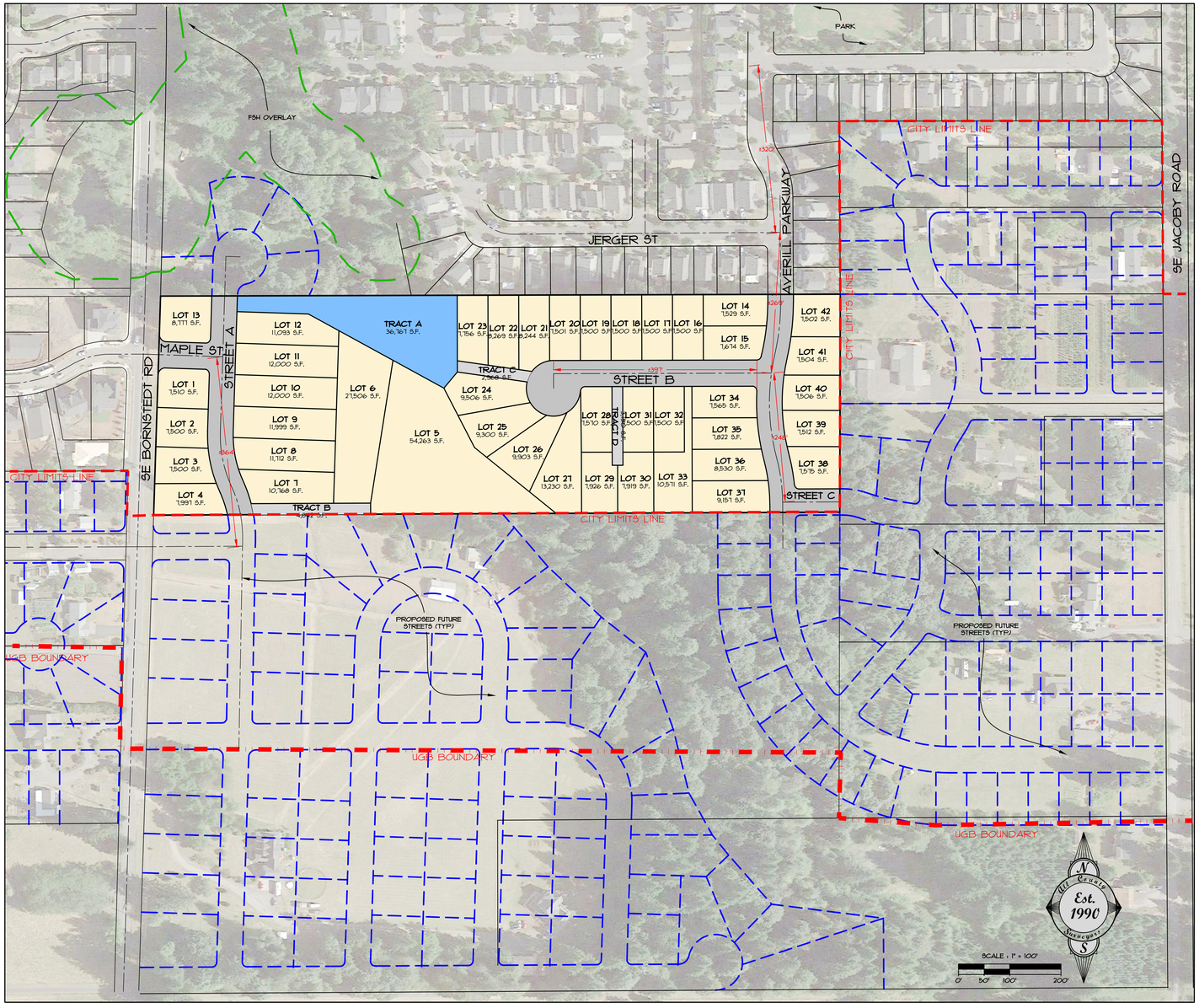
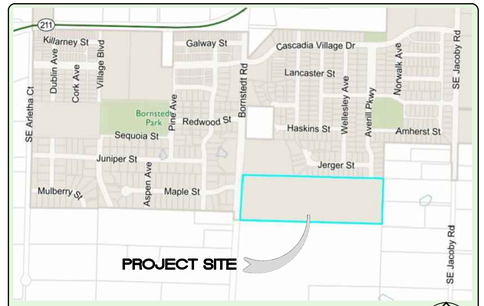
EXHIBIT C

"THE BORNSTEDT VIEWS"

A PROPOSED 42 LOT SUBDIVISION, APRIL 2021



SITE LOCATION AND FUTURE STREET PLAN
SCALE: 1" = 100'



VICINITY MAP
NTS
SANDY, OR

SHEET INDEX

Sheet Number	Sheet Title
C1	COVER SHEET AND FUTURE STREET PLAN
C2	TENTATIVE PLAT MAP
C3	TOPOGRAPHIC SURVEY
C4	TREE INVENTORY LIST 1
C5	TREE INVENTORY LIST 2
C6	TREE INVENTORY LIST 3
C7	TREE RETENTION AND PROTECTION PLAN
C8	STREET AND UTILITY PLAN
C9	GRADING AND EROSION CONTROL PLAN
C10	ON-STREET PARKING PLAN

DENSITY CALCULATIONS:

SITE AREA INFORMATION			
Total Site Area =>	554,897.31	SF	12.739 <=== Acres Total
Public ROW =>	77,975.25	SF	1.790 <=== Acres Total
Public Detention Pond Tracts =>	36,767.25	SF	0.844 <=== Acres Total
Private Tracts =>	10,959.90	SF	0.252 <=== Acres Total
Total Net Lot Area =>	429,194.91	SF	9.853 <=== Acres Total
Total Lot Area + Private Tracts =>	440,154.81	SF	10.105 <=== Acres Total
Denisty Calculations (Based on SFR Zoning)			
Minimum Density =>	3	units/acre	
Max density =>	5.8	units/acre	
Minimum Required Units =>	30.3	units	<=== Minimum Density
Maximum Allowed Units =>	58.6	units	<=== Maximum Base Density

PROPOSAL:

THE PROPOSED SUBDIVISION WILL CREATE A TOTAL OF 42 NEW RESIDENTIAL LOTS. THE MINIMUM DENSITY IS 30 LOTS AND THE MAXIMUM IS 59 LOTS.

SITE INFORMATION:

PROPERTY OWNER:
WILLIAM BLOOM
ADDRESS: 19618 SE BORNSTEDT ROAD
TAX LOT 100, MAP 2S 4E 24
AREA: 12.739 ACRES (554,891 SF)
ZONING: SFR

PROJECT TEAM:

CLIENT
EVEN BETTER HOMES, INC.
ATTN: MAC EVEN
PO BOX 2021
GRESHAM, OR 97030
PHONE: (503) 348-5602

PLANNER:
TRACY BROWN PLANNING CONSULTANTS, LLC
ATTN: TRACY BROWN
11075 FIR DRIVE
SANDY, OR 97055
PHONE: (503) 781-0453

ENGINEER/SURVEYOR
ALL COUNTY SURVEYORS & PLANNERS, INC.
ATTN: RAY MOORE, PE, PLS
TYLER HENDERSON, EIT
PO BOX 955
SANDY, OR 97055
PHONE: (503) 668-3151

ARBORIST
TERAGAN & ASSOCIATES, INC,
ATTN: TODD PRAGER
ASCA REGISTERED CONSULTING ARB #597
3145 WESTVIEW CIRCLE
LAKE OSWEGO, OR 97034
PHONE: (971) 295-4835

TRAFFIC ENGINEER
ARD ENGINEERING
ATTN: MIKE ARD, PE
21370 SW LANGER FARMS PARKW, SU 142,
SHERWOOD, OR 97140
PHONE: (503) 862-6960

GEOTECHNICAL ENGINEER
REDMOND GEOTECHNICAL SERVICES
ATTN: DAN REDMOND, GE
PO BOX 20941
PORTLAND, OR 97294
PHONE: (503) 285-0598

BY	NO.	DATE	REVISION
-	-	-	-

DESIGNED: RLM
DRAWN: RLM
CHECKED: DLH
APPROVED: RLM

PRELIMINARY

REGISTERED PROFESSIONAL LAND SURVEYOR
OREGON JULY 13, 2004 RAY L. MOORE
RENEWAL DATE: 12/31/2022

SHEET C1 OF 10

SCALE: VERT: N/A HORIZ: 1" = 100'
DATE: 4-30-21
FILE:19-268 - Planning-SFR.dwg
LEGAL: SECTION 24 TWP: 2S RANGE 4E

PROJECT:
THE BORNSTEDT VIEWS
COVER SHEET AND FUTURE STREET PLAN

LOCATION:
19618 SE BORNSTEDT ROAD, SANDY, OR

All County Surveyors & Planners, Inc.
Surveying, Planning and Forestry
P.O. Box 955 Sandy, OR 97055
Phone: (503) 668-3151
Fax: (503) 668-4730

DATE OF PLOT: 4-30-21

CLIENT:
EVEN BETTER HOMES, INC.
MAC EVEN
PO BOX 2021
GRESHAM, OR 97030
PHONE: (503) 348-5602
EMAIL: mac@evenbetterhomes.com

SCALE : 1" = 50'

0' 25' 50' 100'

JERGER ST

N89°50'19"E 1326.38'

AVERILL PARKWAY

SE BORNSTEDT RD

S01°52'20"W 417.62'

S00°08'59"W 415.49'

S89°45'29"W 1338.11'

MAPLE ST.

STREET A

STREET B

STREET C

TRACT A
36,161 S.F.
PUBLIC DETENTION POND

TRACT B
4,842 S.F.

TRACT C
2,968 S.F.

TRACT D
1,575 S.F.

LOT 1 1,510 S.F.
LOT 2 1,500 S.F.
LOT 3 1,500 S.F.
LOT 4 1,991 S.F.
LOT 5 54,263 S.F.
LOT 6 21,506 S.F.
LOT 7 10,168 S.F.
LOT 8 11,112 S.F.
LOT 9 11,999 S.F.
LOT 10 12,000 S.F.
LOT 11 12,000 S.F.
LOT 12 11,093 S.F.
LOT 13 8,111 S.F.
LOT 14 7,529 S.F.
LOT 15 7,614 S.F.
LOT 16 7,500 S.F.
LOT 17 7,500 S.F.
LOT 18 7,500 S.F.
LOT 19 7,500 S.F.
LOT 20 7,501 S.F.
LOT 21 8,244 S.F.
LOT 22 8,269 S.F.
LOT 23 7,156 S.F.
LOT 24 9,506 S.F.
LOT 25 9,300 S.F.
LOT 26 9,903 S.F.
LOT 27 13,230 S.F.
LOT 28 7,510 S.F.
LOT 29 7,926 S.F.
LOT 30 7,919 S.F.
LOT 31 7,500 S.F.
LOT 32 7,500 S.F.
LOT 33 10,511 S.F. AREA EXCLUDING FLAG POLE = 8,691.63 SF
LOT 34 7,565 S.F.
LOT 35 7,822 S.F.
LOT 36 8,530 S.F.
LOT 37 9,151 S.F.
LOT 38 7,515 S.F.
LOT 39 7,512 S.F.
LOT 40 7,506 S.F.
LOT 41 7,504 S.F.
LOT 42 7,502 S.F.

TEMP FIRE TURN-AROUND EASEMENT

8' PUE

22.00'

50.00'

30'

R=450.00'

R=400.00'

R=350.00'

R=50.00'

44.50'

PRELIMINARY

REGISTERED PROFESSIONAL LAND SURVEYOR
OREGON
JULY 24, 2007
MATTHEW L. MOSHER
RENEWAL DATE: 12/31/2022

SHEET	OF
C2	10

NO.	DATE	REVISION	BY
–	–	–	–

DESIGNED: RLM
DRAWN: RLM
CHECKED: DLH
APPROVED: RLM

SCALE: VERT: N/A HORIZ: 1" = 50'
DATE: 4-30-21
FILE:19-268 – Planning-SFR.dwg

LEGAL: SECTION 24, TWP. 2S, RANGE 4E

PROJECT:
THE BORNSTEDT VIEWS
TENTATIVE PLAT MAP

LOCATION: 19618 SE BORNSTEDT ROAD, SANDY, OR

Surveyors & Planners, Inc.
Surveying
Planning and
Civil Engineering
P.O. Box 955 Sandy, OR 97055
Phone: (503) 668-3151
Fax: (503) 668-4730

DATE OF PLOT: 4-30-21

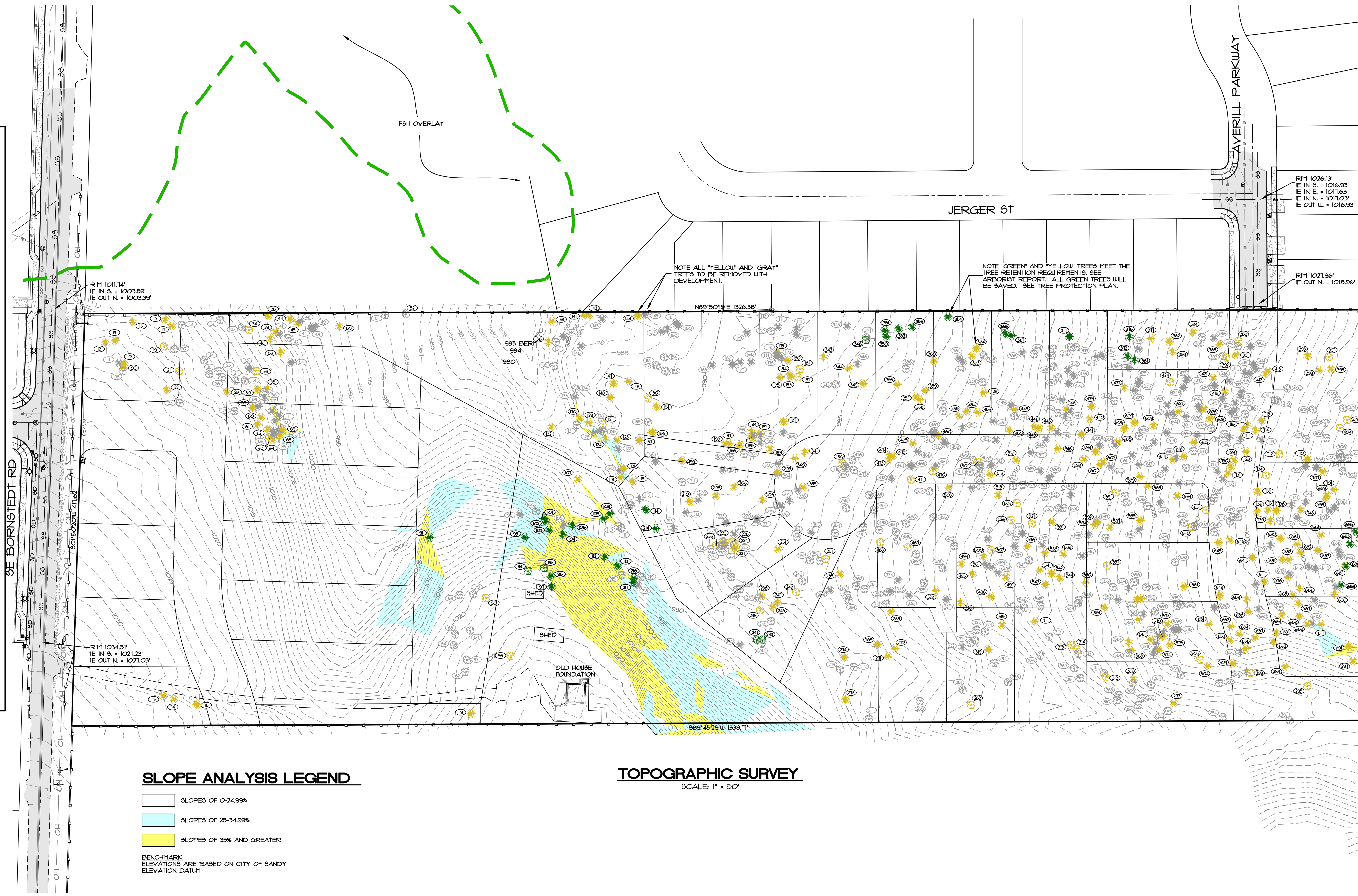
CLIENT:
EVEN BETTER HOMES, INC.
MAC OLSEN
PO BOX 2021
GRESHAM, OR 97030
PHONE: (503) 348-5602
EMAIL: moc@evenbetterhomes.com

SCALE : 1" = 50'

0' 25' 50' 100'

LEGEND

	(E) PROPERTY LINE
	(E) LOT LINE
	(E) CL RIGHT OF WAY
	(E) EASEMENT LINE
—100—	(E) 5' GROUND CONTOUR
—101—	(E) 1' GROUND CONTOUR
	(E) BUILDING WALL
	(E) AC PAVEMENT
	(E) SIDEWALK/CONCRETE
	(E) GRAVEL
	(E) CURB & GUTTER
	(E) FENCE
W	(E) WATER LINE
6W	(E) 6" WATER LINE
8W	(E) 8" WATER LINE
12W	(E) 12" WATER LINE
SD	(E) STORM LINE
SS	(E) SANITARY LINE
GAS	(E) GAS LINE
T	(E) TELEPHONE LINE, CATV
OH	(E) OVERHEAD POWER LINE
	FOUND SURVEY MONUMENT
	(E) STORM MANHOLE
	(E) CATCH BASIN
	(E) WATER METER
	(E) WATER VALVE
	(E) MANHOLE
GV	(E) GAS VALVE
	(E) LIGHT POLE
	(E) UTILITY POLE
	(E) POLE W/ GUY WIRE
	(E) SIGN
	(E) DECIDUOUS TREE
	(E) CONIFEROUS TREE
SS	(P) SANITARY LINE
	(P) SANITARY MANHOLE
SD	(P) STORM LINE
	(P) STORM MANHOLE
	(P) CATCH BASIN
W	(P) WATER LINE
	(P) WATER METER
	(P) WATER VALVE
	(P) FIRE HYDRANT
	(P) STREET LIGHT



SLOPE ANALYSIS LEGEND

SLOPES OF 0-24.99%

SLOPES OF 25-34.99%

SLOPES OF 35% AND GREATER

BENCHMARK
ELEVATIONS ARE BASED ON CITY OF SANDY ELEVATION DATUM

TOPOGRAPHIC SURVEY

SCALE: 1" = 50'

DATE	NO.	REVISION	BY
-	-	-	-

SHEET C3 OF 10

DESIGNED: RLM
DRAWN: RLM
CHECKED: DLH
APPROVED: RLM

PRELIMINARY

REGISTERED PROFESSIONAL ENGINEER 49710 OREGON JULY 21, 1998 RAY L. MOORE
RENEWAL DATE: 12/31/2022

SCALE: VERT.: N/A HORIZ.: 1" = 50'

DATE: 4-30-21

FILE:19-268 - Planning-SFR.dwg

LEGAL

SECTION	TWP.	RANGE
24	2S	4E

PROJECT:
THE BORNSTEDT VIEWS
TOPOGRAPHIC SURVEY

LOCATION:
19618 SE BORNSTEDT ROAD, SANDY, OR

All County Surveyors & Planners, Inc.
Surveying, Planning and Civil Engineering
P.O. Box 955 Sandy, OR 97055
Phone: (503) 668-3151
Fax: (503) 668-4730

DATE OF PLOT 4-30-21

CLIENT:
EVEN BETTER HOMES, INC.
MAC EVEN
PO BOX 2021
GRESHAM, OR 97030
PHONE: (503) 348-5602
EMAIL: mac@evenbetterhomes.com

"YES" INDICATES TREES THAT MEET TREE RETENTION REQUIREMENT. SEE NOTE 4.

"GREEN" HATCH INDICATES TREES THAT WILL BE PROTECTED.

	TREE TO BE SAVED OR REMOVED							TREE RETENTION	
	TREE No	COMMON NAME	SCIENTIFIC NAME	DBH	C-RAD	CONDITION	STRUCTURE	OPTION	COMMENTS
•	1	BITTER CHERRY	PRUNUS EMARGINATA	9	13	GOOD	FAIR	NO	ONE SIDED
•	2	BITTER CHERRY	PRUNUS EMARGINATA	11	15	GOOD	FAIR	YES	ONE SIDED
•	3	BITTER CHERRY	PRUNUS EMARGINATA	9	14	GOOD	FAIR	NO	ONE SIDED
•	4	BITTER CHERRY	PRUNUS EMARGINATA	12	15	GOOD	FAIR	YES	ONE SIDED, CODOMINANT AT 4' AND 6' WITH INCLUDED BARK
•	5	BITTER CHERRY	PRUNUS EMARGINATA	7	14	GOOD	FAIR	NO	ONE SIDED
•	6	BITTER CHERRY	PRUNUS EMARGINATA	6	12	GOOD	FAIR	NO	ONE SIDED
•	7	BITTER CHERRY	PRUNUS EMARGINATA	7	13	GOOD	FAIR	NO	ONE SIDED
•	8	BIGLEAF MAPLE	ACER MACROPHYLLUM	6	16	FAIR	FAIR	NO	ONE SIDED, OVERTOPPED BY ADJACENT TREES
•	9	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	35	20	GOOD	GOOD	YES	
•	10	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	18	12	GOOD	FAIR	YES	ONE SIDED
•	11	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	7	10	FAIR	FAIR	NO	OVERTOPPED BY ADJACENT TREES, MODERATELY SUPPRESSED
•	12	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	30	20	GOOD	FAIR	YES	ONE SIDED
•	13	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	42	20	GOOD	FAIR	YES	CODOMINANT AT 15' WITH INCLUDED BARK
	14	N/A	N/A	N/A	N/A	N/A	N/A	N/A	NUMBER NOT USED
•	15	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	22	17	GOOD	FAIR	YES	MODERATELY ONE SIDED
•	16	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	24	18	GOOD	FAIR	YES	MODERATELY ONE SIDED, CODOMINANT AT 20' WITH INCLUDED BARK
•	17	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	14	9	GOOD	FAIR	YES	ONE SIDED, MARGINAL TRUNK TAPER
•	18	SCOULER'S WILLOW	SALIX SCOULERIANA	11	8	POOR	POOR	NO	EXTENSIVE TOP FAILURES
•	19	BIGLEAF MAPLE	ACER MACROPHYLLUM	14	17	GOOD	FAIR	YES	ONE SIDED
•	20	BIGLEAF MAPLE	ACER MACROPHYLLUM	29	25	FAIR	FAIR	NO	MULTIPLE LEADERS AT LOWER TRUNK WITH INCLUDED BARK, PAST BRANCH FAILURES WITH DECAY
•	21	BIGLEAF MAPLE	ACER MACROPHYLLUM	16,15,14,14	20	GOOD	FAIR	YES	MULTIPLE LEADERS AT GROUND LEVEL
•	22	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	38	20	GOOD	FAIR	YES	MODERATELY ONE SIDED
•	23	SCOULER'S WILLOW	SALIX SCOULERIANA	12,10	15	VERY POOR	VERY POOR	NO	EXTENSIVE DIEBACK AND DECAY
•	24	BIGLEAF MAPLE	ACER MACROPHYLLUM	20	20	POOR	POOR	NO	SCAFFOLD BRANCH DIEBACK
•	25	BIGLEAF MAPLE	ACER MACROPHYLLUM	15,12,12,11	22	FAIR	FAIR	NO	MULTIPLE LEADERS AT GROUND LEVEL, PAST STEM FAILURES AND SCAFFOLD DIEBACK
•	26	BIGLEAF MAPLE	ACER MACROPHYLLUM	18	25	FAIR	FAIR	NO	ONE SIDED, PREVIOUSLY LOST TOP
•	27	BIGLEAF MAPLE	ACER MACROPHYLLUM	27	18	FAIR	FAIR	NO	MULTIPLE LEADERS AT 2' WITH INCLUDED BARK, SCAFFOLD BRANCH DIEBACK
•	28	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	11	11	GOOD	FAIR	YES	OVERTOPPED BY ADJACENT TREES
•	29	SWEET CHERRY	PRUNUS AVIUM	10,10,8	18	FAIR	FAIR	NO	MULTIPLE LEADERS AT GROUND LEVEL, ONE SIDED, LOW VIGOR
•	30	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	30	18	GOOD	FAIR	YES	MODERATELY ONE SIDED
•	31	BIGLEAF MAPLE	ACER MACROPHYLLUM	27	20	FAIR	FAIR	NO	ONE SIDED, CODOMINANT AT 5' WITH INCLUDED BARK, SCAFFOLD BRANCH DIEBACK
•	32	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	10	12	GOOD	FAIR	NO	OVERTOPPED BY ADJACENT TREES
•	33	BIGLEAF MAPLE	ACER MACROPHYLLUM	15	15	GOOD	FAIR	YES	ONE SIDED, MARGINAL TRUNK TAPER
•	34	BIGLEAF MAPLE	ACER MACROPHYLLUM	20	18	GOOD	FAIR	YES	MULTIPLE LEADERS, HIGH CROWN
•	35	BIGLEAF MAPLE	ACER MACROPHYLLUM	14	14	FAIR	FAIR	NO	ONE SIDED, OVERTOPPED BY ADJACENT TREES, MODERATELY SUPPRESSED
•	36	BIGLEAF MAPLE	ACER MACROPHYLLUM	16,12,11	23	FAIR	FAIR	NO	MULTIPLE LEADERS AT GROUND LEVEL, SLOUGHING BARK AT LOWER TRUNK
	37	N/A	N/A	N/A	N/A	N/A	N/A	N/A	NUMBER NOT USED
•	38	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	37	25	GOOD	FAIR	YES	MODERATELY ONE SIDED
•	39	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	19	14	GOOD	FAIR	YES	35% LIVE CROWN RATIO (LCR), MARGINAL TRUNK TAPER
•	40	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	18	15	GOOD	FAIR	YES	ONE SIDED
•	41	WESTERN REDCEDAR	THUJA PLICATA	14,10	0	VERY POOR	VERY POOR	NO	DEAD
•	42	WESTERN REDCEDAR	THUJA PLICATA	7,5	18	FAIR	FAIR	NO	OVERTOPPED BY ADJACENT TREES, SIGNIFICANT LEAN, CODOMINANT AT GROUND LEVEL, DECAY AT LOWER STEMS
•	43	WESTERN REDCEDAR	THUJA PLICATA	37	15	FAIR	FAIR	NO	SIGNIFICANT BARK DAMAGE AND DECAY AT LOWER TRUNK, MULTIPLE LEADERS AT 3' WITH INCLUDED BARK
•	44	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	24	16	GOOD	FAIR	YES	MODERATELY ONE SIDED
•	45	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	20	10	GOOD	FAIR	YES	ONE SIDED, MARGINAL TRUNK TAPER
•	46	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	8	11	GOOD	FAIR	NO	ONE SIDED, OVERTOPPED BY ADJACENT TREES
•	47	WESTERN REDCEDAR	THUJA PLICATA	14	12	FAIR	FAIR	NO	SIGNIFICANT BARK DAMAGE AT LOWER TRUNK
•	48	RED ALDER	ALNUS RUBRA	15	15	POOR	POOR	NO	ONE SIDED, PAST CODOMINANT STEM FAILURE
•	49	WESTERN REDCEDAR	THUJA PLICATA	12	8	VERY POOR	VERY POOR	NO	EXTENSIVE TOP DIEBACK
•	50	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	59	25	GOOD	FAIR	YES	CODOMINANT AT 2'
•	51	SWEET CHERRY	PRUNUS AVIUM	10	8	FAIR	FAIR	NO	ONE SIDED, THIN CROWN
•	52	SWEET CHERRY	PRUNUS AVIUM	6	5	GOOD	FAIR	NO	ONE SIDED, ON PROPERTY LINE?
•	53	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	28	18	GOOD	GOOD	YES	
•	54	WESTERN REDCEDAR	THUJA PLICATA	38	13	FAIR	FAIR	NO	LARGE SCAR AT LOWER TRUNK
•	55	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	30	20	GOOD	FAIR	YES	MODERATELY ONE SIDED
•	56	BIGLEAF MAPLE	ACER MACROPHYLLUM	8	15	POOR	POOR	NO	OVERTOPPED BY ADJACENT TREES, SIGNIFICANT LEAN, DECAY SEAM AT LOWER TRUNK
•	57	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	9	7	GOOD	FAIR	NO	MARGINAL TRUNK TAPER
•	58	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	7	7	FAIR	FAIR	NO	OVERTOPPED BY ADJACENT TREES, MODERATELY SUPPRESSED, MARGINAL TRUNK TAPER
•	59	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	20	11	GOOD	FAIR	YES	ONE SIDED, MARGINAL TRUNK TAPER
•	60	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	13	7	GOOD	FAIR	YES	MARGINAL TRUNK TAPER, CROWN EXTENSION SUPPRESSED BY ADJACENT TREES
•	61	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	32	17	GOOD	FAIR	YES	ONE SIDED
•	62	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	16	12	GOOD	FAIR	YES	ONE SIDED, MARGINAL TRUNK TAPER
•	63	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	17	18	GOOD	FAIR	YES	ONE SIDED
•	64	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	24	22	GOOD	FAIR	YES	ONE SIDED
•	65	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	14	6	FAIR	FAIR	NO	MODERATELY SUPPRESSED, POOR TRUNK TAPER
•	66	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	11	5	FAIR	FAIR	NO	MODERATELY SUPPRESSED, POOR TRUNK TAPER
•	67	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	25	14	FAIR	FAIR	NO	EXTENSIVE PORODAEDALEA PINI CONKS AT LOWER TRUNK
•	68	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	17	10	GOOD	FAIR	YES	ONE SIDED, CODOMINANT AT 15'
•	69	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	22	10	GOOD	FAIR	YES	ONE SIDED
•	70	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	15	13	FAIR	FAIR	NO	CODOMINANT STEM PREVIOUSLY REMOVED, MARGINAL TRUNK TAPER
•	71	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	9	9	GOOD	FAIR	NO	MODERATELY ONE SIDED
•	72	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	17	15	FAIR	FAIR	NO	MARGINAL TRUNK TAPER, RECENTLY EXPOSED
•	73	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	43	31	GOOD	FAIR	YES	ONE SIDED, MULTIPLE LEADERS AT 40'
•	74	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	35	27	GOOD	FAIR	YES	ONE SIDED, MULTIPLE LEADERS AT 40'
•	75	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	40	22	GOOD	FAIR	YES	ONE SIDED, MULTIPLE LEADERS AT 40'
•	76	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	6	9	GOOD	GOOD	NO	
•	77	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	9	11	GOOD	GOOD	NO	
•	78	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	8	10	GOOD	GOOD	NO	
•	79	GIANT SEQUOIA	SEQUOIADENDRON GIGANTEUM	85	28	GOOD	FAIR	YES	MULTIPLE LEADERS AT TOP OF CROWN
•	80	EUROPEAN MT. ASH	SORBUS AUCUPARIA	10	10	FAIR	FAIR	NO	CHLOROTIC, EXTENSIVE ROOT SUCKERS
•	81	ENGLISH HOLLY	ILEX AQUIFOLIUM	10,8,6	10	FAIR	FAIR	NO	MULTIPLE LEADERS AT GROUND LEVEL
•	82	ORCHARD APPLE	MALUS DOMESTICA	8	12	GOOD	GOOD	NO	
•	83	ORCHARD APPLE	MALUS DOMESTICA	14	11	FAIR	FAIR	NO	SIGNIFICANT DECAY AT LOWER TRUNK, CODOMINANT AT 1'
•	84	ORCHARD APPLE	MALUS DOMESTICA	12	13	FAIR	FAIR	NO	DECAY AT LOWER TRUNK
•	85	ORCHARD APPLE	MALUS DOMESTICA	10	8	POOR	POOR	NO	TOP FAILURE, SIGNIFICANT ROOT SUCKERS
•	86	ORCHARD APPLE	MALUS DOMESTICA	16	13	FAIR	FAIR	NO	SIGNIFICANT TRUNK DECAY, MULTIPLE LEADERS AT 1'
•	87	ORCHARD APPLE	MALUS DOMESTICA	9,9	10	VERY POOR	VERY POOR	NO	FALLEN OVER
•	88	ORCHARD PEAR	PYRUS SP.	6	8	GOOD	GOOD	NO	
•	89	ORCHARD PEAR	PYRUS SP.	7	7	GOOD	GOOD	NO	
•	90	ORCHARD APPLE	MALUS DOMESTICA	11	14	GOOD	GOOD	YES	
•	91	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	49	25	GOOD	FAIR	YES	CODOMINANT AT 30' WITH INCLUDED BARK
•	92	SCOULER'S WILLOW	SALIX SCOULERIANA	6,5,5,5,4,4	15	POOR	POOR	NO	MULTIPLE LEADERS AT GROUND LEVEL, BRANCH DIEBACK
•	93	ENGLISH HAWTHORN	CRATAEGUS MONOGYNA	18	18	GOOD	FAIR	YES	MULTIPLE LEADERS
•	94	BIGLEAF MAPLE	ACER MACROPHYLLUM	18	15	GOOD	FAIR	YES	ONE SIDED, MULTIPLE LEADERS AT 1'
•	95	BIGLEAF MAPLE	ACER MACROPHYLLUM	8,7,5	15	GOOD	FAIR	YES	MULTIPLE LEADERS AT GROUND LEVEL
•	96	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	22	20	GOOD	FAIR	YES	ONE SIDED
•	97	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	26	25	GOOD	FAIR	YES	ONE SIDED
•	98	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	32	30	GOOD	FAIR	YES	ONE SIDED
•	99	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	8	9	GOOD	GOOD	NO	
•	100	BIGLEAF MAPLE	ACER MACROPHYLLUM	6	8	GOOD	FAIR	NO	ONE SIDED, PREVIOUS LEADER FAILURE
•	101	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	31	25	GOOD	FAIR	YES	ONE SIDED, CODOMINANT WITH 6" STEM AT 3'
•	102	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	11	8	GOOD	FAIR	YES	ONE SIDED, OVERTOPPED BY ADJACENT TREES
•	103	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	32	25	GOOD	FAIR	YES	ONE SIDED, SUPPRESSED CROWN EXTENSION
•	104	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	35	20	GOOD	FAIR	YES	ONE SIDED, SUPPRESSED CROWN EXTENSION
•	105	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	7	5	GOOD	FAIR	NO	OVERTOPPED BY ADJACENT TREES
•	106	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	28	20	GOOD	FAIR	YES	ONE SIDED
•	107	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	40	30	GOOD	FAIR	YES	MODERATELY ONE SIDED
•	108	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	42	30	GOOD	FAIR	YES	ONE SIDED
•	109	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	46	30	GOOD	FAIR	YES	ONE SIDED
•	110	BIGLEAF MAPLE	ACER MACROPHYLLUM	9	20	GOOD	FAIR	NO	ONE SIDED, OVERTOPPED BY ADJACENT TREES
•	111	BIGLEAF MAPLE	ACER MACROPHYLLUM	6,5,5	20	GOOD	FAIR	NO	ONE SIDED, OVERTOPPED BY ADJACENT TREES, MULTIPLE LEADERS AT GROUND LEVEL
•	112	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	48	30	GOOD	FAIR	YES	ONE SIDED
•	113	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	50	30	GOOD	FAIR	YES	ONE SIDED
•	114	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	28	16	GOOD	FAIR	YES	ONE SIDED, BOWED LOWER TRUNK
•	115	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	18	12	FAIR	FAIR	NO	OVERTOPPED BY ADJACENT TREES, PISTOL BUTT
•	116	BIGLEAF MAPLE	ACER MACROPHYLLUM	6	15	GOOD	FAIR	NO	ONE SIDED, OVERTOPPED BY ADJACENT TREES
•	117	BIGLEAF MAPLE	ACER MACROPHYLLUM	6	15	GOOD	FAIR	NO	ONE SIDED, OVERTOPPED BY ADJACENT TREES
•	118	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	32	30	GOOD	FAIR	YES	ONE SIDED
•	119	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	27	22	GOOD	FAIR	YES	CROWN EXTENSION SUPPRESSED BY ADJACENT TREES
•	120	GRAND FIR	ABIES GRANDIS	10	12	GOOD	FAIR	NO	OVERTOPPED BY ADJACENT TREES
•	121	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	38	20	GOOD	FAIR	YES	MODERATELY ONE SIDED, PREVIOUS STEM FAILURE AT 4'
•	122	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	20	10	FAIR	FAIR	NO	MODERATELY SUPPRESSED, MARGINAL TRUNK TAPER
•	123	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	30	30	GOOD	FAIR	YES	ONE SIDED
•	124	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	21	15	GOOD	FAIR	YES	ONE SIDED, MARGINAL TRUNK TAPER
•	125	BIGLEAF MAPLE	ACER MACROPHYLLUM	8	15	GOOD	FAIR	NO	ONE SIDED, OVERTOPPED BY ADJACENT TREES
•	126	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	9	10	GOOD	FAIR	NO	MODERATELY ONE SIDED, OVERTOPPED BY ADJACENT TREES
•	127	BIGLEAF MAPLE	ACER MACROPHYLLUM	12	20	GOOD	FAIR	YES	ONE SIDED, OVERTOPPED BY ADJACENT TREES
•	128	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	6	8	GOOD	FAIR	NO	ONE SIDED, OVERTOPPED BY ADJACENT TREES
•	129	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	33	15	GOOD	FAIR	YES	ONE SIDED
•	130	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	28	25	GOOD	FAIR	YES	ONE SIDED
•	131	BIGLEAF MAPLE	ACER MACROPHYLLUM	6	15	GOOD	FAIR	NO	ONE SIDED
•	132	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	42	32	GOOD	FAIR	YES	ONE SIDED
•	133	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	12	10	FAIR	FAIR	NO	OVERTOPPED BY ADJACENT TREES, MODERATELY SUPPRESSED, SIGNIFICANT LEAN AT LOWER TRUNK
•	134	BIGLEAF MAPLE	ACER MACROPHYLLUM	7,6	8	FAIR	FAIR	NO	CODOMINANT AT GROUND LEVEL, UNDERSIZED LEAVES
•	135	BIGLEAF MAPLE	ACER MACROPHYLLUM	11	8	FAIR	FAIR	NO	CODOMINANT AT 2' WITH INCLUDED BARK, UNDERSIZED LEAVES
•	136	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	26	25	GOOD	FAIR	YES	ONE SIDED
•	137	SWEET CHERRY	PRUNUS AVIUM	6	7	GOOD	FAIR	NO	OVERTOPPED BY ADJACENT TREES
•	138	ENGLISH HOLLY	ILEX AQUIFOLIUM	6	8	GOOD	GOOD	NO	
•	139	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	40	30	GOOD	FAIR	YES	MODERATELY ONE SIDED
•	140	GRAND FIR	ABIES GRANDIS	23	0	VERY POOR	VERY POOR	NO	DEAD
•	141	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	32	30	GOOD	FAIR	YES	ONE SIDED
•	142	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	30	25	GOOD	FAIR	YES	ONE SIDED
•	143	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	34	30	FAIR	FAIR	NO	PORODAEDALEA PINI CONKS AT LOWER TRUNK
•	144	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	47	35	GOOD	FAIR	YES	PREVIOUS FILL FROM ADJACENT DEVELOPMENT

