND GROUNDWATER ELEVATION AT, OR BELOW, THE OUTLET PIPE INVERT ELEVATION. ENGINEER OF RECORD TO CONFIRM ACTUAL GROUNDWATER ELEVATION. CASTINGS SHALL MEET AASHTO M306 AND BE CAST WITH THE CONTECH LOGO..
- IF REQUIRED, PVC HYDRAULIC SHEAR PLATE IS PLACED ON SHELF AT BOTTOM OF SCREEN CYLINDER. REMOVE AND REPLACE AS NECESSARY DURING MAINTENANCE CLEANING.
- CDS STRUCTURE SHALL BE PRECAST CONCRETE CONFORMING TO ASTM C-478 AND AASHTO LOAD FACTOR DESIGN METHOD.

INSTALLATION NOTES

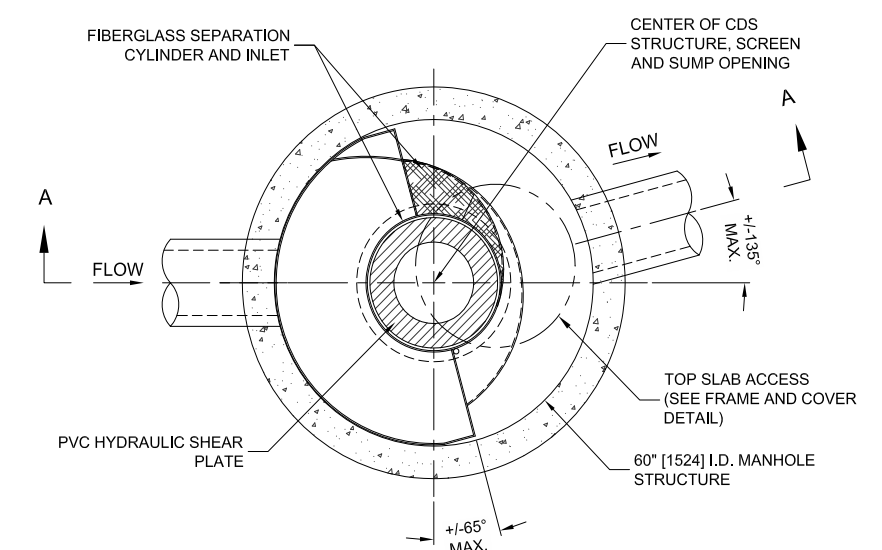
- ANY SUB-BASE, BACKFILL DEPTH, AND/OR ANTI-FLOTATION PROVISIONS ARE SITE-SPECIFIC DESIGN CONSIDERATIONS AND SHALL BE SPECIFIED BY ENGINEER OF RECORD.
- CONTRACTOR TO PROVIDE EQUIPMENT WITH SUFFICIENT LIFTING AND REACH CAPACITY TO LIFT AND SET THE CDS MANHOLE STRUCTURE.
- CONTRACTOR TO INSTALL JOINT SEALANT BETWEEN ALL STRUCTURE SECTIONS AND ASSEMBLE STRUCTURE.
- CONTRACTOR TO PROVIDE, INSTALL, AND GROUT INLET AND OUTLET PIPE(S). MATCH PIPE INVERTS WITH ELEVATIONS SHOWN. ALL PIPE CENTERLINES TO MATCH PIPE OPENING CENTERLINES.
- CONTRACTOR TO TAKE APPROPRIATE MEASURES TO ASSURE UNIT IS WATER TIGHT, HOLDING WATER TO FLOWLINE INVERT MINIMUM. IT IS SUGGESTED THAT ALL JOINTS BELOW PIPE INVERTS ARE GROUTED.

CONTECH
ENGINEERED SOLUTIONS LLC
www.contechES.com
9025 Centre Pointe Dr., Suite 400, West Chester, OH 45069
800-338-1122 513-645-7000 513-645-7993 FAX

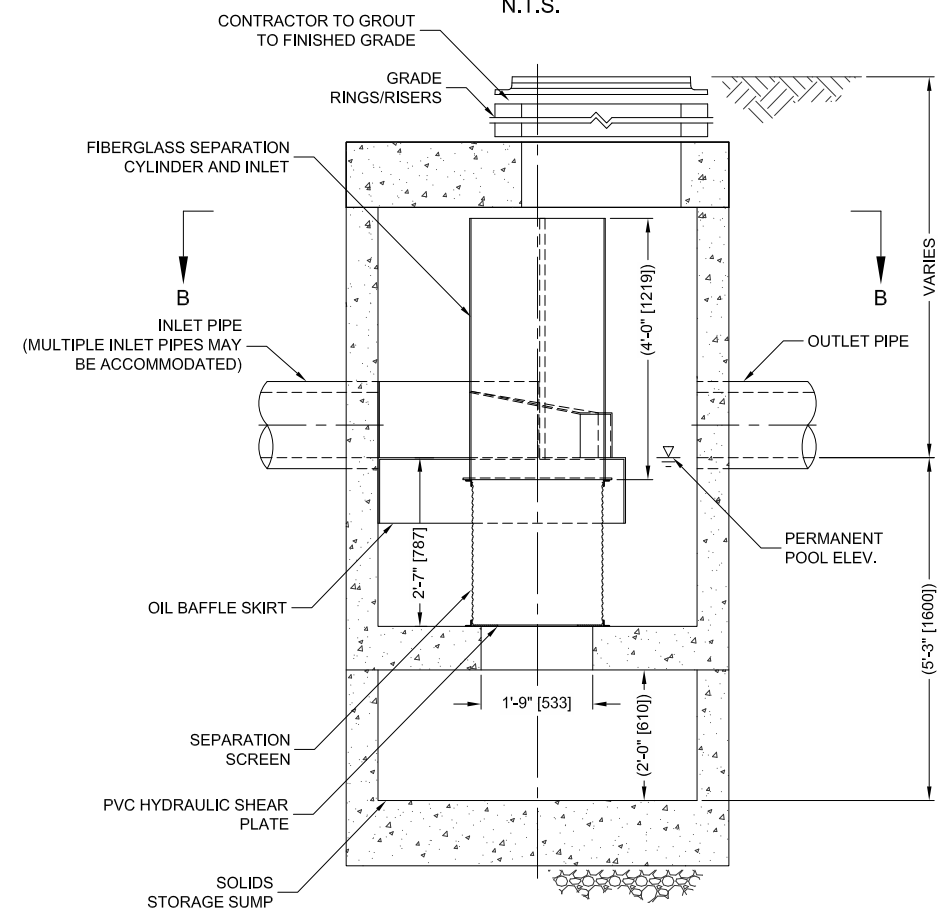
CDS2015-4-C
ONLINE CDS
STANDARD DETAIL



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PLAN VIEW B-B
N.T.S.



ELEVATION A-A
N.T.S.



THIS PRODUCT MAY BE PROTECTED BY ONE OR MORE OF THE FOLLOWING U.S. PATENTS: 5,788,448; 6,841,641; 7,026,431; 6,995,585; 6,981,980. RELATED FOREIGN PATENTS OR OTHER PATENTS PENDING.

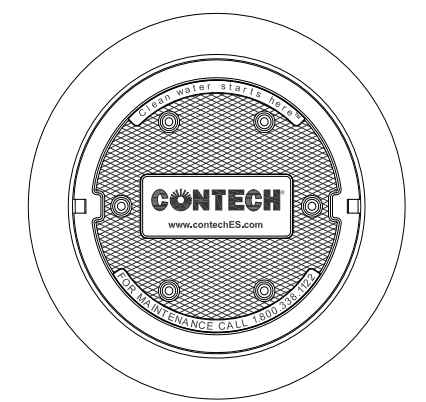
CDS2020-5-C DESIGN NOTES

CDS2020-5-C RATED TREATMENT CAPACITY IS 1.1 CFS [31.2 L/s], OR PER LOCAL REGULATIONS. MAXIMUM HYDRAULIC INTERNAL BYPASS CAPACITY IS 14.0 CFS [396 L/s]. IF THE SITE CONDITIONS EXCEED 14.0 CFS [396 L/s], AN UPSTREAM BYPASS STRUCTURE IS REQUIRED.

THE STANDARD CDS2020-5-C CONFIGURATION IS SHOWN. ALTERNATE CONFIGURATIONS ARE AVAILABLE AND ARE LISTED BELOW. SOME CONFIGURATIONS MAY BE COMBINED TO SUIT SITE REQUIREMENTS.

CONFIGURATION DESCRIPTION

- GRATED INLET ONLY (NO INLET PIPE)
- GRATED INLET WITH INLET PIPE OR PIPES
- CURB INLET ONLY (NO INLET PIPE)
- CURB INLET WITH INLET PIPE OR PIPES
- SEPARATE OIL BAFFLE (SINGLE INLET PIPE REQUIRED FOR THIS CONFIGURATION)
- SEDIMENT WEIR FOR NJDEP / NJCAT CONFORMING UNITS



FRAME AND COVER
(DIAMETER VARIES)
N.T.S.

SITE SPECIFIC DATA REQUIREMENTS

STRUCTURE ID			
WATER QUALITY FLOW RATE (CFS OR L/s)		*	
PEAK FLOW RATE (CFS OR L/s)		*	
RETURN PERIOD OF PEAK FLOW (YRS)		*	
SCREEN APERTURE (2400 OR 4700)		*	
PIPE DATA:	I.E.	MATERIAL	DIAMETER
INLET PIPE 1	*	*	*
INLET PIPE 2	*	*	*
OUTLET PIPE	*	*	*
RIM ELEVATION			
ANTI-FLOTATION BALLAST		WIDTH	HEIGHT
		*	*
NOTES/SPECIAL REQUIREMENTS:			
* PER ENGINEER OF RECORD			

GENERAL NOTES

1. CONTECH TO PROVIDE ALL MATERIALS UNLESS NOTED OTHERWISE.
2. FOR SITE SPECIFIC DRAWINGS WITH DETAILED STRUCTURE DIMENSIONS AND WEIGHT, PLEASE CONTACT YOUR CONTECH ENGINEERED SOLUTIONS LLC REPRESENTATIVE. www.contechES.com
3. CDS WATER QUALITY STRUCTURE SHALL BE IN ACCORDANCE WITH ALL DESIGN DATA AND INFORMATION CONTAINED IN THIS DRAWING. CONTRACTOR TO CONFIRM STRUCTURE MEETS REQUIREMENTS OF PROJECT.
4. STRUCTURE SHALL MEET AASHTO HS20 LOAD RATING, ASSUMING EARTH COVER OF 0' - 2', AND GROUNDWATER ELEVATION AT, OR BELOW, THE OUTLET PIPE INVERT ELEVATION. ENGINEER OF RECORD TO CONFIRM ACTUAL GROUNDWATER ELEVATION. CASTINGS SHALL MEET AASHTO M306 AND BE CAST WITH THE CONTECH LOGO.
5. IF REQUIRED, PVC HYDRAULIC SHEAR PLATE IS PLACED ON SHELF AT BOTTOM OF SCREEN CYLINDER. REMOVE AND REPLACE AS NECESSARY DURING MAINTENANCE CLEANING.
6. CDS STRUCTURE SHALL BE PRECAST CONCRETE CONFORMING TO ASTM C-478 AND AASHTO LOAD FACTOR DESIGN METHOD.

INSTALLATION NOTES

- A. ANY SUB-BASE, BACKFILL DEPTH, AND/OR ANTI-FLOTATION PROVISIONS ARE SITE-SPECIFIC DESIGN CONSIDERATIONS AND SHALL BE SPECIFIED BY ENGINEER OF RECORD.
- B. CONTRACTOR TO PROVIDE EQUIPMENT WITH SUFFICIENT LIFTING AND REACH CAPACITY TO LIFT AND SET THE CDS MANHOLE STRUCTURE.
- C. CONTRACTOR TO INSTALL JOINT SEALANT BETWEEN ALL STRUCTURE SECTIONS AND ASSEMBLE STRUCTURE.
- D. CONTRACTOR TO PROVIDE, INSTALL, AND GROUT INLET AND OUTLET PIPE(S). MATCH PIPE INVERTS WITH ELEVATIONS SHOWN. ALL PIPE CENTERLINES TO MATCH PIPE OPENING CENTERLINES.
- E. CONTRACTOR TO TAKE APPROPRIATE MEASURES TO ASSURE UNIT IS WATER TIGHT, HOLDING WATER TO FLOWLINE INVERT MINIMUM. IT IS SUGGESTED THAT ALL JOINTS BELOW PIPE INVERTS ARE GROUTED.

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**THE VIEWS
TRAFFIC IMPACT STUDY**

SANDY, OREGON



PREPARED FOR:
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EXECUTIVE SUMMARY

1. A residential development is proposed on the northeast side of US Highway 26 at SE Vista Loop Drive in Sandy, Oregon. The proposed development will include 48 apartment dwelling units, 32 four-plex dwelling units and 88 single-family homes. The site will take access via three new driveways on SE Vista Loop Road, with two serving development on the west side of SE Vista Loop Road and one serving the property on the east side of SE Vista Loop Road.
2. Upon completion of proposed development, the subject property is projected to generate 109 new site trips during the morning peak hour, 136 trips during the evening peak hour, and 1,564 new daily site trips.
3. Based on the operational analysis, the study intersections currently operate acceptably and are projected to continue to operate acceptably under year 2022 traffic conditions either with or without the addition of site trips from the proposed development.
4. Based on the queuing analysis, there is sufficient distance along SE Vista Loop Drive between the Highway 26 and the proposed site access location for the Picking Property to allow the intersections to operate without interference from queues. No queuing-related mitigations are necessary or recommended in conjunction with the proposed development.
5. Based on the crash data, the study intersections are currently operating acceptably with respect to safety.
6. Based on the warrant analysis, no new traffic signals or turn lanes are recommended.
7. Intersection sight distance was evaluated for the proposed points of access along SE Vista Loop Drive. Based on the analysis, it is projected that adequate sight distance can be achieved for all access locations with clearing of vegetation from the roadside. No other sight distance mitigations are necessary or recommended.



PROJECT DESCRIPTION & LOCATION

INTRODUCTION

The proposed residential development comprises two properties. The 9.6-acre Knapp property is located between SE Vista Loop Road and US Highway 26. The 23.3-acre Picking property is located on the east side of SE Vista Loop Road near its southern intersection with Highway 26.

The proposed development will consist of 168 total dwelling units on 122 lots. It will take access via three new driveways intersecting SE Vista Loop Road, with one serving the 72 lots on the east side of SE Vista Loop Road and two serving the remaining 50 lots on the west side.

This report addresses the impacts of the proposed development on the surrounding street system. Based on discussions with the City of Sandy and ODOT staff, an operational and safety analysis was conducted for the proposed site access intersections on SE Vista Loop Drive as well as the intersections of Highway 26 at SE Vista Loop Road (west) and Highway 26 at SE Vista Loop Road (east).

The purpose of this analysis is to determine whether the surrounding transportation system is capable of safely and efficiently supporting the proposed use and to identify any necessary improvements and mitigations.

SITE LOCATION AND STUDY AREA DESCRIPTION

The proposed development has a total area of approximately 33 acres and is currently undeveloped. The subject properties are surrounded primarily by a mixture of existing low-density residential development, agricultural uses, and undeveloped forested land. Immediately southeast of the Picking property is the Johnson RV sales facility.

US Highway 26 (Mt. Hood Highway) is classified by the Oregon Department of Transportation as a Statewide Highway and a Freight Route. It has two through lanes in each direction and added turn lanes at intersections. It has a posted speed limit of 55 mph within the study area. The speed limit is reduced to 40 mph northwest of the subject property approximately halfway between SE Vista Loop Drive (west) and SE Langensand Road.

SE Vista Loop Drive is a narrow street without centerline striping and with a posted residential speed limit of 25 mph. It is classified by the City of Sandy as a collector roadway.



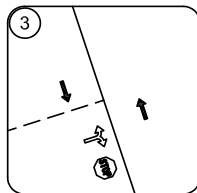
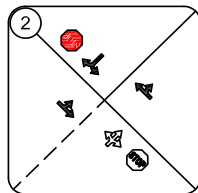
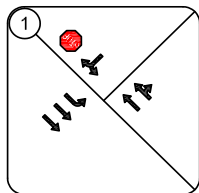
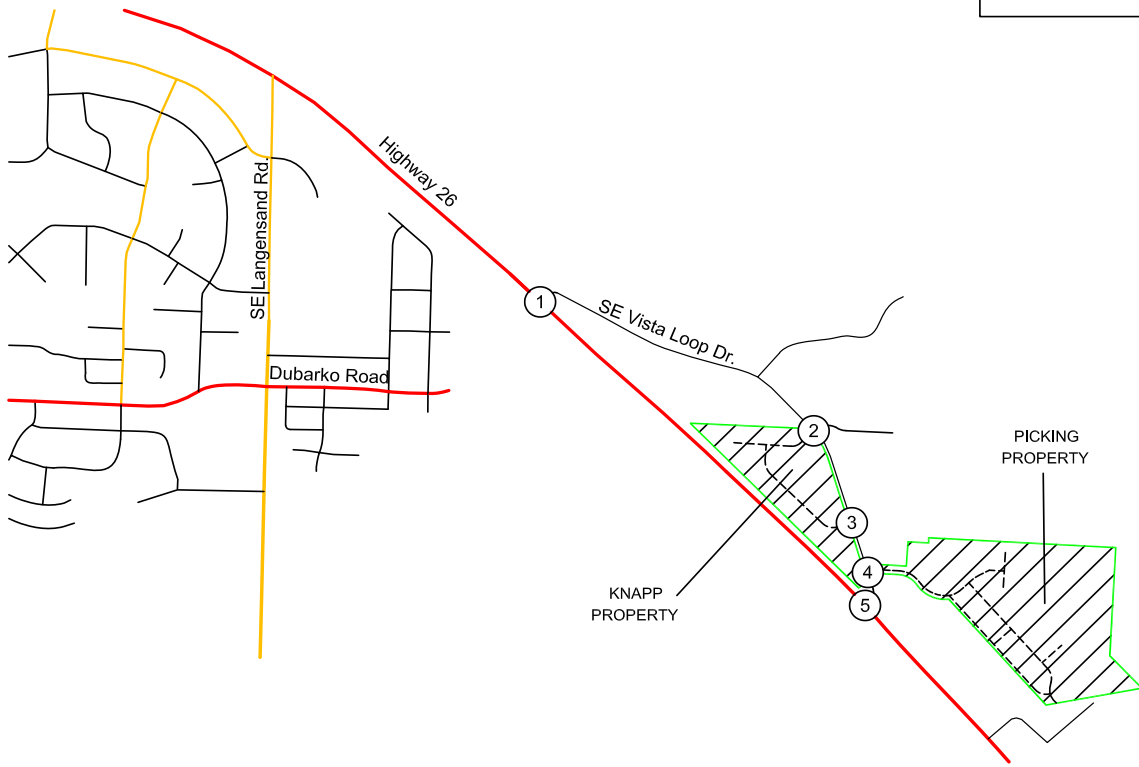
EXISTING CONDITIONS

The intersection of US Highway 26 at SE Vista Loop Drive (west) is currently a T- intersection controlled by a stop sign on the southwest-bound Vista Loop Drive approach. Through traffic traveling along Highway 26 does not stop. The southwest-bound approach has a single, shared lane for all turning movements. The southeast-bound approach has a left-turn lane and two through lanes. The northwest-bound approach has a dedicated through lane and a shared through/right lane.

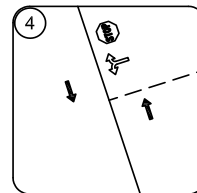
The intersection of US Highway 26 at SE Vista Loop Drive (east) is also a T-intersection controlled by a stop sign on the southwest-bound Vista Loop Drive approach. Through traffic traveling along Highway 26 does not stop. The southwest-bound approach has a single, shared lane for all turning movements. The southeast-bound approach has a left-turn lane and two through lanes. The northwest-bound approach has a dedicated through lane and a shared through/right lane.

A vicinity map displaying the project site, vicinity streets, and the study intersections including lane configurations is provided in Figure 1 on page 6.

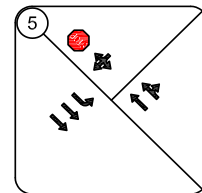
FIGURE 1



FUTURE INTERSECTION



FUTURE INTERSECTION



LEGEND

- # Study Intersection #
- STOP Stop Sign



VICINITY MAP
 Study Intersections
 Lane Configurations and Traffic Control

PAGE
 6



TRAFFIC COUNT DATA

Traffic counts were conducted at the intersection of Highway 26 at SE Vista Loop Drive (west) on Tuesday March 19th, 2019 from 4:00 to 6:00 PM and on Wednesday March 20th, 2019 from 7:00 to 9:00 AM. Traffic counts were conducted at the intersection of Highway 26 at SE Vista Loop Drive (east) on Thursday July 18th from 7:00 AM to 9:00 AM and 4:00 to 6:00 PM. Data was used from the highest-volume hour for each intersection during each analysis period.

The observed traffic volumes were adjusted to account for seasonal traffic variations in order to represent the 30th-highest hour design volumes. Since the July count data was collected closer to the August seasonal peak, this data was used to determine the through traffic volumes on Highway 26, and seasonal-peak through traffic volumes at the intersection of Highway 26 at SE Vista Loop Drive (west) were determined by balancing the turning movement volumes with the 30th-highest hour volumes calculated for Highway 26 at SE Vista Loop Drive (east).

US Highway 26 serves local and commuter traffic as well as trips to and from Mt. Hood and beyond. These trip types would be expected to exhibit very different seasonal variations in travel demands over the course of the year, since local and commuter traffic volumes are relatively stable regardless of season, while travel volumes to and from Mt. Hood vary significantly based on the season.

In order to determine the portion of traffic attributable to each of the two primary travel types, data from ODOT's 2017 Highway Volume Tables was utilized. Specifically, the data used was collected at ODOT's Automatic Count Data station 03-006, located 0.30 miles east of Camp Creek Road in Rhododendron, Oregon. This site is located on Highway 26 approximately 21 miles east of SE Vista Loop Drive. Although the distance to the ATR station means the data cannot be used directly, the ATR data provides useful information regarding the variation in traffic volumes traveling to Mt. Hood and beyond during the time of the count data collection as well as during the peak season of the year. Accordingly, this data allows determination of the likely portion of highway traffic that falls into each of the two seasonal variation categories ("commuter" and "recreational summer/winter"), as well as providing information regarding the most appropriate seasonal adjustment factor for the recreational summer/winter traffic.

Based on the data, 11,291 vehicles per day (approximately 1,129 per hour during the peak hour) travel along Highway 26 to and from Mt. Hood at the Rhododendron permanent count station location during the month of July. This volume represents 60.8 percent of the through traffic volumes measured on Highway 26 east of SE Vista Loop Drive on July 18, 2019. Accordingly, it is expected that no more than 60.8 percent of the trips traveling along Highway 26 in the project vicinity are traveling to and from destinations beyond the Rhododendron count station. Since the remaining 39.2 percent of through traffic volumes on the Highway 26 at the study intersections never reach Mt. Hood, it was assumed that these traffic volumes represent more typical commuter and local trips.

The ODOT data also showed that 11,738 vehicles were measured per day (approximately 1174 per hour during the peak hour) during the peak-season month of August at the ATR station near Rhododendron. This indicates that the seasonal recreational traffic volumes along the Highway 26 corridor increased by no more than 447 vehicles per day (11,738 vehicles per day in August - 11,291

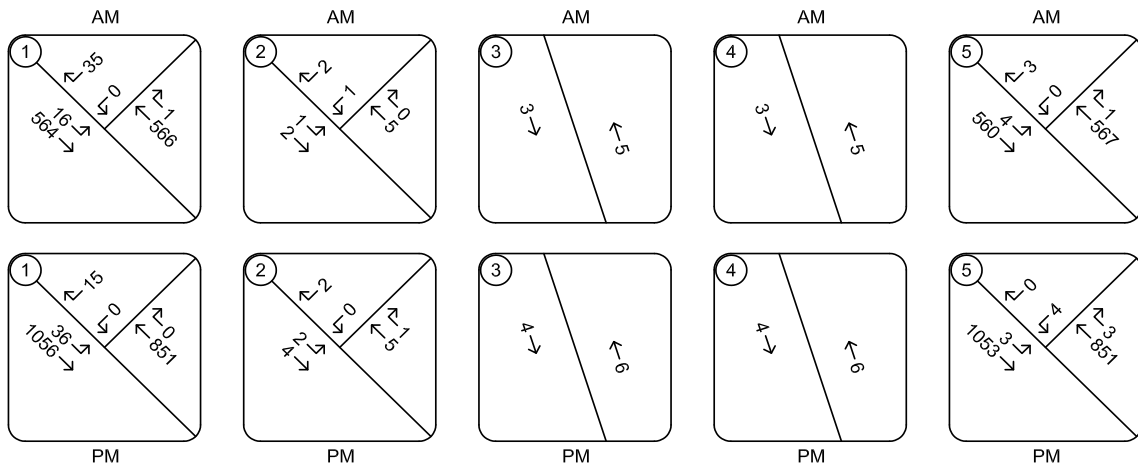
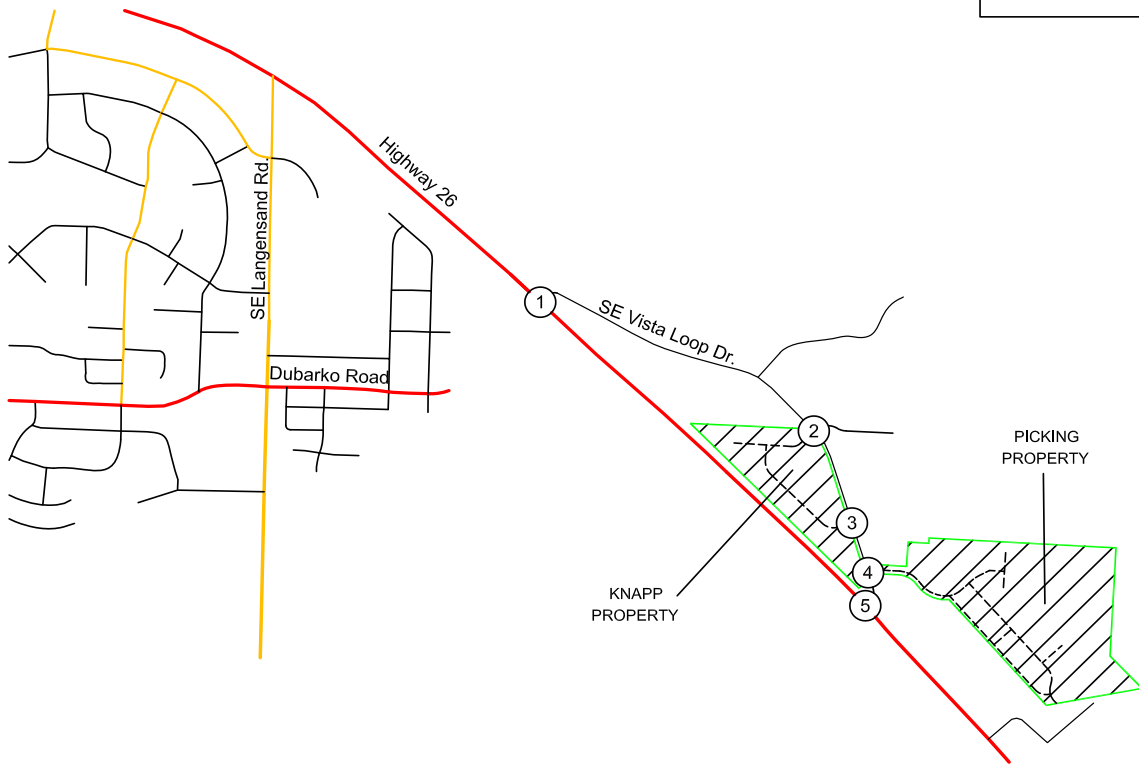


vehicles per day in July). This equates to roughly 45 additional vehicles per hour during the peak hour of the peak recreational season.

In order to seasonally adjust the local and commuter traffic volumes, the through traffic volumes were reduced by the amount of the assumed seasonal traffic (1,129 vehicles per hour during the evening peak hour, and a seasonal adjustment of 1.014 was applied to the remaining local and commuter traffic volumes. Following this adjustment, the 1,129 July recreational trips and the 45 peak-season through trips were added to determine the total peak-season traffic volumes. These calculated through traffic volumes represent the anticipated traffic levels for the intersections along Highway 26 during the 30th-highest hour in August. The morning peak hour traffic volumes along the highway were then increased by the same overall percentage as the evening peak hour volumes (2.96 percent).

Figure 2 on page 9 shows the existing 2019 30th-highest hour traffic volumes for the morning and evening peak hours at the study intersections.

FIGURE 2



TRAFFIC VOLUMES
 2019 Existing 30th-Highest Hour (August) Conditions
 Morning and Evening Peak Hours



OPERATIONAL ANALYSIS

An operational analysis was conducted for the study intersections using Synchro 10 software, with outputs calculated based on the *HIGHWAY CAPACITY MANUAL, 6th Edition*. The analysis was conducted for the weekday morning and evening peak hours.

The purpose of the existing conditions analysis is to establish how the study area intersections operate currently and allow for calibration of the operational analysis if required.

The results of the operational analysis are reported based on delay, Level of Service (LOS), and volume-to-capacity ratio (v/c). Delays are reported in seconds. Level of service is reported as a letter grade and can range from A to F, with level of service A representing nearly free-flow conditions and level of service F representing high delays and severe congestion. A report of level of service D generally indicates moderately high but tolerable delays, and typically occurs prior to reaching intersection capacity. For unsignalized intersections, the v/c represents the portion of the available intersection capacity that is being utilized on the worst intersection approach. A v/c ratio of 1.0 would indicate that the approach is operating at capacity.

The Oregon Department of Transportation requires that the intersections of Highway 26 at each end of SE Vista Loop Drive operate with a v/c ratio of 0.80 or less on the major-street approaches and a v/c ratio of 0.90 or less on the minor-street approaches.

A summary of the existing conditions operational analysis is provided in Table 1 below. The reported delays and levels-of-service represent the approach lane which experiences the highest delays. The reported v/c ratios represent the highest ratio for the major-street and minor-street movements.

Based on the analysis, the study intersections are currently operating acceptably. Detailed capacity analysis worksheets are provided in the technical appendix.

Table 1 - Operational Analysis Summary: 2019 Existing 30th-Highest Hour Conditions

Intersection	AM Peak Hour			PM Peak Hour		
	Delay	LOS	v/c*	Delay	LOS	v/c*
Highway 26 at Vista Loop Drive (west)	10.5	B	0.19/0.05	11.6	B	0.34/0.03
Vista Loop Drive at Ortiz Street	8.5	A	0.01	8.4	A	0.01
Highway 26 at Vista Loop Drive (east)	10.4	B	0.20/0.01	36.6	E	0.35/0.04

*(major street v/c) / (minor-street v/c)



SITE TRIPS

Proposed Development

The proposed new development will consist of 88 single-family homes, 32 four-plex dwelling units and 48 apartment units. To estimate the number of trips that will be generated by the proposed development, trip rates from the *TRIP GENERATION MANUAL, 10th EDITION* were used. Data from land-use codes 210, *Single-Family Detached Housing*, and 220, *Multi-Family Housing*, were used. The trip estimates are based on the number of dwelling units.

A summary of the trip generation calculations is provided in Table 2 below. Detailed trip generation worksheets are also included in the technical appendix.

Table 2 - Proposed Development Trip Generation Summary

	AM Peak Hour			PM Peak Hour			Daily Total
	In	Out	Total	In	Out	Total	
80 Multi-Family Dwelling Units	9	28	37	28	16	44	586
88 Single-Family Homes	18	54	72	58	34	92	978
Total Site Trips	27	82	109	86	50	136	1,564

Density Bonus Analysis

In addition to evaluation of the increase in site trips expected upon completion of the proposed residential development, trip generation calculations were prepared to examine the maximum permitted trip generation without the benefit of bonus density allowed per code section 17.64.40.C for planned developments. This allowed traffic level was compared to the proposed development traffic in order to determine whether the proposed use will result in a meaningful increase over traffic volumes that would otherwise be projected based on the underlying zoning.

The subject property is zoned SFR and has a total area of 32.929 acres and a net site area of 26.170 acres. The City of Sandy allows development of up to 5.8 dwelling units per acre within the SFR zone. Accordingly, the maximum development scenario for the underlying zoning absent a Planned Development would consist of 152 single-family homes.

A summary of the trip generation calculations for this density bonus comparison is provided in Table 3 on the following page. Detailed trip generation calculations are also included in the technical appendix.



Table 3 - Planned Development Trip Generation Calculations

	AM Peak Hour			PM Peak Hour			Daily
	In	Out	Total	In	Out	Total	Total
SFR Zoning (152 homes)	28	85	113	96	56	152	1528
Proposed Development	27	82	109	86	50	136	1564
Net Change In Site Trips	-1	-3	-4	-10	-6	-16	36

Based on the analysis, the proposed Planned Development will not result in an increase in peak-hour traffic as compared to the maximum development permitted absent a Planned Development based on allowed development within the SFD zoning.

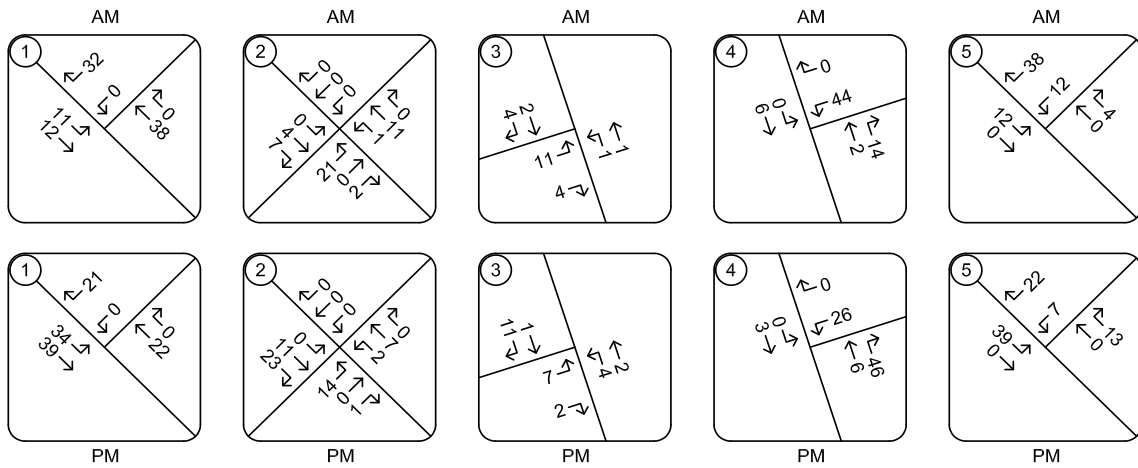
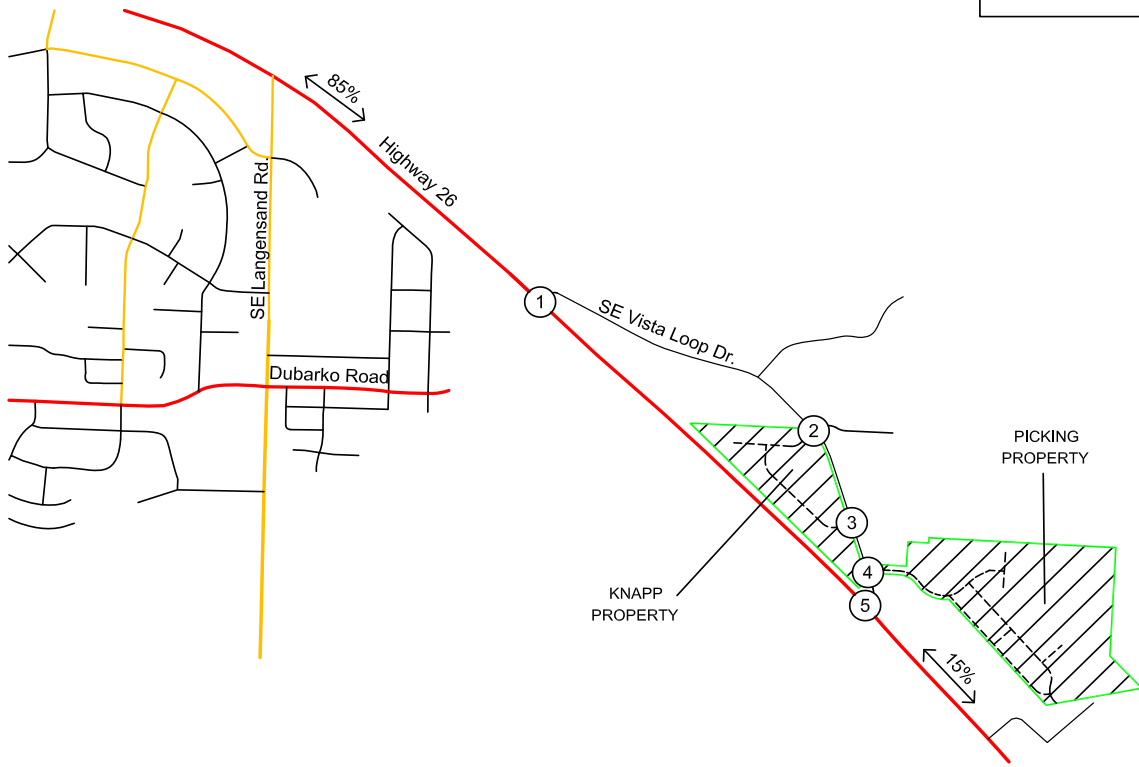
TRIP DISTRIBUTION

The directional distribution of site trips to and from the project site was estimated based the existing travel patterns in the site vicinity, as well as the locations of likely trip destinations and major transportation routes. Overall, 85 percent of the anticipated site trips are projected to travel to and from the northwest on Highway 26 and 15 percent are projected to travel to and from the southeast on Highway 26.

It should be noted that a future development on the west side of Highway 26 may include an extension of Dubarko Road to intersect Highway 26 opposite the Highway 26 at Vista Loop Drive (west) intersection. Upon completion of this future street connection, it would be anticipated that approximately the trip distribution will consist of approximately 70 percent of site trips traveling to and from the north on Highway 26, 15 percent of site trips traveling to and from the west on Dubarko Road, and 15 percent of site trips traveling to and from the south on Highway 26.

The trip distribution percentages and trip assignment for the proposed development are shown in Figure 3 on page 13.

FIGURE 3



TRAFFIC VOLUMES
 Proposed Development - Primary Site Trips
 Morning and Evening Peak Hours

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FUTURE CONDITIONS ANALYSIS

BACKGROUND VOLUMES

In order to determine the expected impact of site trips on the study area intersections, it is necessary to compare traffic conditions both with and without the addition of the projected traffic from the proposed development. Since the proposed use cannot be constructed and occupied immediately, the comparison is made for future traffic conditions at the time of project completion. It is anticipated that the proposed use will be completed and occupied by 2022. Accordingly, the analysis was conducted for year 2022 traffic conditions.

Prior to adding the projected site trips to the study intersections, the existing traffic volumes were adjusted to account for background traffic growth over time. Background growth is expected to occur regardless of whether or not the proposed mixed-use development is constructed, and accounts for other developments outside the immediate project area.

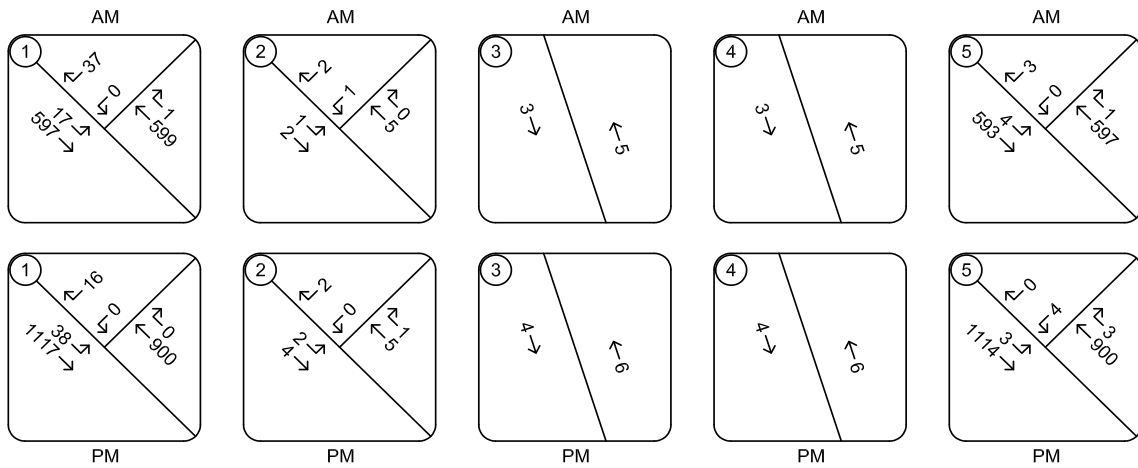
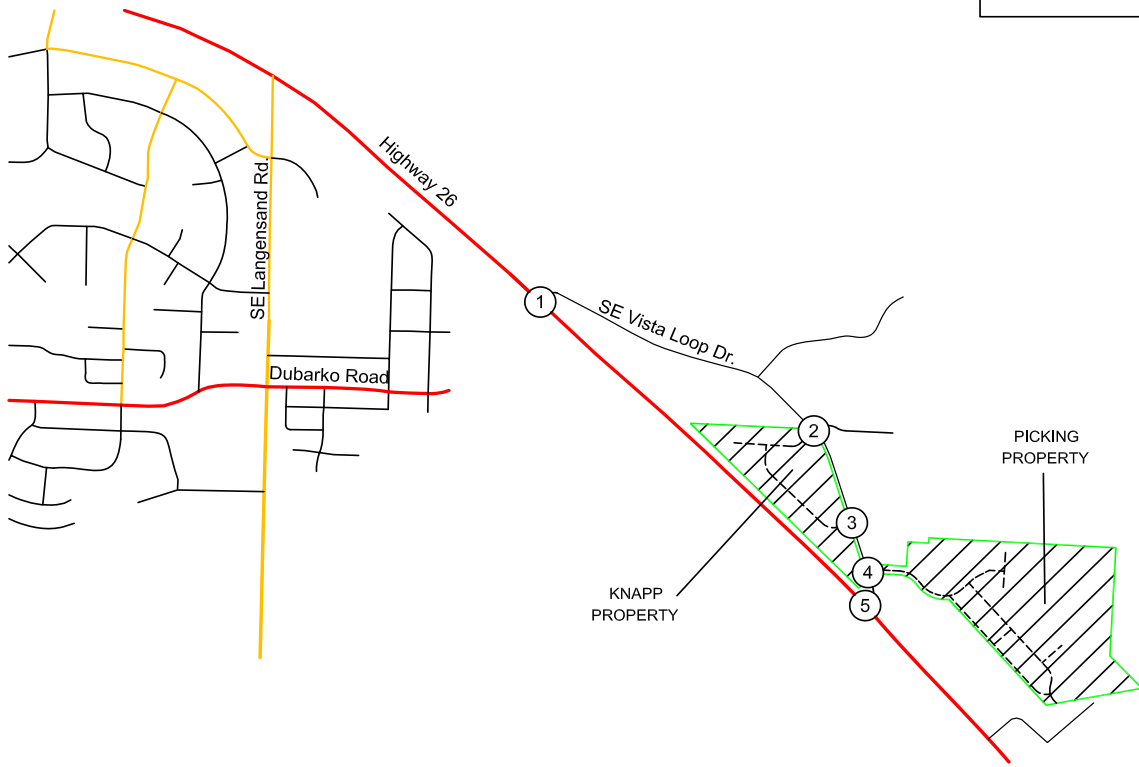
Based on data from ODOT's Future Volume Tables, the growth rate for traffic volumes on Highway 26 in the site vicinity was calculated to be 1.93 percent per year (linear). This growth rate was applied to the through traffic volumes on the highway. All other turning movements had a growth factor of 2 percent per year (exponential) applied.

Figure 4 on page 15 shows the projected year 2022 background traffic volumes at the study intersections during the morning and evening peak hours

BACKGROUND VOLUMES PLUS SITE TRIPS

Peak hour trips calculated to be generated by the proposed development were added to the projected year 2022 background traffic volumes to obtain the year 2022 total traffic volumes following completion of the proposed residential development. The resulting total traffic volumes are shown in figure 5 on page 16.

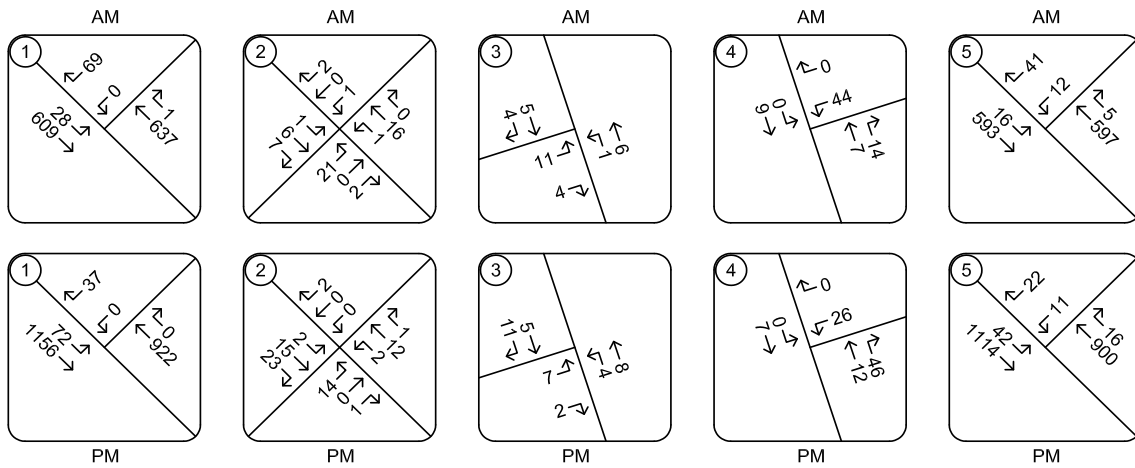
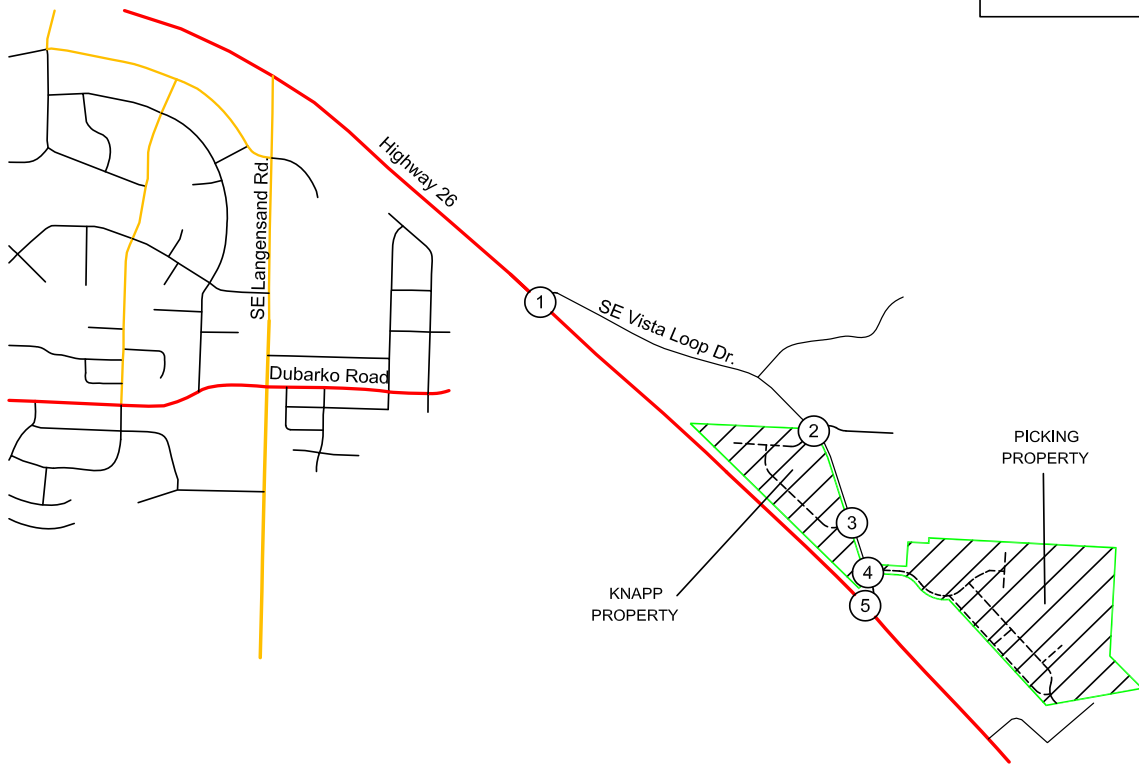
FIGURE 4



TRAFFIC VOLUMES
 2022 Background Conditions
 Morning and Evening Peak Hours

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FIGURE 5



TRAFFIC VOLUMES
 2022 Background Plus Site Trips Conditions
 Morning and Evening Peak Hours

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OPERATIONAL ANALYSIS

The operational analysis for future traffic conditions was again conducted using Synchro analysis software, with outputs based on the analysis methodologies contained in the *HIGHWAY CAPACITY MANUAL, 6th Edition*. The analysis was prepared for the intersections’ morning and evening peak hours.

The results of the operational analysis are summarized in Table 4 below. Detailed analysis worksheets are also included in the technical appendix.

Table 4 - Operational Analysis Summary: Year 2021 Future Conditions

Intersection	AM Peak Hour			PM Peak Hour		
	Delay	LOS	v/c*	Delay	LOS	v/c*
Highway 26 at Vista Loop Drive (west)						
2022 Background Conditions	10.7	B	0.20/0.06	11.9	B	0.36/0.05
2022 Background plus Site	11.2	B	0.22/0.11	12.3	B	0.37/0.11
Vista Loop Drive at Ortiz Street						
2022 Background Conditions	8.5	A	0.01	8.4	A	0.01
2022 Background Plus Site	8.8	A	0.03	9.2	A	0.03
Vista Loop Drive at S Knapp Access						
2022 Background Plus Site	8.6	A	0.02	8.7	A	0.01
Vista Loop Drive at Picking Site Access						
2022 Background Plus Site	8.9	A	0.06	8.9	A	0.04
Highway 26 at Vista Loop Drive (east)						
2022 Background Conditions	10.5	B	0.21/0.01	41.5	E	0.37/0.04
2022 Background plus Site	14.3	B	0.21/0.13	28.0	D	0.37/0.18

*(major street v/c) / (minor-street v/c)

Based on the results of the operational analysis, the study intersections on Highway 26 are projected to operate acceptably per ODOT standards either with or without the addition of site trips from the proposed development. The intersections along Vista Loop Drive are also projected to operate acceptably per the requirements of the City of Sandy. No operational mitigations are necessary or recommended in conjunction with the proposed development.



QUEUING ANALYSIS

In addition to the operational analysis, a queuing analysis was conducted to determine whether the closely spaced intersections of Highway 26 at SE Vista Loop Drive and the proposed Picking property site access on SE Vista Loop Drive can operate without queuing conflicts. The analysis was conducted for the morning and evening peak hours. Since the access will not exist without development of the subject property, the queuing analysis was conducted only for year 2022 background plus site trips conditions.

Based on the analysis, the projected 95th percentile queue lengths for the southwest-bound approach on SE Vista Loop Drive to Highway 26 were 60 feet during the morning peak hour and 63 feet during the evening peak hour (approximately two to three vehicles). Since the projected queue lengths are far shorter than the distance along SE Vista Loop Drive between Highway 26 and the nearest proposed site access, no operational concerns are anticipated in conjunction with the close intersection spacing and no queuing-related mitigations are recommended.



SAFETY ANALYSIS

CRASH DATA ANALYSIS

Using data obtained from the Oregon Department of Transportation, a review of the five most recent years of available crash history (from January 2013 through December 2017) was performed for the study intersections. None of the study intersections had any reported crashes during the five-year analysis period. Based on the crash data, no safety mitigations are recommended.

WARRANT ANALYSIS

Traffic signal and turn-lane warrants were examined for the study intersections.

Based on the projected traffic volumes, traffic signal warrants are not projected to be met at any of the unsignalized study intersections for any of the analysis scenarios. No new traffic signals are recommended in conjunction with the proposed development.

Turn lane warrants were also examined for the major-street approaches to the unsignalized study intersections. Left-turn lane warrants are intended to evaluate whether a meaningful safety benefit may be expected if the turning vehicles are provided with turn lane within the street, allowing left-turning drivers to move out of the through travel lane so that following vehicles may pass without conflicts.

Southeast-bound left-turn lanes are already in place on Highway 26 at both ends of SE Vista Loop Drive. However, northwest-bound right-turn lanes are not provided. Based on the projected turning movement volumes, right-turn lane warrants are not projected to be met. Since the design hour traffic volumes in the outside (westbound) travel lane are well below 700 vehicles per hour, the need for a shoulder improvement per the ODOT Right Turn Lane Criterion is also not triggered.

By inspection, traffic volumes at the site access intersections along SE Vista Loop Drive are too low to warrant either traffic signals or dedicated turn lanes. No new signals or turn lanes are recommended for these intersections.

INTERSECTION SIGHT DISTANCE

Based on the posted speed limit of 25 mph, a minimum of 280 feet of intersection sight distance is required in each direction for each proposed point of access along SE Vista Loop Drive. With clearing of vegetation from the site frontage it is projected that this minimum can be met for the two new intersections that will serve development within the Knapp property.

For the new site access serving the Picking property, 280 feet of intersection sight distance can be provided to the north with clearing of vegetation along the east side of the roadway north of the proposed access. However, sight distance to the south will be limited by the proximity of the proposed access to Highway 26 since the access is spaced approximately 230 feet from Highway 26.



Notably, sight lined from the proposed access are projected to be continuous to Highway 26, and vehicles turning from the site access onto SE Vista Loop Drive are not required to yield to vehicles that have not yet turned onto Vista Loop Drive. Accordingly, it is appropriate to evaluate whether adequate stopping sight distance is available for vehicles turning from Highway 26 onto Vista Loop Drive to stop if necessary to avoid a collision.

Vehicles turning from Highway 26 would be expected to turn at speeds of up to approximately 25 mph. The minimum required stopping sight distance for this approach speed was calculated to be 155 feet. Since the proposed access is spaced more than 155 feet from Highway 26, the access can operate safely.

Based on the sight distance analysis, adequate sight lines can be attained for safe operation of all proposed points of access for the proposed development.



CONCLUSIONS

Based on the operational analysis, the study intersections currently operate acceptably and are projected to continue to operate acceptably under year 2022 traffic conditions either with or without the addition of site trips from the proposed development.

Based on the queuing analysis, there is sufficient distance along SE Vista Loop Drive between the Highway 26 and the proposed site access location for the Picking Property to allow the intersections to operate without interference of queues. No queuing-related mitigations are necessary or recommended in conjunction with the proposed development.

Based on the crash data, the study intersections are currently operating acceptably with respect to safety.

Based on the warrant analysis, no new traffic signals or turn lanes are recommended.

Intersection sight distance was evaluated for the proposed points of access along SE Vista Loop Drive. Based on the analysis, it is projected that adequate sight distance can be achieved for all access locations with clearing of vegetation from the roadside. No other sight distance mitigations are necessary or recommended.

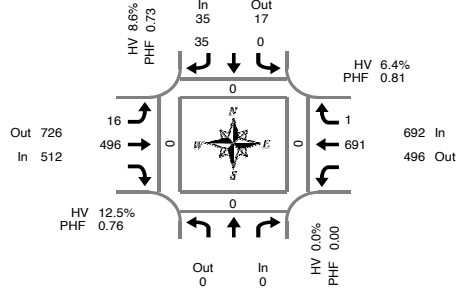


APPENDIX

Total Vehicle Summary



Clay Carney
(503) 833-2740



Peak Hour Summary
7:00 AM to 8:00 AM

SE Vista Loop Dr & Hwy 26

Wednesday, March 20, 2019
7:00 AM to 9:00 AM

5-Minute Interval Summary

7:00 AM to 9:00 AM

Interval Start Time	Northbound SE Vista Loop Dr				Southbound SE Vista Loop Dr				Eastbound Hwy 26				Westbound Hwy 26				Interval Total	Pedestrians Crosswalk			
	Bikes	L	R	Total	Bikes	L	R	Total	L	T	Bikes	T	R	Bikes	Total	North		South	East	West	
7:00 AM	0	0	6	0	1	25	0	68	0	0	100	0	0	0	100	0	0	0	0		
7:05 AM	0	0	2	0	0	25	0	54	0	0	81	0	0	0	81	0	0	0	0		
7:10 AM	0	0	4	0	1	24	0	80	0	0	109	0	0	0	109	0	0	0	0		
7:15 AM	0	0	2	0	2	32	0	71	0	0	107	0	0	0	107	0	0	0	0		
7:20 AM	0	0	2	0	2	51	0	63	0	0	118	0	0	0	118	0	0	0	0		
7:25 AM	0	0	4	0	1	31	0	62	0	0	98	0	0	0	98	0	0	0	0		
7:30 AM	0	0	1	0	2	46	0	62	1	0	112	0	0	0	112	0	0	0	0		
7:35 AM	0	0	4	0	0	43	0	49	0	0	96	0	0	0	96	0	0	0	0		
7:40 AM	0	0	4	0	3	54	0	45	0	0	106	0	0	0	106	0	0	0	0		
7:45 AM	0	0	4	0	0	54	0	44	0	0	102	0	0	0	102	0	0	0	0		
7:50 AM	0	0	0	0	2	53	0	57	0	0	112	0	0	0	112	0	0	0	0		
7:55 AM	0	0	2	0	2	58	0	36	0	0	98	0	0	0	98	0	0	0	0		
8:00 AM	0	0	3	0	1	52	0	31	0	0	87	0	0	0	87	0	0	0	0		
8:05 AM	0	0	2	0	3	44	0	40	0	0	89	0	0	0	89	0	0	0	0		
8:10 AM	0	1	1	0	0	42	0	50	0	0	94	0	0	0	94	0	0	0	0		
8:15 AM	0	0	0	0	1	46	0	32	0	0	79	0	0	0	79	0	0	0	0		
8:20 AM	0	0	1	0	2	38	0	46	0	0	87	0	0	0	87	0	0	0	0		
8:25 AM	0	0	0	0	3	39	0	42	0	0	84	0	0	0	84	0	0	0	0		
8:30 AM	0	0	2	0	0	61	0	42	0	0	105	0	0	0	105	0	0	0	0		
8:35 AM	0	0	0	0	0	56	0	44	0	0	100	0	0	0	100	0	0	0	0		
8:40 AM	0	1	2	0	0	64	0	52	0	0	119	0	0	0	119	0	0	0	0		
8:45 AM	0	0	1	0	0	66	0	56	0	0	123	0	0	0	123	0	0	0	0		
8:50 AM	0	0	0	0	2	56	0	49	0	0	107	0	0	0	107	0	0	0	0		
8:55 AM	0	0	2	0	2	61	0	42	0	0	107	0	0	0	107	0	0	0	0		
Total Survey	0	2	49	0	30	1,121	0	1,217	1	0	2,420	0	0	0	0	0	0	0	0		

15-Minute Interval Summary

7:00 AM to 9:00 AM

Interval Start Time	Northbound SE Vista Loop Dr				Southbound SE Vista Loop Dr				Eastbound Hwy 26				Westbound Hwy 26				Interval Total	Pedestrians Crosswalk			
	Bikes	L	R	Total	Bikes	L	R	Total	L	T	Bikes	T	R	Bikes	Total	North		South	East	West	
7:00 AM	0	0	12	0	2	74	0	202	0	0	290	0	0	0	290	0	0	0	0		
7:15 AM	0	0	8	0	5	114	0	196	0	0	323	0	0	0	323	0	0	0	0		
7:30 AM	0	0	9	0	5	143	0	156	1	0	314	0	0	0	314	0	0	0	0		
7:45 AM	0	0	6	0	4	165	0	137	0	0	312	0	0	0	312	0	0	0	0		
8:00 AM	0	1	6	0	4	138	0	121	0	0	270	0	0	0	270	0	0	0	0		
8:15 AM	0	0	1	0	6	123	0	120	0	0	250	0	0	0	250	0	0	0	0		
8:30 AM	0	1	4	0	0	181	0	138	0	0	324	0	0	0	324	0	0	0	0		
8:45 AM	0	0	3	0	4	183	0	147	0	0	337	0	0	0	337	0	0	0	0		
Total Survey	0	2	49	0	30	1,121	0	1,217	1	0	2,420	0	0	0	2,420	0	0	0	0		

Peak Hour Summary

7:00 AM to 8:00 AM

By Approach	Northbound SE Vista Loop Dr				Southbound SE Vista Loop Dr				Eastbound Hwy 26				Westbound Hwy 26				Total	Pedestrians Crosswalk			
	In	Out	Total	Bikes	In	Out	Total	Bikes	In	Out	Total	Bikes	In	Out	Total	Bikes		North	South	East	West
Volume	0	0	0	0	35	17	52	0	512	726	1,238	0	692	496	1,188	0	1,239	0	0	0	0
%HV	0.0%				8.6%				12.5%				6.4%				9.0%				
PHF	0.00				0.73				0.76				0.81				0.93				

By Movement	Northbound SE Vista Loop Dr				Southbound SE Vista Loop Dr				Eastbound Hwy 26				Westbound Hwy 26				Total				
	Total	L	R	Total	L	T	Total	L	T	Total	T	R	Total								
Volume	0	0	35	35	16	496	512	691	1	692	1,239	0	0	0							
%HV	NA	NA	NA	0.0%	0.0%	NA	8.6%	8.6%	6.3%	12.7%	NA	12.5%	NA	6.4%	0.0%	6.4%	9.0%				
PHF	0.00	0.00	0.73	0.73	0.80	0.75	0.76	0.81	0.25	0.81	0.93										

Rolling Hour Summary

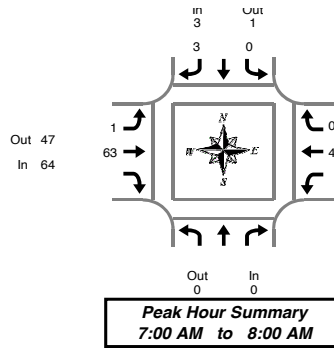
7:00 AM to 9:00 AM

Interval Start Time	Northbound SE Vista Loop Dr				Southbound SE Vista Loop Dr				Eastbound Hwy 26				Westbound Hwy 26				Interval Total	Pedestrians Crosswalk			
	Bikes	L	R	Total	Bikes	L	T	Total	L	T	Bikes	T	R	Bikes	Total	North		South	East	West	
7:00 AM	0	0	35	0	16	496	0	691	1	0	1,239	0	0	0	1,239	0	0	0	0		
7:15 AM	0	1	29	0	18	560	0	610	1	0	1,219	0	0	0	1,219	0	0	0	0		
7:30 AM	0	1	22	0	19	569	0	534	1	0	1,146	0	0	0	1,146	0	0	0	0		
7:45 AM	0	2	17	0	14	607	0	516	0	0	1,156	0	0	0	1,156	0	0	0	0		
8:00 AM	0	2	14	0	14	625	0	526	0	0	1,181	0	0	0	1,181	0	0	0	0		

Heavy Vehicle Summary



Clay Carney
(503) 833-2740



SE Vista Loop Dr & Hwy 26

Wednesday, March 20, 2019
7:00 AM to 9:00 AM

Heavy Vehicle 5-Minute Interval Summary 7:00 AM to 9:00 AM

Interval Start Time	Northbound SE Vista Loop Dr			Southbound SE Vista Loop Dr			Eastbound Hwy 26			Westbound Hwy 26			Interval Total
	SE Vista Loop Dr	Total	L	R	Total	L	T	Total	T	R	Total		
7:00 AM	0	0	0	0	0	0	0	6	6	4	0	4	10
7:05 AM	0	0	0	0	0	0	0	4	4	5	0	5	9
7:10 AM	0	0	1	1	0	2	2	2	2	3	0	3	6
7:15 AM	0	0	0	0	0	0	3	3	3	2	0	2	5
7:20 AM	0	0	0	0	0	0	7	7	7	1	0	1	8
7:25 AM	0	0	0	0	0	0	5	5	5	3	0	3	8
7:30 AM	0	0	0	0	0	0	8	8	8	6	0	6	14
7:35 AM	0	0	1	1	0	4	4	4	4	5	0	5	10
7:40 AM	0	0	1	1	1	9	10	10	10	3	0	3	14
7:45 AM	0	0	0	0	0	7	7	7	7	3	0	3	10
7:50 AM	0	0	0	0	0	0	5	5	5	8	0	8	13
7:55 AM	0	0	0	0	0	0	3	3	3	1	0	1	4
8:00 AM	0	0	0	0	0	1	8	9	9	3	0	3	12
8:05 AM	0	0	1	1	1	10	11	11	11	5	0	5	17
8:10 AM	0	0	1	1	0	3	3	3	3	6	0	6	10
8:15 AM	0	0	0	0	0	0	4	4	4	3	0	3	7
8:20 AM	0	0	0	0	0	1	4	5	5	2	0	2	7
8:25 AM	0	0	0	0	0	1	5	6	6	3	0	3	9
8:30 AM	0	0	0	0	0	0	11	11	11	4	0	4	15
8:35 AM	0	0	0	0	0	0	5	5	5	8	0	8	13
8:40 AM	0	1	0	1	0	7	7	7	7	3	0	3	11
8:45 AM	0	0	0	0	0	0	8	8	8	4	0	4	12
8:50 AM	0	0	0	0	0	1	5	6	6	6	0	6	12
8:55 AM	0	0	0	0	0	0	1	1	1	3	0	3	4
Total Survey	0	1	5	6	6	134	140	140	140	94	0	94	240

Heavy Vehicle 15-Minute Interval Summary 7:00 AM to 9:00 AM

Interval Start Time	Northbound SE Vista Loop Dr			Southbound SE Vista Loop Dr			Eastbound Hwy 26			Westbound Hwy 26			Interval Total
	SE Vista Loop Dr	Total	L	R	Total	L	T	Total	T	R	Total		
7:00 AM	0	0	1	1	0	12	12	12	12	12	0	12	25
7:15 AM	0	0	0	0	0	15	15	15	15	6	0	6	21
7:30 AM	0	0	2	2	1	21	22	22	22	14	0	14	38
7:45 AM	0	0	0	0	0	15	15	15	15	12	0	12	27
8:00 AM	0	0	2	2	2	21	23	23	23	14	0	14	39
8:15 AM	0	0	0	0	0	2	13	15	15	8	0	8	23
8:30 AM	0	1	0	1	0	23	23	23	23	15	0	15	39
8:45 AM	0	0	0	0	0	1	14	15	15	13	0	13	28
Total Survey	0	1	5	6	6	134	140	140	140	94	0	94	240