"YES" INDICATES TREES THAT MEET TREE RETENTION REQUIREMENT. SEE NOTE 4.

	TREE TO BE SAVED OR REMOVED							TREE RETENTION	
	TREE No	COMMON NAME	SCIENTIFIC NAME	DBH	C-RAD	CONDITION	STRUCTURE	OPTION	COMMENTS
•	145	PACIFIC YEW	TAXUS BREVIFOLIA	6	6	GOOD	GOOD	NO	
•	146	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	6	9	GOOD	GOOD	NO	
•	147	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	37	20	GOOD	FAIR	YES	MODERATELY ONE SIDED
•	148	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	38	30	GOOD	FAIR	YES	MODERATELY ONE SIDED
•	149	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	30	25	GOOD	FAIR	YES	MODERATELY ONE SIDED
•	150	BIGLEAF MAPLE	ACER MACROPHYLLUM	11	24	GOOD	FAIR	YES	MULTIPLE LEADERS AT 4', OVERTOPPED BY ADJACENT TREES
•	151	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	37	30	GOOD	FAIR	YES	MODERATELY ONE SIDED
•	152	RED ALDER	ALNUS RUBRA	8	15	GOOD	GOOD	NO	
•	153	RED ALDER	ALNUS RUBRA	8	6	VERY POOR	VERY POOR	NO	95% DEAD
•	154	RED ALDER	ALNUS RUBRA	11	15	GOOD	GOOD	YES	
•	155	BIGLEAF MAPLE	ACER MACROPHYLLUM	9	25	FAIR	FAIR	NO	OVERTOPPED BY ADJACENT TREES, MODERATELY SUPPRESSED
•	156	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	34	32	GOOD	FAIR	YES	MODERATELY ONE SIDED
•	157	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	30	25	GOOD	FAIR	YES	40% LCR
•	158	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	29	25	FAIR	FAIR	NO	PORODAEDALEA PINI CONKS AT LOWER TRUNK
•	159	WESTERN HEMLOCK	TSUGA HETEROPHYLLA	28	30	GOOD	GOOD	YES	
•	160	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	8	8	GOOD	FAIR	NO	ONE SIDED
•	161	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	7	7	GOOD	GOOD	NO	ONE SIDED
•	162	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	6	6	GOOD	FAIR	NO	ONE SIDED
•	163	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	8	10	GOOD	FAIR	NO	MODERATELY ONE SIDED
•	164	BIGLEAF MAPLE	ACER MACROPHYLLUM	6	10	GOOD	GOOD	NO	
•	165	WESTERN HEMLOCK	TSUGA HETEROPHYLLA	25	0	VERY POOR	VERY POOR	NO	DEAD
•	166	BIGLEAF MAPLE	ACER MACROPHYLLUM	36	40	FAIR	FAIR	NO	MULTIPLE LEADERS AT 2', MULTIPLE SCAFFOLD BRANCH FAILURES
•	167	WESTERN HEMLOCK	TSUGA HETEROPHYLLA	27	25	FAIR	FAIR	NO	MODERATELY THIN CROWN
•	168	WESTERN HEMLOCK	TSUGA HETEROPHYLLA	26	25	FAIR	FAIR	NO	MODERATELY THIN CROWN
•	169	WESTERN HEMLOCK	TSUGA HETEROPHYLLA	19	0	VERY POOR	VERY POOR	NO	DEAD
•	170	RED ALDER	ALNUS RUBRA	9	8	FAIR	FAIR	NO	SIGNIFICANT LEAN, EPICORMIC GROWTH AT LOWER TRUNK
•	171	GRAND FIR	ABIES GRANDIS	26	15	FAIR	FAIR	NO	MODERATELY THIN CROWN
•	172	SCOULER'S WILLOW	SALIX SCOULERIANA	14	0	VERY POOR	VERY POOR	NO	DEAD, ON PROPERTY LINE?
•	173	WESTERN HEMLOCK	TSUGA HETEROPHYLLA	14	8	FAIR	FAIR	NO	CODOMINANT AT 4', MODERATELY THIN CROWN
•	174	WESTERN HEMLOCK	TSUGA HETEROPHYLLA	22	15	FAIR	FAIR	NO	MODERATELY THIN CROWN
•	175	WESTERN HEMLOCK	TSUGA HETEROPHYLLA	17	15	GOOD	FAIR	YES	ONE SIDED
•	176	WESTERN HEMLOCK	TSUGA HETEROPHYLLA	11	0	VERY POOR	VERY POOR	NO	DEAD
•	177	WESTERN HEMLOCK	TSUGA HETEROPHYLLA	7	10	POOR	POOR	NO	SUPPRESSED
•	178	WESTERN HEMLOCK	TSUGA HETEROPHYLLA	11	8	POOR	POOR	NO	SUPPRESSED, CODOMINANT STEM AT 4' FAILED
•	179	WESTERN HEMLOCK	TSUGA HETEROPHYLLA	6	5	POOR	POOR	NO	SUPPRESSED
•	180	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	22	20	GOOD	FAIR	YES	35% LCR, MARGINAL TRUNK TAPER
•	181	BIGLEAF MAPLE	ACER MACROPHYLLUM	11	20	GOOD	FAIR	YES	ONE SIDED, OVERTOPPED BY ADJACENT TREES
•	182	BIGLEAF MAPLE	ACER MACROPHYLLUM	21	35	GOOD	FAIR	YES	CODOMINANT AT 4' WITH INCLUDED BARK, ONE SIDED, OVERTOPPED BY ADJACENT TREES
•	183	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	17	15	GOOD	FAIR	YES	ONE SIDED, OVERTOPPED BY ADJACENT TREES
•	184	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	30	30	GOOD	FAIR	YES	ONE SIDED
•	185	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	34	30	GOOD	FAIR	YES	MODERATELY ONE SIDED, PISTOL BUTT
•	186	WESTERN HEMLOCK	TSUGA HETEROPHYLLA	6	8	GOOD	FAIR	NO	OVERTOPPED BY ADJACENT TREES
•	187	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	37	32	GOOD	FAIR	YES	MODERATELY ONE SIDED
•	188	WESTERN HEMLOCK	TSUGA HETEROPHYLLA	6	10	GOOD	GOOD	NO	
•	189	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	35	30	GOOD	FAIR	YES	CROWN EXTENSION SUPPRESSED BY ADJACENT TREES
•	190	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	21	20	FAIR	POOR	NO	25% LCR
•	191	WESTERN HEMLOCK	TSUGA HETEROPHYLLA	8	8	GOOD	GOOD	NO	
•	192	GRAND FIR	ABIES GRANDIS	19	15	GOOD	FAIR	YES	ONE SIDED, MARGINAL TRUNK TAPER
•	193	GRAND FIR	ABIES GRANDIS	21	15	FAIR	POOR	NO	30% LCR
•	194	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	30	30	GOOD	FAIR	YES	ONE SIDED
•	195	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	13	15	GOOD	FAIR	YES	ONE SIDED, OVERTOPPED BY ADJACENT TREES, MARGINAL TRUNK TAPER
•	196	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	31	30	GOOD	FAIR	YES	CROWN EXTENSION SUPPRESSED BY ADJACENT TREES
•	197	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	42	40	GOOD	FAIR	YES	MODERATELY ONE SIDED
•	198	WESTERN HEMLOCK	TSUGA HETEROPHYLLA	13	20	GOOD	FAIR	YES	OVERTOPPED BY ADJACENT TREES
•	199	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	44	40	GOOD	FAIR	YES	MODERATELY ONE SIDED, DECAY POCKET AT LOWER TRUNK
•	200	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	9	0	VERY POOR	VERY POOR	NO	DEAD 20' SNAG
•	201	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	8	0	VERY POOR	VERY POOR	NO	DEAD 25' SNAG
•	202	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	11	5	POOR	POOR	NO	OVERTOPPED BY ADJACENT TREES, SUPPRESSED
•	203	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	51	30	GOOD	FAIR	YES	KINKED LOWER TRUNK
•	204	WESTERN HEMLOCK	TSUGA HETEROPHYLLA	10	10	GOOD	FAIR	NO	OVERTOPPED BY ADJACENT TREES
•	205	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	39	40	GOOD	FAIR	YES	50% LCR
•	206	WESTERN HEMLOCK	TSUGA HETEROPHYLLA	11	15	GOOD	FAIR	YES	CODOMINANT AT 12'
•	207	WESTERN HEMLOCK	TSUGA HETEROPHYLLA	27	18	FAIR	FAIR	NO	CODOMINANT AT 10', MODERATELY THIN CROWN
•	208	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	37	38	GOOD	GOOD	YES	
•	209	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	10	8	FAIR	FAIR	NO	OVERTOPPED BY ADJACENT TREES, MODERATELY SUPPRESSED
•	210	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	41	30	GOOD	FAIR	YES	MODERATELY ONE SIDED, 10" STEM AT 2'
•	211	BIGLEAF MAPLE	ACER MACROPHYLLUM	6	8	GOOD	GOOD	NO	
•	212	WESTERN HEMLOCK	TSUGA HETEROPHYLLA	9	9	GOOD	FAIR	NO	OVERTOPPED BY ADJACENT TREES
•	213	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	40	25	FAIR	FAIR	NO	PORODAEDALEA PINI CONKS AT LOWER TRUNK
•	214	GRAND FIR	ABIES GRANDIS	26	20	GOOD	FAIR	YES	ONE SIDED
•	215	BIGLEAF MAPLE	ACER MACROPHYLLUM	8	10	GOOD	FAIR	NO	ONE SIDED, OVERTOPPED BY ADJACENT TREES
•	216	BIGLEAF MAPLE	ACER MACROPHYLLUM	23	35	GOOD	FAIR	YES	ONE SIDED
•	217	BIGLEAF MAPLE	ACER MACROPHYLLUM	23	35	GOOD	FAIR	YES	ONE SIDED
•	218	WESTERN REDCEDAR	THUJA PLICATA	7	10	GOOD	GOOD	NO	
•	219	BIGLEAF MAPLE	ACER MACROPHYLLUM	7	12	GOOD	FAIR	NO	ONE SIDED, OVERTOPPED BY ADJACENT TREES
•	220	WESTERN HEMLOCK	TSUGA HETEROPHYLLA	14	10	FAIR	FAIR	NO	25% LCR, ONE SIDED
•	221	WESTERN HEMLOCK	TSUGA HETEROPHYLLA	24	15	FAIR	FAIR	NO	25% LCR, ONE SIDED
•	222	WESTERN HEMLOCK	TSUGA HETEROPHYLLA	22	0	VERY POOR	VERY POOR	NO	DEAD
•	223	WESTERN HEMLOCK	TSUGA HETEROPHYLLA	39	20	FAIR	FAIR	NO	CODOMINANT AT 3', MODERATELY THIN CROWN
•	224	BIGLEAF MAPLE	ACER MACROPHYLLUM	24	20	GOOD	FAIR	YES	ONE SIDED, CODOMINANT AT 2' WITH INCLUDED BARK
•	225	BIGLEAF MAPLE	ACER MACROPHYLLUM	10	7	FAIR	FAIR	NO	OVERTOPPED BY ADJACENT TREES, MODERATELY SUPPRESSED
•	226	GRAND FIR	ABIES GRANDIS	32	18	GOOD	FAIR	YES	50% LCR
•	227	GRAND FIR	ABIES GRANDIS	15	15	GOOD	FAIR	YES	ONE SIDED, OVERTOPPED BY ADJACENT TREES
•	228	BIGLEAF MAPLE	ACER MACROPHYLLUM	14	2	POOR	POOR	NO	TOP FAILURE AT 20'
•	229	BIGLEAF MAPLE	ACER MACROPHYLLUM	14	20	GOOD	FAIR	YES	ONE SIDED, MULTIPLE LEADERS AT 20'
•	230	BIGLEAF MAPLE	ACER MACROPHYLLUM	13	15	FAIR	FAIR	NO	ONE SIDED, OVERTOPPED BY ADJACENT TREES
•	231	BIGLEAF MAPLE	ACER MACROPHYLLUM	14	15	FAIR	FAIR	NO	ONE SIDED, OVERTOPPED BY ADJACENT TREES
•	232	BIGLEAF MAPLE	ACER MACROPHYLLUM	16	18	FAIR	FAIR	NO	ONE SIDED, OVERTOPPED BY ADJACENT TREES
•	233	BIGLEAF MAPLE	ACER MACROPHYLLUM	20	25	GOOD	FAIR	YES	ONE SIDED
•	234	BIGLEAF MAPLE	ACER MACROPHYLLUM	13	20	FAIR	FAIR	NO	ONE SIDED, OVERTOPPED BY ADJACENT TREES
•	235	SCOULER'S WILLOW	SALIX SCOULERIANA	10,8,6	0	VERY POOR	VERY POOR	NO	EXTENSIVE DIEBACK AND DECAY
•	236	BIGLEAF MAPLE	ACER MACROPHYLLUM	10	0	VERY POOR	VERY POOR	NO	DEAD
•	237	BIGLEAF MAPLE	ACER MACROPHYLLUM	6	15	GOOD	FAIR	NO	SIGNIFICANT LEAN, OVERTOPPED BY ADJACENT TREES, ONE SIDED
•	238	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	41	25	GOOD	FAIR	YES	MODERATELY ONE SIDED
•	239	BIGLEAF MAPLE	ACER MACROPHYLLUM	32	35	GOOD	FAIR	YES	MULTIPLE LEADERS AT 4', ONE SIDED, OVERTOPPED BY ADJACENT TREES
•	240	WESTERN HEMLOCK	TSUGA HETEROPHYLLA	32	25	FAIR	FAIR	NO	ONE SIDED
•	241	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	26	20	GOOD	FAIR	YES	ONE SIDED
•	242	BLACK HAWTHORN	CRATAEGUS DOUGLASII	13	15	POOR	POOR	NO	OVERTOPPED BY ADJACENT TREES, SIGNIFICANT LEAN, SUPPRESSED
•	243	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	33	20	GOOD	FAIR	YES	ONE SIDED
•	244	BLACK HAWTHORN	CRATAEGUS DOUGLASII	6	6	FAIR	FAIR	NO	ONE SIDED, OVERTOPPED BY ADJACENT TREES
•	245	BIGLEAF MAPLE	ACER MACROPHYLLUM	8	20	GOOD	FAIR	NO	ONE SIDED, OVERTOPPED BY ADJACENT TREES
•	246	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	40	25	GOOD	FAIR	YES	ONE SIDED
•	247	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	31	25	GOOD	FAIR	YES	ONE SIDED
•	248	BIGLEAF MAPLE	ACER MACROPHYLLUM	28	25	GOOD	FAIR	YES	CODOMINANT AT 1' WITH INCLUDED BARK, OVERTOPPED BY ADJACENT TREES
•	249	WESTERN HEMLOCK	TSUGA HETEROPHYLLA	6	5	FAIR	FAIR	NO	OVERTOPPED BY ADJACENT TREES, MODERATELY THIN CROWN
•	250	BIGLEAF MAPLE	ACER MACROPHYLLUM	8	8	FAIR	FAIR	NO	OVERTOPPED BY ADJACENT TREES, MODERATELY SUPPRESSED
•	251	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	37	20	GOOD	FAIR	YES	ONE SIDED
•	252	BIGLEAF MAPLE	ACER MACROPHYLLUM	18	15	FAIR	FAIR	NO	MODERATELY SUPPRESSED
•	253	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	14	15	FAIR	POOR	NO	25% LCR
•	254	BIGLEAF MAPLE	ACER MACROPHYLLUM	50	25	FAIR	POOR	NO	MULTIPLE LEADERS AT 2', TWO FAILED LEADERS, DECAY AT ROOT CROWN
•	255	RED ALDER	ALNUS RUBRA	42	20	FAIR	POOR	NO	MULTIPLE LEADERS AT 3' WITH INCLUDED BARK
•	256	SWEET CHERRY	PRUNUS AVIUM	7	5	FAIR	POOR	NO	15% LCR
•	257	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	14	15	GOOD	GOOD	YES	
•	258	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	26	20	GOOD	FAIR	YES	MODERATELY ONE SIDED
•	259	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	6	6	FAIR	FAIR	NO	OVERTOPPED BY ADJACENT TREES, MODERATELY THIN CROWN
•	260	SWEET CHERRY	PRUNUS AVIUM	9	9	FAIR	POOR	NO	MODERATELY THIN CROWN, 25% LCR
•	261	SWEET CHERRY	PRUNUS AVIUM	10	10	FAIR	FAIR	NO	MODERATELY THIN CROWN
•	262	BIGLEAF MAPLE	ACER MACROPHYLLUM	10	20	GOOD	GOOD	NO	
•	263	SCOULER'S WILLOW	SALIX SCOULERIANA	12	10	POOR	POOR	NO	SIGNIFICANT DIEBACK AND DECAY
•	264	SCOULER'S WILLOW	SALIX SCOULERIANA	8	8	POOR	POOR	NO	SIGNIFICANT DIEBACK AND DECAY
•	265	SCOULER'S WILLOW	SALIX SCOULERIANA	7	5	POOR	POOR	NO	TOP FAILED AT 20'
•	266	BIGLEAF MAPLE	ACER MACROPHYLLUM	8	8	GOOD	FAIR	NO	40% LCR
•	267	SWEET CHERRY	PRUNUS AVIUM	8	10	FAIR	FAIR	NO	MODERATELY SUPPRESSED, MODERATELY THIN CROWN
•	268	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	27	20	GOOD	FAIR	YES	MODERATELY ONE SIDED
•	269	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	34	20	GOOD	FAIR	YES	ONE SIDED
•	270	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	45	30	GOOD	FAIR	YES	ONE SIDED
•	271	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	36	20	GOOD	FAIR	YES	ONE SIDED
•	272	RED ALDER	ALNUS RUBRA	12	10	FAIR	FAIR	NO	OVERTOPPED BY ADJACENT TREES, SIGNIFICANT LEAN
•	273	RED ALDER	ALNUS RUBRA	16	15	FAIR	FAIR	NO	OVERTOPPED BY ADJACENT TREES, SIGNIFICANT LEAN
•	274	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	37	25	GOOD	FAIR	YES	MODERATELY ONE SIDED
•	275	SCOULER'S WILLOW	SALIX SCOULERIANA	25	15	POOR	POOR	NO	SIGNIFICANT DIEBACK AND DECAY
•	276	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	30	20	GOOD	FAIR	YES	MODERATELY ONE SIDED
•	277	BIGLEAF MAPLE	ACER MACROPHYLLUM	25	35	GOOD	FAIR	YES	CODOMINANT AT 15'
	278	N/A	N/A	N/A	N/A	N/A	N/A	N/A	NUMBER NOT USED
	279	N/A	N/A	N/A	N/A	N/A	N/A	N/A	NUMBER NOT USED
•	280	SWEET CHERRY	PRUNUS AVIUM	12	8	POOR	POOR	NO	TOP DIEBACK
•	281	BIGLEAF MAPLE	ACER MACROPHYLLUM	17	25	POOR	POOR	NO	SIGNIFICANT BARK DAMAGE AND DECAY AT LOWER TRUNK
•	282	BIGLEAF MAPLE	ACER MACROPHYLLUM	27	30	GOOD	GOOD	YES	
•	283	SWEET CHERRY	PRUNUS AVIUM	11	10	FAIR	FAIR	NO	ONE SIDED, MODERATELY THIN CROWN
•	284	BIGLEAF MAPLE	ACER MACROPHYLLUM	38	35	FAIR	FAIR	NO	MULTIPLE LEADERS AT LOWER TRUNK WITH INCLUDED BARK, BRANCH DIEBACK
•	285	SWEET CHERRY	PRUNUS AVIUM	9	5	POOR	POOR	NO	SIGNIFICANT DIEBACK AND DECAY
•	286	BIGLEAF MAPLE	ACER MACROPHYLLUM	15	15	FAIR	FAIR	NO	ONE SIDED, OVERTOPPED BY ADJACENT TREES, UNDERSIZED LEAVES
•	287	BIGLEAF MAPLE	ACER MACROPHYLLUM	27	30	FAIR	FAIR	NO	ONE SIDED, OVERTOPPED BY ADJACENT TREES, UNDERSIZED LEAVES
•	288	BIGLEAF MAPLE	ACER MACROPHYLLUM	24	25	FAIR	FAIR	NO	ONE SIDED, UNDERSIZED LEAVES, CODOMINANT AT 3' WITH INCLUDED BARK

TREE SURVEY COMPLETED BY: TERAGAN & ASSOCIATES, INC.

ATTENTION: TODD PRAGER, ASCA REGISTERED CONSULTING ARBORIST #597, ISA BOARD CERTIFIED MASTER ARBORIST, ISA TREE RISK ASSESSMENT QUALIFIED, AICP, AMERICAN PLANNING ASSOCIATION

1. DBH IS THE TRUNK DIAMETER IN INCHES MEASURED IN ACCORDANCE WITH INTERNATIONAL SOCIETY OF ARBORICULTURE STANDARDS.
2. C-RAD IS THE APPROXIMATE CROWN RADIUS IN FEET.
3. CONDITION AND STRUCTURE RATINGS RANGE FROM VERY POOR, POOR, FAIR, TO GOOD.
4. TREE MEETS THE REQUIREMENTS TO BE A RETENTION TREE PER 17.102.50.A-3 TREES PROPOSED FOR RETENTION SHALL BE HEALTHY AND LIKELY TO GROW TO MATURITY. PER CITY OF SANDY, ONLY TREES IN GOOD HEALTH CONDITION ARE ELIGIBLE TO MEET THIS STANDARD.

CLIENT:

EVEN BETTER HOMES, INC.
MAC EVEN
PO BOX 2021
GRESHAM, OR 97030
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EMAIL: mac@evenbetterhomes.com

All County Surveyors & Planners, Inc.
Surveying, Planning and Civil Engineering
P.O. Box 955 Sandy, OR 97055
Phone: (503) 668-3151
Fax: (503) 668-4730

DATE OF PLOT 4-30-21

PROJECT:

THE BORNSTEDT VIEWS

TREE INVENTORY LIST 1

LOCATION:

19618 SE BORNSTEDT ROAD, SANDY, OR

SCALE	VERT.: N/A HORIZ.: N/A
DATE:	4-30-21
FILE:	19-268 - Planning-SFR.dwg

LEGAL		
SECTION	TWP.	RANGE
24	2S	4E

REGISTERED PROFESSIONAL ENGINEER 49710 OREGON JULY 21, 1998 RAY L. MOORE
RENEWAL DATE: 12/31/2022

PRELIMINARY

DESIGNED:	RLM
DRAWN:	RLM
CHECKED:	DLH
APPROVED:	RLM

DATE	NO.	REVISION	BY
-	-	-	-

SHEET C4 OF 10

TREE TO BE SAVED OR REMOVED

"YES" INDICATES TREES THAT MEET TREE RETENTION REQUIREMENT. SEE NOTE 4.

	TREE No	COMMON NAME	SCIENTIFIC NAME	DBH	C-RAD	CONDITION	STRUCTURE	TREE RETENTION OPTION	COMMENTS
•	289	BIGLEAF MAPLE	ACER MACROPHYLLUM	15	20	FAIR	FAIR	NO	ONE SIDED, UNDERSIZED LEAVES
•	290	BIGLEAF MAPLE	ACER MACROPHYLLUM	17	15	POOR	POOR	NO	CODOMINANT AT 1' WITH INCLUDED BARK, CODOMINANT STEM FAILED
•	291	BIGLEAF MAPLE	ACER MACROPHYLLUM	25	25	FAIR	FAIR	NO	UNDERSIZED LEAVES
•	292	BIGLEAF MAPLE	ACER MACROPHYLLUM	20	25	FAIR	FAIR	NO	ONE SIDED, UNDERSIZED LEAVES
•	293	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	31	20	GOOD	FAIR	YES	ONE SIDED
•	294	SCOULER'S WILLOW	SALIX SCOULERIANA	15	8	POOR	POOR	NO	EXTENSIVE DIEBACK AND DECAY
•	295	BIGLEAF MAPLE	ACER MACROPHYLLUM	20	15	GOOD	FAIR	YES	ONE SIDED
•	296	SWEET CHERRY	PRUNUS AVIUM	12	8	FAIR	FAIR	NO	UNDERSIZED LEAVES, ONE SIDED
•	297	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	28	20	GOOD	FAIR	YES	MODERATELY ONE SIDED
•	298	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	32	25	GOOD	FAIR	YES	MODERATELY ONE SIDED
•	299	BIGLEAF MAPLE	ACER MACROPHYLLUM	21	20	GOOD	FAIR	YES	ONE SIDED, MULTIPLE LEADERS AT 10'
•	300	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	7	7	FAIR	FAIR	NO	OVERTOPPED BY ADJACENT TREES, SUPPRESSED
•	301	SWEET CHERRY	PRUNUS AVIUM	7	3	VERY POOR	VERY POOR	NO	90% DEAD
•	302	BIGLEAF MAPLE	ACER MACROPHYLLUM	30	30	FAIR	FAIR	NO	SIGNIFICANT DECAY AT ROOT CROWN, ONE SIDED
•	303	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	23	15	GOOD	FAIR	YES	MODERATELY ONE SIDED
•	304	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	26	18	GOOD	FAIR	YES	MODERATELY ONE SIDED
•	305	BIGLEAF MAPLE	ACER MACROPHYLLUM	16	20	GOOD	FAIR	YES	ONE SIDED
•	306	BIGLEAF MAPLE	ACER MACROPHYLLUM	11	15	FAIR	FAIR	NO	33% LCR, UNDERSIZED LEAVES, MARGINAL TRUNK TAPER
•	307	BIGLEAF MAPLE	ACER MACROPHYLLUM	18,15	20	FAIR	FAIR	NO	OVERTOPPED BY ADJACENT TREES, MULTIPLE LEADERS NEAR GROUND LEVEL
•	308	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	27	25	GOOD	FAIR	YES	60% LCR
•	309	BIGLEAF MAPLE	ACER MACROPHYLLUM	10	10	POOR	POOR	NO	OVERTOPPED BY ADJACENT TREES, TOP FAILED
•	310	BLACK HAWTHORN	CRATAEGUS DOUGLASII	8	10	FAIR	FAIR	NO	SIGNIFICANT LEAN, OVERTOPPED BY ADJACENT TREES, MODERATELY SUPPRESSED
•	311	BLACK COTTONWOOD	POPULUS TRICHOCARPA	12	10	FAIR	FAIR	NO	OVERTOPPED BY ADJACENT TREES, MODERATELY SUPPRESSED
•	312	BIGLEAF MAPLE	ACER MACROPHYLLUM	35	25	GOOD	FAIR	YES	MULTIPLE LEADERS AT LOWER TRUNK WITH INCLUDED BARK
•	313	BIGLEAF MAPLE	ACER MACROPHYLLUM	22	20	FAIR	FAIR	NO	CODOMINANT AT 4' WITH INCLUDED BARK, PAST SCAFFOLD BRANCH FAILURES
•	314	BIGLEAF MAPLE	ACER MACROPHYLLUM	14	15	GOOD	FAIR	YES	ONE SIDED, MARGINAL TRUNK TAPER
•	315	BIGLEAF MAPLE	ACER MACROPHYLLUM	27	25	GOOD	FAIR	YES	MULTIPLE LEADERS AT 2' WITH INCLUDED BARK, ONE SIDED
•	316	SWEET CHERRY	PRUNUS AVIUM	6	3	POOR	POOR	NO	SUPPRESSED
•	317	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	28	25	GOOD	GOOD	YES	
•	318	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	41	25	GOOD	FAIR	YES	SWEEP IN LOWER TRUNK
•	319	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	27	20	GOOD	FAIR	YES	MODERATELY ONE SIDED
•	320	RED ALDER	ALNUS RUBRA	8	8	POOR	POOR	NO	THIN CROWN
•	321	RED ALDER	ALNUS RUBRA	13	13	FAIR	FAIR	NO	ONE SIDED, MARGINAL TRUNK TAPER
•	322	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	6	5	FAIR	FAIR	NO	MODERATELY SUPPRESSED, OVERTOPPED BY ADJACENT TREES
•	323	RED ALDER	ALNUS RUBRA	10	15	FAIR	FAIR	NO	ONE SIDED, MARGINAL TRUNK TAPER
•	324	RED ALDER	ALNUS RUBRA	8	10	FAIR	FAIR	NO	ONE SIDED, MARGINAL TRUNK TAPER
•	325	RED ALDER	ALNUS RUBRA	8	5	POOR	POOR	NO	SUPPRESSED
•	326	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	28	25	GOOD	FAIR	YES	MODERATELY ONE SIDED
•	327	PACIFIC DOGWOOD	CORNUS NUTTALLII	7	2	POOR	POOR	NO	SUPPRESSED
•	328	WESTERN HEMLOCK	TSUGA HETEROPHYLLA	26	25	GOOD	FAIR	YES	GROWING ON OLD STUMP
•	329	SCOULER'S WILLOW	SALIX SCOULERIANA	8	7	POOR	POOR	NO	EXTENSIVE DIEBACK AND DECAY
•	330	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	8	5	GOOD	FAIR	NO	KINK AT LOWER TRUNK
•	331	BLACK HAWTHORN	CRATAEGUS DOUGLASII	6	8	FAIR	FAIR	NO	MODERATELY SUPPRESSED
•	332	SWEET CHERRY	PRUNUS AVIUM	9	5	FAIR	FAIR	NO	ONE SIDED, MODERATELY THIN CROWN
•	333	SWEET CHERRY	PRUNUS AVIUM	9	5	FAIR	FAIR	NO	ONE SIDED, MODERATELY THIN CROWN
•	334	SWEET CHERRY	PRUNUS AVIUM	11	10	FAIR	FAIR	NO	MODERATELY THIN CROWN
•	335	BIGLEAF MAPLE	ACER MACROPHYLLUM	16	20	FAIR	FAIR	NO	OVERTOPPED BY ADJACENT TREES, MODERATELY SUPPRESSED
•	336	WESTERN HEMLOCK	TSUGA HETEROPHYLLA	16	10	FAIR	FAIR	NO	CODOMINANT AT 1', OVERTOPPED BY ADJACENT TREES, MODERATELY SUPPRESSED
•	337	WESTERN HEMLOCK	TSUGA HETEROPHYLLA	21	15	FAIR	FAIR	NO	OVERTOPPED BY ADJACENT TREES, MODERATELY SUPPRESSED
•	338	WESTERN HEMLOCK	TSUGA HETEROPHYLLA	27	15	FAIR	FAIR	NO	ONE SIDED, CODOMINANT STEM PREVIOUSLY REMOVED AT LOWER TRUNK
•	339	WESTERN HEMLOCK	TSUGA HETEROPHYLLA	25	15	GOOD	FAIR	YES	ONE SIDED
•	340	WESTERN HEMLOCK	TSUGA HETEROPHYLLA	30	15	GOOD	FAIR	YES	ONE SIDED
•	341	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	41	30	GOOD	FAIR	YES	MODERATELY ONE SIDED
•	342	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	41	25	GOOD	FAIR	YES	MODERATELY ONE SIDED
•	343	SCOULER'S WILLOW	SALIX SCOULERIANA	14,10,9	15	POOR	POOR	NO	EXTENSIVE DIEBACK AND DECAY
•	344	WESTERN HEMLOCK	TSUGA HETEROPHYLLA	14	10	GOOD	FAIR	YES	GROWING ON OLD STUMP
•	345	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	8	10	GOOD	FAIR	NO	ONE SIDED, OVERTOPPED BY ADJACENT TREES
•	346	BIGLEAF MAPLE	ACER MACROPHYLLUM	24	25	GOOD	FAIR	YES	ONE SIDED
•	347	BIGLEAF MAPLE	ACER MACROPHYLLUM	21	20	GOOD	FAIR	YES	ONE SIDED
•	348	WESTERN HEMLOCK	TSUGA HETEROPHYLLA	7	10	GOOD	FAIR	NO	OVERTOPPED BY ADJACENT TREES, GROWING ON OLD STUMP
•	349	WESTERN HEMLOCK	TSUGA HETEROPHYLLA	20	18	GOOD	GOOD	YES	
•	350	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	16	15	GOOD	FAIR	YES	ONE SIDED, OVERTOPPED BY ADJACENT TREES
•	351	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	44	20	GOOD	FAIR	YES	ONE SIDED
•	352	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	27	20	GOOD	FAIR	YES	ONE SIDED
•	353	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	44	25	GOOD	FAIR	YES	ONE SIDED
•	354	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	45	30	GOOD	FAIR	YES	MODERATELY ONE SIDED
•	355	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	38	30	GOOD	FAIR	YES	MODERATELY ONE SIDED
•	356	BIGLEAF MAPLE	ACER MACROPHYLLUM	6	20	GOOD	GOOD	NO	
•	357	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	29	20	GOOD	FAIR	YES	ONE SIDED
•	358	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	33	20	GOOD	FAIR	YES	ONE SIDED
•	359	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	34	25	GOOD	FAIR	YES	ONE SIDED
•	360	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	56	30	GOOD	FAIR	YES	CODOMINANT AT 2', 16" CODOMINANT STEM SUPPRESSED
•	361	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	10	10	FAIR	FAIR	NO	ONE SIDED, MODERATELY SUPPRESSED, MARGINAL TRUNK TAPER
•	362	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	8	5	FAIR	FAIR	NO	ONE SIDED, MODERATELY SUPPRESSED, MARGINAL TRUNK TAPER
•	363	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	34	30	GOOD	FAIR	YES	ONE SIDED, 50% LCR
•	364	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	52	25	GOOD	FAIR	YES	CODOMINANT AT 1' WITH INCLUDED BARK
•	365	BIGLEAF MAPLE	ACER MACROPHYLLUM	7	15	FAIR	FAIR	NO	MODERATELY SUPPRESSED
•	366	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	40	30	GOOD	FAIR	YES	ONE SIDED
•	367	WESTERN HEMLOCK	TSUGA HETEROPHYLLA	17	15	GOOD	FAIR	YES	ONE SIDED, OVERTOPPED BY ADJACENT TREES
•	368	WESTERN HEMLOCK	TSUGA HETEROPHYLLA	41	25	FAIR	GOOD	NO	MODERATELY THIN CROWN
•	369	BIGLEAF MAPLE	ACER MACROPHYLLUM	12	10	FAIR	FAIR	NO	OVERTOPPED BY ADJACENT TREES, MODERATELY SUPPRESSED
•	370	WESTERN HEMLOCK	TSUGA HETEROPHYLLA	30	0	VERY POOR	VERY POOR	NO	DEAD
•	371	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	29	15	GOOD	FAIR	YES	40% LCR
•	372	BIGLEAF MAPLE	ACER MACROPHYLLUM	18,9	20	FAIR	FAIR	NO	CODOMINANT AT GROUND LEVEL, ONE SIDED, OVERTOPPED BY ADJACENT TREES, MODERATELY SUPPRESSED
•	373	BIGLEAF MAPLE	ACER MACROPHYLLUM	32	25	FAIR	FAIR	NO	SIGNIFICANT DECAY AT ROOT CROWN, OVERTOPPED BY ADJACENT TREES, MODERATELY SUPPRESSED
•	374	WESTERN HEMLOCK	TSUGA HETEROPHYLLA	14	0	VERY POOR	VERY POOR	NO	DEAD
•	375	WESTERN HEMLOCK	TSUGA HETEROPHYLLA	23	20	POOR	POOR	NO	THINNING CROWN
•	376	WESTERN HEMLOCK	TSUGA HETEROPHYLLA	23	15	GOOD	GOOD	YES	
•	377	WESTERN HEMLOCK	TSUGA HETEROPHYLLA	31	20	GOOD	FAIR	YES	MODERATELY ONE SIDED
•	378	WESTERN HEMLOCK	TSUGA HETEROPHYLLA	17	0	VERY POOR	VERY POOR	NO	DEAD
•	379	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	23	15	GOOD	FAIR	YES	ONE SIDED
•	380	WESTERN HEMLOCK	TSUGA HETEROPHYLLA	13	15	FAIR	FAIR	NO	ONE SIDED, OVERTOPPED BY ADJACENT TREES, BRANCH DIEBACK
•	381	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	16	15	GOOD	FAIR	YES	MODERATELY ONE SIDED, MARGINAL TRUNK TAPER
•	382	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	13	10	GOOD	FAIR	YES	OVERTOPPED BY ADJACENT TREES, MARGINAL TRUNK TAPER
•	383	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	30	20	GOOD	FAIR	YES	50% LCR
•	384	WESTERN HEMLOCK	TSUGA HETEROPHYLLA	21	15	GOOD	FAIR	YES	ONE SIDED
•	385	BIGLEAF MAPLE	ACER MACROPHYLLUM	14	15	FAIR	FAIR	NO	OVERTOPPED BY ADJACENT TREES, MODERATELY SUPPRESSED
•	386	WESTERN HEMLOCK	TSUGA HETEROPHYLLA	25	20	FAIR	FAIR	NO	ONE SIDED, MODERATELY THIN CROWN
•	387	BIGLEAF MAPLE	ACER MACROPHYLLUM	6	10	GOOD	GOOD	NO	
•	388	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	22	15	GOOD	FAIR	YES	50% LCR, MARGINAL TRUNK TAPER
•	389	BIGLEAF MAPLE	ACER MACROPHYLLUM	22	30	GOOD	FAIR	YES	ONE SIDED
•	390	BIGLEAF MAPLE	ACER MACROPHYLLUM	7	7	FAIR	FAIR	NO	OVERTOPPED BY ADJACENT TREES, MODERATELY SUPPRESSED
•	391	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	25	20	GOOD	FAIR	YES	50% LCR, MARGINAL TRUNK TAPER
•	392	BIGLEAF MAPLE	ACER MACROPHYLLUM	12	12	GOOD	FAIR	YES	OVERTOPPED BY ADJACENT TREES
•	393	BIGLEAF MAPLE	ACER MACROPHYLLUM	8	8	FAIR	FAIR	NO	OVERTOPPED BY ADJACENT TREES, MODERATELY SUPPRESSED
•	394	WESTERN HEMLOCK	TSUGA HETEROPHYLLA	22	15	POOR	POOR	NO	SIGNIFICANT DIEBACK
•	395	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	75	40	GOOD	FAIR	YES	CODOMINANT AT 1'
•	396	BIGLEAF MAPLE	ACER MACROPHYLLUM	6	10	FAIR	FAIR	NO	ONE SIDED, OVERTOPPED BY ADJACENT TREES
•	397	BIGLEAF MAPLE	ACER MACROPHYLLUM	15	20	GOOD	FAIR	YES	ONE SIDED, OVERTOPPED BY ADJACENT TREES
•	398	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	72	40	GOOD	FAIR	YES	CODOMINANT AT 1' WITH INCLUDED BARK
•	399	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	36	25	GOOD	FAIR	YES	ONE SIDED
•	400	SCOULER'S WILLOW	SALIX SCOULERIANA	10	10	FAIR	FAIR	NO	ONE SIDED
•	401	RED ALDER	ALNUS RUBRA	7	5	GOOD	FAIR	NO	ONE SIDED
•	402	RED ALDER	ALNUS RUBRA	8	10	GOOD	FAIR	NO	ONE SIDED
•	403	RED ALDER	ALNUS RUBRA	11	10	GOOD	FAIR	YES	ONE SIDED, CODOMINANT AT 5' WITH INCLUDED BARK
•	404	RED ALDER	ALNUS RUBRA	11	10	GOOD	FAIR	YES	EXTREME LEAN, CODOMINANT AT 1'
•	405	RED ALDER	ALNUS RUBRA	7	7	GOOD	FAIR	NO	MARGINAL TRUNK TAPER
•	406	RED ALDER	ALNUS RUBRA	9	10	FAIR	FAIR	NO	PREVIOUS TOP FAILURES
•	407	BIGLEAF MAPLE	ACER MACROPHYLLUM	8	15	FAIR	FAIR	NO	PREVIOUS TOP FAILURES
•	408	RED ALDER	ALNUS RUBRA	15	10	FAIR	FAIR	NO	DIEBACK, BOWED TRUNK
•	409	SCOULER'S WILLOW	SALIX SCOULERIANA	9	2	POOR	POOR	NO	TOP FAILED AT 10'
•	410	BIGLEAF MAPLE	ACER MACROPHYLLUM	9	10	FAIR	FAIR	NO	ONE SIDED, UNDERSIZED LEAVES
•	411	SCOULER'S WILLOW	SALIX SCOULERIANA	6	2	POOR	POOR	NO	SIGNIFICANT DIEBACK AND DECAY
•	412	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	32	25	GOOD	FAIR	YES	ONE SIDED
•	413	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	26	15	GOOD	FAIR	YES	ONE SIDED, 60% LCR
•	414	BIGLEAF MAPLE	ACER MACROPHYLLUM	11	10	FAIR	FAIR	NO	OVERTOPPED BY ADJACENT TREES, MODERATELY SUPPRESSED
•	415	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	10	5	POOR	POOR	NO	SUPPRESSED, DECAY AT LOWER TRUNK
•	416	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	18	10	FAIR	FAIR	NO	MODERATELY SUPPRESSED
•	417	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	28	20	FAIR	FAIR	NO	40% LCR, BOWED LOWER TRUNK
•	418	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	14	10	FAIR	FAIR	NO	MODERATELY SUPPRESSED, MARGINAL TRUNK TAPER
•	419	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	28	20	GOOD	FAIR	YES	50% LCR
•	420	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	12	6	POOR	POOR	NO	SUPPRESSED, KINKED TRUNK
•	421	BIGLEAF MAPLE	ACER MACROPHYLLUM	16	15	GOOD	FAIR	YES	MODERATELY SUPPRESSED, EPICORMIC GROWTH AT LOWER TRUNK
•	422	WESTERN HEMLOCK	TSUGA HETEROPHYLLA	11	10	POOR	POOR	NO	OVERTOPPED BY ADJACENT TREES, EXTENSIVE DIEBACK
•	423	WESTERN HEMLOCK	TSUGA HETEROPHYLLA	29	20	FAIR	GOOD	NO	MODERATELY THIN CROWN
•	424	WESTERN HEMLOCK	TSUGA HETEROPHYLLA	13	15	FAIR	FAIR	NO	ONE SIDED, MODERATELY THIN CROWN
•	424	BIGLEAF MAPLE	ACER MACROPHYLLUM	13	15	GOOD	FAIR	YES	ONE SIDED, MODERATELY THIN CROWN
•	425	WESTERN HEMLOCK	TSUGA HETEROPHYLLA	23	0	VERY POOR	VERY POOR	NO	DEAD
•	426	WESTERN HEMLOCK	TSUGA HETEROPHYLLA	10	0	VERY POOR	VERY POOR	NO	DEAD
•	427	WESTERN HEMLOCK	TSUGA HETEROPHYLLA	29	20	FAIR	FAIR	NO	ONE SIDED, MODERATELY THIN CROWN
•	428	BIGLEAF MAPLE	ACER MACROPHYLLUM	11	20	FAIR	FAIR	NO	OVERTOPPED BY ADJACENT TREES, EPICORMIC GROWTH ON LOWER TRUNK
•	429	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	39	20	GOOD	FAIR	YES	50% LCR
•	430	BIGLEAF MAPLE	ACER MACROPHYLLUM	11	8	FAIR	FAIR	NO	OVERTOPPED BY ADJACENT TREES, EPICORMIC GROWTH ON LOWER TRUNK
•	431	BIGLEAF MAPLE	ACER MACROPHYLLUM	8	3	POOR	POOR	NO	SUPPRESSED

"GREEN" HATCH INDICATES TREES THAT WILL BE PROTECTED.

TREE TO BE SAVED OR REMOVED

"YES" INDICATES TREES THAT MEET TREE RETENTION REQUIREMENT. SEE NOTE 4.