Heavy Vehicle Peak Hour Summary 7:00 AM to 8:00 AM

By Approach	Northbound SE Vista Loop Dr			Southbound SE Vista Loop Dr			Eastbound Hwy 26			Westbound Hwy 26			Total
	In	Out	Total	In	Out	Total	In	Out	Total	In	Out	Total	
Volume	0	0	0	3	1	4	64	47	111	44	63	107	111
PHF	0.00			0.38			0.73			0.79			0.73

By Movement	Northbound SE Vista Loop Dr			Southbound SE Vista Loop Dr			Eastbound Hwy 26			Westbound Hwy 26			Total
	Total	L	R	Total	L	T	Total	L	T	Total	T	R	
Volume	0	0	3	3	1	63	64			44	0	44	111
PHF	0.00	0.00	0.38	0.38	0.25	0.75	0.73			0.79	0.00	0.79	0.73

Heavy Vehicle Rolling Hour Summary 7:00 AM to 9:00 AM

Interval Start Time	Northbound SE Vista Loop Dr			Southbound SE Vista Loop Dr			Eastbound Hwy 26			Westbound Hwy 26			Interval Total
	SE Vista Loop Dr	Total	L	R	Total	L	T	Total	T	R	Total		
7:00 AM	0	0	3	3	1	63	64			44	0	44	111
7:15 AM	0	0	4	4	3	72	75			46	0	46	125
7:30 AM	0	0	4	4	5	70	75			48	0	48	127
7:45 AM	0	1	2	3	4	72	76			49	0	49	128
8:00 AM	0	1	2	3	5	71	76			50	0	50	129

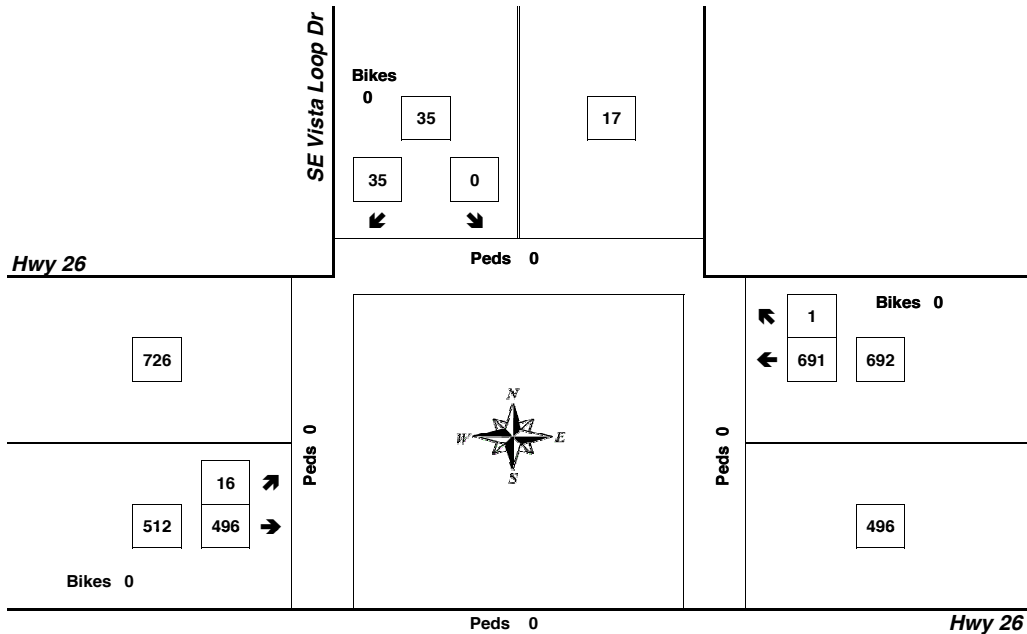
Peak Hour Summary



Clay Carney
(503) 833-2740

SE Vista Loop Dr & Hwy 26

7:00 AM to 8:00 AM
Wednesday, March 20, 2019



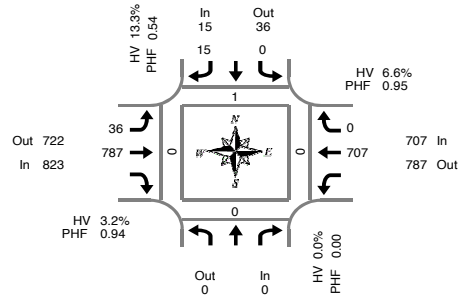
Approach	PHF	HV%	Volume
EB	0.76	12.5%	512
WB	0.81	6.4%	692
NB	0.00	0.0%	0
SB	0.73	8.6%	35
Intersection	0.93	9.0%	1,239

Count Period: 7:00 AM to 9:00 AM

Total Vehicle Summary



Clay Carney
(503) 833-2740



SE Vista Loop Dr & Hwy 26

Tuesday, March 19, 2019
4:00 PM to 6:00 PM

Peak Hour Summary
4:15 PM to 5:15 PM

5-Minute Interval Summary

4:00 PM to 6:00 PM

Interval Start Time	Northbound SE Vista Loop Dr				Southbound SE Vista Loop Dr				Eastbound Hwy 26				Westbound Hwy 26				Interval Total	Pedestrians Crosswalk			
	Bikes	L	R	Total	Bikes	L	R	Total	L	T	Bikes	T	R	Bikes	North	South		East	West		
4:00 PM	0	0	2	0	1	53	0	0	55	0	0	0	0	111	0	0	0	0			
4:05 PM	0	1	0	0	2	65	0	0	60	0	0	0	0	128	0	0	0	0			
4:10 PM	0	0	3	0	5	61	0	0	62	0	0	0	0	131	0	0	0	0			
4:15 PM	0	0	1	0	7	68	0	0	53	0	0	0	0	129	0	0	0	0			
4:20 PM	0	0	3	0	2	86	0	0	68	0	0	0	0	159	0	0	0	0			
4:25 PM	0	0	2	0	1	50	0	0	44	0	0	0	0	97	0	0	0	0			
4:30 PM	0	0	2	0	3	76	1	0	63	0	0	0	0	144	0	0	0	0			
4:35 PM	0	0	1	0	4	69	0	0	54	0	0	0	0	128	0	0	0	0			
4:40 PM	0	0	0	0	2	51	1	0	68	0	0	0	0	121	1	0	0	0			
4:45 PM	0	0	1	1	1	59	0	0	59	0	0	0	0	120	0	0	0	0			
4:50 PM	0	0	0	0	2	70	0	0	59	0	0	0	0	131	0	0	0	0			
4:55 PM	0	0	1	0	4	64	0	0	58	0	0	0	0	127	0	0	0	0			
5:00 PM	0	0	2	0	3	69	0	0	54	0	0	0	0	128	0	0	0	0			
5:05 PM	0	0	1	0	3	64	0	0	58	0	0	0	0	126	0	0	0	0			
5:10 PM	0	0	1	0	4	61	0	0	69	0	0	0	0	135	0	0	0	0			
5:15 PM	0	0	0	0	0	57	0	0	44	0	0	0	0	101	0	0	0	0			
5:20 PM	0	0	0	0	1	73	0	0	39	0	0	0	0	113	0	0	0	0			
5:25 PM	0	0	4	0	2	61	0	0	41	0	0	0	0	108	0	0	0	0			
5:30 PM	0	0	2	0	4	76	0	0	39	0	0	0	0	121	0	0	0	0			
5:35 PM	0	0	0	0	1	56	0	0	39	0	0	0	0	96	0	0	0	0			
5:40 PM	0	0	3	0	0	62	0	0	29	0	0	0	0	94	0	0	0	0			
5:45 PM	0	0	1	0	0	79	0	0	46	0	0	0	0	126	0	0	0	0			
5:50 PM	0	0	0	0	1	60	0	0	45	0	0	0	0	106	0	0	0	0			
5:55 PM	0	0	2	0	3	70	0	0	42	0	0	0	0	117	0	0	0	0			
Total Survey	0	1	32	1	56	1,560	2	0	1,248	0	0	0	0	2,897	1	0	0	0			

15-Minute Interval Summary

4:00 PM to 6:00 PM

Interval Start Time	Northbound SE Vista Loop Dr				Southbound SE Vista Loop Dr				Eastbound Hwy 26				Westbound Hwy 26				Interval Total	Pedestrians Crosswalk			
	Bikes	L	R	Total	Bikes	L	T	Total	L	T	Bikes	T	R	Bikes	North	South		East	West		
4:00 PM	0	1	5	0	8	179	0	0	177	0	0	0	0	370	0	0	0	0			
4:15 PM	0	0	6	0	10	204	0	0	165	0	0	0	0	385	0	0	0	0			
4:30 PM	0	0	3	0	9	196	2	0	185	0	0	0	0	393	1	0	0	0			
4:45 PM	0	0	2	1	7	193	0	0	176	0	0	0	0	378	0	0	0	0			
5:00 PM	0	0	4	0	10	194	0	0	181	0	0	0	0	389	0	0	0	0			
5:15 PM	0	0	4	0	3	191	0	0	124	0	0	0	0	322	0	0	0	0			
5:30 PM	0	0	5	0	5	194	0	0	107	0	0	0	0	311	0	0	0	0			
5:45 PM	0	0	3	0	4	209	0	0	133	0	0	0	0	349	0	0	0	0			
Total Survey	0	1	32	1	56	1,560	2	0	1,248	0	0	0	0	2,897	1	0	0	0			

Peak Hour Summary

4:15 PM to 5:15 PM

By Approach	Northbound SE Vista Loop Dr				Southbound SE Vista Loop Dr				Eastbound Hwy 26				Westbound Hwy 26				Total	Pedestrians Crosswalk			
	In	Out	Total	Bikes	In	Out	Total	Bikes	In	Out	Total	Bikes	In	Out	Total	Bikes		North	South	East	West
Volume	0	0	0	0	15	36	51	1	823	722	1,545	2	707	787	1,494	0	1,545	1	0	0	0
%HV	0.0%				13.3%				3.2%				6.6%				4.9%				
PHF	0.00				0.54				0.94				0.95				0.97				

By Movement	Northbound SE Vista Loop Dr				Southbound SE Vista Loop Dr				Eastbound Hwy 26				Westbound Hwy 26				Total
	Total	L	R	Total	L	T	Total	L	T	Total	T	R	Total				
Volume	0	0	15	15	36	787	823	707	0	707	1,545	2	707				
%HV	NA	NA	NA	0.0%	0.0%	NA	13.3%	13.3%	0.0%	3.3%	NA	3.2%	NA	6.6%	0.0%	6.6%	4.9%
PHF	0.00	0.00	0.54	0.54	0.90	0.93	0.94	0.95	0.00	0.95	0.97	0.00	0.95				

Rolling Hour Summary

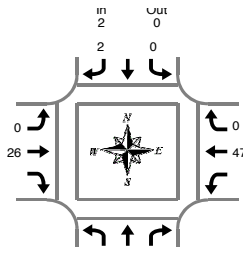
4:00 PM to 6:00 PM

Interval Start Time	Northbound SE Vista Loop Dr				Southbound SE Vista Loop Dr				Eastbound Hwy 26				Westbound Hwy 26				Interval Total	Pedestrians Crosswalk			
	Bikes	L	R	Total	Bikes	L	T	Total	L	T	Bikes	T	R	Bikes	North	South		East	West		
4:00 PM	0	1	16	1	34	772	2	0	703	0	0	0	0	1,526	1	0	0	0			
4:15 PM	0	0	15	1	36	787	2	0	707	0	0	0	0	1,545	1	0	0	0			
4:30 PM	0	0	13	1	29	774	2	0	666	0	0	0	0	1,482	1	0	0	0			
4:45 PM	0	0	15	1	25	772	0	0	588	0	0	0	0	1,400	0	0	0	0			
5:00 PM	0	0	16	0	22	788	0	0	545	0	0	0	0	1,371	0	0	0	0			

Heavy Vehicle Summary



Clay Carney
(503) 833-2740



Out 49
In 26

Peak Hour Summary
4:15 PM to 5:15 PM

SE Vista Loop Dr & Hwy 26

Tuesday, March 19, 2019
4:00 PM to 6:00 PM

Heavy Vehicle 5-Minute Interval Summary 4:00 PM to 6:00 PM

Interval Start Time	Northbound SE Vista Loop Dr			Southbound SE Vista Loop Dr			Eastbound Hwy 26			Westbound Hwy 26			Interval Total
	In	Out	Total	L	R	Total	L	T	Total	T	R	Total	
4:00 PM	0	0	0	1	1	2	0	2	2	10	0	10	13
4:05 PM	0	1	1	0	1	1	1	6	7	2	0	2	10
4:10 PM	0	0	0	1	1	2	1	2	3	7	0	7	11
4:15 PM	0	0	0	0	0	0	0	3	3	3	0	3	6
4:20 PM	0	0	0	1	1	2	0	6	6	4	0	4	11
4:25 PM	0	0	0	1	1	2	0	3	3	3	0	3	7
4:30 PM	0	0	0	0	0	0	0	1	1	1	0	1	2
4:35 PM	0	0	0	0	0	0	0	0	0	5	0	5	5
4:40 PM	0	0	0	0	0	0	0	3	3	3	0	3	6
4:45 PM	0	0	0	0	0	0	0	1	1	3	0	3	4
4:50 PM	0	0	0	0	0	0	2	2	2	8	0	8	10
4:55 PM	0	0	0	0	0	0	0	1	1	1	0	1	2
5:00 PM	0	0	0	0	0	0	4	4	4	4	0	4	8
5:05 PM	0	0	0	0	0	0	1	1	1	8	0	8	9
5:10 PM	0	0	0	0	0	0	1	1	1	4	0	4	5
5:15 PM	0	0	0	0	0	0	2	2	2	1	0	1	3
5:20 PM	0	0	0	0	0	0	0	0	0	5	0	5	5
5:25 PM	0	0	0	0	0	0	0	0	0	1	0	1	1
5:30 PM	0	0	0	0	0	0	2	2	2	2	0	2	4
5:35 PM	0	0	0	0	0	0	0	0	0	4	0	4	4
5:40 PM	0	0	0	0	0	0	2	2	2	2	0	2	4
5:45 PM	0	0	0	0	0	0	2	2	2	1	0	1	3
5:50 PM	0	0	0	0	0	0	0	0	0	2	0	2	2
5:55 PM	0	0	0	0	0	0	2	2	2	3	0	3	5
Total Survey	0	1	1	4	5	9	2	46	48	87	0	87	140

Heavy Vehicle 15-Minute Interval Summary 4:00 PM to 6:00 PM

Interval Start Time	Northbound SE Vista Loop Dr			Southbound SE Vista Loop Dr			Eastbound Hwy 26			Westbound Hwy 26			Interval Total
	In	Out	Total	L	R	Total	L	T	Total	T	R	Total	
4:00 PM	0	1	1	2	3	5	2	10	12	19	0	19	34
4:15 PM	0	0	0	2	2	4	0	12	12	10	0	10	24
4:30 PM	0	0	0	0	0	0	4	4	4	9	0	9	13
4:45 PM	0	0	0	0	0	0	4	4	4	12	0	12	16
5:00 PM	0	0	0	0	0	0	6	6	6	16	0	16	22
5:15 PM	0	0	0	0	0	0	2	2	2	7	0	7	9
5:30 PM	0	0	0	0	0	0	4	4	4	8	0	8	12
5:45 PM	0	0	0	0	0	0	4	4	4	6	0	6	10
Total Survey	0	1	1	4	5	9	2	46	48	87	0	87	140

Heavy Vehicle Peak Hour Summary 4:15 PM to 5:15 PM

By Approach	Northbound SE Vista Loop Dr			Southbound SE Vista Loop Dr			Eastbound Hwy 26			Westbound Hwy 26			Total
	In	Out	Total	In	Out	Total	In	Out	Total	In	Out	Total	
Volume	0	0	0	2	0	2	26	49	75	47	26	73	75
PHF	0.00			0.25			0.54			0.73			0.78

By Movement	Northbound SE Vista Loop Dr			Southbound SE Vista Loop Dr			Eastbound Hwy 26			Westbound Hwy 26			Total
	In	Out	Total	L	R	Total	L	T	Total	T	R	Total	
Volume	0	0	0	2	2	4	0	26	26	47	0	47	75
PHF	0.00	0.00		0.25	0.25		0.00	0.54	0.54	0.73	0.00	0.73	0.78

Heavy Vehicle Rolling Hour Summary 4:00 PM to 6:00 PM

Interval Start Time	Northbound SE Vista Loop Dr			Southbound SE Vista Loop Dr			Eastbound Hwy 26			Westbound Hwy 26			Interval Total
	In	Out	Total	L	R	Total	L	T	Total	T	R	Total	
4:00 PM	0	1	1	4	5	9	2	30	32	50	0	50	87
4:15 PM	0	0	0	2	2	4	0	26	26	47	0	47	75
4:30 PM	0	0	0	0	0	0	4	16	16	44	0	44	60
4:45 PM	0	0	0	0	0	0	4	16	16	43	0	43	59
5:00 PM	0	0	0	0	0	0	4	16	16	37	0	37	53

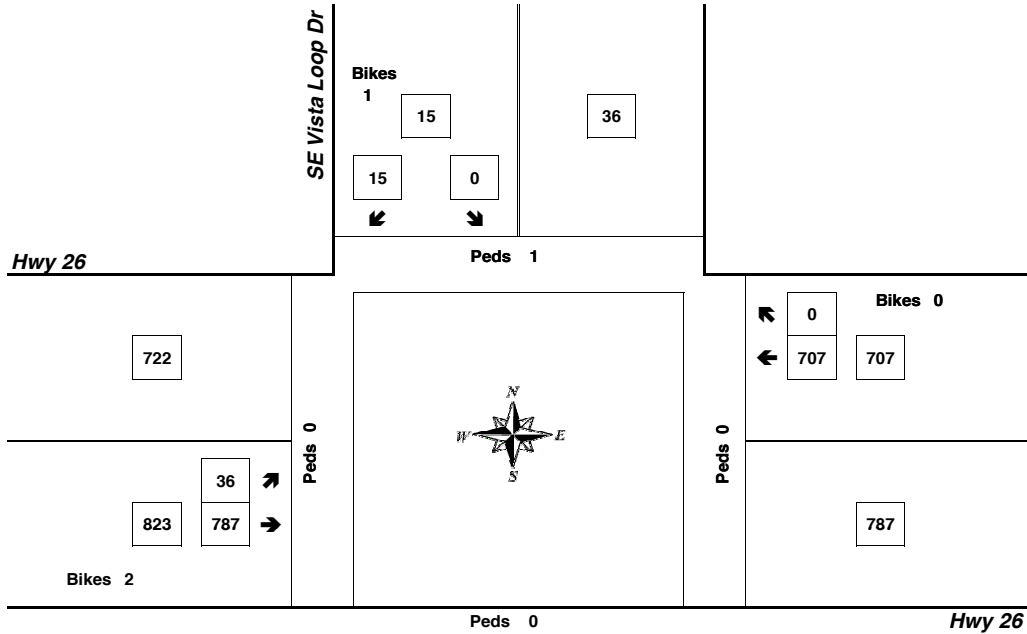
Peak Hour Summary



Clay Carney
(503) 833-2740

SE Vista Loop Dr & Hwy 26

4:15 PM to 5:15 PM
Tuesday, March 19, 2019



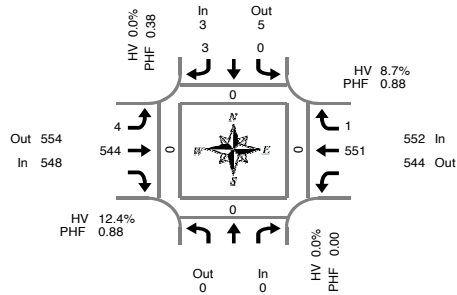
Approach	PHF	HV%	Volume
EB	0.94	3.2%	823
WB	0.95	6.6%	707
NB	0.00	0.0%	0
SB	0.54	13.3%	15
Intersection	0.97	4.9%	1,545

Count Period: 4:00 PM to 6:00 PM

Total Vehicle Summary



Clay Carney
(503) 833-2740



SE Vista Loop Dr & Hwy 26

Thursday, July 18, 2019
7:00 AM to 9:00 AM

Peak Hour Summary
8:00 AM to 9:00 AM

5-Minute Interval Summary

7:00 AM to 9:00 AM

Interval Start Time	Northbound SE Vista Loop Dr				Southbound SE Vista Loop Dr				Eastbound Hwy 26				Westbound Hwy 26				Interval Total	Pedestrians Crosswalk			
	Bikes	L	R	Bikes	L	R	Bikes	L	T	Bikes	T	R	Bikes	North	South	East		West			
7:00 AM	0	0	1	0	0	0	0	23	0	41	0	0	65	0	0	0	0				
7:05 AM	0	0	0	0	0	0	0	23	0	55	0	0	78	0	0	0	0				
7:10 AM	0	0	1	0	1	0	1	31	0	47	0	0	80	0	0	0	0				
7:15 AM	0	0	0	0	0	0	0	35	0	53	0	0	88	0	0	0	0				
7:20 AM	0	1	0	0	0	0	0	30	0	56	0	0	87	0	0	0	0				
7:25 AM	0	0	0	0	0	0	0	38	1	43	0	0	81	0	0	0	0				
7:30 AM	0	1	1	0	0	0	0	34	0	52	0	0	88	0	0	0	0				
7:35 AM	0	0	0	0	0	0	0	45	0	47	0	0	92	0	0	0	0				
7:40 AM	0	0	0	0	0	0	0	36	0	41	0	0	77	0	0	0	0				
7:45 AM	0	0	0	0	0	0	0	34	0	52	0	0	86	0	0	0	0				
7:50 AM	0	0	0	0	0	0	0	43	0	35	0	0	78	0	0	0	0				
7:55 AM	0	0	0	0	0	0	0	26	0	44	1	0	71	0	0	0	0				
8:00 AM	0	0	0	0	0	1	60	0	42	0	0	0	103	0	0	0	0				
8:05 AM	0	0	0	0	0	1	45	0	31	0	0	0	77	0	0	0	0				
8:10 AM	0	0	2	0	1	28	0	40	0	40	0	0	71	0	0	0	0				
8:15 AM	0	0	0	0	0	0	40	0	45	0	0	0	85	0	0	0	0				
8:20 AM	0	0	0	0	0	0	35	0	51	0	0	0	86	0	0	0	0				
8:25 AM	0	0	0	0	0	0	53	0	36	0	0	0	89	0	0	0	0				
8:30 AM	0	0	0	0	1	36	0	40	0	50	0	0	87	0	0	0	0				
8:35 AM	0	0	0	0	0	0	44	0	50	0	0	0	94	0	0	0	0				
8:40 AM	0	0	0	0	0	0	50	0	56	0	0	0	106	0	0	0	0				
8:45 AM	0	0	0	0	0	0	62	0	50	0	0	0	112	0	0	0	0				
8:50 AM	0	0	1	0	0	0	40	0	46	1	0	0	88	0	0	0	0				
8:55 AM	0	0	0	0	0	0	51	0	54	0	0	0	105	0	0	0	0				
Total Survey	0	2	6	0	5	942	1	1,117	2	0	2,074	0	0	0	0	0	0				

15-Minute Interval Summary

7:00 AM to 9:00 AM

Interval Start Time	Northbound SE Vista Loop Dr				Southbound SE Vista Loop Dr				Eastbound Hwy 26				Westbound Hwy 26				Interval Total	Pedestrians Crosswalk			
	Bikes	L	R	Bikes	L	R	Bikes	L	T	Bikes	T	R	Bikes	North	South	East		West			
7:00 AM	0	0	2	0	1	77	0	143	0	0	223	0	0	0	0	0	0				
7:15 AM	0	1	0	0	0	103	1	152	0	0	256	0	0	0	0	0	0				
7:30 AM	0	1	1	0	0	115	0	140	0	0	257	0	0	0	0	0	0				
7:45 AM	0	0	0	0	0	103	0	131	1	0	235	0	0	0	0	0	0				
8:00 AM	0	0	2	0	3	133	0	113	0	0	251	0	0	0	0	0	0				
8:15 AM	0	0	0	0	0	128	0	132	0	0	260	0	0	0	0	0	0				
8:30 AM	0	0	0	0	1	130	0	156	0	0	287	0	0	0	0	0	0				
8:45 AM	0	0	1	0	0	153	0	150	1	0	305	0	0	0	0	0	0				
Total Survey	0	2	6	0	5	942	1	1,117	2	0	2,074	0	0	0	0	0	0				

Peak Hour Summary

8:00 AM to 9:00 AM

By Approach	Northbound SE Vista Loop Dr				Southbound SE Vista Loop Dr				Eastbound Hwy 26				Westbound Hwy 26				Total	Pedestrians Crosswalk			
	In	Out	Total	Bikes	In	Out	Total	Bikes	In	Out	Total	Bikes	In	Out	Total	Bikes		North	South	East	West
Volume	0	0	0	0	3	5	8	0	548	554	1,102	0	552	544	1,096	0	1,103	0	0	0	0
%HV	0.0%				0.0%				12.4%				8.7%				10.5%				
PHF	0.00				0.38				0.88				0.88				0.88				

By Movement	Northbound SE Vista Loop Dr				Southbound SE Vista Loop Dr				Eastbound Hwy 26				Westbound Hwy 26				Total
	Total	L	R	Total	L	T	Total	T	R	Total	T	R	Total				
Volume	0	0	3	3	4	544	548	551	1	552	1,103	0	1,103				
%HV	NA	NA	NA	0.0%	0.0%	NA	0.0%	0.0%	75.0%	11.9%	NA	12.4%	NA	8.7%	0.0%	8.7%	10.5%
PHF	0.00	0.00	0.38	0.38	0.33	0.87	0.88	0.88	0.25	0.88	0.88						

Rolling Hour Summary

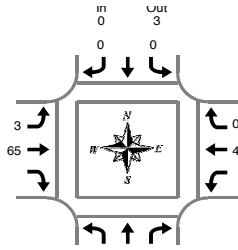
7:00 AM to 9:00 AM

Interval Start Time	Northbound SE Vista Loop Dr				Southbound SE Vista Loop Dr				Eastbound Hwy 26				Westbound Hwy 26				Interval Total	Pedestrians Crosswalk			
	Bikes	L	R	Bikes	L	T	Bikes	L	T	Bikes	T	R	Bikes	North	South	East		West			
7:00 AM	0	2	3	0	1	398	1	566	1	0	971	0	0	0	0	0	0				
7:15 AM	0	2	3	0	3	454	1	536	1	0	999	0	0	0	0	0	0				
7:30 AM	0	1	3	0	3	479	0	516	1	0	1,003	0	0	0	0	0	0				
7:45 AM	0	0	2	0	4	494	0	532	1	0	1,033	0	0	0	0	0	0				
8:00 AM	0	0	3	0	4	544	0	551	1	0	1,103	0	0	0	0	0	0				

Heavy Vehicle Summary



Clay Carney
(503) 833-2740



Peak Hour Summary
8:00 AM to 9:00 AM

SE Vista Loop Dr & Hwy 26

Thursday, July 18, 2019
7:00 AM to 9:00 AM

Heavy Vehicle 5-Minute Interval Summary 7:00 AM to 9:00 AM

Interval Start Time	Northbound SE Vista Loop Dr			Southbound SE Vista Loop Dr			Eastbound Hwy 26			Westbound Hwy 26			Interval Total
	In	Out	Total	L	R	Total	L	T	Total	T	R	Total	
7:00 AM	0	0	0	0	0	0	0	5	5	0	0	5	10
7:05 AM	0	0	0	0	0	0	0	4	4	0	0	4	8
7:10 AM	0	0	0	0	0	0	0	2	2	0	0	2	4
7:15 AM	0	0	0	0	0	0	0	3	3	1	0	1	4
7:20 AM	0	0	0	0	0	0	0	6	6	4	0	4	10
7:25 AM	0	0	0	0	0	0	0	5	5	2	0	2	7
7:30 AM	0	0	0	0	0	0	0	2	2	1	0	1	3
7:35 AM	0	0	0	0	0	0	0	9	9	2	0	2	11
7:40 AM	0	0	0	0	0	0	0	4	4	2	0	2	6
7:45 AM	0	0	0	0	0	0	0	3	3	4	0	4	7
7:50 AM	0	0	0	0	0	0	0	5	5	2	0	2	7
7:55 AM	0	0	0	0	0	0	0	2	2	4	1	5	7
8:00 AM	0	0	0	0	0	1	8	9	9	1	0	1	10
8:05 AM	0	0	0	0	0	0	13	13	13	2	0	2	15
8:10 AM	0	0	0	0	0	1	5	6	6	3	0	3	9
8:15 AM	0	0	0	0	0	0	4	4	4	4	0	4	8
8:20 AM	0	0	0	0	0	0	2	2	2	3	0	3	5
8:25 AM	0	0	0	0	0	0	7	7	7	7	0	7	14
8:30 AM	0	0	0	0	0	1	7	8	8	6	0	6	14
8:35 AM	0	0	0	0	0	0	2	2	2	6	0	6	8
8:40 AM	0	0	0	0	0	0	2	2	2	6	0	6	8
8:45 AM	0	0	0	0	0	0	5	5	5	4	0	4	9
8:50 AM	0	0	0	0	0	0	4	4	4	3	0	3	7
8:55 AM	0	0	0	0	0	0	6	6	6	3	0	3	9
Total Survey	0	0	0	0	0	3	115	118	118	81	1	82	200

Heavy Vehicle 15-Minute Interval Summary 7:00 AM to 9:00 AM

Interval Start Time	Northbound SE Vista Loop Dr			Southbound SE Vista Loop Dr			Eastbound Hwy 26			Westbound Hwy 26			Interval Total
	In	Out	Total	L	R	Total	L	T	Total	T	R	Total	
7:00 AM	0	0	0	0	0	0	0	11	11	11	0	11	22
7:15 AM	0	0	0	0	0	0	0	14	14	7	0	7	21
7:30 AM	0	0	0	0	0	0	0	15	15	5	0	5	20
7:45 AM	0	0	0	0	0	0	0	10	10	10	1	11	21
8:00 AM	0	0	0	0	0	2	26	28	28	6	0	6	34
8:15 AM	0	0	0	0	0	0	13	13	13	14	0	14	27
8:30 AM	0	0	0	0	0	1	11	12	12	18	0	18	30
8:45 AM	0	0	0	0	0	0	15	15	15	10	0	10	25
Total Survey	0	0	0	0	0	3	115	118	118	81	1	82	200

Heavy Vehicle Peak Hour Summary 8:00 AM to 9:00 AM

By Approach	Northbound SE Vista Loop Dr			Southbound SE Vista Loop Dr			Eastbound Hwy 26			Westbound Hwy 26			Total
	In	Out	Total	In	Out	Total	In	Out	Total	In	Out	Total	
Volume	0	0	0	0	3	3	68	48	116	48	65	113	116
PHF	0.00			0.00			0.61			0.63			0.81

By Movement	Northbound SE Vista Loop Dr			Southbound SE Vista Loop Dr			Eastbound Hwy 26			Westbound Hwy 26			Total
	In	Out	Total	L	R	Total	L	T	Total	T	R	Total	
Volume				0	0	0	3	65	68	48	0	48	116
PHF				0.00	0.00	0.00	0.38	0.63	0.61	0.63	0.00	0.63	0.81

Heavy Vehicle Rolling Hour Summary 7:00 AM to 9:00 AM

Interval Start Time	Northbound SE Vista Loop Dr			Southbound SE Vista Loop Dr			Eastbound Hwy 26			Westbound Hwy 26			Interval Total
	In	Out	Total	L	R	Total	L	T	Total	T	R	Total	
7:00 AM	0	0	0	0	0	0	0	50	50	33	1	34	84
7:15 AM	0	0	0	0	0	0	2	65	67	28	1	29	96
7:30 AM	0	0	0	0	0	2	64	66	66	35	1	36	102
7:45 AM	0	0	0	0	0	3	60	63	63	48	1	49	112
8:00 AM	0	0	0	0	0	3	65	68	68	48	0	48	116

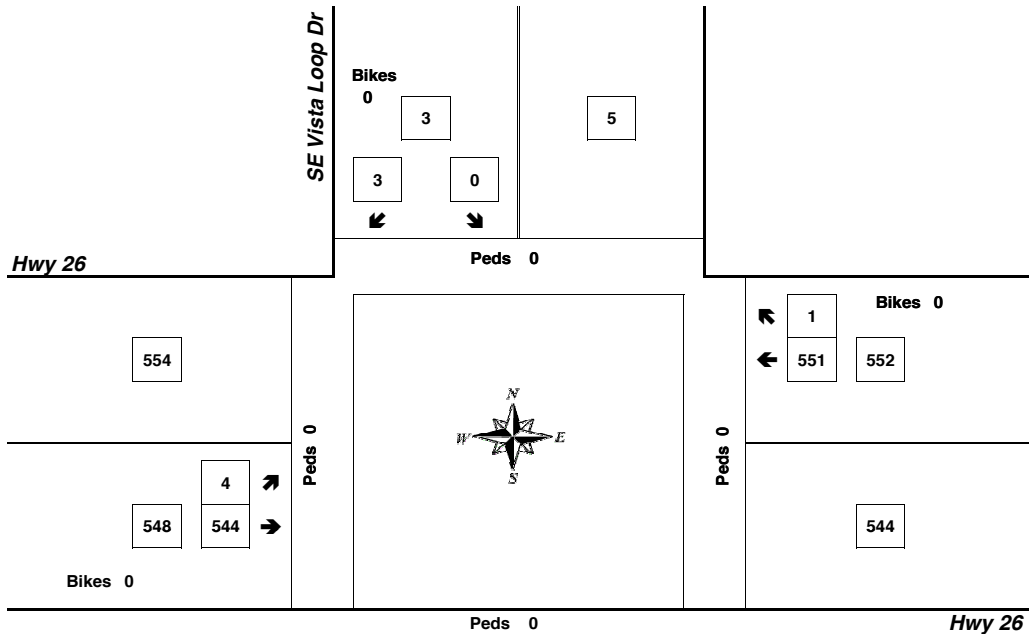
Peak Hour Summary



Clay Carney
(503) 833-2740

SE Vista Loop Dr & Hwy 26

8:00 AM to 9:00 AM
Thursday, July 18, 2019



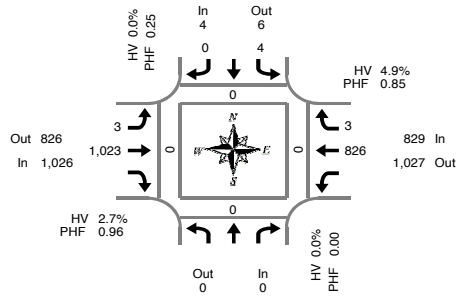
Approach	PHF	HV%	Volume
EB	0.88	12.4%	548
WB	0.88	8.7%	552
NB	0.00	0.0%	0
SB	0.38	0.0%	3
Intersection	0.88	10.5%	1,103

Count Period: 7:00 AM to 9:00 AM

Total Vehicle Summary



Clay Carney
(503) 833-2740



SE Vista Loop Dr & Hwy 26

Thursday, July 18, 2019
4:00 PM to 6:00 PM

Peak Hour Summary
4:50 PM to 5:50 PM

5-Minute Interval Summary
4:00 PM to 6:00 PM

Interval Start Time	Northbound SE Vista Loop Dr				Southbound SE Vista Loop Dr				Eastbound Hwy 26			Westbound Hwy 26			Interval Total	Pedestrians Crosswalk			
	In	Out	Total	Bikes	In	Out	Total	Bikes	L	T	R	In	Out	Total		Bikes	North	South	East
4:00 PM	0	0	0	0	1	0	0	0	75	0	0	82	0	0	158	0	0	0	0
4:05 PM	0	0	0	0	0	0	0	0	91	0	0	68	0	0	159	0	0	0	0
4:10 PM	0	0	0	0	0	0	0	0	60	0	0	82	0	0	142	0	0	0	0
4:15 PM	0	0	0	0	0	0	0	0	89	0	0	62	0	0	151	0	0	0	0
4:20 PM	0	0	0	0	0	0	0	0	95	0	0	70	0	0	165	0	0	0	0
4:25 PM	0	0	0	0	1	0	2	69	0	0	63	0	0	135	0	0	0	0	
4:30 PM	0	0	0	0	1	0	0	72	0	0	61	0	0	134	0	0	0	0	
4:35 PM	0	0	0	0	0	0	0	88	0	0	67	0	0	155	0	0	0	0	
4:40 PM	0	0	0	0	0	0	0	60	0	0	66	0	0	126	0	0	0	0	
4:45 PM	0	0	0	0	0	0	0	76	0	0	58	0	0	134	0	0	0	0	
4:50 PM	0	0	0	0	0	0	1	81	0	0	76	0	0	158	0	0	0	0	
4:55 PM	0	0	0	0	0	0	0	89	0	0	68	0	0	157	0	0	0	0	
5:00 PM	0	0	0	0	0	0	1	79	0	0	99	0	0	179	0	0	0	0	
5:05 PM	0	0	0	0	0	0	0	76	0	0	59	0	0	135	0	0	0	0	
5:10 PM	0	0	0	0	0	0	1	95	0	0	60	0	1	156	0	0	0	0	
5:15 PM	0	0	0	0	0	0	0	92	0	0	79	1	0	172	0	0	0	0	
5:20 PM	0	0	0	0	0	0	0	78	0	0	56	0	0	134	0	0	0	0	
5:25 PM	0	0	0	0	0	0	0	92	0	0	76	0	0	168	0	0	0	0	
5:30 PM	0	2	0	0	0	0	0	82	0	0	69	0	0	153	0	0	0	0	
5:35 PM	0	0	0	0	0	0	0	93	0	0	61	0	0	154	0	0	0	0	
5:40 PM	0	2	0	0	0	0	0	76	0	0	67	2	0	147	0	0	0	0	
5:45 PM	0	0	0	0	0	0	0	90	1	0	56	0	0	146	0	0	0	0	
5:50 PM	0	0	0	1	0	0	0	78	0	0	59	0	0	138	0	0	0	0	
5:55 PM	0	0	0	0	0	0	1	72	0	0	50	0	0	123	0	0	0	0	
Total Survey	0	4	4	0	6	1,948	1	1,614	3	1	3,579	0	0	0	0	0	0	0	

15-Minute Interval Summary
4:00 PM to 6:00 PM

Interval Start Time	Northbound SE Vista Loop Dr				Southbound SE Vista Loop Dr				Eastbound Hwy 26			Westbound Hwy 26			Interval Total	Pedestrians Crosswalk			
	In	Out	Total	Bikes	In	Out	Total	Bikes	L	T	R	In	Out	Total		Bikes	North	South	East
4:00 PM	0	0	0	0	1	0	0	226	0	0	232	0	0	459	0	0	0	0	
4:15 PM	0	0	0	0	1	0	2	253	0	0	195	0	0	451	0	0	0	0	
4:30 PM	0	0	0	0	1	0	0	220	0	0	194	0	0	415	0	0	0	0	
4:45 PM	0	0	0	0	0	0	1	246	0	0	202	0	0	449	0	0	0	0	
5:00 PM	0	0	0	0	0	0	2	250	0	0	218	0	1	470	0	0	0	0	
5:15 PM	0	0	0	0	0	0	0	262	0	0	211	1	0	474	0	0	0	0	
5:30 PM	0	4	0	0	0	0	0	251	0	0	197	2	0	454	0	0	0	0	
5:45 PM	0	0	0	1	0	1	240	1	0	0	165	0	0	407	0	0	0	0	
Total Survey	0	4	4	0	6	1,948	1	1,614	3	1	3,579	0	0	0	0	0	0	0	

Peak Hour Summary
4:50 PM to 5:50 PM

By Approach	Northbound SE Vista Loop Dr				Southbound SE Vista Loop Dr				Eastbound Hwy 26			Westbound Hwy 26			Total	Pedestrians Crosswalk					
	In	Out	Total	Bikes	In	Out	Total	Bikes	In	Out	Total	In	Out	Total		Bikes	North	South	East	West	
Volume	0	0	0	0	4	6	10	0	1,026	826	1,852	1	829	1,027	1,856	1	1,859	0	0	0	0
%HV	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	2.7%	2.7%	4.9%	4.9%	3.7%	3.7%	0.94						
PHF	0.00	0.00	0.00	0.00	0.25	0.25	0.38	0.96	0.96	0.85	0.38	0.85	0.94	0.94							

By Movement	Northbound SE Vista Loop Dr				Southbound SE Vista Loop Dr				Eastbound Hwy 26			Westbound Hwy 26			Total		
	Total	L	R	Total	L	T	R	Total	T	R	Total						
Volume	0	4	0	4	3	1,023	3	1,026	826	3	829	1,859					
%HV	NA	NA	NA	0.0%	0.0%	NA	0.0%	0.0%	0.0%	2.7%	NA	2.7%	NA	5.0%	0.0%	4.9%	3.7%
PHF	0.00	0.25	0.00	0.25	0.38	0.96	0.38	0.96	0.96	0.85	0.38	0.85	0.94				

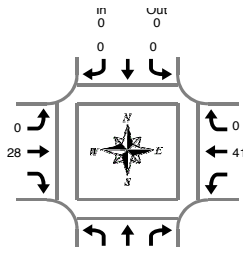
Rolling Hour Summary
4:00 PM to 6:00 PM

Interval Start Time	Northbound SE Vista Loop Dr				Southbound SE Vista Loop Dr				Eastbound Hwy 26			Westbound Hwy 26			Interval Total	Pedestrians Crosswalk			
	In	Out	Total	Bikes	In	Out	Total	Bikes	L	T	R	In	Out	Total		Bikes	North	South	East
4:00 PM	0	0	0	0	3	0	3	945	0	0	823	0	0	1,774	0	0	0	0	
4:15 PM	0	0	0	0	2	0	5	969	0	0	809	0	1	1,785	0	0	0	0	
4:30 PM	0	0	0	0	1	0	3	978	0	0	825	1	1	1,808	0	0	0	0	
4:45 PM	0	4	0	0	0	0	3	1,009	0	0	828	3	1	1,847	0	0	0	0	
5:00 PM	0	4	0	0	1	0	3	1,003	1	0	791	3	1	1,805	0	0	0	0	

Heavy Vehicle Summary



Clay Carney
(503) 833-2740



SE Vista Loop Dr & Hwy 26

Thursday, July 18, 2019
4:00 PM to 6:00 PM

Peak Hour Summary
4:50 PM to 5:50 PM

Heavy Vehicle 5-Minute Interval Summary 4:00 PM to 6:00 PM

Interval Start Time	Northbound SE Vista Loop Dr			Southbound SE Vista Loop Dr			Eastbound Hwy 26			Westbound Hwy 26			Interval Total
	SE Vista Loop Dr	Total	L	R	Total	L	T	Total	T	R	Total		
4:00 PM	0	0	0	0	0	0	0	3	3	7	0	7	10
4:05 PM	0	0	0	0	0	0	0	2	2	5	0	5	7
4:10 PM	0	0	0	0	0	0	0	5	5	5	0	5	10
4:15 PM	0	0	0	0	0	0	0	3	3	1	0	1	4
4:20 PM	0	0	0	0	0	0	0	2	2	4	0	4	6
4:25 PM	0	0	0	0	0	0	0	4	4	3	0	3	7
4:30 PM	0	0	0	0	0	0	0	1	1	3	0	3	4
4:35 PM	0	0	0	0	0	0	0	5	5	7	0	7	12
4:40 PM	0	0	0	0	0	0	0	0	0	3	0	3	3
4:45 PM	0	0	0	0	0	0	0	1	1	4	0	4	5
4:50 PM	0	0	0	0	0	0	0	4	4	3	0	3	7
4:55 PM	0	0	0	0	0	0	0	1	1	2	0	2	3
5:00 PM	0	0	0	0	0	0	0	4	4	4	0	4	8
5:05 PM	0	0	0	0	0	0	0	5	5	0	0	0	5
5:10 PM	0	0	0	0	0	0	0	4	4	1	0	1	5
5:15 PM	0	0	0	0	0	0	0	1	1	8	0	8	9
5:20 PM	0	0	0	0	0	0	0	3	3	2	0	2	5
5:25 PM	0	0	0	0	0	0	0	1	1	4	0	4	5
5:30 PM	0	0	0	0	0	0	0	1	1	1	0	1	2
5:35 PM	0	0	0	0	0	0	0	1	1	4	0	4	5
5:40 PM	0	0	0	0	0	0	0	2	2	9	0	9	11
5:45 PM	0	0	0	0	0	0	0	1	1	3	0	3	4
5:50 PM	0	0	0	0	0	0	0	1	1	3	0	3	4
5:55 PM	0	0	0	0	0	0	0	2	2	3	0	3	5
Total Survey	0	0	0	0	0	0	0	57	57	89	0	89	146

Heavy Vehicle 15-Minute Interval Summary 4:00 PM to 6:00 PM

Interval Start Time	Northbound SE Vista Loop Dr			Southbound SE Vista Loop Dr			Eastbound Hwy 26			Westbound Hwy 26			Interval Total
	SE Vista Loop Dr	Total	L	R	Total	L	T	Total	T	R	Total		
4:00 PM	0	0	0	0	0	0	0	10	10	17	0	17	27
4:15 PM	0	0	0	0	0	0	0	9	9	8	0	8	17
4:30 PM	0	0	0	0	0	0	0	6	6	13	0	13	19
4:45 PM	0	0	0	0	0	0	0	6	6	9	0	9	15
5:00 PM	0	0	0	0	0	0	0	13	13	5	0	5	18
5:15 PM	0	0	0	0	0	0	0	5	5	14	0	14	19
5:30 PM	0	0	0	0	0	0	0	4	4	14	0	14	18
5:45 PM	0	0	0	0	0	0	0	4	4	9	0	9	13
Total Survey	0	0	0	0	0	0	0	57	57	89	0	89	146

Heavy Vehicle Peak Hour Summary 4:50 PM to 5:50 PM

By Approach	Northbound SE Vista Loop Dr			Southbound SE Vista Loop Dr			Eastbound Hwy 26			Westbound Hwy 26			Total
	In	Out	Total	In	Out	Total	In	Out	Total	In	Out	Total	
Volume	0	0	0	0	0	0	28	41	69	41	28	69	69
PHF	0.00			0.00			0.54			0.64			0.86

By Movement	Northbound SE Vista Loop Dr			Southbound SE Vista Loop Dr			Eastbound Hwy 26			Westbound Hwy 26			Total
	Total	L	R	Total	L	R	Total	T	R	Total	T	R	
Volume	0	0	0	0	0	0	0	28	28	41	0	41	69
PHF	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.54	0.54	0.64	0.00	0.64	0.86

Heavy Vehicle Rolling Hour Summary 4:00 PM to 6:00 PM

Interval Start Time	Northbound SE Vista Loop Dr			Southbound SE Vista Loop Dr			Eastbound Hwy 26			Westbound Hwy 26			Interval Total
	SE Vista Loop Dr	Total	L	R	Total	L	T	Total	T	R	Total		
4:00 PM	0	0	0	0	0	0	0	31	31	47	0	47	78
4:15 PM	0	0	0	0	0	0	0	34	34	35	0	35	69
4:30 PM	0	0	0	0	0	0	0	30	30	41	0	41	71
4:45 PM	0	0	0	0	0	0	0	28	28	42	0	42	70
5:00 PM	0	0	0	0	0	0	0	26	26	42	0	42	68

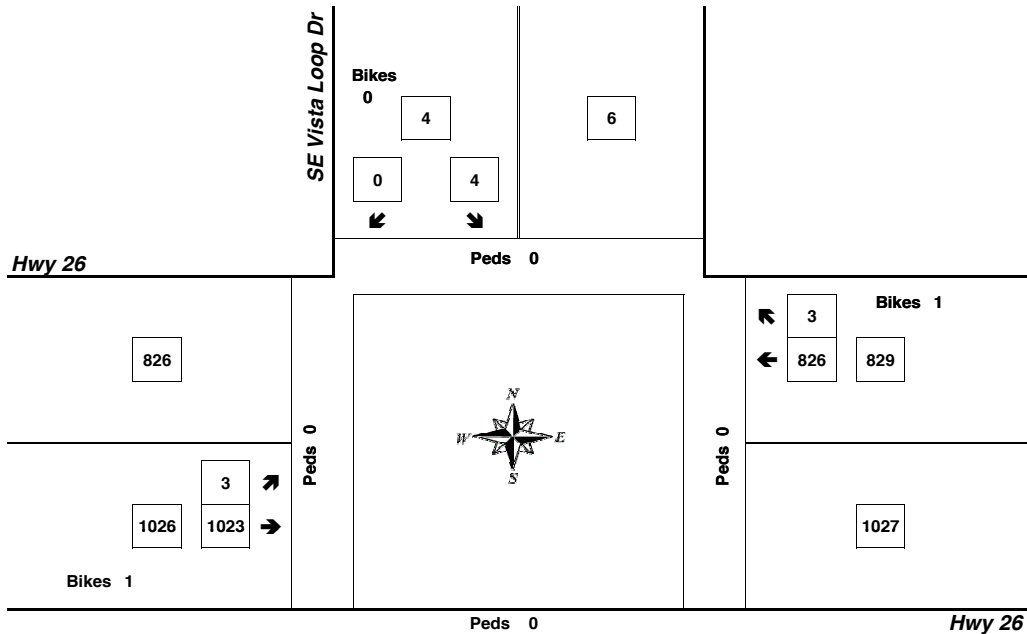
Peak Hour Summary



Clay Carney
(503) 833-2740

SE Vista Loop Dr & Hwy 26

4:50 PM to 5:50 PM
Thursday, July 18, 2019



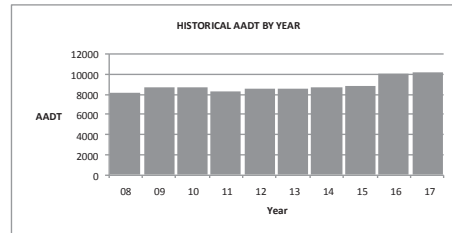
Approach	PHF	HV%	Volume
EB	0.96	2.7%	1,026
WB	0.85	4.9%	829
NB	0.00	0.0%	0
SB	0.25	0.0%	4
Intersection	0.94	3.7%	1,859

Count Period: 4:00 PM to 6:00 PM

Location:	US26; MP 46.38; MT. HOOD HIGHWAY NO. 26; 0.30 mile east of Camp Creek Rd	Site Name:	Rhododendron (03-006)
	(USFS 28)		Installed:

HISTORICAL TRAFFIC DATA

Year	AADT	Percent of AADT				
		Max Day	Max Hour	10TH Hour	20TH Hour	30TH Hour
2008	8162	233	22.9	20.1	19.1	18.2
2009	8737	197	22.3	19.6	18.4	17.8
2010	8714	207	21.6	19.8	18.9	18.5
2011	8330	214	24.7	20.0	18.6	18.1
2012	8480	227	24.0	21.0	20.2	19.4
2013	8527	213	23.4	21.1	20.3	19.1
2014	8652	216	23.2	21.1	20.3	19.2
2015	8861	242	21.4	20.3	19.4	18.7
2016	10071	208	22.9	19.6	18.8	17.9
2017	10223	200	19.9	19.1	18.1	17.5



2017 TRAFFIC DATA

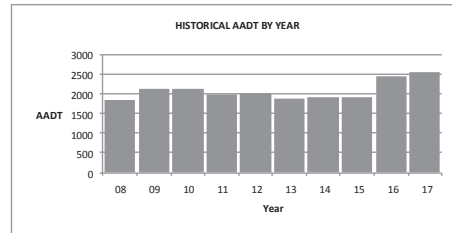
	Average Weekday Traffic	Percent of AADT	Average Daily Traffic	Percent of AADT
January	6744	66	9080	89
February	6533	64	9496	93
March	6763	66	9337	91
April	6166	60	8675	85
May	7675	75	9598	94
June	8568	84	10695	105
July	11291	110	13874	136
August	11738	115	13623	133
September	11300	111	12734	125
October	6589	64	8087	79
November	5493	54	7313	72
December	8753	86	10161	99

For Vehicle Classification data near your project, please go to the following web page:
https://www.oregon.gov/ODOT/Data/Documents/TVT_2017.xlsx

Location:	OR35; MP 57.79; MT. HOOD HIGHWAY NO. 26; 0.02 mile east of Warm Springs Highway No. 53 (US26)	Site Name:	Mt. Hood Meadows (03-007)
			Installed:

HISTORICAL TRAFFIC DATA

Year	AADT	Percent of AADT				
		Max Day	Max Hour	10TH Hour	20TH Hour	30TH Hour
2008	1854	398	56.8	44.2	39.9	36.1
2009	2130	***	***	***	***	***
2010	2145	374	49.2	39.5	34.8	33.2
2011	1976	476	79.2	49.1	45.0	39.1
2012	2023	452	65.4	43.4	40.3	37.7
2013	1868	427	68.1	48.7	42.0	37.1
2014	1908	400	60.0	41.9	37.4	33.6
2015	1931	393	50.4	38.6	34.4	32.6
2016	2455	366	55.9	38.3	33.1	31.2
2017	2565	340	52.1	37.7	32.5	31.3



2017 TRAFFIC DATA

	Average Weekday Traffic	Percent of AADT	Average Daily Traffic	Percent of AADT
January	2449	95	3616	141
February	1978	77	3362	131
March	1781	69	2833	110
April	1116	44	2050	80
May	1202	47	1609	63
June	1794	70	2070	81
July	2405	94	2837	111
August	2302	90	2614	102
September	3956	154	3993	156
October	1387	54	1614	63
November	768	30	1156	45
December	2499	97	2966	116

For Vehicle Classification data near your project, please go to the following web page:
https://www.oregon.gov/ODOT/Data/Documents/TVT_2017.xlsx

SEASONAL TREND TABLE (Updated: 8/1/2018)															
TREND	1-Mar	15-Mar	1-Apr	15-Apr	1-May	15-May	1-Jun	15-Jun	1-Jul	15-Jul	1-Aug	15-Aug	1-Sep	15-Sep	Seasonal Trend Peak Period Factor
INTERSTATE URBANIZED	0.9398	0.9832	0.9657	0.9482	0.9460	0.9439	0.9240	0.9042	0.9115	0.9189	0.9374	0.9558	0.9558	0.9557	0.9042
INTERSTATE NONURBANIZED	1.1933	1.0909	1.0645	1.0382	1.0025	0.9667	0.9201	0.8735	0.8857	0.8379	0.8295	0.8271	0.8945	1.0880	0.8211
COMMUTER	0.9841	0.9691	0.9491	0.9292	0.9207	0.9123	0.9016	0.8910	0.9014	0.9119	0.9020	0.8921	0.9074	0.9228	0.8910
COASTAL DESTINATION	1.1609	1.1128	1.1031	1.0934	1.0569	1.0205	0.9791	0.9377	0.8642	0.8306	0.8299	0.8293	0.8775	0.9257	0.8293
COASTAL DESTINATION ROUTE	1.3599	1.2675	1.2537	1.2400	1.1531	1.0662	1.0030	0.9399	0.8492	0.7584	0.7570	0.7556	0.8301	0.9045	0.7556
AGRICULTURE	1.3802	1.2567	1.1986	1.1404	1.1072	1.0740	0.9827	0.8915	0.8529	0.8142	0.7179	0.6215	0.7163	0.8110	0.6215
RECREATIONAL SUMMER	1.7358	1.5512	1.4576	1.3641	1.1766	0.9892	0.9061	0.8230	0.7650	0.7071	0.7124	0.7177	0.9130	1.1082	0.7071
RECREATIONAL SUMMER WINTER	1.6218	1.6172	1.7108	1.8044	1.5925	1.3807	1.2325	1.0844	0.9631	0.8419	0.8674	0.8929	0.9274	0.9619	0.8419
RECREATIONAL WINTER	1.3685	1.4402	1.8693	2.2984	2.2161	2.1339	1.7818	1.4298	1.2481	1.0665	1.0903	1.1142	0.8813	0.6484	0.6484
SUMMER	1.1680	1.1061	1.0661	1.0261	0.9838	0.9415	0.9095	0.8774	0.8570	0.8366	0.8182	0.7997	0.8529	0.9060	0.7997
SUMMER < 2500	1.1953	1.1025	1.0553	1.0080	0.9476	0.8871	0.8570	0.8268	0.8134	0.7999	0.7782	0.7565	0.8144	0.8723	0.7565

*Seasonal Trend Table factors are based on previous year ATR data. The table is updated yearly.

*Grey shading indicates months where seasonal factor is greater than 30%

Commuter Adjustment for Hwy 26: (per Seasonal Trend Table)

	15-Jul	1-Aug	Delta	18-Jul	Adjustment
	0.9119	0.9020	-0.0023	0.9049	1.014

Seasonal Adjustment Calculations

Rhododendron ATR

11738 August Average Weekday Traffic

11291 July Average Weekday Traffic

447 ADT Delta

45 PM Peak Hour Delta

July 18 PM Peak Hour Volume: 1856 vehicles

July Seasonal PM Traffic 1129 vehicles

July 18 Commuter Volume: 727 vehicles

Commuter Adjustment:

July 18 Commuter Volume: 727 vehicles

Times Adjustment Factor (1.014) 737 vehicles

July 18 PM Peak-Hour Volume: 1856 vehicles

Recreational Traffic Adjustment: 45 vehicles

Commuter Traffic Adjustment: 10 vehicles

August PM Peak Hour Traffic: 1911 vehicles

Equivalent Adjustment Factor: 1.0296

HCM 6th TWSC
1: Highway 26 & Vista Loop Drive (W)

08/14/2019

Intersection						
Int Delay, s/veh	0.5					
Movement	SEL	SET	NWT	NWR	SWL	SWR
Lane Configurations	↘	↑↑	↑↑		↘	
Traffic Vol, veh/h	16	564	566	1	0	35
Future Vol, veh/h	16	564	566	1	0	35
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	155	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	93	93	93	93	93	93
Heavy Vehicles, %	12	12	9	9	2	2
Mvmt Flow	17	606	609	1	0	38
Major/Minor	Major1	Major2	Minor2			
Conflicting Flow All	610	0	-	0	947	305
Stage 1	-	-	-	-	610	-
Stage 2	-	-	-	-	337	-
Critical Hdwy	4.34	-	-	-	6.84	6.94
Critical Hdwy Stg 1	-	-	-	-	5.84	-
Critical Hdwy Stg 2	-	-	-	-	5.84	-
Follow-up Hdwy	2.32	-	-	-	3.52	3.32
Pot Cap-1 Maneuver	900	-	-	-	259	691
Stage 1	-	-	-	-	505	-
Stage 2	-	-	-	-	695	-
Platoon blocked, %	-	-	-	-	-	-
Mov Cap-1 Maneuver	900	-	-	-	254	691
Mov Cap-2 Maneuver	-	-	-	-	254	-
Stage 1	-	-	-	-	495	-
Stage 2	-	-	-	-	695	-
Approach	SE	NW	SW			
HCM Control Delay, s	0.3	0	10.5			
HCM LOS			B			
Minor Lane/Major Mvmt	NWT	NWR	SEL	SETSWLn1		
Capacity (veh/h)	-	-	900	-	691	
HCM Lane V/C Ratio	-	-	0.019	-	0.054	
HCM Control Delay (s)	-	-	9.1	-	10.5	
HCM Lane LOS	-	-	A	-	B	
HCM 95th %tile Q(veh)	-	-	0.1	-	0.2	

HCM 6th TWSC
2: Vista Loop Drive & Ortiz Street

08/14/2019

Intersection						
Int Delay, s/veh	3					
Movement	SEL	SET	NWT	NWR	SWL	SWR
Lane Configurations		↕	↕		↕	
Traffic Vol, veh/h	1	2	5	0	1	2
Future Vol, veh/h	1	2	5	0	1	2
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	50	50	50	50	50	50
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	2	4	10	0	2	4
Major/Minor	Major1	Major2	Minor2			
Conflicting Flow All	10	0	-	0	18	10
Stage 1	-	-	-	-	10	-
Stage 2	-	-	-	-	8	-
Critical Hdwy	4.12	-	-	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	2.218	-	-	-	3.518	3.318
Pot Cap-1 Maneuver	1610	-	-	-	1000	1071
Stage 1	-	-	-	-	1013	-
Stage 2	-	-	-	-	1015	-
Platoon blocked, %	-	-	-	-	-	-
Mov Cap-1 Maneuver	1610	-	-	-	999	1071
Mov Cap-2 Maneuver	-	-	-	-	999	-
Stage 1	-	-	-	-	1012	-
Stage 2	-	-	-	-	1015	-
Approach	SE	NW		SW		
HCM Control Delay, s	2.4	0		8.5		
HCM LOS				A		
Minor Lane/Major Mvmt	NWT	NWR	SEL	SETSWLn1		
Capacity (veh/h)	-	-	1610	-	1046	
HCM Lane V/C Ratio	-	-	0.001	-	0.006	
HCM Control Delay (s)	-	-	7.2	0	8.5	
HCM Lane LOS	-	-	A	A	A	
HCM 95th %tile Q(veh)	-	-	0	-	0	

HCM 6th TWSC
5: Highway 26 & Vista Loop Drive (E)

08/14/2019

Intersection						
Int Delay, s/veh	0.1					
Movement	SEL	SET	NWT	NWR	SWL	SWR
Lane Configurations	↘	↑↑	↑↑		↘	
Traffic Vol, veh/h	4	560	567	1	0	3
Future Vol, veh/h	4	560	567	1	0	3
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	140	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	88	88	88	88	88	88
Heavy Vehicles, %	12	12	9	9	2	2
Mvmt Flow	5	636	644	1	0	3
Major/Minor	Major1	Major2	Minor2			
Conflicting Flow All	645	0	-	0	973	323
Stage 1	-	-	-	-	645	-
Stage 2	-	-	-	-	328	-
Critical Hdwy	4.34	-	-	-	6.84	6.94
Critical Hdwy Stg 1	-	-	-	-	5.84	-
Critical Hdwy Stg 2	-	-	-	-	5.84	-
Follow-up Hdwy	2.32	-	-	-	3.52	3.32
Pot Cap-1 Maneuver	871	-	-	-	250	673
Stage 1	-	-	-	-	484	-
Stage 2	-	-	-	-	702	-
Platoon blocked, %	-	-	-	-	-	-
Mov Cap-1 Maneuver	871	-	-	-	249	673
Mov Cap-2 Maneuver	-	-	-	-	249	-
Stage 1	-	-	-	-	481	-
Stage 2	-	-	-	-	702	-
Approach	SE	NW		SW		
HCM Control Delay, s	0.1	0		10.4		
HCM LOS				B		
Minor Lane/Major Mvmt	NWT	NWR	SEL	SETSWLn1		
Capacity (veh/h)	-	-	871	-	673	
HCM Lane V/C Ratio	-	-	0.005	-	0.005	
HCM Control Delay (s)	-	-	9.2	-	10.4	
HCM Lane LOS	-	-	A	-	B	
HCM 95th %tile Q(veh)	-	-	0	-	0	

HCM 6th TWSC
1: Highway 26 & Vista Loop Drive (W)

08/14/2019

Intersection						
Int Delay, s/veh	0.3					
Movement	SEL	SET	NWT	NWR	SWL	SWR
Lane Configurations	↘	↑↑	↑↑		↘	
Traffic Vol, veh/h	36	1056	851	0	0	15
Future Vol, veh/h	36	1056	851	0	0	15
Conflicting Peds, #/hr	1	0	0	1	1	1
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	155	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	97	97	97	97	97	97
Heavy Vehicles, %	3	3	5	5	2	2
Mvmt Flow	37	1089	877	0	0	15
Major/Minor	Major1	Major2	Minor2			
Conflicting Flow All	878	0	-	0	1498	441
Stage 1	-	-	-	-	878	-
Stage 2	-	-	-	-	620	-
Critical Hdwy	4.16	-	-	-	6.84	6.94
Critical Hdwy Stg 1	-	-	-	-	5.84	-
Critical Hdwy Stg 2	-	-	-	-	5.84	-
Follow-up Hdwy	2.23	-	-	-	3.52	3.32
Pot Cap-1 Maneuver	759	-	-	-	113	564
Stage 1	-	-	-	-	367	-
Stage 2	-	-	-	-	499	-
Platoon blocked, %	-	-	-	-	-	-
Mov Cap-1 Maneuver	758	-	-	-	107	563
Mov Cap-2 Maneuver	-	-	-	-	107	-
Stage 1	-	-	-	-	349	-
Stage 2	-	-	-	-	499	-
Approach	SE	NW	SW			
HCM Control Delay, s	0.3	0	11.6			
HCM LOS			B			
Minor Lane/Major Mvmt	NWT	NWR	SEL	SETSWLn1		
Capacity (veh/h)	-	-	758	-	563	
HCM Lane V/C Ratio	-	-	0.049	-	0.027	
HCM Control Delay (s)	-	-	10	-	11.6	
HCM Lane LOS	-	-	A	-	B	
HCM 95th %tile Q(veh)	-	-	0.2	-	0.1	

HCM 6th TWSC
2: Vista Loop Drive & Ortiz Street

08/14/2019

Intersection						
Int Delay, s/veh	2.2					
Movement	SEL	SET	NWT	NWR	SWL	SWR
Lane Configurations		↕	↕		↕	
Traffic Vol, veh/h	2	4	5	1	0	2
Future Vol, veh/h	2	4	5	1	0	2
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	50	50	50	50	50	50
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	4	8	10	2	0	4
Major/Minor	Major1	Major2	Minor2			
Conflicting Flow All	12	0	-	0	27	11
Stage 1	-	-	-	-	11	-
Stage 2	-	-	-	-	16	-
Critical Hdwy	4.12	-	-	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	2.218	-	-	-	3.518	3.318
Pot Cap-1 Maneuver	1607	-	-	-	988	1070
Stage 1	-	-	-	-	1012	-
Stage 2	-	-	-	-	1007	-
Platoon blocked, %	-	-	-	-	-	-
Mov Cap-1 Maneuver	1607	-	-	-	985	1070
Mov Cap-2 Maneuver	-	-	-	-	985	-
Stage 1	-	-	-	-	1009	-
Stage 2	-	-	-	-	1007	-
Approach	SE	NW	SW			
HCM Control Delay, s	2.4	0	8.4			
HCM LOS			A			
Minor Lane/Major Mvmt	NWT	NWR	SEL	SETSWLn1		
Capacity (veh/h)	-	-	1607	-	1070	
HCM Lane V/C Ratio	-	-	0.002	-	0.004	
HCM Control Delay (s)	-	-	7.2	0	8.4	
HCM Lane LOS	-	-	A	A	A	
HCM 95th %tile Q(veh)	-	-	0	-	0	

HCM 6th TWSC
5: Highway 26 & Vista Loop Drive (E)

08/14/2019

Intersection						
Int Delay, s/veh	0.1					
Movement	SEL	SET	NWT	NWR	SWL	SWR
Lane Configurations	↘	↑↑	↑↑		↘	
Traffic Vol, veh/h	3	1053	851	3	4	0
Future Vol, veh/h	3	1053	851	3	4	0
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	140	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	94	94	94	94	94	94
Heavy Vehicles, %	3	3	5	5	2	2
Mvmt Flow	3	1120	905	3	4	0
Major/Minor	Major1	Major2	Minor2			
Conflicting Flow All	908	0	-	0	1473	454
Stage 1	-	-	-	-	907	-
Stage 2	-	-	-	-	566	-
Critical Hdwy	4.16	-	-	-	6.84	6.94
Critical Hdwy Stg 1	-	-	-	-	5.84	-
Critical Hdwy Stg 2	-	-	-	-	5.84	-
Follow-up Hdwy	2.23	-	-	-	3.52	3.32
Pot Cap-1 Maneuver	739	-	-	-	118	553
Stage 1	-	-	-	-	354	-
Stage 2	-	-	-	-	532	-
Platoon blocked, %	-	-	-	-	-	-
Mov Cap-1 Maneuver	739	-	-	-	118	553
Mov Cap-2 Maneuver	-	-	-	-	118	-
Stage 1	-	-	-	-	353	-
Stage 2	-	-	-	-	532	-
Approach	SE	NW		SW		
HCM Control Delay, s	0	0		36.6		
HCM LOS				E		
Minor Lane/Major Mvmt	NWT	NWR	SEL	SETSWLn1		
Capacity (veh/h)	-	-	739	-	118	
HCM Lane V/C Ratio	-	-	0.004	-	0.036	
HCM Control Delay (s)	-	-	9.9	-	36.6	
HCM Lane LOS	-	-	A	-	E	
HCM 95th %tile Q(veh)	-	-	0	-	0.1	

Trip Generation Calculation Worksheet



Land Use Description: Single-Family Detached Housing
ITE Land Use Code: 210
Independent Variable: Dwelling Units
Quantity: 39 Dwelling Units

Summary of ITE Trip Generation Data

AM Peak Hour of Adjacent Street Traffic

Trip Equation: $T = 0.71(X) + 4.80$

Directional Distribution: 25% Entering 75% Exiting

PM Peak Hour of Adjacent Street Traffic

Trip Equation: $\ln(T) = 0.96 \ln(X) + 0.20$

Directional Distribution: 63% Entering 37% Exiting

Total Weekday Traffic

Trip Equation: $\ln(T) = 0.92 \ln(X) + 2.71$

Directional Distribution: 50% Entering 50% Exiting

Site Trip Generation Calculations

39 Dwelling Units

	Entering	Exiting	Total
AM Peak Hour	8	24	32
PM Peak Hour	26	15	41
Weekday	219	219	438

Data Source: *Trip Generation Manual, 10th Edition*, Institute of Transportation Engineers, 2017

Trip Generation Calculation Worksheet



Land Use Description: Multi-Family Housing (Low-Rise)
 ITE Land Use Code: 220
 Independent Variable: Dwelling Units
 Quantity: 56 Dwelling Units

Summary of ITE Trip Generation Data

AM Peak Hour of Adjacent Street Traffic

Trip Rate: 0.46 trips per dwelling unit
 Directional Distribution: 23% Entering 77% Exiting

PM Peak Hour of Adjacent Street Traffic

Trip Rate: 0.56 trips per dwelling unit
 Directional Distribution: 63% Entering 37% Exiting

Total Weekday Traffic

Trip Rate: 7.32 trips per dwelling unit
 Directional Distribution: 50% Entering 50% Exiting

Site Trip Generation Calculations

56 Dwelling Units

	Entering	Exiting	Total
AM Peak Hour	6	20	26
PM Peak Hour	20	11	31
Weekday	205	205	410

Data Source: *Trip Generation Manual, 10th Edition*, Institute of Transportation Engineers, 2017

Trip Generation Calculation Worksheet



Land Use Description: Single-Family Detached Housing
ITE Land Use Code: 210
Independent Variable: Dwelling Units
Quantity: 49 Dwelling Units

Summary of ITE Trip Generation Data

AM Peak Hour of Adjacent Street Traffic

Trip Equation: $T = 0.71(X) + 4.80$

Directional Distribution: 25% Entering 75% Exiting

PM Peak Hour of Adjacent Street Traffic

Trip Equation: $\ln(T) = 0.96 \ln(X) + 0.20$

Directional Distribution: 63% Entering 37% Exiting

Total Weekday Traffic

Trip Equation: $\ln(T) = 0.92 \ln(X) + 2.71$

Directional Distribution: 50% Entering 50% Exiting

Site Trip Generation Calculations

49 Dwelling Units

	Entering	Exiting	Total
AM Peak Hour	10	30	40
PM Peak Hour	32	19	51
Weekday	270	270	540

Data Source: *Trip Generation Manual, 10th Edition*, Institute of Transportation Engineers, 2017

Trip Generation Calculation Worksheet



Land Use Description: Multi-Family Housing (Low-Rise)
ITE Land Use Code: 220
Independent Variable: Dwelling Units
Quantity: 24 Dwelling Units

Summary of ITE Trip Generation Data

AM Peak Hour of Adjacent Street Traffic

Trip Rate: 0.46 trips per dwelling unit
Directional Distribution: 23% Entering 77% Exiting

PM Peak Hour of Adjacent Street Traffic

Trip Rate: 0.56 trips per dwelling unit
Directional Distribution: 63% Entering 37% Exiting

Total Weekday Traffic

Trip Rate: 7.32 trips per dwelling unit
Directional Distribution: 50% Entering 50% Exiting

Site Trip Generation Calculations

24 Dwelling Units

	Entering	Exiting	Total
AM Peak Hour	3	8	11
PM Peak Hour	8	5	13
Weekday	88	88	176

Data Source: *Trip Generation Manual, 10th Edition*, Institute of Transportation Engineers, 2017

Trip Generation Calculation Worksheet



Land Use Description: Single-Family Detached Housing
ITE Land Use Code: 210
Independent Variable: Dwelling Units
Quantity: 152 Dwelling Units

Summary of ITE Trip Generation Data

AM Peak Hour of Adjacent Street Traffic

Trip Equation: $T = 0.71(X) + 4.80$

Directional Distribution: 25% Entering 75% Exiting

PM Peak Hour of Adjacent Street Traffic

Trip Equation: $\ln(T) = 0.96 \ln(X) + 0.20$

Directional Distribution: 63% Entering 37% Exiting

Total Weekday Traffic

Trip Equation: $\ln(T) = 0.92 \ln(X) + 2.71$

Directional Distribution: 50% Entering 50% Exiting

Site Trip Generation Calculations

152 Dwelling Units

	Entering	Exiting	Total
AM Peak Hour	28	85	113
PM Peak Hour	96	56	152
Weekday	764	764	1528

Data Source: *Trip Generation Manual, 10th Edition*, Institute of Transportation Engineers, 2017

HWY	MP	DIR	HS	Location	2014	2015	2016	2036	RSQ
026	22.72	1		0.02 mile northwest of S.E. 362nd Drive, west city limits of Sandy		29500		41400	MODEL
026	23.85	1		0.02 mile west of Bluff Road		30100		42600	MODEL
026	23.89	1		0.02 mile east of Bluff Road		15100		21600	MODEL
026	24.02	1		0.02 mile west of Beers Avenue		15100		21600	MODEL
026	24.35	1		0.05 mile west of Eagle Creek-Sandy Highway (OR211)		14800		21600	MODEL
026	24.42	1		0.02 mile east of Eagle Creek-Sandy Highway (OR211)		12000		17100	MODEL
026	24.59	1		0.02 mile west of Ten Eyck Road		11200		16000	MODEL
026	23.89	2	W	0.02 mile east of Bluff Road		15200		21300	MODEL
026	24.04	2	W	0.02 mile west of Beers Avenue		15200		21300	MODEL
026	24.36	2	W	0.05 mile west of Eagle Creek-Sandy Highway (OR211)		14500		20700	MODEL
026	24.40	2	W	0.02 mile east of Eagle Creek-Sandy Highway (OR211)		12100		16900	MODEL
026	24.61	2	W	0.02 mile west of Ten Eyck Road		11700		16400	MODEL
026	25.10	1		0.02 mile west of Langensand Road		18000		25400	MODEL
026	25.66	1		0.10 mile east of Vista Loop Drive		19700		27600	MODEL

HCM 6th TWSC
1: Highway 26 & Vista Loop Drive (W)

06/15/2020

Intersection						
Int Delay, s/veh	0.5					
Movement	SEL	SET	NWT	NWR	SWL	SWR
Lane Configurations	↘	↑↑	↑↑		↘	
Traffic Vol, veh/h	17	597	599	1	0	37
Future Vol, veh/h	17	597	599	1	0	37
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	155	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	93	93	93	93	93	93
Heavy Vehicles, %	12	12	9	9	2	2
Mvmt Flow	18	642	644	1	0	40
Major/Minor	Major1	Major2	Minor2			
Conflicting Flow All	645	0	-	0	1002	323
Stage 1	-	-	-	-	645	-
Stage 2	-	-	-	-	357	-
Critical Hdwy	4.34	-	-	-	6.84	6.94
Critical Hdwy Stg 1	-	-	-	-	5.84	-
Critical Hdwy Stg 2	-	-	-	-	5.84	-
Follow-up Hdwy	2.32	-	-	-	3.52	3.32
Pot Cap-1 Maneuver	871	-	-	-	239	673
Stage 1	-	-	-	-	484	-
Stage 2	-	-	-	-	679	-
Platoon blocked, %	-	-	-	-	-	-
Mov Cap-1 Maneuver	871	-	-	-	234	673
Mov Cap-2 Maneuver	-	-	-	-	234	-
Stage 1	-	-	-	-	474	-
Stage 2	-	-	-	-	679	-
Approach	SE	NW	SW			
HCM Control Delay, s	0.3	0	10.7			
HCM LOS			B			
Minor Lane/Major Mvmt	NWT	NWR	SEL	SETSWLn1		
Capacity (veh/h)	-	-	871	-	673	
HCM Lane V/C Ratio	-	-	0.021	-	0.059	
HCM Control Delay (s)	-	-	9.2	-	10.7	
HCM Lane LOS	-	-	A	-	B	
HCM 95th %tile Q(veh)	-	-	0.1	-	0.2	

HCM 6th TWSC
2: Vista Loop Drive & Ortiz Street

06/15/2020

Intersection						
Int Delay, s/veh	3					
Movement	SEL	SET	NWT	NWR	SWL	SWR
Lane Configurations		↕	↕		↕	
Traffic Vol, veh/h	1	2	5	0	1	2
Future Vol, veh/h	1	2	5	0	1	2
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	50	50	50	50	50	50
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	2	4	10	0	2	4
Major/Minor	Major1	Major2	Minor2			
Conflicting Flow All	10	0	-	0	18	10
Stage 1	-	-	-	-	10	-
Stage 2	-	-	-	-	8	-
Critical Hdwy	4.12	-	-	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	2.218	-	-	-	3.518	3.318
Pot Cap-1 Maneuver	1610	-	-	-	1000	1071
Stage 1	-	-	-	-	1013	-
Stage 2	-	-	-	-	1015	-
Platoon blocked, %	-	-	-	-	-	-
Mov Cap-1 Maneuver	1610	-	-	-	999	1071
Mov Cap-2 Maneuver	-	-	-	-	999	-
Stage 1	-	-	-	-	1012	-
Stage 2	-	-	-	-	1015	-
Approach	SE	NW		SW		
HCM Control Delay, s	2.4	0		8.5		
HCM LOS				A		
Minor Lane/Major Mvmt	NWT	NWR	SEL	SETSWLn1		
Capacity (veh/h)	-	-	1610	-	1046	
HCM Lane V/C Ratio	-	-	0.001	-	0.006	
HCM Control Delay (s)	-	-	7.2	0	8.5	
HCM Lane LOS	-	-	A	A	A	
HCM 95th %tile Q(veh)	-	-	0	-	0	

HCM 6th TWSC
5: Highway 26 & Vista Loop Drive (E)

06/15/2020

Intersection						
Int Delay, s/veh	0.1					
Movement	SEL	SET	NWT	NWR	SWL	SWR
Lane Configurations	↘	↑↑	↑↑		↘	
Traffic Vol, veh/h	4	593	597	1	0	3
Future Vol, veh/h	4	593	597	1	0	3
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	140	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	88	88	88	88	88	88
Heavy Vehicles, %	12	12	9	9	2	2
Mvmt Flow	5	674	678	1	0	3
Major/Minor	Major1	Major2	Minor2			
Conflicting Flow All	679	0	-	0	1026	340
Stage 1	-	-	-	-	679	-
Stage 2	-	-	-	-	347	-
Critical Hdwy	4.34	-	-	-	6.84	6.94
Critical Hdwy Stg 1	-	-	-	-	5.84	-
Critical Hdwy Stg 2	-	-	-	-	5.84	-
Follow-up Hdwy	2.32	-	-	-	3.52	3.32
Pot Cap-1 Maneuver	845	-	-	-	231	656
Stage 1	-	-	-	-	465	-
Stage 2	-	-	-	-	687	-
Platoon blocked, %	-	-	-	-	-	-
Mov Cap-1 Maneuver	845	-	-	-	230	656
Mov Cap-2 Maneuver	-	-	-	-	230	-
Stage 1	-	-	-	-	462	-
Stage 2	-	-	-	-	687	-
Approach	SE	NW	SW			
HCM Control Delay, s	0.1	0	10.5			
HCM LOS			B			
Minor Lane/Major Mvmt	NWT	NWR	SEL	SETSWLn1		
Capacity (veh/h)	-	-	845	-	656	
HCM Lane V/C Ratio	-	-	0.005	-	0.005	
HCM Control Delay (s)	-	-	9.3	-	10.5	
HCM Lane LOS	-	-	A	-	B	
HCM 95th %tile Q(veh)	-	-	0	-	0	

HCM 6th TWSC
1: Highway 26 & Vista Loop Drive (W)

06/15/2020

Intersection						
Int Delay, s/veh	0.3					
Movement	SEL	SET	NWT	NWR	SWL	SWR
Lane Configurations	↘	↑↑	↑↑		↘	
Traffic Vol, veh/h	38	1117	900	0	0	16
Future Vol, veh/h	38	1117	900	0	0	16
Conflicting Peds, #/hr	1	0	0	1	1	1
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	155	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	97	97	97	97	97	97
Heavy Vehicles, %	3	3	5	5	2	2
Mvmt Flow	39	1152	928	0	0	16
Major/Minor	Major1	Major2	Minor2			
Conflicting Flow All	929	0	-	0	1584	466
Stage 1	-	-	-	-	929	-
Stage 2	-	-	-	-	655	-
Critical Hdwy	4.16	-	-	-	6.84	6.94
Critical Hdwy Stg 1	-	-	-	-	5.84	-
Critical Hdwy Stg 2	-	-	-	-	5.84	-
Follow-up Hdwy	2.23	-	-	-	3.52	3.32
Pot Cap-1 Maneuver	726	-	-	-	99	543
Stage 1	-	-	-	-	345	-
Stage 2	-	-	-	-	479	-
Platoon blocked, %	-	-	-	-	-	-
Mov Cap-1 Maneuver	725	-	-	-	93	542
Mov Cap-2 Maneuver	-	-	-	-	93	-
Stage 1	-	-	-	-	326	-
Stage 2	-	-	-	-	479	-
Approach	SE	NW	SW			
HCM Control Delay, s	0.3	0	11.9			
HCM LOS			B			
Minor Lane/Major Mvmt	NWT	NWR	SEL	SETSWLn1		
Capacity (veh/h)	-	-	725	-	542	
HCM Lane V/C Ratio	-	-	0.054	-	0.03	
HCM Control Delay (s)	-	-	10.2	-	11.9	
HCM Lane LOS	-	-	B	-	B	
HCM 95th %tile Q(veh)	-	-	0.2	-	0.1	

HCM 6th TWSC
2: Vista Loop Drive & Ortiz Street

06/15/2020

Intersection						
Int Delay, s/veh	2.2					
Movement	SEL	SET	NWT	NWR	SWL	SWR
Lane Configurations		↕	↕		↕	
Traffic Vol, veh/h	2	4	5	1	0	2
Future Vol, veh/h	2	4	5	1	0	2
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	50	50	50	50	50	50
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	4	8	10	2	0	4
Major/Minor	Major1	Major2	Minor2			
Conflicting Flow All	12	0	-	0	27	11
Stage 1	-	-	-	-	11	-
Stage 2	-	-	-	-	16	-
Critical Hdwy	4.12	-	-	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	2.218	-	-	-	3.518	3.318
Pot Cap-1 Maneuver	1607	-	-	-	988	1070
Stage 1	-	-	-	-	1012	-
Stage 2	-	-	-	-	1007	-
Platoon blocked, %	-	-	-	-	-	-
Mov Cap-1 Maneuver	1607	-	-	-	985	1070
Mov Cap-2 Maneuver	-	-	-	-	985	-
Stage 1	-	-	-	-	1009	-
Stage 2	-	-	-	-	1007	-
Approach	SE	NW	SW			
HCM Control Delay, s	2.4	0	8.4			
HCM LOS			A			
Minor Lane/Major Mvmt	NWT	NWR	SEL	SETSWLn1		
Capacity (veh/h)	-	-	1607	-	1070	
HCM Lane V/C Ratio	-	-	0.002	-	0.004	
HCM Control Delay (s)	-	-	7.2	0	8.4	
HCM Lane LOS	-	-	A	A	A	
HCM 95th %tile Q(veh)	-	-	0	-	0	

HCM 6th TWSC
5: Highway 26 & Vista Loop Drive (E)

06/15/2020

Intersection						
Int Delay, s/veh	0.1					
Movement	SEL	SET	NWT	NWR	SWL	SWR
Lane Configurations	↘	↑↑	↑↑		↘	
Traffic Vol, veh/h	3	1114	900	3	4	0
Future Vol, veh/h	3	1114	900	3	4	0
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	140	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	94	94	94	94	94	94
Heavy Vehicles, %	3	3	5	5	2	2
Mvmt Flow	3	1185	957	3	4	0
Major/Minor	Major1	Major2	Minor2			
Conflicting Flow All	960	0	-	0	1558	480
Stage 1	-	-	-	-	959	-
Stage 2	-	-	-	-	599	-
Critical Hdwy	4.16	-	-	-	6.84	6.94
Critical Hdwy Stg 1	-	-	-	-	5.84	-
Critical Hdwy Stg 2	-	-	-	-	5.84	-
Follow-up Hdwy	2.23	-	-	-	3.52	3.32
Pot Cap-1 Maneuver	706	-	-	-	103	532
Stage 1	-	-	-	-	333	-
Stage 2	-	-	-	-	511	-
Platoon blocked, %	-	-	-	-	-	-
Mov Cap-1 Maneuver	706	-	-	-	103	532
Mov Cap-2 Maneuver	-	-	-	-	103	-
Stage 1	-	-	-	-	332	-
Stage 2	-	-	-	-	511	-
Approach	SE	NW		SW		
HCM Control Delay, s	0	0		41.5		
HCM LOS				E		
Minor Lane/Major Mvmt	NWT	NWR	SEL	SETSWLn1		
Capacity (veh/h)	-	-	706	-	103	
HCM Lane V/C Ratio	-	-	0.005	-	0.041	
HCM Control Delay (s)	-	-	10.1	-	41.5	
HCM Lane LOS	-	-	B	-	E	
HCM 95th %tile Q(veh)	-	-	0	-	0.1	

HCM 6th TWSC
1: Highway 26 & Vista Loop Drive (W)

06/15/2020

Intersection						
Int Delay, s/veh	0.8					
Movement	SEL	SET	NWT	NWR	SWL	SWR
Lane Configurations	↘	↑↑	↑↑		↘	
Traffic Vol, veh/h	28	609	637	1	0	69
Future Vol, veh/h	28	609	637	1	0	69
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	155	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	93	93	93	93	93	93
Heavy Vehicles, %	12	12	9	9	2	2
Mvmt Flow	30	655	685	1	0	74
Major/Minor	Major1	Major2	Minor2			
Conflicting Flow All	686	0	-	0	1074	343
Stage 1	-	-	-	-	686	-
Stage 2	-	-	-	-	388	-
Critical Hdwy	4.34	-	-	-	6.84	6.94
Critical Hdwy Stg 1	-	-	-	-	5.84	-
Critical Hdwy Stg 2	-	-	-	-	5.84	-
Follow-up Hdwy	2.32	-	-	-	3.52	3.32
Pot Cap-1 Maneuver	840	-	-	-	215	653
Stage 1	-	-	-	-	461	-
Stage 2	-	-	-	-	655	-
Platoon blocked, %	-	-	-	-	-	-
Mov Cap-1 Maneuver	840	-	-	-	207	653
Mov Cap-2 Maneuver	-	-	-	-	207	-
Stage 1	-	-	-	-	444	-
Stage 2	-	-	-	-	655	-
Approach	SE	NW		SW		
HCM Control Delay, s	0.4	0		11.2		
HCM LOS				B		
Minor Lane/Major Mvmt	NWT	NWR	SEL	SETSWLn1		
Capacity (veh/h)	-	-	840	-	653	
HCM Lane V/C Ratio	-	-	0.036	-	0.114	
HCM Control Delay (s)	-	-	9.4	-	11.2	
HCM Lane LOS	-	-	A	-	B	
HCM 95th %tile Q(veh)	-	-	0.1	-	0.4	

HCM 6th TWSC
2: Knapp N Site Access/Ortiz Street & Vista Loop Drive

06/15/2020

Intersection												
Int Delay, s/veh	4.3											
Movement	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	1	5	7	1	16	0	21	0	2	1	0	2
Future Vol, veh/h	1	5	7	1	16	0	21	0	2	1	0	2
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	75	75	75	75	75	75	75	75	75	75	75	75
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	1	7	9	1	21	0	28	0	3	1	0	3
Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	21	0	0	16	0	0	39	37	12	38	41	21
Stage 1	-	-	-	-	-	-	14	14	-	23	23	-
Stage 2	-	-	-	-	-	-	25	23	-	15	18	-
Critical Hdwy	4.12	-	-	4.12	-	-	7.12	6.52	6.22	7.12	6.52	6.22
Critical Hdwy Stg 1	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Follow-up Hdwy	2.218	-	-	2.218	-	-	3.518	4.018	3.318	3.518	4.018	3.318
Pot Cap-1 Maneuver	1595	-	-	1602	-	-	966	855	1069	967	851	1056
Stage 1	-	-	-	-	-	-	1006	884	-	995	876	-
Stage 2	-	-	-	-	-	-	993	876	-	1005	880	-
Platoon blocked, %	-	-	-	-	-	-	-	-	-	-	-	-
Mov Cap-1 Maneuver	1595	-	-	1602	-	-	962	853	1069	963	849	1056
Mov Cap-2 Maneuver	-	-	-	-	-	-	962	853	-	963	849	-
Stage 1	-	-	-	-	-	-	1005	883	-	994	875	-
Stage 2	-	-	-	-	-	-	990	875	-	1001	879	-
Approach	SE			NW			NE			SW		
HCM Control Delay, s	0.6			0.4			8.8			8.5		
HCM LOS							A			A		
Minor Lane/Major Mvmt	NELn1	NWL	NWT	NWR	SEL	SET	SERSWLn1					
Capacity (veh/h)	970	1602	-	-	1595	-	1023					
HCM Lane V/C Ratio	0.032	0.001	-	-	0.001	-	0.004					
HCM Control Delay (s)	8.8	7.2	0	-	7.3	0	8.5					
HCM Lane LOS	A	A	A	-	A	A	A					
HCM 95th %tile Q(veh)	0.1	0	-	-	0	-	0					

HCM 6th TWSC
3: Vista Loop Drive & Knapp S Site Access

06/15/2020

Intersection						
Int Delay, s/veh	4.4					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations	Y			↑	↑	
Traffic Vol, veh/h	11	4	1	6	5	4
Future Vol, veh/h	11	4	1	6	5	4
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	75	75	75	75	75	75
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	15	5	1	8	7	5
Major/Minor	Minor2	Major1		Major2		
Conflicting Flow All	20	10	12	0	-	0
Stage 1	10	-	-	-	-	-
Stage 2	10	-	-	-	-	-
Critical Hdwy	6.42	6.22	4.12	-	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	2.218	-	-	-
Pot Cap-1 Maneuver	997	1071	1607	-	-	-
Stage 1	1013	-	-	-	-	-
Stage 2	1013	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	996	1071	1607	-	-	-
Mov Cap-2 Maneuver	996	-	-	-	-	-
Stage 1	1012	-	-	-	-	-
Stage 2	1013	-	-	-	-	-
Approach	EB	NB		SB		
HCM Control Delay, s	8.6	1		0		
HCM LOS	A					
Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR	
Capacity (veh/h)	1607	-	1015	-	-	
HCM Lane V/C Ratio	0.001	-	0.02	-	-	
HCM Control Delay (s)	7.2	0	8.6	-	-	
HCM Lane LOS	A	A	A	-	-	
HCM 95th %tile Q(veh)	0	-	0.1	-	-	

HCM 6th TWSC
4: Vista Loop Drive & Picking Site Access

06/15/2020

Intersection						
Int Delay, s/veh	5.3					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	Y		Y			Y
Traffic Vol, veh/h	44	0	7	14	0	9
Future Vol, veh/h	44	0	7	14	0	9
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	75	75	75	75	75	75
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	59	0	9	19	0	12
Major/Minor	Minor1	Major1		Major2		
Conflicting Flow All	31	19	0	0	28	0
Stage 1	19	-	-	-	-	-
Stage 2	12	-	-	-	-	-
Critical Hdwy	6.42	6.22	-	-	4.12	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	-	-	2.218	-
Pot Cap-1 Maneuver	983	1059	-	-	1585	-
Stage 1	1004	-	-	-	-	-
Stage 2	1011	-	-	-	-	-
Platoon blocked, %			-	-	-	-
Mov Cap-1 Maneuver	983	1059	-	-	1585	-
Mov Cap-2 Maneuver	983	-	-	-	-	-
Stage 1	1004	-	-	-	-	-
Stage 2	1011	-	-	-	-	-
Approach	WB	NB		SB		
HCM Control Delay, s	8.9	0		0		
HCM LOS	A					
Minor Lane/Major Mvmt	NBT	NBRWBLn1	SBL	SBT		
Capacity (veh/h)	-	-	983	1585	-	
HCM Lane V/C Ratio	-	-	0.06	-	-	
HCM Control Delay (s)	-	-	8.9	0	-	
HCM Lane LOS	-	-	A	A	-	
HCM 95th %tile Q(veh)	-	-	0.2	0	-	

HCM 6th TWSC
5: Highway 26 & Vista Loop Drive (E)

06/15/2020

Intersection						
Int Delay, s/veh	0.7					
Movement	SEL	SET	NWT	NWR	SWL	SWR
Lane Configurations	↘	↑↑	↑↑		↘	
Traffic Vol, veh/h	16	593	597	5	12	41
Future Vol, veh/h	16	593	597	5	12	41
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	140	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	88	88	88	88	88	88
Heavy Vehicles, %	12	12	9	9	2	2
Mvmt Flow	18	674	678	6	14	47
Major/Minor	Major1	Major2	Minor2			
Conflicting Flow All	684	0	-	0	1054	342
Stage 1	-	-	-	-	681	-
Stage 2	-	-	-	-	373	-
Critical Hdwy	4.34	-	-	-	6.84	6.94
Critical Hdwy Stg 1	-	-	-	-	5.84	-
Critical Hdwy Stg 2	-	-	-	-	5.84	-
Follow-up Hdwy	2.32	-	-	-	3.52	3.32
Pot Cap-1 Maneuver	841	-	-	-	221	654
Stage 1	-	-	-	-	464	-
Stage 2	-	-	-	-	666	-
Platoon blocked, %	-	-	-	-	-	-
Mov Cap-1 Maneuver	841	-	-	-	216	654
Mov Cap-2 Maneuver	-	-	-	-	216	-
Stage 1	-	-	-	-	454	-
Stage 2	-	-	-	-	666	-
Approach	SE	NW	SW			
HCM Control Delay, s	0.2	0	14.3			
HCM LOS			B			
Minor Lane/Major Mvmt	NWT	NWR	SEL	SETSWLn1		
Capacity (veh/h)	-	-	841	-	448	
HCM Lane V/C Ratio	-	-	0.022	-	0.134	
HCM Control Delay (s)	-	-	9.4	-	14.3	
HCM Lane LOS	-	-	A	-	B	
HCM 95th %tile Q(veh)	-	-	0.1	-	0.5	

HCM 6th TWSC
1: Highway 26 & Vista Loop Drive (W)

06/15/2020

Intersection						
Int Delay, s/veh	0.5					
Movement	SEL	SET	NWT	NWR	SWL	SWR
Lane Configurations	↘	↑↑	↑↑		↘	
Traffic Vol, veh/h	72	1156	922	0	0	37
Future Vol, veh/h	72	1156	922	0	0	37
Conflicting Peds, #/hr	1	0	0	1	1	1
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	155	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	97	97	97	97	97	97
Heavy Vehicles, %	3	3	5	5	2	2
Mvmt Flow	74	1192	951	0	0	38
Major/Minor	Major1	Major2	Minor2			
Conflicting Flow All	952	0	-	0	1697	478
Stage 1	-	-	-	-	952	-
Stage 2	-	-	-	-	745	-
Critical Hdwy	4.16	-	-	-	6.84	6.94
Critical Hdwy Stg 1	-	-	-	-	5.84	-
Critical Hdwy Stg 2	-	-	-	-	5.84	-
Follow-up Hdwy	2.23	-	-	-	3.52	3.32
Pot Cap-1 Maneuver	711	-	-	-	83	534
Stage 1	-	-	-	-	335	-
Stage 2	-	-	-	-	430	-
Platoon blocked, %	-	-	-	-	-	-
Mov Cap-1 Maneuver	710	-	-	-	74	533
Mov Cap-2 Maneuver	-	-	-	-	74	-
Stage 1	-	-	-	-	300	-
Stage 2	-	-	-	-	430	-
Approach	SE	NW		SW		
HCM Control Delay, s	0.6	0		12.3		
HCM LOS				B		
Minor Lane/Major Mvmt	NWT	NWR	SEL	SETSWLn1		
Capacity (veh/h)	-	-	710	-	533	
HCM Lane V/C Ratio	-	-	0.105	-	0.072	
HCM Control Delay (s)	-	-	10.7	-	12.3	
HCM Lane LOS	-	-	B	-	B	
HCM 95th %tile Q(veh)	-	-	0.3	-	0.2	

HCM 6th TWSC
2: Knapp N Site Access/Ortiz Street & Vista Loop Drive

06/15/2020

Intersection												
Int Delay, s/veh	2.6											
Movement	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	2	15	23	2	12	1	14	0	1	0	0	2
Future Vol, veh/h	2	15	23	2	12	1	14	0	1	0	0	2
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	50	50	50	50	50	50	50	50	50	50	50	50
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	4	30	46	4	24	2	28	0	2	0	0	4
Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	26	0	0	76	0	0	96	95	53	95	117	25
Stage 1	-	-	-	-	-	-	61	61	-	33	33	-
Stage 2	-	-	-	-	-	-	35	34	-	62	84	-
Critical Hdwy	4.12	-	-	4.12	-	-	7.12	6.52	6.22	7.12	6.52	6.22
Critical Hdwy Stg 1	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Follow-up Hdwy	2.218	-	-	2.218	-	-	3.518	4.018	3.318	3.518	4.018	3.318
Pot Cap-1 Maneuver	1588	-	-	1523	-	-	887	795	1014	888	773	1051
Stage 1	-	-	-	-	-	-	950	844	-	983	868	-
Stage 2	-	-	-	-	-	-	981	867	-	949	825	-
Platoon blocked, %	-	-	-	-	-	-	-	-	-	-	-	-
Mov Cap-1 Maneuver	1588	-	-	1523	-	-	880	790	1014	882	768	1051
Mov Cap-2 Maneuver	-	-	-	-	-	-	880	790	-	882	768	-
Stage 1	-	-	-	-	-	-	947	841	-	980	865	-
Stage 2	-	-	-	-	-	-	974	864	-	944	823	-
Approach	SE			NW			NE			SW		
HCM Control Delay, s	0.4			1			9.2			8.4		
HCM LOS							A			A		
Minor Lane/Major Mvmt	NELn1	NWL	NWT	NWR	SEL	SET	SERSWLn1					
Capacity (veh/h)	888	1523	-	-	1588	-	1051					
HCM Lane V/C Ratio	0.034	0.003	-	-	0.003	-	0.004					
HCM Control Delay (s)	9.2	7.4	0	-	7.3	0	8.4					
HCM Lane LOS	A	A	A	-	A	A	A					
HCM 95th %tile Q(veh)	0.1	0	-	-	0	-	0					

HCM 6th TWSC
3: Vista Loop Drive & Knapp S Site Access

06/15/2020

Intersection						
Int Delay, s/veh	2.9					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations	T		T		T	
Traffic Vol, veh/h	7	2	4	8	5	11
Future Vol, veh/h	7	2	4	8	5	11
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	75	75	75	75	75	75
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	9	3	5	11	7	15
Major/Minor	Minor2	Major1		Major2		
Conflicting Flow All	36	15	22	0	0	
Stage 1	15	-	-	-	-	
Stage 2	21	-	-	-	-	
Critical Hdwy	6.42	6.22	4.12	-	-	
Critical Hdwy Stg 1	5.42	-	-	-	-	
Critical Hdwy Stg 2	5.42	-	-	-	-	
Follow-up Hdwy	3.518	3.318	2.218	-	-	
Pot Cap-1 Maneuver	977	1065	1593	-	-	
Stage 1	1008	-	-	-	-	
Stage 2	1002	-	-	-	-	
Platoon blocked, %				-	-	
Mov Cap-1 Maneuver	974	1065	1593	-	-	
Mov Cap-2 Maneuver	974	-	-	-	-	
Stage 1	1005	-	-	-	-	
Stage 2	1002	-	-	-	-	
Approach	EB	NB		SB		
HCM Control Delay, s	8.7	2.4		0		
HCM LOS	A					
Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR	
Capacity (veh/h)	1593	-	993	-	-	
HCM Lane V/C Ratio	0.003	-	0.012	-	-	
HCM Control Delay (s)	7.3	0	8.7	-	-	
HCM Lane LOS	A	A	A	-	-	
HCM 95th %tile Q(veh)	0	-	0	-	-	

HCM 6th TWSC
4: Vista Loop Drive & Picking Site Access

06/15/2020

Intersection						
Int Delay, s/veh	2.5					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	Y		Y			Y
Traffic Vol, veh/h	26	0	12	46	0	7
Future Vol, veh/h	26	0	12	46	0	7
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	75	75	75	75	75	75
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	35	0	16	61	0	9
Major/Minor	Minor1	Major1		Major2		
Conflicting Flow All	56	47	0	0	77	
Stage 1	47	-	-	-	-	
Stage 2	9	-	-	-	-	
Critical Hdwy	6.42	6.22	-	-	4.12	
Critical Hdwy Stg 1	5.42	-	-	-	-	
Critical Hdwy Stg 2	5.42	-	-	-	-	
Follow-up Hdwy	3.518	3.318	-	-	2.218	
Pot Cap-1 Maneuver	952	1022	-	-	1522	
Stage 1	975	-	-	-	-	
Stage 2	1014	-	-	-	-	
Platoon blocked, %			-	-	-	
Mov Cap-1 Maneuver	952	1022	-	-	1522	
Mov Cap-2 Maneuver	952	-	-	-	-	
Stage 1	975	-	-	-	-	
Stage 2	1014	-	-	-	-	
Approach	WB	NB		SB		
HCM Control Delay, s	8.9	0		0		
HCM LOS	A					
Minor Lane/Major Mvmt	NBT	NBRWBLn1	SBL	SBT		
Capacity (veh/h)	-	-	952	1522	-	
HCM Lane V/C Ratio	-	-	0.036	-	-	
HCM Control Delay (s)	-	-	8.9	0	-	
HCM Lane LOS	-	-	A	A	-	
HCM 95th %tile Q(veh)	-	-	0.1	0	-	

HCM 6th TWSC
5: Highway 26 & Vista Loop Drive (E)

06/15/2020

Intersection						
Int Delay, s/veh	0.7					
Movement	SEL	SET	NWT	NWR	SWL	SWR
Lane Configurations	↘	↕	↕		↕	↘
Traffic Vol, veh/h	42	1114	900	16	11	22
Future Vol, veh/h	42	1114	900	16	11	22
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	140	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	94	94	94	94	94	94
Heavy Vehicles, %	3	3	5	5	2	2
Mvmt Flow	45	1185	957	17	12	23
Major/Minor	Major1	Major2	Minor2			
Conflicting Flow All	974	0	-	0	1649	487
Stage 1	-	-	-	-	966	-
Stage 2	-	-	-	-	683	-
Critical Hdwy	4.16	-	-	-	6.84	6.94
Critical Hdwy Stg 1	-	-	-	-	5.84	-
Critical Hdwy Stg 2	-	-	-	-	5.84	-
Follow-up Hdwy	2.23	-	-	-	3.52	3.32
Pot Cap-1 Maneuver	698	-	-	-	90	526
Stage 1	-	-	-	-	330	-
Stage 2	-	-	-	-	463	-
Platoon blocked, %	-	-	-	-	-	-
Mov Cap-1 Maneuver	698	-	-	-	84	526
Mov Cap-2 Maneuver	-	-	-	-	84	-
Stage 1	-	-	-	-	309	-
Stage 2	-	-	-	-	463	-
Approach	SE	NW	SW			
HCM Control Delay, s	0.4	0	28			
HCM LOS			D			
Minor Lane/Major Mvmt	NWT	NWR	SEL	SETSWLn1		
Capacity (veh/h)	-	-	698	-	191	
HCM Lane V/C Ratio	-	-	0.064	-	0.184	
HCM Control Delay (s)	-	-	10.5	-	28	
HCM Lane LOS	-	-	B	-	D	
HCM 95th %tile Q(veh)	-	-	0.2	-	0.7	

Queuing and Blocking Report
2021 Background plus Site Trips AM Peak Hour

06/15/2020

Intersection: 1: Highway 26 & Vista Loop Drive (W)

Movement	SE	SW
Directions Served	L	LR
Maximum Queue (ft)	59	64
Average Queue (ft)	13	33
95th Queue (ft)	42	54
Link Distance (ft)		32
Upstream Blk Time (%)		9
Queuing Penalty (veh)		4
Storage Bay Dist (ft)	155	
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 2: Knapp N Site Access/Ortiz Street & Vista Loop Drive

Movement	NE	SW
Directions Served	LTR	LTR
Maximum Queue (ft)	43	31
Average Queue (ft)	18	4
95th Queue (ft)	46	21
Link Distance (ft)	240	281
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 3: Vista Loop Drive & Knapp S Site Access

Movement	EB
Directions Served	LR
Maximum Queue (ft)	38
Average Queue (ft)	14
95th Queue (ft)	41
Link Distance (ft)	142
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (ft)	
Storage Blk Time (%)	
Queuing Penalty (veh)	

Queuing and Blocking Report
2021 Background plus Site Trips AM Peak Hour

06/15/2020

Intersection: 4: Vista Loop Drive & Picking Site Access

Movement	WB
Directions Served	LR
Maximum Queue (ft)	52
Average Queue (ft)	23
95th Queue (ft)	50
Link Distance (ft)	312
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (ft)	
Storage Blk Time (%)	
Queuing Penalty (veh)	

Intersection: 5: Highway 26 & Vista Loop Drive (E)

Movement	SE	SW
Directions Served	L	LR
Maximum Queue (ft)	32	67
Average Queue (ft)	7	29
95th Queue (ft)	28	60
Link Distance (ft)		35
Upstream Blk Time (%)		8
Queuing Penalty (veh)		4
Storage Bay Dist (ft)	140	
Storage Blk Time (%)		
Queuing Penalty (veh)		

Network Summary

Network wide Queuing Penalty: 8

Queuing and Blocking Report
 2021 Background plus Site Trips PM Peak Hour

06/15/2020

Intersection: 1: Highway 26 & Vista Loop Drive (W)

Movement	SE	SE	SE	NW	NW	SW	B13
Directions Served	L	T	T	T	TR	LR	T
Maximum Queue (ft)	76	24	14	25	26	76	4
Average Queue (ft)	31	1	0	1	1	26	0
95th Queue (ft)	61	11	8	10	12	55	3
Link Distance (ft)		1362	1362	2803	2803	32	1364
Upstream Blk Time (%)						7	
Queuing Penalty (veh)						2	
Storage Bay Dist (ft)	155						
Storage Blk Time (%)							
Queuing Penalty (veh)							

Intersection: 2: Knapp N Site Access/Ortiz Street & Vista Loop Drive

Movement	NE	SW
Directions Served	LTR	LTR
Maximum Queue (ft)	48	20
Average Queue (ft)	12	1
95th Queue (ft)	40	9
Link Distance (ft)	240	281
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 3: Vista Loop Drive & Knapp S Site Access

Movement	EB
Directions Served	LR
Maximum Queue (ft)	34
Average Queue (ft)	7
95th Queue (ft)	30
Link Distance (ft)	142
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (ft)	
Storage Blk Time (%)	
Queuing Penalty (veh)	

Queuing and Blocking Report
2021 Background plus Site Trips PM Peak Hour

06/15/2020

Intersection: 4: Vista Loop Drive & Picking Site Access

Movement	WB
Directions Served	LR
Maximum Queue (ft)	33
Average Queue (ft)	18
95th Queue (ft)	44
Link Distance (ft)	312
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (ft)	
Storage Blk Time (%)	
Queuing Penalty (veh)	

Intersection: 5: Highway 26 & Vista Loop Drive (E)

Movement	SE	SW	B8
Directions Served	L	LR	T
Maximum Queue (ft)	56	72	23
Average Queue (ft)	17	28	2
95th Queue (ft)	45	63	20
Link Distance (ft)		35	108
Upstream Blk Time (%)		13	0
Queuing Penalty (veh)		4	0
Storage Bay Dist (ft)	140		
Storage Blk Time (%)			
Queuing Penalty (veh)			

Network Summary

Network wide Queuing Penalty: 6

OREGON... DEPARTMENT OF TRANSPORTATION - TRANSPORTATION DEVELOPMENT DIVISION
 TRANSPORTATION DATA SECTION - CRASH ANALYSIS AND REPORTING UNIT
 URBAN NON-SYSTEM CRASH LISTING
VISTA LP DR at MT HOOD HY, City of Sandy, Clackamas County, 01/01/2013 to 12/31/2017

CDS380
 08/14/2019
 CITY OF SANDY, CLACKAMAS COUNTY

SR#	INVEST	RD DPT	UNLOC?	D C S V L K LAT	T M H R TIME	CLASS	CITY STREET	RD CHAR	INT-TYPE	INT-REL	OFFRD	WTHR	CRASH	TRLR	SPCL USE	MOVE	PH TYPE	SVRTY	E X RES	LOC	ACT EVENT	CAUSE
	E A I C O DAY	DIST	FROM	LONG	FROM		FIRST STREET	DIRECT	(MEDIAN)	LEGS	TRAF-	RNDBT	SURF	COLL	OWNER	FROM		INJ				
							SECOND STREET	LOCIN	(LANES)	CONTL	DRVWY	LIGHT	SVRTY	V# TYPE		TO						

Disclaimer: The information contained in this report is compiled from individual driver and police crash reports submitted to the Oregon Department of Transportation as required in ORS 811.720. The Crash Analysis and Reporting Unit is committed to providing the highest quality crash data to customers. However, because submission of crash report forms is the responsibility of the individual driver, the Crash Analysis and Reporting Unit can not guarantee that all qualifying crashes are represented nor can assurances be made that all details pertaining to a single crash are accurate. Note: Legislative changes to DMV's vehicle crash reporting requirement, effective 01/01/2004, may result in fewer property damage only crashes being eligible for inclusion in the Statewide Crash Data File.

OREGON... DEPARTMENT OF TRANSPORTATION - TRANSPORTATION DEVELOPMENT DIVISION
TRANSPORTATION DATA SECTION - CRASH ANALYSIS AND REPORTING UNIT
URBAN NON-SYSTEM CRASH LISTING

VISTA LP DR and Inter-Sectional Crashes at VISTA LP DR, City of Sandy, Clackamas County, 01/01/2013 to 12/31/2017

CDS380
08/14/2019

CITY OF SANDY, CLACKAMAS COUNTY

SR#	INVEST	RD DPT	UNLOC?	S D M	P R J S W DATE	CLASS	CITY STREET	RD CHAR	INT-TYPE	INT-REL	OFFRD	WTHR	CRASH	TRLR QTY	SPCL USE	MOVE	PH TYPE	SVRTY	E X RES	LOC	ACT EVENT	CAUSE
	E A I C O DAY	DIST	FROM	RD DPT	FIRST STREET	LONG	SECOND STREET	DIRRECT	(MEDIAN)	LEGS	TRAF-	CONTL	DRVWY	LIGHT	SVRTY	COLL	OWNER	V# TYPE	TO	INJ	PED	
					LES			LOCIN	(LANES)													

Disclaimer: The information contained in this report is compiled from individual driver and police crash reports submitted to the Oregon Department of Transportation as required in ORS 811.720. The Crash Analysis and Reporting Unit is committed to providing the highest quality crash data to customers. However, because submission of crash report forms is the responsibility of the individual driver, the Crash Analysis and Reporting Unit can not guarantee that all qualifying crashes are represented nor can assurances be made that all details pertaining to a single crash are accurate. Note: Legislative changes to DMV's vehicle crash reporting requirement, effective 01/01/2004, may result in fewer property damage only crashes being eligible for inclusion in the Statewide Crash Data File.

Preliminary Traffic Signal Warrant Analysis



Project Name: The Views

Intersection: Highway 26 at SE Vista Loop Road (West)

Scenario: 2021 Background Plus Site Trips

Number of Major Street Lanes: 2

PM Peak Hour Volume 2150 (sum of both approaches)

Number of Minor Street Lanes 1

PM Peak Hour Volume 0 (highest-volume approach)^a

Posted or 85th percentile speed > 40 mph: Yes

Isolated Population Less than 10,000: No

Warrant 1, Eight-Hour Vehicular Volume

Condition A - Minimum Vehicular Volume

Number of lanes for moving traffic on each approach		Vehicles per hour on major street (total of both approaches)				Vehicles per hour on minor street (total of both approaches)			
Major Street	Minor Street	100%	80%	70%	56%	100%	80%	70%	56%
1	1	500	400	350	280	150	120	105	84
2 or more	1	600	480	420	336	150	120	105	84
2 or more	2 or more	600	480	420	336	200	160	140	112
1	2 or more	500	400	350	280	200	160	140	112

Condition B - Interruption of Continuous Traffic

Number of lanes for moving traffic on each approach		Vehicles per hour on major street (total of both approaches)				Vehicles per hour on minor street (total of both approaches)			
Major Street	Minor Street	100%	80%	70%	56%	100%	80%	70%	56%
1	1	750	600	525	420	75	60	53	42
2 or more	1	900	720	630	504	75	60	53	42
2 or more	2 or more	900	720	630	504	100	80	70	56
1	2 or more	750	600	525	420	100	80	70	56

Warrant Analysis Calculations

	8th Highest Hour ^b	Minimum Volume	Warrant Satisfied?
Condition A - Minimum Vehicular Volume			
Major Street Volume	1215	420	
Minor Street Volume	0	105	No
Condition B - Interruption of Continuous Traffic			
Major Street Volume	1215	630	
Minor Street Volume	0	53	No
Combination Warrant^c			
Major Street Volume	1215	504	
Minor Street Volume	0	84	No

^a Minor-Street right turn volumes are reduced to account for the impact of right-turns on red.

^b Eighth-highest hour volumes are calculated as 5.65 percent of the expected daily traffic volume.

^c This warrant should be used only after adequate trial of other alternatives has failed to solve traffic problems.

Preliminary Traffic Signal Warrant Analysis



Project Name: The Views

Intersection: Highway 26 at SE Vista Loop Road (East)

Scenario: 2021 Background Plus Site Trips

Number of Major Street Lanes: 2 PM Peak Hour Volume 2072 (sum of both approaches)

Number of Minor Street Lanes 1 PM Peak Hour Volume 11 (highest-volume approach)^a

Posted or 85th percentile speed > 40 mph: Yes

Isolated Population Less than 10,000: No

Warrant 1, Eight-Hour Vehicular Volume

Condition A - Minimum Vehicular Volume

Number of lanes for moving traffic on each approach		Vehicles per hour on major street (total of both approaches)				Vehicles per hour on minor street (total of both approaches)			
Major Street	Minor Street	100%	80%	70%	56%	100%	80%	70%	56%
1	1	500	400	350	280	150	120	105	84
2 or more	1	600	480	420	336	150	120	105	84
2 or more	2 or more	600	480	420	336	200	160	140	112
1	2 or more	500	400	350	280	200	160	140	112

Condition B - Interruption of Continuous Traffic

Number of lanes for moving traffic on each approach		Vehicles per hour on major street (total of both approaches)				Vehicles per hour on minor street (total of both approaches)			
Major Street	Minor Street	100%	80%	70%	56%	100%	80%	70%	56%
1	1	750	600	525	420	75	60	53	42
2 or more	1	900	720	630	504	75	60	53	42
2 or more	2 or more	900	720	630	504	100	80	70	56
1	2 or more	750	600	525	420	100	80	70	56

Warrant Analysis Calculations

	8th Highest Hour ^b	Minimum Volume	Warrant Satisfied?
Condition A - Minimum Vehicular Volume			
Major Street Volume	1171	420	
Minor Street Volume	6	105	No
Condition B - Interruption of Continuous Traffic			
Major Street Volume	1171	630	
Minor Street Volume	6	53	No
Combination Warrant^c			
Major Street Volume	1171	504	
Minor Street Volume	6	84	No

^a Minor-Street right turn volumes are reduced to account for the impact of right-turns on red.

^b Eighth-highest hour volumes are calculated as 5.65 percent of the expected daily traffic volume.

^c This warrant should be used only after adequate trial of other alternatives has failed to solve traffic problems.

Right-Turn Lane Warrant Analysis (ODOT Methodology)



Project Name: The Views

Approach: Northwest-Bound Highway 26 at SE Vista Loop Drive (West)

Scenario: 2021 Background Plus Site Trips

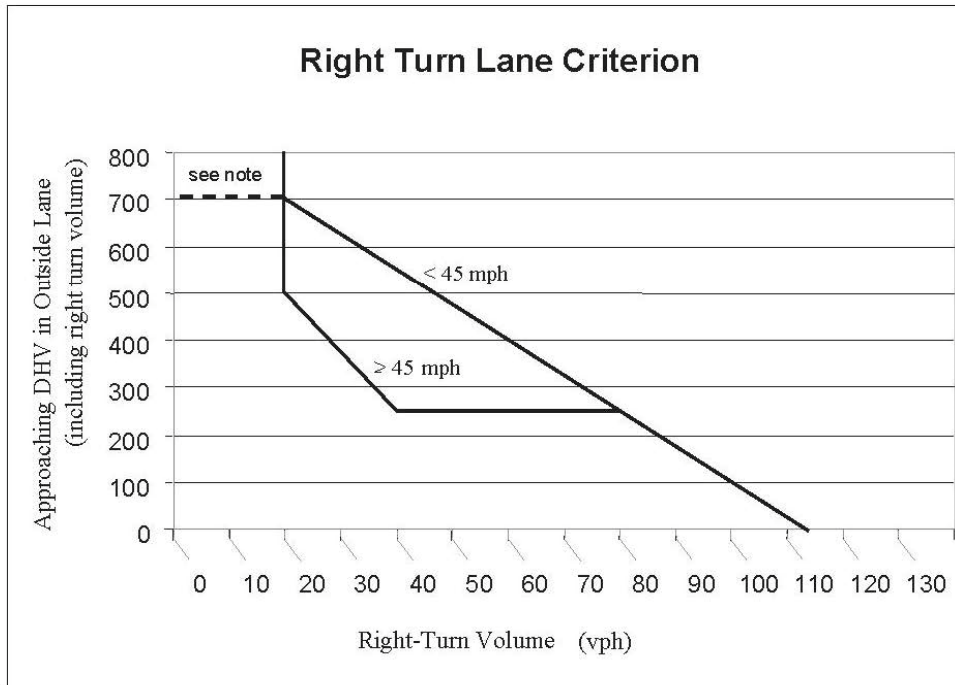
Major-Street Design Speed: 60 mph

	AM Volume	PM Volume
Number of Right Turns per Hour:	1	0
Approaching DVH in Outside Lane:	320	461
Calculated Turn Volume Threshold:	34	23
Right Turn Volume Exceeds Threshold?	NO	NO

Criterion 1: Vehicular Volume

The vehicular volume criterion is intended for application where the volume of intersecting traffic is the principal reason for considering installation of a right turn lane. The vehicular volume criteria are determined using the curve in Exhibit 7-2.

Exhibit 7-2 Right Turn Lane Criterion



Note: If there is no right turn lane, a shoulder needs to be provided. If this intersection is in a rural area and is a connection to a public street, a right turn lane is needed.

Right-Turn Lane Warrant Analysis (ODOT Methodology)



Project Name: The Views

Approach: Northwest-Bound Highway 26 at SE Vista Loop Drive (East)

Scenario: 2021 Background Plus Site Trips

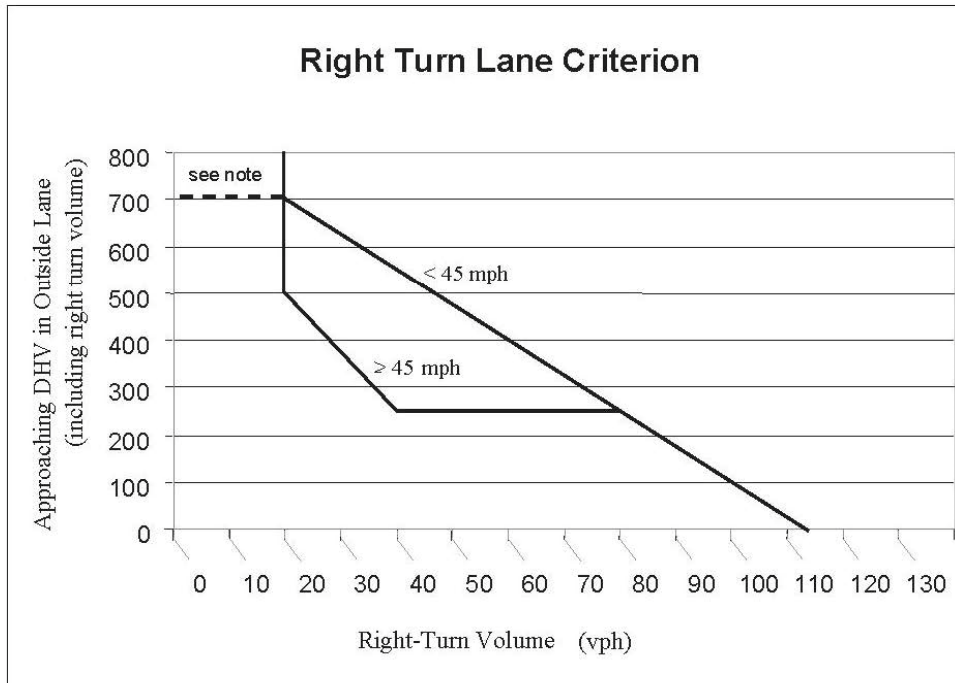
Major-Street Design Speed: 60 mph

	AM Volume	PM Volume
Number of Right Turns per Hour:	5	16
Approaching DVH in Outside Lane:	304	466
Calculated Turn Volume Threshold:	36	23
Right Turn Volume Exceeds Threshold?	NO	NO

Criterion 1: Vehicular Volume

The vehicular volume criterion is intended for application where the volume of intersecting traffic is the principal reason for considering installation of a right turn lane. The vehicular volume criteria are determined using the curve in Exhibit 7-2.

Exhibit 7-2 Right Turn Lane Criterion



Note: If there is no right turn lane, a shoulder needs to be provided. If this intersection is in a rural area and is a connection to a public street, a right turn lane is needed.

EXHIBIT G



TERAGAN & ASSOCIATES, INC. ARBORICULTURAL CONSULTANTS

MEMORANDUM

DATE: June 15, 2020
TO: Mac Even (Even Better Homes)
FROM: Todd Prager, RCA #597, ISA Board Certified Master Arborist
RE: Tree Plan for The Views Subdivision

Summary

This report includes tree removal, preservation, and protection recommendations for the proposed Views Subdivision in Sandy, Oregon.

Background

Even Better Homes is proposing to construct a 122 lot subdivision with new streets, sidewalks, utilities, and open space at 41717 Highway 26 in Sandy, Oregon. The proposed site plan with the proposed tree removal and retention is provided in Attachment 1.

The assignment requested of our firm for this project was to:

- Assess the trees within and adjacent to the portion of the site to be developed;
- Identify the trees to be removed and retained; and
- Provide tree protection recommendations for the trees to be retained.

Tree Assessment

In March, May, and June 2020 I completed the inventory of existing trees at the site.

The complete inventory data for each tree is provided in Attachment 2 and includes the tree number, common name, scientific name, trunk diameter (DBH), crown radius, health condition, structural condition, pertinent comments, whether it is an onsite 11-inch DBH or greater tree in good condition¹, and whether the tree will be retained or removed.

All County Surveyors and Planners added color coded labels to the inventory to denote onsite trees within the restricted development area (green), onsite trees

¹ Section 17.102.50 of the City of Sandy Code requires three onsite trees over 11-inch DBH that are in good condition to be retained.

outside the restricted development area (light salmon), offsite trees (gray), trees that are 11-inch DBH or greater and in good condition (yellow), trees that are not 11-inch DBH or greater and/or not in good condition (red), and trees to be removed (dark salmon).

The tree numbers in the inventory in Attachment 2 correspond to the tree numbers on the plans in Attachment 1. The trees were also tagged with their corresponding numbers in the field.

Tree Removal and Retention

This section of the report includes tree removal and retention recommendations based on the proposed site plan.

Tree Removal

The standard tree protection requirements in the City of Sandy Code range from at least 10 feet from the trunks of retained trees (SDC 17.102.50.B.1) to five feet beyond the driplines (SDC 17.92.10.D) unless otherwise approved by the Planning Director.

A typical alternative minimum protection zone allows encroachments no closer than a radius from a tree of .5 feet per inch of DBH as long as no more than 25 percent of the critical root protection zone area (estimated at one foot radius per inch of DBH) is impacted. Figure 1 illustrates this concept.

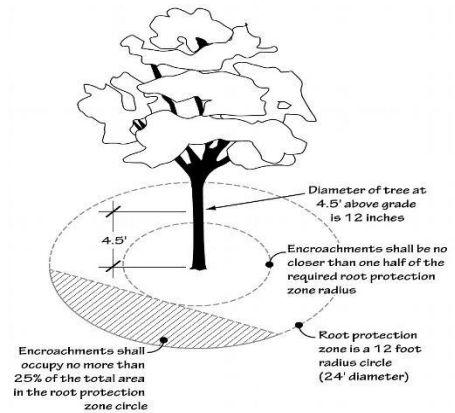


Figure 1: Alternative minimum protection zone

Using the criteria described above, while considering the tree conditions and their locations relative to grading, paving, construction, and other site improvements, 190 of the assessed trees at the site are proposed for removal.

Tree Retention

A total of 212 onsite trees are proposed to be retained. Of these 212 trees, 99 trees are in good condition and over 11-inch DBH. Section 17.102.50.A of the City of Sandy Code includes five criteria for tree retention with development. The five criteria followed by my findings in *italics* are listed below:

1. At least three trees 11 inches DBH or greater are to be retained for every one-acre of contiguous ownership.

Finding: The site is 32.87 acres in size so 98.61 trees over 11-inch DBH in good condition are required to be retained. The proposed preservation includes 99 trees over 11-inch DBH in good condition. This criterion is met.

2. Retained trees can be located anywhere on the site at the landowner's discretion before the harvest begins. Clusters of trees are encouraged.

Teragan & Associates, Inc.
3145 Westview Circle • Lake Oswego, OR 97034
Phone: 971.295.4835 • Fax: 503.697.1976
Email: todd@teragan.com • Website: teragan.com

Finding: The retained trees are clustered primarily within the restricted development areas of the site as shown in Attachment 1. This criterion is met.

3. Trees proposed for retention shall be healthy and likely to grow to maturity, and be located to minimize the potential for blow-down following the harvest.

Finding: All of the trees subject to this standard are in good health condition and likely to grow to maturity. The proposed clustering of retained trees in the restricted development will help to minimize blow down hazards. Therefore, this criterion is met.

4. If possible, at least two of the required trees per acre must be of conifer species.

Finding: Sixty-nine (69) of the 99 trees over 11-inch DBH and in good condition to be retained are conifer species. This criterion is met.

5. Trees within the required protected setback areas may be counted towards the tree retention standard if they meet these requirements.

Finding: There is no protected setback area at the site. This criterion is not applicable.

Tree Protection Recommendations

The standard tree protection requirements in the City of Sandy Code range from at least 10 feet from the trunks of retained trees (SDC 17.102.50.B.1) to five feet beyond the driplines (SDC 17.92.10.D) unless otherwise approved by the Planning Director.

A typical alternative minimum protection zone allows encroachments no closer than a radius from a tree of .5 feet per inch of DBH as long as no more than 25 percent of the critical root protection zone area (estimated at one foot radius per inch of DBH) is impacted. Figure 1 illustrates this concept.

The reason for using this alternative is because it allows the tree protection zone to better relate to the size of the tree and its root zone. For example, a 10 foot tree protection setback would not be adequate for a 48-inch DBH tree which should have a minimum setback of at least 24 feet. Also, driplines can be highly variable based on species growth habits and onsite conditions such as the presence of adjacent trees or past pruning.

The trees to be retained can be adequately protected by placing tree protection fencing as shown in Attachment 1. The tree protection fencing will protect at least 75 percent of their critical roots zones and avoid any encroachments closer than a radius of .5 feet per inch of DBH to a tree to be retained. No grading, stockpiling, storage,

disposal, or any other construction related activity shall occur in the tree protection zones unless specifically reviewed and approved by the project arborist.

The following additional protection measures shall apply to the trees at the site:

- *Tree Protection Fencing*: Establish tree protection fencing in the locations shown in Attachment 1. Required fencing shall be a minimum of six feet tall supported with metal posts placed no farther than ten feet apart installed flush with the initial undisturbed grade. Fence installation may be delayed until immediately after tree removal is complete.
- *Directional Felling*: Fell the trees to be removed away from the trees to be retained so they do not contact or otherwise damage the trunks or branches of the trees to be retained. No vehicles or heavy equipment shall be permitted within the tree protection zones during tree removal operations.
- *Stump Removal*: The stumps of the trees to be removed from within the tree protection zones shall either be retained in place or stump ground to protect the root systems of the trees to be retained.
- *Protect Tree Crowns*: Care will need to be taken to not contact or otherwise damage the crowns of the trees that may extend into the construction area.
- *Monitoring of New Grove Edges*: It will be important to reassess and monitor the trees along the newly exposed tree grove edges following site clearing and periodically during construction and after high wind events to ensure they do not pose a high risk. This monitoring should occur for the next two to three storm seasons following site clearing.
- *Sediment Fencing*: Shift sediment fencing to outside the tree protection zones. If erosion control is required inside the tree protection zones, use straw wattles to minimize root zone disturbance of the trees to be retained.

Additional tree protection recommendations for the trees to be retained are provided in Attachment 3.

Conclusion

Ninety-nine (99) trees over 11-inch DBH in good condition are proposed to be retained at The Views Subdivision site. The required tree retention for the 32.87 acre site is 98.61 trees.

The trees to be retained will be adequately protected by adhering to the recommendations in this report.

Please contact me if you have questions, concerns, or need any additional information.