	TREE No	COMMON NAME	SCIENTIFIC NAME	DBH	C-RAD	CONDITION	STRUCTURE	TREE RETENTION OPTION	COMMENTS
•	432	WESTERN HEMLOCK	TSUGA HETEROPHYLLA	27	20	FAIR	FAIR	NO	ONE SIDED, MODERATELY THIN CROWN
•	433	WESTERN HEMLOCK	TSUGA HETEROPHYLLA	26	20	FAIR	FAIR	NO	50% LCR, MODERATELY THIN CROWN
•	434	WESTERN HEMLOCK	TSUGA HETEROPHYLLA	22	0	VERY POOR	VERY POOR	NO	DEAD, LEANS ON TREE 432
•	435	WESTERN HEMLOCK	TSUGA HETEROPHYLLA	24	20	FAIR	FAIR	NO	ONE SIDED, MODERATELY THIN CROWN
•	436	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	8	8	FAIR	FAIR	NO	OVERTOPPED BY ADJACENT TREES, ONE SIDED, SUPPRESSED
•	437	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	40	20	GOOD	FAIR	YES	MODERATELY ONE SIDED
•	438	BIGLEAF MAPLE	ACER MACROPHYLLUM	9	10	FAIR	FAIR	NO	OVERTOPPED BY ADJACENT TREES, KINKED LOWER TRUNK, EPICORMIC GROWTH ON LOWER TRUNK
•	439	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	26	15	GOOD	FAIR	YES	40% LCR, MODERATELY ONE SIDED, MARGINAL TRUNK TAPER
•	440	WESTERN HEMLOCK	TSUGA HETEROPHYLLA	19	20	GOOD	GOOD	YES	
•	441	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	29	20	GOOD	FAIR	YES	40% LCR, MODERATELY ONE SIDED
•	442	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	23	20	FAIR	FAIR	NO	ONE SIDED, MODERATELY SUPPRESSED, , 35% LCR, MARGINAL TRUNK TAPER
•	443	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	32	20	GOOD	FAIR	YES	CROWN EXTENSION SUPPRESSED BY ADJACENT TREES
•	444	WESTERN HEMLOCK	TSUGA HETEROPHYLLA	6	8	FAIR	FAIR	NO	OVERTOPPED BY ADJACENT TREES, MODERATELY SUPPRESSED
•	445	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	32	20	GOOD	FAIR	YES	ONE SIDED
•	446	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	25	20	GOOD	FAIR	YES	ONE SIDED, MARGINAL TRUNK TAPER
•	447	BIGLEAF MAPLE	ACER MACROPHYLLUM	16	15	POOR	POOR	NO	SUPPRESSED, BRANCH DIEBACK
•	448	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	31	20	GOOD	FAIR	YES	MODERATELY ONE SIDED
•	449	WESTERN HEMLOCK	TSUGA HETEROPHYLLA	18	20	FAIR	FAIR	NO	OVERTOPPED BY ADJACENT TREES, MODERATELY THIN CROWN
•	450	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	31	22	GOOD	FAIR	YES	MODERATELY ONE SIDED
•	451	WESTERN HEMLOCK	TSUGA HETEROPHYLLA	6	0	VERY POOR	VERY POOR	NO	DEAD
•	452	WESTERN HEMLOCK	TSUGA HETEROPHYLLA	27	18	FAIR	FAIR	NO	MODERATELY ONE SIDED, MODERATELY THIN CROWN
•	453	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	34	22	GOOD	FAIR	YES	MODERATELY ONE SIDED
•	454	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	29	25	GOOD	FAIR	YES	CROWN EXTENSION SUPPRESSED BY ADJACENT TREES
•	455	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	32	22	GOOD	FAIR	YES	CROWN EXTENSION SUPPRESSED BY ADJACENT TREES
•	456	BIGLEAF MAPLE	ACER MACROPHYLLUM	9	15	FAIR	FAIR	NO	OVERTOPPED BY ADJACENT TREES, EPICORMIC GROWTH AT LOWER TRUNK
•	457	WESTERN HEMLOCK	TSUGA HETEROPHYLLA	9	0	VERY POOR	VERY POOR	NO	DEAD
•	458	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	17	15	FAIR	FAIR	NO	ONE SIDED, MODERATELY SUPPRESSED
•	459	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	28	18	GOOD	FAIR	YES	ONE SIDED, 40% LCR
•	460	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	35	20	GOOD	FAIR	YES	40% LCR
•	461	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	10	0	VERY POOR	VERY POOR	NO	DEAD
•	462	WESTERN HEMLOCK	TSUGA HETEROPHYLLA	8	8	FAIR	FAIR	NO	ONE SIDED, MODERATELY SUPPRESSED
•	463	BIGLEAF MAPLE	ACER MACROPHYLLUM	6	8	POOR	POOR	NO	SUPPRESSED, LOST TOP
•	464	BIGLEAF MAPLE	ACER MACROPHYLLUM	9	15	GOOD	FAIR	NO	ONE SIDED, OVERTOPPED BY ADJACENT TREES
•	465	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	34	25	GOOD	FAIR	YES	ONE SIDED
•	466	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	38	20	GOOD	FAIR	YES	ONE SIDED
•	467	WESTERN HEMLOCK	TSUGA HETEROPHYLLA	22	15	FAIR	FAIR	NO	CODOMINANT AT 25' WITH INCLUDED BARK, MODERATELY SUPPRESSED
•	468	WESTERN HEMLOCK	TSUGA HETEROPHYLLA	26	15	FAIR	FAIR	NO	ONE SIDED, MODERATELY THIN CROWN
•	469	WESTERN HEMLOCK	TSUGA HETEROPHYLLA	19	12	FAIR	FAIR	NO	MODERATELY THIN CROWN
•	470	BIGLEAF MAPLE	ACER MACROPHYLLUM	21	20	GOOD	FAIR	YES	50% LCR
•	471	BIGLEAF MAPLE	ACER MACROPHYLLUM	11	10	GOOD	FAIR	YES	35% LCR, MARGINAL TRUNK TAPER
•	472	WESTERN HEMLOCK	TSUGA HETEROPHYLLA	32	15	POOR	POOR	NO	SIGNIFICANTLY THIN CROWN
•	473	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	32	18	GOOD	FAIR	YES	ONE SIDED
•	474	WESTERN HEMLOCK	TSUGA HETEROPHYLLA	13	14	FAIR	FAIR	NO	ONE SIDED, OVERTOPPED BY ADJACENT TREES
•	475	WESTERN HEMLOCK	TSUGA HETEROPHYLLA	27	20	GOOD	FAIR	YES	ONE SIDED
•	476	BIGLEAF MAPLE	ACER MACROPHYLLUM	15	18	FAIR	FAIR	NO	ONE SIDED, UNDERSIZED LEAVES
•	477	BIGLEAF MAPLE	ACER MACROPHYLLUM	11	8	POOR	POOR	NO	SUPPRESSED, BARK DAMAGE AT LOWER TRUNK
•	478	BIGLEAF MAPLE	ACER MACROPHYLLUM	6	8	FAIR	FAIR	NO	OVERTOPPED BY ADJACENT TREES, MODERATELY SUPPRESSED
•	479	BIGLEAF MAPLE	ACER MACROPHYLLUM	8	12	FAIR	FAIR	NO	SIGNIFICANT LEAN, OVERTOPPED BY ADJACENT TREES, MODERATELY SUPPRESSED
•	480	BIGLEAF MAPLE	ACER MACROPHYLLUM	20	20	GOOD	FAIR	YES	ONE SIDED, CODOMINANT AT 2' WITH INCLUDED BARK
•	481	SWEET CHERRY	PRUNUS AVIUM	9	6	FAIR	POOR	NO	20% LCR
•	482	SWEET CHERRY	PRUNUS AVIUM	8	5	FAIR	POOR	NO	15% LCR
•	483	BIGLEAF MAPLE	ACER MACROPHYLLUM	19	22	GOOD	FAIR	YES	MODERATELY ONE SIDED
•	484	SWEET CHERRY	PRUNUS AVIUM	8	5	POOR	POOR	NO	10% LCR
•	485	BIGLEAF MAPLE	ACER MACROPHYLLUM	41	25	FAIR	FAIR	NO	HISTORY OF BRANCH FAILURE
•	486	BIGLEAF MAPLE	ACER MACROPHYLLUM	16	15	FAIR	FAIR	NO	ONE SIDED, 35% LCR, MARGINAL TRUNK TAPER
•	487	BIGLEAF MAPLE	ACER MACROPHYLLUM	7	12	FAIR	POOR	NO	OVERTOPPED BY ADJACENT TREES, MODERATELY SUPPRESSED, EXTREME LEAN
•	488	BIGLEAF MAPLE	ACER MACROPHYLLUM	10	12	FAIR	FAIR	NO	35% LCR, MARGINAL TRUNK TAPER
•	489	BIGLEAF MAPLE	ACER MACROPHYLLUM	20	23	GOOD	FAIR	YES	MODERATELY ONE SIDED
•	490	BIGLEAF MAPLE	ACER MACROPHYLLUM	12	25	FAIR	FAIR	NO	ONE SIDED, MODERATELY SUPPRESSED
•	491	SCOULER'S WILLOW	SALIX SCOULERIANA	8	6	POOR	POOR	NO	20% LCR, SIGNIFICANT DIEBACK
•	492	BIGLEAF MAPLE	ACER MACROPHYLLUM	16	20	GOOD	FAIR	YES	60% LCR
•	493	BIGLEAF MAPLE	ACER MACROPHYLLUM	41	30	FAIR	FAIR	NO	SIGNIFICANT DECAY AT LOWER TRUNK, MULTIPLE LEADERS WITH INCLUDED BARK AT 6'
•	494	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	30	25	GOOD	FAIR	YES	ONE SIDED
•	495	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	29	25	GOOD	FAIR	YES	ONE SIDED
•	496	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	33	25	GOOD	FAIR	YES	MODERATELY ONE SIDED
•	497	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	31	25	GOOD	FAIR	YES	MODERATELY ONE SIDED
•	498	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	10	0	VERY POOR	VERY POOR	NO	DEAD
•	499	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	12	10	FAIR	POOR	NO	33% LCR, POOR TRUNK TAPER
•	500	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	21	18	GOOD	FAIR	YES	ONE SIDED, MARGINAL TRUNK TAPER
•	501	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	6	0	VERY POOR	VERY POOR	NO	DEAD
•	502	BIGLEAF MAPLE	ACER MACROPHYLLUM	24	25	GOOD	FAIR	YES	ONE SIDED, CODOMINANT AT 3' AND 12'
•	503	WESTERN HEMLOCK	TSUGA HETEROPHYLLA	6	8	GOOD	GOOD	NO	
•	504	SCOULER'S WILLOW	SALIX SCOULERIANA	8	0	VERY POOR	VERY POOR	NO	DEAD 18' SNAG
•	505	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	33	24	GOOD	FAIR	YES	MODERATELY ONE SIDED
•	506	BIGLEAF MAPLE	ACER MACROPHYLLUM	7	0	VERY POOR	VERY POOR	NO	DEAD 18' SNAG
•	507	BIGLEAF MAPLE	ACER MACROPHYLLUM	16	20	GOOD	FAIR	YES	50% LCR
•	508	BIGLEAF MAPLE	ACER MACROPHYLLUM	13	0	VERY POOR	VERY POOR	NO	DEAD 30' SNAG
•	509	BIGLEAF MAPLE	ACER MACROPHYLLUM	12	18	FAIR	FAIR	NO	ONE SIDED, MODERATELY SUPPRESSED
•	510	BIGLEAF MAPLE	ACER MACROPHYLLUM	7	15	FAIR	FAIR	NO	ONE SIDED, OVERTOPPED BY ADJACENT TREES, MODERATELY SUPPRESSED
•	511	BIGLEAF MAPLE	ACER MACROPHYLLUM	21	22	POOR	POOR	NO	MULTIPLE LEADERS AT 4', TWO FAILED LEADERS
•	512	WESTERN HEMLOCK	TSUGA HETEROPHYLLA	22	0	VERY POOR	VERY POOR	NO	18' SNAG
•	513	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	35	30	GOOD	FAIR	YES	MODERATELY ONE SIDED, BOWED LOWER TRUNK
•	514	WESTERN HEMLOCK	TSUGA HETEROPHYLLA	7	10	GOOD	GOOD	NO	
•	515	WESTERN HEMLOCK	TSUGA HETEROPHYLLA	20	15	GOOD	GOOD	YES	
•	516	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	43	27	GOOD	FAIR	YES	60% LCR
•	517	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	6	5	POOR	POOR	NO	SUPPRESSED
•	518	WESTERN HEMLOCK	TSUGA HETEROPHYLLA	38	28	GOOD	FAIR	YES	CODOMINANT AT 2' WITH INCLUDED BARK
•	519	WESTERN HEMLOCK	TSUGA HETEROPHYLLA	15	0	VERY POOR	VERY POOR	NO	DEAD
•	520	WESTERN HEMLOCK	TSUGA HETEROPHYLLA	22	18	FAIR	FAIR	NO	BOWED LOWER TRUNK, MODERATELY THIN CROWN
•	521	WESTERN HEMLOCK	TSUGA HETEROPHYLLA	18	0	VERY POOR	VERY POOR	NO	DEAD
•	522	BIGLEAF MAPLE	ACER MACROPHYLLUM	10	12	FAIR	POOR	NO	25% LCR, POOR TRUNK TAPER
•	523	BIGLEAF MAPLE	ACER MACROPHYLLUM	22	15	FAIR	FAIR	NO	MULTIPLE LEADERS AT 4', BRANCH DIEBACK, MODERATELY SUPPRESSED
•	524	BIGLEAF MAPLE	ACER MACROPHYLLUM	8	6	FAIR	FAIR	NO	OVERTOPPED BY ADJACENT TREES, MODERATELY SUPPRESSED
•	525	BIGLEAF MAPLE	ACER MACROPHYLLUM	16	25	GOOD	FAIR	YES	ONE SIDED
•	526	BIGLEAF MAPLE	ACER MACROPHYLLUM	19	25	GOOD	FAIR	YES	ONE SIDED
•	527	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	18	12	GOOD	FAIR	YES	40% LCR, MARGINAL TRUNK TAPER
•	528	SWEET CHERRY	PRUNUS AVIUM	9	7	POOR	POOR	NO	33% LCR, POOR TRUNK TAPER
•	529	SWEET CHERRY	PRUNUS AVIUM	9	0	VERY POOR	VERY POOR	NO	DEAD
•	530	BIGLEAF MAPLE	ACER MACROPHYLLUM	9	12	FAIR	POOR	NO	33% LCR, MARGINAL TRUNK TAPER
•	531	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	14	15	GOOD	FAIR	YES	MARGINAL TRUNK TAPER
•	532	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	8	8	FAIR	POOR	NO	POOR TRUNK TAPER
•	533	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	14	16	FAIR	POOR	NO	33% LCR, MARGINAL TRUNK TAPER
•	534	BIGLEAF MAPLE	ACER MACROPHYLLUM	20	24	FAIR	FAIR	NO	CODOMINANT AT 2' WITH INCLUDED BARK, MODERATELY SUPPRESSED
•	535	WESTERN HEMLOCK	TSUGA HETEROPHYLLA	7	12	GOOD	GOOD	NO	
•	536	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	16	12	GOOD	FAIR	YES	40% LCR, MARGINAL TRUNK TAPER, ONE SIDED
•	537	BLACK COTTONWOOD	POPULUS TRICHOCARPA	12	8	FAIR	POOR	NO	25% LCR, POOR TRUNK TAPER
•	538	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	24	18	GOOD	FAIR	YES	BRANCH EXTENSION SUPPRESSED BY ADJACENT TREES
•	539	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	23	15	GOOD	FAIR	YES	BRANCH EXTENSION SUPPRESSED BY ADJACENT TREES
•	540	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	25	23	FAIR	GOOD	NO	MODERATELY THIN CROWN
•	541	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	24	20	GOOD	FAIR	YES	ONE SIDED
•	542	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	22	18	GOOD	FAIR	YES	35% LCR, MARGINAL TRUNK TAPER
•	543	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	28	24	GOOD	FAIR	YES	MODERATELY ONE SIDED
•	544	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	24	23	GOOD	FAIR	YES	MODERATELY ONE SIDED
•	545	RED ALDER	ALNUS RUBRA	9	10	FAIR	FAIR	NO	OVERTOPPED BY ADJACENT TREES, MODERATELY SUPPRESSED
•	546	RED ALDER	ALNUS RUBRA	11	10	FAIR	FAIR	NO	MODERATELY SUPPRESSED, EPICORMIC GROWTH AT LOWER TRUNK
•	547	RED ALDER	ALNUS RUBRA	6	0	VERY POOR	VERY POOR	NO	DEAD
•	548	RED ALDER	ALNUS RUBRA	9	6	GOOD	FAIR	NO	ONE SIDED
•	549	RED ALDER	ALNUS RUBRA	8	6	GOOD	FAIR	NO	ONE SIDED
•	550	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	32	20	GOOD	FAIR	YES	MODERATELY ONE SIDED
•	551	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	15	10	GOOD	FAIR	YES	MARGINAL TRUNK TAPER
•	552	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	10	8	GOOD	FAIR	NO	MODERATELY ONE SIDED
•	553	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	7	4	POOR	POOR	NO	SUPPRESSED
•	554	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	6	5	POOR	POOR	NO	SUPPRESSED
	555	N/A	N/A	N/A	N/A	N/A	N/A	N/A	NUMBER NOT USED
•	556	BIGLEAF MAPLE	ACER MACROPHYLLUM	8	15	GOOD	FAIR	NO	OVERTOPPED BY ADJACENT TREES, MARGINAL TRUNK TAPER
•	557	BIGLEAF MAPLE	ACER MACROPHYLLUM	33	30	GOOD	FAIR	YES	CODOMINANT AT 6' WITH INCLUDED BARK
•	558	BIGLEAF MAPLE	ACER MACROPHYLLUM	6	10	POOR	POOR	NO	OVERTOPPED BY ADJACENT TREES, SUPPRESSED
•	559	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	36	28	GOOD	FAIR	YES	ONE SIDED
•	560	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	39	25	GOOD	FAIR	YES	ONE SIDED
•	561	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	13,10	15	FAIR	FAIR	NO	CODOMINANT AT GROUND LEVEL, OVERTOPPED BY ADJACENT TREES, MODERATELY SUPPRESSED
•	562	BIGLEAF MAPLE	ACER MACROPHYLLUM	8	15	POOR	POOR	NO	SUPPRESSED
•	563	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	20	18	GOOD	FAIR	YES	ONE SIDED
•	564	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	16	16	GOOD	FAIR	YES	ONE SIDED
•	565	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	30	25	GOOD	FAIR	YES	MODERATELY ONE SIDED
•	566	BIGLEAF MAPLE	ACER MACROPHYLLUM	8	18	POOR	POOR	NO	SUPPRESSED
•	567	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	20	18	GOOD	FAIR	YES	ONE SIDED, CROWN EXTENSION SUPPRESSED BY ADJACENT TREES
•	568	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	16	10	FAIR	POOR	NO	MODERATELY SUPPRESSED, POOR TRUNK TAPER
•	569	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	15	8	FAIR	POOR	NO	POOR TRUNK TAPER, 25% LCR
•	570	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	8	6	POOR	POOR	NO	SUPPRESSED
•	571	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	13	8	POOR	POOR	NO	SUPPRESSED
•	572	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	7	5	POOR	POOR	NO	SUPPRESSED
•	573	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	16	15	FAIR	FAIR	NO	ONE SIDED, MODERATELY SUPPRESSED
•	574	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	19	18	GOOD	FAIR	YES	ONE SIDED
•	575	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	26	18	GOOD	FAIR	YES	ONE SIDED

TREE SURVEY COMPLETED BY: TERAGAN & ASSOCIATES, INC.

ATTENTION: TODD PRAGER, ASCA REGISTERED CONSULTING ARBORIST #597, ISA BOARD CERTIFIED MASTER ARBORIST, ISA TREE RISK ASSESSMENT QUALIFIED, AICP, AMERICAN PLANNING ASSOCIATION

1. DBH IS THE TRUNK DIAMETER IN INCHES MEASURED IN ACCORDANCE WITH INTERNATIONAL SOCIETY OF ARBORICULTURE STANDARDS.
2. C-RAD IS THE APPROXIMATE CROWN RADIUS IN FEET.
3. CONDITION AND STRUCTURE RATINGS RANGE FROM VERY POOR, POOR, FAIR, TO GOOD.
4. TREE MEETS THE REQUIREMENTS TO BE A RETENTION TREE PER 17.102.50.A-3 TREES PROPOSED FOR RETENTION SHALL BE HEALTHY AND LIKELY TO GROW TO MATURITY. PER CITY OF SANDY, ONLY TREES IN GOOD HEALTH CONDITION ARE ELIGIBLE TO MEET THIS STANDARD.

PROJECT: THE BORNSTEDT VIEWS
TREE INVENTORY LIST 2

LOCATION: 19618 SE BORNSTEDT ROAD, SANDY, OR

SCALE: VERT.: N/A HORIZ.: N/A
DATE: 4-30-21
FILE: 19-268 - Planning-SFR.dwg
LEGAL: SECTION 24, TWP. 2S, RANGE 4E

DATE: - NO.: - REVISION: - BY: -

DESIGNED: RLM
DRAWN: RLM
CHECKED: DLH
APPROVED: RLM

SHEET C5 OF 10

REGISTERED PROFESSIONAL ENGINEER, OREGON, RAY L. MOORE
PRELIMINARY
RENEWAL DATE: 12/31/2022

All County Surveyors & Planners, Inc.
Surveying, Planning and Civil Engineering
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DATE OF PLOT 4-30-21

CLIENT:
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MAC EVEN
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GRESHAM, OR 97030
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TREE TO BE SAVED OR REMOVED							TREE RETENTION	"YES" INDICATES TREES THAT MEET TREE RETENTION REQUIREMENT. SEE NOTE 4.
TREE No	COMMON NAME	SCIENTIFIC NAME	DBH	C-RAD	CONDITION	STRUCTURE	OPTION	COMMENTS
576	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	15	10	GOOD	FAIR	YES	ONE SIDED, MARGINAL TRUNK TAPER, 40% LCR
577	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	27	15	GOOD	FAIR	YES	35% LCR, MARGINAL TRUNK TAPER
578	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	12	10	FAIR	FAIR	NO	ONE SIDED, OVERTOPPED BY ADJACENT TREES, MODERATELY SUPPRESSED
579	BIGLEAF MAPLE	ACER MACROPHYLLUM	13	18	FAIR	FAIR	NO	MODERATELY SUPPRESSED, EPICORMIC GROWTH AT LOWER TRUNK, CODOMINANT AT 2' WITH INCLUDED BARK
580	BIGLEAF MAPLE	ACER MACROPHYLLUM	7	18	FAIR	FAIR	NO	MODERATELY SUPPRESSED, EPICORMIC GROWTH AT LOWER TRUNK
581	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	45	30	GOOD	GOOD	YES	
582	SCOULER'S WILLOW	SALIX SCOULERIANA	6	6	POOR	POOR	NO	25% LCR, SIGNIFICANT DIEBACK
583	BIGLEAF MAPLE	ACER MACROPHYLLUM	10	15	GOOD	FAIR	NO	ONE SIDED
584	BIGLEAF MAPLE	ACER MACROPHYLLUM	12	15	FAIR	FAIR	NO	ONE SIDED, OVERTOPPED BY ADJACENT TREES, MODERATELY SUPPRESSED
585	BIGLEAF MAPLE	ACER MACROPHYLLUM	18	20	GOOD	FAIR	YES	MODERATELY ONE SIDED
586	BIGLEAF MAPLE	ACER MACROPHYLLUM	10	16	FAIR	FAIR	NO	OVERTOPPED BY ADJACENT TREES, MODERATELY SUPPRESSED
587	WESTERN HEMLOCK	TSUGA HETEROPHYLLA	7	8	GOOD	FAIR	NO	ONE SIDED
588	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	21	18	GOOD	FAIR	YES	ONE SIDED, 60% LCR
589	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	44	30	GOOD	FAIR	YES	MODERATELY ONE SIDED
590	BIGLEAF MAPLE	ACER MACROPHYLLUM	11	8	POOR	POOR	NO	SUPPRESSED
591	BIGLEAF MAPLE	ACER MACROPHYLLUM	18	20	GOOD	FAIR	YES	ONE SIDED
592	WESTERN HEMLOCK	TSUGA HETEROPHYLLA	6	8	GOOD	FAIR	NO	ONE SIDED, OVERTOPPED BY ADJACENT TREES
593	WESTERN HEMLOCK	TSUGA HETEROPHYLLA	23	20	GOOD	FAIR	YES	ONE SIDED, PUSHING AGAINST ADJACENT TREE
594	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	37	20	GOOD	FAIR	YES	ONE SIDED, PUSHING AGAINST ADJACENT TREE
595	WESTERN HEMLOCK	TSUGA HETEROPHYLLA	7	8	GOOD	GOOD	NO	
596	BIGLEAF MAPLE	ACER MACROPHYLLUM	7	5	POOR	POOR	NO	OVERTOPPED BY ADJACENT TREES, SUPPRESSED
597	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	25	18	GOOD	FAIR	YES	ONE SIDED
598	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	43	25	GOOD	FAIR	YES	ONE SIDED
599	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	26	18	GOOD	FAIR	YES	40% LCR, MARGINAL TRUNK TAPER, CROWN EXTENSION SUPPRESSED BY ADJACENT TREES
600	WESTERN HEMLOCK	TSUGA HETEROPHYLLA	13	0	VERY POOR	VERY POOR	NO	25' SNAG
601	WESTERN HEMLOCK	TSUGA HETEROPHYLLA	31	25	GOOD	FAIR	YES	ONE SIDED
602	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	33	20	GOOD	FAIR	YES	ONE SIDED
603	WESTERN HEMLOCK	TSUGA HETEROPHYLLA	6	0	VERY POOR	VERY POOR	NO	7' SNAG
604	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	25	18	FAIR	POOR	NO	33% LCR, POOR TRUNK TAPER
605	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	27	15	GOOD	FAIR	YES	ONE SIDED, MARGINAL TRUNK TAPER
606	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	34	25	GOOD	FAIR	YES	40% LCR
607	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	11	10	GOOD	FAIR	YES	OVERTOPPED BY ADJACENT TREES, MODERATELY SUPPRESSED
608	BIGLEAF MAPLE	ACER MACROPHYLLUM	6	8	POOR	POOR	NO	SUPPRESSED, SIGNIFICANT LEAN, TOP FAILED
609	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	39	25	GOOD	FAIR	YES	MODERATELY ONE SIDED
610	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	11	0	VERY POOR	VERY POOR	NO	DEAD
611	WESTERN HEMLOCK	TSUGA HETEROPHYLLA	17	0	VERY POOR	VERY POOR	NO	DEAD
612	WESTERN HEMLOCK	TSUGA HETEROPHYLLA	10	8	POOR	POOR	NO	EXTENSIVE DIEBACK
613	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	16	10	POOR	POOR	NO	OVERTOPPED BY ADJACENT TREES, SUPPRESSED
614	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	42	25	GOOD	FAIR	YES	ONE SIDED
615	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	25	18	FAIR	FAIR	NO	MODERATELY SUPPRESSED
616	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	29	20	GOOD	FAIR	YES	ONE SIDED
617	BIGLEAF MAPLE	ACER MACROPHYLLUM	9	8	POOR	POOR	NO	OVERTOPPED BY ADJACENT TREES, SUPPRESSED
618	BIGLEAF MAPLE	ACER MACROPHYLLUM	12	15	FAIR	FAIR	NO	ONE SIDED, BRANCH DIEBACK
619	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	29	15	FAIR	FAIR	NO	35% LCR, MARGINAL TRUNK TAPER
620	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	9	0	VERY POOR	VERY POOR	NO	DEAD 20' SNAG
621	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	17	12	FAIR	POOR	NO	ONE SIDED, POOR TRUNK TAPER, 25% LCR
622	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	18	18	FAIR	FAIR	NO	OVERTOPPED BY ADJACENT TREES, TWO DEAD LEADERS AT 12'
623	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	34	15	GOOD	FAIR	YES	ONE SIDED, 40% LCR, MARGINAL TRUNK TAPER
624	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	26	16	FAIR	FAIR	NO	MODERATELY SUPPRESSED, MARGINAL TRUNK TAPER, CROWN EXTENSION SUPPRESSED BY ADJACENT TREES
625	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	10	6	FAIR	FAIR	NO	MODERATELY SUPPRESSED, MARGINAL TRUNK TAPER, CROWN EXTENSION SUPPRESSED BY ADJACENT TREES
626	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	8	0	VERY POOR	VERY POOR	NO	DEAD 7' SNAG
627	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	24	8	FAIR	FAIR	NO	MODERATELY SUPPRESSED, MARGINAL TRUNK TAPER, CROWN EXTENSION SUPPRESSED BY ADJACENT TREES
628	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	25	18	GOOD	FAIR	YES	MARGINAL TRUNK TAPER, CROWN EXTENSION SUPPRESSED BY ADJACENT TREES
629	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	25	18	GOOD	FAIR	YES	MARGINAL TRUNK TAPER, CROWN EXTENSION SUPPRESSED BY ADJACENT TREES, 40% LCR
630	BIGLEAF MAPLE	ACER MACROPHYLLUM	7	10	POOR	POOR	NO	MODERATELY SUPPRESSED, TOP FAILED
631	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	13	8	FAIR	FAIR	NO	MODERATELY SUPPRESSED, MARGINAL TRUNK TAPER
632	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	29	20	GOOD	FAIR	YES	50% LCR, CROWN EXTENSION SUPPRESSED BY ADJACENT TREES
633	WESTERN HEMLOCK	TSUGA HETEROPHYLLA	10	8	POOR	POOR	NO	SUPPRESSED, SIGNIFICANT DIEBACK
634	WESTERN HEMLOCK	TSUGA HETEROPHYLLA	26	18	GOOD	FAIR	YES	MODERATELY ONE SIDED
635	BIGLEAF MAPLE	ACER MACROPHYLLUM	9	4	FAIR	FAIR	NO	MODERATELY SUPPRESSED
636	WESTERN HEMLOCK	TSUGA HETEROPHYLLA	23	0	VERY POOR	VERY POOR	NO	DEAD
637	BIGLEAF MAPLE	ACER MACROPHYLLUM	16	16	GOOD	FAIR	YES	ONE SIDED, 35% LCR
638	BIGLEAF MAPLE	ACER MACROPHYLLUM	16	20	FAIR	FAIR	NO	STEM FAILURE AND DECAY
639	BIGLEAF MAPLE	ACER MACROPHYLLUM	9	12	GOOD	FAIR	NO	ONE SIDED, MARGINAL TRUNK TAPER
640	BIGLEAF MAPLE	ACER MACROPHYLLUM	11	15	GOOD	FAIR	YES	ONE SIDED, MARGINAL TRUNK TAPER
641	BIGLEAF MAPLE	ACER MACROPHYLLUM	10	8	FAIR	FAIR	NO	OVERTOPPED BY ADJACENT TREES, MODERATELY SUPPRESSED, CODOMINANT AT 2' WITH INCLUDED BARK
642	BIGLEAF MAPLE	ACER MACROPHYLLUM	12	10	FAIR	FAIR	NO	ONE SIDED, MODERATELY SUPPRESSED
643	BIGLEAF MAPLE	ACER MACROPHYLLUM	11	10	FAIR	FAIR	NO	ONE SIDED, MODERATELY SUPPRESSED
644	BIGLEAF MAPLE	ACER MACROPHYLLUM	9	8	FAIR	FAIR	NO	ONE SIDED, MODERATELY SUPPRESSED
645	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	46	25	GOOD	FAIR	YES	ONE SIDED
646	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	45	20	GOOD	FAIR	YES	ONE SIDED, 50% LCR
647	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	44	25	GOOD	FAIR	YES	40% LCR
648	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	42	25	GOOD	FAIR	YES	40% LCR
649	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	51	25	GOOD	FAIR	YES	MODERATELY ONE SIDED
650	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	9	12	FAIR	FAIR	NO	ONE SIDED, OVERTOPPED BY ADJACENT TREES, MODERATELY SUPPRESSED
651	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	23	13	GOOD	FAIR	YES	MARGINAL TRUNK TAPER
652	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	14	15	GOOD	FAIR	YES	ONE SIDED, MARGINAL TRUNK TAPER
653	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	23	15	GOOD	FAIR	YES	ONE SIDED, KINKED LOWER TRUNK
654	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	15	12	GOOD	FAIR	YES	CROWN EXTENSION SUPPRESSED BY ADJACENT TREES, MARGINAL TRUNK TAPER
655	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	7	5	POOR	POOR	NO	OVERTOPPED BY ADJACENT TREES, SUPPRESSED
656	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	23	15	GOOD	FAIR	YES	MARGINAL TRUNK TAPER
657	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	23	15	GOOD	FAIR	YES	MARGINAL TRUNK TAPER
658	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	16	10	GOOD	FAIR	YES	MARGINAL TRUNK TAPER, 35% LCR
659	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	24	12	GOOD	FAIR	YES	MARGINAL TRUNK TAPER, 40% LCR
660	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	10	10	FAIR	FAIR	NO	ONE SIDED, LARGE SCAR AT LOWER TRUNK
661	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	16	15	GOOD	FAIR	YES	MODERATELY ONE SIDED, MARGINAL TRUNK TAPER
662	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	14	12	GOOD	FAIR	YES	ONE SIDED, MARGINAL TRUNK TAPER
663	BIGLEAF MAPLE	ACER MACROPHYLLUM	8	15	GOOD	FAIR	NO	OVERTOPPED BY ADJACENT TREES
664	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	14	12	GOOD	FAIR	YES	ONE SIDED, MARGINAL TRUNK TAPER
665	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	23	18	GOOD	FAIR	YES	ONE SIDED, MARGINAL TRUNK TAPER
666	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	22	18	GOOD	FAIR	YES	MODERATELY ONE SIDED, MARGINAL TRUNK TAPER
667	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	14	14	GOOD	FAIR	YES	ONE SIDED, MARGINAL TRUNK TAPER
668	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	29	20	GOOD	FAIR	YES	ONE SIDED
669	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	19	18	GOOD	FAIR	YES	ONE SIDED, MARGINAL TRUNK TAPER
670	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	17	18	FAIR	FAIR	NO	MARGINAL TRUNK TAPER, MODERATELY SUPPRESSED
671	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	24	20	GOOD	FAIR	YES	ONE SIDED
672	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	26	18	FAIR	FAIR	NO	CODOMINANT AT 3' WITH INCLUDED BARK, MODERATELY SUPPRESSED
673	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	11	8	FAIR	FAIR	NO	MARGINAL TRUNK TAPER, MODERATELY SUPPRESSED
674	BIGLEAF MAPLE	ACER MACROPHYLLUM	9	22	GOOD	FAIR	NO	ONE SIDED
675	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	9	0	VERY POOR	VERY POOR	NO	DEAD
676	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	24	20	GOOD	FAIR	YES	ONE SIDED, MARGINAL TRUNK TAPER
677	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	16	15	GOOD	FAIR	YES	50% LCR, MARGINAL TRUNK TAPER
678	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	6	6	GOOD	FAIR	NO	ONE SIDED, MARGINAL TRUNK TAPER
679	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	6	6	FAIR	FAIR	NO	MODERATELY SUPPRESSED, OVERTOPPED BY ADJACENT TREES
680	BIGLEAF MAPLE	ACER MACROPHYLLUM	22	20	GOOD	FAIR	YES	CODOMINANT AT 2' WITH INCLUDED BARK, MODERATELY SUPPRESSED
681	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	19	15	GOOD	FAIR	YES	40% LCR, MARGINAL TRUNK TAPER
681	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	15	14	FAIR	POOR	NO	33% LCR, POOR TRUNK TAPER
682	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	15	14	FAIR	POOR	NO	33% LCR, POOR TRUNK TAPER
682	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	19	17	GOOD	FAIR	YES	40% LCR, MARGINAL TAPER
683	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	17	15	GOOD	FAIR	YES	40% LCR, MARGINAL TAPER, BOWED TRUNK
684	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	23	20	GOOD	FAIR	YES	MODERATELY ONE SIDED
685	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	19	15	GOOD	FAIR	YES	MARGINAL TRUNK TAPER, 40% LCR, PREVIOUS LEADER FAILURE AT 20'
686	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	13	18	GOOD	FAIR	YES	ONE SIDED
687	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	29	20	GOOD	FAIR	YES	MODERATELY ONE SIDED
688	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	27	20	GOOD	FAIR	YES	MODERATELY ONE SIDED
689	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	6	8	FAIR	FAIR	NO	OVERTOPPED BY ADJACENT TREES, MODERATELY SUPPRESSED
690	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	37	22	GOOD	FAIR	YES	MODERATELY ONE SIDED
691	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	24	15	GOOD	FAIR	YES	ONE SIDED
692	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	9	5	POOR	POOR	NO	SUPPRESSED
693	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	26	20	GOOD	FAIR	YES	ONE SIDED
694	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	22	16	GOOD	FAIR	YES	ONE SIDED
695	RED ALDER	PSEUDOTSUGA MENZIESII	25	18	GOOD	FAIR	YES	ONE SIDED
696	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	6	5	POOR	POOR	NO	SUPPRESSED
697	RED ALDER	ALNUS RUBRA	14	0	VERY POOR	VERY POOR	NO	DEAD
698	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	17	10	GOOD	FAIR	YES	ONE SIDED, MARGINAL TRUNK TAPER
699	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	19	12	GOOD	FAIR	YES	ONE SIDED, MARGINAL TRUNK TAPER
700	BIGLEAF MAPLE	ACER MACROPHYLLUM	13	10	FAIR	FAIR	NO	OVERTOPPED BY ADJACENT TREES, MODERATELY SUPPRESSED
701	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	28	22	GOOD	FAIR	YES	MODERATELY ONE SIDED
702	RED ALDER	ALNUS RUBRA	7	5	FAIR	FAIR	NO	SIGNIFICANT LEAN, THIN CROWN
703	SCOULER'S WILLOW	SALIX SCOULERIANA	13	18	POOR	POOR	NO	SIGNIFICANT LEAN, SIGNIFICANT DECAY
704	RED ALDER	ALNUS RUBRA	6	7	FAIR	FAIR	NO	THIN CROWN
705	RED ALDER	ALNUS RUBRA	6	7	FAIR	FAIR	NO	THIN CROWN
706	RED ALDER	ALNUS RUBRA	6	5	FAIR	FAIR	NO	THIN CROWN, CODOMINANT AT 6'
707	WESTERN REDCEDAR	THUJA PLICATA	28	18	GOOD	GOOD	YES	
708	WESTERN REDCEDAR	THUJA PLICATA	7	7	GOOD	GOOD	NO	
709	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	6	6	POOR	POOR	NO	SUPPRESSED
710	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	52	25	GOOD	GOOD	YES	
711	BIGLEAF MAPLE	ACER MACROPHYLLUM	6	15	FAIR	FAIR	NO	EXTREME LEAN, OVERTOPPED BY ADJACENT TREES, MODERATELY SUPPRESSED
712	BIGLEAF MAPLE	ACER MACROPHYLLUM	11	12	GOOD	FAIR	YES	OVERTOPPED BY ADJACENT TREES, MODERATELY SUPPRESSED
713	WESTERN HEMLOCK	TSUGA HETEROPHYLLA	30	0	VERY POOR	VERY POOR	NO	DEAD
714	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	44	20	GOOD	FAIR	YES	50% LCR
715	BIGLEAF MAPLE	ACER MACROPHYLLUM	14	15	GOOD	FAIR	YES	ONE SIDED, OVERTOPPED BY ADJACENT TREES
716	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	19	12	GOOD	FAIR	YES	ONE SIDED, MARGINAL TRUNK TAPER
717	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	25	18	GOOD	FAIR	YES	ONE SIDED, MARGINAL TRUNK TAPER, BOWED TRUNK

"GREEN" HATCH INDICATES TREES THAT WILL BE PROTECTED.