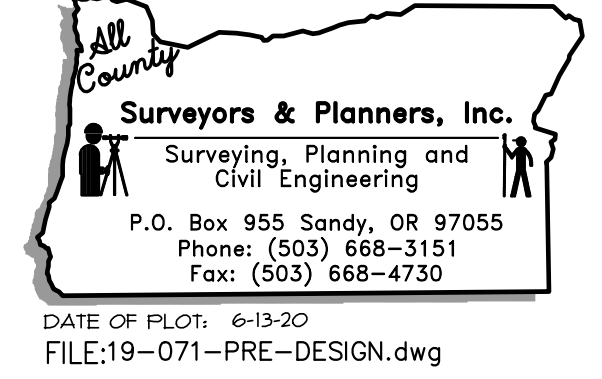
Sincerely,



Todd Prager

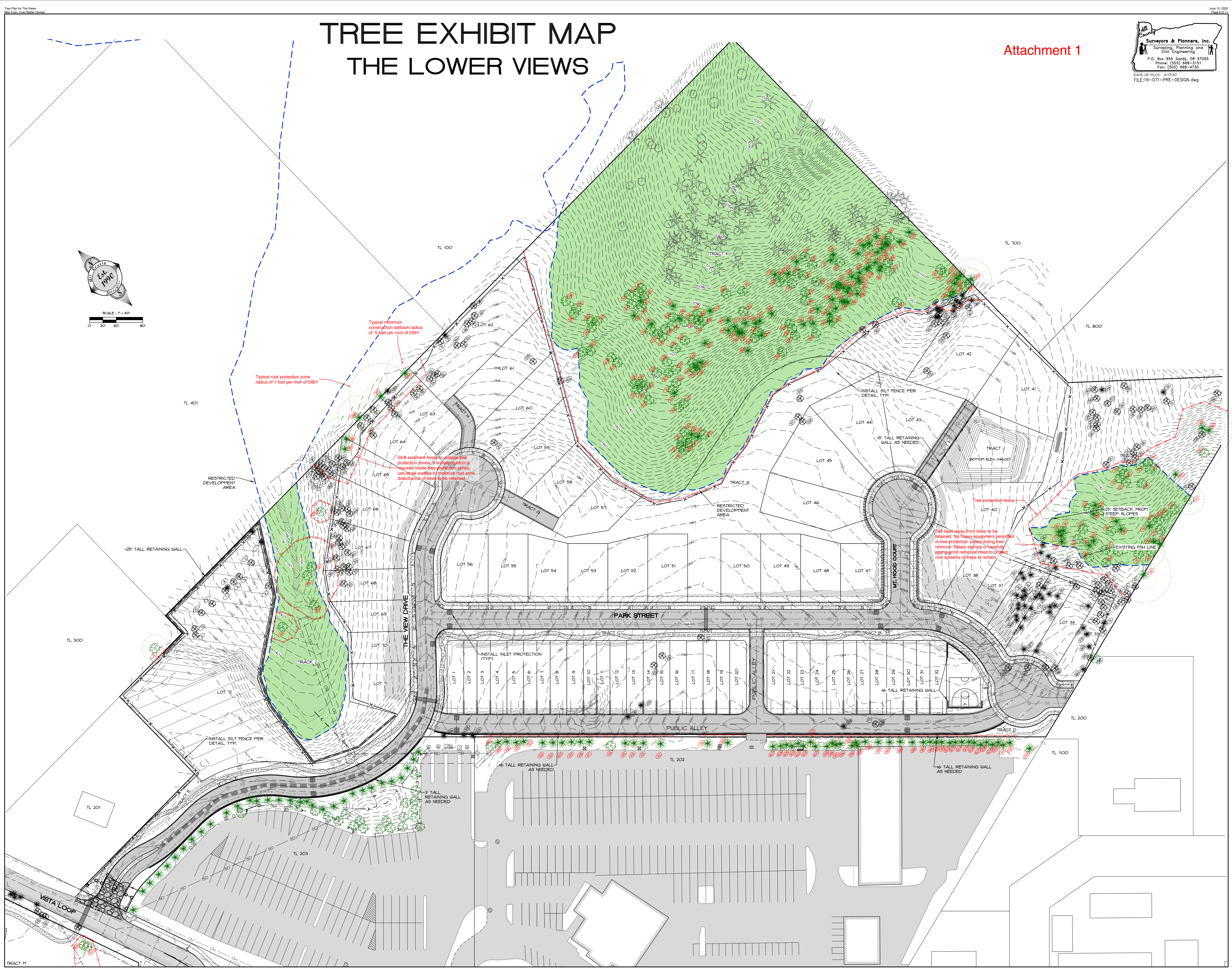
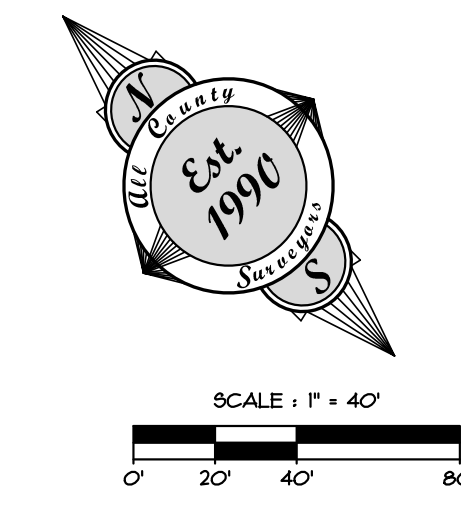
*ASCA Registered Consulting Arborist #597
ISA Board Certified Master Arborist, WE-6723B
ISA Qualified Tree Risk Assessor
AICP, American Planning Association*

Attachments: Attachment 1 - Site Plan w/ Tree Removal, Retention and Protection
Attachment 2 - Tree Inventory
Attachment 3 - Tree Protection Recommendations
Attachment 4 - Assumptions and Limiting Conditions



Attachment 1

TREE EXHIBIT MAP THE LOWER VIEWS



Typical minimum construction setback radius of 5 feet per inch of DBH

Typical root protection zone radius of 1 foot per inch of DBH

Shift sediment fence to align with protection zones, if erosion control is required inside tree protection zones, use large wattles to minimize soil some disturbance of trees to be retained.

All trees away from trees to be retained. No heavy equipment permitted in tree protection zones during tree removal. Eriksen stumps or healthy stumps and retained trees to ground root systems of trees to remain.

Tree protection fence

25' SETBACK FROM STEEP SLOPES

EXISTING P54 LINE

125' TALL RETAINING WALL

RESTRICTED DEVELOPMENT AREA

RESTRICTED DEVELOPMENT AREA

INSTALL SILT FENCE PER DETAIL TYP.

15' TALL RETAINING WALL AS NEEDED

INSTALL INLET PROTECTION (ITP)

16' TALL RETAINING WALL

16' TALL RETAINING WALL AS NEEDED

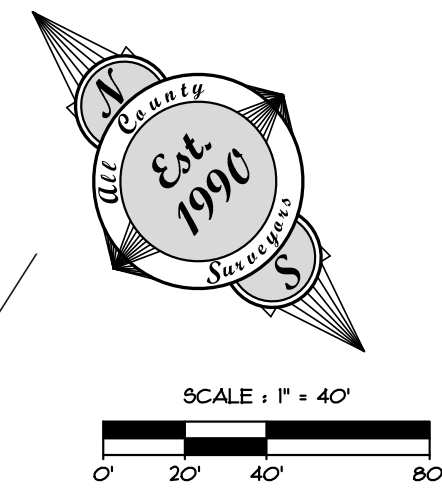
9' TALL RETAINING WALL AS NEEDED

16' TALL RETAINING WALL AS NEEDED

TREE EXHIBIT MAP THE UPPER VIEWS

Attachment 1

June 15, 2020
Page 2 of 2
Surveyors & Planners, Inc.
Surveying, Planning and
Civil Engineering
P.O. Box 855 Sandy, OR 97055
Phone: (503) 468-3151
Fax: (503) 668-4792
DATE OF PLOT: 6-13-20
FILE: 19-071-PRE-DESIGN.dwg



Attachment 3 Additional Tree Protection Recommendations

The following recommendations meet or exceed City of Sandy Code requirements:

Before Construction Begins

1. Notify all contractors of tree protection procedures. For successful tree protection on a construction site, all contractors must know and understand the goals of tree protection.
 - a. Hold a tree protection meeting with all contractors to explain the goals of tree protection.
 - c. Have all contractors sign memoranda of understanding regarding the goals of tree protection. The memoranda should include a penalty for violating the tree protection plan. The penalty should equal the resulting fines issued by the local jurisdiction plus the appraised value of the tree(s) within the violated tree protection zone per the current Trunk Formula Method as outline in the current edition of the *Guide for Plant Appraisal* by the Council of Tree & Landscape Appraisers. The penalty should be paid to the owner of the property.
2. Fencing
 - a. Trees to remain in the grove should be protected by installation of tree protection fencing as shown in Attachment 1.
 - b. The fencing should be put in place before the ground is cleared in order to protect the trees and the soil around the trees from disturbances.
 - c. Fencing should be established by the project arborist based on the needs of the trees to be protected and to facilitate construction.
 - d. Fencing should consist of 6-foot high steel fencing on concrete blocks or 6-foot metal fencing secured to the ground with 8-foot metal posts placed no farther than ten feet apart to prevent it from being moved by contractors, sagging, or falling down.
 - e. Fencing should remain in the position that is established by the project arborist and not be moved without approval from the project arborist until final project approval.
3. Signage
 - a. All tree protection fencing should have signage as follows so that all contractors understand the purpose of the fencing:

TREE PROTECTION ZONE

**DO NOT REMOVE OR ADJUST THE APPROVED
LOCATION OF THIS TREE PROTECTION FENCING.**

Please contact the project arborist if alterations to the approved
location of the tree protection fencing are necessary.

Todd Prager, Project Arborist - 971-295-4835

- b. Signage should be placed every 75-feet or less.

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Phone: 971.295.4835 • Fax: 503.697.1976
Email: todd@teragan.com • Website: teragan.com

During Construction

1. Protection Guidelines Within the Tree Protection Zones:
 - a. No new buildings; grade change or cut and fill, during or after construction; new impervious surfaces; or utility or drainage field placement should be allowed within the tree protection zones.
 - b. No traffic should be allowed within the tree protection zones. This includes but is not limited to vehicle, heavy equipment, or even repeated foot traffic.
 - c. No storage of materials including but not limiting to soil, construction material, or waste from the site should be permitted within the tree protection zones. Waste includes but is not limited to concrete wash out, gasoline, diesel, paint, cleaner, thinners, etc.
 - d. Construction trailers should not to be parked/placed within the tree protection zones.
 - e. No vehicles should be allowed to park within the tree protection zones.
 - f. No other activities should be allowed that will cause soil compaction within the tree protection zones.
2. The trees should be protected from any cutting, skinning or breaking of branches, trunks or woody roots.
3. The project arborist should be notified prior to the cutting of woody roots from trees that are to be retained to evaluate and oversee the proper cutting of roots with sharp cutting tools. Cut roots should be immediately covered with soil or mulch to prevent them from drying out.
4. Trees that have roots cut should be provided supplemental water during the summer months.
5. Any necessary passage of utilities through the tree protection zones should be by means of tunneling under woody roots by hand digging or boring with oversight by the project arborist.
6. Any deviation from the recommendations in this section should receive prior approval from the project arborist.

After Construction

1. Carefully landscape the areas within the tree protection zones. Do not allow trenching for irrigation or other utilities within the tree protection zones.
2. Carefully plant new plants within the tree protection zones. Avoid cutting the woody roots of trees that are retained.
3. Do not install permanent irrigation within the tree protection zones unless it is drip irrigation to support a specific planting or the irrigation is approved by the project arborist.
4. Provide adequate drainage within the tree protection zones and do not alter soil hydrology significantly from existing conditions for the trees to be retained.
5. Provide for the ongoing inspection and treatment of insect and disease populations that are capable of damaging the retained trees and plants.
6. The retained trees may need to be fertilized if recommended by the project arborist.
7. Any deviation from the recommendations in this section should receive prior approval from the project arborist.

Attachment 4 Assumptions and Limiting Conditions

1. Any legal description provided to the consultant is assumed to be correct. The site plans and other information provided by Even Better Homes and their consultants was the basis of the information provided in this report.
2. It is assumed that this property is not in violation of any codes, statutes, ordinances, or other governmental regulations.
3. The consultant is not responsible for information gathered from others involved in various activities pertaining to this project. Care has been taken to obtain information from reliable sources.
4. Loss or alteration of any part of this delivered report invalidates the entire report.
5. Drawings and information contained in this report may not be to scale and are intended to be used as display points of reference only.
6. The consultant's role is only to make recommendations. Inaction on the part of those receiving the report is not the responsibility of the consultant.
7. The purpose of this report is to:
 - Assess the within and adjacent to the portion of the site to be developed;
 - Identify the trees to be removed and retained; and
 - Provide tree protection recommendations for the trees to be retained.



SCHOTT & ASSOCIATES
Ecologists & Wetlands Specialists

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EXHIBIT H

**JURISDICTIONAL WETLAND
DELINEATION REPORT
FOR**

The Views

T2S, R5E, S19, TL 200
Sandy, Oregon

Prepared for

Even Better Homes, Inc
Mac Even
P.O. Box 2021
Gresham, OR 97030

Prepared by

Kim Biafora
of
Schott & Associates, Inc.

Date:

February 2020

Project #: 2748

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(A) Landscape Setting and Land Use

Schott & Associates (S&A) was contracted to conduct wetland delineation verification on a 23.24-acre study site located at 41717 Highway 26 in Sandy, Clackamas County, Oregon (T2S, R5EW, S19, TL 200). This site was originally delineated by S&A in 2014 and wetland boundaries were concurred with by the Oregon Department of State Lands (DSL) in a letter issued March 10, 2015 (WD2014-0465). WD2014-0465 will expire on March 10, 2020 and the applicant wishes to renew the delineation in anticipation of future development. This report complies with all standards and requirements set forth in Oregon Administrative Rules (OAR) 141-090-0035 (1-17) for wetland delineation reports and jurisdictional determinations for the purpose of regulating fill and removal within waters of the state. This report will be used to fulfill federal and state regulatory requirements for project permitting.

The study site encompassed the entirety of tax lot 200. The site featured rural residential development including home and outbuildings along the western boundary but was otherwise undeveloped. An open stormwater pipe extended from a recreational vehicle (RV) sales lot to the south of the site into the northwestern portion of the site within a storm sewer easement. Site topography was undulating and dissected by several steep-sided ravines along the northern portion of the site which sloped to the north and east; two of the ravines contained the upper reaches of first-order streams. The site in this area was vegetated by mixed coniferous-deciduous forest with dense Himalayan blackberry (*Rubus armeniacus*) thickets at the forest margins. Blackberry was recently cleared to facilitate site access and verification of the wetland and stream boundaries. The remainder of the site consisted of a semi-regularly mown field vegetated by mixed pasture grasses and weedy forbs with areas of stockpiled fill material.

The site was surrounded by the RV sales lot and other commercial development to the southwest, woodland to the north and east, and low-density residential development to the south. At the time of delineation, the site was zoned for single-family residential (SFR) and the forested portion of the site featured a Flood and Slope Hazard (FSH) overlay designation according to City of Sandy zoning maps

(B) Site Alterations

Aerial photographs for the time period between 1995 and 2018, available from Google Earth, were reviewed to assess site history. The site is believed to have been in agricultural use for decades, predominantly hay and pasture. In the earliest available aerial photograph (1995; Figure 5c), the site is in much the same condition as it is currently, though the adjacent RV lot is smaller. In 2003 (Figure 5b), the RV lot was expanded, and vehicle tracks are visible throughout the unforested portion of the study site. During a 2004 wetland delineation conducted by S&A, a dirt bike track was observed throughout the site resulting in significant soil and vegetation disturbance, and the storm drain discharging onto the northeastern portion of the property had recently been installed. The RV lot to the south began expanding again in the mid-2000s and the existing footprint was in place by the mid-2010s.

(C) Precipitation Data and Analysis

Precipitation data for the date of fieldwork and the time period preceding it were reviewed to evaluate observed wetland hydrology conditions relative to actual and statistically normal precipitation. Precipitation that deviates from normal ranges can affect site conditions and impact observed wetland hydrology indicators. Precipitation data was acquired from the Natural Resources Conservation Service (NRCS) Agricultural Applied Climate Information System (AgACIS) for the Headworks Portland Wtr B station near Sandy to provide context for observed hydrological conditions of the study area at the time of the site visit (AgACIS 2019-2020). Table 1 provides the precipitation data, comparison to the normal water year average, as well as normal monthly ranges of precipitation representing 70% probability as reported for the Headworks Portland Wtr B NRCS WETS station (NRCS 1981-2010).

Table 1. Precipitation Summary for the Date of Fieldwork and Preceding Water Year (October 1, 2019 – January 23, 2020)

Date of Field Visit	Observed Precipitation*				
	Date of Visit (in.)	2 weeks to-Date (in.)	Water Year to-Date (in.)	Normal Water Year to-Date (in.)	% of Normal Water Year-to-Date
January 23, 2020	1.24	7.85	25.89	36.71	71%

*Data provided by NRCS AgACIS data from the Headworks Portland Wtr B Station, OR, 2018-2019

Table 2. Precipitation Summary for Three Months Preceding Fieldwork and Comparison to WETS Average and Normal Range

Month	Total Precipitation (inches)*	WETS Average (inches)**	WETS Normal Range (inches)**	% of Normal
December	6.87	11.15	8.38-12.81	17%
November	2.89	11.19	8.25-13.13	25%
October	4.85	6.53	3.97-7.91	60%

*Data provided by NRCS AgACIS data from the Headworks Portland Wtr B Station, OR, 2018-2019

**Data provided by NRCS WETS station for the Headworks Portland Wtr B Station, OR, 1981-2010

Fieldwork took place on January 23, 2020 when 1.24 inches of precipitation was observed. In the two weeks preceding fieldwork, 7.85 inches of precipitation was observed (168% of normal precipitation at 4.67 inches). Precipitation observed in December and November was below the WETS average and normal range. Precipitation observed in the month of October was below the WETS average, but within the normal range. Precipitation for the water year (October 1, 2019-January 23, 2020) was observed at 71% of normal (36.71 inches). Despite a very dry start to the water year, precipitation levels increased considerably during the first few weeks of January. Because of the heavy rain observed on the day of and in the weeks leading to fieldwork, and the open stormwater pipe discharging into the site from the adjacent RV lot, it is assumed that

that surface and groundwater levels observed during fieldwork were likely temporarily higher than normal.

(D) Site Specific Methods

Prior to visiting the site, the following existing data and information was reviewed:

- Clackamas County tax map (<https://cmap.clackamas.us/maps/cmap/>; Figure 2)
- U.S. Fish and Wildlife Service (USFWS) National Wetland Inventory (NWI) and Local Wetland Inventory (LWI) for Sandy (Appendix D; SRI/SHAPIRO/AGCD, Inc., 1997)
- U.S. Department of Agriculture (USDA) National Resource Conservation Service (NRCS) gridded Soil Survey Geographic (gSSURGO) database for Clackamas County (Figure 4)
- Recent and historical aerial photographs provided by Google Earth (Figures 5a-5c)
- USGS National Elevation Data (NED), 1/9 arc-second, 2013 (Figure 6)
- Wetland delineation report #WD2014-0465

Two soil series were mapped within the study site boundary according to the USDA NRCS soil survey for Clackamas County: Cazadero silty clay loam at slopes ranging from 0-20% was mapped over all but the northeastern corner of the site and Klickitat stony loam at slopes of 30-69% was mapped in the northeastern corner. The Cazadero series is rated predominantly nonhydryc (2% hydric inclusions) at slopes of 0-7% (occurring over the central and northwestern portions of the site) and nonhydryc at slopes greater than 7%. Klickitat stony loam is rated nonhydryc. Neither soil series are subject to flooding or ponding.

WD2014-0465 identified two wetlands totaling 0.24 acres and two streams located in ravines in the northeastern and northwestern portions of the site, which extended offsite. The wetlands had formed at the heads of the drainages.

Schott & Associates visited the site on January 23, 2019 to verify the boundaries of wetlands and waters delineated in 2014. The 2014 wetland boundaries and sample plots were flagged in the field by the surveying company that had surveyed the 2014 wetland delineation (All County Surveyors and Planners, Inc). New data were collected at previously established sample plot locations according to methods described in the *1987 Manual* and the *Regional Supplement to the Corps of Engineers Delineation Manual: Western Mountains, Valleys and Coast Region (Version 2.0)* and new sample plots were established as needed. For each sample plot, data on vegetation, hydrology, and soils was collected, recorded in the field and later transferred to data forms (Appendix B). Plant indicator status was determined using the 2016 National Wetland Plant List (Lichvar et al. 2016). Onsite streams were delineated via the ordinary high-water mark (OHWM) as indicated by top of bank, wrack or scour lines, change in vegetation communities, or gage elevation where applicable.

All identified wetlands are classified according to the USFWS *Classification of Wetlands and Deepwater Habitats of the United States* (Cowardin et al. 1979) and the *Guidebook for Hydrogeomorphic (HGM)-based Assessment of Oregon Wetland and Riparian Sites* (DSL 2001).

Representative ground level photographs were recorded to document site conditions (Appendix C; Figure 6).

(E) Description of All Wetlands and Other Non-Wetland Waters

The boundaries of the two wetlands and two streams were verified within the site, though the wetland in the northeast was found to be larger in size than it was in 2014. Onsite wetland area totaled 0.47 acre and onsite stream area totaled 0.04 acre. Wetland, stream, and sample plot locations are shown in Figure 6.

Wetland 1: Wetland 1 was located in the northwestern portion of the site at the head of a steep-sided ravine and sloped north-northeast. The wetland received direct discharge from an open storm water pipe associated with the RV lot to the south. During the time of fieldwork, this pipe was observed to be overflowing and flooding areas of upland near the pipe. Surface water flows eventually coalesced into a defined channel (Stream 1) downslope of the wetland, which continued offsite to the north. The wetland was assessed as a slope HGM class with a Cowardin class of seasonally flooded palustrine scrub-shrub (PSSC). The vegetation community consisted predominantly of Himalayan blackberry with patches of soft rush (*Juncus effusus*; FACW), as well as creeping bentgrass (*Agrostis stolonifera*; FAC) and velvetgrass (*Holcus lanatus*; FAC).

Soil samples met the Corps hydric indicator of redox dark surface (F6) indicating that iron in the soil has been removed and translocated under saturated, anoxic conditions within dark-colored soils. Soil layers were generally very dark grayish brown (10 YR 3/2) in matrix color and featured common yellow-red redoximorphic concentrations occurring as soft masses. These dark soils were underlain by depleted matrix color (10 YR 4/1) at about 10 inches of depth in some cases. Soil samples on the south end of the wetland exhibited mixed matrices, presumably due to disturbance from the installation of the stormwater pipe. Soil texture was silt loam to silty clay loam to silty clay. Wetland hydrological indicators observed included surface water (A1), high water table (A2), and soil saturation (A3).

Wetland 1 was bound by the ravine sideslopes. These areas were generally vegetated by Himalayan blackberry along with pasture grasses such as orchardgrass (*Dactylis glomerata*; FACU), tall fescue (*Schedonorus arundinaceus*; FAC), bentgrass, and velvetgrass. Soil samples frequently exhibited mixed matrices of 10 YR 3/2 with dark brown (10 YR 3/3) and brown (7.5 YR 4/3) colors, likely due to past disturbance. No redoximorphic features were present. Hydrology indicators were present in some cases, attributed to recent heavy rains and the presence of an overflowing open stormwater pipe.

Wetland 2: Wetland 2 was located in the northeastern portion of the site, also at the head of a ravine, and sloped east. The wetland was apparently sustained by one or more seeps

on the face of the ravine. Flows eventually drained into Stream 2 and continued offsite to the east. The wetland was assessed as a slope HGM class with a Cowardin class of seasonally flooded palustrine forested (PFOC). The vegetation community consisted an overstory of western redcedar (*Thuja plicata*; FAC) with an understory of vine maple (*Acer circinatum*; FAC), salmonberry (*Rubus spectabilis*; FAC), piggyback plant (*Tolmiea menziesii*; FAC), and skunk cabbage (*Symplocarpus foetidus*; OBL).

Soils met the Corps hydric indicator of depleted below dark surface (A11). Dark soil surface layers were very dark grayish brown in matrix color, depleted layers were dark grayish brown (10 YR 4/2) to grayish brown (10 YR 5/2) in matrix color and featured many yellow-red redoximorphic concentrations occurring as soft masses. Soil texture was cobbly, gravelly loamy sand. Wetland hydrological indicators observed included surface water, high water table, and soil saturation.

The wetland was bound by the ravine sideslopes vegetated by mixed forest including bigleaf maple (*Acer macrophyllum*; FACU), Douglas-fir (*Pseudotsuga menziesii*; FACU), and western red cedar with an understory of vine maple, hazelnut (*Corylus cornuta*; FACU), western swordfern (*Polystichum munitum*; FACU), trailing blackberry (*Rubus ursinus*; FACU), and wood sorrel (*Oxalis oregana*; FACU). Soils were brown to dark brown silt loam with no redoximorphic features. No hydrological indicators were present at sample plots.

Stream 1: Stream 1 flowed northeast from Wetland 1. The channel within the study site was approximately 2-3 feet wide and 1-2 feet deep with a silty substrate and featured a few inches of flowing water at the time of fieldwork. Based on the intermittently defined bed and banks and relatively low flow despite wet conditions, it is assumed that this headwater reach of Stream 1 is intermittent in flow period. The feature was assessed as a seasonally flooded intermittent riverine stream bed (R4SBC) Cowardin class. Riparian vegetation consisted of a red alder (*Alnus rubra*; FAC) with an understory dominated by Himalayan blackberry and some English ivy (*Hedera helix*; FACU).

Stream 2: Stream 2 flowed east from Wetland 2. The channel within the study site was approximately 3-4 feet wide and less than 1 foot deep with a sandy-gravelly substrate and featured a few inches of flowing water at the time of fieldwork. The stream had intermittently defined bed and banks and low flow, so is assumed intermittent in flow period. The feature was assessed as a R4SBC Cowardin class. Riparian vegetation consisted of western redcedar forest with an understory of vine maple, western swordfern, and wood sorrel.

(F) Deviation from LWI or NWI

The NWI depicts the upper end of a seasonally flooded intermittent riverine stream bed (R4SBC) aquatic habitat mapped in the general location of Stream 2. This feature is associated with an ODF mapped intermittent stream (Figure 3). The Sandy LWI depicts wetlands in the general locations of Wetland/Stream 1 and Wetland/Stream 2, referred to as CC3 and CC4, respectively (Appendix D). The results of this study confirm and refine the LWI and augments the NWI, identifying PSSC and PFOC wetlands at the heads of two R4SBC streams as shown in Figures 6a and 6b.

(G) Mapping Method

The mapped wetland areas were based on soils, vegetation, and hydrology data. The wetland and OHWM boundaries and sample plot locations were recorded with a handheld Trimble GPS unit capable of sub-meter accuracy following differential correction with Pathfinder Office desktop software. These data were converted to ESRI shapefile and mapped using ArcMap 10.6 desktop software.

(H) Additional Information

None.

(I) Summary and Conclusions

Based on vegetation, soils, and hydrology data, two wetlands (totaling 0.47 acre) and two streams (totaling 0.04 acre) were identified within the study site. Wetland 1 occurred at the bottom of a ravine at the head of Stream 1 and was classified as a slope HGM class and PSSC Cowardin class. Wetland 2 occurred at the bottom of a ravine at the head of Stream 2 and was classified as a slope HGM class and PFOC Cowardin class. Both streams were assessed as R4SBC Cowardin classes and continue beyond the study site boundaries.

(J) Disclaimer

This report documents the investigation, best professional judgment, and conclusions of the investigators. It is correct and complete to the best of our knowledge. It should be considered a Preliminary Jurisdictional Determination of wetlands and other waters and used at your own risk unless it has been reviewed and approved in writing by the Oregon Department of State lands in accordance with OAR 141-090-0005 through 141-090-0055.

APPENDIX A: FIGURES

FIGURE 1: LOCATION MAP



Date: 1/27/2020

Data Source: ESRI, 2020

Figure 1. Location Map

The Views Project Site: S&A #2748

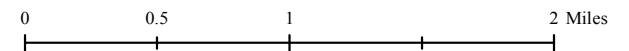
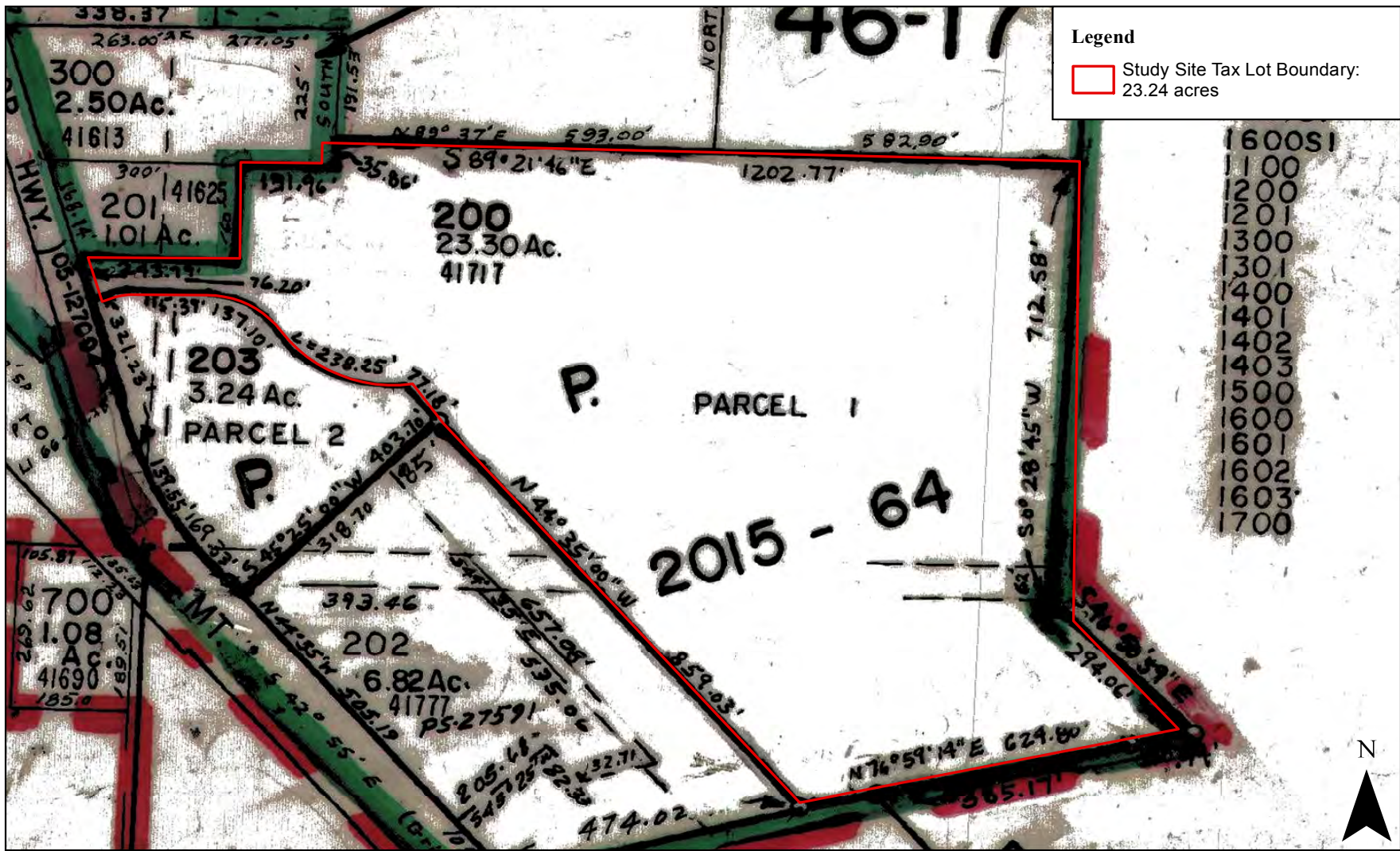


FIGURE 2: TAX MAP



Date: 1/27/2020

Data Source: ESRI, 20120; Clackamas County GIS Dept., 2019; USFWS, NWI, 2019; ODF, 2019

Figure 2. Clackamas County Tax Map - 2S5E19

The Views Project Site: S&A #2748

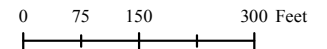


FIGURE 3: WETLAND INVENTORY MAP



Date: 1/31/2020

Data Source: ESRI, 20120; Clackamas County GIS Dept., 2019; USFWS, NWI, 2019; ODF, 2019

Figure 3. Wetland Inventory Map

The Views Project Site: S&A #2748

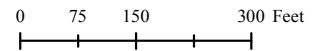
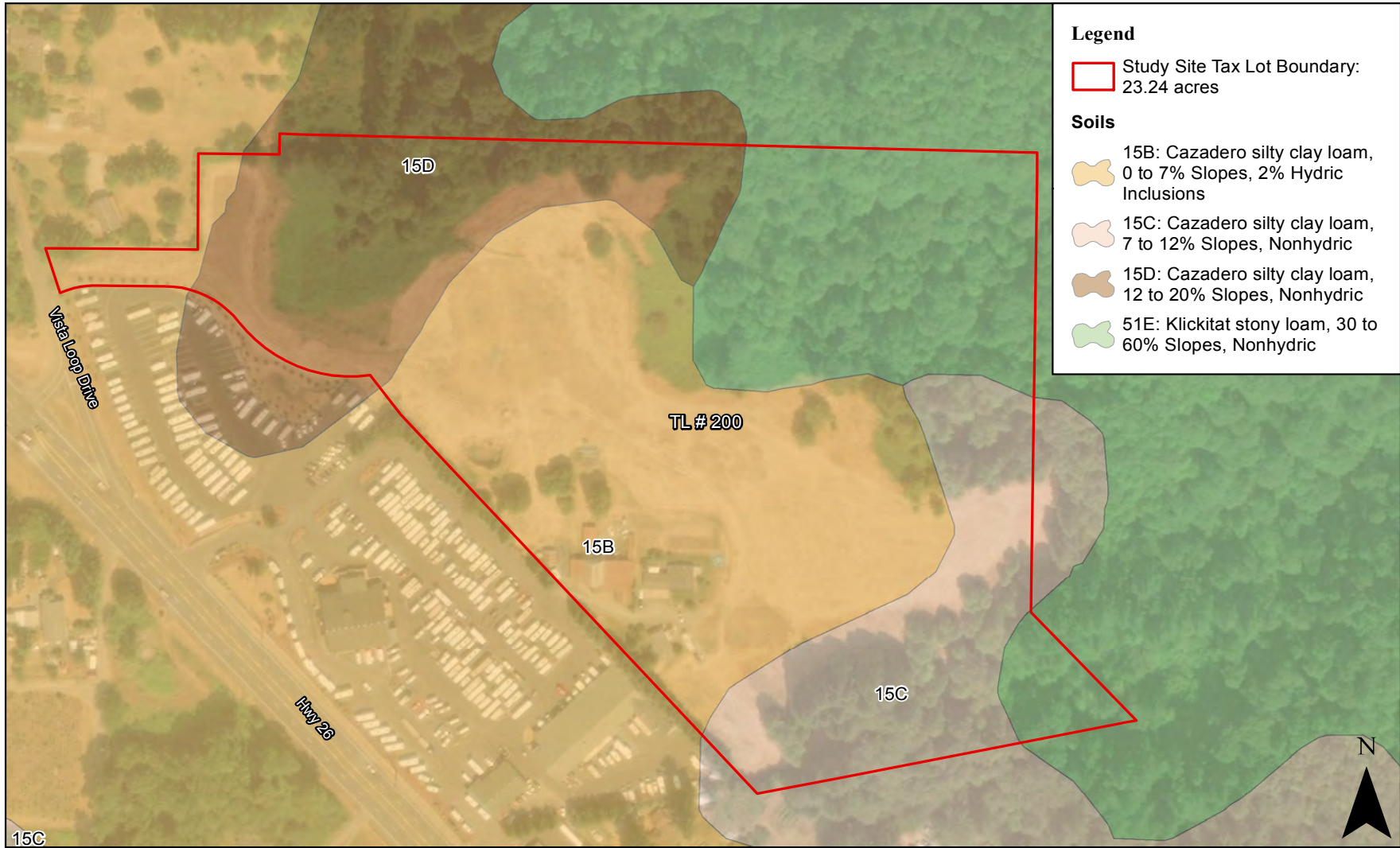


FIGURE 4: USDA/NRCS SOIL SURVEY MAP



Date: 1/27/2020

Data Source: ESRI, 20120; Clackamas County GIS Dept., 2019; Soil Survey Staff, USDA, NRCS, 12/2/2019

Figure 4. USDA/NRCS Soil Survey Map of Clackamas County

The Views Project Site: S&A #2748

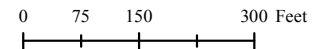


FIGURE 5A: RECENT AERIAL IMAGE – SEPTEMBER 3, 2018



Legend
 [Red Outline] Study Site Tax Lot Boundary:
 23.24 acres

Date: 1/27/2020

Data Source: ESRI, 20120; Clackamas County GIS Dept., 2019; USFWS, NWI, 2019; ODF, 2019

Figure 5a. Recent Aerial Image -
 September 3, 2018

The Views Project Site: S&A #2748

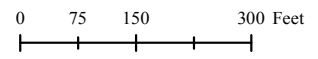


FIGURE 5B: HISTORICAL AERIAL IMAGE – JUNE 15, 2003



Date: 1/27/2020

Data Source: ESRI, 20120; Clackamas County GIS Dept., 2019; USFWS, NWI, 2019; ODF, 2019

Figure 5b. Recent Aerial Image -
June 15, 2003

The Views Project Site: S&A #2748

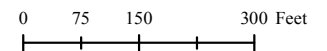


FIGURE 5C: HISTORICAL AERIAL IMAGE – JUNE 30, 1995



Date: 1/27/2020

Data Source: ESRI, 20120; Clackamas County GIS Dept., 2019; USFWS, NWI, 2019; ODF, 2019

Figure 5c. Recent Aerial Image -
 June 30, 1995

The Views Project Site: S&A #2748

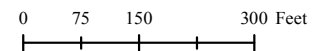


FIGURE 6A: WETLAND DELINEATION MAP – OVERVIEW



Legend

- Study Site Tax Lot Boundary: 23.24 acres
- Wetlands: 0.47 acre
- Stream OHWM: 0.04 acre
- Stormwater Pipe
- Contours: 5-ft. Interval
- Photo Points
- Sample Plots
- ➔ Feature Continues Offsite

Mapping Method and Precision Statement: The mapped areas were based on indicators of OHWM as well as vegetation, soils, and hydrology data gathered in the field by Schott & Associates. The sample plots and feature boundaries were recorded utilizing a Trimble Geo XT hand-held unit and post-processed to a +/- 3 foot accuracy. The GPS data were then imported into ArcGIS software to produce maps.

Date: 1/28/2020
 1 inch = 208 feet
 Data Source: ESRI, 2020; Clackamas GIS Dept., 2019 ; USGS, NED, 2011

Figure 6a. Wetland Delineation Map - Overview

The Views Project Site: S&A #2748

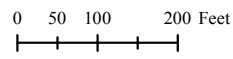
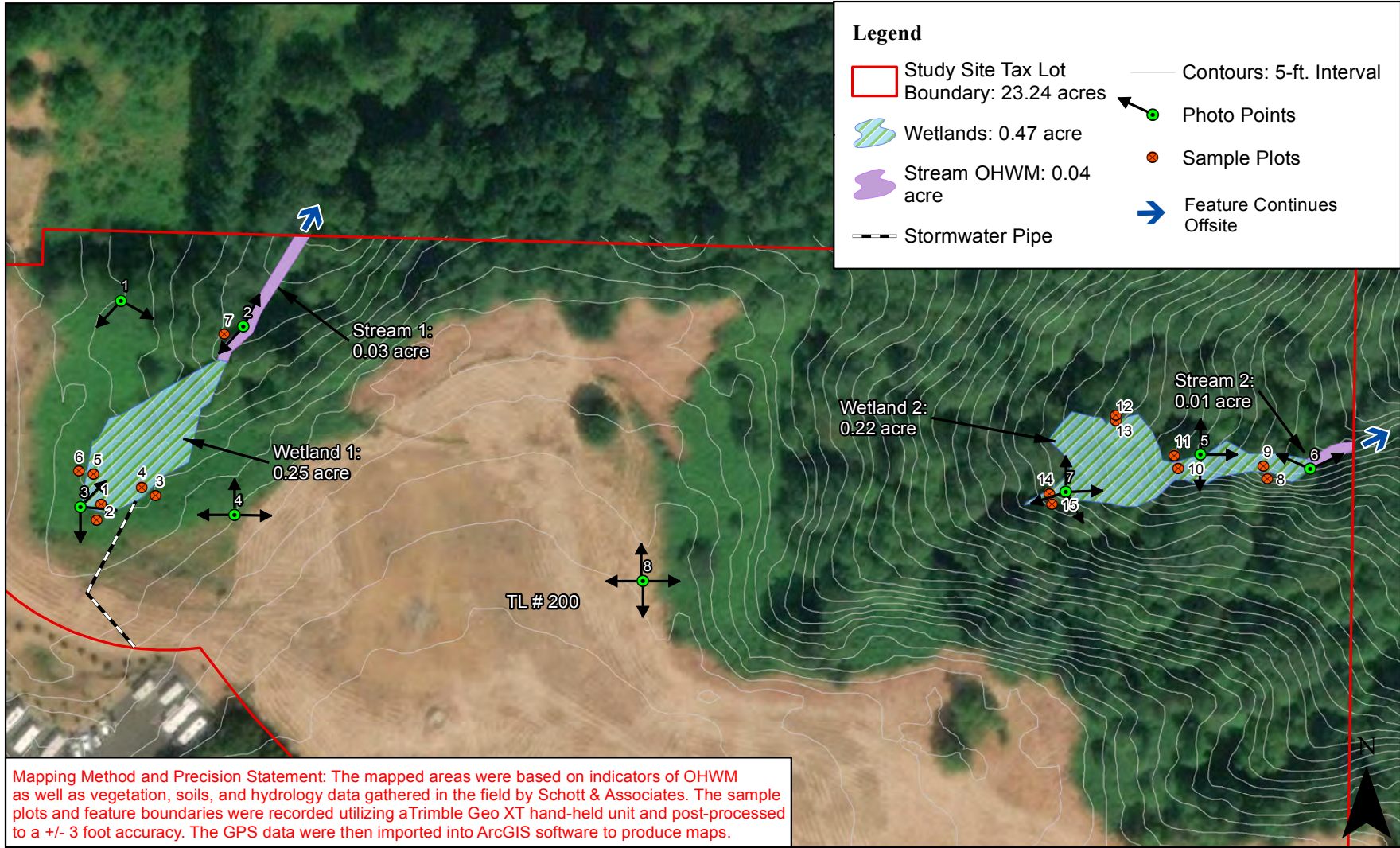


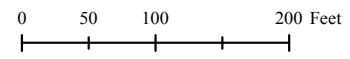
FIGURE 6B: WETLAND DELINEATION MAP – DETAIL



Date: 1/28/2020
 1 inch = 125 feet
 Data Source: ESRI, 2020; Clackamas GIS Dept., 2019; USGS, NED, 2011

Figure 6b. Wetland Delineation Map - Detail

The Views Project Site: S&A #2748



APPENDIX B: DATA FORMS

WETLAND DETERMINATION DATA FORM – Western Mountains, Valleys and Coast Region

Project/Site: The Views City/County: Sandy/Clackamas Sampling Date: 1/23/2020
 Applicant/Owner: Even Better Homes State: OR Sampling Point: 1
 Investigator(s): K. Biafora Section, Township, Range: S19, T2S, R5E
 Landform (hillslope, terrace, etc.): Ravine Local relief (concave, convex, none): none Slope (%): 4-7%
 Subregion (LRR): Northwest Forests and Coast (LRR A) Lat: 45.38688397 Long: -122.2330827 Datum: WGS 84
 Soil Map Unit Name: Cazadero silty clay loam NWI Classification: none
 Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No (If no, explain in Remarks)
 Are Vegetation , Soil , or Hydrology significantly disturbed? Are "Normal Circumstances" Present? Yes X No
 Are Vegetation , Soil , or Hydrology naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes <u>X</u> No <u> </u>	Is the Sampled Area within a Wetland?	Yes <u>X</u> No <u> </u>
Hydric Soil Present?	Yes <u>X</u> No <u> </u>		
Wetland Hydrology Present?	Yes <u>X</u> No <u> </u>		
Remarks: Himalayan blackberry recently cleared along margins of wetland to facilitate access.			

VEGETATION

<u>Tree Stratum</u> (Use scientific names.)	Absolute % Cover	Dominant Species?	Indicator Status?	Dominance Test worksheet:
1. _____	_____	_____	_____	Number of Dominant Species That Are OBL, FACW, or FAC: <u>1</u> (A) Total Number of Dominant Species Across All Strata: <u>1</u> (B) Percent of Dominant Species That Are OBL, FACW, or FAC: <u>100%</u> (A/B)
2. _____	_____	_____	_____	
3. _____	_____	_____	_____	
4. _____	_____	_____	_____	
Total Cover: <u>0</u>				Prevalence Index Worksheet: Total % Cover of: _____ Multiply by: OBL species _____ x1 = <u>0</u> FACW species _____ x2 = <u>0</u> FAC species _____ x3 = <u>0</u> FACU species _____ x4 = <u>0</u> UPL species _____ x5 = <u>0</u> Column Totals: <u>0</u> (A) <u>0</u> (B) Prevalence Index = B/A = _____
Shrub Stratum				
1. <u>Rubus armeniacus</u>	100	Y	FAC	
2. _____	_____	_____	_____	
3. _____	_____	_____	_____	
4. _____	_____	_____	_____	
5. _____	_____	_____	_____	
Total Cover: <u>100</u>				Hydrophytic Vegetation Indicators: _____ 1 - Rapid Test for Hydrophytic Vegetation <u>X</u> _____ 2 - Dominance Test is >50% _____ 3 - Prevalence Index is ≤3.0 ¹ _____ 4 - Morphological Adaptation ¹ (Provide supporting data in Remarks or on a separate sheet) _____ 5 - Wetland Non-Vascular Plants ¹ _____ Problematic Hydrophytic Vegetation ¹ (Explain)
Herb Stratum				
1. _____	_____	_____	_____	
2. _____	_____	_____	_____	
3. _____	_____	_____	_____	
4. _____	_____	_____	_____	
5. _____	_____	_____	_____	
6. _____	_____	_____	_____	
7. _____	_____	_____	_____	
8. _____	_____	_____	_____	
9. _____	_____	_____	_____	
10. _____	_____	_____	_____	
11. _____	_____	_____	_____	
Total Cover: <u>0</u>				¹ Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.
Woody Vine Stratum				
1. _____	_____	_____	_____	
2. _____	_____	_____	_____	
Total Cover: <u>0</u>				Hydrophytic Vegetation Present? Yes <u>X</u> No <u> </u>
% Bare Ground in Herb Stratum <u>0</u> % Cover of Biotic Crust <u>0</u>				

Remarks: Blackberry recently cut

SOIL

Sampling Point: _____ 1

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix		Redox Features				Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type ¹	Loc ²		
0-16	10 YR 3/2	90	10 YR 3/6	10	C	M	SCL	

¹Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. ²Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

Indicators for Problematic Hydric Soils³:

- | | | |
|--|--|---|
| <input type="checkbox"/> Histosol (A1) | <input type="checkbox"/> Sandy Redox (S5) | <input type="checkbox"/> 2 cm Muck (A10) |
| <input type="checkbox"/> Histic Epipedon (A2) | <input type="checkbox"/> Stripped Matrix (S6) | <input type="checkbox"/> Red Parent Material (TF2) |
| <input type="checkbox"/> Black Histic (A3) | <input type="checkbox"/> Loamy Mucky Mineral (F1) (except MLRA 1) | <input type="checkbox"/> Other (Explain in Remarks) |
| <input type="checkbox"/> Hydrogen Sulfide (A4) | <input type="checkbox"/> Loamy Gleyed Matrix (F2) | |
| <input type="checkbox"/> Depleted Below Dark Surface (A11) | <input type="checkbox"/> Depleted Matrix (F3) | |
| <input type="checkbox"/> Thick Dark Surface (A12) | <input checked="" type="checkbox"/> Redox Dark Surface (F6) | ³ Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic. |
| <input type="checkbox"/> Sandy Muck Mineral (S1) | <input type="checkbox"/> Depleted Dark Surface (F7) | |
| <input type="checkbox"/> Sandy gleyed Matrix (S4) | <input type="checkbox"/> Redox Depressions (F8) | |

Restrictive Layer (if present):

Type: _____
Depth (inches): _____

Hydric Soil Present? Yes No

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (any one indicator is sufficient)		Secondary Indicators (2 or more required)
<input type="checkbox"/> Surface Water (A1)	<input type="checkbox"/> Water-Stained Leaves (B9) (except MLRA 1, 2, 4A and 4B)	<input type="checkbox"/> Water-Stained Leaves (B9) (MLRA 1, 2, 4A and 4B)
<input checked="" type="checkbox"/> High Water Table (A2)	<input type="checkbox"/> Salt Crust (B11)	<input type="checkbox"/> Drainage Patterns (B10)
<input type="checkbox"/> Saturation (A3)	<input type="checkbox"/> Aquatic Invertebrates (B13)	<input type="checkbox"/> Dry-Season Water Table (C2)
<input type="checkbox"/> Water Marks (B1)	<input type="checkbox"/> Hydrogen Sulfide Odor (C1)	<input type="checkbox"/> Saturation Visible on Aerial Imagery (C9)
<input type="checkbox"/> Sediment Deposits (B2)	<input type="checkbox"/> Oxidized Rhizospheres along Living Roots (C3)	<input type="checkbox"/> Geomorphic Position (D2)
<input type="checkbox"/> Drift Deposits (B3)	<input type="checkbox"/> Presence of Reduced Iron (C4)	<input type="checkbox"/> Shallow Aquitard (D3)
<input type="checkbox"/> Algal Mat or Crust (B4)	<input type="checkbox"/> Recent Iron Reduction in Plowed Soils (C6)	<input type="checkbox"/> FAC-Neutral Test (D5)
<input type="checkbox"/> Iron Deposits (B5)	<input type="checkbox"/> Stunted or Stressed Plants (D1) (LRR A)	<input type="checkbox"/> Raised Ant Mounds (D6) (LRR A)
<input type="checkbox"/> Surface Soil Cracks (B6)	<input type="checkbox"/> Other (Explain in Remarks)	<input type="checkbox"/> Frost-Heave Hummocks (D7)
<input type="checkbox"/> Inundation Visible on Aerial Imagery (B7)		
<input type="checkbox"/> Sparsely Vegetated Concave Surface (B8)		

Field Observations:

Surface Water Present? Yes No Depth (inches): _____
 Water table Present? Yes No Depth (inches): 6
 Saturation Present? Yes No Depth (inches): 0
 (includes capillary fringe)

Wetland Hydrology Present? Yes No

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

WETLAND DETERMINATION DATA FORM – Western Mountains, Valleys and Coast Region

Project/Site: The Views City/County: Sandy/Clackamas Sampling Date: 1/23/2020
 Applicant/Owner: Even Better Homes State: OR Sampling Point: 2
 Investigator(s): K. Biafora Section, Township, Range: S19, T2S, R5E
 Landform (hillslope, terrace, etc.): Ravine Local relief (concave, convex, none): none Slope (%): 4-7%
 Subregion (LRR): Northwest Forests and Coast (LRR A) Lat: 45.38684183 Long: -122.2330976 Datum: WGS 84
 Soil Map Unit Name: Cazadero silty clay loam NWI Classification: none
 Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No _____ (If no, explain in Remarks)
 Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" Present? Yes X No _____
 Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes <u>X</u> No _____	Is the Sampled Area within a Wetland?	Yes _____ No <u>X</u>
Hydric Soil Present?	Yes _____ No <u>X</u>		
Wetland Hydrology Present?	Yes <u>X</u> No _____		
Remarks: Himalayan blackberry recently cleared along margins of wetland to facilitate access. Heavy rains prior to and during fieldwork causing open stormwater pipe to overflow and flood surrounding upland areas.			

VEGETATION

<u>Tree Stratum</u> (Use scientific names.)	Absolute % Cover	Dominant Species?	Indicator Status?	Dominance Test worksheet:
1. _____	_____	_____	_____	Number of Dominant Species That Are OBL, FACW, or FAC: <u>1</u> (A)
2. _____	_____	_____	_____	Total Number of Dominant Species Across All Strata: <u>1</u> (B)
3. _____	_____	_____	_____	Percent of Dominant Species That Are OBL, FACW, or FAC: <u>100%</u> (A/B)
4. _____	_____	_____	_____	
Total Cover: <u>0</u>				
<u>Shrub Stratum</u>				Prevalence Index Worksheet:
1. <u>Rubus armeniacus</u>	<u>100</u>	<u>Y</u>	<u>FAC</u>	Total % Cover of: _____ Multiply by: _____
2. _____	_____	_____	_____	OBL species _____ x1 = <u>0</u>
3. _____	_____	_____	_____	FACW species _____ x2 = <u>0</u>
4. _____	_____	_____	_____	FAC species _____ x3 = <u>0</u>
5. _____	_____	_____	_____	FACU species _____ x4 = <u>0</u>
Total Cover: <u>100</u>				UPL species _____ x5 = <u>0</u>
<u>Herb Stratum</u>				Column Totals: <u>0</u> (A) <u>0</u> (B)
1. _____	_____	_____	_____	Prevalence Index = B/A = _____
2. _____	_____	_____	_____	
3. _____	_____	_____	_____	Hydrophytic Vegetation Indicators:
4. _____	_____	_____	_____	1 - Rapid Test for Hydrophytic Vegetation
5. _____	_____	_____	_____	<u>X</u> 2 - Dominance Test is >50%
6. _____	_____	_____	_____	3 - Prevalence Index is ≤3.0 ¹
7. _____	_____	_____	_____	4 - Morphological Adaptation ¹ (Provide supporting data in Remarks or on a separate sheet)
8. _____	_____	_____	_____	5 - Wetland Non-Vascular Plants ¹
9. _____	_____	_____	_____	Problematic Hydrophytic Vegetation ¹ (Explain)
10. _____	_____	_____	_____	
11. _____	_____	_____	_____	
Total Cover: <u>0</u>				
<u>Woody Vine Stratum</u>				¹ Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.
1. _____	_____	_____	_____	
2. _____	_____	_____	_____	Hydrophytic Vegetation Present? Yes <u>X</u> No _____
Total Cover: <u>0</u>				
% Bare Ground in Herb Stratum <u>0</u> % Cover of Biotic Crust <u>0</u>				

Remarks: Blackberry recently cut.

SOIL

Sampling Point: _____ 2

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix		Redox Features				Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type ¹	Loc ²		
0-8	10 YR 3/2	100					SCL	
8-12	10 YR 3/3	50	7.5 YR 4/3	50			SCL	mixed matrix
12-16	10 YR 3/3	100						

¹Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. ²Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

Indicators for Problematic Hydric Soils³:

- | | | |
|--|--|---|
| <input type="checkbox"/> Histosol (A1) | <input type="checkbox"/> Sandy Redox (S5) | <input type="checkbox"/> 2 cm Muck (A10) |
| <input type="checkbox"/> Histic Epipedon (A2) | <input type="checkbox"/> Stripped Matrix (S6) | <input type="checkbox"/> Red Parent Material (TF2) |
| <input type="checkbox"/> Black Histic (A3) | <input type="checkbox"/> Loamy Mucky Mineral (F1) (except MLRA 1) | <input type="checkbox"/> Other (Explain in Remarks) |
| <input type="checkbox"/> Hydrogen Sulfide (A4) | <input type="checkbox"/> Loamy Gleyed Matrix (F2) | |
| <input type="checkbox"/> Depleted Below Dark Surface (A11) | <input type="checkbox"/> Depleted Matrix (F3) | |
| <input type="checkbox"/> Thick Dark Surface (A12) | <input type="checkbox"/> Redox Dark Surface (F6) | ³ Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic. |
| <input type="checkbox"/> Sandy Muck Mineral (S1) | <input type="checkbox"/> Depleted Dark Surface (F7) | |
| <input type="checkbox"/> Sandy gleyed Matrix (S4) | <input type="checkbox"/> Redox Depressions (F8) | |

Restrictive Layer (if present):

Type: _____
Depth (inches): _____

Hydric Soil Present? Yes _____ No X

Remarks: Soil profile appears disturbed, likely due to installation of nearby stormwater pipe.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (any one indicator is sufficient)		Secondary Indicators (2 or more required)
<input type="checkbox"/> Surface Water (A1)	<input type="checkbox"/> Water-Stained Leaves (B9) (except MLRA 1, 2, 4A and 4B)	<input type="checkbox"/> Water-Stained Leaves (B9) (MLRA 1, 2, 4A and 4B)
<input checked="" type="checkbox"/> High Water Table (A2)	<input type="checkbox"/> Salt Crust (B11)	<input type="checkbox"/> Drainage Patterns (B10)
<input type="checkbox"/> Saturation (A3)	<input type="checkbox"/> Aquatic Invertebrates (B13)	<input type="checkbox"/> Dry-Season Water Table (C2)
<input type="checkbox"/> Water Marks (B1)	<input type="checkbox"/> Hydrogen Sulfide Odor (C1)	<input type="checkbox"/> Saturation Visible on Aerial Imagery (C9)
<input type="checkbox"/> Sediment Deposits (B2)	<input type="checkbox"/> Oxidized Rhizospheres along Living Roots (C3)	<input type="checkbox"/> Geomorphic Position (D2)
<input type="checkbox"/> Drift Deposits (B3)	<input type="checkbox"/> Presence of Reduced Iron (C4)	<input type="checkbox"/> Shallow Aquitard (D3)
<input type="checkbox"/> Algal Mat or Crust (B4)	<input type="checkbox"/> Recent Iron Reduction in Plowed Soils (C6)	<input type="checkbox"/> FAC-Neutral Test (D5)
<input type="checkbox"/> Iron Deposits (B5)	<input type="checkbox"/> Stunted or Stressed Plants (D1) (LRR A)	<input type="checkbox"/> Raised Ant Mounds (D6) (LRR A)
<input type="checkbox"/> Surface Soil Cracks (B6)	<input type="checkbox"/> Other (Explain in Remarks)	<input type="checkbox"/> Frost-Heave Hummocks (D7)
<input type="checkbox"/> Inundation Visible on Aerial Imagery (B7)		
<input type="checkbox"/> Sparsely Vegetated Concave Surface (B8)		

Field Observations:

Surface Water Present? Yes _____ No X Depth (inches): _____
 Water table Present? Yes X No _____ Depth (inches): 6
 Saturation Present? Yes X No _____ Depth (inches): 0
 (includes capillary fringe)

Wetland Hydrology Present? Yes X No _____

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks: Heavy rains prior to and during fieldwork causing open stormwater pipe to overflow and flood surrounding upland areas

WETLAND DETERMINATION DATA FORM – Western Mountains, Valleys and Coast Region

Project/Site: The Views City/County: Sandy/Clackamas Sampling Date: 1/23/2020
 Applicant/Owner: Even Better Homes State: OR Sampling Point: 3
 Investigator(s): K. Biafora Section, Township, Range: S19, T2S, R5E
 Landform (hillslope, terrace, etc.): Ravine Local relief (concave, convex, none): none Slope (%): 4-7%
 Subregion (LRR): Northwest Forests and Coast (LRR A) Lat: 45.38690985 Long: -122.2328834 Datum: WGS 84
 Soil Map Unit Name: Cazadero silty clay loam NWI Classification: none
 Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No _____ (If no, explain in Remarks)
 Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" Present? Yes X No _____
 Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes <u>X</u> No _____	Is the Sampled Area within a Wetland?	Yes _____ No <u>X</u>
Hydric Soil Present?	Yes _____ No <u>X</u>		
Wetland Hydrology Present?	Yes <u>X</u> No _____		
Remarks: Himalayan blackberry recently cleared along margins of wetland to facilitate access. Heavy rains prior to and during fieldwork causing open stormwater pipe to overflow and flood surrounding upland areas.			

VEGETATION

<u>Tree Stratum</u> (Use scientific names.)	Absolute % Cover	Dominant Species?	Indicator Status?	Dominance Test worksheet:
1. _____	_____	_____	_____	Number of Dominant Species That Are OBL, FACW, or FAC: <u>1</u> (A)
2. _____	_____	_____	_____	Total Number of Dominant Species Across All Strata: <u>1</u> (B)
3. _____	_____	_____	_____	Percent of Dominant Species That Are OBL, FACW, or FAC: <u>100%</u> (A/B)
4. _____	_____	_____	_____	
Total Cover: <u>0</u>				
<u>Shrub Stratum</u>				Prevalence Index Worksheet:
1. <u>Rubus armeniacus</u>	<u>100</u>	<u>Y</u>	<u>FAC</u>	Total % Cover of: _____ Multiply by: _____
2. _____	_____	_____	_____	OBL species _____ x1 = <u>0</u>
3. _____	_____	_____	_____	FACW species _____ x2 = <u>0</u>
4. _____	_____	_____	_____	FAC species _____ x3 = <u>0</u>
5. _____	_____	_____	_____	FACU species _____ x4 = <u>0</u>
Total Cover: <u>100</u>				UPL species _____ x5 = <u>0</u>
<u>Herb Stratum</u>				Column Totals: <u>0</u> (A) <u>0</u> (B)
1. _____	_____	_____	_____	Prevalence Index = B/A = _____
2. _____	_____	_____	_____	
3. _____	_____	_____	_____	Hydrophytic Vegetation Indicators:
4. _____	_____	_____	_____	1 - Rapid Test for Hydrophytic Vegetation
5. _____	_____	_____	_____	<u>X</u> 2 - Dominance Test is >50%
6. _____	_____	_____	_____	3 - Prevalence Index is ≤3.0 ¹
7. _____	_____	_____	_____	4 - Morphological Adaptation ¹ (Provide supporting data in Remarks or on a separate sheet)
8. _____	_____	_____	_____	5 - Wetland Non-Vascular Plants ¹
9. _____	_____	_____	_____	Problematic Hydrophytic Vegetation ¹ (Explain)
10. _____	_____	_____	_____	
11. _____	_____	_____	_____	
Total Cover: <u>0</u>				
<u>Woody Vine Stratum</u>				¹ Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.
1. _____	_____	_____	_____	
2. _____	_____	_____	_____	Hydrophytic Vegetation Present? Yes <u>X</u> No _____
Total Cover: <u>0</u>				
% Bare Ground in Herb Stratum <u>0</u> % Cover of Biotic Crust <u>0</u>				

Remarks: Blackberry recently cut

SOIL

Sampling Point: _____ 3

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix		Redox Features				Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type ¹	Loc ²		
0-6	10 YR 3/2	100					SCL	
6-16	10 YR 3/3	60	7.5 YR 3/3	30			SCL	mixed matrix
			10 YR 4/1	10				mixed matrix

¹Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. ²Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

Indicators for Problematic Hydric Soils³:

- | | | |
|--|--|---|
| <input type="checkbox"/> Histosol (A1) | <input type="checkbox"/> Sandy Redox (S5) | <input type="checkbox"/> 2 cm Muck (A10) |
| <input type="checkbox"/> Histic Epipedon (A2) | <input type="checkbox"/> Stripped Matrix (S6) | <input type="checkbox"/> Red Parent Material (TF2) |
| <input type="checkbox"/> Black Histic (A3) | <input type="checkbox"/> Loamy Mucky Mineral (F1) (except MLRA 1) | <input type="checkbox"/> Other (Explain in Remarks) |
| <input type="checkbox"/> Hydrogen Sulfide (A4) | <input type="checkbox"/> Loamy Gleyed Matrix (F2) | |
| <input type="checkbox"/> Depleted Below Dark Surface (A11) | <input type="checkbox"/> Depleted Matrix (F3) | |
| <input type="checkbox"/> Thick Dark Surface (A12) | <input type="checkbox"/> Redox Dark Surface (F6) | ³ Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic. |
| <input type="checkbox"/> Sandy Muck Mineral (S1) | <input type="checkbox"/> Depleted Dark Surface (F7) | |
| <input type="checkbox"/> Sandy gleyed Matrix (S4) | <input type="checkbox"/> Redox Depressions (F8) | |

Restrictive Layer (if present):

Type: _____
Depth (inches): _____

Hydric Soil Present? Yes _____ No X

Remarks: Soil profile appears disturbed, likely due to installation of nearby stormwater pipe.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (any one indicator is sufficient)		Secondary Indicators (2 or more required)
<input type="checkbox"/> Surface Water (A1)	<input type="checkbox"/> Water-Stained Leaves (B9) (except MLRA 1, 2, 4A and 4B)	<input type="checkbox"/> Water-Stained Leaves (B9) (MLRA 1, 2, 4A and 4B)
<input checked="" type="checkbox"/> High Water Table (A2)	<input type="checkbox"/> Salt Crust (B11)	<input type="checkbox"/> Drainage Patterns (B10)
<input type="checkbox"/> Saturation (A3)	<input type="checkbox"/> Aquatic Invertebrates (B13)	<input type="checkbox"/> Dry-Season Water Table (C2)
<input type="checkbox"/> Water Marks (B1)	<input type="checkbox"/> Hydrogen Sulfide Odor (C1)	<input type="checkbox"/> Saturation Visible on Aerial Imagery (C9)
<input type="checkbox"/> Sediment Deposits (B2)	<input type="checkbox"/> Oxidized Rhizospheres along Living Roots (C3)	<input type="checkbox"/> Geomorphic Position (D2)
<input type="checkbox"/> Drift Deposits (B3)	<input type="checkbox"/> Presence of Reduced Iron (C4)	<input type="checkbox"/> Shallow Aquitard (D3)
<input type="checkbox"/> Algal Mat or Crust (B4)	<input type="checkbox"/> Recent Iron Reduction in Plowed Soils (C6)	<input type="checkbox"/> FAC-Neutral Test (D5)
<input type="checkbox"/> Iron Deposits (B5)	<input type="checkbox"/> Stunted or Stressed Plants (D1) (LRR A)	<input type="checkbox"/> Raised Ant Mounds (D6) (LRR A)
<input type="checkbox"/> Surface Soil Cracks (B6)	<input type="checkbox"/> Other (Explain in Remarks)	<input type="checkbox"/> Frost-Heave Hummocks (D7)
<input type="checkbox"/> Inundation Visible on Aerial Imagery (B7)		
<input type="checkbox"/> Sparsely Vegetated Concave Surface (B8)		

Field Observations:

Surface Water Present? Yes _____ No X Depth (inches): _____
 Water table Present? Yes X No _____ Depth (inches): 6
 Saturation Present? Yes X No _____ Depth (inches): 0
 (includes capillary fringe)

Wetland Hydrology Present? Yes X No _____

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks: Heavy rains prior to and during fieldwork causing open stormwater pipe to overflow and flood surrounding upland areas

WETLAND DETERMINATION DATA FORM – Western Mountains, Valleys and Coast Region

Project/Site: The Views City/County: Sandy/Clackamas Sampling Date: 1/23/2020
 Applicant/Owner: Even Better Homes State: OR Sampling Point: 4
 Investigator(s): K. Biafora Section, Township, Range: S19, T2S, R5E
 Landform (hillslope, terrace, etc.): Ravine Local relief (concave, convex, none): none Slope (%): 4-7%
 Subregion (LRR): Northwest Forests and Coast (LRR A) Lat: 45.38693192 Long: -122.2329354 Datum: WGS 84
 Soil Map Unit Name: Cazadero silty clay loam NWI Classification: none
 Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No (If no, explain in Remarks)
 Are Vegetation , Soil , or Hydrology significantly disturbed? Are "Normal Circumstances" Present? Yes X No
 Are Vegetation , Soil , or Hydrology naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes <u>X</u> No <u> </u>	Is the Sampled Area within a Wetland?	Yes <u>X</u> No <u> </u>
Hydric Soil Present?	Yes <u>X</u> No <u> </u>		
Wetland Hydrology Present?	Yes <u>X</u> No <u> </u>		
Remarks: <u>Himalayan blackberry recently cleared along margins of wetland to facilitate access.</u>			

VEGETATION

<u>Tree Stratum</u> (Use scientific names.)	Absolute % Cover	Dominant Species?	Indicator Status?	Dominance Test worksheet:
1. _____	_____	_____	_____	Number of Dominant Species That Are OBL, FACW, or FAC: <u>1</u> (A)
2. _____	_____	_____	_____	Total Number of Dominant Species Across All Strata: <u>1</u> (B)
3. _____	_____	_____	_____	Percent of Dominant Species That Are OBL, FACW, or FAC: <u>100%</u> (A/B)
4. _____	_____	_____	_____	
Total Cover: <u>0</u>				
<u>Shrub Stratum</u>				Prevalence Index Worksheet:
1. <u>Rubus armeniacus</u>	<u>100</u>	<u>Y</u>	<u>FAC</u>	Total % Cover of: _____ Multiply by: _____
2. _____	_____	_____	_____	OBL species _____ x1 = <u>0</u>
3. _____	_____	_____	_____	FACW species _____ x2 = <u>0</u>
4. _____	_____	_____	_____	FAC species _____ x3 = <u>0</u>
5. _____	_____	_____	_____	FACU species _____ x4 = <u>0</u>
Total Cover: <u>100</u>				UPL species _____ x5 = <u>0</u>
<u>Herb Stratum</u>				Column Totals: <u>0</u> (A) <u>0</u> (B)
1. _____	_____	_____	_____	Prevalence Index = B/A = _____
2. _____	_____	_____	_____	
3. _____	_____	_____	_____	
4. _____	_____	_____	_____	
5. _____	_____	_____	_____	
6. _____	_____	_____	_____	
7. _____	_____	_____	_____	
8. _____	_____	_____	_____	
9. _____	_____	_____	_____	
10. _____	_____	_____	_____	
11. _____	_____	_____	_____	
Total Cover: <u>0</u>				
<u>Woody Vine Stratum</u>				Hydrophytic Vegetation Indicators:
1. _____	_____	_____	_____	1 - Rapid Test for Hydrophytic Vegetation
2. _____	_____	_____	_____	<u>X</u> 2 - Dominance Test is >50%
Total Cover: <u>0</u>				3 - Prevalence Index is ≤3.0 ¹
% Bare Ground in Herb Stratum <u>0</u> % Cover of Biotic Crust <u>0</u>				4 - Morphological Adaptation ¹ (Provide supporting data in Remarks or on a separate sheet)
				5 - Wetland Non-Vascular Plants ¹
				Problematic Hydrophytic Vegetation ¹ (Explain)
				¹ Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.
				Hydrophytic Vegetation Present? Yes <u>X</u> No <u> </u>

Remarks: Blackberry recently cut

SOIL

Sampling Point: _____ 4

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix		Redox Features				Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type ¹	Loc ²		
0-5	10 YR 3/2	90	10 YR 3/6	10	C	M	SCL	
5-10	10 YR 3/2	60	10 YR 3/4	20	C	M		
			10 YR 4/1	20	D	M	SCL	
10-16	10 YR 4/1	70	10 YR 3/2	25	C	M	SCL	
			10 YR 3/4	2	C	M		

¹Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. ²Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

Indicators for Problematic Hydric Soils³:

<input type="checkbox"/> Histosol (A1)	<input type="checkbox"/> Sandy Redox (S5)	<input type="checkbox"/> 2 cm Muck (A10)
<input type="checkbox"/> Histic Epipedon (A2)	<input type="checkbox"/> Stripped Matrix (S6)	<input type="checkbox"/> Red Parent Material (TF2)
<input type="checkbox"/> Black Histic (A3)	<input type="checkbox"/> Loamy Mucky Mineral (F1) (except MLRA 1)	<input type="checkbox"/> Other (Explain in Remarks)
<input type="checkbox"/> Hydrogen Sulfide (A4)	<input type="checkbox"/> Loamy Gleyed Matrix (F2)	
<input type="checkbox"/> Depleted Below Dark Surface (A11)	<input type="checkbox"/> Depleted Matrix (F3)	
<input type="checkbox"/> Thick Dark Surface (A12)	<input checked="" type="checkbox"/> Redox Dark Surface (F6)	³ Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.
<input type="checkbox"/> Sandy Muck Mineral (S1)	<input type="checkbox"/> Depleted Dark Surface (F7)	
<input type="checkbox"/> Sandy gleyed Matrix (S4)	<input type="checkbox"/> Redox Depressions (F8)	

Restrictive Layer (if present):

Type: _____
Depth (inches): _____

Hydric Soil Present? Yes No

Remarks: Soil profile appears disturbed, likely due to installation of nearby stormwater pipe

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (any one indicator is sufficient)

Secondary Indicators (2 or more required)

<input type="checkbox"/> Surface Water (A1)	<input type="checkbox"/> Water-Stained Leaves (B9) (except MLRA 1, 2, 4A and 4B)	<input type="checkbox"/> Water-Stained Leaves (B9) (MLRA 1, 2, 4A and 4B)
<input checked="" type="checkbox"/> High Water Table (A2)	<input type="checkbox"/> Salt Crust (B11)	<input type="checkbox"/> Drainage Patterns (B10)
<input type="checkbox"/> Saturation (A3)	<input type="checkbox"/> Aquatic Invertebrates (B13)	<input type="checkbox"/> Dry-Season Water Table (C2)
<input type="checkbox"/> Water Marks (B1)	<input type="checkbox"/> Hydrogen Sulfide Odor (C1)	<input type="checkbox"/> Saturation Visible on Aerial Imagery (C9)
<input type="checkbox"/> Sediment Deposits (B2)	<input type="checkbox"/> Oxidized Rhizospheres along Living Roots (C3)	<input type="checkbox"/> Geomorphic Position (D2)
<input type="checkbox"/> Drift Deposits (B3)	<input type="checkbox"/> Presence of Reduced Iron (C4)	<input type="checkbox"/> Shallow Aquitard (D3)
<input type="checkbox"/> Algal Mat or Crust (B4)	<input type="checkbox"/> Recent Iron Reduction in Plowed Soils (C6)	<input type="checkbox"/> FAC-Neutral Test (D5)
<input type="checkbox"/> Iron Deposits (B5)	<input type="checkbox"/> Stunted or Stressed Plants (D1) (LRR A)	<input type="checkbox"/> Raised Ant Mounds (D6) (LRR A)
<input type="checkbox"/> Surface Soil Cracks (B6)	<input type="checkbox"/> Other (Explain in Remarks)	<input type="checkbox"/> Frost-Heave Hummocks (D7)
<input type="checkbox"/> Inundation Visible on Aerial Imagery (B7)		
<input type="checkbox"/> Sparsely Vegetated Concave Surface (B8)		

Field Observations:

Surface Water Present? Yes No Depth (inches): _____
 Water table Present? Yes No Depth (inches): 0
 Saturation Present? Yes No Depth (inches): 0
 (includes capillary fringe)

Wetland Hydrology Present? Yes No

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

WETLAND DETERMINATION DATA FORM – Western Mountains, Valleys and Coast Region

Project/Site: The Views City/County: Sandy/Clackamas Sampling Date: 1/23/2020
 Applicant/Owner: Even Better Homes State: OR Sampling Point: 5
 Investigator(s): K. Biafora Section, Township, Range: S19, T2S, R5E
 Landform (hillslope, terrace, etc.): Ravine Local relief (concave, convex, none): none Slope (%): 4-7%
 Subregion (LRR): Northwest Forests and Coast (LRR A) Lat: 45.38696354 Long: -122.2331121 Datum: WGS 84
 Soil Map Unit Name: Cazadero silty clay loam NWI Classification: none
 Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No (If no, explain in Remarks)
 Are Vegetation , Soil , or Hydrology significantly disturbed? Are "Normal Circumstances" Present? Yes X No
 Are Vegetation , Soil , or Hydrology naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes <u>X</u> No <u> </u>	Is the Sampled Area within a Wetland?	Yes <u>X</u> No <u> </u>
Hydric Soil Present?	Yes <u>X</u> No <u> </u>		
Wetland Hydrology Present?	Yes <u>X</u> No <u> </u>		
Remarks: <u>Himalayan blackberry recently cleared along margins of wetland to facilitate access.</u>			

VEGETATION

<u>Tree Stratum</u> (Use scientific names.)	Absolute % Cover	Dominant Species?	Indicator Status?	Dominance Test worksheet:
1. _____	_____	_____	_____	Number of Dominant Species That Are OBL, FACW, or FAC: <u>1</u> (A)
2. _____	_____	_____	_____	Total Number of Dominant Species Across All Strata: <u>1</u> (B)
3. _____	_____	_____	_____	Percent of Dominant Species That Are OBL, FACW, or FAC: <u>100%</u> (A/B)
4. _____	_____	_____	_____	
Total Cover: <u>0</u>				
<u>Shrub Stratum</u>				Prevalence Index Worksheet:
1. <u>Rubus armeniacus</u>	<u>100</u>	<u>Y</u>	<u>FAC</u>	Total % Cover of: _____ Multiply by: _____
2. _____	_____	_____	_____	OBL species _____ x1 = <u>0</u>
3. _____	_____	_____	_____	FACW species _____ x2 = <u>0</u>
4. _____	_____	_____	_____	FAC species _____ x3 = <u>0</u>
5. _____	_____	_____	_____	FACU species _____ x4 = <u>0</u>
Total Cover: <u>100</u>				UPL species _____ x5 = <u>0</u>
<u>Herb Stratum</u>				Column Totals: <u>0</u> (A) <u>0</u> (B)
1. _____	_____	_____	_____	Prevalence Index = B/A = _____
2. _____	_____	_____	_____	
3. _____	_____	_____	_____	
4. _____	_____	_____	_____	
5. _____	_____	_____	_____	
6. _____	_____	_____	_____	
7. _____	_____	_____	_____	
8. _____	_____	_____	_____	
9. _____	_____	_____	_____	
10. _____	_____	_____	_____	
11. _____	_____	_____	_____	
Total Cover: <u>0</u>				
<u>Woody Vine Stratum</u>				Hydrophytic Vegetation Indicators:
1. _____	_____	_____	_____	1 - Rapid Test for Hydrophytic Vegetation
2. _____	_____	_____	_____	<u>X</u> 2 - Dominance Test is >50%
				3 - Prevalence Index is ≤3.0 ¹
				4 - Morphological Adaptation ¹ (Provide supporting data in Remarks or on a separate sheet)
				5 - Wetland Non-Vascular Plants ¹
				Problematic Hydrophytic Vegetation ¹ (Explain)
Total Cover: <u>0</u>				¹ Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.
% Bare Ground in Herb Stratum <u>0</u> % Cover of Biotic Crust <u>0</u>				Hydrophytic Vegetation Present? Yes <u>X</u> No <u> </u>

Remarks: Blackberry recently cut

SOIL

Sampling Point: _____ 5

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix		Redox Features				Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type ¹	Loc ²		
0-4	10 YR 3/2	100					SCL	
4-8	10 YR 3/2	80	7.5 YR 3/4	15	C	M		
			10 YR 4/1	5	D	M	SCL	
8-16	10 YR 4/1	75	10 YR 3/2	15	C	M	SCL	
			7.5 YR 3/4	10	C	M		

¹Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. ²Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

Indicators for Problematic Hydric Soils³:

- | | | |
|--|--|---|
| <input type="checkbox"/> Histosol (A1) | <input type="checkbox"/> Sandy Redox (S5) | <input type="checkbox"/> 2 cm Muck (A10) |
| <input type="checkbox"/> Histic Epipedon (A2) | <input type="checkbox"/> Stripped Matrix (S6) | <input type="checkbox"/> Red Parent Material (TF2) |
| <input type="checkbox"/> Black Histic (A3) | <input type="checkbox"/> Loamy Mucky Mineral (F1) (except MLRA 1) | <input type="checkbox"/> Other (Explain in Remarks) |
| <input type="checkbox"/> Hydrogen Sulfide (A4) | <input type="checkbox"/> Loamy Gleyed Matrix (F2) | |
| <input type="checkbox"/> Depleted Below Dark Surface (A11) | <input type="checkbox"/> Depleted Matrix (F3) | |
| <input type="checkbox"/> Thick Dark Surface (A12) | <input checked="" type="checkbox"/> Redox Dark Surface (F6) | ³ Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic. |
| <input type="checkbox"/> Sandy Muck Mineral (S1) | <input type="checkbox"/> Depleted Dark Surface (F7) | |
| <input type="checkbox"/> Sandy gleyed Matrix (S4) | <input type="checkbox"/> Redox Depressions (F8) | |

Restrictive Layer (if present):

Type: _____
Depth (inches): _____

Hydric Soil Present? Yes No

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (any one indicator is sufficient)

Secondary Indicators (2 or more required)

- | | | |
|--|---|--|
| <input type="checkbox"/> Surface Water (A1) | <input type="checkbox"/> Water-Stained Leaves (B9) (except MLRA 1, 2, 4A and 4B) | <input type="checkbox"/> Water-Stained Leaves (B9) (MLRA 1, 2, 4A and 4B) |
| <input checked="" type="checkbox"/> High Water Table (A2) | <input type="checkbox"/> Salt Crust (B11) | <input type="checkbox"/> Drainage Patterns (B10) |
| <input type="checkbox"/> Saturation (A3) | <input type="checkbox"/> Aquatic Invertebrates (B13) | <input type="checkbox"/> Dry-Season Water Table (C2) |
| <input type="checkbox"/> Water Marks (B1) | <input type="checkbox"/> Hydrogen Sulfide Odor (C1) | <input type="checkbox"/> Saturation Visible on Aerial Imagery (C9) |
| <input type="checkbox"/> Sediment Deposits (B2) | <input type="checkbox"/> Oxidized Rhizospheres along Living Roots (C3) | <input type="checkbox"/> Geomorphic Position (D2) |
| <input type="checkbox"/> Drift Deposits (B3) | <input type="checkbox"/> Presence of Reduced Iron (C4) | <input type="checkbox"/> Shallow Aquitard (D3) |
| <input type="checkbox"/> Algal Mat or Crust (B4) | <input type="checkbox"/> Recent Iron Reduction in Plowed Soils (C6) | <input type="checkbox"/> FAC-Neutral Test (D5) |
| <input type="checkbox"/> Iron Deposits (B5) | <input type="checkbox"/> Stunted or Stressed Plants (D1) (LRR A) | <input type="checkbox"/> Raised Ant Mounds (D6) (LRR A) |
| <input type="checkbox"/> Surface Soil Cracks (B6) | <input type="checkbox"/> Other (Explain in Remarks) | <input type="checkbox"/> Frost-Heave Hummocks (D7) |
| <input type="checkbox"/> Inundation Visible on Aerial Imagery (B7) | | |
| <input type="checkbox"/> Sparsely Vegetated Concave Surface (B8) | | |

Field Observations:

Surface Water Present? Yes No Depth (inches): _____
 Water table Present? Yes No Depth (inches): 4
 Saturation Present? Yes No Depth (inches): 0
 (includes capillary fringe)

Wetland Hydrology Present? Yes No

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

WETLAND DETERMINATION DATA FORM – Western Mountains, Valleys and Coast Region

Project/Site: The Views City/County: Sandy/Clackamas Sampling Date: 1/23/2020
 Applicant/Owner: Even Better Homes State: OR Sampling Point: 6
 Investigator(s): K. Biafora Section, Township, Range: S19, T2S, R5E
 Landform (hillslope, terrace, etc.): Ravine Local relief (concave, convex, none): none Slope (%): 4-7%
 Subregion (LRR): Northwest Forests and Coast (LRR A) Lat: 45.38697034 Long: -122.2331664 Datum: WGS 84
 Soil Map Unit Name: Cazadero silty clay loam NWI Classification: none
 Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No _____ (If no, explain in Remarks)
 Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" Present? Yes X No _____
 Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes <u>X</u> No _____	Is the Sampled Area within a Wetland?	Yes _____ No <u>X</u>
Hydric Soil Present?	Yes _____ No <u>X</u>		
Wetland Hydrology Present?	Yes _____ No <u>X</u>		
Remarks: Himalayan blackberry recently cleared along margins of wetland to facilitate access.			

VEGETATION

<u>Tree Stratum</u> (Use scientific names.)	Absolute % Cover	Dominant Species?	Indicator Status?	Dominance Test worksheet:	
1. _____	_____	_____	_____	Number of Dominant Species That Are OBL, FACW, or FAC: <u>1</u> (A)	
2. _____	_____	_____	_____	Total Number of Dominant Species Across All Strata: <u>1</u> (B)	
3. _____	_____	_____	_____	Percent of Dominant Species That Are OBL, FACW, or FAC: <u>100%</u> (A/B)	
4. _____	_____	_____	_____		
Total Cover: <u>0</u>					
<u>Shrub Stratum</u>	Absolute % Cover	Dominant Species?	Indicator Status?	Prevalence Index Worksheet:	
1. <u>Rubus armeniacus</u>	<u>100</u>	<u>Y</u>	<u>FAC</u>	Total % Cover of: _____ Multiply by: _____	
2. _____	_____	_____	_____	OBL species _____ x1 = <u>0</u>	
3. _____	_____	_____	_____	FACW species _____ x2 = <u>0</u>	
4. _____	_____	_____	_____	FAC species _____ x3 = <u>0</u>	
5. _____	_____	_____	_____	FACU species _____ x4 = <u>0</u>	
Total Cover: <u>100</u>				UPL species _____ x5 = <u>0</u>	
				Column Totals: <u>0</u> (A) <u>0</u> (B)	
				Prevalence Index = B/A = _____	
<u>Herb Stratum</u>	Absolute % Cover	Dominant Species?	Indicator Status?	Hydrophytic Vegetation Indicators:	
1. _____	_____	_____	_____	1 - Rapid Test for Hydrophytic Vegetation	
2. _____	_____	_____	_____	<u>X</u> 2 - Dominance Test is >50%	
3. _____	_____	_____	_____	3 - Prevalence Index is ≤3.0 ¹	
4. _____	_____	_____	_____	4 - Morphological Adaptation ¹ (Provide supporting data in Remarks or on a separate sheet)	
5. _____	_____	_____	_____	5 - Wetland Non-Vascular Plants ¹	
6. _____	_____	_____	_____	Problematic Hydrophytic Vegetation ¹ (Explain)	
7. _____	_____	_____	_____		
8. _____	_____	_____	_____		
9. _____	_____	_____	_____		
10. _____	_____	_____	_____		
11. _____	_____	_____	_____		
Total Cover: <u>0</u>					
<u>Woody Vine Stratum</u>	Absolute % Cover	Dominant Species?	Indicator Status?	Hydrophytic Vegetation Present?	
1. _____	_____	_____	_____	Yes <u>X</u> No _____	
2. _____	_____	_____	_____		
Total Cover: <u>0</u>					
% Bare Ground in Herb Stratum <u>0</u> % Cover of Biotic Crust <u>0</u>					

Remarks: Blackberry recently cut

SOIL

Sampling Point: _____ 6

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix		Redox Features				Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type ¹	Loc ²		
0-16	10 YR 3/2	100					SCL	

¹Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. ²Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

Indicators for Problematic Hydric Soils³:

- | | | |
|--|--|---|
| <input type="checkbox"/> Histosol (A1) | <input type="checkbox"/> Sandy Redox (S5) | <input type="checkbox"/> 2 cm Muck (A10) |
| <input type="checkbox"/> Histic Epipedon (A2) | <input type="checkbox"/> Stripped Matrix (S6) | <input type="checkbox"/> Red Parent Material (TF2) |
| <input type="checkbox"/> Black Histic (A3) | <input type="checkbox"/> Loamy Mucky Mineral (F1) (except MLRA 1) | <input type="checkbox"/> Other (Explain in Remarks) |
| <input type="checkbox"/> Hydrogen Sulfide (A4) | <input type="checkbox"/> Loamy Gleyed Matrix (F2) | |
| <input type="checkbox"/> Depleted Below Dark Surface (A11) | <input type="checkbox"/> Depleted Matrix (F3) | |
| <input type="checkbox"/> Thick Dark Surface (A12) | <input type="checkbox"/> Redox Dark Surface (F6) | ³ Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic. |
| <input type="checkbox"/> Sandy Muck Mineral (S1) | <input type="checkbox"/> Depleted Dark Surface (F7) | |
| <input type="checkbox"/> Sandy gleyed Matrix (S4) | <input type="checkbox"/> Redox Depressions (F8) | |

Restrictive Layer (if present):

Type: _____
Depth (inches): _____

Hydric Soil Present? Yes _____ No X

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

- | | | |
|--|---|--|
| <u>Primary Indicators (any one indicator is sufficient)</u> | | <u>Secondary Indicators (2 or more required)</u> |
| <input type="checkbox"/> Surface Water (A1) | <input type="checkbox"/> Water-Stained Leaves (B9) (except MLRA 1, 2, 4A and 4B) | <input type="checkbox"/> Water-Stained Leaves (B9) (MLRA 1, 2, 4A and 4B) |
| <input type="checkbox"/> High Water Table (A2) | <input type="checkbox"/> Salt Crust (B11) | <input type="checkbox"/> Drainage Patterns (B10) |
| <input type="checkbox"/> Saturation (A3) | <input type="checkbox"/> Aquatic Invertebrates (B13) | <input type="checkbox"/> Dry-Season Water Table (C2) |
| <input type="checkbox"/> Water Marks (B1) | <input type="checkbox"/> Hydrogen Sulfide Odor (C1) | <input type="checkbox"/> Saturation Visible on Aerial Imagery (C9) |
| <input type="checkbox"/> Sediment Deposits (B2) | <input type="checkbox"/> Oxidized Rhizospheres along Living Roots (C3) | <input type="checkbox"/> Geomorphic Position (D2) |
| <input type="checkbox"/> Drift Deposits (B3) | <input type="checkbox"/> Presence of Reduced Iron (C4) | <input type="checkbox"/> Shallow Aquitard (D3) |
| <input type="checkbox"/> Algal Mat or Crust (B4) | <input type="checkbox"/> Recent Iron Reduction in Plowed Soils (C6) | <input type="checkbox"/> FAC-Neutral Test (D5) |
| <input type="checkbox"/> Iron Deposits (B5) | <input type="checkbox"/> Stunted or Stressed Plants (D1) (LRR A) | <input type="checkbox"/> Raised Ant Mounds (D6) (LRR A) |
| <input type="checkbox"/> Surface Soil Cracks (B6) | <input type="checkbox"/> Other (Explain in Remarks) | <input type="checkbox"/> Frost-Heave Hummocks (D7) |
| <input type="checkbox"/> Inundation Visible on Aerial Imagery (B7) | | |
| <input type="checkbox"/> Sparsely Vegetated Concave Surface (B8) | | |

Field Observations:

Surface Water Present? Yes _____ No X Depth (inches): _____
 Water table Present? Yes _____ No X Depth (inches): _____
 Saturation Present? Yes X No _____ Depth (inches): 14

Wetland Hydrology Present? Yes _____ No X

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks: Heavy rains prior to and during fieldwork causing open stormwater pipe to overflow and flood surrounding upland areas.

WETLAND DETERMINATION DATA FORM – Western Mountains, Valleys and Coast Region

Project/Site: The Views City/County: Sandy/Clackamas Sampling Date: 1/23/2020
 Applicant/Owner: Even Better Homes State: OR Sampling Point: 7
 Investigator(s): K. Biafora Section, Township, Range: S19, T2S, R5E
 Landform (hillslope, terrace, etc.): Ravine Local relief (concave, convex, none): none Slope (%): 2-4%
 Subregion (LRR): Northwest Forests and Coast (LRR A) Lat: 45.38733918 Long: -122.2326447 Datum: WGS 84
 Soil Map Unit Name: Cazadero silty clay loam NWI Classification: none
 Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No _____ (If no, explain in Remarks)
 Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" Present? Yes X No _____
 Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes <u>X</u> No _____	Is the Sampled Area within a Wetland?	Yes _____ No <u>X</u>
Hydric Soil Present?	Yes _____ No <u>X</u>		
Wetland Hydrology Present?	Yes _____ No <u>X</u>		
Remarks: Plot located near Stream 1.			

VEGETATION

<u>Tree Stratum</u> (Use scientific names.)	Absolute % Cover	Dominant Species?	Indicator Status?	Dominance Test worksheet:
1. <u>Alnus rubra</u>	25		FAC	Number of Dominant Species That Are OBL, FACW, or FAC: <u>2</u> (A)
2. _____				Total Number of Dominant Species Across All Strata: <u>2</u> (B)
3. _____				Percent of Dominant Species That Are OBL, FACW, or FAC: <u>100%</u> (A/B)
4. _____				
Total Cover: <u>25</u>				
<u>Shrub Stratum</u>				Prevalence Index Worksheet:
1. <u>Rubus armeniacus</u>	100	Y	FAC	Total % Cover of: _____ Multiply by: _____
2. _____				OBL species _____ x1 = <u>0</u>
3. _____				FACW species _____ x2 = <u>0</u>
4. _____				FAC species _____ x3 = <u>0</u>
5. _____				FACU species _____ x4 = <u>0</u>
Total Cover: <u>100</u>				UPL species _____ x5 = <u>0</u>
<u>Herb Stratum</u>				Column Totals: <u>0</u> (A) <u>0</u> (B)
1. _____				Prevalence Index = B/A = _____
2. _____				
3. _____				
4. _____				
5. _____				
6. _____				
7. _____				
8. _____				
9. _____				
10. _____				
11. _____				
Total Cover: <u>0</u>				
<u>Woody Vine Stratum</u>				Hydrophytic Vegetation Indicators:
1. _____				1 - Rapid Test for Hydrophytic Vegetation
2. _____				<u>X</u> 2 - Dominance Test is >50%
				3 - Prevalence Index is ≤3.0 ¹
				4 - Morphological Adaptation ¹ (Provide supporting data in Remarks or on a separate sheet)
				5 - Wetland Non-Vascular Plants ¹
				Problematic Hydrophytic Vegetation ¹ (Explain)
Total Cover: <u>0</u>				¹ Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.
% Bare Ground in Herb Stratum <u>0</u> % Cover of Biotic Crust <u>0</u>				Hydrophytic Vegetation Present? Yes <u>X</u> No _____

Remarks:

SOIL

Sampling Point: _____ 7

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix		Redox Features				Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type ¹	Loc ²		
0-16	10 YR 3/3	100					SCL	

¹Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. ²Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

Indicators for Problematic Hydric Soils³:

- | | | |
|--|--|---|
| <input type="checkbox"/> Histic Epipedon (A2) | <input type="checkbox"/> Sandy Redox (S5) | <input type="checkbox"/> 2 cm Muck (A10) |
| <input type="checkbox"/> Black Histic (A3) | <input type="checkbox"/> Stripped Matrix (S6) | <input type="checkbox"/> Red Parent Material (TF2) |
| <input type="checkbox"/> Hydrogen Sulfide (A4) | <input type="checkbox"/> Loamy Mucky Mineral (F1) (except MLRA 1) | <input type="checkbox"/> Other (Explain in Remarks) |
| <input type="checkbox"/> Depleted Below Dark Surface (A11) | <input type="checkbox"/> Loamy Gleyed Matrix (F2) | |
| <input type="checkbox"/> Thick Dark Surface (A12) | <input type="checkbox"/> Depleted Matrix (F3) | |
| <input type="checkbox"/> Sandy Muck Mineral (S1) | <input type="checkbox"/> Redox Dark Surface (F6) | ³ Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic. |
| <input type="checkbox"/> Sandy gleyed Matrix (S4) | <input type="checkbox"/> Depleted Dark Surface (F7) | |
| | <input type="checkbox"/> Redox Depressions (F8) | |

Restrictive Layer (if present):

Type: _____
Depth (inches): _____

Hydric Soil Present? Yes _____ No X

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (any one indicator is sufficient)		Secondary Indicators (2 or more required)
<input type="checkbox"/> Surface Water (A1)	<input type="checkbox"/> Water-Stained Leaves (B9) (except MLRA 1, 2, 4A and 4B)	<input type="checkbox"/> Water-Stained Leaves (B9) (MLRA 1, 2, 4A and 4B)
<input type="checkbox"/> High Water Table (A2)	<input type="checkbox"/> Salt Crust (B11)	<input type="checkbox"/> Drainage Patterns (B10)
<input type="checkbox"/> Saturation (A3)	<input type="checkbox"/> Aquatic Invertebrates (B13)	<input type="checkbox"/> Dry-Season Water Table (C2)
<input type="checkbox"/> Water Marks (B1)	<input type="checkbox"/> Hydrogen Sulfide Odor (C1)	<input type="checkbox"/> Saturation Visible on Aerial Imagery (C9)
<input type="checkbox"/> Sediment Deposits (B2)	<input type="checkbox"/> Oxidized Rhizospheres along Living Roots (C3)	<input type="checkbox"/> Geomorphic Position (D2)
<input type="checkbox"/> Drift Deposits (B3)	<input type="checkbox"/> Presence of Reduced Iron (C4)	<input type="checkbox"/> Shallow Aquitard (D3)
<input type="checkbox"/> Algal Mat or Crust (B4)	<input type="checkbox"/> Recent Iron Reduction in Plowed Soils (C6)	<input type="checkbox"/> FAC-Neutral Test (D5)
<input type="checkbox"/> Iron Deposits (B5)	<input type="checkbox"/> Stunted or Stressed Plants (D1) (LRR A)	<input type="checkbox"/> Raised Ant Mounds (D6) (LRR A)
<input type="checkbox"/> Surface Soil Cracks (B6)	<input type="checkbox"/> Other (Explain in Remarks)	<input type="checkbox"/> Frost-Heave Hummocks (D7)
<input type="checkbox"/> Inundation Visible on Aerial Imagery (B7)		
<input type="checkbox"/> Sparsely Vegetated Concave Surface (B8)		

Field Observations:

Surface Water Present? Yes _____ No X Depth (inches): _____
 Water table Present? Yes _____ No X Depth (inches): _____
 Saturation Present? Yes _____ No X Depth (inches): _____
 (includes capillary fringe)

Wetland Hydrology Present? Yes _____ No X

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

WETLAND DETERMINATION DATA FORM – Western Mountains, Valleys and Coast Region

Project/Site: The Views City/County: Sandy/Clackamas Sampling Date: 1/23/2020
 Applicant/Owner: Even Better Homes State: OR Sampling Point: 8
 Investigator(s): K. Biafora Section, Township, Range: S19, T2S, R5E
 Landform (hillslope, terrace, etc.): Ravine Local relief (concave, convex, none): none Slope (%): 2-4%
 Subregion (LRR): Northwest Forests and Coast (LRR A) Lat: 45.38701663 Long: -122.2288159 Datum: WGS 84
 Soil Map Unit Name: Klickitat stony loam NWI Classification: none
 Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No (If no, explain in Remarks)
 Are Vegetation , Soil , or Hydrology significantly disturbed? Are "Normal Circumstances" Present? Yes X No
 Are Vegetation , Soil , or Hydrology naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes <u> </u> No <u>X</u>	Is the Sampled Area within a Wetland?	Yes <u> </u> No <u>X</u>
Hydric Soil Present?	Yes <u> </u> No <u>X</u>		
Wetland Hydrology Present?	Yes <u> </u> No <u>X</u>		
Remarks:			

VEGETATION

<u>Tree Stratum</u> (Use scientific names.)	Absolute % Cover	Dominant Species?	Indicator Status?	Dominance Test worksheet:
1. <u><i>Acer macrophyllum</i></u>	<u>50</u>	<u>Y</u>	<u>FACU</u>	Number of Dominant Species That Are OBL, FACW, or FAC: <u>1</u> (A)
2. _____				Total Number of Dominant Species Across All Strata: <u>3</u> (B)
3. _____				Percent of Dominant Species That Are OBL, FACW, or FAC: <u>33%</u> (A/B)
4. _____				
Total Cover: <u>50</u>				
<u>Shrub Stratum</u>				Prevalence Index Worksheet:
1. <u><i>Thuja plicata</i></u>	<u>20</u>	<u>Y</u>	<u>FAC</u>	Total % Cover of: _____ Multiply by: _____
2. _____				OBL species _____ x1 = <u>0</u>
3. _____				FACW species _____ x2 = <u>0</u>
4. _____				FAC species <u>20</u> x3 = <u>60</u>
5. _____				FACU species <u>90</u> x4 = <u>360</u>
Total Cover: <u>20</u>				UPL species _____ x5 = <u>0</u>
<u>Herb Stratum</u>				Column Totals: <u>110</u> (A) <u>420</u> (B)
1. <u><i>Polystichum munitum</i></u>	<u>40</u>	<u>Y</u>	<u>FACU</u>	Prevalence Index = B/A = <u>3.8</u>
2. _____				
3. _____				
4. _____				
5. _____				
6. _____				
7. _____				
8. _____				
9. _____				
10. _____				
11. _____				
Total Cover: <u>40</u>				
<u>Woody Vine Stratum</u>				Hydrophytic Vegetation Indicators:
1. _____				1 - Rapid Test for Hydrophytic Vegetation
2. _____				2 - Dominance Test is >50%
				3 - Prevalence Index is ≤3.0 ¹
				4 - Morphological Adaptation ¹ (Provide supporting data in Remarks or on a separate sheet)
				5 - Wetland Non-Vascular Plants ¹
				Problematic Hydrophytic Vegetation ¹ (Explain)
Total Cover: <u>0</u>				¹ Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.
% Bare Ground in Herb Stratum <u>60</u> % Cover of Biotic Crust <u>0</u>				Hydrophytic Vegetation Present? Yes <u> </u> No <u>X</u>

Remarks:

SOIL

Sampling Point: _____ 8

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix		Redox Features				Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type ¹	Loc ²		
0-16	10 YR 4/3	100					SiL	

¹Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. ²Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

Indicators for Problematic Hydric Soils³:

- | | | |
|--|--|---|
| <input type="checkbox"/> Histosol (A1) | <input type="checkbox"/> Sandy Redox (S5) | <input type="checkbox"/> 2 cm Muck (A10) |
| <input type="checkbox"/> Histic Epipedon (A2) | <input type="checkbox"/> Stripped Matrix (S6) | <input type="checkbox"/> Red Parent Material (TF2) |
| <input type="checkbox"/> Black Histic (A3) | <input type="checkbox"/> Loamy Mucky Mineral (F1) (except MLRA 1) | <input type="checkbox"/> Other (Explain in Remarks) |
| <input type="checkbox"/> Hydrogen Sulfide (A4) | <input type="checkbox"/> Loamy Gleyed Matrix (F2) | |
| <input type="checkbox"/> Depleted Below Dark Surface (A11) | <input type="checkbox"/> Depleted Matrix (F3) | |
| <input type="checkbox"/> Thick Dark Surface (A12) | <input type="checkbox"/> Redox Dark Surface (F6) | ³ Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic. |
| <input type="checkbox"/> Sandy Muck Mineral (S1) | <input type="checkbox"/> Depleted Dark Surface (F7) | |
| <input type="checkbox"/> Sandy gleyed Matrix (S4) | <input type="checkbox"/> Redox Depressions (F8) | |

Restrictive Layer (if present):

Type: _____
Depth (inches): _____

Hydric Soil Present? Yes _____ No X

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (any one indicator is sufficient)

Secondary Indicators (2 or more required)

- | | | |
|--|---|--|
| <input type="checkbox"/> Surface Water (A1) | <input type="checkbox"/> Water-Stained Leaves (B9) (except MLRA 1, 2, 4A and 4B) | <input type="checkbox"/> Water-Stained Leaves (B9) (MLRA 1, 2, 4A and 4B) |
| <input type="checkbox"/> High Water Table (A2) | <input type="checkbox"/> Salt Crust (B11) | <input type="checkbox"/> Drainage Patterns (B10) |
| <input type="checkbox"/> Saturation (A3) | <input type="checkbox"/> Aquatic Invertebrates (B13) | <input type="checkbox"/> Dry-Season Water Table (C2) |
| <input type="checkbox"/> Water Marks (B1) | <input type="checkbox"/> Hydrogen Sulfide Odor (C1) | <input type="checkbox"/> Saturation Visible on Aerial Imagery (C9) |
| <input type="checkbox"/> Sediment Deposits (B2) | <input type="checkbox"/> Oxidized Rhizospheres along Living Roots (C3) | <input type="checkbox"/> Geomorphic Position (D2) |
| <input type="checkbox"/> Drift Deposits (B3) | <input type="checkbox"/> Presence of Reduced Iron (C4) | <input type="checkbox"/> Shallow Aquitard (D3) |
| <input type="checkbox"/> Algal Mat or Crust (B4) | <input type="checkbox"/> Recent Iron Reduction in Plowed Soils (C6) | <input type="checkbox"/> FAC-Neutral Test (D5) |
| <input type="checkbox"/> Iron Deposits (B5) | <input type="checkbox"/> Stunted or Stressed Plants (D1) (LRR A) | <input type="checkbox"/> Raised Ant Mounds (D6) (LRR A) |
| <input type="checkbox"/> Surface Soil Cracks (B6) | <input type="checkbox"/> Other (Explain in Remarks) | <input type="checkbox"/> Frost-Heave Hummocks (D7) |
| <input type="checkbox"/> Inundation Visible on Aerial Imagery (B7) | | |
| <input type="checkbox"/> Sparsely Vegetated Concave Surface (B8) | | |

Field Observations:

Surface Water Present? Yes _____ No X Depth (inches): _____
 Water table Present? Yes _____ No X Depth (inches): _____
 Saturation Present? Yes _____ No X Depth (inches): _____
 (includes capillary fringe)

Wetland Hydrology Present? Yes _____ No X

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

WETLAND DETERMINATION DATA FORM – Western Mountains, Valleys and Coast Region

Project/Site: The Views City/County: Sandy/Clackamas Sampling Date: 1/23/2020
 Applicant/Owner: Even Better Homes State: OR Sampling Point: 9
 Investigator(s): K. Biafora Section, Township, Range: S19, T2S, R5E
 Landform (hillslope, terrace, etc.): Ravine Local relief (concave, convex, none): none Slope (%): 2-4%
 Subregion (LRR): Northwest Forests and Coast (LRR A) Lat: 45.38704856 Long: -122.2288304 Datum: WGS 84
 Soil Map Unit Name: Klickitat stony loam NWI Classification: none
 Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No (If no, explain in Remarks)
 Are Vegetation , Soil , or Hydrology significantly disturbed? Are "Normal Circumstances" Present? Yes X No
 Are Vegetation , Soil , or Hydrology naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes <u>X</u> No <u> </u>	Is the Sampled Area within a Wetland?	Yes <u>X</u> No <u> </u>
Hydric Soil Present?	Yes <u>X</u> No <u> </u>		
Wetland Hydrology Present?	Yes <u>X</u> No <u> </u>		
Remarks:			

VEGETATION

Tree Stratum (Use scientific names.)	Absolute % Cover	Dominant Species?	Indicator Status?	Dominance Test worksheet:
1. <u>Thuja plicata</u>	<u>30</u>	<u>Y</u>	<u>FAC</u>	Number of Dominant Species That Are OBL, FACW, or FAC: <u>4</u> (A)
2. _____	_____	_____	_____	Total Number of Dominant Species Across All Strata: <u>4</u> (B)
3. _____	_____	_____	_____	Percent of Dominant Species That Are OBL, FACW, or FAC: <u>100%</u> (A/B)
4. _____	_____	_____	_____	
Total Cover: <u>30</u>				
Shrub Stratum				Prevalence Index Worksheet:
1. <u>Rubus spectabilis</u>	<u>10</u>	<u>Y</u>	<u>FAC</u>	Total % Cover of: _____ Multiply by: _____
2. <u>Acer circinatum</u>	<u>20</u>	<u>Y</u>	<u>FAC</u>	OBL species _____ x1 = <u>0</u>
3. _____	_____	_____	_____	FACW species _____ x2 = <u>0</u>
4. _____	_____	_____	_____	FAC species _____ x3 = <u>0</u>
5. _____	_____	_____	_____	FACU species _____ x4 = <u>0</u>
Total Cover: <u>30</u>				UPL species _____ x5 = <u>0</u>
Herb Stratum				Column Totals: <u>0</u> (A) <u>0</u> (B)
1. <u>Tolmiea menziesii</u>	<u>5</u>	<u>Y</u>	<u>FAC</u>	Prevalence Index = B/A = _____
2. _____	_____	_____	_____	
3. _____	_____	_____	_____	
4. _____	_____	_____	_____	
5. _____	_____	_____	_____	
6. _____	_____	_____	_____	
7. _____	_____	_____	_____	
8. _____	_____	_____	_____	
9. _____	_____	_____	_____	
10. _____	_____	_____	_____	
11. _____	_____	_____	_____	
Total Cover: <u>5</u>				
Woody Vine Stratum				Hydrophytic Vegetation Indicators:
1. _____	_____	_____	_____	1 - Rapid Test for Hydrophytic Vegetation
2. _____	_____	_____	_____	<u>X</u> 2 - Dominance Test is >50%
				3 - Prevalence Index is ≤3.0 ¹
				4 - Morphological Adaptation ¹ (Provide supporting data in Remarks or on a separate sheet)
				5 - Wetland Non-Vascular Plants ¹
				Problematic Hydrophytic Vegetation ¹ (Explain)
Total Cover: <u>0</u>				¹ Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.
% Bare Ground in Herb Stratum <u>95</u> % Cover of Biotic Crust <u>0</u>				Hydrophytic Vegetation Present? Yes <u>X</u> No <u> </u>

Remarks:

SOIL

Sampling Point: _____ 9

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix		Redox Features				Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type ¹	Loc ²		
0-2	10 YR 3/2	100					CoGrLS	
2-10	10 YR 4/2	75	7.5 YR 3/4	15	C	M	CoGrLS	
			7.5 YR 5/6	5	C	M		

¹Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. ²Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

Indicators for Problematic Hydric Soils³:

- | | | |
|---|--|---|
| <input type="checkbox"/> Histic Sol (A1) | <input type="checkbox"/> Sandy Redox (S5) | <input type="checkbox"/> 2 cm Muck (A10) |
| <input type="checkbox"/> Histic Epipedon (A2) | <input type="checkbox"/> Stripped Matrix (S6) | <input type="checkbox"/> Red Parent Material (TF2) |
| <input type="checkbox"/> Black Histic (A3) | <input type="checkbox"/> Loamy Mucky Mineral (F1) (except MLRA 1) | <input type="checkbox"/> Other (Explain in Remarks) |
| <input type="checkbox"/> Hydrogen Sulfide (A4) | <input type="checkbox"/> Loamy Gleyed Matrix (F2) | |
| <input checked="" type="checkbox"/> Depleted Below Dark Surface (A11) | <input type="checkbox"/> Depleted Matrix (F3) | |
| <input type="checkbox"/> Thick Dark Surface (A12) | <input type="checkbox"/> Redox Dark Surface (F6) | |
| <input type="checkbox"/> Sandy Muck Mineral (S1) | <input type="checkbox"/> Depleted Dark Surface (F7) | |
| <input type="checkbox"/> Sandy gleyed Matrix (S4) | <input type="checkbox"/> Redox Depressions (F8) | |

³Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: _____ shovel refusal - cobble
 Depth (inches): _____ 10

Hydric Soil Present? Yes No

Remarks: sandy soils underlain by cobble.

HYDROLOGY

Wetland Hydrology Indicators:

- | Primary Indicators (any one indicator is sufficient) | | Secondary Indicators (2 or more required) |
|--|---|--|
| <input type="checkbox"/> Surface Water (A1) | <input type="checkbox"/> Water-Stained Leaves (B9) (except MLRA 1, 2, 4A and 4B) | <input type="checkbox"/> Water-Stained Leaves (B9) (MLRA 1, 2, 4A and 4B) |
| <input checked="" type="checkbox"/> High Water Table (A2) | <input type="checkbox"/> Salt Crust (B11) | <input type="checkbox"/> Drainage Patterns (B10) |
| <input type="checkbox"/> Saturation (A3) | <input type="checkbox"/> Aquatic Invertebrates (B13) | <input type="checkbox"/> Dry-Season Water Table (C2) |
| <input type="checkbox"/> Water Marks (B1) | <input type="checkbox"/> Hydrogen Sulfide Odor (C1) | <input type="checkbox"/> Saturation Visible on Aerial Imagery (C9) |
| <input type="checkbox"/> Sediment Deposits (B2) | <input type="checkbox"/> Oxidized Rhizospheres along Living Roots (C3) | <input type="checkbox"/> Geomorphic Position (D2) |
| <input type="checkbox"/> Drift Deposits (B3) | <input type="checkbox"/> Presence of Reduced Iron (C4) | <input type="checkbox"/> Shallow Aquitard (D3) |
| <input type="checkbox"/> Algal Mat or Crust (B4) | <input type="checkbox"/> Recent Iron Reduction in Plowed Soils (C6) | <input type="checkbox"/> FAC-Neutral Test (D5) |
| <input type="checkbox"/> Iron Deposits (B5) | <input type="checkbox"/> Stunted or Stressed Plants (D1) (LRR A) | <input type="checkbox"/> Raised Ant Mounds (D6) (LRR A) |
| <input type="checkbox"/> Surface Soil Cracks (B6) | <input type="checkbox"/> Other (Explain in Remarks) | <input type="checkbox"/> Frost-Heave Hummocks (D7) |
| <input type="checkbox"/> Inundation Visible on Aerial Imagery (B7) | | |
| <input type="checkbox"/> Sparsely Vegetated Concave Surface (B8) | | |

Field Observations:

Surface Water Present? Yes No Depth (inches): _____
 Water table Present? Yes No Depth (inches): _____ 0
 Saturation Present? Yes No Depth (inches): _____ 0
 (includes capillary fringe)

Wetland Hydrology Present? Yes No

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

WETLAND DETERMINATION DATA FORM – Western Mountains, Valleys and Coast Region

Project/Site: The Views City/County: Sandy/Clackamas Sampling Date: 1/23/2020
 Applicant/Owner: Even Better Homes State: OR Sampling Point: 10
 Investigator(s): K. Biafora Section, Township, Range: S19, T2S, R5E
 Landform (hillslope, terrace, etc.): Ravine Local relief (concave, convex, none): none Slope (%): 2-4%
 Subregion (LRR): Northwest Forests and Coast (LRR A) Lat: 45.38703908 Long: -122.2291427 Datum: WGS 84
 Soil Map Unit Name: Klickitat stony loam NWI Classification: none
 Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No (If no, explain in Remarks)
 Are Vegetation , Soil , or Hydrology significantly disturbed? Are "Normal Circumstances" Present? Yes X No
 Are Vegetation , Soil , or Hydrology naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes <u>X</u> No <u> </u>	Is the Sampled Area within a Wetland?	Yes <u>X</u> No <u> </u>
Hydric Soil Present?	Yes <u>X</u> No <u> </u>		
Wetland Hydrology Present?	Yes <u>X</u> No <u> </u>		
Remarks:			

VEGETATION

<u>Tree Stratum</u> (Use scientific names.)	Absolute % Cover	Dominant Species?	Indicator Status?	Dominance Test worksheet:
1. <u><i>Thuja plicata</i></u>	<u>60</u>	<u>Y</u>	<u>FAC</u>	Number of Dominant Species That Are OBL, FACW, or FAC: <u>2</u> (A)
2. _____				Total Number of Dominant Species Across All Strata: <u>2</u> (B)
3. _____				Percent of Dominant Species That Are OBL, FACW, or FAC: <u>100%</u> (A/B)
4. _____				
Total Cover: <u>60</u>				
<u>Shrub Stratum</u>				Prevalence Index Worksheet:
1. <u><i>Acer circinatum</i></u>	<u>40</u>	<u>Y</u>	<u>FAC</u>	Total % Cover of: _____ Multiply by: _____
2. _____				OBL species _____ x1 = <u>0</u>
3. _____				FACW species _____ x2 = <u>0</u>
4. _____				FAC species _____ x3 = <u>0</u>
5. _____				FACU species _____ x4 = <u>0</u>
Total Cover: <u>40</u>				UPL species _____ x5 = <u>0</u>
<u>Herb Stratum</u>				Column Totals: <u>0</u> (A) <u>0</u> (B)
1. _____				Prevalence Index = B/A = _____
2. _____				
3. _____				
4. _____				
5. _____				
6. _____				
7. _____				
8. _____				
9. _____				
10. _____				
11. _____				
Total Cover: <u>0</u>				
<u>Woody Vine Stratum</u>				Hydrophytic Vegetation Indicators:
1. _____				1 - Rapid Test for Hydrophytic Vegetation
2. _____				<u>X</u> 2 - Dominance Test is >50%
				3 - Prevalence Index is ≤3.0 ¹
				4 - Morphological Adaptation ¹ (Provide supporting data in Remarks or on a separate sheet)
				5 - Wetland Non-Vascular Plants ¹
				Problematic Hydrophytic Vegetation ¹ (Explain)
Total Cover: <u>0</u>				¹ Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.
% Bare Ground in Herb Stratum <u>100</u> % Cover of Biotic Crust <u>0</u>				Hydrophytic Vegetation Present? Yes <u>X</u> No <u> </u>

Remarks:

SOIL

Sampling Point: _____ 10

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix		Redox Features				Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type ¹	Loc ²		
0-6	10 YR 3/2	100					CoGrLS	
6-12	10 YR 5/2	80	7.5 YR 4/6	20	C	M	CoGrLS	

¹Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. ²Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

Indicators for Problematic Hydric Soils³:

- | | | |
|---|--|---|
| <input type="checkbox"/> Histic Epipedon (A2) | <input type="checkbox"/> Sandy Redox (S5) | <input type="checkbox"/> 2 cm Muck (A10) |
| <input type="checkbox"/> Black Histic (A3) | <input type="checkbox"/> Stripped Matrix (S6) | <input type="checkbox"/> Red Parent Material (TF2) |
| <input type="checkbox"/> Hydrogen Sulfide (A4) | <input type="checkbox"/> Loamy Mucky Mineral (F1) (except MLRA 1) | <input type="checkbox"/> Other (Explain in Remarks) |
| <input checked="" type="checkbox"/> Depleted Below Dark Surface (A11) | <input type="checkbox"/> Loamy Gleyed Matrix (F2) | |
| <input type="checkbox"/> Thick Dark Surface (A12) | <input type="checkbox"/> Depleted Matrix (F3) | |
| <input type="checkbox"/> Sandy Muck Mineral (S1) | <input type="checkbox"/> Redox Dark Surface (F6) | ³ Indicators of hydrophytic vegetation and |
| <input type="checkbox"/> Sandy gleyed Matrix (S4) | <input type="checkbox"/> Depleted Dark Surface (F7) | wetland hydrology must be present, |
| | <input type="checkbox"/> Redox Depressions (F8) | unless disturbed or problematic. |

Restrictive Layer (if present):

Type: _____ shovel refusal - cobble
 Depth (inches): _____ 12

Hydric Soil Present? Yes No _____

Remarks: sandy soils underlain by cobble.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (any one indicator is sufficient)

Secondary Indicators (2 or more required)

- | | | |
|--|---|--|
| <input type="checkbox"/> Surface Water (A1) | <input type="checkbox"/> Water-Stained Leaves (B9) (except MLRA 1, 2, 4A and 4B) | <input type="checkbox"/> Water-Stained Leaves (B9) (MLRA 1, 2, 4A and 4B) |
| <input checked="" type="checkbox"/> High Water Table (A2) | <input type="checkbox"/> Salt Crust (B11) | <input type="checkbox"/> Drainage Patterns (B10) |
| <input type="checkbox"/> Saturation (A3) | <input type="checkbox"/> Aquatic Invertebrates (B13) | <input type="checkbox"/> Dry-Season Water Table (C2) |
| <input type="checkbox"/> Water Marks (B1) | <input type="checkbox"/> Hydrogen Sulfide Odor (C1) | <input type="checkbox"/> Saturation Visible on Aerial Imagery (C9) |
| <input type="checkbox"/> Sediment Deposits (B2) | <input type="checkbox"/> Oxidized Rhizospheres along Living Roots (C3) | <input type="checkbox"/> Geomorphic Position (D2) |
| <input type="checkbox"/> Drift Deposits (B3) | <input type="checkbox"/> Presence of Reduced Iron (C4) | <input type="checkbox"/> Shallow Aquitard (D3) |
| <input type="checkbox"/> Algal Mat or Crust (B4) | <input type="checkbox"/> Recent Iron Reduction in Plowed Soils (C6) | <input type="checkbox"/> FAC-Neutral Test (D5) |
| <input type="checkbox"/> Iron Deposits (B5) | <input type="checkbox"/> Stunted or Stressed Plants (D1) (LRR A) | <input type="checkbox"/> Raised Ant Mounds (D6) (LRR A) |
| <input type="checkbox"/> Surface Soil Cracks (B6) | <input type="checkbox"/> Other (Explain in Remarks) | <input type="checkbox"/> Frost-Heave Hummocks (D7) |
| <input type="checkbox"/> Inundation Visible on Aerial Imagery (B7) | | |
| <input type="checkbox"/> Sparsely Vegetated Concave Surface (B8) | | |

Field Observations:

Surface Water Present? Yes _____ No Depth (inches): _____
 Water table Present? Yes No _____ Depth (inches): _____ 0
 Saturation Present? Yes No _____ Depth (inches): _____ 0
 (includes capillary fringe)

Wetland Hydrology Present? Yes No _____

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

WETLAND DETERMINATION DATA FORM – Western Mountains, Valleys and Coast Region

Project/Site: The Views City/County: Sandy/Clackamas Sampling Date: 1/23/2020
 Applicant/Owner: Even Better Homes State: OR Sampling Point: 11
 Investigator(s): K. Biafora Section, Township, Range: S19, T2S, R5E
 Landform (hillslope, terrace, etc.): Ravine Local relief (concave, convex, none): none Slope (%): 2-4%
 Subregion (LRR): Northwest Forests and Coast (LRR A) Lat: 45.38707194 Long: -122.2291584 Datum: WGS 84
 Soil Map Unit Name: Klickitat stony loam NWI Classification: none
 Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No _____ (If no, explain in Remarks)
 Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" Present? Yes X No _____
 Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes _____	No <u>X</u>	Is the Sampled Area within a Wetland?	Yes _____	No <u>X</u>
Hydric Soil Present?	Yes _____	No <u>X</u>			
Wetland Hydrology Present?	Yes _____	No <u>X</u>			
Remarks:					

VEGETATION

<u>Tree Stratum</u> (Use scientific names.)	Absolute % Cover	Dominant Species?	Indicator Status?	Dominance Test worksheet:
1. <u><i>Thuja plicata</i></u>	70	Y	FAC	Number of Dominant Species That Are OBL, FACW, or FAC: <u>1</u> (A)
2. <u><i>Pseudotsuga menziesii</i></u>	30	Y	FACU	Total Number of Dominant Species Across All Strata: <u>3</u> (B)
3. _____				Percent of Dominant Species That Are OBL, FACW, or FAC: <u>33%</u> (A/B)
4. _____				
Total Cover: <u>100</u>				
<u>Shrub Stratum</u>				Prevalence Index Worksheet:
1. _____				Total % Cover of: _____ Multiply by: _____
2. _____				OBL species _____ x1 = <u>0</u>
3. _____				FACW species _____ x2 = <u>0</u>
4. _____				FAC species <u>75</u> x3 = <u>225</u>
5. _____				FACU species <u>55</u> x4 = <u>220</u>
Total Cover: <u>0</u>				UPL species _____ x5 = <u>0</u>
<u>Herb Stratum</u>				Column Totals: <u>130</u> (A) <u>445</u> (B)
1. <u><i>Polystichum munitum</i></u>	20	Y	FACU	Prevalence Index = B/A = <u>3.4</u>
2. <u><i>Oxalis oregana</i></u>	5		FACU	
3. <u><i>Blechnum spicant</i></u>	5		FAC	
4. _____				
5. _____				
6. _____				
7. _____				
8. _____				
9. _____				
10. _____				
11. _____				
Total Cover: <u>30</u>				
<u>Woody Vine Stratum</u>				Hydrophytic Vegetation Indicators:
1. _____				1 - Rapid Test for Hydrophytic Vegetation _____
2. _____				2 - Dominance Test is >50% _____
				3 - Prevalence Index is ≤3.0 ¹ _____
				4 - Morphological Adaptation ¹ (Provide supporting data in Remarks or on a separate sheet) _____
				5 - Wetland Non-Vascular Plants ¹ _____
				Problematic Hydrophytic Vegetation ¹ (Explain) _____
Total Cover: <u>0</u>				¹ Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.
% Bare Ground in Herb Stratum <u>70</u> % Cover of Biotic Crust <u>0</u>				Hydrophytic Vegetation Present? Yes _____ No <u>X</u>

Remarks:

SOIL

Sampling Point: _____ 11

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix		Redox Features				Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type ¹	Loc ²		
0-10	10 YR 3/3	100					SiL	

¹Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. ²Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

Indicators for Problematic Hydric Soils³:

- | | | |
|--|--|---|
| <input type="checkbox"/> Histic Epipedon (A2) | <input type="checkbox"/> Sandy Redox (S5) | <input type="checkbox"/> 2 cm Muck (A10) |
| <input type="checkbox"/> Black Histic (A3) | <input type="checkbox"/> Stripped Matrix (S6) | <input type="checkbox"/> Red Parent Material (TF2) |
| <input type="checkbox"/> Hydrogen Sulfide (A4) | <input type="checkbox"/> Loamy Mucky Mineral (F1) (except MLRA 1) | <input type="checkbox"/> Other (Explain in Remarks) |
| <input type="checkbox"/> Depleted Below Dark Surface (A11) | <input type="checkbox"/> Loamy Gleyed Matrix (F2) | |
| <input type="checkbox"/> Thick Dark Surface (A12) | <input type="checkbox"/> Depleted Matrix (F3) | |
| <input type="checkbox"/> Sandy Muck Mineral (S1) | <input type="checkbox"/> Redox Dark Surface (F6) | ³ Indicators of hydrophytic vegetation and |
| <input type="checkbox"/> Sandy gleyed Matrix (S4) | <input type="checkbox"/> Depleted Dark Surface (F7) | wetland hydrology must be present, |
| | <input type="checkbox"/> Redox Depressions (F8) | unless disturbed or problematic. |

Restrictive Layer (if present):

Type: _____ shovel refusal- tree roots _____
 Depth (inches): _____ 10 _____

Hydric Soil Present? Yes _____ No X

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (any one indicator is sufficient)

Secondary Indicators (2 or more required)

- | | | |
|--|---|--|
| <input type="checkbox"/> Surface Water (A1) | <input type="checkbox"/> Water-Stained Leaves (B9) (except MLRA 1, 2, 4A and 4B) | <input type="checkbox"/> Water-Stained Leaves (B9) (MLRA 1, 2, 4A and 4B) |
| <input type="checkbox"/> High Water Table (A2) | <input type="checkbox"/> Salt Crust (B11) | <input type="checkbox"/> Drainage Patterns (B10) |
| <input type="checkbox"/> Saturation (A3) | <input type="checkbox"/> Aquatic Invertebrates (B13) | <input type="checkbox"/> Dry-Season Water Table (C2) |
| <input type="checkbox"/> Water Marks (B1) | <input type="checkbox"/> Hydrogen Sulfide Odor (C1) | <input type="checkbox"/> Saturation Visible on Aerial Imagery (C9) |
| <input type="checkbox"/> Sediment Deposits (B2) | <input type="checkbox"/> Oxidized Rhizospheres along Living Roots (C3) | <input type="checkbox"/> Geomorphic Position (D2) |
| <input type="checkbox"/> Drift Deposits (B3) | <input type="checkbox"/> Presence of Reduced Iron (C4) | <input type="checkbox"/> Shallow Aquitard (D3) |
| <input type="checkbox"/> Algal Mat or Crust (B4) | <input type="checkbox"/> Recent Iron Reduction in Plowed Soils (C6) | <input type="checkbox"/> FAC-Neutral Test (D5) |
| <input type="checkbox"/> Iron Deposits (B5) | <input type="checkbox"/> Stunted or Stressed Plants (D1) (LRR A) | <input type="checkbox"/> Raised Ant Mounds (D6) (LRR A) |
| <input type="checkbox"/> Surface Soil Cracks (B6) | <input type="checkbox"/> Other (Explain in Remarks) | <input type="checkbox"/> Frost-Heave Hummocks (D7) |
| <input type="checkbox"/> Inundation Visible on Aerial Imagery (B7) | | |
| <input type="checkbox"/> Sparsely Vegetated Concave Surface (B8) | | |

Field Observations:

Surface Water Present? Yes _____ No X Depth (inches): _____
 Water table Present? Yes _____ No X Depth (inches): _____
 Saturation Present? Yes _____ No X Depth (inches): _____
 (includes capillary fringe)

Wetland Hydrology Present? Yes _____ No X

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

WETLAND DETERMINATION DATA FORM – Western Mountains, Valleys and Coast Region

Project/Site: The Views City/County: Sandy/Clackamas Sampling Date: 1/23/2020
 Applicant/Owner: Even Better Homes State: OR Sampling Point: 12
 Investigator(s): K. Biafora Section, Township, Range: S19, T2S, R5E
 Landform (hillslope, terrace, etc.): Ravine Local relief (concave, convex, none): none Slope (%): 2-4%
 Subregion (LRR): Northwest Forests and Coast (LRR A) Lat: 45.38716036 Long: -122.2293741 Datum: WGS 84
 Soil Map Unit Name: Klickitat stony loam NWI Classification: none
 Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No _____ (If no, explain in Remarks)
 Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" Present? Yes X No _____
 Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes _____ No <u>X</u>	Is the Sampled Area within a Wetland?	Yes _____ No <u>X</u>
Hydric Soil Present?	Yes _____ No <u>X</u>		
Wetland Hydrology Present?	Yes _____ No <u>X</u>		

Remarks:

VEGETATION

<u>Tree Stratum</u> (Use scientific names.)	Absolute % Cover	Dominant Species?	Indicator Status?	Dominance Test worksheet: Number of Dominant Species That Are OBL, FACW, or FAC: <u>2</u> (A) Total Number of Dominant Species Across All Strata: <u>4</u> (B) Percent of Dominant Species That Are OBL, FACW, or FAC: <u>50%</u> (A/B)
1. <u>Thuja plicata</u>	<u>30</u>	<u>Y</u>	<u>FAC</u>	
2. _____	_____	_____	_____	
3. _____	_____	_____	_____	
4. _____	_____	_____	_____	
Total Cover: <u>30</u>				
<u>Shrub Stratum</u>	Absolute % Cover	Dominant Species?	Indicator Status?	Prevalence Index Worksheet: Total % Cover of: _____ Multiply by: OBL species _____ x1 = <u>0</u> FACW species _____ x2 = <u>0</u> FAC species <u>50</u> x3 = <u>150</u> FACU species <u>66</u> x4 = <u>264</u> UPL species _____ x5 = <u>0</u> Column Totals: <u>116</u> (A) <u>414</u> (B) Prevalence Index = B/A = <u>3.6</u>
1. <u>Acer circinatum</u>	<u>20</u>	<u>Y</u>	<u>FAC</u>	
2. _____	_____	_____	_____	
3. _____	_____	_____	_____	
4. _____	_____	_____	_____	
5. _____	_____	_____	_____	
Total Cover: <u>20</u>				
<u>Herb Stratum</u>	Absolute % Cover	Dominant Species?	Indicator Status?	Hydrophytic Vegetation Indicators: 1 - Rapid Test for Hydrophytic Vegetation _____ 2 - Dominance Test is >50% _____ 3 - Prevalence Index is ≤3.0 ¹ _____ 4 - Morphological Adaptation ¹ (Provide supporting data in Remarks or on a separate sheet) _____ 5 - Wetland Non-Vascular Plants ¹ _____ Problematic Hydrophytic Vegetation ¹ (Explain) _____ ¹ Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.
1. <u>Polystichum munitum</u>	<u>50</u>	<u>Y</u>	<u>FACU</u>	
2. <u>Oxalis oregana</u>	<u>1</u>	_____	<u>FACU</u>	
3. <u>Rubus ursinus</u>	<u>15</u>	<u>Y</u>	<u>FACU</u>	
4. _____	_____	_____	_____	
5. _____	_____	_____	_____	
6. _____	_____	_____	_____	
7. _____	_____	_____	_____	
8. _____	_____	_____	_____	
9. _____	_____	_____	_____	
10. _____	_____	_____	_____	
11. _____	_____	_____	_____	
Total Cover: <u>66</u>				
<u>Woody Vine Stratum</u>	Absolute % Cover	Dominant Species?	Indicator Status?	Hydrophytic Vegetation Present? Yes _____ No <u>X</u>
1. _____	_____	_____	_____	
2. _____	_____	_____	_____	
Total Cover: <u>0</u>				
% Bare Ground in Herb Stratum <u>34</u> % Cover of Biotic Crust <u>0</u>				

Remarks:

SOIL

Sampling Point: _____ 12

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix		Redox Features				Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type ¹	Loc ²		
0-16	10 YR 3/3	100					SiL	

¹Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. ²Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.) **Indicators for Problematic Hydric Soils³:**

- | | | |
|--|--|---|
| <input type="checkbox"/> Histosol (A1) | <input type="checkbox"/> Sandy Redox (S5) | <input type="checkbox"/> 2 cm Muck (A10) |
| <input type="checkbox"/> Histic Epipedon (A2) | <input type="checkbox"/> Stripped Matrix (S6) | <input type="checkbox"/> Red Parent Material (TF2) |
| <input type="checkbox"/> Black Histic (A3) | <input type="checkbox"/> Loamy Mucky Mineral (F1) (except MLRA 1) | <input type="checkbox"/> Other (Explain in Remarks) |
| <input type="checkbox"/> Hydrogen Sulfide (A4) | <input type="checkbox"/> Loamy Gleyed Matrix (F2) | |
| <input type="checkbox"/> Depleted Below Dark Surface (A11) | <input type="checkbox"/> Depleted Matrix (F3) | |
| <input type="checkbox"/> Thick Dark Surface (A12) | <input type="checkbox"/> Redox Dark Surface (F6) | ³ Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic. |
| <input type="checkbox"/> Sandy Muck Mineral (S1) | <input type="checkbox"/> Depleted Dark Surface (F7) | |
| <input type="checkbox"/> Sandy gleyed Matrix (S4) | <input type="checkbox"/> Redox Depressions (F8) | |

Restrictive Layer (if present):

Type: _____
Depth (inches): _____

Hydric Soil Present? Yes _____ No X

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

- | | | |
|--|---|--|
| <u>Primary Indicators (any one indicator is sufficient)</u> | | <u>Secondary Indicators (2 or more required)</u> |
| <input type="checkbox"/> Surface Water (A1) | <input type="checkbox"/> Water-Stained Leaves (B9) (except MLRA 1, 2, 4A and 4B) | <input type="checkbox"/> Water-Stained Leaves (B9) (MLRA 1, 2, 4A and 4B) |
| <input type="checkbox"/> High Water Table (A2) | <input type="checkbox"/> Salt Crust (B11) | <input type="checkbox"/> Drainage Patterns (B10) |
| <input type="checkbox"/> Saturation (A3) | <input type="checkbox"/> Aquatic Invertebrates (B13) | <input type="checkbox"/> Dry-Season Water Table (C2) |
| <input type="checkbox"/> Water Marks (B1) | <input type="checkbox"/> Hydrogen Sulfide Odor (C1) | <input type="checkbox"/> Saturation Visible on Aerial Imagery (C9) |
| <input type="checkbox"/> Sediment Deposits (B2) | <input type="checkbox"/> Oxidized Rhizospheres along Living Roots (C3) | <input type="checkbox"/> Geomorphic Position (D2) |
| <input type="checkbox"/> Drift Deposits (B3) | <input type="checkbox"/> Presence of Reduced Iron (C4) | <input type="checkbox"/> Shallow Aquitard (D3) |
| <input type="checkbox"/> Algal Mat or Crust (B4) | <input type="checkbox"/> Recent Iron Reduction in Plowed Soils (C6) | <input type="checkbox"/> FAC-Neutral Test (D5) |
| <input type="checkbox"/> Iron Deposits (B5) | <input type="checkbox"/> Stunted or Stressed Plants (D1) (LRR A) | <input type="checkbox"/> Raised Ant Mounds (D6) (LRR A) |
| <input type="checkbox"/> Surface Soil Cracks (B6) | <input type="checkbox"/> Other (Explain in Remarks) | <input type="checkbox"/> Frost-Heave Hummocks (D7) |
| <input type="checkbox"/> Inundation Visible on Aerial Imagery (B7) | | |
| <input type="checkbox"/> Sparsely Vegetated Concave Surface (B8) | | |