TREE TO BE SAVED OR REMOVED							TREE RETENTION	"YES" INDICATES TREES THAT MEET TREE RETENTION REQUIREMENT. SEE NOTE 4.
TREE No	COMMON NAME	SCIENTIFIC NAME	DBH	C-RAD	CONDITION	STRUCTURE	OPTION	COMMENTS
718	BIGLEAF MAPLE	ACER MACROPHYLLUM	12	8	POOR	POOR	NO	TOP FAILED, SUPPRESSED
719	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	23	10	FAIR	FAIR	NO	ONE SIDED, MARGINAL TRUNK TAPER, KINKED TRUNK, MODERATELY SUPPRESSED
720	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	9	5	POOR	POOR	NO	SUPPRESSED, EXTENSIVE PORODAEDALEA PINI CONKS
721	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	14	10	FAIR	FAIR	NO	ONE SIDED, MODERATELY SUPPRESSED, MARGINAL TRUNK TAPER
722	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	17	8	FAIR	FAIR	NO	ONE SIDED, MODERATELY SUPPRESSED, MARGINAL TRUNK TAPER
723	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	32	8	FAIR	FAIR	NO	ONE SIDED, MODERATELY SUPPRESSED, MARGINAL TRUNK TAPER, KINKED TRUNK
724	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	19	10	FAIR	FAIR	NO	ONE SIDED, MODERATELY SUPPRESSED, MARGINAL TRUNK TAPER
725	BIGLEAF MAPLE	ACER MACROPHYLLUM	10	15	FAIR	FAIR	NO	OVERTOPPED BY ADJACENT TREES, MODERATELY SUPPRESSED
726	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	13	8	FAIR	POOR	NO	MODERATELY SUPPRESSED, POOR TRUNK TAPER
727	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	11	7	FAIR	POOR	NO	MODERATELY SUPPRESSED, POOR TRUNK TAPER
728	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	19	22	GOOD	FAIR	YES	ONE SIDED, 35% LCR, MARGINAL TRUNK TAPER
729	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	24	18	GOOD	FAIR	YES	ONE SIDED, 60% LCR, MARGINAL TRUNK TAPER
730	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	30	18	GOOD	FAIR	YES	CROWN EXTENSION SUPPRESSED BY ADJACENT TREES, 50% LCR
731	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	35	20	GOOD	FAIR	YES	ONE SIDED
732	WESTERN HEMLOCK	TSUGA HETEROPHYLLA	27	18	FAIR	FAIR	NO	ONE SIDED, DECAY POCKET AT ROOT CROWN
733	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	27	12	FAIR	FAIR	NO	EXTREME KINK IN TRUNK
734	BIGLEAF MAPLE	ACER MACROPHYLLUM	13	13	GOOD	FAIR	YES	MODERATELY ONE SIDED
735	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	23	13	GOOD	FAIR	YES	MODERATELY ONE SIDED
736	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	17	13	GOOD	FAIR	YES	ONE SIDED, 40% LCR
737	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	15	13	GOOD	FAIR	YES	ONE SIDED, 50% LCR
738	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	15	10	GOOD	FAIR	YES	35% LCR, MARGINAL TRUNK TAPER
739	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	16	10	GOOD	FAIR	YES	35% LCR, MARGINAL TRUNK TAPER
740	BIGLEAF MAPLE	ACER MACROPHYLLUM	12	8	FAIR	FAIR	NO	OVERTOPPED BY ADJACENT TREES, MODERATELY SUPPRESSED
741	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	7	7	GOOD	FAIR	NO	ONE SIDED, OVERTOPPED BY ADJACENT TREES, MODERATELY SUPPRESSED
742	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	7	6	POOR	POOR	NO	SUPPRESSED
743	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	41	20	GOOD	FAIR	YES	MODERATELY ONE SIDED
744	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	9	12	GOOD	FAIR	NO	ONE SIDED, OVERTOPPED BY ADJACENT TREES, MODERATELY SUPPRESSED
745	BIGLEAF MAPLE	ACER MACROPHYLLUM	12	0	VERY POOR	VERY POOR	NO	DEAD
746	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	30	18	GOOD	FAIR	YES	ONE SIDED
747	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	25	10	FAIR	POOR	NO	ONE SIDED, SIGNIFICANT PORODAEDALEA PINI CONKS AT LOWER TRUNK
748	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	20	10	FAIR	POOR	NO	ONE SIDED, SIGNIFICANT PORODAEDALEA PINI CONKS AT LOWER TRUNK
749	ENGLISH WALNUT	JUGLANS REGIA	14,14,14	20	FAIR	FAIR	NO	MULTIPLE LEADERS AT GROUND LEVEL, THIN CROWN, NEAR TREE 89, COULD BE THREE TREES, NOT TAGGED AND SIZE ESTIMATED BECAUSE OF EXTENSIVE BLACKBERRY GROWTH

TREE SURVEY COMPLETED BY: TERAGAN & ASSOCIATES, INC.

ATTENTION: TODD PRAGER, ASCA REGISTERED CONSULTING ARBORIST #597, ISA BOARD CERTIFIED MASTER ARBORIST, ISA TREE RISK ASSESSMENT QUALIFIED, AICP, AMERICAN PLANNING ASSOCIATION

1. DBH IS THE TRUNK DIAMETER IN INCHES MEASURED IN ACCORDANCE WITH INTERNATIONAL SOCIETY OF ARBORICULTURE STANDARDS.
2. C-RAD IS THE APPROXIMATE CROWN RADIUS IN FEET.
3. CONDITION AND STRUCTURE RATINGS RANGE FROM VERY POOR, POOR, FAIR, TO GOOD.
4. TREE MEETS THE REQUIREMENTS TO BE A RETENTION TREE PER 17.102.50.A-3 TREES PROPOSED FOR RETENTION SHALL BE HEALTHY AND LIKELY TO GROW TO MATURITY. PER CITY OF SANDY, ONLY TREES IN GOOD HEALTH CONDITION ARE ELIGIBLE TO MEET THIS STANDARD.

TREE RETENTION ANALYSIS

- (yellow) TREES THAT MEET TREE RETENTION REQUIREMENT. SEE NOTE 4. (NUMBER OF TREES = 333)
- (red) TREES THAT DON'T MEET TREE RETENTION REQUIREMENT. SEE NOTE 4. (NUMBER OF TREES = 414)
- (green) TREES TO BE SAVED THAT MEET TREE RETENTION REQUIREMENT. = 38 TREES
- (pink) TREES TO BE REMOVED. (NUMBER OF TREES = 709)

PER CODE SECTION 17.102.50 A-1 "AT LEAST THREE TREES 11 INCHES DBH OR GREATER ARE TO BE RETAINED FOR EVERY ONE-ACRE OF CONTIGUOUS OWNERSHIP". THERE IS 12.739 ACRES (12.739 X 3 = 38.21). SO A MINIMUM OF 38 TREES NEED TO BE RETAINED. AS DEMONSTRATED ABOVE, 38 TREES WILL BE RETAINED MEETING THIS CODE REQUIREMENT.

SHEET C6 OF 10

REVISION: DATE – NO. – BY –

DESIGNED: RLM DRAWN: RLM CHECKED: DLH APPROVED: RLM

REGISTERED PROFESSIONAL ENGINEER 49710 OREGON JULY 21, 1989 RAY L. MOORE — RENEWAL DATE: 12/31/2022 — PRELIMINARY

SCALE VERT.: N/A HORIZ.: N/A
DATE: 4-30-21
FILE: 19-268 – Planning-SFR.dwg
LEGAL: SECTION 24, TWP. 2S, RANGE 4E

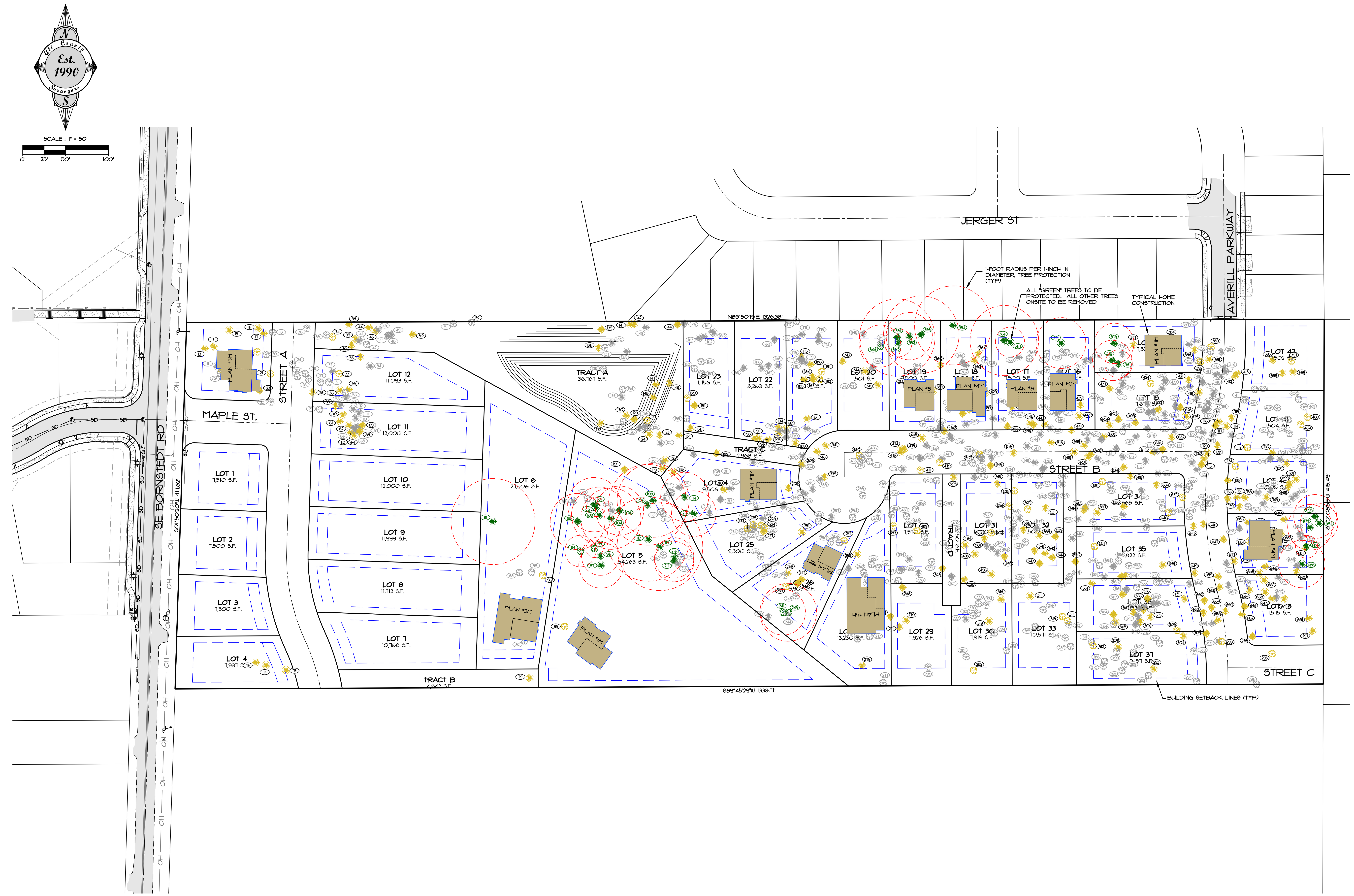
PROJECT: THE BORNSTEDT VIEWS
TREE INVENTORY LIST 3

LOCATION: 19618 SE BORNSTEDT ROAD, SANDY, OR

All County Surveyors & Planners, Inc.
Surveying, Planning and Civil Engineering
P.O. Box 955 Sandy, OR 97055
Phone: (503) 668-3151
Fax: (503) 668-4730

DATE OF PLOT 4-30-21

CLIENT:
EVEN BETTER HOMES, INC.
MAC EVEN
PO BOX 2021
GRESHAM, OR 97030
PHONE: (503) 348-5602
EMAIL: mac@evenbetterhomes.com



SHEET **C7** OF **10**

DATE	NO.	REVISION	BY
-	-	-	-

DESIGNED: RLM
DRAWN: RLM
CHECKED: DLH
APPROVED: RLM

REGISTERED PROFESSIONAL ENGINEER 49710PE OREGON JULY 21, 1998 RAY L. MOORE
RENEWAL DATE: 12/31/2022
PRELIMINARY

SCALE VERT: N/A HORIZ: 1" = 50'
DATE: 4-30-21
FILE: 19-268 - Planning-SFR.dwg

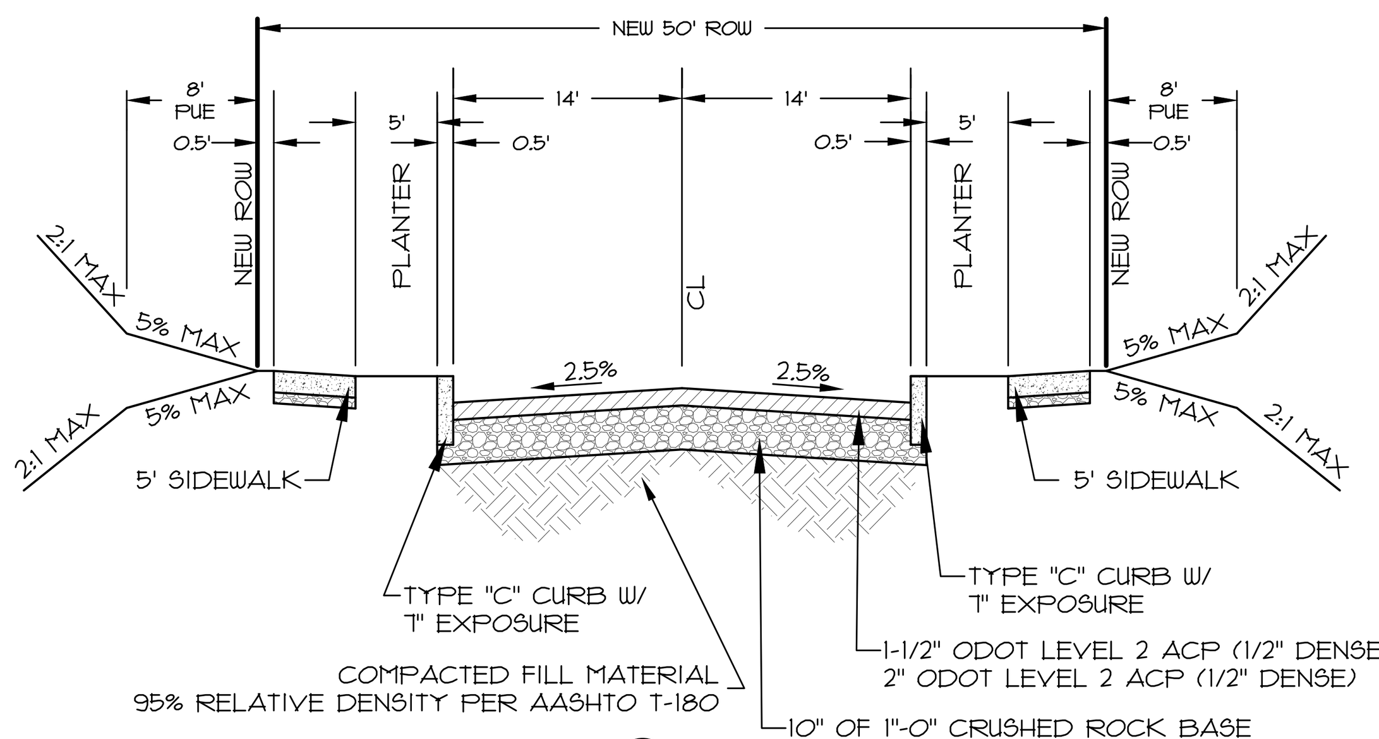
LEGAL		
SECTION	TWP.	RANGE
24	2S	4E

PROJECT:
THE BORNSTEDT VIEWS
TREE RETENTION AND PROTECTION PLAN

LOCATION:
19618 SE BORNSTEDT ROAD, SANDY, OR

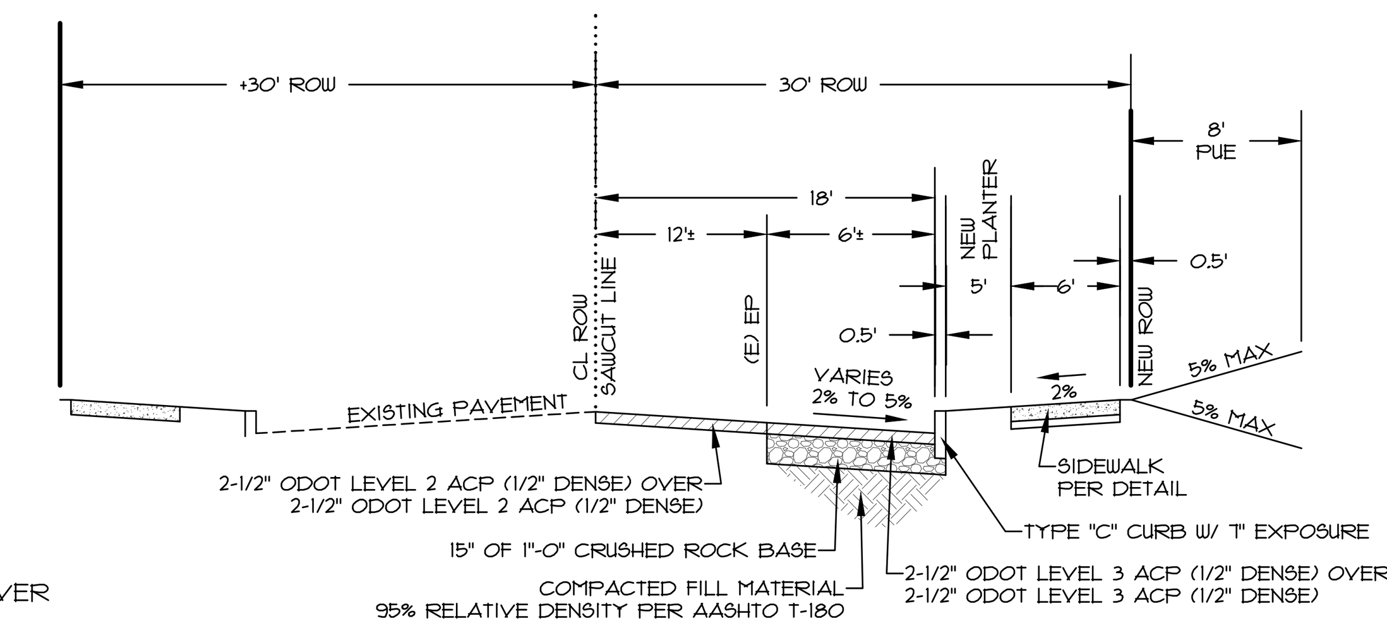
All County Surveyors & Planners, Inc.
Surveying, Planning and Civil Engineering
P.O. Box 955 Sandy, OR 97055
Phone: (503) 668-3151
Fax: (503) 668-4730
DATE OF PLOT 4-30-21

CLIENT:
EVEN BETTER HOMES, INC.
MAC EVEN
PO BOX 2021
GRESHAM, OR 97030
PHONE: (503) 348-5602
EMAIL: mac@evenbetterhomes.com



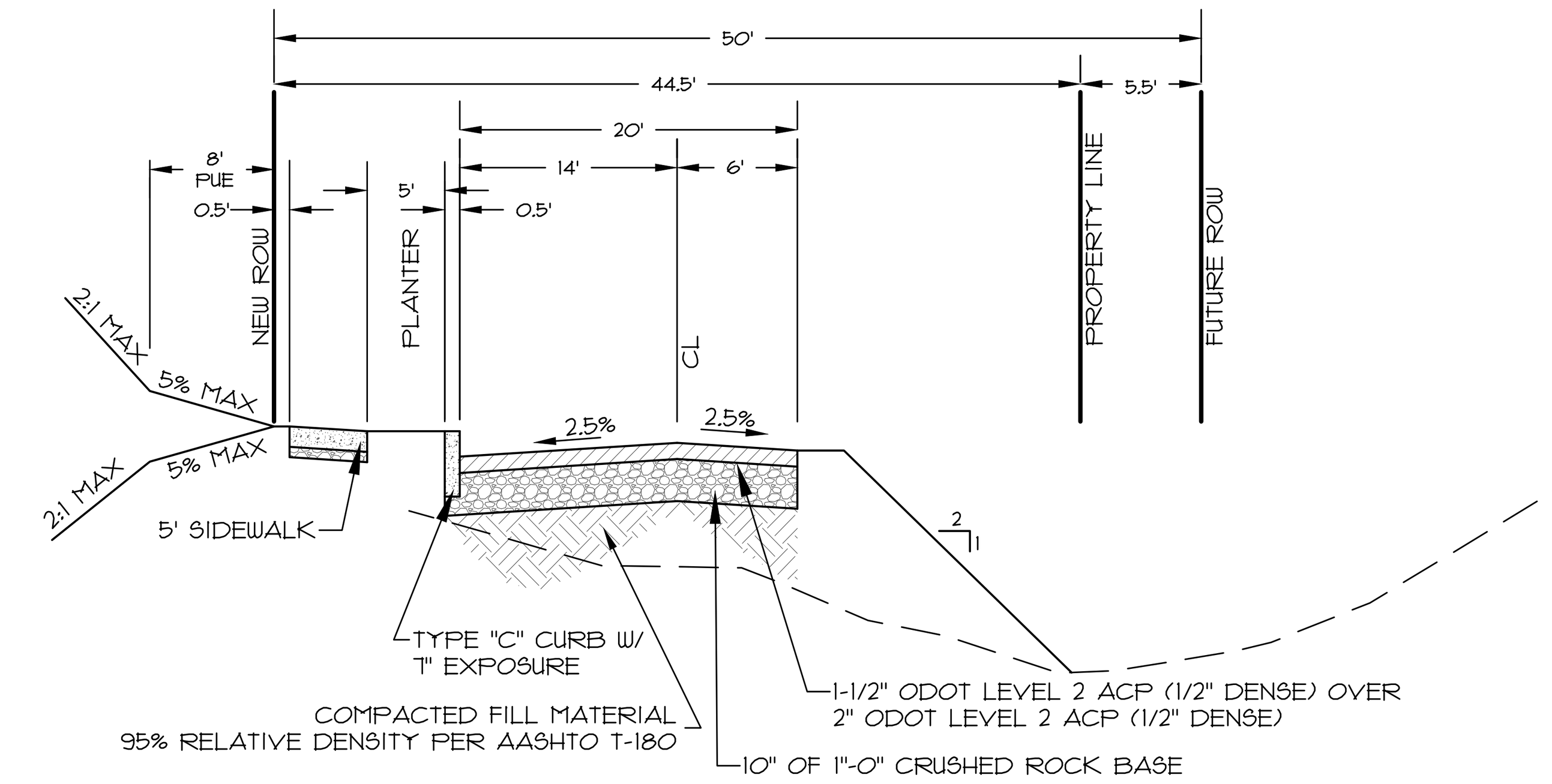
SECTION (A) LOCAL STREET

(PARKING ON BOTH SIDES)
NTS



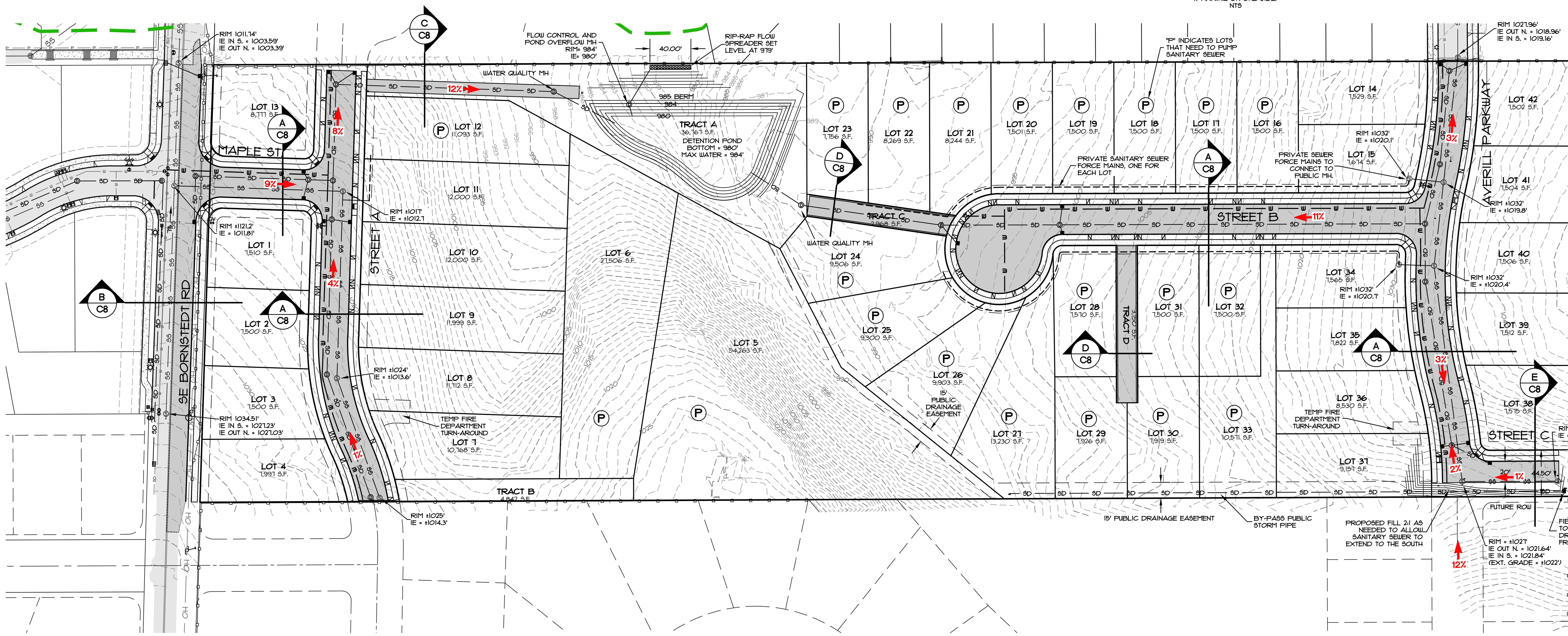
SECTION (B) (MIN 60' ROW)