Field Observations:

Surface Water Present? Yes _____ No X Depth (inches): _____
 Water table Present? Yes _____ No X Depth (inches): _____
 Saturation Present? Yes _____ No X Depth (inches): _____
 (includes capillary fringe)

Wetland Hydrology Present? Yes _____ No X

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

WETLAND DETERMINATION DATA FORM – Western Mountains, Valleys and Coast Region

Project/Site: The Views City/County: Sandy/Clackamas Sampling Date: 1/23/2020
 Applicant/Owner: Even Better Homes State: OR Sampling Point: 13
 Investigator(s): K. Biafora Section, Township, Range: S19, T2S, R5E
 Landform (hillslope, terrace, etc.): Ravine Local relief (concave, convex, none): none Slope (%): 2-4%
 Subregion (LRR): Northwest Forests and Coast (LRR A) Lat: 45.3871747 Long: -122.2293743 Datum: WGS 84
 Soil Map Unit Name: Klickitat stony loam NWI Classification: none
 Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No (If no, explain in Remarks)
 Are Vegetation , Soil , or Hydrology significantly disturbed? Are "Normal Circumstances" Present? Yes X No
 Are Vegetation , Soil , or Hydrology naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes <u>X</u> No <u> </u>	Is the Sampled Area within a Wetland?	Yes <u>X</u> No <u> </u>
Hydric Soil Present?	Yes <u>X</u> No <u> </u>		Yes <u>X</u> No <u> </u>
Wetland Hydrology Present?	Yes <u>X</u> No <u> </u>		Yes <u>X</u> No <u> </u>
Remarks:			

VEGETATION

<u>Tree Stratum</u> (Use scientific names.)	Absolute % Cover	Dominant Species?	Indicator Status?	Dominance Test worksheet:
1. <u><i>Thuja plicata</i></u>	25	Y	FAC	Number of Dominant Species That Are OBL, FACW, or FAC: <u>2</u> (A)
2. _____	_____	_____	_____	Total Number of Dominant Species Across All Strata: <u>2</u> (B)
3. _____	_____	_____	_____	Percent of Dominant Species That Are OBL, FACW, or FAC: <u>100%</u> (A/B)
4. _____	_____	_____	_____	
Total Cover: <u>25</u>				
<u>Shrub Stratum</u>				Prevalence Index Worksheet:
1. <u><i>Rubus spectabilis</i></u>	15	Y	FAC	Total % Cover of: _____ Multiply by: _____
2. _____	_____	_____	_____	OBL species _____ x1 = <u>0</u>
3. _____	_____	_____	_____	FACW species _____ x2 = <u>0</u>
4. _____	_____	_____	_____	FAC species _____ x3 = <u>0</u>
5. _____	_____	_____	_____	FACU species _____ x4 = <u>0</u>
Total Cover: <u>15</u>				UPL species _____ x5 = <u>0</u>
<u>Herb Stratum</u>				Column Totals: <u>0</u> (A) <u>0</u> (B)
1. <u><i>Lysichiton americanus</i></u>	2	_____	OBL	Prevalence Index = B/A = _____
2. _____	_____	_____	_____	
3. _____	_____	_____	_____	
4. _____	_____	_____	_____	
5. _____	_____	_____	_____	
6. _____	_____	_____	_____	
7. _____	_____	_____	_____	
8. _____	_____	_____	_____	
9. _____	_____	_____	_____	
10. _____	_____	_____	_____	
11. _____	_____	_____	_____	
Total Cover: <u>2</u>				
<u>Woody Vine Stratum</u>				Hydrophytic Vegetation Indicators:
1. _____	_____	_____	_____	1 - Rapid Test for Hydrophytic Vegetation
2. _____	_____	_____	_____	<u>X</u> 2 - Dominance Test is >50%
				3 - Prevalence Index is ≤3.0 ¹
				4 - Morphological Adaptation ¹ (Provide supporting data in Remarks or on a separate sheet)
				5 - Wetland Non-Vascular Plants ¹
				Problematic Hydrophytic Vegetation ¹ (Explain)
Total Cover: <u>0</u>				¹ Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.
% Bare Ground in Herb Stratum <u>98</u> % Cover of Biotic Crust <u>0</u>				Hydrophytic Vegetation Present? Yes <u>X</u> No <u> </u>

Remarks:

SOIL

Sampling Point: _____ 13

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix		Redox Features				Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type ¹	Loc ²		
0-4	10 YR 3/2	100					CoGrLS	
4-10	10 YR 4/2	85	7.5 YR 3/4	15	C	M	CoGrLS	

¹Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. ²Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

Indicators for Problematic Hydric Soils³:

<input type="checkbox"/> Histic Epipedon (A2)	<input type="checkbox"/> Sandy Redox (S5)	<input type="checkbox"/> 2 cm Muck (A10)
<input type="checkbox"/> Black Histic (A3)	<input type="checkbox"/> Stripped Matrix (S6)	<input type="checkbox"/> Red Parent Material (TF2)
<input type="checkbox"/> Hydrogen Sulfide (A4)	<input type="checkbox"/> Loamy Mucky Mineral (F1) (except MLRA 1)	<input type="checkbox"/> Other (Explain in Remarks)
<input checked="" type="checkbox"/> Depleted Below Dark Surface (A11)	<input type="checkbox"/> Loamy Gleyed Matrix (F2)	
<input type="checkbox"/> Thick Dark Surface (A12)	<input type="checkbox"/> Depleted Matrix (F3)	
<input type="checkbox"/> Sandy Muck Mineral (S1)	<input type="checkbox"/> Redox Dark Surface (F6)	
<input type="checkbox"/> Sandy gleyed Matrix (S4)	<input type="checkbox"/> Depleted Dark Surface (F7)	
	<input type="checkbox"/> Redox Depressions (F8)	

³Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: _____ shovel refusal - cobble
 Depth (inches): _____ 10

Hydric Soil Present? Yes No _____

Remarks: sandy soils underlain by cobble

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (any one indicator is sufficient)

Secondary Indicators (2 or more required)

<input type="checkbox"/> Surface Water (A1)	<input type="checkbox"/> Water-Stained Leaves (B9) (except MLRA 1, 2, 4A and 4B)	<input type="checkbox"/> Water-Stained Leaves (B9) (MLRA 1, 2, 4A and 4B)
<input checked="" type="checkbox"/> High Water Table (A2)	<input type="checkbox"/> Salt Crust (B11)	<input type="checkbox"/> Drainage Patterns (B10)
<input type="checkbox"/> Saturation (A3)	<input type="checkbox"/> Aquatic Invertebrates (B13)	<input type="checkbox"/> Dry-Season Water Table (C2)
<input type="checkbox"/> Water Marks (B1)	<input type="checkbox"/> Hydrogen Sulfide Odor (C1)	<input type="checkbox"/> Saturation Visible on Aerial Imagery (C9)
<input type="checkbox"/> Sediment Deposits (B2)	<input type="checkbox"/> Oxidized Rhizospheres along Living Roots (C3)	<input type="checkbox"/> Geomorphic Position (D2)
<input type="checkbox"/> Drift Deposits (B3)	<input type="checkbox"/> Presence of Reduced Iron (C4)	<input type="checkbox"/> Shallow Aquitard (D3)
<input type="checkbox"/> Algal Mat or Crust (B4)	<input type="checkbox"/> Recent Iron Reduction in Plowed Soils (C6)	<input type="checkbox"/> FAC-Neutral Test (D5)
<input type="checkbox"/> Iron Deposits (B5)	<input type="checkbox"/> Stunted or Stressed Plants (D1) (LRR A)	<input type="checkbox"/> Raised Ant Mounds (D6) (LRR A)
<input type="checkbox"/> Surface Soil Cracks (B6)	<input type="checkbox"/> Other (Explain in Remarks)	<input type="checkbox"/> Frost-Heave Hummocks (D7)
<input type="checkbox"/> Inundation Visible on Aerial Imagery (B7)		
<input type="checkbox"/> Sparsely Vegetated Concave Surface (B8)		

Field Observations:

Surface Water Present? Yes _____ No Depth (inches): _____
 Water table Present? Yes No _____ Depth (inches): _____ 0
 Saturation Present? Yes No _____ Depth (inches): _____ 0
 (includes capillary fringe)

Wetland Hydrology Present? Yes No _____

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

WETLAND DETERMINATION DATA FORM – Western Mountains, Valleys and Coast Region

Project/Site: The Views City/County: Sandy/Clackamas Sampling Date: 1/23/2020
 Applicant/Owner: Even Better Homes State: OR Sampling Point: 14
 Investigator(s): K. Biafora Section, Township, Range: S19, T2S, R5E
 Landform (hillslope, terrace, etc.): Ravine Local relief (concave, convex, none): none Slope (%): 2-4%
 Subregion (LRR): Northwest Forests and Coast (LRR A) Lat: 45.38696484 Long: -122.2296122 Datum: WGS 84
 Soil Map Unit Name: Klickitat stony loam NWI Classification: none
 Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No (If no, explain in Remarks)
 Are Vegetation , Soil , or Hydrology significantly disturbed? Are "Normal Circumstances" Present? Yes X No
 Are Vegetation , Soil , or Hydrology naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes <u>X</u> No <u> </u>	Is the Sampled Area within a Wetland?	Yes <u>X</u> No <u> </u>
Hydric Soil Present?	Yes <u>X</u> No <u> </u>		
Wetland Hydrology Present?	Yes <u>X</u> No <u> </u>		
Remarks:			

VEGETATION

<u>Tree Stratum</u> (Use scientific names.)	Absolute % Cover	Dominant Species?	Indicator Status?	Dominance Test worksheet:
1. <u><i>Thuja plicata</i></u>	<u>30</u>	<u>Y</u>	<u>FAC</u>	Number of Dominant Species That Are OBL, FACW, or FAC: <u>4</u> (A)
2. _____	_____	_____	_____	Total Number of Dominant Species Across All Strata: <u>4</u> (B)
3. _____	_____	_____	_____	Percent of Dominant Species That Are OBL, FACW, or FAC: <u>100%</u> (A/B)
4. _____	_____	_____	_____	
Total Cover: <u>30</u>				
<u>Shrub Stratum</u>				Prevalence Index Worksheet:
1. <u><i>Rubus spectabilis</i></u>	<u>30</u>	<u>Y</u>	<u>FAC</u>	Total % Cover of: _____ Multiply by: _____
2. <u><i>Acer circinatum</i></u>	<u>30</u>	<u>Y</u>	<u>FAC</u>	OBL species _____ x1 = <u>0</u>
3. _____	_____	_____	_____	FACW species _____ x2 = <u>0</u>
4. _____	_____	_____	_____	FAC species _____ x3 = <u>0</u>
5. _____	_____	_____	_____	FACU species _____ x4 = <u>0</u>
Total Cover: <u>60</u>				UPL species _____ x5 = <u>0</u>
<u>Herb Stratum</u>				Column Totals: <u>0</u> (A) <u>0</u> (B)
1. <u><i>Lysichiton americanus</i></u>	<u>5</u>	<u>Y</u>	<u>OBL</u>	Prevalence Index = B/A = _____
2. _____	_____	_____	_____	
3. _____	_____	_____	_____	
4. _____	_____	_____	_____	
5. _____	_____	_____	_____	
6. _____	_____	_____	_____	
7. _____	_____	_____	_____	
8. _____	_____	_____	_____	
9. _____	_____	_____	_____	
10. _____	_____	_____	_____	
11. _____	_____	_____	_____	
Total Cover: <u>5</u>				
<u>Woody Vine Stratum</u>				Hydrophytic Vegetation Indicators:
1. _____	_____	_____	_____	1 - Rapid Test for Hydrophytic Vegetation
2. _____	_____	_____	_____	<u>X</u> 2 - Dominance Test is >50%
				3 - Prevalence Index is ≤3.0 ¹
				4 - Morphological Adaptation ¹ (Provide supporting data in Remarks or on a separate sheet)
				5 - Wetland Non-Vascular Plants ¹
				Problematic Hydrophytic Vegetation ¹ (Explain)
Total Cover: <u>0</u>				¹ Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.
% Bare Ground in Herb Stratum <u>95</u> % Cover of Biotic Crust <u>0</u>				Hydrophytic Vegetation Present? Yes <u>X</u> No <u> </u>

Remarks:

SOIL

Sampling Point: _____ 14

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix		Redox Features				Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type ¹	Loc ²		
0-10	10 YR 3/1	93	10 YR 4/6	5	C	M	loamy clay	
			10 YR 5/2	2	D	M		
10-12	10 YR 4/2	80	7.5 YR 3/4	20	C	M	loamy clay	

¹Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. ²Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

Indicators for Problematic Hydric Soils³:

- | | | |
|---|--|---|
| <input type="checkbox"/> Histosol (A1) | <input type="checkbox"/> Sandy Redox (S5) | <input type="checkbox"/> 2 cm Muck (A10) |
| <input type="checkbox"/> Histic Epipedon (A2) | <input type="checkbox"/> Stripped Matrix (S6) | <input type="checkbox"/> Red Parent Material (TF2) |
| <input type="checkbox"/> Black Histic (A3) | <input type="checkbox"/> Loamy Mucky Mineral (F1) (except MLRA 1) | <input type="checkbox"/> Other (Explain in Remarks) |
| <input type="checkbox"/> Hydrogen Sulfide (A4) | <input type="checkbox"/> Loamy Gleyed Matrix (F2) | |
| <input checked="" type="checkbox"/> Depleted Below Dark Surface (A11) | <input type="checkbox"/> Depleted Matrix (F3) | |
| <input type="checkbox"/> Thick Dark Surface (A12) | <input type="checkbox"/> Redox Dark Surface (F6) | |
| <input type="checkbox"/> Sandy Muck Mineral (S1) | <input type="checkbox"/> Depleted Dark Surface (F7) | |
| <input type="checkbox"/> Sandy gleyed Matrix (S4) | <input type="checkbox"/> Redox Depressions (F8) | |
- ³Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: _____ shovel refusal - tree roots
 Depth (inches): _____ 12

Hydric Soil Present? Yes No _____

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (any one indicator is sufficient)

Secondary Indicators (2 or more required)

- | | | |
|--|---|--|
| <input type="checkbox"/> Surface Water (A1) | <input type="checkbox"/> Water-Stained Leaves (B9) (except MLRA 1, 2, 4A and 4B) | <input type="checkbox"/> Water-Stained Leaves (B9) (MLRA 1, 2, 4A and 4B) |
| <input checked="" type="checkbox"/> High Water Table (A2) | <input type="checkbox"/> Salt Crust (B11) | <input type="checkbox"/> Drainage Patterns (B10) |
| <input type="checkbox"/> Saturation (A3) | <input type="checkbox"/> Aquatic Invertebrates (B13) | <input type="checkbox"/> Dry-Season Water Table (C2) |
| <input type="checkbox"/> Water Marks (B1) | <input type="checkbox"/> Hydrogen Sulfide Odor (C1) | <input type="checkbox"/> Saturation Visible on Aerial Imagery (C9) |
| <input type="checkbox"/> Sediment Deposits (B2) | <input type="checkbox"/> Oxidized Rhizospheres along Living Roots (C3) | <input type="checkbox"/> Geomorphic Position (D2) |
| <input type="checkbox"/> Drift Deposits (B3) | <input type="checkbox"/> Presence of Reduced Iron (C4) | <input type="checkbox"/> Shallow Aquitard (D3) |
| <input type="checkbox"/> Algal Mat or Crust (B4) | <input type="checkbox"/> Recent Iron Reduction in Plowed Soils (C6) | <input type="checkbox"/> FAC-Neutral Test (D5) |
| <input type="checkbox"/> Iron Deposits (B5) | <input type="checkbox"/> Stunted or Stressed Plants (D1) (LRR A) | <input type="checkbox"/> Raised Ant Mounds (D6) (LRR A) |
| <input type="checkbox"/> Surface Soil Cracks (B6) | <input type="checkbox"/> Other (Explain in Remarks) | <input type="checkbox"/> Frost-Heave Hummocks (D7) |
| <input type="checkbox"/> Inundation Visible on Aerial Imagery (B7) | | |
| <input type="checkbox"/> Sparsely Vegetated Concave Surface (B8) | | |

Field Observations:

Surface Water Present? Yes _____ No Depth (inches): _____
 Water table Present? Yes No _____ Depth (inches): _____ 0
 Saturation Present? Yes No _____ Depth (inches): _____ 0
 (includes capillary fringe)

Wetland Hydrology Present? Yes No _____

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

WETLAND DETERMINATION DATA FORM – Western Mountains, Valleys and Coast Region

Project/Site: The Views City/County: Sandy/Clackamas Sampling Date: 1/23/2020
 Applicant/Owner: Even Better Homes State: OR Sampling Point: 15
 Investigator(s): K. Biafora Section, Township, Range: S19, T2S, R5E
 Landform (hillslope, terrace, etc.): Ravine Local relief (concave, convex, none): none Slope (%): 2-4%
 Subregion (LRR): Northwest Forests and Coast (LRR A) Lat: 45.38693738 Long: -122.229602 Datum: WGS 84
 Soil Map Unit Name: Klickitat stony loam NWI Classification: none
 Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No (If no, explain in Remarks)
 Are Vegetation , Soil , or Hydrology significantly disturbed? Are "Normal Circumstances" Present? Yes X No
 Are Vegetation , Soil , or Hydrology naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes <u> </u> No <u>X</u>	Is the Sampled Area within a Wetland?	Yes <u> </u> No <u>X</u>
Hydric Soil Present?	Yes <u> </u> No <u>X</u>		
Wetland Hydrology Present?	Yes <u> </u> No <u>X</u>		

Remarks:

VEGETATION

<u>Tree Stratum</u> (Use scientific names.)	Absolute % Cover	Dominant Species?	Indicator Status?	Dominance Test worksheet: Number of Dominant Species That Are OBL, FACW, or FAC: <u>2</u> (A) Total Number of Dominant Species Across All Strata: <u>4</u> (B) Percent of Dominant Species That Are OBL, FACW, or FAC: <u>50%</u> (A/B)
1. <u>Thuja plicata</u>	<u>20</u>	<u>Y</u>	<u>FAC</u>	
2. <u>Acer macrophyllum</u>	<u>15</u>	<u>Y</u>	<u>FACU</u>	
3. <u> </u>				
4. <u> </u>				
Total Cover: <u>35</u>				
<u>Shrub Stratum</u>	Absolute % Cover	Dominant Species?	Indicator Status?	Prevalence Index Worksheet: Total % Cover of: <u> </u> Multiply by: OBL species <u> </u> x1 = <u>0</u> FACW species <u> </u> x2 = <u>0</u> FAC species <u>40</u> x3 = <u>120</u> FACU species <u>45</u> x4 = <u>180</u> UPL species <u> </u> x5 = <u>0</u> Column Totals: <u>85</u> (A) <u>300</u> (B) Prevalence Index = B/A = <u>3.5</u>
1. <u>Acer circinatum</u>	<u>20</u>	<u>Y</u>	<u>FAC</u>	
2. <u> </u>				
3. <u> </u>				
4. <u> </u>				
5. <u> </u>				
Total Cover: <u>20</u>				
<u>Herb Stratum</u>	Absolute % Cover	Dominant Species?	Indicator Status?	Hydrophytic Vegetation Indicators: 1 - Rapid Test for Hydrophytic Vegetation <u> </u> 2 - Dominance Test is >50% <u> </u> 3 - Prevalence Index is ≤3.0 ¹ <u> </u> 4 - Morphological Adaptation ¹ (Provide supporting data in Remarks or on a separate sheet) <u> </u> 5 - Wetland Non-Vascular Plants ¹ <u> </u> Problematic Hydrophytic Vegetation ¹ (Explain) <u> </u> ¹ Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.
1. <u>Polystichum munitum</u>	<u>30</u>	<u>Y</u>	<u>FACU</u>	
2. <u> </u>				
3. <u> </u>				
4. <u> </u>				
5. <u> </u>				
6. <u> </u>				
7. <u> </u>				
8. <u> </u>				
9. <u> </u>				
10. <u> </u>				
11. <u> </u>				
Total Cover: <u>30</u>				
<u>Woody Vine Stratum</u>	Absolute % Cover	Dominant Species?	Indicator Status?	Hydrophytic Vegetation Present? Yes <u> </u> No <u>X</u>
1. <u> </u>				
2. <u> </u>				
Total Cover: <u>0</u>				
% Bare Ground in Herb Stratum <u>70</u> % Cover of Biotic Crust <u>0</u>				

Remarks:

SOIL

Sampling Point: _____ 15

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix		Redox Features				Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type ¹	Loc ²		
0-12	10 YR 3/3	100					SiL	

¹Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. ²Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

Indicators for Problematic Hydric Soils³:

- | | | |
|--|--|---|
| <input type="checkbox"/> Histosol (A1) | <input type="checkbox"/> Sandy Redox (S5) | <input type="checkbox"/> 2 cm Muck (A10) |
| <input type="checkbox"/> Histic Epipedon (A2) | <input type="checkbox"/> Stripped Matrix (S6) | <input type="checkbox"/> Red Parent Material (TF2) |
| <input type="checkbox"/> Black Histic (A3) | <input type="checkbox"/> Loamy Mucky Mineral (F1) (except MLRA 1) | <input type="checkbox"/> Other (Explain in Remarks) |
| <input type="checkbox"/> Hydrogen Sulfide (A4) | <input type="checkbox"/> Loamy Gleyed Matrix (F2) | |
| <input type="checkbox"/> Depleted Below Dark Surface (A11) | <input type="checkbox"/> Depleted Matrix (F3) | |
| <input type="checkbox"/> Thick Dark Surface (A12) | <input type="checkbox"/> Redox Dark Surface (F6) | |
| <input type="checkbox"/> Sandy Muck Mineral (S1) | <input type="checkbox"/> Depleted Dark Surface (F7) | |
| <input type="checkbox"/> Sandy gleyed Matrix (S4) | <input type="checkbox"/> Redox Depressions (F8) | |
- ³Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: _____ shovel refusal - tree roots
 Depth (inches): _____ 12

Hydric Soil Present? Yes _____ No X

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (any one indicator is sufficient)

Secondary Indicators (2 or more required)

- | | | |
|--|---|--|
| <input type="checkbox"/> Surface Water (A1) | <input type="checkbox"/> Water-Stained Leaves (B9) (except MLRA 1, 2, 4A and 4B) | <input type="checkbox"/> Water-Stained Leaves (B9) (MLRA 1, 2, 4A and 4B) |
| <input type="checkbox"/> High Water Table (A2) | <input type="checkbox"/> Salt Crust (B11) | <input type="checkbox"/> Drainage Patterns (B10) |
| <input type="checkbox"/> Saturation (A3) | <input type="checkbox"/> Aquatic Invertebrates (B13) | <input type="checkbox"/> Dry-Season Water Table (C2) |
| <input type="checkbox"/> Water Marks (B1) | <input type="checkbox"/> Hydrogen Sulfide Odor (C1) | <input type="checkbox"/> Saturation Visible on Aerial Imagery (C9) |
| <input type="checkbox"/> Sediment Deposits (B2) | <input type="checkbox"/> Oxidized Rhizospheres along Living Roots (C3) | <input type="checkbox"/> Geomorphic Position (D2) |
| <input type="checkbox"/> Drift Deposits (B3) | <input type="checkbox"/> Presence of Reduced Iron (C4) | <input type="checkbox"/> Shallow Aquitard (D3) |
| <input type="checkbox"/> Algal Mat or Crust (B4) | <input type="checkbox"/> Recent Iron Reduction in Plowed Soils (C6) | <input type="checkbox"/> FAC-Neutral Test (D5) |
| <input type="checkbox"/> Iron Deposits (B5) | <input type="checkbox"/> Stunted or Stressed Plants (D1) (LRR A) | <input type="checkbox"/> Raised Ant Mounds (D6) (LRR A) |
| <input type="checkbox"/> Surface Soil Cracks (B6) | <input type="checkbox"/> Other (Explain in Remarks) | <input type="checkbox"/> Frost-Heave Hummocks (D7) |
| <input type="checkbox"/> Inundation Visible on Aerial Imagery (B7) | | |
| <input type="checkbox"/> Sparsely Vegetated Concave Surface (B8) | | |

Field Observations:

Surface Water Present? Yes _____ No X Depth (inches): _____
 Water table Present? Yes _____ No X Depth (inches): _____
 Saturation Present? Yes _____ No X Depth (inches): _____
 (includes capillary fringe)

Wetland Hydrology Present? Yes _____ No X

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

APPENDIX C: GROUND LEVEL PHOTOGRAPHS



Photo Point 1. From the side slope of the ravine in the northwestern portion of the site facing southwest.



Photo Point 1. From the side slope of the ravine in the northwestern portion of the site facing southeast toward Stream 1.

APPENDIX C: GROUND LEVEL PHOTOGRAPHS
The Views Project Site
S&A#2748

Schott & Associates
P.O. Box 589
Aurora, OR. 97002
503.678.6007



Photo Point 2. From Stream 1, facing northeast downstream.



Photo Point 2. From Stream 1, facing southwest upstream.

APPENDIX C: GROUND LEVEL PHOTOGRAPHS
The Views Project Site
S&A#2748

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P.O. Box 589
Aurora, OR. 97002
503.678.6007



Photo Point 3. From the top of Wetland 1, facing northeast toward wetland area.



Photo Point 3. From the top of Wetland 1 facing east toward the western ravine side slope.

APPENDIX C: GROUND LEVEL PHOTOGRAPHS
The Views Project Site
S&A#2748

Schott & Associates
P.O. Box 589
Aurora, OR. 97002
503.678.6007



Photo Point 3. From the top of Wetland 1 facing south toward the face of the ravine and stormwater pipe.



Photo Point 4. From the top of the western ravine side slope facing north toward Stream 1.

APPENDIX C: GROUND LEVEL PHOTOGRAPHS
The Views Project Site
S&A#2748

Schott & Associates
P.O. Box 589
Aurora, OR. 97002
503.678.6007



Photo Point 4. From the top of the western ravine side slope facing west toward Wetland 1.



Photo Point 4. From the top of the western ravine side slope facing east toward upland field.

APPENDIX C: GROUND LEVEL PHOTOGRAPHS
The Views Project Site
S&A#2748

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Photo Point 5. From Wetland 2 facing east toward wetland area.



Photo Point 5. From Wetland 2 facing south toward wetland area.

APPENDIX C: GROUND LEVEL PHOTOGRAPHS
The Views Project Site
S&A#2748

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Photo Point 5. From Wetland 2 facing north toward adjacent upland forest.



Photo Point 6. From the start of Stream 2 facing northeast, downstream.

APPENDIX C: GROUND LEVEL PHOTOGRAPHS
The Views Project Site
S&A#2748

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Photo Point 6. From the start of Stream 2 facing northwest toward wetland.



Photo Point 7. From near the top of Wetland 2 facing east toward wetland area.

APPENDIX C: GROUND LEVEL PHOTOGRAPHS
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Photo Point 7. From near the top of Wetland 2 facing north toward wetland area.



Photo Point 7. From near the top of Wetland 2 facing west toward seep area.

APPENDIX C: GROUND LEVEL PHOTOGRAPHS
The Views Project Site
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Photo Point 7. From near the top of Wetland 2 facing southeast toward adjacent upland forest.



Photo Point 8. From the upland field in the central portion of the site facing east toward ravine containing Wetland 2 and Stream 2.

APPENDIX C: GROUND LEVEL PHOTOGRAPHS
The Views Project Site
S&A#2748

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Photo Point 8. From the upland field in the central portion of the site facing south toward onsite rural residential development.



Photo Point 8. From the upland field in the central portion of the site facing west toward ravine containing Wetland 1 and Stream 1.

APPENDIX C: GROUND LEVEL PHOTOGRAPHS
The Views Project Site
S&A#2748

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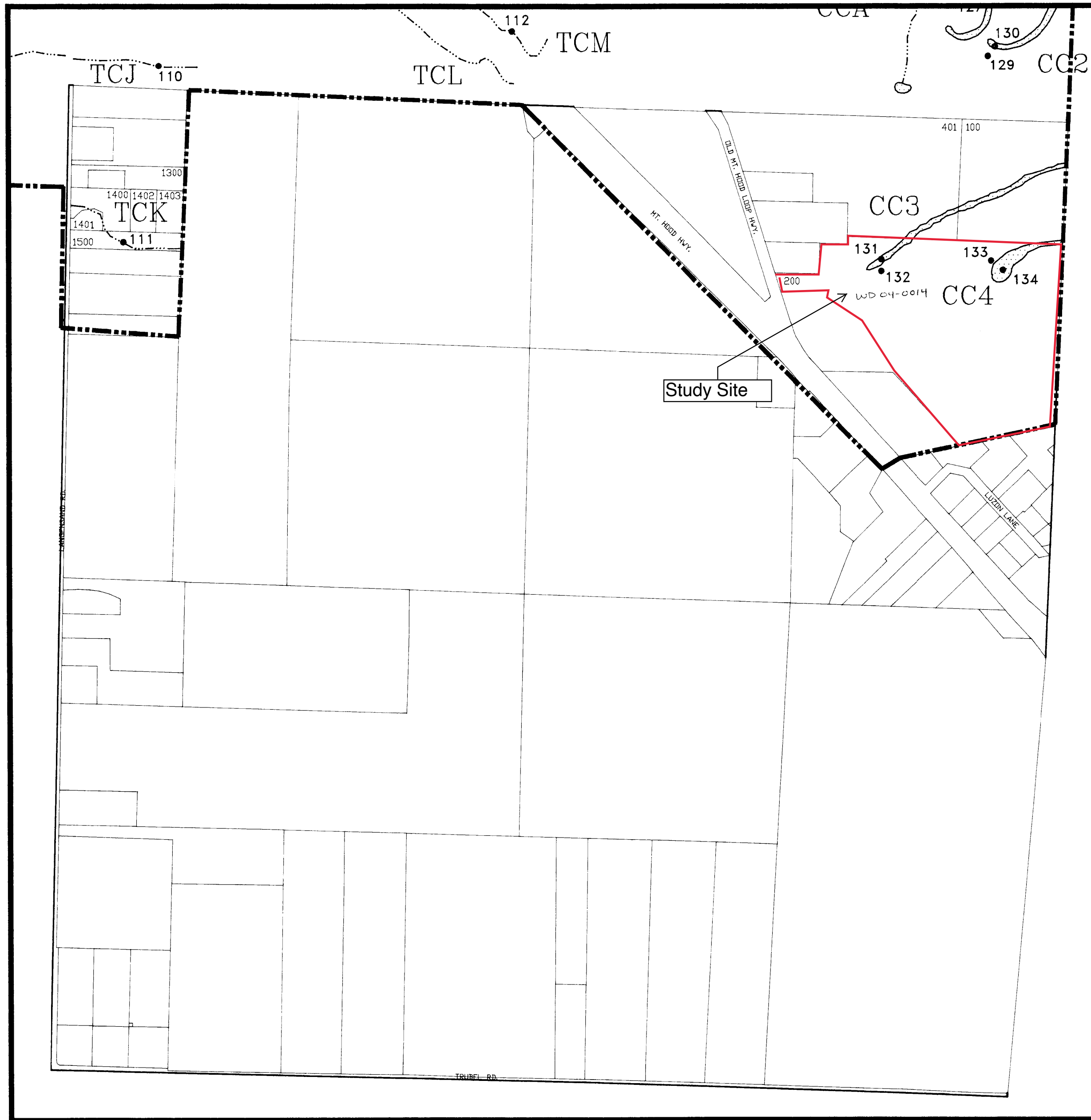


Photo Point 8. From the upland field in the central portion of the site facing north toward upland forest.

APPENDIX C: GROUND LEVEL PHOTOGRAPHS
The Views Project Site
S&A#2748

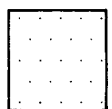
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Aurora, OR, 97002
503.678.6007

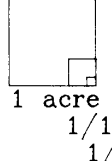
APPENDIX D: LOCAL WETLAND INVENTORY MAP FOR SANDY





T 2S R 5E Section 19

CITY OF SANDY LOCAL WETLAND INVENTORY

- ⁸ Sample site
- TC4 Wetland designator
- Urban Growth Boundary
-  Potentially jurisdictional wetland
- Intermittent stream

 Wetland acreage
 1 acre
 1/10th acre
 1/100th acre

 NORTH  0 400 800 FEET JANUARY 1997

WETLAND INFORMATION IS SUBJECT TO CHANGE

This map is for planning purposes only. It has not been finalized and adopted by the City of Sandy or approved by the wetland regulatory agencies. You are advised to contact the Oregon Division of State Lands or the U.S. Army Corps of Engineers with any regulatory questions. Mapped wetland boundaries were not flagged or surveyed, but are accurate to within 25 feet, and there may be unmapped wetlands subject to regulation. Some areas have been identified as potential wetlands and are located on the maps. In all cases, actual field conditions determine wetland boundaries.

City of Sandy

39250 Pioneer Boulevard
Sandy, Oregon 97055

 SRI/SHAPIRO AGCO
INCORPORATED

City of Sandy Wetlands Inventory
 Oregon Division of State Lands
 Meets Local Wetlands Inventory standards
 Date 3-18-92 / approved by J. Markan

APPENDIX E: LITERATURE CITATIONS

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REDMOND GEOTECHNICAL SERVICES

EXHIBIT I

Geotechnical Investigation and Consultation Services

Proposed The Views Planned Development Site

Tax Lot No's. 200 and 500

41717 Highway 26

Sandy (Clackamas County), Oregon

for

Even Better Homes, Inc.

**Project No. 1666.002.G
May 15, 2020**

REDMOND GEOTECHNICAL SERVICES

May 15, 2020

Mr. Mac Even
Even Better Homes, Inc.
P.O. Box 2021
Gresham, Oregon 97030

Dear Mr. Even:

**Re: Geotechnical Investigation and Consultation Services,
Proposed The Views Planned Development Site, Tax Lot No's. 200 and 500,
41717 Highway 26, Sandy (Clackamas County), Oregon**

Submitted herewith is our report entitled "Geotechnical Investigation and Consultation Services, Proposed The Views Planned Development Site, Tax Lot No's. 200 and 500, 41717 Highway 26, Sandy (Clackamas County), Oregon". The scope of our services was outlined in our formal proposal to Mr. Mac Even of Even Better Homes, Inc. dated November 20, 2019. Authorization of our services was provided by Mr. Mac Even on December 19, 2019.

During the course of our investigation, we have kept you and/or others advised of our schedule and preliminary findings. We appreciate the opportunity to assist you with this phase of the project. Should you have any questions regarding this report, please do not hesitate to call.

Sincerely,



Daniel M. Redmond, P.E., G.E.
President/Principal Engineer

Cc: Mr. Ray Moore
All County Surveyors & Planners, Inc.

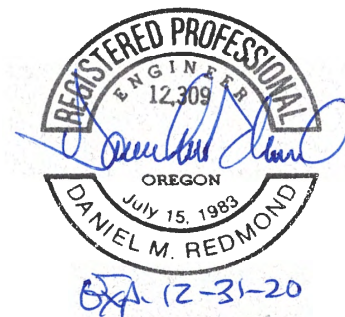


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REDMOND GEOTECHNICAL SERVICES

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**GEOTECHNICAL INVESTIGATION AND CONSULTATION SERVICES
PROPOSED THE VIEWS PLANNED DEVELOPMENT SITE
TAX LOT NO'S. 200 AND 500
41717 HIGHWAY 26
SANDY (CLACKAMAS COUNTY) OREGON**

INTRODUCTION

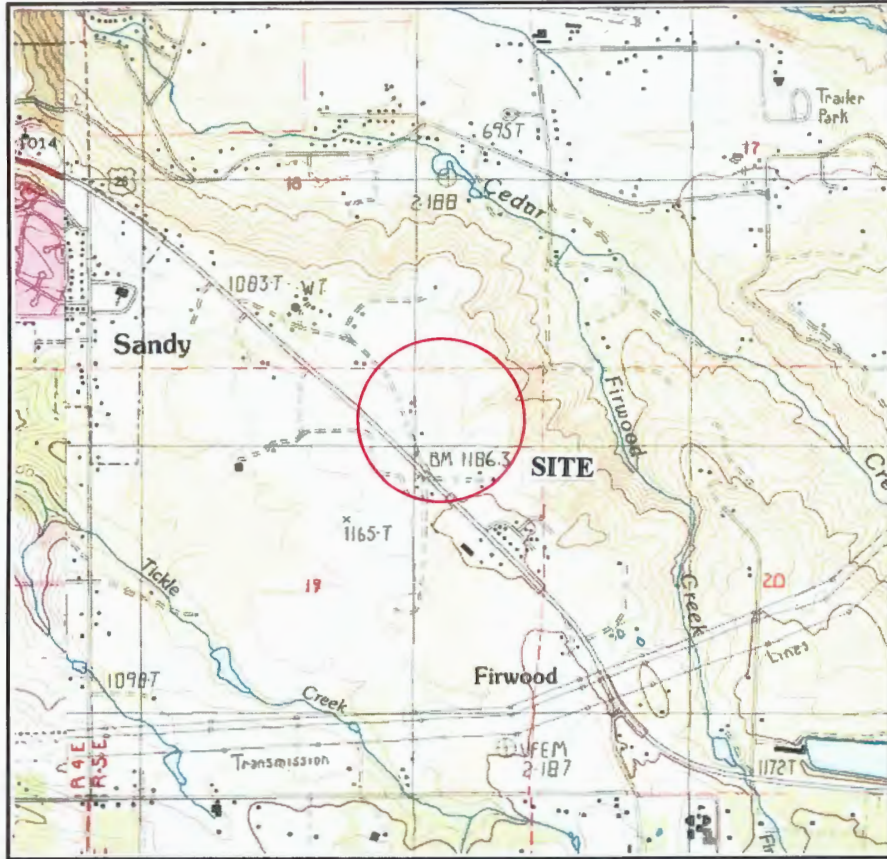
Redmond Geotechnical Services, LLC is please to submit to you the results of our Geotechnical Investigation and Consultation Services at the site of the proposed new The Views planned development project located to the east of Highway 26 and to the east and/or west of the intersection of SE Vista Loop Drive in Sandy (Clackamas County), Oregon. The general location of the subject site is shown on the Site Vicinity Map, Figure No. 1. The purpose of our geotechnical investigation and consultation services at this time was to explore the existing subsurface soils and/or groundwater conditions across the subject site and to evaluate any potential concerns with regard to development at the site as well as to develop and/or provide appropriate geotechnical design and construction recommendations for the proposed new The Views planned development project.

PROJECT DESCRIPTION

Based on a review of the proposed site development plans, we understand that present plans will consist of the construction of a new planned development. Reportedly, the project will consist of the development and/or construction of approximately one hundred and twenty-two (122) new mixed use structures and/or lots ranging in size from about 2,000 to 11,000 square feet. We understand that the lots will primarily be developed with new single-family, one- and/or two-story wood-frame residential structures. However, construction of new two- and/or three-story wood-frame multi-family (apartment) buildings is also planned.

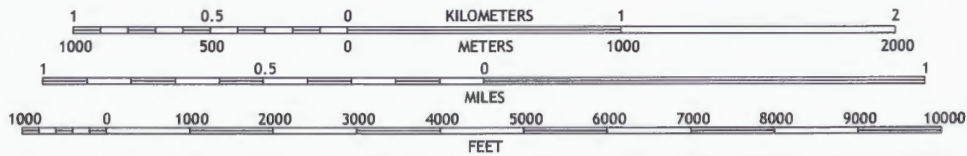
Support of the new single- and/or multi-family residential structures is anticipated to consist primarily of conventional shallow strip (continuous) footings although some individual (column) footings will also be required. Additionally, we envision that the proposed new single-and/or multi-family residential structures will be constructed with raised wooden post and beams floors and/or concrete slab-on-grade floors, respectively. Further, due to the sloping site grades, we anticipate that some of the proposed new residential homes and/or structures may be constructed with partial and/or below level. As such, construction of some below grade retaining walls is also anticipated form the project. Structural loading information, although unavailable at this time, is anticipated to be fairly typical for this type of single- and/or four-story wood-frame structures and is expected to result in maximum dead plus live continuous (strip) and individual (column) footing loads on the order of about 1.5 to 4.0 kips per lineal foot (klf) and 10 to 35 kips, respectively.

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**BULL RUN QUADRANGLE
OREGON
7.5-MINUTE SERIES**

SCALE 1:24 000



CONTOUR INTERVAL 10 FEET
NORTH AMERICAN VERTICAL DATUM OF 1988

SITE VICINITY MAP

Project No. 1666.002.G

**THE VIEWS
TAX LOT NO'S. 200 AND 500**

Figure No. 1

Other associated site improvements for the project will include construction of new paved public streets and/or private access drives and parking areas. Additionally, the project will include the construction of new underground utility services as well as new concrete curbs and sidewalks. Further, we understand that development of the site will also include the collection of storm water from hard and/or impervious surfaces (i.e., roofs and pavements) for on-site treatment and disposal within various storm water detention facilities designed by the Civil Engineer.

Earthwork and grading operations for the project to bring the subject property to finish design grades and/or elevations will reportedly result in both cuts and/or fills. A review of the proposed site grading plans for the project indicate that cuts and/or fills of between ten (10) to fifteen (15) feet are generally anticipated across the site.

SCOPE OF WORK

The purpose of our geotechnical studies was to evaluate the overall subsurface soil and/or groundwater conditions underlying the subject site with regard to the proposed new residential development and construction at the site and any associated impacts or concerns with respect to development at the site as well as provide appropriate geotechnical design and construction recommendations for the project. Specifically, our geotechnical investigation included the following scope of work items:

1. Review of available and relevant geologic and/or geotechnical investigation reports for the subject site and/or area including a Preliminary Report of Engineering Geology and Geotechnical Engineering Services for the proposed Timber Valley Development prepared by GeoDesign, Inc. dated August 24, 2007.
2. A detailed field reconnaissance and subsurface exploration program of the soil and ground water conditions underlying the site by means of eleven (11) exploratory test pit excavations. The exploratory test pits were excavated to depths ranging from about five (5) to eight (8) feet beneath existing site grades at the approximate locations as shown on the Site Exploration Plan, Figure No. 2. Additionally, field infiltration testing was also performed within various test pits excavated across the subject site.
3. Laboratory testing to evaluate and identify pertinent physical and engineering properties of the subsurface soils encountered relative to the planned site development and construction at the site. The laboratory testing program included tests to help evaluate the natural (field) moisture content and dry density, maximum dry density and optimum moisture content, gradational characteristics, Atterberg Limits and (remolded) direct shear strength tests as well as direct shear strength and "R"-value tests.

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4. A literature review and engineering evaluation and assessment of the regional seismicity to evaluate the potential ground motion hazard(s) at the subject site. The evaluation and assessment included a review of the regional earthquake history and sources such as potential seismic sources, maximum credible earthquakes, and reoccurrence intervals as well as a discussion of the possible ground response to the selected design earthquake(s), fault rupture, landsliding, liquefaction, and tsunami and seiche flooding.
5. Engineering analyses utilizing the field and laboratory data as a basis for furnishing recommendations for foundation support of the proposed new residential structures. Recommendations include maximum design allowable contact bearing pressure(s), depth of footing embedment, estimates of foundation settlement, lateral soil resistance, and foundation subgrade preparation. Additionally, construction and/or permanent subsurface water drainage considerations have also been prepared. Further, our report includes recommendations regarding site preparation, placement and compaction of structural fill materials, suitability of the on-site soils for use as structural fill, criteria for import fill materials, and preparation of foundation, pavement and/or floor slab subgrades.
6. Flexible pavement design and construction recommendations for the proposed new public streets and private access drives and parking area improvements.

SITE CONDITIONS

Regional and Site Geology

The subject site and/or area is located on the eastern margin of the Portland Basin near where the basin meets the western edge of the Cascade Mountains physiographic province (Orr and Orr, 1999). Bedrock in this region consists of volcanic rocks emplaced tens of millions of years ago, associated with the Columbia River Basalt Group and with volcanics from the Western Cascades province (Gannet and Caldwell, 1998).

The volcanic basement is overlain by silts, sands and gravels of Miocene to Pleistocene age which form the majority of the basin fill in the area. The basin fill sediments generally are mapped as Sandy River Mudstone towards the lower portion of the assemblage in turn overlain by the Troutdale Formation, a series of gravels, sands and silts deposited by the ancestral Columbia River and smaller rivers flowing from the Cascade Mountains (Schlicker and Finlayson, 1979). In the vicinity of Sandy, the Troutdale Formation is overlain by the Springwater Formation, a conglomerate with some volcanoclastic sands, silts, and debris flows derived from the Cascade Range. The conglomerate consists of gravels, cobbles, and boulders of volcanic composition that are strongly and deeply weathered to completely decomposed residual soils often producing a red, fine-grained soil up to 75 feet deep.

Surface Conditions

The proposed new The Views planned development property consists of two (2) generally irregular shaped tax lots (TL's 200 and 500) which encompass a total plan area of approximately 35.32 acres. The proposed The Views planned development property is roughly located to the east of Highway 26 and to the east and west of the intersection with SE Vista Loop Drive. The easterly portion of the subject property (Tax Lot No. 500) is presently unimproved and consists of an existing tree farm while the westerly portion of the subject property (Tax Lot No. 20) is presently improved and contains an existing single-family residential home as well as various detached wooden outbuildings along the westerly site boundary. Surface vegetation across the easterly portion of the site generally consists of a light to moderate growth of grass and weeds as well as brush and numerous small to large sized trees across the easterly portion of the site. Additionally, the easterly portion of the subject property (Tax Lot No. 200) contains three (3) existing seasonal drainage basins.

Topographically, the westerly portion of the subject site (Tax Lot No. 500) is characterized as gently sloping terrain (i.e., less than 5 percent) descending downward towards the west with overall topographic relief estimated at about fifty (50) feet and ranges from a low about Elevation 1128 feet near the northwesterly corner of the subject site to a high of about Elevation 1178 near the southwesterly corner of the site. However, the easterly portion of the subject property (Tax Lot No. 200) is characterized as gently sloping to moderately steep terrain (i.e., 10 to 35 percent) descending downwards from the center of the site towards the north, south and east. Overall topographic relief across the easterly portion of the subject property is estimated at about two hundred feet (200) and ranges from a low of about Elevation 990 feet near the bottom of the existing easterly seasonal drainage basin to a high of about Elevation 1190 feet near the existing westerly residential home site.

Subsurface Soil Conditions

Our understanding of the subsurface soil conditions underlying the site was developed by means of eleven (11) exploratory test pits excavated to depths ranging from about five (5) to eight (8) feet beneath existing site grades on April 15, 2020 with a John Deere 200C track-mounted excavator. The location of the exploratory test pits were located in the field by marking off distances from existing and/or known site features and are shown in relation to the existing site features and/or site improvements on the Site Exploration Plan, Figure No's. 2A and 2B. Detailed logs of the test pit explorations, presenting conditions encountered at each location explored, are presented in the Appendix, Figure No's. A-4 through A-9.

The exploratory test pit excavations were observed by staff from Redmond Geotechnical Services, LLC who logged each of the test pit explorations and obtained representative samples of the subsurface soils encountered across the site. Additionally, the elevation of the exploratory test pit excavations were referenced from a site topographic survey and should be considered as approximate. All subsurface soils encountered at the site and/or within the exploratory test pit excavations were logged and classified in general conformance with the Unified Soil Classification System (USCS) which is outlined on Figure No. A-3.

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The test pit explorations revealed that the subject site is underlain by native soil deposits comprised of residual soils and/or highly weathered bedrock deposits composed of a surficial layer of dark brown, wet, soft, organic, sandy, clayey silt topsoil materials to depths of about 12 to 14 inches. These surficial topsoil materials were in turn underlain by medium to reddish-brown, very moist, medium stiff to stiff, sandy, clayey silt to the maximum depth explored of about eight (8) feet beneath the existing site and/or surface grades. These sandy, clayey silt subgrade soils and/or residual soils (highly weathered bedrock deposits) are best characterized by relatively moderate strength and low to moderate compressibility.

Groundwater

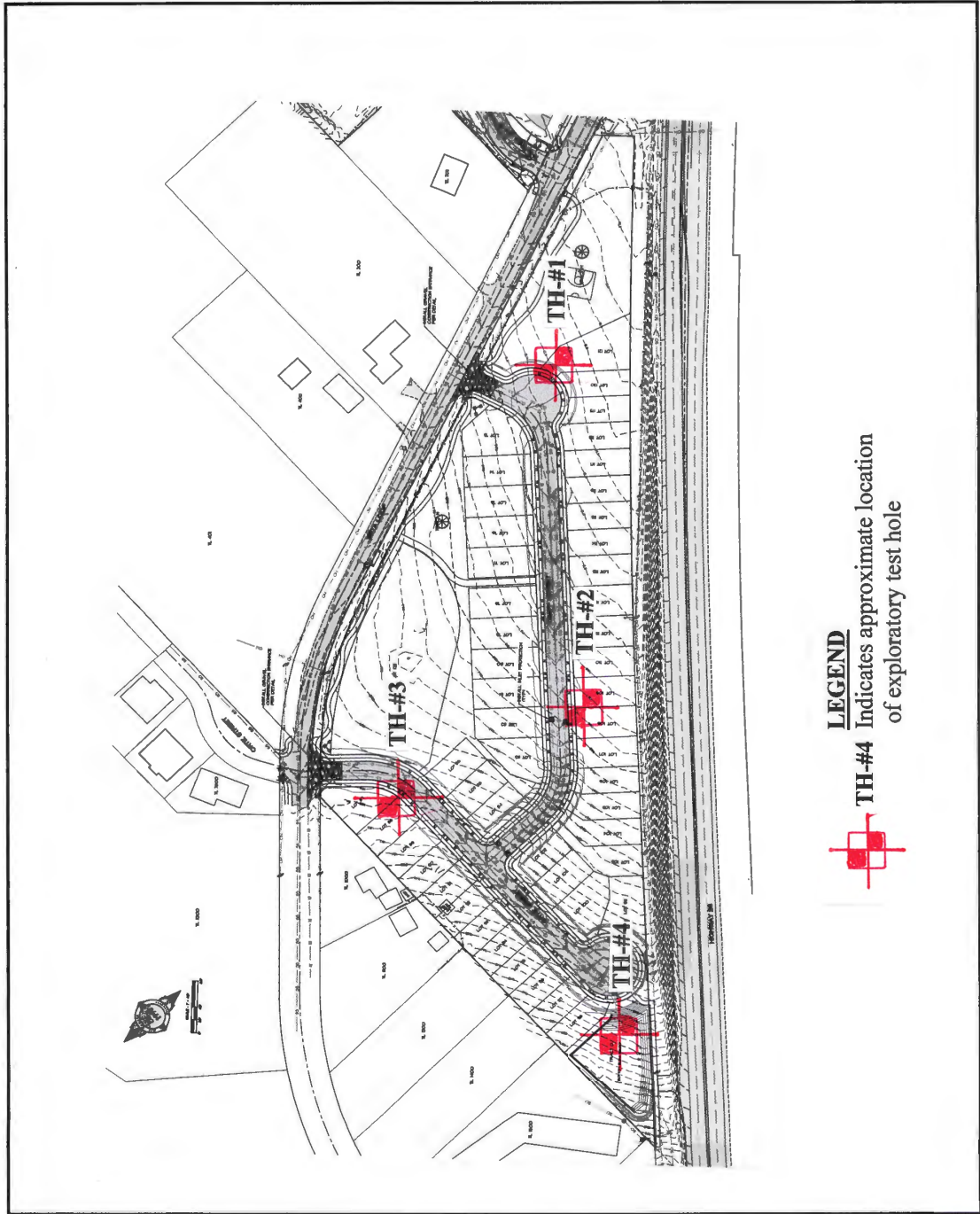
Groundwater was not encountered within any of the exploratory test pit explorations (TH-#1 through TH-#11) at the time of excavation to depths of at least 8.0 feet beneath existing surface grades except. However, the northerly, easterly and southerly portions of the subject property contain existing seasonal drainage basins.

In this regard, groundwater elevations at the site may fluctuate seasonally in accordance with rainfall conditions and/or associated with runoff across the site as well as changes in site utilization. As such, we are generally of the opinion that the static water levels and/or surface water ponding observed and/or not observed during our recent field exploration work generally reflect the seasonal groundwater level(s) at and/or beneath the site.

INFILTRATION TESTING

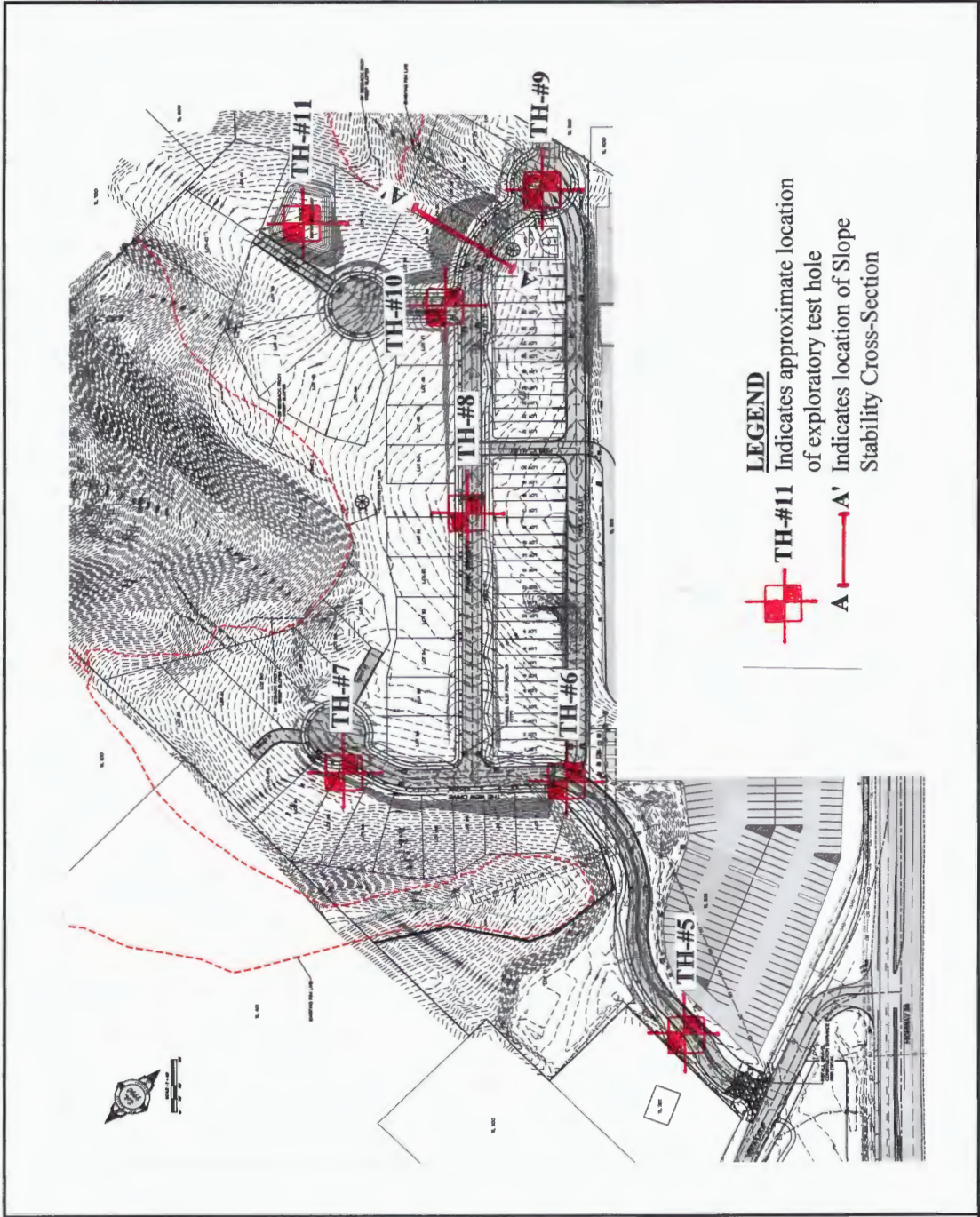
We performed two (2) field infiltration tests at the site on April 15, 2020. The infiltration tests were performed in test holes TH-#4 and TH-#11 at depths of between five (5) and six (6) feet beneath the existing site and/or surface grades. The subgrade soils encountered in the infiltration test hole consisted of sandy, clayey silt. The infiltration testing was performed in general conformance with current EPA and/or the City of Sandy/Clackamas County Encased Falling Head test method which consisted of advancing a 6-inch diameter PVC pipe approximately 6 inches into the exposed soil horizon at each test location. Using a steady water flow, water was discharged into the pipe and allowed to penetrate and saturate the subgrade soils. The water level was adjusted over a two (2) hour period and allowed to achieve a saturated subgrade soil condition consistent with the bottom elevation of the surrounding test pit excavation. Following the required saturating period, water was again added into the PVC pipe and the time and/or rate at which the water level dropped was monitored and recorded. Each measurable drop in the water level was recorded until a consistent infiltration rate was observed and/or repeated.

Based on the results of the field infiltration testing at the site, we have found that the native sandy, clayey silt subgrade soil deposits possess an ultimate infiltration rate on the order of about 0.1 to 0.2 inches per hour (in/hr).



LEGEND
 TH-#4 Indicates approximate location of exploratory test hole

SITE EXPLORATION PLAN		
THE VIEWS		
TAX LOT NO'S. 200 AND 500		
Project No. 1666.002.G		Figure No. 2A



LEGEND
 TH-#11 Indicates approximate location of exploratory test hole
 A-A' Indicates location of Slope Stability Cross-Section

SITE EXPLORATION PLAN

**THE VIEWS
 TAX LOT NO'S. 200 AND 500**

Project No. 1666.002.G

Figure No. 2B

LABORATORY TESTING

Representative samples of the on-site subsurface soils were collected at selected depths and intervals from various test pit excavations and returned to our laboratory for further examination and testing and/or to aid in the classification of the subsurface soils as well as to help evaluate and identify their engineering strength and compressibility characteristics. The laboratory testing consisted of visual and textural sample inspection, moisture content and dry density determinations, maximum dry density and optimum moisture content, gradation analyses and Atterberg Limits as well as direct shear strength and "R"-value tests. Results of the various laboratory tests are presented in the Appendix, Figure No's. A-10 through A-15.

SEISMICITY AND EARTHQUAKE SOURCES

The seismicity of the southwest Washington and northwest Oregon area, and hence the potential for ground shaking, is controlled by three separate fault mechanisms. These include the Cascadia Subduction Zone (CSZ), the mid-depth intraplate zone, and the relatively shallow crustal zone. Descriptions of these potential earthquake sources are presented below.

The CSZ is located offshore and extends from northern California to British Columbia. Within this zone, the oceanic Juan de Fuca Plate is being subducted beneath the continental North American Plate to the east. The interface between these two plates is located at a depth of approximately 15 to 20 kilometers (km). The seismicity of the CSZ is subject to several uncertainties, including the maximum earthquake magnitude and the recurrence intervals associated with various magnitude earthquakes. Anecdotal evidence of previous CSZ earthquakes has been observed within coastal marshes along the Washington and Oregon coastlines. Sequences of interlayered peat and sands have been interpreted to be the result of large Subduction zone earthquakes occurring at intervals on the order of 300 to 500 years, with the most recent event taking place approximately 300 years ago. A study by Geomatrix (1995) and/or USGS (2008) suggests that the maximum earthquake associated with the CSZ is moment magnitude (M_w) 8 to 9. This is based on an empirical expression relating moment magnitude to the area of fault rupture derived from earthquakes that have occurred within Subduction zones in other parts of the world. An M_w 9 earthquake would involve a rupture of the entire CSZ. As discussed by Geomatrix (1995) this has not occurred in other subduction zones that have exhibited much higher levels of historical seismicity than the CSZ. However, the 2008 USGS report has assigned a probability of 0.67 for a M_w 9 earthquake and a probability of 0.33 for a M_w 8.3 earthquake. For the purpose of this study an earthquake of M_w 9.0 was assumed to occur within the CSZ.

The intraplate zone encompasses the portion of the subducting Juan de Fuca Plate located at a depth of approximately 30 to 50 km below western Washington and western Oregon. Very low levels of seismicity have been observed within the intraplate zone in western Oregon and western Washington. However, much higher levels of seismicity within this zone have been recorded in Washington and California. Several reasons for this seismic quiescence were suggested in the Geomatrix (1995) study and include changes in the direction of Subduction between Oregon, Washington, and British Columbia as well as the effects of volcanic activity along the Cascade Range.

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Historical activity associated with the intraplate zone includes the 1949 Olympia magnitude 7.1 and the 1965 Puget Sound magnitude 6.5 earthquakes. Based on the data presented within the Geomatrix (1995) report, an earthquake of magnitude 7.25 has been chosen to represent the seismic potential of the intraplate zone.

The third source of seismicity that can result in ground shaking within the Vancouver and southwest Washington area is near-surface crustal earthquakes occurring within the North American Plate. The historical seismicity of crustal earthquakes in this area is higher than the seismicity associated with the CSZ and the intraplate zone. The 1993 Scotts Mills (magnitude 5.6) and Klamath Falls (magnitude 6.0), Oregon earthquakes were crustal earthquakes.

Liquefaction

Seismic induced soil liquefaction is a phenomenon in which loose, granular soils and some silty soils, located below the water table, develop high pore water pressures and lose strength due to ground vibrations induced by earthquakes. Soil liquefaction can result in lateral flow of material into river channels, ground settlements and increased lateral and uplift pressures on underground structures. Buildings supported on soils that have liquefied often settle and tilt and may displace laterally. Soils located above the ground water table cannot liquefy, but granular soils located above the water table may settle during the earthquake shaking.

Our review of the subsurface soil test pit logs from our exploratory field explorations (TH-#1 through TH-#11) and laboratory test results indicate that the site is generally underlain by medium stiff to stiff, sandy, clayey silt residual soils and/or highly weathered bedrock deposits to depths of at least 8.0 feet beneath existing site grades. Additionally, groundwater was generally not encountered within any of the exploratory test pit excavations (TH-#1 through TH-#11) at the site during our field exploration work.

As such, due to the medium stiff to stiff and/or cohesive nature of the sandy, clayey silt subgrade soils and/or highly weathered bedrock deposits beneath the site, it is our opinion that the native clayey, sandy silt subgrade soil and/or highly weathered bedrock deposits located beneath the subject site have a very low potential for liquefaction during the design earthquake motions previously described.

Landslides

No ancient and/or active landslides were observed or are known to be present on the subject site. Additionally, the subject property does not contain any steep slopes (i.e., greater than 40 percent). As such, development of the subject site into the planned residential development does not appear to present a potential geologic and/or landslide hazard provided that the site grading and development activities conform with the recommendations presented within this report.

Surface Rupture

Although the site is generally located within a region of the country known for seismic activity, no known faults exist on and/or immediately adjacent to the subject site. As such, the risk of surface rupture due to faulting is considered negligible.

Tsunami and Seiche

A tsunami, or seismic sea wave, is produced when a major fault under the ocean floor moves vertically and shifts the water column above it. A seiche is a periodic oscillation of a body of water resulting in changing water levels, sometimes caused by an earthquake. Tsunami and seiche are not considered a potential hazard at this site because the site is not near to the coast and/or there are no adjacent significant bodies of water.

Flooding and Erosion

Stream flooding is a potential hazard that should be considered in lowland areas of Clackamas County and Sandy. The FEMA (Federal Emergency Management Agency) flood maps should be reviewed as part of the design for the proposed new residential structures and site improvements. Elevations of structures on the site should be designed based upon consultants reports, FEMA (Federal Emergency Management Agency), and Clackamas County requirements for the 100-year flood levels of any nearby creeks, streams and/or drainage basins.

SLOPE STABILITY ANALYSIS

For the purpose of evaluating slope stability at the subject site, we performed quantitative slope stability modeling and analyses based upon the existing site conditions and/or the proposed site development plan.

Quantitative slope stability modeling and analyses were performed to evaluate slope stability on the site under the existing and/or post construction in-situ conditions using Slide 7.0 computer program developed by Rocscience, Inc. of Toronto, Ontario, Canada. This numerical analysis program utilizes a two-dimensional limiting equilibrium method to calculate the factor of safety of a potential slip surface, and incorporates search routines to identify the most critical potential failure surfaces for the case(s) analyzed. Factors of safety were calculated using Bishop and Janbu method of slices.

Proposed residential development at the subject site is anticipated to be constructed at and/or above the existing in-situ soil conditions of the existing easterly descending slope at the site and were modeled as a two (2) layer system with the upper layer as sandy, clayey silt structural fill soil and the lower layer as the existing (native) very moist, medium stiff to stiff, sandy, clayey silt residual soils encountered in test holes TH-#1 through TH-#11. Site and slope topography, subsurface geometry, and other site conditions modeled in the analyses are based on a topographic map provided by the client and/or our field measurements. In our analysis, we considered potential groundwater levels to be located greater than 50 feet beneath the site.

For stability calculations, the potential failure model was considered primarily as circular sliding along a basal shear surface. Shear strength parameters used in the model were selected based on soil conditions encountered in the test pits, SPT N-value correlations, and our local experience with similar soil types and geologic conditions. The results of our slope stability analyses for the proposed single-family residential structures constructed above the in-situ subgrade soil conditions on structural fill soils are summarized in Table 2. The slope stability analyses cross-section is presented as an attachment to this report in Appendix B. The location of the cross-section used is indicated on the Site Exploration Plan, Figure No. 2B.

Table 1 - Summary of Estimated In-Situ/Fill Soil Strength Parameters

Geologic Unit	Wet Unit Weight (pcf)	Friction Angle	Cohesion (psf)
STRUCTURAL FILL: sandy, clayey SILT (ML)	100	26	450
Medium stiff, sandy, clayey SILT (ML)	100	24	400

Table 2 - Summary of Slope Stability Analyses for In-Situ/Fill Soil Conditions with Proposed Development

Pre-Construction	Factor of Safety (Static)	Factor of Safety (Seismic)
Cross-Section A-A'	2.882	1.567

The results of the quantitative slope stability modeling and analysis performed using Slide 7.0 computer program indicated an existing in-situ and/or post construction slope stability factor of safety (FS) under static and seismic loading greater than 1.5 and 1.2 (see Slope Stability Results in Appendix B). In our opinion, the calculated factor of safety is adequate for the proposed residential construction and development of the subject site as we understand it.

CONCLUSIONS AND RECOMMENDATIONS

General

Based on the results of our field explorations, laboratory testing, and engineering analyses, it is our opinion that the site is presently stable and suitable for the proposed new The Views planned development and its associated site improvements provided that the recommendations contained within this report are properly incorporated into the design and construction of The Views planned development project.

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The primary features of concern at the site are 1) the presence of highly moisture sensitive clayey and silty subgrade soils across the site, 2) the presence of gently to moderately steep sloping site conditions across the site and 3) the relatively low infiltration rates anticipated within the near surface clayey and silty subgrade soils.

With regard to the moisture sensitive clayey and silty subgrade soils, we are generally of the opinion that all site grading and earthwork activities be scheduled for the drier summer months which is typically June through September. In regards to the gently to moderately steep sloping site conditions across the site, we are of the opinion that site grading and/or structural fill placement should be minimized where possible and should generally limit cuts and/or fills to about fifteen (15) feet unless approved by the Geotechnical Engineer. Additionally, where existing site slopes and/or surface grades exceed about 20 percent (1V:5H) and in order to construct the proposed new site improvements, benching and keying of all fills into the natural site slopes will be required. Further, due to the presence of the existing seasonal drainage basins at the site, the use of subdrains will be required beneath all structural fills and/or within all fill slopes. In addition to the above, we recommend that each lot which borders the moderately steep slopes (Lots 33 through 40 and Lots 57 through 71) engage a Geotechnical Engineer to provide site specific design and construction recommendations for the proposed single-family residential structure. With regard to the relatively low infiltration rates anticipated within the clayey and silty subgrade soils beneath the site, we generally do not recommend any storm water detention and/or infiltration within structural and/or embankment fills. However, storm water detention and some infiltration may be feasible within storm water detention basins excavated into the existing medium stiff to stiff, sandy, clayey silt residual soils. In this regard, we recommend that all proposed storm water detention and/or infiltration systems for the project be reviewed and approved by Redmond Geotechnical Services, LLC.

The following sections of this report provide specific recommendations regarding subgrade preparation and grading as well as foundation and floor slab design and construction for the new The Views planned development project.

Site Preparation

As an initial step in site preparation, we recommend that the proposed new The Views planned development site as well as any associated structural and/or site improvement area(s) be stripped and cleared of all existing improvements, any existing unsuitable fill materials, surface debris, existing vegetation, topsoil materials, and/or any other deleterious materials present at the time of construction. In general, we envision that the site stripping to remove existing vegetation and topsoil materials will generally be about 12 inches. However, localized areas requiring deeper removals, such as any existing undocumented and/or unsuitable fill materials as well as old foundation remnants, will likely be encountered and should be evaluated at the time of construction by the Geotechnical Engineer. The stripped and cleared materials should be properly disposed of as they are generally considered unsuitable for use/reuse as fill materials.

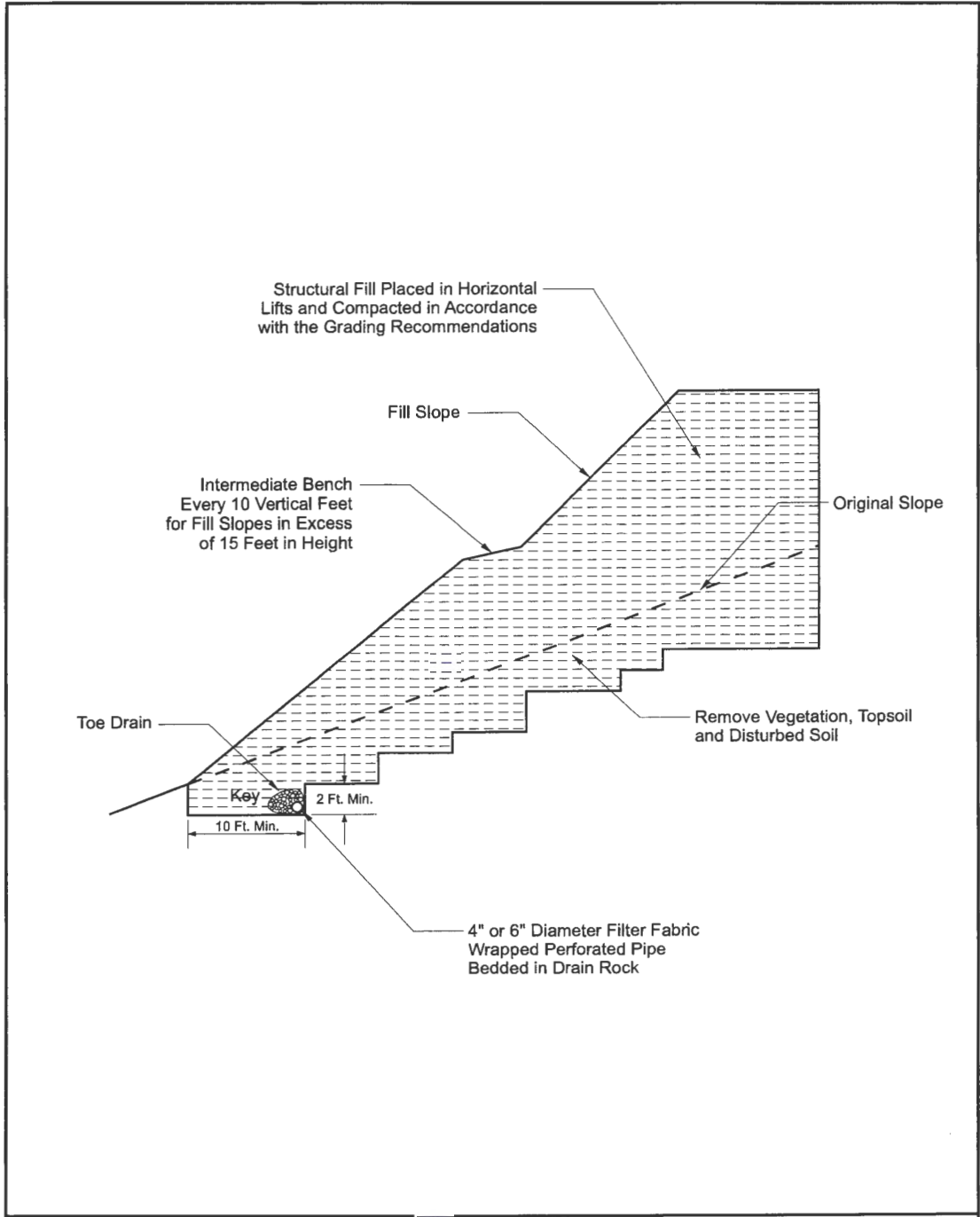
Following the completion of the site stripping and clearing work and prior to the placement of any required structural fill materials and/or structural improvements, the exposed subgrade soils within the planned structural improvement area(s) should be inspected and approved by the Geotechnical Engineer and possibly proof-rolled with a half and/or fully loaded dump truck. Areas found to be soft or otherwise unsuitable should be over-excavated and removed or scarified and recompacted as structural fill. During wet and/or inclement weather conditions, proof rolling and/or scarification and recompaction as noted above may not be appropriate.

The on-site native sandy, clayey silt subgrade soil materials are generally considered suitable for use/reuse as structural fill materials provided that they are free of organic materials, debris, and rock fragments in excess of about 6 inches in dimension. However, if site grading is performed during wet or inclement weather conditions, the use of some of the on-site native soil materials which contain significant silt and clay sized particles will be difficult at best. In this regard, during wet or inclement weather conditions, we recommend that an import structural fill material be utilized which should consist of a free-draining (clean) granular fill (sand & gravel) containing no more than about 5 percent fines. Representative samples of the materials which are to be used as structural fill materials should be submitted to the Geotechnical Engineer and/or laboratory for approval and determination of the maximum dry density and optimum moisture content for compaction.

In general, all site earthwork and grading activities should be scheduled for the drier summer months (June through September) if possible. However, if wet weather site preparation and grading is required, it is generally recommended that the stripping of topsoil materials be accomplished with a tracked excavator utilizing a large smooth-toothed bucket working from areas yet to be excavated. Additionally, the loading of strippings into trucks and/or protection of moisture sensitive subgrade soils will also be required during wet weather grading and construction. In this regard, we recommend that areas in which construction equipment will be traveling be protected by covering the exposed subgrade soils with a geotextile fabric such as Mirafi FW404 followed by at least 12 inches or more of crushed aggregate base rock. Further, the geotextile fabric should have a minimum Mullen burst strength of at least 250 pounds per square inch for puncture resistance and an apparent opening size (AOS) between the U.S. Standard No. 70 and No. 100 sieves.

All structural fill materials placed within the new building and/or pavement areas should be moistened or dried as necessary to near (within 3 percent) optimum moisture conditions and compacted by mechanical means to a minimum of 92 percent of the maximum dry density as determined by the ASTM D-1557 (AASHTO T-180) test procedures. Structural fill materials should be placed in lifts (layers) such that when compacted do not exceed about 8 inches. Additionally, all fill materials placed within five (5) lineal feet of the perimeter (limits) of the proposed single-family and/or multi-family structures and/or pavements should be considered structural fill. Additionally, due to the sloping site conditions, we recommend that all structural fill materials planned in areas where existing surface and/or slope gradients exceed about 20 percent (1V:5H) be properly benched and/or keyed into the native (natural) slope subgrade soils. In general, a bench width of about eight (8) to ten (10) feet and a keyway depth of about one (1) to one and one-half (1.5) feet is recommended (see Typical Fill Slope Key and Bench Detail, Figure No. 3).

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TYPICAL FILL SLOPE KEY AND BENCH DETAIL

Project No. 1666.002.G	THE VIEWS TAX LOT NO'S. 200 AND 500	Figure No. 3
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However, the actual bench width and keyway depth should be determined at the time of construction by the Geotechnical Engineer. Further, all fill slopes should be constructed with a finish slope surface gradient no steeper than about 2H:1V. All aspects of the site grading, including a review of the proposed site grading plan(s), should be approved and/or monitored by a representative of Redmond Geotechnical Services, LLC.

Foundation Support

Based on the results of our investigation, it is our opinion that the site of the proposed new The Views planned development is suitable for support of the planned single- and/or three-story wood-frame structures provided that the following foundation design recommendations are followed. The following sections of this report present specific foundation design and construction recommendations for the planned new single-family and/or multi-family structures.

Shallow Foundations

In general, conventional shallow continuous (strip) footings and individual (spread) column footings may be supported by approved native (untreated) subgrade soil materials and/or clayey silt structural fill soils based on an allowable contact bearing pressure of about 2,000 pounds per square foot (psf). This recommended allowable contact bearing pressure is intended for dead loads and sustained live loads and may be increased by one-third for the total of all loads including short-term wind or seismic loads. In general, continuous strip footings should have a minimum width of at least 16 inches and be embedded at least 18 inches below the lowest adjacent finish grade (includes frost protection). Individual column footings (where required) should be embedded at least 18 inches below grade and have a minimum width of at least 24 inches. Additionally, if foundation excavation and construction work is planned to be performed during wet and/or inclement weather conditions, we recommend that a 2- to 4-inch layer of compacted crushed rock be used to help protect the exposed foundation bearing surfaces until the placement of concrete.

Total and differential settlements of foundations constructed as recommended above and supported by approved native subgrade soils or by properly compacted structural fill materials are expected to be well within the tolerable limits for this type of wood-frame structure and should generally be less than about 1-inch and 1/2-inch, respectively.

Allowable lateral frictional resistance between the base of the footing element and the supporting subgrade bearing soil can be expressed as the applied vertical load multiplied by a coefficient of friction of 0.30 and 0.45 for native silty subgrade soils and/or import gravel fill materials, respectively. In addition, lateral loads may be resisted by passive earth pressures on footings poured "neat" against in-situ (native) subgrade soils or properly backfilled with structural fill materials based on an equivalent fluid density of 250 pounds per cubic foot (pcf). This recommended value includes a factor of safety of approximately 1.5 which is appropriate due to the amount of movement required to develop full passive resistance.

Floor Slab Support

In order to provide uniform subgrade reaction beneath concrete slab-on-grade floors, we recommend that the floor slab area be underlain by a minimum of 6 inches of free-draining (less than 5 percent passing the No. 200 sieve), well-graded, crushed rock. The crushed rock should help provide a capillary break to prevent migration of moisture through the slab. However, additional moisture protection can be provided by using a 10-mil polyolefin geo-membrane sheet such as StegoWrap.

The base course materials should be compacted to at least 95 percent of the maximum dry density as determined by the ASTM D-1557 (AASHTO T-180) test procedures. Where floor slab subgrade materials are undisturbed, firm and stable and where the underslab aggregate base rock section has been prepared and compacted as recommended above, we recommend that a modulus of subgrade reaction of 150 pci be used for design.

Retaining/Below Grade Walls

Retaining and/or below grade walls should be designed to resist lateral earth pressures imposed by native soils or granular backfill materials as well as any adjacent surcharge loads. For walls which are unrestrained at the top and free to rotate about their base, we recommend that active earth pressures be computed on the basis of the following equivalent fluid densities:

Non-Restrained Retaining Wall Pressure Design Recommendations

Slope Backfill (Horizontal/Vertical)	Equivalent Fluid Density/Silt (pcf)	Equivalent Fluid Density/Gravel (pcf)
Level	35	30
3H:1V	60	50
2H:1V	90	80

For walls which are fully restrained at the top and prevented from rotation about their base, we recommend that at-rest earth pressures be computed on the basis of the following equivalent fluid densities:

Restrained Retaining Wall Pressure Design Recommendations

Slope Backfill (Horizontal/Vertical)	Equivalent Fluid Density/Silt (pcf)	Equivalent Fluid Density/Gravel (pcf)
Level	45	35
3H:1V	65	60
2H:1V	95	90

The above recommended values assume that the walls will be adequately drained to prevent the buildup of hydrostatic pressures. Where wall drainage will not be present and/or if adjacent surcharge loading is present, the above recommended values will be significantly higher.

Backfill materials behind walls should be compacted to 90 percent of the maximum dry density as determined by the ASTM D-1557 (AASHTO T-180) test procedures. Special care should be taken to avoid over-compaction near the walls which could result in higher lateral earth pressures than those indicated herein. In areas within three (3) to five (5) feet behind walls, we recommend the use of hand-operated compaction equipment.

Pavements

Flexible pavement design for the proposed new public street improvements as well as the proposed new private drives and parking area improvements for The Views planned development was determined in accordance with the City of Sandy and/or Clackamas County Department of Public Works standards.

The subgrade soil samples collected at the site were tested in the laboratory in accordance with the ASTM Vol. 4.08 Part D-2844-69 (AASHTO T-190-93) test method for the determination of the subgrade soil "R"-value and expansion pressure. The results of the "R"-value testing was then converted to an equivalent Resilient Modulus (M_{RSg}) in accordance with current AASHTO methodology. The results of the laboratory "R"-value tests revealed that the subgrade soils have an apparent "R"-value of between 29 and 31 with an average "R"-value of 30 (see Figure No. A-15). Using the current AASHTO methodology for converting "R"-value to Resilient Modulus (M_{RSg}), the subgrade soils have a Resilient Modulus (M_{RSg}) of about 6,070 psi which is classified a "Fair" (M_{RSg} = 5,000 psi to 10,000 psi). Based on the above, we recommend that the asphaltic concrete pavement section(s) for the new The Views planned development areas at the site consist of the following:

Collector Streets

The following documents and/or design input parameters were used to help determine the flexible pavement section design for improvements to new and/or existing Collector Streets:

- . **Street Classification:** Collector Street
- . **Design Life:** 20 years
- . **Serviceability:** 4.2 initial, 2.5 terminal
- . **Traffic Loading Data:** 1,000,000 18-kip EAL's
- . **Reliability Level:** 90%
- . **Drainage Coefficient:** 1.0 (asphalt), 0.8 (aggregate)
- . **Asphalt Structural Coefficient:** 0.41
- . **Aggregate Structural Coefficient:** 0.10

Based on the above design input parameters and using the design procedures contained within the AASHTO 1993 Design of Pavement Structures Manual, a Structural Number (SN) of 4.1 was determined. In this regard, we recommend the following flexible pavement section for the new improvements to new and/or existing Collector Streets:

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<u>Material Type</u>	<u>Pavement Section (inches)</u>
Asphaltic Concrete	5.0
Aggregate Base Rock	14.0

Local Residential Streets

The following documents and/or design input parameters were used to help determine the flexible pavement section design for new local residential streets:

- . **Street Classification:** Local Residential Street
- . **Design Life:** 25 years
- . **Serviceability:** 4.2 initial, 2.5 terminal
- . **Traffic Loading Data:** 100,000 18-kip EAL's
- . **Reliability Level:** 90%
- . **Drainage Coefficient:** 1.0 (asphalt), 0.8 (aggregate)
- . **Asphalt Structural Coefficient:** 0.41
- . **Aggregate Structural Coefficient:** 0.10

Based on the above design input parameters and using the design procedures contained within the AASHTO 1993 Design of Pavement Structures Manual, a Structural Number (SN) of 2.6 was determined. In this regard, we recommend the following flexible pavement section for the construction of new Local Residential Streets:

<u>Material Type</u>	<u>Pavement Section (inches)</u>
Asphaltic Concrete	4.0
Aggregate Base Rock	10.0

Private Access Drives and Parking Areas

We recommend that the asphaltic concrete pavement section(s) for any private access drives and parking areas associated with The Views planned development areas consist of the following:

	<u>Asphaltic Concrete Thickness (inches)</u>	<u>Crushed Base Rock Thickness (inches)</u>
Automobile Parking Areas	3.0	8.0
Automobile Drive Areas	3.5	10.0

Note: Where heavy vehicle traffic is anticipated such as those required for fire and/or garbage trucks, we recommend that the automobile drive area pavement section be increased by adding 0.5 inches of asphaltic concrete and 2.0 inches of aggregate base rock. Additionally, the above recommended flexible pavement section(s) assumes a design life of 20 years.

Pavement Subgrade, Base Course & Asphalt Materials

The above recommended pavement section(s) were based on the design assumptions listed herein and on the assumption that construction of the pavement section(s) will be completed during an extended period of reasonably dry weather. All thicknesses given are intended to be the minimum acceptable. Increased base rock sections and the use of a woven geotextile fabric may be required during wet and/or inclement weather conditions and/or in order to adequately support construction traffic and protect the subgrade during construction. Additionally, the above recommended pavement section(s) assume that the subgrade will be prepared as recommended herein, that the exposed subgrade soils will be properly protected from rain and construction traffic, and that the subgrade is firm and unyielding at the time of paving. Further, it assumes that the subgrade is graded to prevent any ponding of water which may tend to accumulate in the base course.

Pavement base course materials should consist of well-graded 1-1/2 inch and/or 3/4-inch minus crushed base rock having less than 5 percent fine materials passing the No. 200 sieve. The base course and asphaltic concrete materials should conform to the requirements set forth in the latest edition of the Oregon Department of Transportation, Standard Specifications for Highway Construction. The base course materials should be compacted to at least 95 percent of the maximum dry density as determined by the ASTM D-1557 (AASHTO T-180) test procedures. The asphaltic concrete paving materials should be compacted to at least 92 percent of the theoretical maximum density as determined by the ASTM D-2041 (Rice Gravity) test method.

Wet Weather Grading and Soft Spot Mitigation

Construction of the proposed new paved site improvements is generally recommended during dry weather. However, during wet weather grading and construction, excavation to subgrade can proceed during periods of light to moderate rainfall provided that the subgrade remains covered with aggregate. A total aggregate thickness of 8- to 12-inches may be necessary to protect the subgrade soils from heavy construction traffic. Construction traffic should not be allowed directly on the exposed subgrade but only atop a sufficient compacted base rock thickness to help mitigate subgrade pumping. If the subgrade becomes wet and pumps, no construction traffic shall be allowed on the road alignment. Positive site drainage shall be maintained if site paving will not occur before the on-set of the wet season.

Depending on the timing for the project, any soft subgrade found during proof-rolling or by visual observations can either be removed and replaced with properly dried and compacted fill soils or removed and replaced with compacted crushed aggregate. However, and where approved by the Geotechnical Engineer, the soft area may be covered with a bi-axial geogrid and covered with compacted crushed aggregate.

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Soil Shrink-Swell and Frost Heave

The results of the laboratory "R"-value tests indicate that the native subgrade soils possess a low to moderate expansion potential. As such, the exposed subgrade soils should not be allowed to completely dry and should be moistened to near optimum moisture content (plus or minus 3 percent) at the time of the placement of the crushed aggregate base rock materials. Additionally, exposure of the subgrade soils to freezing weather may result in frost heave and softening of the subgrade. As such, all subgrade soils exposed to freezing weather should be evaluated and approved by the Geotechnical Engineer prior to the placement of the crushed aggregate base rock materials.

Excavation/Slopes

Temporary excavations of up to about four (4) feet in depth may be constructed with near vertical inclinations. Temporary excavations greater than about four (4) feet but less than eight (8) feet should be excavated with inclinations of at least 1 to 1 (horizontal to vertical) or properly braced/shored. Where excavations are planned to exceed about eight (8) feet, this office should be consulted. All shoring systems and/or temporary excavation bracing for the project should be the responsibility of the excavation contractor. Permanent slopes should be constructed no steeper than about 2H to 1V unless approved by the Geotechnical Engineer.

Depending on the time of year in which trench excavations occur, trench dewatering may be required in order to maintain dry working conditions if the invert elevations of the proposed utilities are located at and/or below the groundwater level. If groundwater is encountered during utility excavation work, we recommend placing trench stabilization materials along the base of the excavation.

Trench stabilization materials should consist of 1-foot of well-graded gravel, crushed gravel, or crushed rock with a maximum particle size of 4 inches and less than 5 percent fines passing the No. 200 sieve. The material should be free of organic matter and other deleterious material and placed in a single lift and compacted until well keyed.

Surface Drainage/Groundwater

We recommend that positive measures be taken to properly finish grade the site so that drainage waters from the residential structures and landscaping areas as well as adjacent properties or buildings are directed away from the new single- and/or multi-family residential structures foundations and/or floor slabs. All roof drainage should be directed into conduits that carry runoff water away from the residential structures to a suitable outfall. Roof downspouts should not be connected to foundation drains. A minimum ground slope of about 2 percent is generally recommended in unpaved areas around the proposed new residential structures.

Groundwater was not encountered at the site within any of the exploratory test pits excavated at the site at the time of excavation to depths of up to 8.0 feet beneath existing site grades. However, the northerly, easterly and southerly portion(s) of the site contain existing seasonal drainage basins. Further, groundwater elevations in the area and/or across the subject property may fluctuate seasonally and may temporarily pond/perch near the ground surface during periods of prolonged rainfall.

As such, based on our current understand of the possible site grading required to bring the subject site to finish design grade(s), we are of the opinion that an underslab drainage system is generally not required for the proposed multi-family residential structures. However, a perimeter foundation drain is recommended for any perimeter footings and/or below grade retaining walls. A typical recommended perimeter footing/retaining wall drain detail is shown on Figure No. 4. Additionally, a subdrain is recommended beneath and/or within all structural fills which are constructed within and/or above the existing seasonal drainage basins. Further, due to our understanding that various storm water detention and/or infiltration basins will be utilized for the project as well as the relatively low infiltration rates of the near surface sandy, clayey silt subgrade soils and/or highly weathered bedrock deposits anticipated within and/or near to the foundation bearing level of the proposed residential structures, we are generally of the opinion that storm water detention basins and/or infiltration systems should not be utilized around and/or up-gradient of the proposed residential structures unless approved by the Geotechnical Engineer.

Design Infiltration Rates

Based on the results of our field infiltration testing, we recommend using the following infiltration rate to design any on-site near surface storm water infiltration and/or disposal systems for the project:

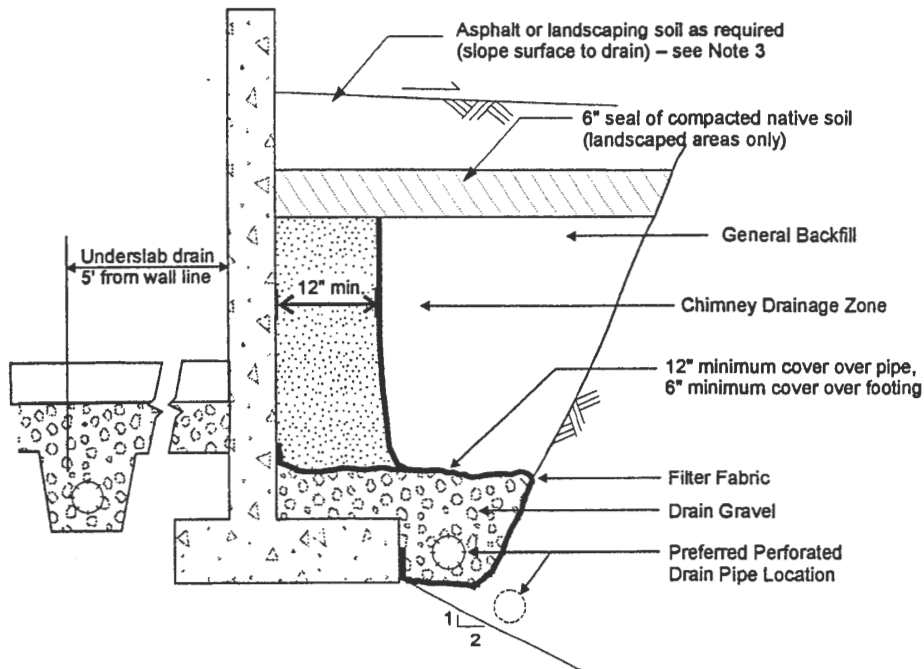
Subgrade Soil Type	Recommended Infiltration Rate
sandy, clayey SILT (ML)	less than 0.1 inches per hour (in/hr)

Note: A safety factor of two (2) was used to calculate the above recommended design infiltration rate. Additionally, given the gradational variability of the on-site sandy, clayey sit subgrade soils beneath the site as well as the anticipation of some site grading for the project, it is generally recommended that field testing be performed during and/or following construction of any on-site storm water infiltration system(s) in order to confirm that the above recommended design infiltration rates are appropriate.

Seismic Design Considerations

Structures at the site should be designed to resist earthquake loading in accordance with the methodology described in the 2019 and/or latest edition of the State of Oregon Structural Specialty Code (OSSC) and/or Amendments to the 2015 International Building Code (IBC).

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SCHEMATIC - NOT TO SCALE

NOTES:

1. Filter Fabric to be non-woven geotextile (Amoco 4545, Mirafi 140N, or equivalent)
2. Lay perforated drain pipe on minimum 0.5% gradient, widening excavation as required. Maintain pipe above 2:1 slope, as shown.
3. All-granular backfill is recommended for support of slabs, pavements, etc. (see text for structural fill).
4. Drain gravel to be clean, washed ¾" to 1½" gravel.
5. General backfill to be on-site gravels, or ¾"-0 or 1½"-0 crushed rock compacted to 92% Modified Proctor (AASHTO T-180).
6. Chimney drainage zone to be 12" wide (minimum) zone of clean washed, medium to coarse sand or drain gravel if protected with filter fabric. Alternatively, prefabricated drainage structures (Miradrain 6000 or similar) may be used.

PERIMETER FOOTING/RETAINING WALL DRAIN DETAIL

Project No. 1666.002.G	THE VIEWS TAX LOT NO'S. 200 AND 500	Figure No. 4
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The maximum considered earthquake ground motion for short period and 1.0 period spectral response may be determined from the Oregon Structural Specialty Code and/or from the National Earthquake Hazard Reduction Program (NEHRP) "Recommended Provisions for Seismic Regulations for New Buildings and Other Structures" published by the Building Seismic Safety Council. We recommend Site Class "D" be used for design. Using this information, the structural engineer can select the appropriate site coefficient values (F_a and F_v) from the 2015 IBC and/or ASCE 7-16 to determine the maximum considered earthquake spectral response acceleration for the project. However, we have assumed the following response spectrum for the project:

Table 1. Recommended Seismic Design Parameters

Site Class	S_s	S_1	F_a	F_v	S_{M5}	S_{M1}	S_{D5}	S_{D1}
D	0.698	0.311	1.241	1.989	0.867	0.619	0.578	0.413

Notes: 1. S_s and S_1 were established based on the ASCE 7-16 mapped maximum considered earthquake spectral acceleration maps for 2% probability of exceedence in 50 years.

2. F_a and F_v were established based on the ASCE 7-16 using the selected S_s and S_1 values.

CONSTRUCTION MONITORING AND TESTING

We recommend that **Redmond Geotechnical Services, LLC** be retained to provide construction monitoring and testing services during all earthwork operations for the proposed new The Views planned development. The purpose of our monitoring services would be to confirm that the site conditions reported herein are as anticipated, provide field recommendations as required based on the actual conditions encountered, document the activities of the grading contractor and assess his/her compliance with the project specifications and recommendations. It is important that our representative meet with the contractor prior to any site grading to help establish a plan that will minimize costly over-excavation and site preparation work. Of primary importance will be observations made during site preparation and stripping, structural fill placement, footing excavations and construction as well as retaining wall backfill.

CLOSURE AND LIMITATIONS

This report is intended for the exclusive use of the addressee and/or their representative(s) to use to design and construct the proposed new single- and/or multi-family residential structures and their associated site improvements described herein as well as to prepare any related construction documents. The conclusions and recommendations contained in this report are based on site conditions as they presently exist and assume that the explorations are representative of the subsurface conditions between the explorations and/or at other locations across the study area. The data, analyses, and recommendations herein may not be appropriate for other structures and/or purposes.

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We recommend that parties contemplating other structures and/or purposes contact our office. In the absence of our written approval, we make no representation and assume no responsibility to other parties regarding this report. Additionally, the above recommendations are contingent on Redmond Geotechnical Services, LLC being retained to provide all site inspections and construction monitoring services for this project. Redmond Geotechnical Services, LLC will not assume any responsibility and/or liability for any engineering judgment, inspection and/or testing services performed by others.

It is the owners/developers responsibility for insuring that the project designers and/or contractors involved with this project implement our recommendations into the final design plans, specifications and/or construction activities for the project. Further, in order to avoid delays during construction, we recommend that the final design plans and specifications for the project be reviewed by our office to evaluate as to whether our recommendations have been properly interpreted and incorporated into the project.

If during any future site grading and construction, subsurface conditions different from those encountered in the explorations are observed or appear to be present beneath excavations, we should be advised immediately so that we may review these conditions and evaluate whether modifications of the design criteria are required. We also should be advised if significant modifications of the proposed site development are anticipated so that we may review our conclusions and recommendations.

LEVEL OF CARE

The services performed by the Geotechnical Engineer for this project have been conducted with that level of care and skill ordinarily exercised by members of the profession currently practicing in the area under similar budget and time restraints. No warranty or other conditions, either expressed or implied, is made.

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Appendix "A"

Test Pit Logs and Laboratory Test Data

APPENDIX

FIELD EXPLORATIONS AND LABORATORY TESTING

FIELD EXPLORATION

Subsurface conditions at the site were explored by excavating eleven (11) exploratory test pits (TH-#1 through TH-#11) on April 15, 2020. The approximate location of the test pit explorations are shown in relation to the existing site features and/or site improvements on the Site Exploration Plan, Figure No's. 2A and 2B.

The test pits were excavated using track-mounted excavating equipment in general conformance with ASTM Methods in Vol. 4.08, D-1586-94 and D-1587-83. The test pits were excavated to depths ranging from about 5.0 to 8.0 feet beneath existing site grades. Detailed logs of the test pits are presented on the Log of Test Pits, Figure No's. A-4 through A-9. The soils were classified in accordance with the Unified Soil Classification System (USCS), which is outlined on Figure No. A-3.

The exploration program was coordinated by a field engineer who monitored the excavating and exploration activity, obtained representative samples of the subsurface soils encountered, classified the soils by visual and textural examination, and maintained continuous logs of the subsurface conditions. Disturbed and/or undisturbed samples of the subsurface soils were obtained at appropriate depths and/or intervals and placed in plastic bags and/or with a thin walled ring sample.

Groundwater was not encountered within any of the exploratory test pits (TH-#1 through TH-#11) at the time of excavating to depths of up to 8.0 feet beneath existing surface grades.

LABORATORY TESTING

Pertinent physical and engineering characteristics of the soils encountered during our subsurface investigation were evaluated by a laboratory testing program to be used as a basis for selection of soil design parameters and for correlation purposes. Selected tests were conducted on representative soil samples. The program consisted of tests to evaluate the existing (in-situ) moisture-density, maximum dry density and optimum moisture content, Atterberg Limits and gradational characteristics as well as direct shear strength and "R"-value tests.

Dry Density and Moisture Content Determinations

Density and moisture content determinations were performed on both disturbed and relatively undisturbed samples from the test pit explorations in general conformance with ASTM Vol. 4.08 Part D-216. The results of these tests were used to calculate existing overburden pressures and to correlate strength and compressibility characteristics of the soils. Test results are shown on the test pit logs at the appropriate sample depths.

A-2

Maximum Dry Density

Two (2) Maximum Dry Density and Optimum Moisture Content tests were performed on representative samples of the on-site sandy, clayey silt subgrade soils in accordance with ASTM Vol. 4.08 Part D-1557. This test was conducted to help establish various engineering properties for use as structural fill. The test results are presented on Figure No. A-10.

Atterberg Limits

Two (2) Liquid Limit (LL) and Plastic Limit (PL) tests were performed on representative samples of the sandy, clayey silt subgrade soils in accordance with ASTM Vol. 4.08 Part D-4318-85. These tests were conducted to facilitate classification of the soils and for correlation purposes. The test results appear on Figure No. A-11.

Gradation Analysis

Two (2) Gradation analyses were performed on representative samples of the sandy, clayey silt subsurface soils in accordance with ASTM Vol. 4.08 Part D-422. The test results were used to classify the soil in accordance with the Unified Soil Classification System (USCS). The test results are shown graphically on Figure No. A-12.

Direct Shear Strength Test

Two (2) Direct Shear Strength tests were performed on undisturbed and/or remolded samples of the sandy, clayey silt subgrade soils at a continuous rate of shearing deflection (0.02 inches per minute) in accordance with ASTM Vol. 4.08 Part D-3080-79. The test results were used to determine engineering strength properties and are shown graphically on Figure No's. A-13 and A-14.

"R"-Value Tests

Two (2) "R"-value tests were performed on remolded samples of the sandy, clayey silt subgrade soils in accordance with ASTM Vol. 4.08 Part D-2844. The test results were used to help evaluate the subgrade soils supporting and performance capabilities when subjected to traffic loading. The test results are shown on Figure No. A-15.

The following figures are attached and complete the Appendix:

Figure No. A-3	Key To Exploratory Test Pit Logs
Figure No's. A-4 through A-9	Log of Test Pits
Figure No. A-10	Maximum Dry Density
Figure No. A-11	Atterberg Limits Test Results
Figure No. A-12	Gradation Test Results
Figure No's. A-13 and A-14	Direct Shear Strength Test Results
Figure No. A-15	Results of "R"-Value Tests
Figure No's. A-16 and A-17	Field Infiltration Test Results

REDMOND GEOTECHNICAL SERVICES

PRIMARY DIVISIONS			GROUP SYMBOL	SECONDARY DIVISIONS
COARSE GRAINED SOILS MORE THAN HALF OF MATERIAL IS LARGER THAN NO. 200 SIEVE SIZE	GRAVELS MORE THAN HALF OF COARSE FRACTION IS LARGER THAN NO. 4 SIEVE	CLEAN GRAVELS (LESS THAN 5% FINES)	GW	Well graded gravels, gravel-sand mixtures, little or no fines.
			GP	Poorly graded gravels or gravel-sand mixtures, little or no fines.
		GRAVEL WITH FINES	GM	Silty gravels, gravel-sand-silt mixtures, non-plastic fines.
			GC	Clayey gravels, gravel-sand-clay mixtures, plastic fines.
	SANDS MORE THAN HALF OF COARSE FRACTION IS SMALLER THAN NO. 4 SIEVE	CLEAN SANDS (LESS THAN 5% FINES)	SW	Well graded sands, gravelly sands, little or no fines.
			SP	Poorly graded sands or gravelly sands, little or no fines.
		SANDS WITH FINES	SM	Silty sands, sand-silt mixtures, non-plastic fines.
			SC	Clayey sands, sand-clay mixtures, plastic fines.
FINE GRAINED SOILS MORE THAN HALF OF MATERIAL IS SMALLER THAN NO. 200 SIEVE SIZE	SILTS AND CLAYS LIQUID LIMIT IS LESS THAN 50%		ML	Inorganic silts and very fine sands, rock flour, silty, or clayey fine sands or clayey silts with slight plasticity.
			CL	Inorganic clays of low to medium plasticity, gravelly clays, sandy clays, silty clays, lean clays.
			OL	Organic silts and organic silty clays of low plasticity.
	SILTS AND CLAYS LIQUID LIMIT IS GREATER THAN 50%		MH	Inorganic silts, micaceous or diatomaceous fine sandy or silty soils, elastic silts.
			CH	Inorganic clays of high plasticity, fat clays.
			OH	Organic clays of medium to high plasticity, organic silts.
HIGHLY ORGANIC SOILS			Pt	Peat and other highly organic soils.

DEFINITION OF TERMS

	U.S. STANDARD SERIES SIEVE				CLEAR SQUARE SIEVE OPENINGS				
	200	40	10	4	3/4"	3"	12"		
SILTS AND CLAYS	SAND			GRAVEL		COBBLES	BOULDERS		
	FINE	MEDIUM	COARSE	FINE	COARSE				

GRAIN SIZES

SANDS, GRAVELS AND NON-PLASTIC SILTS	BLOWS/FOOT †
VERY LOOSE	0 - 4
LOOSE	4 - 10
MEDIUM DENSE	10 - 30
DENSE	30 - 50
VERY DENSE	OVER 50


CLAYS AND PLASTIC SILTS	STRENGTH ‡	BLOWS/FOOT †
VERY SOFT	0 - 1/4	0 - 2
SOFT	1/4 - 1/2	2 - 4
FIRM	1/2 - 1	4 - 8
STIFF	1 - 2	8 - 16
VERY STIFF	2 - 4	16 - 32
HARD	OVER 4	OVER 32

RELATIVE DENSITY

† Number of blows of 140 pound hammer falling 30 inches to drive a 2 inch O.D. (1-3/8 inch I.D.) split spoon (ASTM D-1586).

‡ Unconfined compressive strength in tons/sq. ft. as determined by laboratory testing or approximated by the standard penetration test (ASTM D-1586), pocket penetrometer, torvane, or visual observation.

CONSISTENCY

 <p>REDMOND GEOTECHNICAL SERVICES PO Box 20547 • PORTLAND, OREGON 97294</p>	KEY TO EXPLORATORY TEST PIT LOGS Unified Soil Classification System (ASTM D-2487)		
	THE VIEWS Sandy, Oregon		
	PROJECT NO.	DATE	Figure A-3
	1666.002.G	5/15/20	

BACKHOE COMPANY: Inland Company BUCKET SIZE: 18 inches DATE: 4/15/20

DEPTH (FEET)	BAG SAMPLE	DENSITY TEST	DRY DENSITY (pcf)	MOISTURE CONTENT (%)	SOIL CLASS. (U.S.C.S.)	SOIL DESCRIPTION
						TEST PIT NO. TH-#1 ELEVATION 1,173;±
0					ML	Dark brown, wet, soft, organic, sandy, clayey SILT (Topsoil)
	X			38.8		
					ML	Medium to reddish-brown, very moist, medium stiff to stiff, sandy, clayey SILT
	X			40.2		
5						
						Total Depth = 6.0 feet No groundwater encountered at time of exploration
10						
15						

TEST PIT NO. TH-#2 ELEVATION 1,166'±						
DEPTH (FEET)	BAG SAMPLE	DENSITY TEST	DRY DENSITY (pcf)	MOISTURE CONTENT (%)	SOIL CLASS. (U.S.C.S.)	SOIL DESCRIPTION
						TEST PIT NO. TH-#2 ELEVATION 1,166'±
0					ML	Dark brown, wet, soft, organic, sandy, clayey SILT (Topsoil)
	X			39.3		
					ML	Medium to reddish-brown, very moist, medium stiff to stiff, sandy, clayey SILT
	X			41.1		
5						
						Total Depth = 6.0 feet No groundwater encountered at time of exploration
10						
15						

LOG OF TEST PITS

PROJECT NO. 1666.002.G THE VIEWS FIGURE NO. A-4

REDMOND GEOTECHNICAL SERVICES

BACKHOE COMPANY: Inland Company						BUCKET SIZE: 18 inches		DATE: 4/15/20	
DEPTH (FEET)	BAG SAMPLE	DENSITY TEST	DRY DENSITY (pcf)	MOISTURE CONTENT (%)	SOIL CLASS. (U.S.C.S.)	SOIL DESCRIPTION			
						TEST PIT NO. TH-#3 ELEVATION 1,155'±			
0					ML	Dark brown, wet, soft, organic, sandy, clayey SILT (Topsoil)			
	X			37.9	ML	Medium to reddish-brown, very moist, medium stiff to stiff, sandy, clayey SILT			
5						Total Depth = 6.0 feet No groundwater encountered at time of exploration			
10									
15									
TEST PIT NO. TH-#4						ELEVATION 1,142'±			
0					ML	Dark brown, wet, soft, organic, sandy, clayey SILT (Topsoil)			
	X			39.6	ML	Medium to reddish-brown, very moist, medium stiff to stiff, sandy, clayey SILT			
5									
	X			42.6					
10						Total Depth = 8.0 feet No groundwater encountered at time of exploration			
15									
LOG OF TEST PITS									
PROJECT NO. 1666.002.G				THE VIEWS			FIGURE NO. A-5		

REDMOND GEOTECHNICAL SERVICES

BACKHOE COMPANY: Inland Company BUCKET SIZE: 18 inches DATE: 4/15/20

DEPTH (FEET)	BAG SAMPLE	DENSITY TEST	DRY DENSITY (pcf)	MOISTURE CONTENT (%)	SOIL CLASS. (U.S.C.S.)	SOIL DESCRIPTION
						TEST PIT NO. TH-#5 ELEVATION 1,174'±
0					ML	Dark brown, wet, soft, organic, sandy, clayey SILT (Topsoil)
	X			38.6	ML	Medium to reddish-brown, very moist, medium stiff to stiff, sandy, clayey SILT
5						
						Total Depth = 6.0 feet No groundwater encountered at time of exploration
10						
15						

TEST PIT NO. TH-#6 ELEVATION 1,168'±						
DEPTH (FEET)	BAG SAMPLE	DENSITY TEST	DRY DENSITY (pcf)	MOISTURE CONTENT (%)	SOIL CLASS. (U.S.C.S.)	SOIL DESCRIPTION
						TEST PIT NO. TH-#6 ELEVATION 1,168'±
0					ML	Dark brown, wet, soft, organic, sandy, clayey SILT (Topsoil)
	X			40.4	ML	Medium to reddish-brown, very moist, medium stiff to stiff, sandy, clayey SILT
5						
						Total Depth = 6.0 feet No groundwater encountered at time of exploration
10						
15						

LOG OF TEST PITS

PROJECT NO. 1666.002.G THE VIEWS FIGURE NO. A-6

REDMOND GEOTECHNICAL SERVICES

BACKHOE COMPANY: Inland Company BUCKET SIZE: 18 inches DATE: 4/15/20

DEPTH (FEET)	BAG SAMPLE	DENSITY TEST	DRY DENSITY (pcf)	MOISTURE CONTENT (%)	SOIL CLASS. (U.S.C.S.)	SOIL DESCRIPTION
TEST PIT NO. TH-#7 ELEVATION 1,165'±						
0					ML	Dark brown, wet, soft, organic, sandy, clayey SILT (Topsoil)
	X			40.1	ML	Medium to reddish-brown, very moist, medium stiff to stiff, sandy, clayey SILT
5						
	X			44.8		
Total Depth = 7.0 feet No groundwater encountered at time of exploration						
10						
15						

TEST PIT NO. TH-#8 ELEVATION 1,188'±						
0					ML	Dark brown, wet, soft, organic, sandy, clayey SILT (Topsoil)
	X			40.5	ML	Medium to reddish-brown, very moist, medium stiff to stiff, sandy, clayey SILT
5						
Total Depth = 6.0 feet No groundwater encountered at time of exploration						
10						
15						

LOG OF TEST PITS

PROJECT NO. 1666.002.G	THE VIEWS	FIGURE NO. A-7
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REDMOND GEOTECHNICAL SERVICES

BACKHOE COMPANY: Inland Company							BUCKET SIZE: 18 inches		DATE: 4/15/20		
DEPTH (FEET)	BAG SAMPLE	DENSITY TEST	DRY DENSITY (pcf)	MOISTURE CONTENT (%)	SOIL CLASS. (U.S.C.S.)	SOIL DESCRIPTION					
						TEST PIT NO. TH-#9 ELEVATION 1,188'±					
0					ML	Dark brown, wet, soft, organic, sandy, clayey SILT (Topsoil)					
	X			39.2	ML	Medium to reddish-brown, very moist, medium stiff to stiff, sandy, clayey SILT					
5						Total Depth = 6.0 feet No groundwater encountered at time of exploration					
10											
15											
TEST PIT NO. TH-#10							ELEVATION 1,176'±				
0					ML	Dark brown, wet, soft, organic, sandy, clayey SILT (Topsoil)					
	X			39.9	ML	Medium to reddish-brown, very moist, medium stiff to stiff, sandy, clayey SILT					
5											
	X			42.7							
10						Total Depth = 7.0 feet No groundwater encountered at time of exploration					
15											
LOG OF TEST PITS											
PROJECT NO. 1666.002.G				THE VIEWS				FIGURE NO. A-8			

REDMOND GEOTECHNICAL SERVICES

BACKHOE COMPANY: Inland Company							BUCKET SIZE: 18 inches		DATE: 4/15/20		
DEPTH (FEET)	BAG SAMPLE	DENSITY TEST	DRY DENSITY (pcf)	MOISTURE CONTENT (%)	SOIL CLASS. (U.S.C.S.)	SOIL DESCRIPTION					
						TEST PIT NO. TH-#11 ELEVATION 1,155'±					
0					ML	Dark brown, wet, soft, organic, sandy, clayey SILT (Topsoil)					
	X			40.1	ML						Medium to reddish-brown, very moist, medium stiff to stiff, sandy, clayey SILT
5						Total Depth = 8.0 feet No groundwater encountered at time of exploration					
	X			46.6							
10											
15											
						TEST PIT NO.		ELEVATION			
0											
5											
10											
15											

LOG OF TEST PITS

PROJECT NO. 1666.002.G

THE VIEWS

FIGURE NO. A-9

REDMOND GEOTECHNICAL SERVICES

MAXIMUM DENSITY TEST RESULTS

SAMPLE LOCATION	SOIL DESCRIPTION	MAXIMUM DRY DENSITY (pcf)	OPTIMUM MOISTURE CONTENT (%)
TH-#1 @ 2.0'	Medium to reddish-brown, sandy, clayey SILT (ML)	34.0	100.0
TH-#8 @ 3.0'	Medium to reddish-brown, sandy, clayey SILT (ML)	36.0	98.0

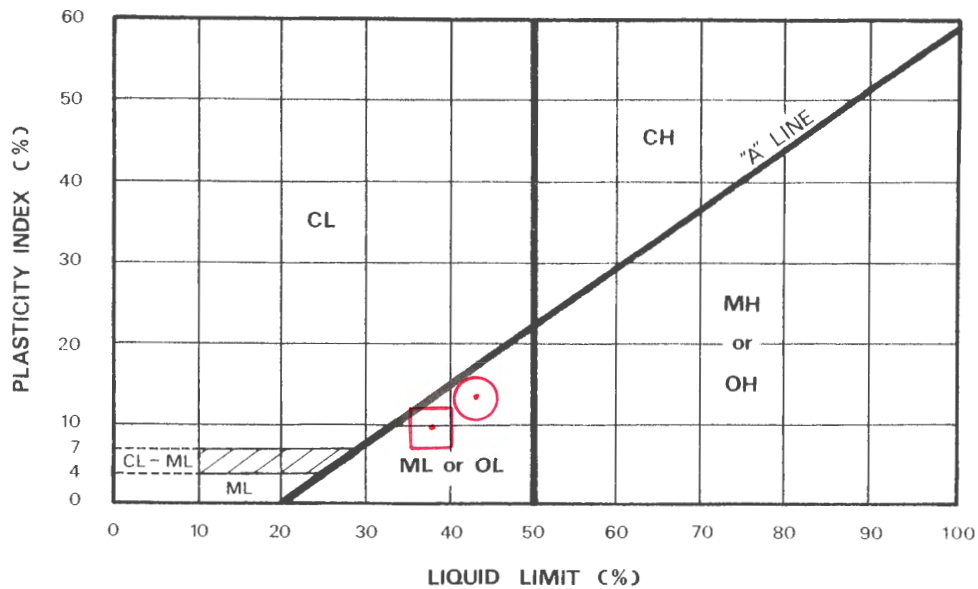
EXPANSION INDEX TEST RESULTS

SAMPLE LOCATION	INITIAL MOISTURE (%)	COMPACTED DRY DENSITY (pcf)	FINAL MOISTURE (%)	VOLUMETRIC SWELL (%)	EXPANSION INDEX	EXPANSIVE CLASS.


MAXIMUM DENSITY & EXPANSION INDEX TEST RESULTS

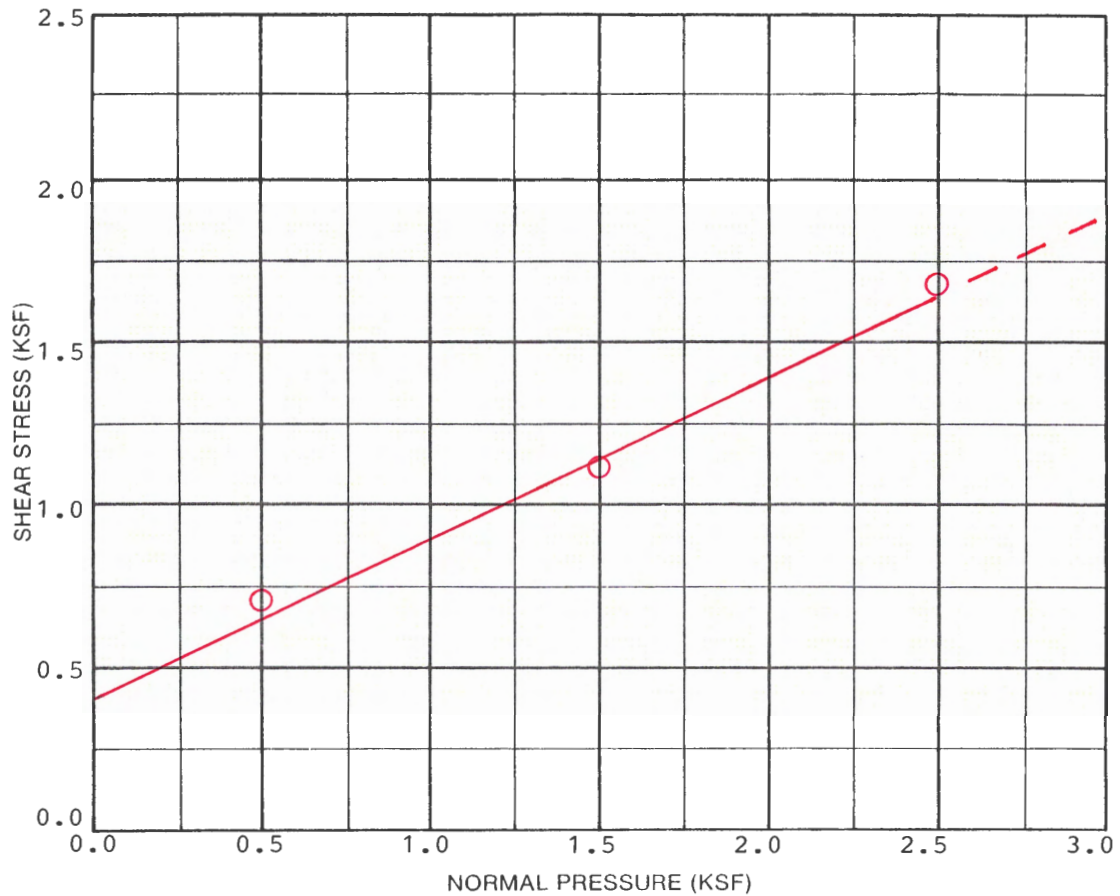
PROJECT NO.: 1666.002.G	THE VIEWS	FIGURE NO.: A-10
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REDMOND GEOTECHNICAL SERVICES



KEY SYMBOL	BORING NO.	SAMPLE DEPTH (feet)	NATURAL WATER CONTENT %	LIQUID LIMIT %	PLASTICITY INDEX %	PASSING NO. 200 SIEVE %	LIQUIDITY INDEX	UNIFIED SOIL CLASSIFICATION SYMBOL
□	TH-#1	2.0	38.8	38.6	10.1	91.8		ML
○	TH-#8	3.0	40.5	42.6	12.7	92.2		ML

 PO Box 20547 • PORTLAND, OREGON 97294	PLASTICITY CHART AND DATA		
	THE VIEWS Sandy, Oregon		
	PROJECT NO.	DATE	Figure A-11
	1666.002.G	5/15/20	

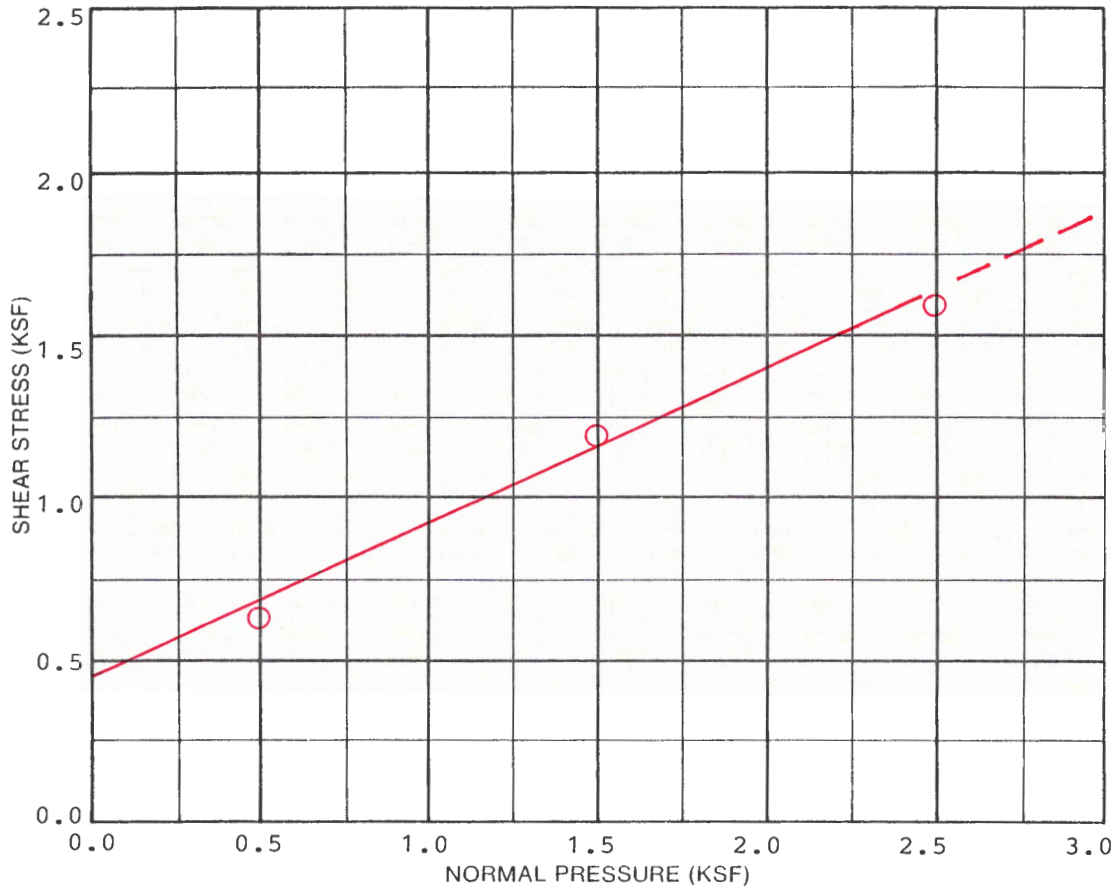


SAMPLE DATA	
DESCRIPTION: Medium to reddish-brown sandy, clayey SILT (ML) (Remolded)	
BORING NO.: TH-#1	
DEPTH (ft): 2.0	ELEVATION (ft):
TEST RESULTS	
APPARENT COHESION (C): 400 psf	
APPARENT ANGLE OF INTERNAL FRICTION (φ): 26°	

TEST DATA				
TEST NUMBER	1	2	3	4
NORMAL PRESSURE (KSF)	0.5	1.5	2.5	
SHEAR STRENGTH (KSF)	0.7	1.1	1.6	
INITIAL H ₂ O CONTENT (%)	34.0	34.0	34.0	
FINAL H ₂ O CONTENT (%)	34.8	29.5	22.7	
INITIAL DRY DENSITY (PCF)	92.0	92.0	92.0	
FINAL DRY DENSITY (PCF)	93.0	95.6	99.7	
STRAIN RATE: 0.02 inches per minute				

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DIRECT SHEAR TEST DATA		
THE VIEWS Sandy, Oregon		
PROJECT NO.	DATE	Figure A-13
1666.002.G	5/15/20	



SAMPLE DATA	
DESCRIPTION: Medium to reddish-brown sandy, clayey SILT (ML) (remolded)	
BORING NO.:	TH-#8
DEPTH (ft.):	3.0
ELEVATION (ft.):	
TEST RESULTS	
APPARENT COHESION (C):	400 psf
APPARENT ANGLE OF INTERNAL FRICTION (Φ):	24°

TEST DATA				
TEST NUMBER	1	2	3	4
NORMAL PRESSURE (KSF)	0.5	1.5	2.5	
SHEAR STRENGTH (KSF)	0.6	1.2	1.6	
INITIAL H ₂ O CONTENT (%)	36.0	36.0	36.0	
FINAL H ₂ O CONTENT (%)	36.8	30.3	24.1	
INITIAL DRY DENSITY (PCF)	92.0	92.0	92.0	
FINAL DRY DENSITY (PCF)	92.9	95.2	99.3	
STRAIN RATE: 0.02 inches per minute				

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DIRECT SHEAR TEST DATA		
THE VIEWS		
Sandy, Oregon		
PROJECT NO.	DATE	Figure A-14
1666.002.G	5/15/20	

RESULTS OF R (RESISTANCE) VALUE TESTS

SAMPLE LOCATION: TH-#2

SAMPLE DEPTH: 2.5 feet bgs

Specimen	A	B	C
Exudation Pressure (psi)	219	329	431
Expansion Dial (0.0001")	0	1	2
Expansion Pressure (psf)	0	3	8
Moisture Content (%)	37.6	34.4	31.1
Dry Density (pcf)	92.4	96.2	100.6
Resistance Value, "R"	18	29	36
"R"-Value at 300 psi Exudation Pressure = 28			

SAMPLE LOCATION: TH-#6

SAMPLE DEPTH: 3.0 feet bgs

Specimen	A	B	C
Exudation Pressure (psi)	208	326	439
Expansion Dial (0.0001")	0	1	2
Expansion Pressure (psf)	0	3	8
Moisture Content (%)	37.2	34.1	30.7
Dry Density (pcf)	92.9	97.1	101.4
Resistance Value "R"	19	31	40
"R"-Value at 300 psi Exudation Pressure = 30			

Division 004 Appendix C - Infiltration Testing

Location: The Views Planned Development	Date: April 15, 2020	Test Hole: TH-#4
Depth to Bottom of Hole: 5.0 feet	Hole Diameter: 6 inches	Test Method: Encased Falling Head
Tester's Name: Daniel M. Redmond, P.E., G.E.		
Tester's Company: Redmond Geotechnical Services, LLC		Tester's Contact Number: 503-285-0598
Depth (feet)	Soil Characteristics	
0-1.0	Dark brown Topsoil	
1.0-5.0	Medium to reddish-brown, sandy, clayey SILT (ML)	

Time	Time Interval (Minutes)	Measurement (inches)	Drop in Water (inches)	Infiltration Rate (inches/hour)	Remarks
11:00	0	48.00	----		Filled w/12" water
11:20	20	48.20	0.20	0.60	
11:40	20	48.34	0.14	0.42	
12:00	20	48.45	0.11	0.33	
12:20	20	48.54	0.09	0.27	
12:40	20	48.62	0.08	0.24	
1:00	20	48.69	0.07	0.21	
1:20	20	48.76	0.07	0.21	
1:40	20	48.83	0.07	0.21	

Infiltration Test Data Table

Figure No. A-16

Division 004 Appendix C - Infiltration Testing

Location: The Views Planned Development	Date: April 15, 2020	Test Hole: TH-#11
Depth to Bottom of Hole: 6.0 feet	Hole Diameter: 6 inches	Test Method: Encased Falling Head
Tester's Name: Daniel M. Redmond, P.E., G.E.		
Tester's Company: Redmond Geotechnical Services, LLC		Tester's Contact Number: 503-285-0598
Depth (feet)	Soil Characteristics	
0-1.0	Dark brown Topsoil	
1.0-6.0	Medium to reddish-brown, sandy, clayey SILT (ML)	

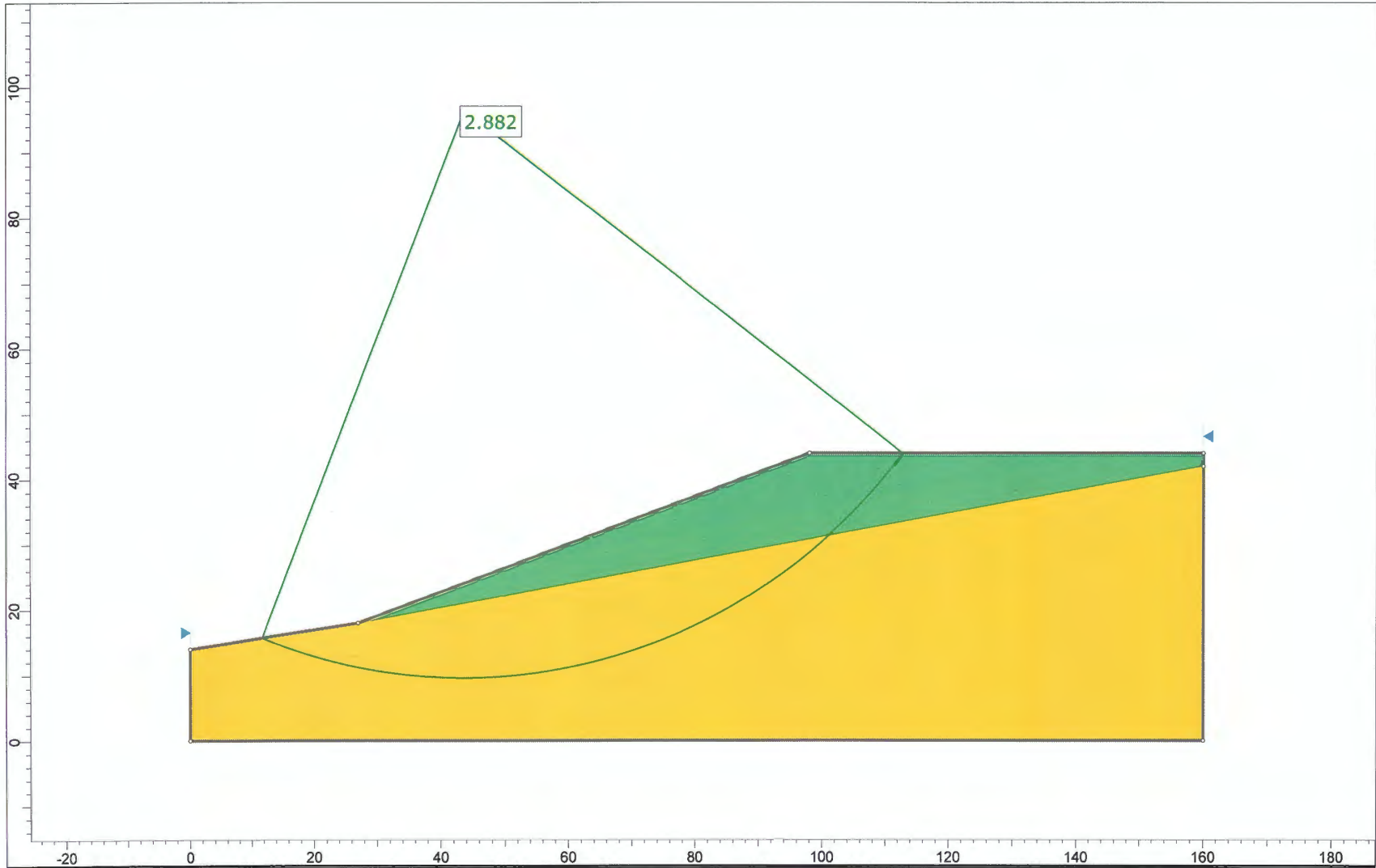
Time	Time Interval (Minutes)	Measurement (inches)	Drop in Water (inches)	Infiltration Rate (inches/hour)	Remarks
11:30	0	60.00	---		Filled w/12" water
11:50	20	60.15	0.15	0.45	
12:10	20	60.25	0.10	0.30	
12:30	20	60.32	0.07	0.21	
12:50	20	60.37	0.05	0.15	
1:10	20	60.41	0.04	0.12	
1:30	20	60.44	0.03	0.09	
1:50	20	60.47	0.03	0.09	
2:10	20	60.50	0.03	0.09	


Infiltration Test Data Table

Figure No. A-17

Appendix "B"

Slope Stability Analysis



 <small>SLIDEINTERPRET 8.020</small>	Project			The Views		
	Analysis Description					
	Drawn By	Daniel M. Redmond	Scale	1:248	Company	Redmond Geotechnical Services, LLC
	Date	May 11, 2020		File Name	The Views Static.sldm	

Slide Analysis Information

The Views Static

Project Summary

File Name:	The Views Static.slmd
Slide Modeler Version:	8.02
Compute Time:	00h:00m:00.673s
Project Title:	The Views
Author:	Daniel M. Redmond
Company:	Redmond Geotechnical Services, LLC
Date Created:	May 11, 2020

General Settings

Units of Measurement:	Imperial Units
Time Units:	days
Permeability Units:	feet/second
Data Output:	Standard
Failure Direction:	Right to Left

Analysis Options

Slices Type:	Vertical
--------------	----------

Analysis Methods Used

	Bishop simplified
	Janbu simplified
Number of slices:	50
Tolerance:	0.005
Maximum number of iterations:	75
Check malpha < 0.2:	Yes
Create Interslice boundaries at intersections with water tables and piezos:	Yes
Initial trial value of FS:	1
Steffensen Iteration:	Yes

Groundwater Analysis

Groundwater Method: Water Surfaces
 Pore Fluid Unit Weight [lbs/ft3]: 62.4
 Use negative pore pressure cutoff: Yes
 Maximum negative pore pressure [psf]: 0
 Advanced Groundwater Method: None

Random Numbers

Pseudo-random Seed: 10116
 Random Number Generation Method: Park and Miller v.3



Surface Options

Surface Type: Circular
 Search Method: Auto Refine Search
 Divisions along slope: 20
 Circles per division: 10
 Number of iterations: 10
 Divisions to use in next iteration: 50%
 Composite Surfaces: Disabled
 Minimum Elevation: Not Defined
 Minimum Depth: Not Defined
 Minimum Area: Not Defined
 Minimum Weight: Not Defined

Seismic Loading

Advanced seismic analysis: No
 Staged pseudostatic analysis: No

Materials

Property	Material 1	Material 2
Color		
Strength Type	Mohr-Coulomb	Mohr-Coulomb
Unit Weight [lbs/ft3]	100	100
Cohesion [psf]	400	450
Friction Angle [°]	24	24
Water Surface	None	None
Ru Value	0	0

Global Minimums

Method: bishop simplified

FS	2.882170
Center:	43.648, 96.485
Radius:	86.829
Left Slip Surface Endpoint:	11.725, 15.737
Right Slip Surface Endpoint:	112.819, 44.000
Resisting Moment:	9.25215e+06 lb-ft
Driving Moment:	3.21013e+06 lb-ft
Total Slice Area:	1353.86 ft ²
Surface Horizontal Width:	101.094 ft
Surface Average Height:	13.3921 ft

Method: janbu simplified

FS	2.615210
Center:	49.090, 67.552
Radius:	62.814
Left Slip Surface Endpoint:	13.254, 15.964
Right Slip Surface Endpoint:	107.322, 44.000
Resisting Horizontal Force:	105805 lb
Driving Horizontal Force:	40457.4 lb
Total Slice Area:	1637.73 ft ²
Surface Horizontal Width:	94.0679 ft
Surface Average Height:	17.4101 ft

Valid/Invalid Surfaces

Method: bishop simplified

Number of Valid Surfaces: 9861
 Number of Invalid Surfaces: 8

Error Codes:

Error Code -112 reported for 8 surfaces

Method: janbu simplified

Number of Valid Surfaces: 9293
 Number of Invalid Surfaces: 576

Error Codes:

Error Code -108 reported for 238 surfaces
Error Code -111 reported for 338 surfaces

Error Codes

The following errors were encountered during the computation:

- 108 = Total driving moment or total driving force < 0.1. This is to limit the calculation of extremely high safety factors if the driving force is very small (0.1 is an arbitrary number).
- 111 = safety factor equation did not converge
- 112 = The coefficient $M\text{-Alpha} = \cos(\alpha)(1 + \tan(\alpha)\tan(\phi))/F < 0.2$ for the final iteration of the safety factor calculation. This screens out some slip surfaces which may not be valid in the context of the analysis, in particular, deep seated slip surfaces with many high negative base angle slices in the passive zone.