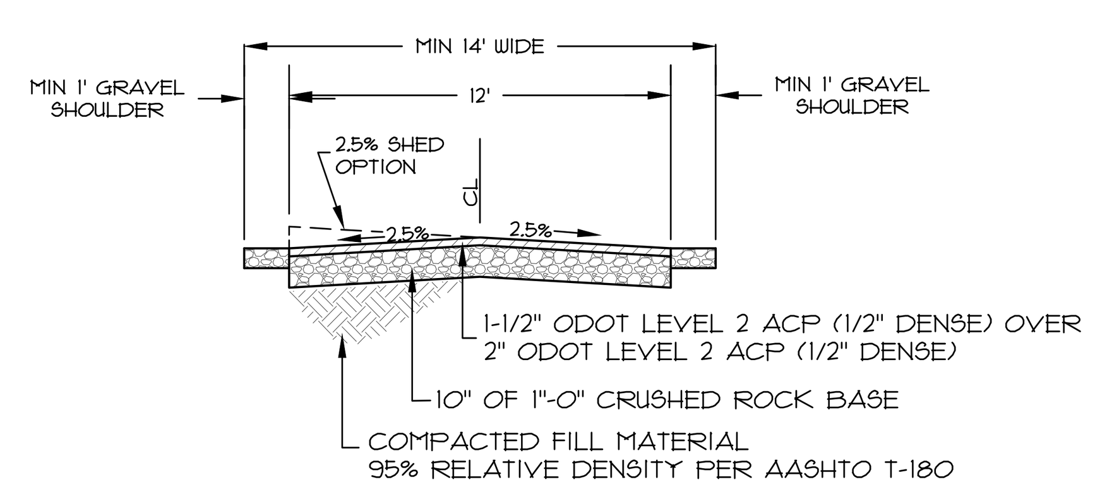
BORNSTEDT RD.
MINOR ARTERIAL
NTS



SECTION (E) LOCAL STREET

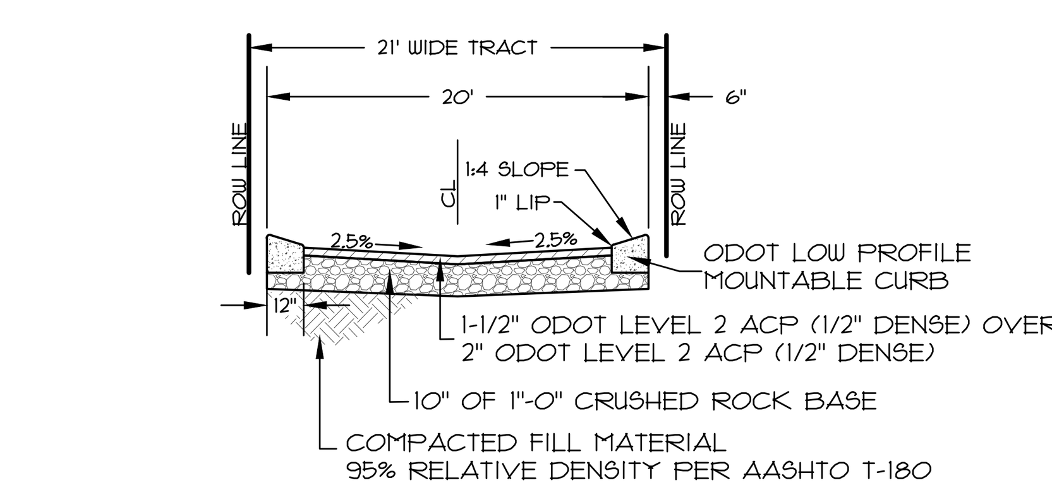
(PARKING ON ONE SIDE)
NTS





SECTION (C) PUBLIC ACCESS ROAD

NTS



SECTION (D) SHARED PRIVATE DRIVEWAY

(NO PARKING, MAXIMUM 2 LOTS)
NTS

N
All County Surveyors Est. 1990
S

SCALE : 1" = 50'
0' 25' 50' 100'

DATE	NO.	REVISION	BY
-	-	-	-

SHEET C8 OF 10

DESIGNED: RLM
DRAWN: RLM
CHECKED: DLH
APPROVED: RLM

REGISTERED PROFESSIONAL ENGINEER 49710 OREGON JULY 21, 1989 RAY L. MOORE
RENEWAL DATE: 12/31/2022
PRELIMINARY

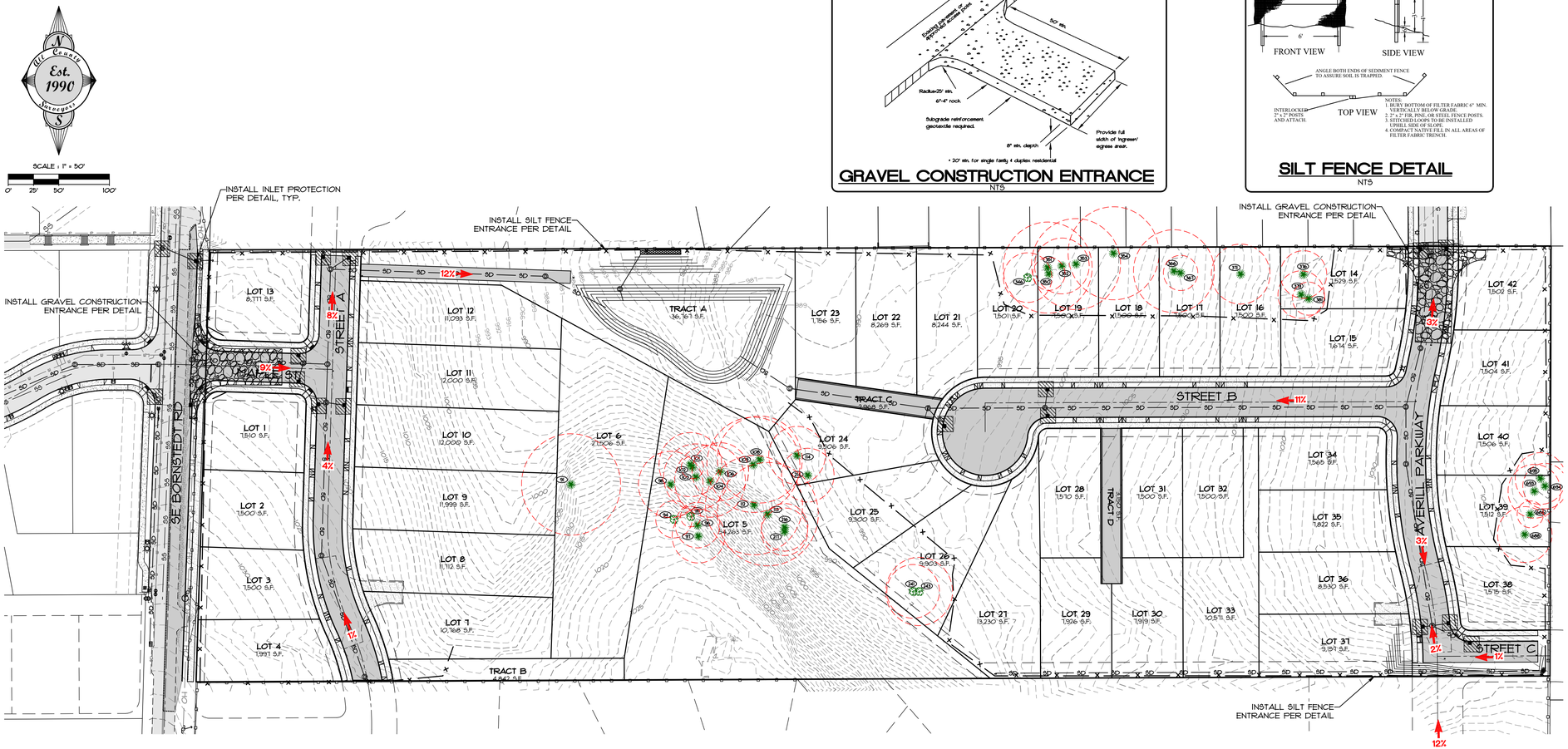
SCALE: VERT: N/A HORIZ: 1" = 50'
DATE: 4-30-21
FILE: 19-268 - Planning-SFR.dwg
LEGAL: SECTION 24 TWP. 2S RANGE 4E

PROJECT:
THE BORNSTEDT VIEWS
STREET AND UTILITY PLAN

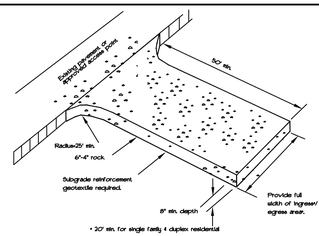
LOCATION: 19618 SE BORNSTEDT ROAD, SANDY, OR

All County Surveyors & Planners, Inc.
Surveying, Planning and Civil Engineering
P.O. Box 955 Sandy, OR 97055
Phone: (503) 668-3151
Fax: (503) 668-4730
DATE OF PLOT 4-30-21

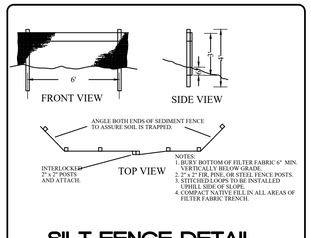
CLIENT:
EVEN BETTER HOMES, INC.
MAC EVEN
PO BOX 2021
GRESHAM, OR 97030
PHONE: (503) 348-5602
EMAIL: mac@evenbetterhomes.com



GRAVEL CONSTRUCTION ENTRANCE
NTS



SILT FENCE DETAIL
NTS



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, REPLACEMENT AND UPGRADING 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 COMMENCED 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.

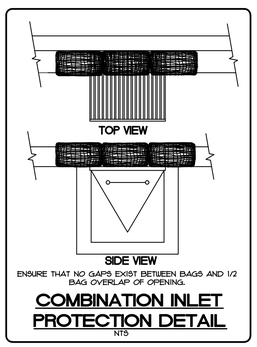
STORM INLETS, BASINS, AND AREA DRAINS SHALL BE PROTECTED UNTIL PAVEMENT SURFACES ARE COMPLETED AND/OR VEGETATION IS RE-ESTABLISHED.

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 WET 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.



ENSURE THAT NO GAPS EXIST BETWEEN BAGS AND 1/2 BAG OVERLAP OF OPENING.

COMBINATION INLET PROTECTION DETAIL
NTS

LEGEND

- PROPOSED INLET PROTECTION
- x — INSTALL SEDIMENT FENCE
- 400 — EXISTING GROUND CONTOUR
- 400 — PROPOSED FINISH GRADE CONTOUR

SHEET C9 OF 10

NO.	DATE	REVISION	BY
–	–	–	–

DESIGNED: RLM
DRAWN: RLM
CHECKED: DLH
APPROVED: RLM

PRELIMINARY
REGISTERED PROFESSIONAL ENGINEER
OREGON
JULY 25, 2003
MARK L. MOSER
RENEWAL DATE: 12/31/2022

SCALE VERT: N/A HORIZ: 1" = 50'
DATE: 4-30-21
FILE:19-268 – Planning-SFR.dwg
LEGAL
SECTION 24 TWP: 2S RANGE 4E

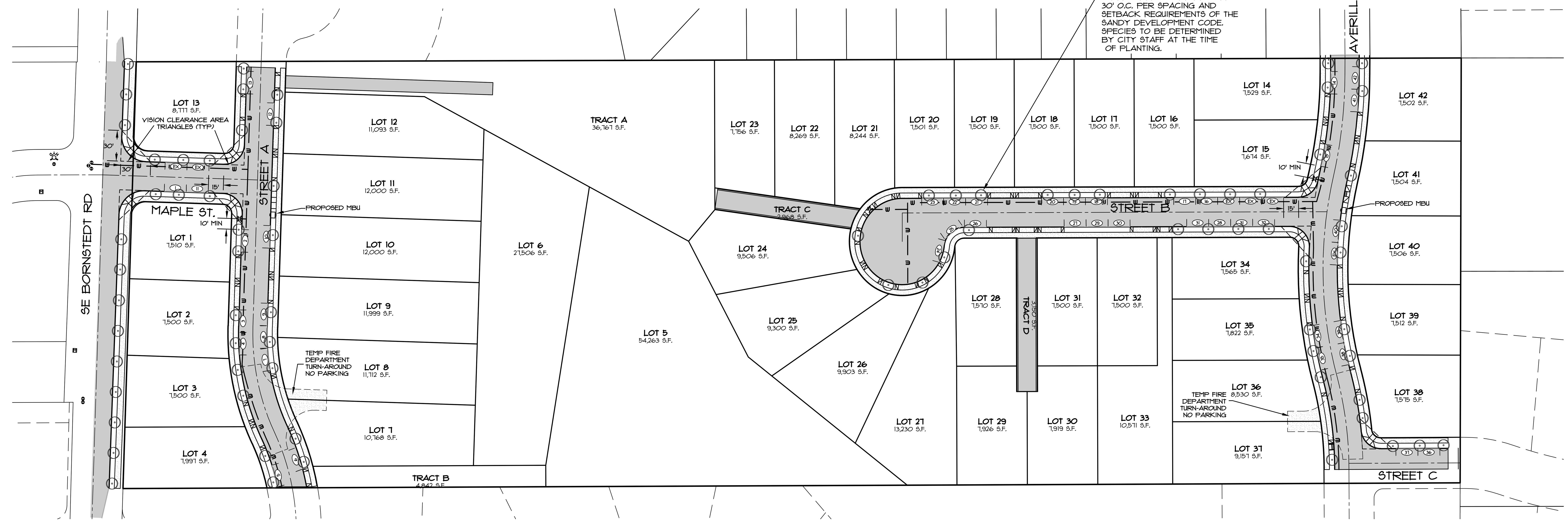
PROJECT:
THE BORNSTEDT VIEWS
GRADING AND EROSION CONTROL PLAN

LOCATION:
19618 SE BORNSTEDT ROAD, SANDY, OR

Surveyors & Planners, Inc.
Surveying, Planning and Project Management
P.O. Box 955 Sandy, OR 97055
Phone: (503) 668-3151
Fax: (503) 668-4730

DATE OF PLOT 4-30-21

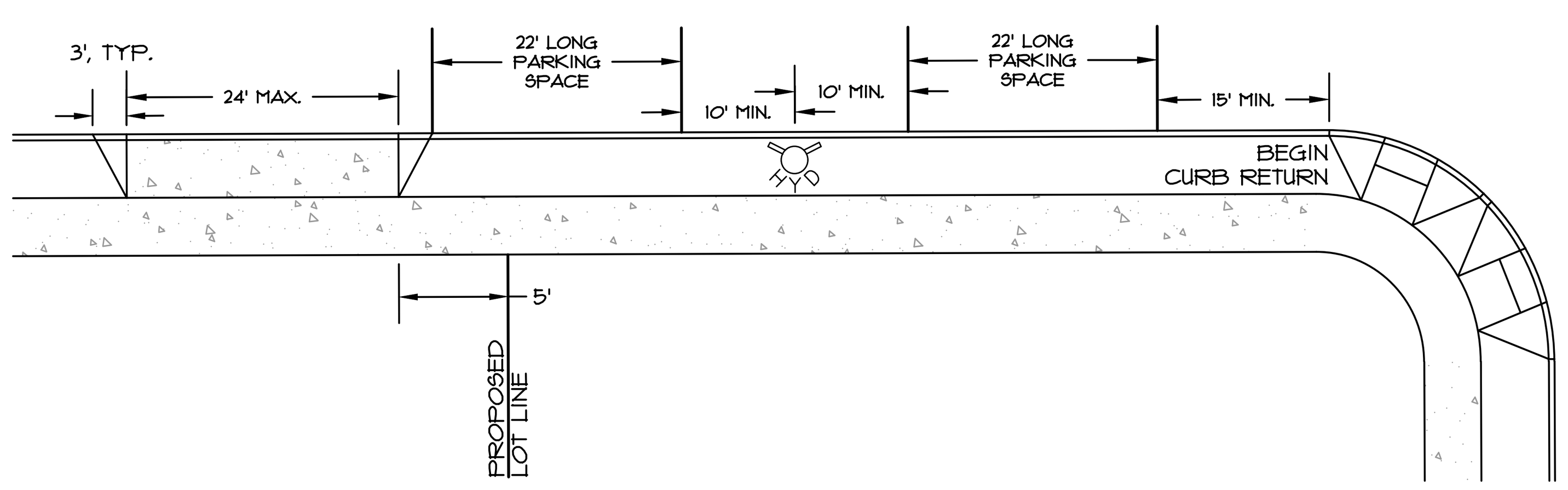
CLIENT:
EVEN BETTER HOMES, INC.
MAC EVEN
PO BOX 2021
GRESHAM, OR 97030
PHONE: (503) 348-5602
EMAIL: mac@evenbetterhomes.com



TYPICAL ON-STREET CAR PARKING TOTAL
ON-STREET SPACES PROPOSED = 48
MINIMUM REQUIRED = 42

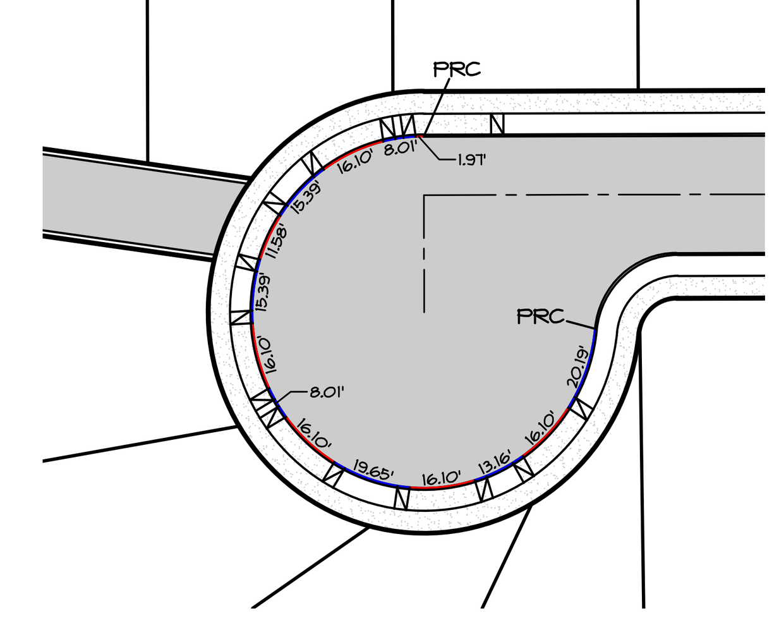
TYPICAL ON-STREET PARKING REQUIREMENT DIMENSIONS

NTS



LEGEND

- SUBJECT PROPERTY BOUNDARY LINE
- PROPOSED LOT LINE
- PROPOSED CURB AND PAVEMENT
- PROPOSED SIDEWALK
- PROPOSED UNSTRIPED 22' LONG ON-STREET PARKING SPACE
- PARKING SPACE NUMBER CORRESPONDING TO LOT NUMBER (EACH SPACE IS WITHIN 300' OF EACH DWELLING
- PARKING SPACE THAT EXCEEDS THE REQUIREMENT
- PROPOSED FIRE HYDRANT
- PROPOSED MBU



TOTAL CIRCUMFERENCE FROM PRC TO PRC = 193.85'
TOTAL GAPS = 99.80' (51%)
TOTAL DRIVEWAY LENGTH = 94.85' (49%)
(49% IS LESS THAN 51%. MEETS CODE)

SCALE : 1" = 40'

CLIENT:
EVEN BETTER HOMES, INC.
MAC EVEN
PO BOX 2021
GRESHAM, OR 97030
PHONE: (503) 348-5602
EMAIL: mac@evenbetterhomes.com

All County Surveyors & Planners, Inc.
Surveying, Planning and Civil Engineering
P.O. Box 955 Sandy, OR 97055
Phone: (503) 668-3151
Fax: (503) 668-4730

DATE OF PLOT 4-30-21

PROJECT:
THE BORNSTEDT VIEWS
ON-STREET PARKING PLAN

LOCATION:
19618 SE BORNSTEDT ROAD, SANDY, OR

SCALE	VERT: N/A HORIZ: 1" = 50'
DATE:	4-30-21
FILE:	19-268 - Planning-SFR.dwg
LEGAL	

SECTION	TWP.	RANGE
24	2S	4E

REGISTERED PROFESSIONAL ENGINEER 49710PE OREGON JULY 21, 1998 RAY L. MOORE
RENEWAL DATE: 12/31/2022
PRELIMINARY

DESIGNED:	RLM
DRAWN:	RLM
CHECKED:	DLH
APPROVED:	RLM

DATE	NO.	REVISION	BY
-	-	-	-

SHEET C10 OF 10

EXHIBIT D

Preliminary Storm Drainage Report
For: The Bornstedt Views Subdivision

July 26, 2021

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 #19-268

Prepared For:
Even Better Homes, Inc.
Mac Even
PO Box 2021
Gresham, OR 97030
Phone: 503-348-5602

RENEWAL DATE: 12/31/2022

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Table of Contents

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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 Bornstedt Views Subdivision will be constructed in 1 phase. The site is Tax Lot 100, Map 2S 4E 24C, and is approximately 12.7 acres and is located on the east side of SE Bornstedt Road and just south of Jerger Street. Averill Parkway is currently stubbed to the north line of the subject site near the northeast corner.

The site is bisected by a steep ravine running northwest through the site. There are steep slopes on the property (greater than 35%) that will not be developed. The site is currently wooded on the easterly side and a pasture on the west side. This entire site drains to this ravine and then flows north to Tickle Creek. See the Existing Conditions Map in Appendix A.

Proposed Improvements

The proposed 41 lot subdivision will consist of lots 7,500 sf and greater. There will be 12 new lots on the west side of the ravine and 29 lots on the east side. A new detention pond will be constructed in the ravine at the north end of the site. This pond will serve both sides of the development and discharge into the existing drainage way with a rip-rap flow spreader.

The site improvements will include streets, curbs, sidewalks, and utilities. New storm sewer pipes, manholes, and catch basins will be installed to convey storm water to the new public detention systems. See the Developed Conditions Map in Appendix B

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 Stated Department of Agriculture (USDA). The post-development soil is assumed to be the same as pre-development. Soil Type: 15B,C, and D, 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	
Pre-Developed	
Total Area	**12.734 ac**
Impervious Area	0.130 ac
Pervious Area	12.604 ac
Post-Developed	
Total Area	**12.734 ac**
Impervious Area	4.791 ac
Pervious Area	7.948 ac

Curve Numbers

Curve Numbers are taken from the 2016 City of Portland Stormwater Management Manual.

Description	CN	Land Use Description
Pre-Developed	70	Woods
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 assumed for these preliminary calculations.

Basin 1	
Pre-Developed	35 minutes (assumed)
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 4-deep detention pond. **The required storage volume is 35,495-cubic feet. This can be contained in a 4-foot deep pond with a bottom area of 6,464 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 C for more information and the detailed analysis.

Basin 1, Detention Pond				
Recurrence Interval (years)	Pre-Developed Outflow (cfs)	Developed Outflow (cfs)	Proposed Release Rates (cfs)	Reduction in outflow from Pre-Developed to Proposed
25	4.43	12.47	4.37	1%
10	3.26	10.25	3.24	1%
5	2.79	9.32	2.72	2%
2	1.37	6.36	1.33	3%

Orifice Table Detention Pond (Basin 1)		
Orifice	**Dia. (inches)**	**Height (feet)**
Bottom	5.51	0
Top	10.45	3.12

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

Two CDS manholes by Contech Stormwater Solutions will be designed for water quality for this site, one for each drainage basin, see details in Appendix D. 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) X (0.2) X (4.761) = 0.86 cfs (total site). Final storm report will detail out the east and west manholes.

The Contech Stormwater Solutions Treatment Device Model CDS2015-4-C has a treatment capacity of 0.7 cfs. Therefore, two of this manholes will work for the entire Basins.

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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SCALE: 1" = 50'

0' 25' 50' 100'

LEGEND

- (E) PROPERTY LINE
- (E) LOT LINE
- (E) CL RIGHT OF WAY
- (E) EASEMENT LINE
- (E) 5' GROUND CONTOUR
- (E) 1' GROUND CONTOUR
- (E) BUILDING WALL
- (E) AC PAVEMENT
- (E) SIDEWALK/CONCRETE
- (E) GRAVEL
- (E) CURB & GUTTER
- (E) FENCE
- (E) WATER LINE
- (E) 6" WATER LINE
- (E) 8" WATER LINE
- (E) 12" WATER LINE
- (E) STORM LINE
- (E) SANITARY LINE
- (E) GAS LINE
- (E) TELEPHONE LINE, CATV
- (E) OVERHEAD POWER LINE
- FOUND SURVEY MONUMENT
- (E) STORM MANHOLE
- (E) CATCH BASIN
- (E) WATER METER
- (E) WATER VALVE
- (E) MANHOLE
- (E) GAS VALVE
- (E) LIGHT POLE
- (E) UTILITY POLE
- (E) POLE W/ GUY WIRE
- (E) SIGN
- (E) DECIDUOUS TREE
- (E) CONIFEROUS TREE
- (P) SANITARY LINE
- (P) SANITARY MANHOLE
- (P) STORM LINE
- (P) STORM MANHOLE
- (P) CATCH BASIN
- (P) WATER LINE
- (P) WATER METER
- (P) WATER VALVE
- (P) FIRE HYDRANT
- (P) STREET LIGHT

FSH OVERLAY

JERGER ST

AVERILL PARKWAY

SE BORNSTEDT RD

RIM 1011.74'
IE IN S. = 1003.59'
IE OUT N. = 1003.39'

NOTE ALL "YELLOW" AND "GRAY" TREES TO BE REMOVED WITH DEVELOPMENT.

N89°50'19"E 1326.38'

NOTE "GREEN" AND "YELLOW" TREES MEET THE TREE RETENTION REQUIREMENTS, SEE ARBORIST REPORT. ALL GREEN TREES WILL BE SAVED. SEE TREE PROTECTION PLAN.

RIM 1026.13'
IE IN S. = 1016.93'
IE IN E. = 1017.63
IE IN N. = 1017.03'
IE OUT W. = 1016.93'

RIM 1027.96'
IE OUT N. = 1018.96'

985 BERM
984
980

SHED

SHED

OLD HOUSE FOUNDATION

S89°45'29"W 1338.11'

RIM 1034.51'
IE IN S. = 1027.23'
IE OUT N. = 1027.03'

S01°50'00"W 417.62'

SLOPE ANALYSIS LEGEND

- SLOPES OF 0-24.99%
- SLOPES OF 25-34.99%
- SLOPES OF 35% AND GREATER

BENCHMARK
ELEVATIONS ARE BASED ON CITY OF SANDY ELEVATION DATUM

TOPOGRAPHIC SURVEY

SCALE: 1" = 50'

NO.	DATE	REVISION	BY
-	-	-	-

DESIGNED: RLM
DRAWN: RLM
CHECKED: DLH
APPROVED: RLM

REGISTERED PROFESSIONAL LAND SURVEYOR
OREGON
JULY 24, 2007
RAY L. MOSS
RENEWAL DATE: 12/31/2022

PRELIMINARY

SCALE
VERT: N/A
HORIZ: 1" = 50'
DATE: 4-30-21
FILE: 19-268 - Planning-SFR.dwg
LEGAL
SECTION 24
TWP: 2S
RANGE 4E

SHEET C3 OF 10

PROJECT:
THE BORNSTEDT VIEWS
TOPOGRAPHIC SURVEY

LOCATION:
19618 SE BORNSTEDT ROAD, SANDY, OR

Surveyors & Planners, Inc.
Surveying, Planning and Civil Engineering
P.O. Box 955 Sandy, OR 97055
Phone: (503) 668-3151
Fax: (503) 668-4730

DATE OF PLOT 4-30-21

CLIENT:
EVEN BETTER HOMES, INC.
MAC OSTLUND
PO BOX 2021
GRESHAM, OR 97030
PHONE: (503) 348-5602
EMAIL: mac@evenbetterhomes.com

Appendix B

Developed Conditions Map

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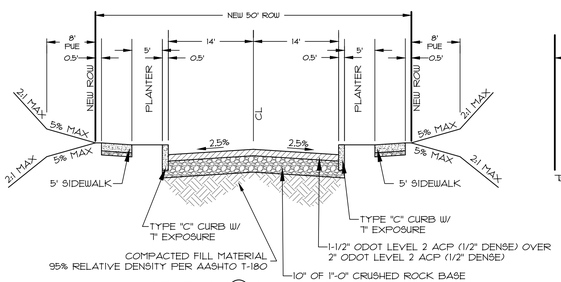
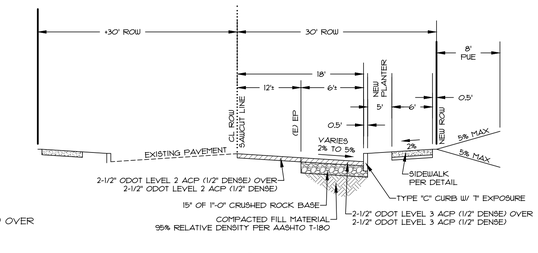


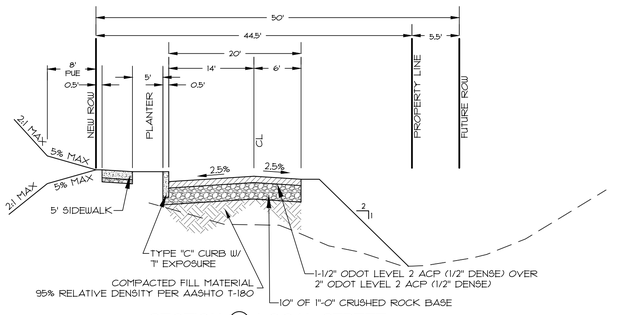
SECTION Ⓐ LOCAL STREET

(PARKING ON BOTH SIDES)
NTS



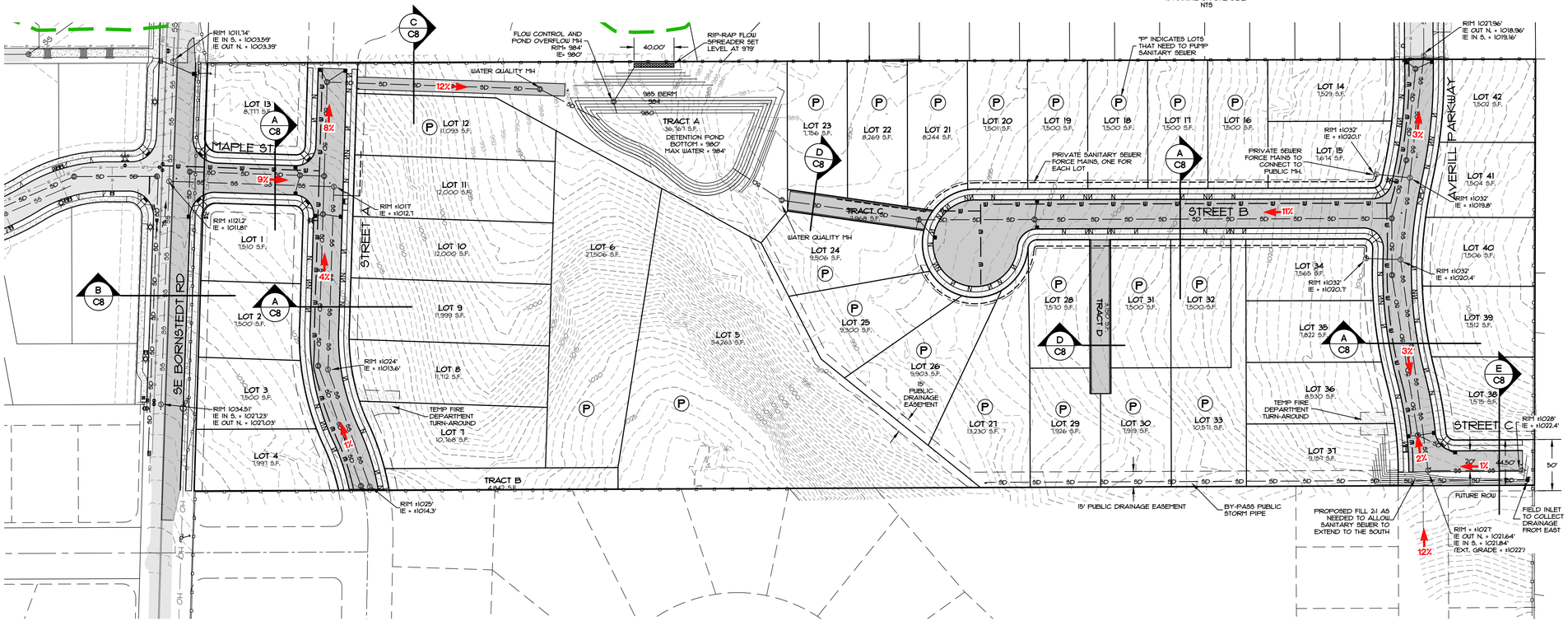
SECTION Ⓑ (MIN 60' ROW)

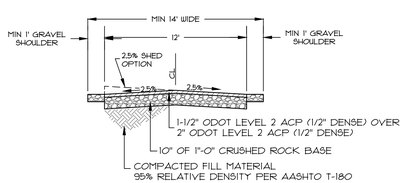
BORNSTEDT RD.
MINOR ARTERIAL
NTS



SECTION Ⓔ LOCAL STREET

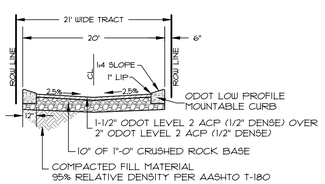
(PARKING ON ONE SIDE)
NTS





SECTION Ⓒ PUBLIC ACCESS ROAD

NTS



SECTION Ⓓ SHARED PRIVATE DRIVEWAY

(NO PARKING, MAXIMUM 2 LOTS)
NTS

SHEET C8 OF 10

BY	NO.	DATE	REVISION
–	–	–	–

DESIGNED: RLM
DRAWN: RLM
CHECKED: DLH
APPROVED: RLM

PROFESSIONAL ENGINEER — OREGON — JULY 24, 2007 — MAY L. MOSSER — RENEWAL DATE: 12/31/2022

PRELIMINARY

SCALE — VERT: N/A; HORIZ: 1" = 50'
DATE: 4-30-21
FILE: 19-268 – Planning-SFR.dwg
LEGAL — SECTION: 24; TWP.: 2S; RANGE: 4E

PROJECT:
THE BORNSTEDT VIEWS
STREET AND UTILITY PLAN

LOCATION:
19618 SE BORNSTEDT ROAD, SANDY, OR

DATE OF PLOT: 4-30-21

Surveyors & Planners, Inc.
Surveying, Planning and Project Management
P.O. Box 955 Sandy, OR 97055
Phone: (503) 668-3151
Fax: (503) 668-4730

CLIENT:
EVEN BETTER HOMES, INC.
MAC EVEN
P.O. BOX 2021
GRESHAM, OR 97030
PHONE: (503) 348-5602
EMAIL: mac@evenbetterhomes.com

Appendix C

Basin 1 Analysis, Data, and Detention Pond Design

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Project Name: The Bornstedt Views - Basin 1 Pond

Hydrograph Analysis Summary

Job # 19-268
Date: 7/26/2021

Rainfall (year)	Rainfall (inches)
2	3.50
5	4.50
10	4.80
25	5.50
100	0.00

Pre-Developed
Pervious
Area = 12.604 acres
CN = 70 na
Impervious
Area = 0.13 acres
CN = 98 na
Tc = 35 min
Total A = 12.734 acres

Developed
Pervious
Area = 7.948 acres
CN = 74 na
Impervious
Area = 4.761 acres
CN = 98 na
Tc = 5 min
Total A = 12.709 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.

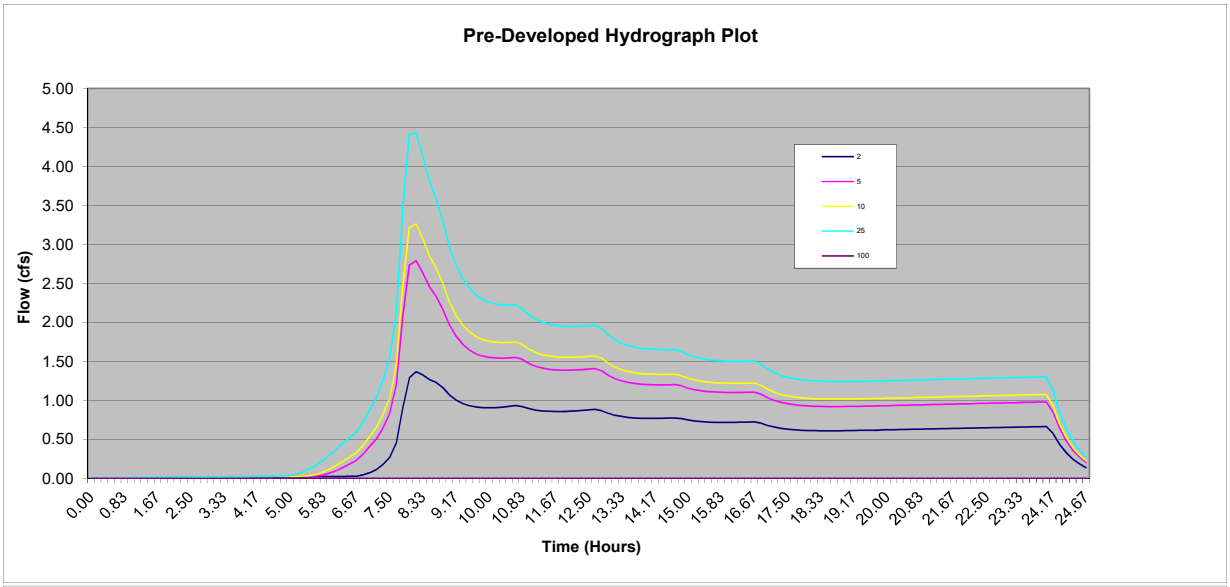
		Pre-Developed Hydrographs					Developed Hydrographs				
Year	========>	2	5	10	25	100	2	5	10	25	100
Qpeak	cfs =>	1.37	2.79	3.26	4.43	0.00	6.36	9.32	10.25	12.47	0.00
Volume	cf =>	47,386	78,180	88,143	112,398	-	92,187	130,544	142,450	170,774	-
Tpeak	min =>	490	490	490	490	10	470	470	470	470	10
Tpeak	hr =>	8.17	8.17	8.17	8.17	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 (min)	Time (hr)	Hyd (cfs)	Hyd (cfs)	Hyd (cfs)	Hyd (cfs)	Hyd (cfs)	Hyd (cfs)	Hyd (cfs)	Hyd (cfs)	Hyd (cfs)	Hyd (cfs)
0	0.00	0.00	0.00	0.00	0.00	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	0.00	0.00	0.00	0.00	0.00
20	0.33	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
30	0.50	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.02	0.04	0.00
40	0.67	0.00	0.00	0.00	0.00	0.00	0.02	0.06	0.08	0.13	0.00
50	0.83	0.00	0.00	0.00	0.00	0.00	0.05	0.13	0.15	0.21	0.00
60	1.00	0.00	0.00	0.00	0.00	0.00	0.09	0.18	0.21	0.28	0.00
70	1.17	0.00	0.00	0.00	0.00	0.00	0.13	0.22	0.25	0.33	0.00
80	1.33	0.00	0.00	0.00	0.01	0.00	0.16	0.26	0.29	0.37	0.00
90	1.50	0.00	0.01	0.01	0.01	0.00	0.18	0.29	0.32	0.40	0.00
100	1.67	0.00	0.01	0.01	0.01	0.00	0.20	0.31	0.35	0.43	0.00
110	1.83	0.00	0.01	0.01	0.01	0.00	0.25	0.38	0.42	0.51	0.00
120	2.00	0.01	0.01	0.01	0.01	0.00	0.30	0.45	0.49	0.60	0.00
130	2.17	0.01	0.01	0.01	0.01	0.00	0.32	0.47	0.51	0.62	0.00
140	2.33	0.01	0.01	0.01	0.01	0.00	0.34	0.49	0.53	0.64	0.00
150	2.50	0.01	0.01	0.01	0.01	0.00	0.35	0.50	0.55	0.66	0.00
160	2.67	0.01	0.01	0.01	0.02	0.00	0.37	0.52	0.56	0.67	0.00
170	2.83	0.01	0.01	0.01	0.02	0.00	0.42	0.58	0.63	0.75	0.00
180	3.00	0.01	0.01	0.02	0.02	0.00	0.47	0.65	0.71	0.83	0.00
190	3.17	0.01	0.02	0.02	0.02	0.00	0.48	0.66	0.72	0.85	0.00
200	3.33	0.01	0.02	0.02	0.02	0.00	0.49	0.67	0.73	0.86	0.00
210	3.50	0.01	0.02	0.02	0.02	0.00	0.50	0.68	0.74	0.86	0.00
220	3.67	0.01	0.02	0.02	0.02	0.00	0.51	0.69	0.75	0.87	0.00
230	3.83	0.01	0.02	0.02	0.02	0.00	0.56	0.76	0.82	0.95	0.00
240	4.00	0.01	0.02	0.02	0.02	0.00	0.61	0.82	0.89	1.03	0.00
250	4.17	0.01	0.02	0.02	0.03	0.00	0.62	0.83	0.89	1.04	0.00
260	4.33	0.02	0.02	0.02	0.03	0.00	0.63	0.84	0.90	1.05	0.00
270	4.50	0.02	0.02	0.02	0.03	0.00	0.63	0.84	0.91	1.09	0.00
280	4.67	0.02	0.02	0.02	0.03	0.00	0.64	0.85	0.91	1.13	0.00
290	4.83	0.02	0.02	0.02	0.03	0.00	0.70	0.93	1.01	1.28	0.00
300	5.00	0.02	0.02	0.03	0.03	0.00	0.76	1.01	1.13	1.43	0.00
310	5.17	0.02	0.02	0.03	0.05	0.00	0.76	1.05	1.17	1.48	0.00
320	5.33	0.02	0.03	0.03	0.08	0.00	0.77	1.08	1.21	1.53	0.00
330	5.50	0.02	0.03	0.03	0.12	0.00	0.77	1.12	1.26	1.58	0.00
340	5.67	0.02	0.03	0.05	0.17	0.00	0.78	1.16	1.29	1.62	0.00
350	5.83	0.02	0.04	0.08	0.23	0.00	0.84	1.29	1.44	1.80	0.00
360	6.00	0.02	0.07	0.12	0.30	0.00	0.93	1.43	1.59	1.99	0.00
370	6.17	0.02	0.10	0.17	0.37	0.00	0.96	1.47	1.64	2.04	0.00
380	6.33	0.02	0.14	0.22	0.45	0.00	0.99	1.52	1.69	2.10	0.00
390	6.50	0.02	0.18	0.27	0.52	0.00	1.02	1.56	1.73	2.15	0.00
400	6.67	0.03	0.23	0.33	0.59	0.00	1.05	1.60	1.77	2.19	0.00
410	6.83	0.04	0.31	0.42	0.71	0.00	1.30	1.97	2.18	2.70	0.00
420	7.00	0.07	0.40	0.54	0.88	0.00	1.56	2.36	2.61	3.22	0.00
430	7.17	0.11	0.50	0.65	1.03	0.00	1.62	2.43	2.68	3.30	0.00
440	7.33	0.18	0.65	0.82	1.25	0.00	1.97	2.94	3.25	3.99	0.00
450	7.50	0.27	0.83	1.03	1.54	0.00	2.34	3.48	3.84	4.71	0.00
460	7.67	0.45	1.20	1.46	2.11	0.00	3.55	5.24	5.78	7.06	0.00
470	7.83	0.90	2.06	2.45	3.43	0.00	6.36	9.32	10.25	12.47	0.00
480	8.00	1.29	2.73	3.22	4.42	0.00	6.12	8.91	9.78	11.86	0.00
490	8.17	1.37	2.79	3.26	4.43	0.00	3.55	5.14	5.64	6.81	0.00
500	8.33	1.33	2.64	3.07	4.13	0.00	2.54	3.66	4.00	4.83	0.00
510	8.50	1.27	2.46	2.85	3.81	0.00	2.20	3.16	3.46	4.17	0.00

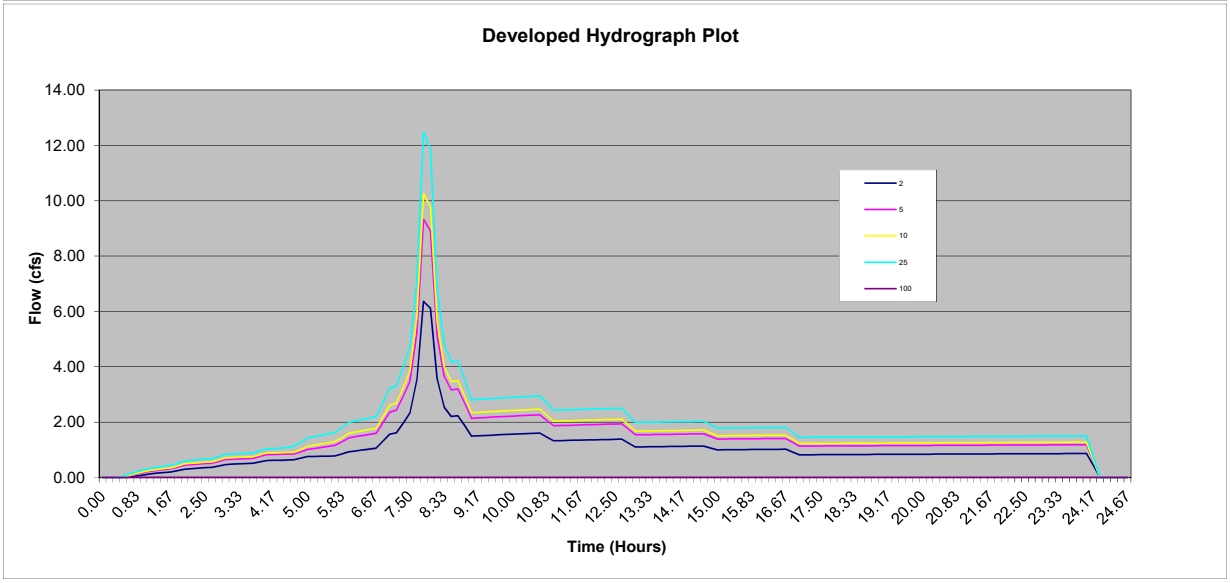
		Pre-Developed Hydrographs					Developed Hydrographs				
Year ========>		2	5	10	25	100	2	5	10	25	100
Qpeak cfs =>		1.37	2.79	3.26	4.43	0.00	6.36	9.32	10.25	12.47	0.00
Volume cf =>		47,386	78,180	88,143	112,398	-	92,187	130,544	142,450	170,774	-
Tpeak min =>		490	490	490	490	10	470	470	470	470	10
Tpeak hr =>		8.17	8.17	8.17	8.17	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 (min)	Time (hr)	Hyd (cfs)	Hyd (cfs)	Hyd (cfs)	Hyd (cfs)	Hyd (cfs)	Hyd (cfs)	Hyd (cfs)	Hyd (cfs)	Hyd (cfs)	Hyd (cfs)
520	8.67	1.23	2.34	2.70	3.59	0.00	2.23	3.20	3.50	4.21	0.00
530	8.83	1.17	2.18	2.50	3.31	0.00	1.87	2.67	2.92	3.52	0.00
540	9.00	1.07	1.97	2.27	2.98	0.00	1.50	2.14	2.34	2.81	0.00
550	9.17	1.01	1.83	2.09	2.74	0.00	1.51	2.15	2.35	2.82	0.00
560	9.33	0.96	1.72	1.97	2.57	0.00	1.52	2.17	2.37	2.84	0.00
570	9.50	0.93	1.65	1.88	2.44	0.00	1.53	2.18	2.38	2.85	0.00
580	9.67	0.91	1.60	1.82	2.35	0.00	1.54	2.19	2.39	2.87	0.00
590	9.83	0.91	1.57	1.78	2.30	0.00	1.55	2.21	2.41	2.88	0.00
600	10.00	0.90	1.55	1.76	2.26	0.00	1.56	2.22	2.42	2.90	0.00
610	10.17	0.91	1.54	1.74	2.23	0.00	1.57	2.23	2.43	2.91	0.00
620	10.33	0.91	1.54	1.74	2.22	0.00	1.58	2.24	2.44	2.92	0.00
630	10.50	0.92	1.54	1.74	2.22	0.00	1.59	2.25	2.46	2.93	0.00
640	10.67	0.93	1.55	1.75	2.22	0.00	1.60	2.27	2.47	2.95	0.00
650	10.83	0.92	1.53	1.72	2.18	0.00	1.47	2.07	2.25	2.69	0.00
660	11.00	0.89	1.47	1.66	2.10	0.00	1.33	1.87	2.04	2.43	0.00
670	11.17	0.87	1.44	1.61	2.04	0.00	1.33	1.88	2.04	2.44	0.00
680	11.33	0.86	1.41	1.59	2.00	0.00	1.34	1.88	2.05	2.44	0.00
690	11.50	0.86	1.40	1.57	1.98	0.00	1.34	1.89	2.06	2.45	0.00
700	11.67	0.86	1.39	1.56	1.96	0.00	1.35	1.90	2.07	2.46	0.00
710	11.83	0.86	1.39	1.55	1.95	0.00	1.36	1.90	2.07	2.47	0.00
720	12.00	0.86	1.39	1.55	1.95	0.00	1.36	1.91	2.08	2.47	0.00
730	12.17	0.86	1.39	1.55	1.95	0.00	1.37	1.92	2.09	2.48	0.00
740	12.33	0.87	1.39	1.56	1.95	0.00	1.37	1.92	2.09	2.49	0.00
750	12.50	0.88	1.40	1.56	1.96	0.00	1.38	1.93	2.10	2.49	0.00
760	12.67	0.88	1.41	1.57	1.96	0.00	1.38	1.94	2.10	2.50	0.00
770	12.83	0.87	1.38	1.54	1.92	0.00	1.24	1.74	1.89	2.25	0.00
780	13.00	0.83	1.32	1.47	1.84	0.00	1.10	1.54	1.68	1.99	0.00
790	13.17	0.81	1.28	1.43	1.78	0.00	1.11	1.55	1.68	1.99	0.00
800	13.33	0.79	1.25	1.39	1.73	0.00	1.11	1.55	1.68	2.00	0.00
810	13.50	0.78	1.23	1.37	1.70	0.00	1.11	1.55	1.69	2.00	0.00
820	13.67	0.77	1.21	1.35	1.68	0.00	1.12	1.56	1.69	2.00	0.00
830	13.83	0.77	1.21	1.34	1.67	0.00	1.12	1.56	1.69	2.01	0.00
840	14.00	0.77	1.20	1.34	1.66	0.00	1.12	1.56	1.70	2.01	0.00
850	14.17	0.77	1.20	1.33	1.65	0.00	1.13	1.57	1.70	2.02	0.00
860	14.33	0.77	1.20	1.33	1.65	0.00	1.13	1.57	1.70	2.02	0.00
870	14.50	0.77	1.20	1.33	1.65	0.00	1.13	1.57	1.71	2.02	0.00
880	14.67	0.77	1.20	1.33	1.65	0.00	1.13	1.58	1.71	2.03	0.00
890	14.83	0.76	1.19	1.32	1.63	0.00	1.07	1.48	1.61	1.91	0.00
900	15.00	0.75	1.16	1.28	1.59	0.00	1.00	1.39	1.51	1.78	0.00
910	15.17	0.73	1.14	1.26	1.56	0.00	1.00	1.39	1.51	1.79	0.00
920	15.33	0.73	1.12	1.24	1.53	0.00	1.00	1.39	1.51	1.79	0.00
930	15.50	0.72	1.11	1.23	1.52	0.00	1.01	1.40	1.51	1.79	0.00
940	15.67	0.72	1.11	1.23	1.51	0.00	1.01	1.40	1.52	1.79	0.00
950	15.83	0.72	1.10	1.22	1.50	0.00	1.01	1.40	1.52	1.80	0.00
960	16.00	0.72	1.10	1.22	1.50	0.00	1.01	1.40	1.52	1.80	0.00
970	16.17	0.72	1.10	1.22	1.50	0.00	1.01	1.40	1.52	1.80	0.00
980	16.33	0.72	1.10	1.22	1.50	0.00	1.02	1.41	1.53	1.80	0.00
990	16.50	0.72	1.10	1.22	1.50	0.00	1.02	1.41	1.53	1.81	0.00
1000	16.67	0.72	1.10	1.22	1.50	0.00	1.02	1.41	1.53	1.81	0.00
1010	16.83	0.71	1.08	1.19	1.47	0.00	0.92	1.27	1.38	1.63	0.00
1020	17.00	0.68	1.03	1.14	1.40	0.00	0.82	1.13	1.23	1.45	0.00
1030	17.17	0.66	1.00	1.10	1.35	0.00	0.82	1.13	1.23	1.45	0.00
1040	17.33	0.64	0.97	1.08	1.32	0.00	0.82	1.14	1.23	1.45	0.00
1050	17.50	0.63	0.96	1.06	1.29	0.00	0.82	1.14	1.23	1.45	0.00
1060	17.67	0.62	0.94	1.04	1.28	0.00	0.82	1.14	1.23	1.46	0.00
1070	17.83	0.62	0.93	1.03	1.26	0.00	0.83	1.14	1.23	1.46	0.00
1080	18.00	0.61	0.93	1.02	1.25	0.00	0.83	1.14	1.24	1.46	0.00
1090	18.17	0.61	0.92	1.02	1.25	0.00	0.83	1.14	1.24	1.46	0.00
1100	18.33	0.61	0.92	1.02	1.24	0.00	0.83	1.14	1.24	1.46	0.00
1110	18.50	0.61	0.92	1.02	1.24	0.00	0.83	1.14	1.24	1.46	0.00
1120	18.67	0.61	0.92	1.01	1.24	0.00	0.83	1.15	1.24	1.46	0.00
1130	18.83	0.61	0.92	1.01	1.24	0.00	0.83	1.15	1.24	1.46	0.00
1140	19.00	0.61	0.92	1.02	1.24	0.00	0.83	1.15	1.24	1.47	0.00
1150	19.17	0.61	0.92	1.02	1.24	0.00	0.84	1.15	1.24	1.47	0.00
1160	19.33	0.61	0.92	1.02	1.24	0.00	0.84	1.15	1.25	1.47	0.00
1170	19.50	0.61	0.92	1.02	1.24	0.00	0.84	1.15	1.25	1.47	0.00
1180	19.67	0.62	0.93	1.02	1.25	0.00	0.84	1.15	1.25	1.47	0.00
1190	19.83	0.62	0.93	1.02	1.25	0.00	0.84	1.15	1.25	1.47	0.00
1200	20.00	0.62	0.93	1.03	1.25	0.00	0.84	1.16	1.25	1.47	0.00
1210	20.17	0.62	0.93	1.03	1.25	0.00	0.84	1.16	1.25	1.47	0.00

		Pre-Developed Hydrographs					Developed Hydrographs				
Year ========>		2	5	10	25	100	2	5	10	25	100
Qpeak	cfs =>	1.37	2.79	3.26	4.43	0.00	6.36	9.32	10.25	12.47	0.00
Volume	cf =>	47,386	78,180	88,143	112,398	-	92,187	130,544	142,450	170,774	-
Tpeak	min =>	490	490	490	490	10	470	470	470	470	10
Tpeak	hr =>	8.17	8.17	8.17	8.17	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 (min)	Time (hr)	Hyd (cfs)	Hyd (cfs)	Hyd (cfs)	Hyd (cfs)	Hyd (cfs)	Hyd (cfs)	Hyd (cfs)	Hyd (cfs)	Hyd (cfs)	Hyd (cfs)
1220	20.33	0.62	0.93	1.03	1.25	0.00	0.84	1.16	1.25	1.48	0.00
1230	20.50	0.63	0.94	1.03	1.26	0.00	0.84	1.16	1.25	1.48	0.00
1240	20.67	0.63	0.94	1.03	1.26	0.00	0.85	1.16	1.26	1.48	0.00
1250	20.83	0.63	0.94	1.04	1.26	0.00	0.85	1.16	1.26	1.48	0.00
1260	21.00	0.63	0.94	1.04	1.26	0.00	0.85	1.16	1.26	1.48	0.00
1270	21.17	0.63	0.94	1.04	1.26	0.00	0.85	1.16	1.26	1.48	0.00
1280	21.33	0.63	0.95	1.04	1.27	0.00	0.85	1.17	1.26	1.48	0.00
1290	21.50	0.64	0.95	1.04	1.27	0.00	0.85	1.17	1.26	1.48	0.00
1300	21.67	0.64	0.95	1.05	1.27	0.00	0.85	1.17	1.26	1.49	0.00
1310	21.83	0.64	0.95	1.05	1.27	0.00	0.85	1.17	1.26	1.49	0.00
1320	22.00	0.64	0.95	1.05	1.28	0.00	0.85	1.17	1.26	1.49	0.00
1330	22.17	0.64	0.96	1.05	1.28	0.00	0.85	1.17	1.27	1.49	0.00
1340	22.33	0.65	0.96	1.05	1.28	0.00	0.86	1.17	1.27	1.49	0.00
1350	22.50	0.65	0.96	1.06	1.28	0.00	0.86	1.17	1.27	1.49	0.00
1360	22.67	0.65	0.96	1.06	1.28	0.00	0.86	1.17	1.27	1.49	0.00
1370	22.83	0.65	0.96	1.06	1.29	0.00	0.86	1.17	1.27	1.49	0.00
1380	23.00	0.65	0.97	1.06	1.29	0.00	0.86	1.18	1.27	1.49	0.00
1390	23.17	0.65	0.97	1.06	1.29	0.00	0.86	1.18	1.27	1.50	0.00
1400	23.33	0.66	0.97	1.07	1.29	0.00	0.86	1.18	1.27	1.50	0.00
1410	23.50	0.66	0.97	1.07	1.29	0.00	0.86	1.18	1.27	1.50	0.00
1420	23.67	0.66	0.97	1.07	1.30	0.00	0.86	1.18	1.28	1.50	0.00
1430	23.83	0.66	0.98	1.07	1.30	0.00	0.86	1.18	1.28	1.50	0.00
1440	24.00	0.66	0.98	1.07	1.30	0.00	0.87	1.18	1.28	1.50	0.00
1450	24.17	0.58	0.86	0.94	1.14	0.00	0.43	0.59	0.64	0.75	0.00
1460	24.33	0.44	0.64	0.71	0.85	0.00	0.00	0.00	0.00	0.00	0.00
1470	24.50	0.33	0.48	0.53	0.64	0.00	0.00	0.00	0.00	0.00	0.00
1480	24.67	0.25	0.36	0.40	0.48	0.00	0.00	0.00	0.00	0.00	0.00
1490	24.67	0.18	0.27	0.30	0.36	0.00	0.00	0.00	0.00	0.00	0.00
1500	24.67	0.14	0.20	0.22	0.27	0.00	0.00	0.00	0.00	0.00	0.00

		Pre-Developed Hydrographs				
Year	=======>	2	5	10	25	100
Qpeak	cfs =>	1.37	2.79	3.26	4.43	0.00
Volume	cf =>	47,386	78,180	88,143	112,398	-
Tpeak	min =>	490	490	490	490	10
Tpeak	hr =>	8.17	8.17	8.17	8.17	0.17
Hydrograph Name=>		2	5	10	25	100
Time (min)	Time (hr)	Hyd (cfs)	Hyd (cfs)	Hyd (cfs)	Hyd (cfs)	Hyd (cfs)