Slice Data

- **Global Minimum Query (bishop simplified) - Safety Factor: 2.88217**

Slice Number	Width [ft]	Weight [lbs]	Angle of Slice Base [degrees]	Base Material	Base Cohesion [psf]	Base Friction Angle [degrees]	Shear Stress [psf]	Shear Strength [psf]	Base Normal Stress [psf]	Pore Pressure [psf]	Effective Normal Stress [psf]
1	2.03095	109.117	-20.8537	Material 1	400	24	156.278	450.42	113.246	0	113.246
2	2.03095	321.522	-19.4261	Material 1	400	24	172.643	497.587	219.183	0	219.183
3	2.03095	522.417	-18.0109	Material 1	400	24	187.958	541.728	318.325	0	318.325
4	2.03095	712.089	-16.6071	Material 1	400	24	202.264	582.958	410.93	0	410.93
5	2.03095	890.791	-15.2134	Material 1	400	24	215.594	621.379	497.223	0	497.223
6	2.03095	1058.75	-13.8288	Material 1	400	24	227.982	657.082	577.416	0	577.416
7	2.03095	1216.17	-12.4525	Material 1	400	24	239.454	690.148	651.682	0	651.682
8	2.03095	1373.52	-11.0834	Material 1	400	24	250.845	722.979	725.423	0	725.423
9	2.03095	1588.08	-9.72076	Material 1	400	24	266.63	768.473	827.606	0	827.606
10	2.03095	1804.78	-8.36361	Material 1	400	24	282.472	814.132	930.158	0	930.158
11	2.03095	2011.51	-7.01117	Material 1	400	24	297.432	857.249	1027	0	1027
12	2.03095	2208.37	-5.66266	Material 1	400	24	311.527	897.873	1118.24	0	1118.24
13	2.03095	2395.44	-4.31728	Material 1	400	24	324.771	936.046	1203.98	0	1203.98
14	2.03095	2572.77	-2.97428	Material 1	400	24	337.179	971.806	1284.3	0	1284.3
15	2.03095	2740.41	-1.63292	Material 1	400	24	348.759	1005.18	1359.27	0	1359.27
16	2.03095	2898.39	-0.292458	Material 1	400	24	359.524	1036.21	1428.94	0	1428.94
17	2.03095	3046.72	1.04785	Material 1	400	24	369.478	1064.9	1493.39	0	1493.39
18	2.03095	3185.39	2.38873	Material 1	400	24	378.63	1091.28	1552.63	0	1552.63
19	2.03095	3314.39	3.73092	Material 1	400	24	386.984	1115.35	1606.71	0	1606.71
20	2.03095	3433.67	5.07516	Material 1	400	24	394.543	1137.14	1655.64	0	1655.64
21	2.03095	3543.19	6.42221	Material 1	400	24	401.308	1156.64	1699.43	0	1699.43
22	2.03095	3642.87	7.77284	Material 1	400	24	407.28	1173.85	1738.1	0	1738.1
23	2.03095	3732.63	9.12784	Material 1	400	24	412.458	1188.78	1771.62	0	1771.62

24	2.03095	3812.36	10.488	Material 1	400	24	416.84	1201.4	1799.98	0	1799.98
25	2.03095	3881.94	11.8542	Material 1	400	24	420.421	1211.72	1823.16	0	1823.16
26	2.03095	3941.22	13.2272	Material 1	400	24	423.196	1219.72	1841.13	0	1841.13
27	2.03095	3990.04	14.6081	Material 1	400	24	425.159	1225.38	1853.83	0	1853.83
28	2.03095	4028.21	15.9976	Material 1	400	24	426.3	1228.67	1861.22	0	1861.22
29	2.03095	4055.51	17.3969	Material 1	400	24	426.608	1229.56	1863.22	0	1863.22
30	2.03095	4071.7	18.807	Material 1	400	24	426.073	1228.01	1859.75	0	1859.75
31	2.03095	4076.51	20.2291	Material 1	400	24	424.68	1224	1850.73	0	1850.73
32	2.03095	4069.63	21.6642	Material 1	400	24	422.412	1217.46	1836.05	0	1836.05
33	2.03095	4050.73	23.1138	Material 1	400	24	419.252	1208.36	1815.6	0	1815.6
34	2.03095	4019.42	24.5793	Material 1	400	24	415.178	1196.61	1789.23	0	1789.23
35	2.03095	3975.27	26.0621	Material 1	400	24	410.167	1182.17	1756.78	0	1756.78
36	2.03095	3917.8	27.5639	Material 1	400	24	404.193	1164.95	1718.11	0	1718.11
37	2.03095	3846.46	29.0866	Material 1	400	24	397.225	1144.87	1673	0	1673
38	2.03095	3760.66	30.6322	Material 1	400	24	389.229	1121.82	1621.24	0	1621.24
39	2.03095	3659.69	32.2029	Material 1	400	24	380.167	1095.71	1562.58	0	1562.58
40	2.03095	3542.78	33.8012	Material 1	400	24	369.997	1066.39	1496.75	0	1496.75
41	2.03095	3409.03	35.43	Material 1	400	24	358.67	1033.75	1423.42	0	1423.42
42	2.03095	3257.41	37.0925	Material 1	400	24	346.129	997.604	1342.24	0	1342.24
43	2.03095	3066.35	38.7923	Material 1	400	24	330.933	953.806	1243.87	0	1243.87
44	2.03095	2741.65	40.5337	Material 1	400	24	306.801	884.253	1087.65	0	1087.65
45	1.95539	2295.97	42.2875	Material 2	450	24	295.944	852.962	905.067	0	905.067
46	1.95539	1937.1	44.0574	Material 2	450	24	268.97	775.216	730.446	0	730.446
47	1.95539	1554.96	45.882	Material 2	450	24	240.647	693.586	547.104	0	547.104
48	1.95539	1147.2	47.7687	Material 2	450	24	210.883	607.8	354.424	0	354.424

49	1.95539	710.952	49.7266	Material 2	450	24	179.566	517.54	151.698	0	151.698
50	1.95539	242.656	51.7672	Material 2	450	24	146.57	422.44	-61.8999	0	-61.8999

- **Global Minimum Query (janbu simplified) - Safety Factor: 2.61521**

Slice Number	Width [ft]	Weight [lbs]	Angle of Slice Base [degrees]	Base Material	Base Cohesion [psf]	Base Friction Angle [degrees]	Shear Stress [psf]	Shear Strength [psf]	Base Normal Stress [psf]	Pore Pressure [psf]	Effective Normal Stress [psf]
1	1.8932	146.283	-33.7476	Material 1	400	24	187.44	490.195	202.583	0	202.583
2	1.8932	429.775	-31.6943	Material 1	400	24	214.123	559.976	359.312	0	359.312
3	1.8932	695.692	-29.6855	Material 1	400	24	238.692	624.229	503.624	0	503.624
4	1.8932	945.103	-27.7162	Material 1	400	24	261.329	683.43	636.596	0	636.596
5	1.8932	1178.92	-25.7819	Material 1	400	24	282.186	737.976	759.105	0	759.105
6	1.8932	1397.92	-23.8786	Material 1	400	24	301.388	788.194	871.896	0	871.896
7	1.8932	1602.77	-22.003	Material 1	400	24	319.043	834.364	975.599	0	975.599
8	1.8932	1815.4	-20.1519	Material 1	400	24	337.288	882.078	1082.77	0	1082.77
9	1.8932	2069.11	-18.3226	Material 1	400	24	359.285	939.606	1211.97	0	1211.97
10	1.8932	2312.84	-16.5123	Material 1	400	24	380.13	994.121	1334.42	0	1334.42
11	1.8932	2544.3	-14.719	Material 1	400	24	399.631	1045.12	1448.97	0	1448.97
12	1.8932	2763.8	-12.9402	Material 1	400	24	417.842	1092.74	1555.93	0	1555.93
13	1.8932	2971.63	-11.1741	Material 1	400	24	434.807	1137.11	1655.58	0	1655.58
14	1.8932	3168.02	-9.41865	Material 1	400	24	450.568	1178.33	1748.16	0	1748.16
15	1.8932	3353.14	-7.6721	Material 1	400	24	465.157	1216.48	1833.85	0	1833.85
16	1.8932	3527.15	-5.93271	Material 1	400	24	478.603	1251.65	1912.83	0	1912.83
17	1.8932	3690.19	-4.19879	Material 1	400	24	490.931	1283.89	1985.24	0	1985.24
18	1.8932	3842.32	-2.46872	Material 1	400	24	502.16	1313.25	2051.2	0	2051.2
19	1.8932	3983.62	-0.740899	Material 1	400	24	512.306	1339.79	2110.8	0	2110.8
20	1.8932	4114.1	0.986245	Material 1	400	24	521.383	1363.53	2164.11	0	2164.11
21	1.8932	4233.78	2.71429	Material 1	400	24	529.398	1384.49	2211.19	0	2211.19
22	1.8932	4342.6	4.44481	Material 1	400	24	536.358	1402.69	2252.07	0	2252.07
23	1.8932	4440.52	6.1794	Material 1	400	24	542.262	1418.13	2286.76	0	2286.76

24	1.8932	4527.44	7.91971	Material 1	400	24	547.115	1430.82	2315.26	0	2315.26
25	1.8932	4603.23	9.66741	Material 1	400	24	550.908	1440.74	2337.55	0	2337.55
26	1.8932	4667.74	11.4242	Material 1	400	24	553.638	1447.88	2353.58	0	2353.58
27	1.8932	4720.78	13.1921	Material 1	400	24	555.294	1452.21	2363.29	0	2363.29
28	1.8932	4762.09	14.9728	Material 1	400	24	555.856	1453.68	2366.61	0	2366.61
29	1.8932	4791.42	16.7684	Material 1	400	24	555.313	1452.26	2363.42	0	2363.42
30	1.8932	4808.43	18.5812	Material 1	400	24	553.642	1447.89	2353.6	0	2353.6
31	1.8932	4812.74	20.4135	Material 1	400	24	550.812	1440.49	2336.99	0	2336.99
32	1.8932	4803.91	22.2679	Material 1	400	24	546.801	1430	2313.41	0	2313.41
33	1.8932	4781.44	24.1472	Material 1	400	24	541.563	1416.3	2282.64	0	2282.64
34	1.8932	4744.73	26.0547	Material 1	400	24	535.056	1399.28	2244.43	0	2244.43
35	1.8932	4693.11	27.9937	Material 1	400	24	527.234	1378.83	2198.48	0	2198.48
36	1.8932	4625.76	29.9684	Material 1	400	24	518.036	1354.77	2144.45	0	2144.45
37	1.8932	4541.77	31.9831	Material 1	400	24	507.392	1326.94	2081.93	0	2081.93
38	1.8932	4440.04	34.0432	Material 1	400	24	495.223	1295.11	2010.46	0	2010.46
39	1.8932	4319.27	36.1547	Material 1	400	24	481.434	1259.05	1929.46	0	1929.46
40	1.8932	4177.92	38.3249	Material 1	400	24	465.911	1218.45	1838.28	0	1838.28
41	1.8932	4014.11	40.5622	Material 1	400	24	448.518	1172.97	1736.12	0	1736.12
42	1.8932	3825.57	42.8771	Material 1	400	24	429.092	1122.17	1622.01	0	1622.01
43	1.8932	3609.44	45.2827	Material 1	400	24	407.432	1065.52	1494.78	0	1494.78
44	1.8932	3362.09	47.7954	Material 1	400	24	383.287	1002.38	1352.96	0	1352.96
45	1.8932	3075.15	50.4365	Material 1	400	24	356.065	931.186	1193.06	0	1193.06
46	1.8932	2656.63	53.235	Material 1	400	24	319.091	834.491	975.884	0	975.884
47	1.74518	2001.14	56.1051	Material 2	450	24	292.993	766.237	710.282	0	710.282
48	1.74518	1520.22	59.0818	Material 2	450	24	249.424	652.297	454.366	0	454.366

49	1.74518	975.333	62.3462	Material 2	450	24	201.654	527.368	173.772	0	173.77:
50	1.74518	342.355	66.0201	Material 2	450	24	148.568	388.536	-138.052	0	-138.05:

Interslice Data

- **Global Minimum Query (bishop simplified) - Safety Factor: 2.88217**

Slice Number	X coordinate [ft]	Y coordinate - Bottom [ft]	Interslice Normal Force [lbs]	Interslice Shear Force [lbs]	Interslice Force Angle [degrees]
1	11.7246	15.737	0	0	0
2	13.7556	14.9633	404.936	0	0
3	15.7865	14.2471	912.476	0	0
4	17.8175	13.5867	1504.32	0	0
5	19.8484	12.981	2163.93	0	0
6	21.8794	12.4287	2876.31	0	0
7	23.9103	11.9288	3627.89	0	0
8	25.9413	11.4803	4406.37	0	0
9	27.9722	11.0824	5204.32	0	0
10	30.0032	10.7345	6033.64	0	0
11	32.0341	10.4359	6884.93	0	0
12	34.0651	10.1862	7745.38	0	0
13	36.096	9.9848	8603.12	0	0
14	38.127	9.83147	9447.17	0	0
15	40.1579	9.72595	10267.3	0	0
16	42.1889	9.66805	11054.2	0	0
17	44.2198	9.65768	11799	0	0
18	46.2508	9.69483	12493.7	0	0
19	48.2817	9.77955	13131	0	0
20	50.3127	9.91199	13704	0	0
21	52.3436	10.0924	14206.5	0	0
22	54.3746	10.321	14632.8	0	0
23	56.4055	10.5982	14978	0	0
24	58.4365	10.9245	15237.4	0	0
25	60.4674	11.3005	15407	0	0
26	62.4983	11.7268	15483.5	0	0
27	64.5293	12.2041	15463.8	0	0
28	66.5602	12.7335	15345.8	0	0
29	68.5912	13.3157	15127.7	0	0
30	70.6221	13.9521	14808.3	0	0
31	72.6531	14.6438	14387.1	0	0
32	74.684	15.3922	13864.3	0	0
33	76.715	16.1989	13240.8	0	0
34	78.7459	17.0658	12518.2	0	0
35	80.7769	17.9947	11699.1	0	0
36	82.8078	18.988	10786.9	0	0
37	84.8388	20.0481	9786.24	0	0
38	86.8697	21.1779	8702.66	0	0
39	88.9007	22.3806	7543.21	0	0
40	90.9316	23.6597	6316.44	0	0
41	92.9626	25.0193	5032.64	0	0
42	94.9935	26.4643	3704.18	0	0
43	97.0245	27.9998	2345.88	0	0

44	99.0554	29.6323	987.255	0	0
45	101.086	31.369	-278.67	0	0
46	103.042	33.1475	-1309.77	0	0
47	104.997	35.0395	-2166.01	0	0
48	106.953	37.0561	-2798.81	0	0
49	108.908	39.2102	-3150.02	0	0
50	110.863	41.5181	-3149.08	0	0
51	112.819	44	0	0	0

- **Global Minimum Query (janbu simplified) - Safety Factor: 2.61521**

Slice Number	X coordinate [ft]	Y coordinate - Bottom [ft]	Interslice Normal Force [lbs]	Interslice Shear Force [lbs]	Interslice Force Angle [degrees]
1	13.2539	15.9635	0	0	0
2	15.1471	14.6987	611.338	0	0
3	17.0403	13.5297	1437.02	0	0
4	18.9335	12.4504	2432.73	0	0
5	20.8267	11.4558	3560.99	0	0
6	22.7199	10.5413	4789.75	0	0
7	24.6131	9.70321	6091.46	0	0
8	26.5063	8.93819	7442.22	0	0
9	28.3995	8.24344	8833.46	0	0
10	30.2927	7.61649	10273.9	0	0
11	32.1859	7.05526	11743	0	0
12	34.0791	6.55792	13220.7	0	0
13	35.9723	6.12292	14689.1	0	0
14	37.8655	5.74894	16132	0	0
15	39.7587	5.43489	17534.6	0	0
16	41.6519	5.17986	18883.5	0	0
17	43.5451	4.98312	20166.5	0	0
18	45.4383	4.84414	21372.4	0	0
19	47.3315	4.76251	22491.2	0	0
20	49.2247	4.73803	23513.4	0	0
21	51.1179	4.77062	24430.6	0	0
22	53.0111	4.86038	25235	0	0
23	54.9043	5.00754	25919.7	0	0
24	56.7975	5.21252	26478.3	0	0
25	58.6907	5.47589	26905	0	0
26	60.5839	5.79839	27194.8	0	0
27	62.4771	6.18096	27343.2	0	0
28	64.3703	6.62473	27346.4	0	0
29	66.2635	7.13104	27201.2	0	0
30	68.1567	7.7015	26905	0	0
31	70.0499	8.33794	26455.9	0	0
32	71.9431	9.04252	25852.8	0	0
33	73.8363	9.81774	25095.3	0	0
34	75.7295	10.6665	24183.9	0	0
35	77.6227	11.5921	23120	0	0
36	79.5159	12.5985	21906.4	0	0
37	81.4091	13.6901	20546.8	0	0
38	83.3023	14.8723	19046.7	0	0
39	85.1955	16.1514	17413.4	0	0
40	87.0887	17.5347	15656.4	0	0
41	88.9819	19.0312	13788	0	0
42	90.8751	20.6517	11824.4	0	0
43	92.7683	22.4096	9785.98	0	0

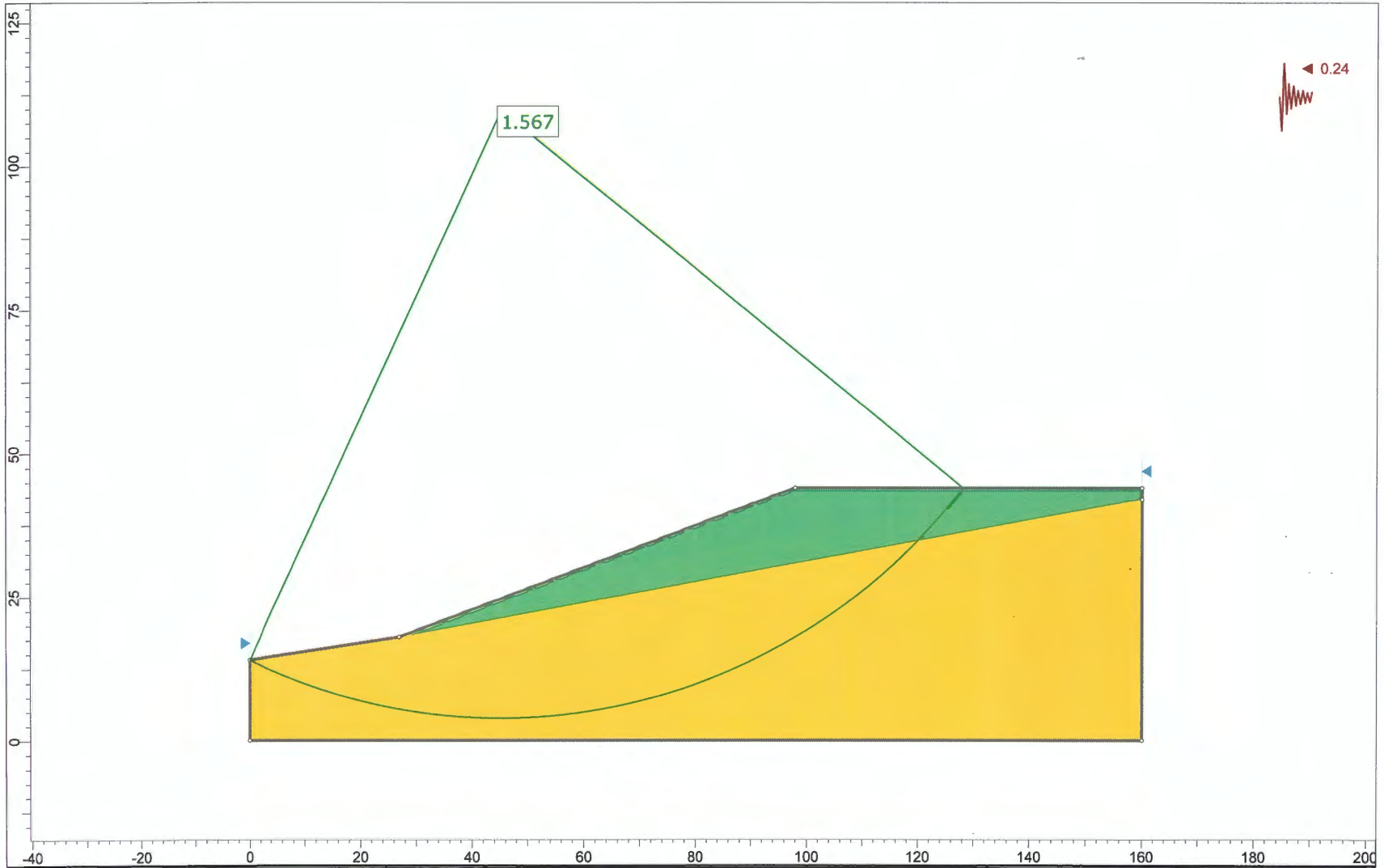
44	94.6615	24.3215	7699.85	0	0
45	96.5547	26.4091	5601.56	0	0
46	98.4479	28.7006	3542.25	0	0
47	100.341	31.2345	1673.94	0	0
48	102.086	33.8321	340.576	0	0
49	103.831	36.746	-547.815	0	0
50	105.577	40.0766	-774.426	0	0
51	107.322	44	0	0	0


Entity Information

Group: Group 1

Shared Entities

Type	Coordinates
External Boundary	X Y
	160 0
	160 42
	160 44
	98 44
	27 18
	0 14
0 0	
Material Boundary	X Y
	27 18
	160 42



	Project			The Views		
	Analysis Description					
	Drawn By	Daniel M. Redmond	Scale	1:282	Company	Redmond Geotechnical Services, LLC
	Date	May 11, 2020		File Name	The Views Seismic.slm	

SLIDEINTERPRET 8.020

Slide Analysis Information

The Views Seismic

Project Summary

File Name:	The Views Seismic.slm
Slide Modeler Version:	8.02
Compute Time:	00h:00m:00.586s
Project Title:	The Views
Author:	Daniel M. Redmond
Company:	Redmond Geotechnical Services, LLC
Date Created:	May 11, 2020

General Settings

Units of Measurement:	Imperial Units
Time Units:	days
Permeability Units:	feet/second
Data Output:	Standard
Failure Direction:	Right to Left

Analysis Options

Slices Type:	Vertical
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Analysis Methods Used

	Bishop simplified
	Janbu simplified
Number of slices:	50
Tolerance:	0.005
Maximum number of iterations:	75
Check $\alpha < 0.2$:	Yes
Create Interslice boundaries at intersections with water tables and piezos:	Yes
Initial trial value of FS:	1
Steffensen Iteration:	Yes

Groundwater Analysis

Groundwater Method:	Water Surfaces
Pore Fluid Unit Weight [lbs/ft ³]:	62.4
Use negative pore pressure cutoff:	Yes
Maximum negative pore pressure [psf]:	0
Advanced Groundwater Method:	None

Random Numbers

Pseudo-random Seed:	10116
Random Number Generation Method:	Park and Miller v.3



Surface Options

Surface Type:	Circular
Search Method:	Auto Refine Search
Divisions along slope:	20
Circles per division:	10
Number of iterations:	10
Divisions to use in next iteration:	50%
Composite Surfaces:	Disabled
Minimum Elevation:	Not Defined
Minimum Depth:	Not Defined
Minimum Area:	Not Defined
Minimum Weight:	Not Defined

Seismic Loading

Advanced seismic analysis:	No
Staged pseudostatic analysis:	No
Seismic Load Coefficient (Horizontal):	0.24

Materials

Property	Material 1	Material 2
Color		
Strength Type	Mohr-Coulomb	Mohr-Coulomb
Unit Weight [lbs/ft3]	100	100
Cohesion [psf]	400	450
Friction Angle [°]	24	24
Water Surface	None	None
Ru Value	0	0

Global Minimums

Method: bishop simplified

FS	1.566590
Center:	45.226, 109.816
Radius:	105.925
Left Slip Surface Endpoint:	0.051, 14.008
Right Slip Surface Endpoint:	128.221, 44.000
Resisting Moment:	1.66238e+07 lb-ft
Driving Moment:	1.06114e+07 lb-ft
Total Slice Area:	2303.82 ft ²
Surface Horizontal Width:	128.17 ft
Surface Average Height:	17.9747 ft

Method: janbu simplified

FS	1.416710
Center:	48.300, 89.634
Radius:	89.606
Left Slip Surface Endpoint:	0.204, 14.030
Right Slip Surface Endpoint:	125.416, 44.000
Resisting Horizontal Force:	156706 lb
Driving Horizontal Force:	110613 lb
Total Slice Area:	2625.28 ft ²
Surface Horizontal Width:	125.212 ft
Surface Average Height:	20.9667 ft

Valid/Invalid Surfaces

Method: bishop simplified

Number of Valid Surfaces:	9986
Number of Invalid Surfaces:	3

Error Codes:

Error Code -112 reported for 3 surfaces

Method: janbu simplified

Number of Valid Surfaces: 9260

Number of Invalid Surfaces: 729

Error Codes:

Error Code -108 reported for 188 surfaces

Error Code -111 reported for 539 surfaces

Error Code -112 reported for 2 surfaces

Error Codes

The following errors were encountered during the computation:

-108 = Total driving moment or total driving force < 0.1. This is to limit the calculation of extremely high safety factors if the driving force is very small (0.1 is an arbitrary number).

-111 = safety factor equation did not converge

-112 = The coefficient $M\text{-Alpha} = \cos(\alpha)(1 + \tan(\alpha)\tan(\phi))/F < 0.2$ for the final iteration of the safety factor calculation. This screens out some slip surfaces which may not be valid in the context of the analysis, in particular, deep seated slip surfaces with many high negative base angle slices in the passive zone.

Slice Data

- **Global Minimum Query (bishop simplified) - Safety Factor: 1.56659**

Slice Number	Width [ft]	Weight [lbs]	Angle of Slice Base [degrees]	Base Material	Base Cohesion [psf]	Base Friction Angle [degrees]	Shear Stress [psf]	Shear Strength [psf]	Base Normal Stress [psf]	Pore Pressure [psf]	Effective Normal Stress [psf]
1	2.55188	196.528	-24.4859	Material 1	400	24	318.4	498.803	221.915	0	221.915
2	2.55188	579.356	-22.9778	Material 1	400	24	363.644	569.681	381.109	0	381.109
3	2.55188	942.064	-21.4864	Material 1	400	24	405.59	635.393	528.702	0	528.702
4	2.55188	1285.29	-20.0101	Material 1	400	24	444.439	696.253	665.395	0	665.395
5	2.55188	1609.58	-18.5476	Material 1	400	24	480.362	752.53	791.796	0	791.796
6	2.55188	1915.46	-17.0975	Material 1	400	24	513.513	804.465	908.443	0	908.443
7	2.55188	2203.36	-15.6586	Material 1	400	24	544.027	852.267	1015.81	0	1015.81
8	2.55188	2473.68	-14.2298	Material 1	400	24	572.02	896.121	1114.31	0	1114.31
9	2.55188	2726.76	-12.81	Material 1	400	24	597.599	936.193	1204.31	0	1204.31
10	2.55188	2962.91	-11.3981	Material 1	400	24	620.856	972.627	1286.14	0	1286.14
11	2.55188	3196.12	-9.99319	Material 1	400	24	643.483	1008.07	1365.76	0	1365.76
12	2.55188	3518.87	-8.59435	Material 1	400	24	676.253	1059.41	1481.06	0	1481.06
13	2.55188	3847.69	-7.20065	Material 1	400	24	709.297	1111.18	1597.33	0	1597.33
14	2.55188	4160.44	-5.81123	Material 1	400	24	740.069	1159.38	1705.61	0	1705.61
15	2.55188	4457.25	-4.42523	Material 1	400	24	768.627	1204.12	1806.09	0	1806.09
16	2.55188	4738.22	-3.04182	Material 1	400	24	795.024	1245.48	1898.97	0	1898.97
17	2.55188	5003.43	-1.66018	Material 1	400	24	819.306	1283.52	1984.41	0	1984.41
18	2.55188	5252.93	-0.279513	Material 1	400	24	841.514	1318.31	2062.55	0	2062.55
19	2.55188	5486.73	1.10099	Material 1	400	24	861.684	1349.91	2133.52	0	2133.52
20	2.55188	5704.83	2.48214	Material 1	400	24	879.845	1378.36	2197.43	0	2197.43
21	2.55188	5907.19	3.86473	Material 1	400	24	896.023	1403.7	2254.35	0	2254.35
22	2.55188	6093.75	5.24958	Material 1	400	24	910.238	1425.97	2304.37	0	2304.37
23	2.55188	6264.41	6.63752	Material 1	400	24	922.513	1445.2	2347.55	0	2347.55

24	2.55188	6419.06	8.02938	Material 1	400	24	932.848	1461.39	2383.93	0	2383.93
25	2.55188	6557.55	9.42603	Material 1	400	24	941.267	1474.58	2413.54	0	2413.54
26	2.55188	6679.69	10.8284	Material 1	400	24	947.766	1484.76	2436.4	0	2436.4
27	2.55188	6785.26	12.2373	Material 1	400	24	952.342	1491.93	2452.52	0	2452.52
28	2.55188	6874.01	13.6538	Material 1	400	24	955.004	1496.1	2461.88	0	2461.88
29	2.55188	6945.66	15.0788	Material 1	400	24	955.738	1497.25	2464.47	0	2464.47
30	2.55188	6999.87	16.5135	Material 1	400	24	954.538	1495.37	2460.24	0	2460.24
31	2.55188	7036.28	17.9589	Material 1	400	24	951.385	1490.43	2449.15	0	2449.15
32	2.55188	7054.44	19.4163	Material 1	400	24	946.259	1482.4	2431.12	0	2431.12
33	2.55188	7053.9	20.8868	Material 1	400	24	939.148	1471.26	2406.08	0	2406.08
34	2.55188	7034.1	22.3719	Material 1	400	24	930.007	1456.94	2373.93	0	2373.93
35	2.55188	6994.45	23.873	Material 1	400	24	918.817	1439.41	2334.55	0	2334.55
36	2.55188	6934.26	25.3918	Material 1	400	24	905.534	1418.6	2287.81	0	2287.81
37	2.55188	6852.78	26.9299	Material 1	400	24	890.112	1394.44	2233.55	0	2233.55
38	2.55188	6749.14	28.4894	Material 1	400	24	872.504	1366.86	2171.59	0	2171.59
39	2.55188	6576.97	30.0722	Material 1	400	24	848.31	1328.95	2086.46	0	2086.46
40	2.55188	6204.99	31.6808	Material 1	400	24	805.246	1261.49	1934.94	0	1934.94
41	2.55188	5790.01	33.3178	Material 1	400	24	758.559	1188.35	1770.67	0	1770.67
42	2.55188	5348.11	34.9862	Material 1	400	24	709.862	1112.06	1599.32	0	1599.32
43	2.55188	4877.63	36.6893	Material 1	400	24	659.089	1032.52	1420.67	0	1420.67
44	2.55188	4376.67	38.4311	Material 1	400	24	606.166	949.613	1234.45	0	1234.45
45	2.55188	3843	40.216	Material 1	400	24	551.011	863.208	1040.38	0	1040.38
46	2.55188	3274	42.0493	Material 1	400	24	493.536	773.168	838.148	0	838.148
47	2.55188	2666.57	43.9373	Material 1	400	24	433.641	679.337	627.401	0	627.401
48	2.74395	2140.57	45.9634	Material 2	450	24	393.408	616.309	373.536	0	373.536

49	2.74395	1331.01	48.1434	Material 2	450	24	322.784	505.67	125.038	0	125.038
50	2.74395	455.397	50.4204	Material 2	450	24	248.906	389.934	-134.91	0	-134.91

- **Global Minimum Query (janbu simplified) - Safety Factor: 1.41671**

Slice Number	Width [ft]	Weight [lbs]	Angle of Slice Base [degrees]	Base Material	Base Cohesion [psf]	Base Friction Angle [degrees]	Shear Stress [psf]	Shear Strength [psf]	Base Normal Stress [psf]	Pore Pressure [psf]	Effective Normal Stress [psf]
1	2.52796	243.26	-31.5148	Material 1	400	24	387.262	548.638	333.847	0	333.847
2	2.52796	715.647	-29.6369	Material 1	400	24	452.225	640.672	540.558	0	540.558
3	2.52796	1160.53	-27.7933	Material 1	400	24	511.389	724.49	728.817	0	728.817
4	2.52796	1579.34	-25.9805	Material 1	400	24	565.322	800.898	900.432	0	900.432
5	2.52796	1973.3	-24.1954	Material 1	400	24	614.491	870.556	1056.89	0	1056.89
6	2.52796	2343.47	-22.4348	Material 1	400	24	659.285	934.016	1199.42	0	1199.42
7	2.52796	2690.79	-20.6964	Material 1	400	24	700.03	991.739	1329.07	0	1329.07
8	2.52796	3016.07	-18.9777	Material 1	400	24	737.001	1044.12	1446.71	0	1446.71
9	2.52796	3320.01	-17.2766	Material 1	400	24	770.437	1091.49	1553.1	0	1553.1
10	2.52796	3603.23	-15.591	Material 1	400	24	800.538	1134.13	1648.88	0	1648.88
11	2.52796	3877.41	-13.9192	Material 1	400	24	828.984	1174.43	1739.4	0	1739.4
12	2.52796	4234.98	-12.2594	Material 1	400	24	868.152	1229.92	1864.03	0	1864.03
13	2.52796	4598.29	-10.61	Material 1	400	24	907.451	1285.6	1989.08	0	1989.08
14	2.52796	4942.6	-8.9695	Material 1	400	24	943.636	1336.86	2104.22	0	2104.22
15	2.52796	5268.19	-7.33635	Material 1	400	24	976.823	1383.88	2209.82	0	2209.82
16	2.52796	5575.3	-5.70917	Material 1	400	24	1007.12	1426.79	2306.21	0	2306.21
17	2.52796	5864.1	-4.0866	Material 1	400	24	1034.6	1465.73	2393.66	0	2393.66
18	2.52796	6134.71	-2.46731	Material 1	400	24	1059.35	1500.79	2472.42	0	2472.42
19	2.52796	6387.25	-0.849997	Material 1	400	24	1081.44	1532.08	2542.69	0	2542.69
20	2.52796	6621.73	0.766642	Material 1	400	24	1100.91	1559.67	2604.65	0	2604.65
21	2.52796	6838.18	2.38389	Material 1	400	24	1117.82	1583.62	2658.44	0	2658.44
22	2.52796	7036.53	4.00305	Material 1	400	24	1132.19	1603.98	2704.19	0	2704.19
23	2.52796	7216.72	5.62541	Material 1	400	24	1144.07	1620.81	2741.99	0	2741.99

24	2.52796	7378.61	7.25232	Material 1	400	24	1153.47	1634.13	2771.91	0	2771.91
25	2.52796	7522.02	8.88513	Material 1	400	24	1160.41	1643.96	2793.99	0	2793.99
26	2.52796	7646.72	10.5253	Material 1	400	24	1164.9	1650.32	2808.27	0	2808.27
27	2.52796	7752.44	12.1742	Material 1	400	24	1166.94	1653.21	2814.75	0	2814.75
28	2.52796	7838.85	13.8334	Material 1	400	24	1166.51	1652.61	2813.41	0	2813.41
29	2.52796	7905.55	15.5045	Material 1	400	24	1163.63	1648.52	2804.21	0	2804.21
30	2.52796	7952.08	17.1893	Material 1	400	24	1158.25	1640.9	2787.1	0	2787.1
31	2.52796	7977.92	18.8896	Material 1	400	24	1150.35	1629.71	2761.97	0	2761.97
32	2.52796	7982.46	20.6073	Material 1	400	24	1139.9	1614.91	2728.74	0	2728.74
33	2.52796	7964.99	22.3447	Material 1	400	24	1126.86	1596.44	2687.24	0	2687.24
34	2.52796	7924.71	24.104	Material 1	400	24	1111.17	1574.21	2637.32	0	2637.32
35	2.52796	7860.7	25.8879	Material 1	400	24	1092.78	1548.15	2578.79	0	2578.79
36	2.52796	7771.9	27.6991	Material 1	400	24	1071.6	1518.15	2511.4	0	2511.4
37	2.52796	7657.09	29.541	Material 1	400	24	1047.55	1484.08	2434.87	0	2434.87
38	2.52796	7514.86	31.4171	Material 1	400	24	1020.53	1445.8	2348.9	0	2348.9
39	2.52796	7332.01	33.3316	Material 1	400	24	989.236	1401.46	2249.32	0	2249.32
40	2.52796	6950.73	35.2892	Material 1	400	24	937.721	1328.48	2085.4	0	2085.4
41	2.52796	6481.21	37.2954	Material 1	400	24	877.804	1243.59	1894.74	0	1894.74
42	2.52796	5975.77	39.3567	Material 1	400	24	815.02	1154.65	1694.97	0	1694.97
43	2.52796	5431.21	41.4809	Material 1	400	24	749.217	1061.42	1485.58	0	1485.58
44	2.52796	4843.59	43.6773	Material 1	400	24	680.22	963.674	1266.03	0	1266.03
45	2.52796	4208.09	45.9575	Material 1	400	24	607.829	861.117	1035.69	0	1035.69
46	2.52796	3518.61	48.3361	Material 1	400	24	531.813	753.425	793.806	0	793.806
47	2.52796	2767.3	50.8317	Material 1	400	24	451.913	640.229	539.562	0	539.562
48	2.1325	1699.02	53.251	Material 2	450	24	399.689	566.243	261.086	0	261.086

49	2.1325	1062.47	55.5974	Material 2	450	24	324.971	460.389	23.3352	0	23.3352
50	2.1325	365.215	58.0942	Material 2	450	24	246.795	349.637	-225.42	0	-225.42

Interslice Data

- **Global Minimum Query (bishop simplified) - Safety Factor: 1.56659**

Slice Number	X coordinate [ft]	Y coordinate - Bottom [ft]	Interslice Normal Force [lbs]	Interslice Shear Force [lbs]	Interslice Force Angle [degrees]
1	0.0509766	14.0076	0	0	0
2	2.60286	12.8454	1022.67	0	0
3	5.15474	11.7633	2223.29	0	0
4	7.70663	10.7588	3562.54	0	0
5	10.2585	9.82947	5005.76	0	0
6	12.8104	8.97327	6522.33	0	0
7	15.3623	8.18833	8085.16	0	0
8	17.9142	7.47302	9670.25	0	0
9	20.466	6.82588	11256.3	0	0
10	23.0179	6.24564	12824.6	0	0
11	25.5698	5.73118	14358.3	0	0
12	28.1217	5.28152	15846.3	0	0
13	30.6736	4.89585	17297.4	0	0
14	33.2255	4.57344	18697.7	0	0
15	35.7773	4.31372	20029.3	0	0
16	38.3292	4.11624	21276.3	0	0
17	40.8811	3.98063	22423.9	0	0
18	43.433	3.90667	23459.1	0	0
19	45.9849	3.89422	24370	0	0
20	48.5368	3.94326	25145.8	0	0
21	51.0886	4.05388	25777.2	0	0
22	53.6405	4.22627	26255.7	0	0
23	56.1924	4.46074	26574	0	0
24	58.7443	4.7577	26725.9	0	0
25	61.2962	5.11767	26705.9	0	0
26	63.848	5.54133	26509.8	0	0
27	66.3999	6.02943	26134.3	0	0
28	68.9518	6.58291	25576.9	0	0
29	71.5037	7.20281	24836.3	0	0
30	74.0556	7.89035	23912	0	0
31	76.6075	8.64691	22804.8	0	0
32	79.1593	9.47404	21516.4	0	0
33	81.7112	10.3735	20049.6	0	0
34	84.2631	11.3473	18408.4	0	0
35	86.815	12.3977	16598.3	0	0
36	89.3669	13.5271	14626	0	0
37	91.9188	14.7383	12499.7	0	0
38	94.4706	16.0347	10229.5	0	0
39	97.0225	17.4196	7827.02	0	0
40	99.5744	18.8972	5328.74	0	0
41	102.126	20.4721	2845.61	0	0
42	104.678	22.1495	420.21	0	0
43	107.23	23.9355	-1909.45	0	0

44	109.782	25.8368	-4100.62	0	0
45	112.334	27.8617	-6104.87	0	0
46	114.886	30.0194	-7866.98	0	0
47	117.438	32.3211	-9323.39	0	0
48	119.989	34.7801	-10400.3	0	0
49	122.733	37.6179	-10895.4	0	0
50	125.477	40.6807	-10712.7	0	0
51	128.221	44	0	0	0

- **Global Minimum Query (janbu simplified) - Safety Factor: 1.41671**

Slice Number	X coordinate [ft]	Y coordinate - Bottom [ft]	Interslice Normal Force [lbs]	Interslice Shear Force [lbs]	Interslice Force Angle [degrees]
1	0.203906	14.0302	0	0	0
2	2.73187	12.4802	1438.76	0	0
3	5.25983	11.0419	3188.47	0	0
4	7.78779	9.70947	5174.74	0	0
5	10.3158	8.47756	7335.06	0	0
6	12.8437	7.3417	9616.45	0	0
7	15.3717	6.29795	11973.7	0	0
8	17.8996	5.34289	14368.2	0	0
9	20.4276	4.47354	16766.4	0	0
10	22.9556	3.6873	19139.7	0	0
11	25.4835	2.98191	21463.2	0	0
12	28.0115	2.3554	23719.5	0	0
13	30.5395	1.80609	25923.2	0	0
14	33.0674	1.33253	28057.2	0	0
15	35.5954	0.933523	30097.7	0	0
16	38.1233	0.608053	32023.7	0	0
17	40.6513	0.35532	33816.2	0	0
18	43.1793	0.174708	35458.4	0	0
19	45.7072	0.0657796	36935.3	0	0
20	48.2352	0.0282739	38233.5	0	0
21	50.7632	0.0621012	39341.1	0	0
22	53.2911	0.167342	40248	0	0
23	55.8191	0.34425	40945	0	0
24	58.347	0.593251	41424.4	0	0
25	60.875	0.914952	41679.8	0	0
26	63.403	1.31015	41705.8	0	0
27	65.9309	1.77983	41498.5	0	0
28	68.4589	2.3252	41054.9	0	0
29	70.9869	2.94769	40373.2	0	0
30	73.5148	3.64897	39453	0	0
31	76.0428	4.43099	38295	0	0
32	78.5707	5.296	36901.2	0	0
33	81.0987	6.24657	35275.3	0	0
34	83.6267	7.28566	33422	0	0
35	86.1546	8.41669	31348.2	0	0
36	88.6826	9.64354	29062.3	0	0
37	91.2106	10.9707	26574.8	0	0
38	93.7385	12.4033	23898.9	0	0
39	96.2665	13.9475	21050	0	0
40	98.7944	15.61	18053.2	0	0
41	101.322	17.3992	15026.1	0	0
42	103.85	19.3247	12042.9	0	0
43	106.378	21.398	9156.38	0	0

44	108.906	23.633	6427.86	0	0
45	111.434	26.0469	3930.15	0	0
46	113.962	28.6608	1750.67	0	0
47	116.49	31.5017	-3.58852	0	0
48	119.018	34.6048	-1198.83	0	0
49	121.151	37.4606	-1499.29	0	0
50	123.283	40.5748	-1133.47	0	0
51	125.416	44	0	0	0

Entity Information

Group: Group 1 

Shared Entities

Type	Coordinates																
External Boundary	<table border="1"><tr><th>X</th><th>Y</th></tr><tr><td>160</td><td>0</td></tr><tr><td>160</td><td>42</td></tr><tr><td>160</td><td>44</td></tr><tr><td>98</td><td>44</td></tr><tr><td>27</td><td>18</td></tr><tr><td>0</td><td>14</td></tr><tr><td>0</td><td>0</td></tr></table>	X	Y	160	0	160	42	160	44	98	44	27	18	0	14	0	0
	X	Y															
	160	0															
	160	42															
	160	44															
	98	44															
	27	18															
0	14																
0	0																
Material Boundary	<table border="1"><tr><th>X</th><th>Y</th></tr><tr><td>27</td><td>18</td></tr><tr><td>160</td><td>42</td></tr></table>	X	Y	27	18	160	42										
	X	Y															
27	18																
160	42																

EXHIBIT J



ARCHITECTURAL PLANS

The Views

Upper & Lower Views S.F. Detached Houses

Table 17.90.150 – A: Number of Required Design Elements

Garage Width Percent:

Greater than 60 percent and up to 70 percent or a garage under home design 7 elements

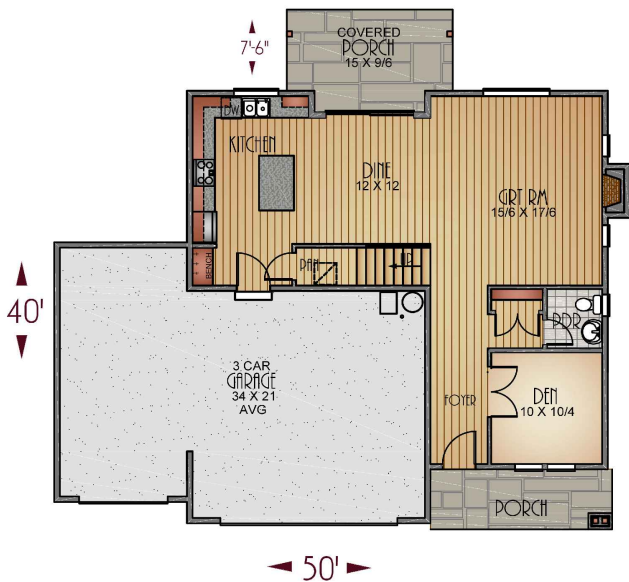
Typical Design Elements:

1. Covered porch entry – minimum 40 square foot covered front porch, minimum five (5) feet deep.
2. Building face containing two (2) or more off-sets of 16 inches or greater
3. Roof overhang of 16 inches or greater
4. Columns, pillars or posts at least four (4) inches wide and containing larger base materials.
5. Decorative gables – cross or diagonal bracing, shingles, trim, corbels, exposed rafter ends, or brackets
6. Decorative “belly-band” between building floors or gables
7. Windows and front door – occupying a minimum of 10 percent of the primary street facing façade
8. Sidelight and/or transom windows associated with the front door or windows in the front door
9. Window grids on all façade windows
10. Other item – mixing board and batt siding with lap siding for architectural detail



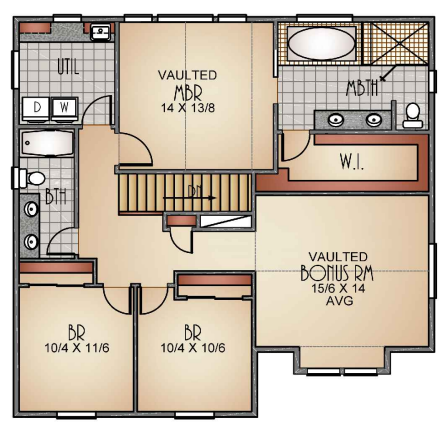
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THE WILLAMETTE C 3CAR NO.113016 C3C



1

MAIN FLOOR PLAN
948 SQUARE FEET
2198 SQUARE FEET TOTAL



UPPER FLOOR PLAN
1250 SQUARE FEET



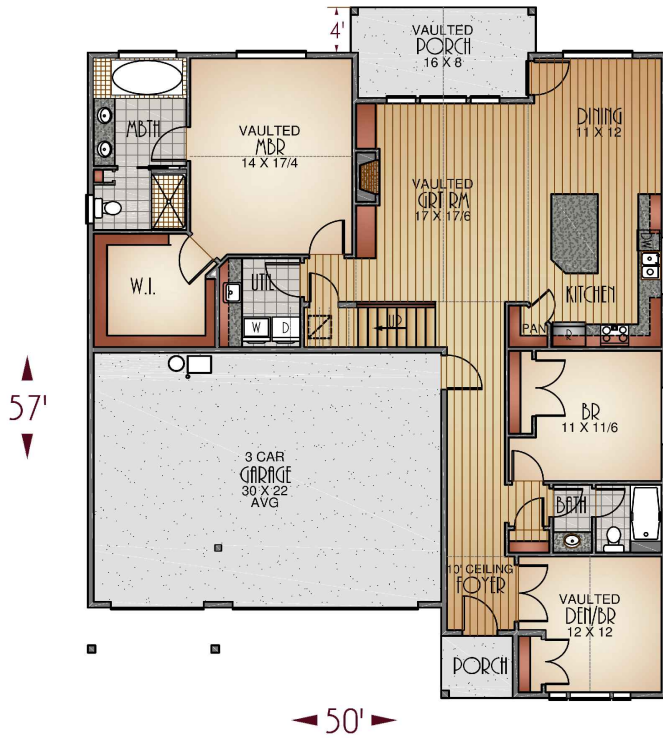
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THE TAMARACK

NO. 21016



UPPER FLOOR PLAN
464 SQUARE FEET

2

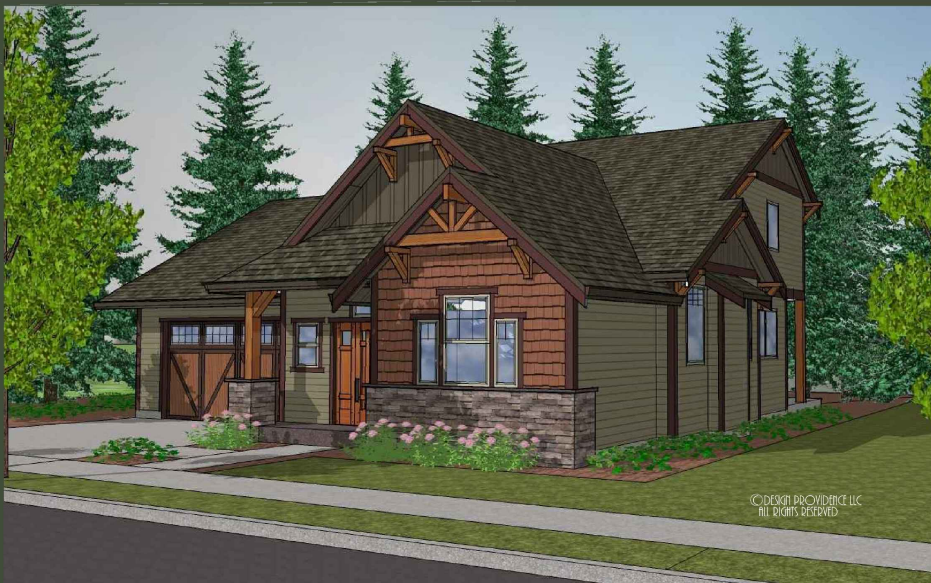
MAIN FLOOR PLAN

1820 SQUARE FEET
2284 SQUARE FEET TOTAL



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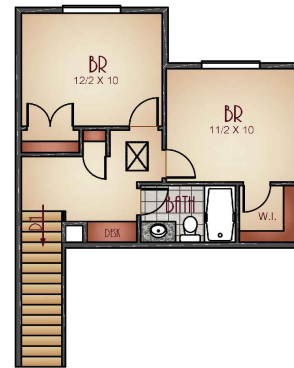
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THE MEMALOOSE

NO. 73112



UPPER FLOOR PLAN
455 SQUARE FEET

3

MAIN FLOOR PLAN
1420 SQUARE FEET
1875 SQUARE FEET TOTAL



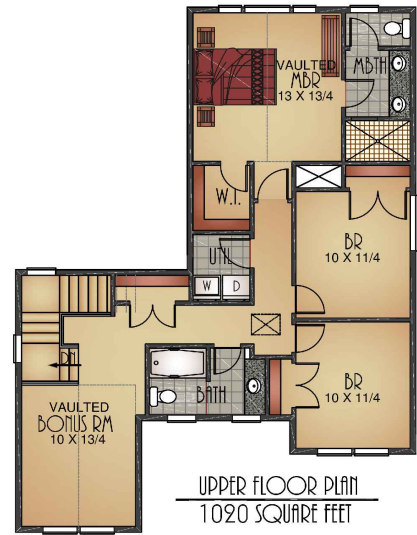
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THE CANEMAH 3 CAR

NO. 21712 3C

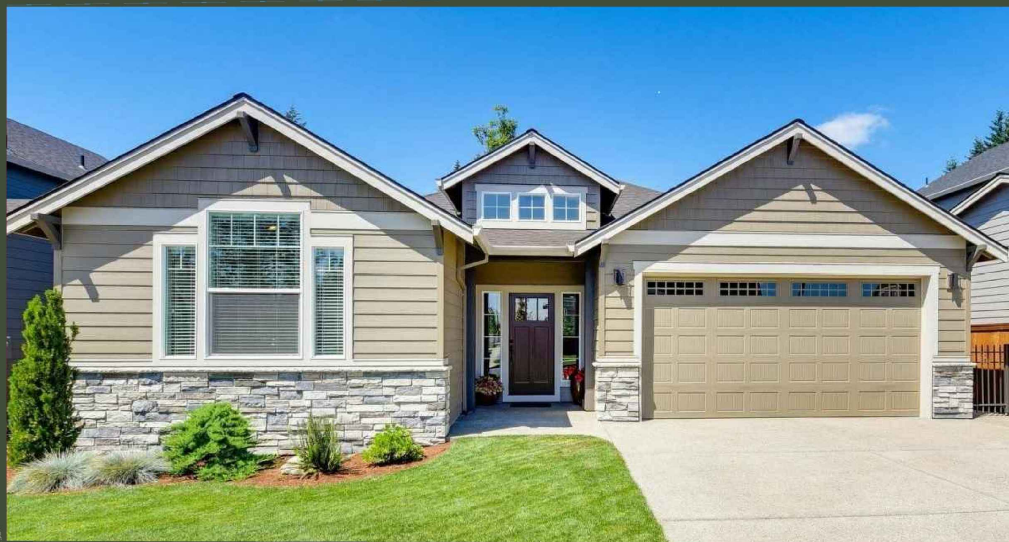


4



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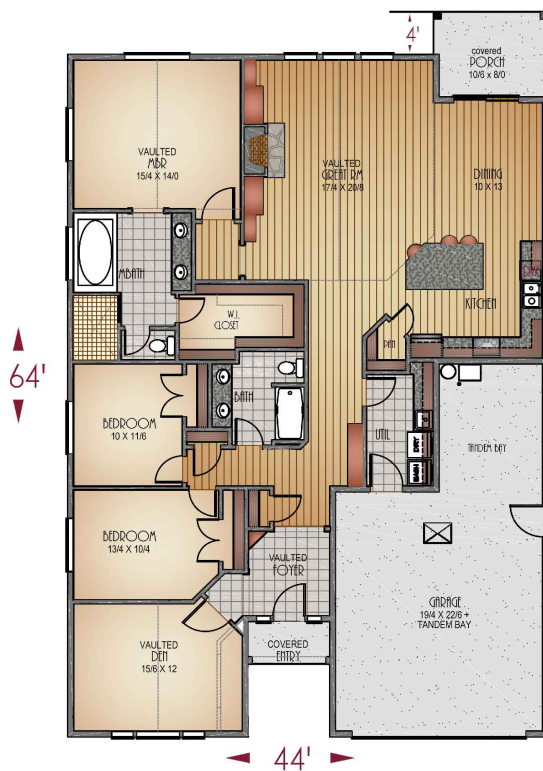
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THE RIPPLEBROOK C

NO. 102708



5

FLOOR PLAN
2060 SQUARE FEET



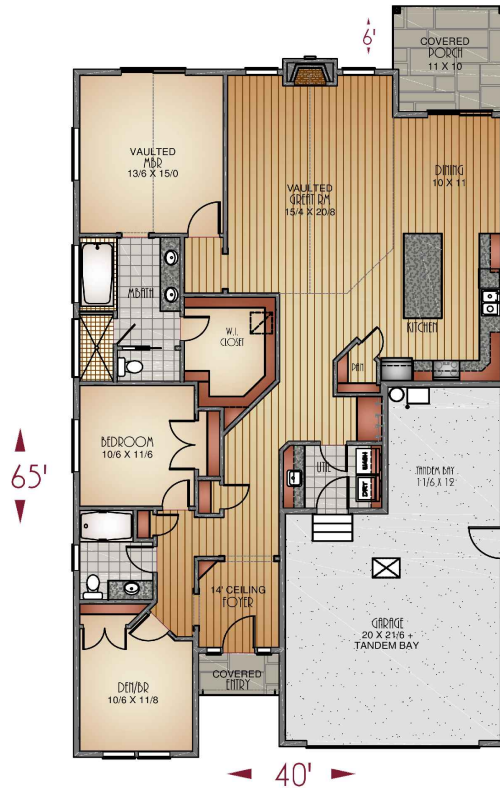
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FLOOR PLAN PHONE & FAX: 503-760-0446 WEB: DESIGNPROVIDENCELLC.COM



THE RIPPLEBROOK D

NO. 102708



6

40'
 FLOOR PLAN
 1870 SQUARE FEET

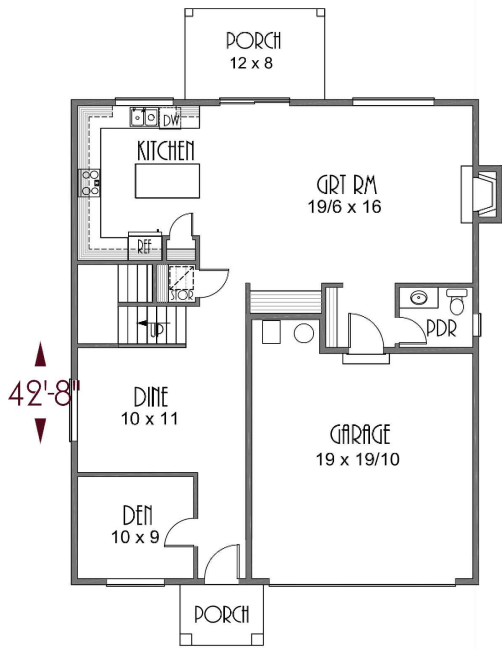


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THE CEDAR **NO.1521**

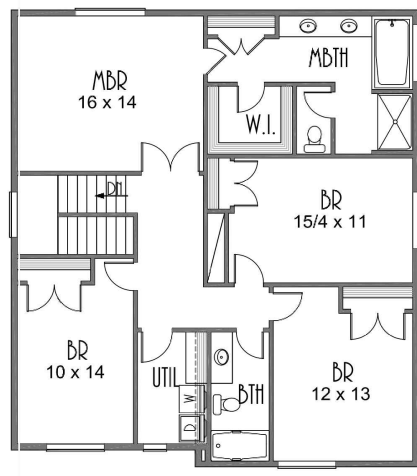


42'-8"

35'

7

MAIN FLOOR PLAN
 1066 SQUARE FEET
 2363 SQUARE FEET TOTAL



UPPER FLOOR PLAN
 1297 SQUARE FEET



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THE FAIRVIEW

NO. 11514



35'

MAIN FLOOR PLAN

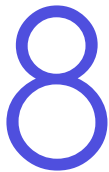
720 SQUARE FEET
1,680 SQUARE FEET TOTAL

35'-6"



UPPER FLOOR PLAN

960 SQUARE FEET



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THE CHARLOTTE

NO. 4212



9 **MAIN FLOOR PLAN**
840 SQUARE FEET
1700 SQUARE FEET TOTAL



UPPER FLOOR PLAN
860 SQUARE FEET



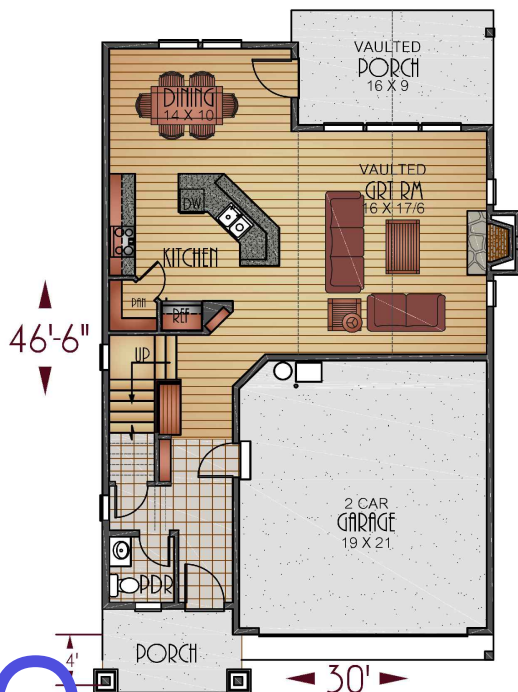
PMB 362 12042 S.E. SUNNYSIDE RD. CLACKAMAS, OR 97015

PHONE & FAX: 503-760-0446 WEB: DESIGNPROVIDENCELLC.COM



THE CHARLOTTE B

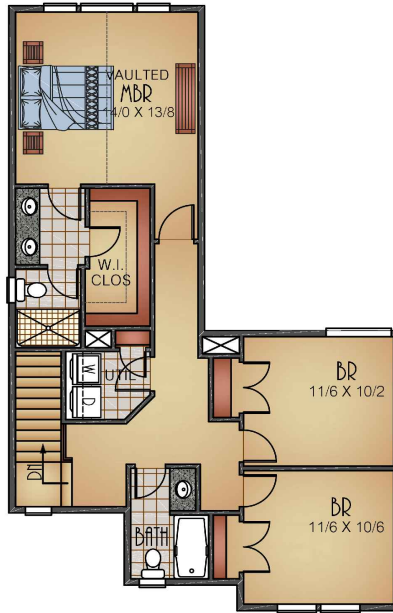
NO. 4212 B



46'-6"

4' 30'

10
 MAIN FLOOR PLAN
 856 SQUARE FEET
 1760 SQUARE FEET TOTAL



UPPER FLOOR PLAN
 904 SQUARE FEET



PMB 362 12042 S.E. SUNNYSIDE RD. CLACKAMAS, OR 97015

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The Views

Lower Views S.F. Attached Townhouses

Table 17.90.150 – A: Number of Required Design Elements

*Detached Garage

(An independent, self-supporting structure separated from the dwelling by at least 6 feet)

4 elements plus 4 elements on the garage

*Rear Loaded Garage

4 elements (zero for garage)

Townhouse Design Elements:

Front Façade:

1. Covered porch entry – minimum 40 square foot covered front porch, minimum five (5) feet deep.
2. Building face containing two (2) or more off-sets of 16 inches or greater
3. Roof overhang of 16 inches or greater
4. Columns, pillars or posts at least four (4) inches wide and containing larger base materials.
5. Decorative gables – cross or diagonal bracing, shingles, trim, corbels, exposed rafter ends, or brackets
6. Decorative “belly-band” between building floors or gables
7. Windows and front door – occupying a minimum of 10 percent of the primary street facing façade
8. Sidelight and/or transom windows associated with the front door or windows in the front door
9. Window grids on all façade windows
10. Other item – mixing board and batt siding with lap siding for architectural detail

Additional Street Facing Façades (3) minimum:

1. Roof overhang of 16 inches or greater.
2. Decorative “belly-band” between building floors or gables
3. Window grids on all façade windows

ADDITIONAL REQUIREMENTS

Roofs shall be gabled or hip type roofs (minimum pitch 3:12)

Proposed: 7:12 pitch

Garage Design Elements:

1. Roof overhang of 16 inches or greater
2. Decorative gables – cross or diagonal bracing, shingles, trim, corbels, exposed rafter ends, or brackets
3. Decorative “belly-band” between building floors or gables