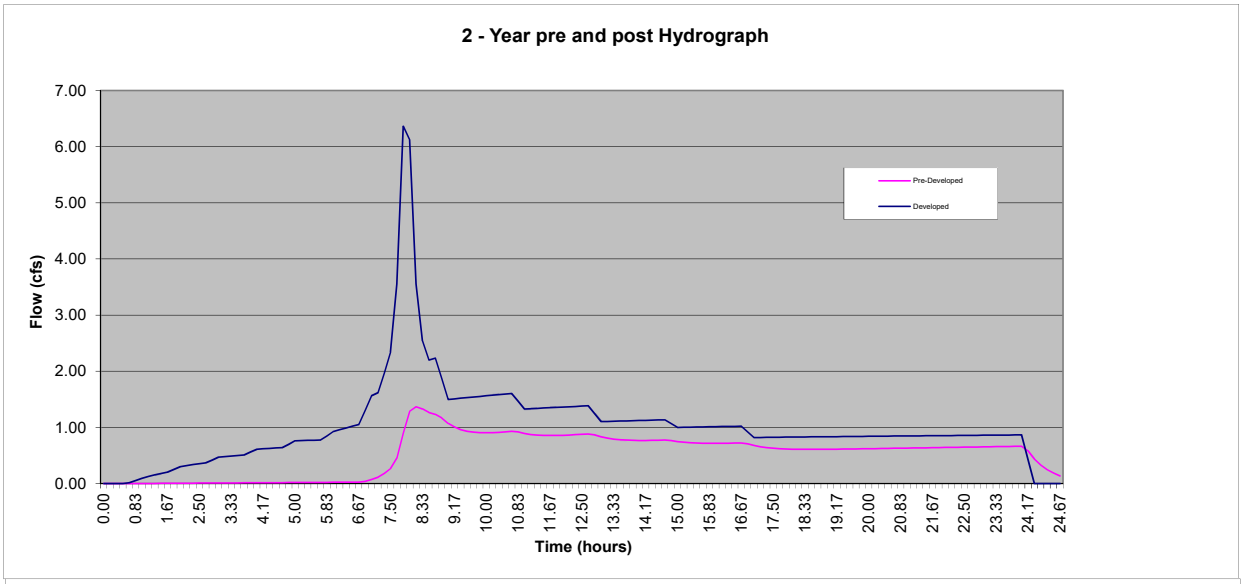
Developed Hydrographs				
2	5	10	25	100
6.36	9.32	10.25	12.47	0.00
92,187	130,544	142,450	170,774	-
470	470	470	470	10
7.83	7.83	7.83	7.83	0.17
2	5	10	25	100
Hyd (cfs)	Hyd (cfs)	Hyd (cfs)	Hyd (cfs)	Hyd (cfs)

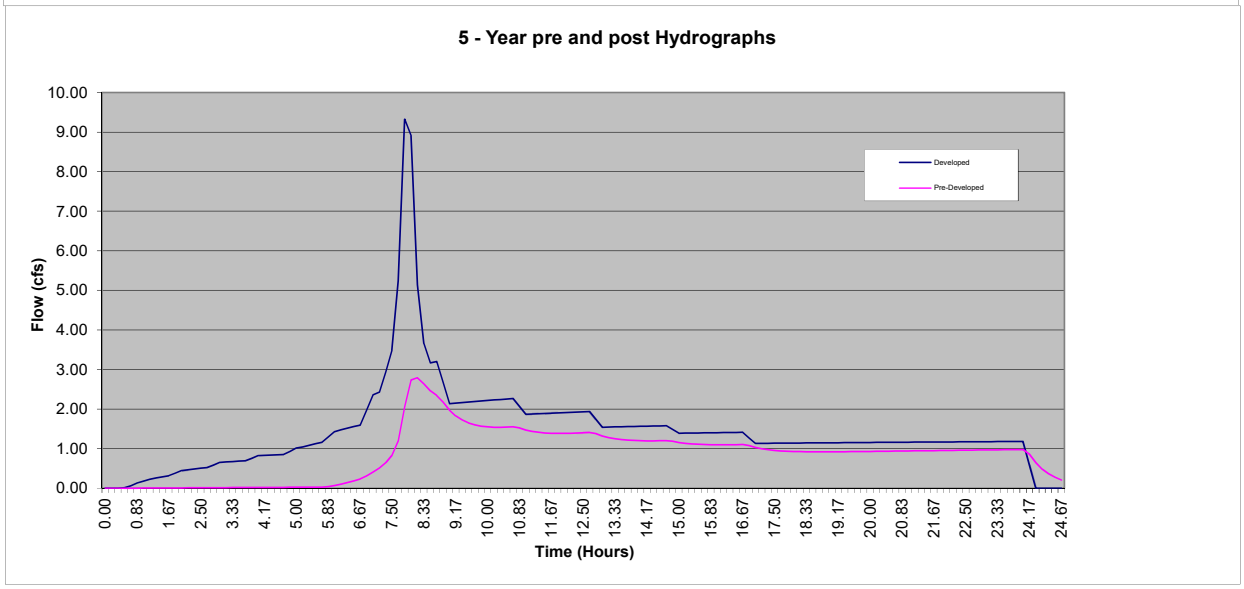




Pre-Developed Hydrographs						
Year	========>	2	5	10	25	100
Qpeak	cfs =>	1.37	2.79	3.26	4.43	0.00
Volume	cf =>	47,386	78,180	88,143	112,398	-
Tpeak	min =>	490	490	490	490	10
Tpeak	hr =>	8.17	8.17	8.17	8.17	0.17
Hydrograph Name=>		2	5	10	25	100
Time	Time	Hyd	Hyd	Hyd	Hyd	Hyd
(min)	(hr)	(cfs)	(cfs)	(cfs)	(cfs)	(cfs)

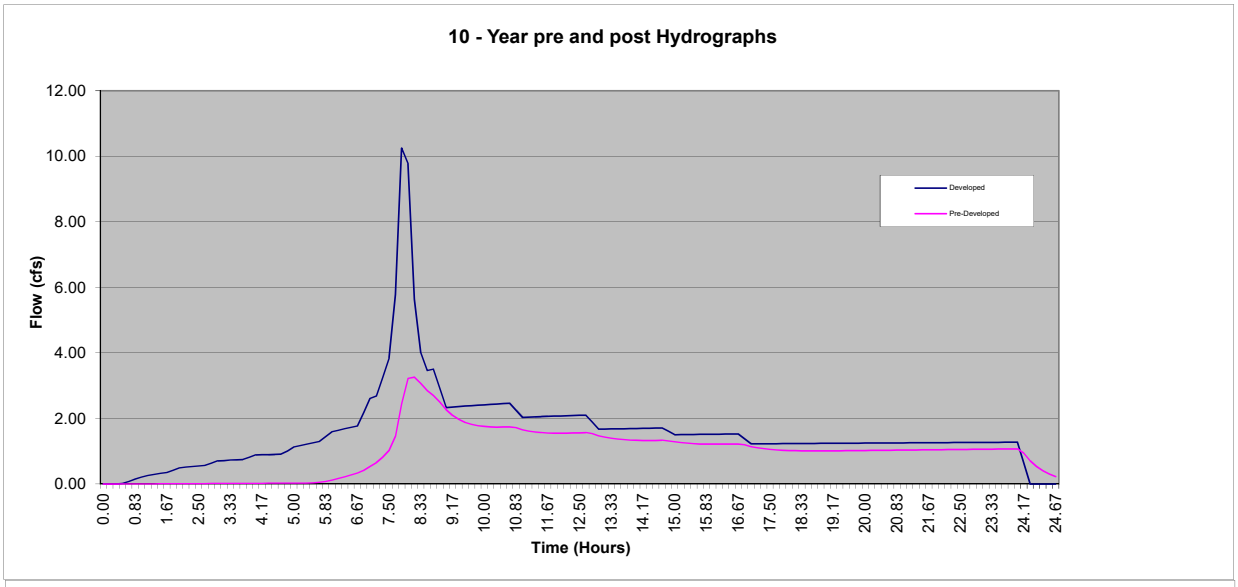
Developed Hydrographs				
2	5	10	25	100
6.36	9.32	10.25	12.47	0.00
92,187	130,544	142,450	170,774	-
470	470	470	470	10
7.83	7.83	7.83	7.83	0.17
2	5	10	25	100
Hyd	Hyd	Hyd	Hyd	Hyd
(cfs)	(cfs)	(cfs)	(cfs)	(cfs)

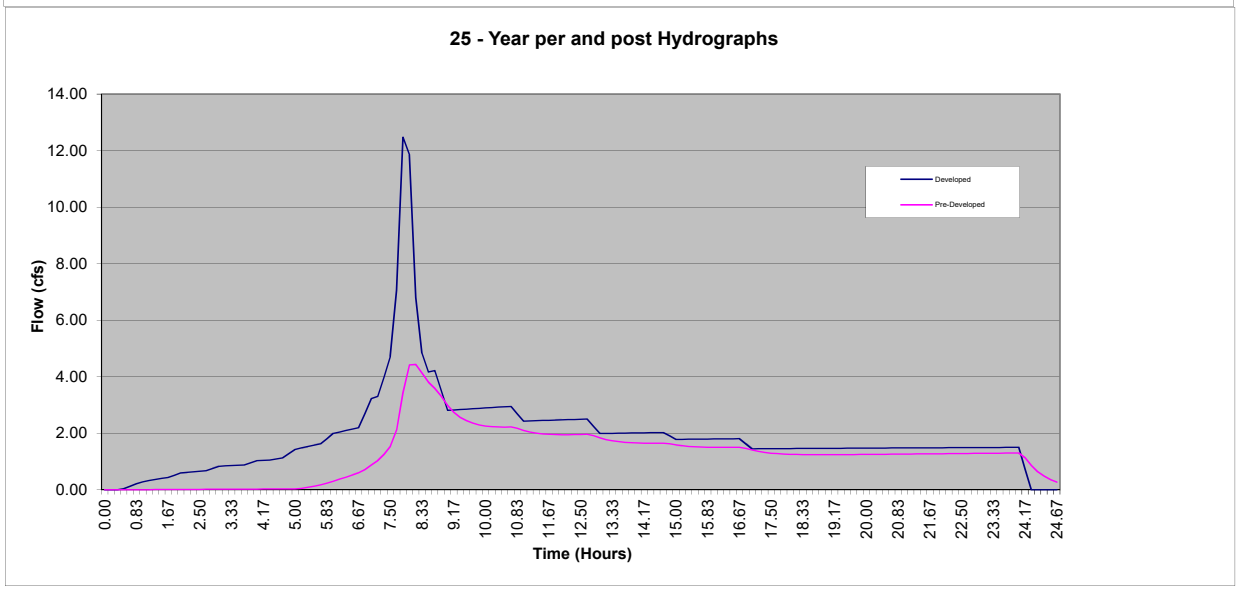




		Pre-Developed Hydrographs				
Year	=======>	2	5	10	25	100
Qpeak	cfs =>	1.37	2.79	3.26	4.43	0.00
Volume	cf =>	47,386	78,180	88,143	112,398	-
Tpeak	min =>	490	490	490	490	10
Tpeak	hr =>	8.17	8.17	8.17	8.17	0.17
Hydrograph Name=>		2	5	10	25	100
Time (min)	Time (hr)	Hyd (cfs)	Hyd (cfs)	Hyd (cfs)	Hyd (cfs)	Hyd (cfs)

Developed Hydrographs				
2	5	10	25	100
6.36	9.32	10.25	12.47	0.00
92,187	130,544	142,450	170,774	-
470	470	470	470	10
7.83	7.83	7.83	7.83	0.17
2	5	10	25	100
Hyd (cfs)	Hyd (cfs)	Hyd (cfs)	Hyd (cfs)	Hyd (cfs)





Project Name:	The Bornstedt Views - Basin 1 Pond
Detention System Summary	
Job #	19-268
Date:	7/26/2021

Note: The detention system design is based on the King County Model "Facility Design Routine".

1) Detention Facility Design Input:

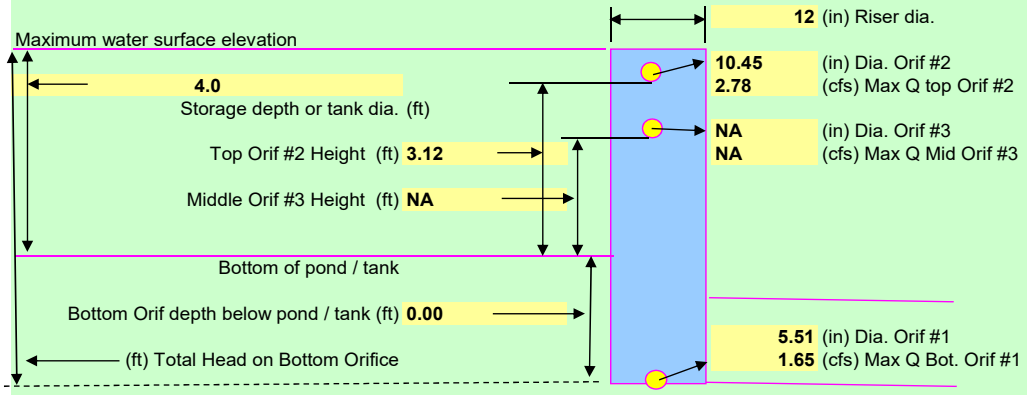
2) Type of facility:		USER	
3) Pond side slopes:	3	NA in USER mode	
4) Pond storage depth:	**4**	**ft (from bottom of pond to overflow)**	
5) Vertical permeability	0	min/in	
6) Number of orifices:	2		
7) Riser dia. =>	12	in	
8) Orifice coefficient	0.62	(typically 0.62)	
9) IE - bottom orifice:	0	ft (distance below bottom of pond - Negative #)	
10) Max Q Bottom Orif. #1	1.65	cfs	
11) Top Orif #2 Height =	3.12	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	12.47	4.43	**4.37**	3.97	35,495
10	10.25	3.26	**3.24**	3.45	29,864
5	9.32	2.79	**2.72**	3.29	28,094
2	6.36	1.37	**1.33**	2.59	20,949
			Required Storage ====		35,495

	Bottom Orif.	Middle Orif.	Top Orif.	Optional Weir Design
Total Q =	1.65	0.00	2.78	(for top orifice)
Head (ft) =	4.00	0.00	0.88	1.35 La (ft)
Dist. from bottom of pond (ft) =	0.00	NA	3.12	154.38 < deg.
Orif. Dia. (in) =	5.51	0.00	10.45	Weir is an option

FLOW CONTROL STRUCTURE SCHEMATIC



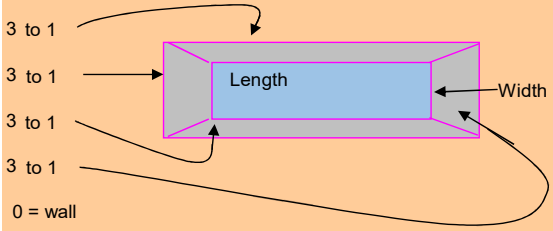
Project Name:	The Bornstedt Views - Basin 1 Pond
Detention Facility Type	
Job #	19-268
Date:	7/26/2021

Detention Facility Type:

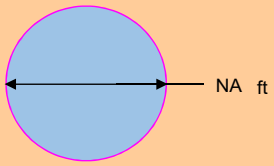
USER

L =	**NA ft**
W =	**NA ft**
D =	**4.0 ft**
Pond Area =	**NA sf**

DETENTION POND
NA



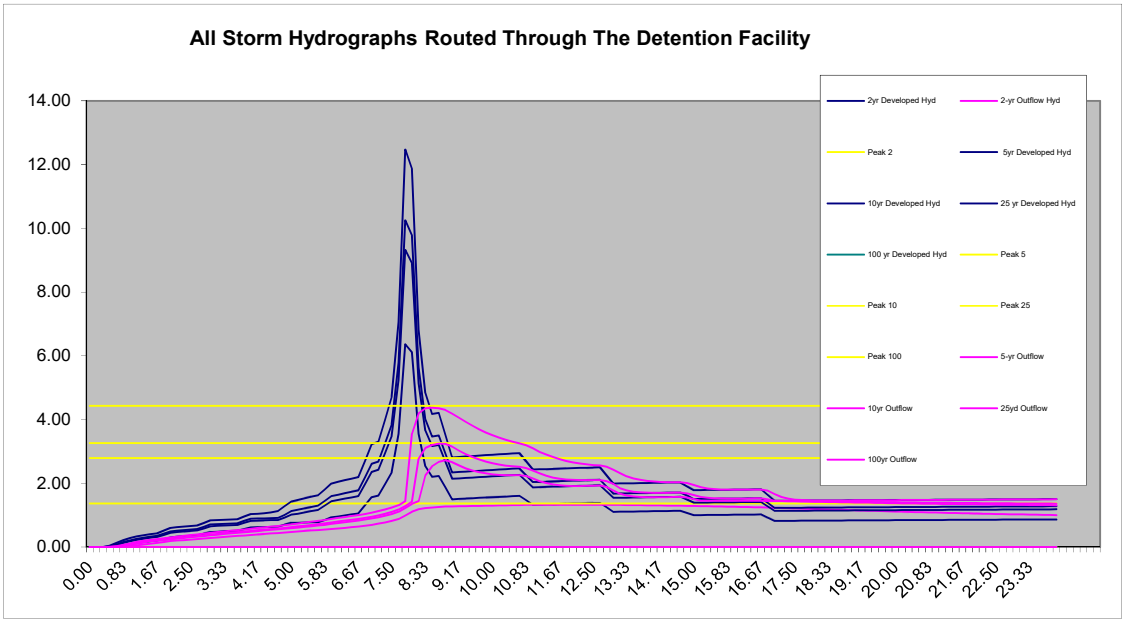
DETENTION TANK
NA

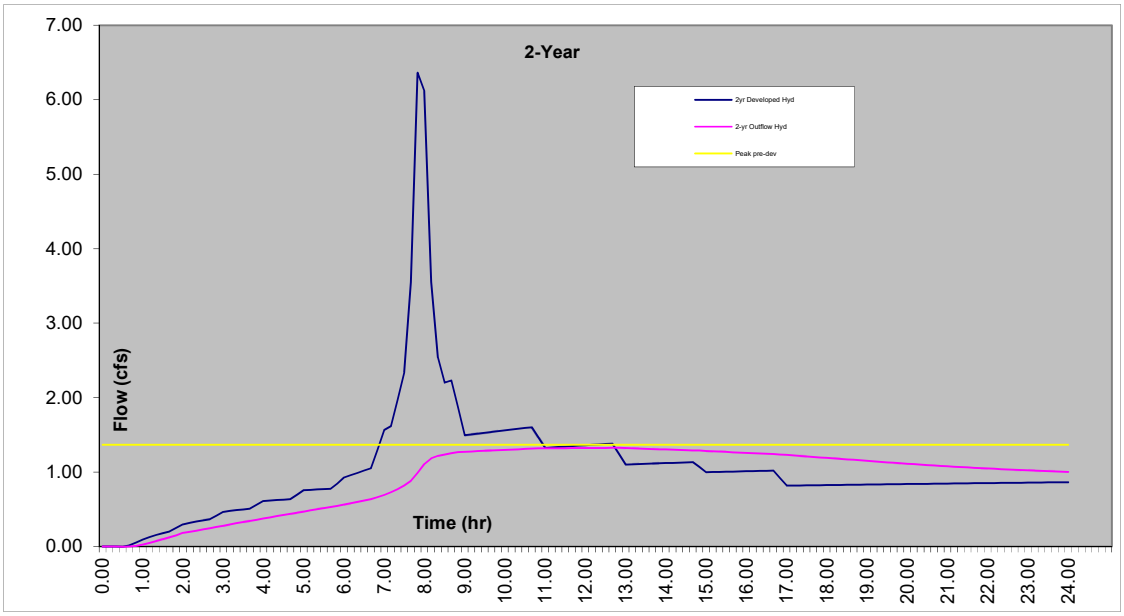


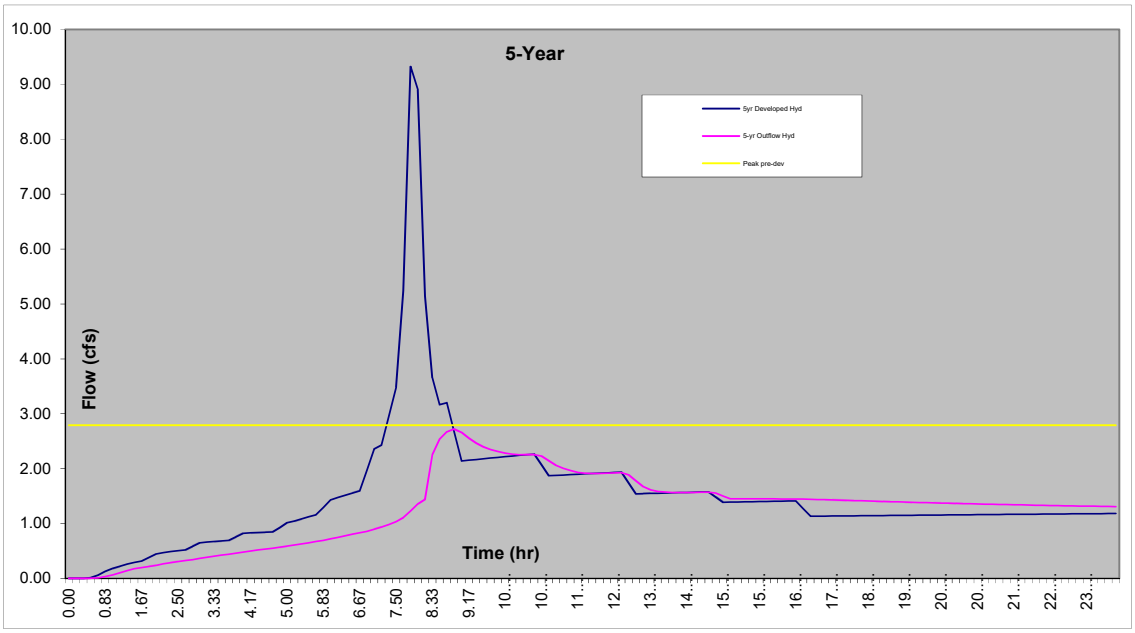
USER DEFINED POND

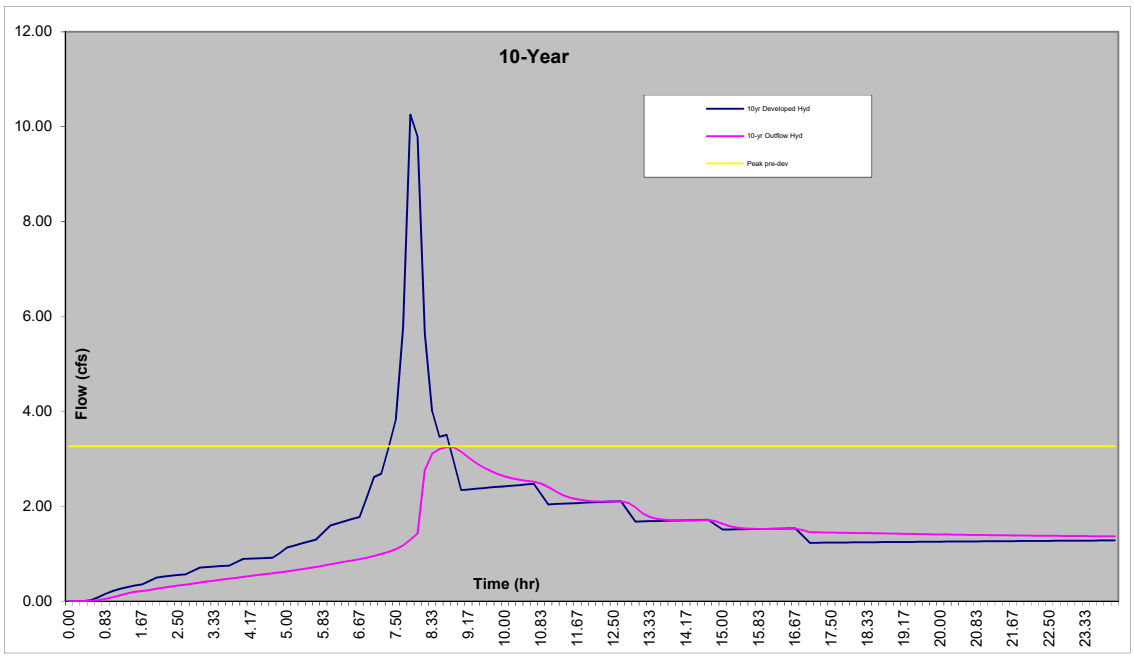
Pond Geometry

Stage (ft)	Area (sf)
0	6,464
1	7,645
2	8,904
3	10,242
4	11,656
5	12,317
6	13,000
7	14,000
8	15,000
9	16,000
10	17,000
11	18,000
12	18,000
13	18,000
14	18,000
15	18,000


All Storm Hydrographs Routed Through The Detention Facility
14.00
12.00
10.00
8.00
6.00
4.00
2.00
0.00
0.00
0.83
1.67
2.50
3.33
4.17
5.00
5.83
6.67
7.50
8.33
9.17
10.00
10.83
11.67
12.50
13.33
14.17
15.00
15.83
16.67
17.50
18.33
19.17
20.00
20.83
21.67
22.50
23.33
2yr Developed Hyd
2-yr Outflow Hyd
Peak 2
5yr Developed Hyd
10yr Developed Hyd
25 yr Developed Hyd
100 yr Developed Hyd
Peak 5
Peak 10
Peak 25
Peak 100
5-yr Outflow
10yr Outflow
25yd Outflow
100yr Outflow


2-Year
7.00
6.00
5.00
4.00
3.00
2.00
1.00
0.00
Flow (cfs)
Time (hr)
0.00
1.00
2.00
3.00
4.00
5.00
6.00
7.00
8.00
9.00
10.00
11.00
12.00
13.00
14.00
15.00
16.00
17.00
18.00
19.00
20.00
21.00
22.00
23.00
24.00
2yr Developed Hyd
2-yr Outflow Hyd
Peak pre-dev


5-Year
5yr Developed Hyd
5-yr Outflow Hyd
Peak pre-dev
Flow (cfs)
Time (hr)
10.00
9.00
8.00
7.00
6.00
5.00
4.00
3.00
2.00
1.00
0.00
0.00
0.83
1.67
2.50
3.33
4.17
5.00
5.83
6.67
7.50
8.33
9.17
10...
10...
11...
12...
13...
14...
15...
15...
16...
17...
18...
19...
20...
20...
21...
22...
23...


10-Year
10yr Developed Hyd
10-yr Outflow Hyd
Peak pre-dev
Flow (cfs)
Time (hr)
12.00
10.00
8.00
6.00
4.00
2.00
0.00
0.00
0.83
1.67
2.50
3.33
4.17
5.00
5.83
6.67
7.50
8.33
9.17
10.00
10.83
11.67
12.50
13.33
14.17
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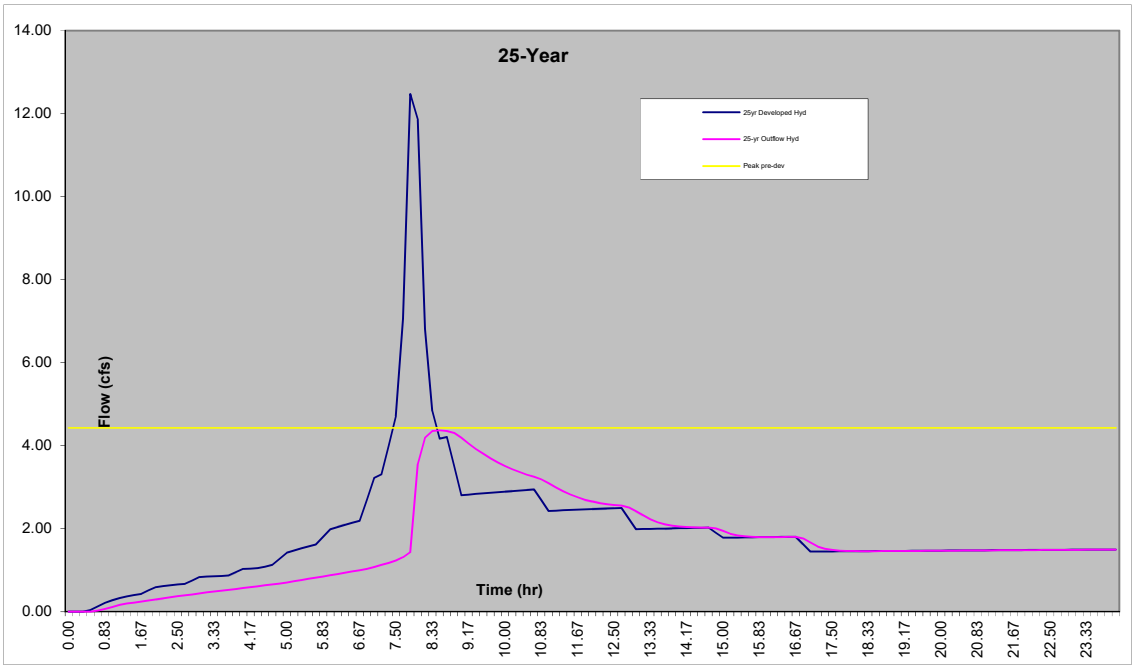
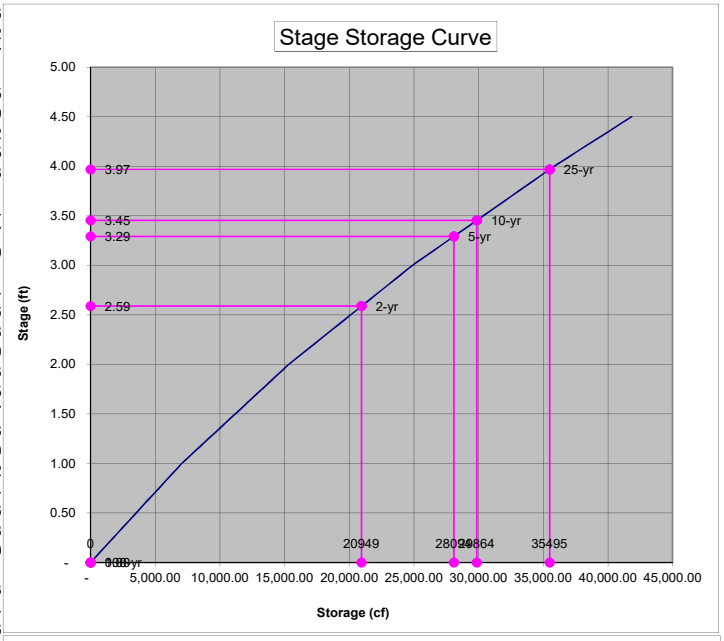
19.17
20.00
20.83
21.67
22.50
23.33

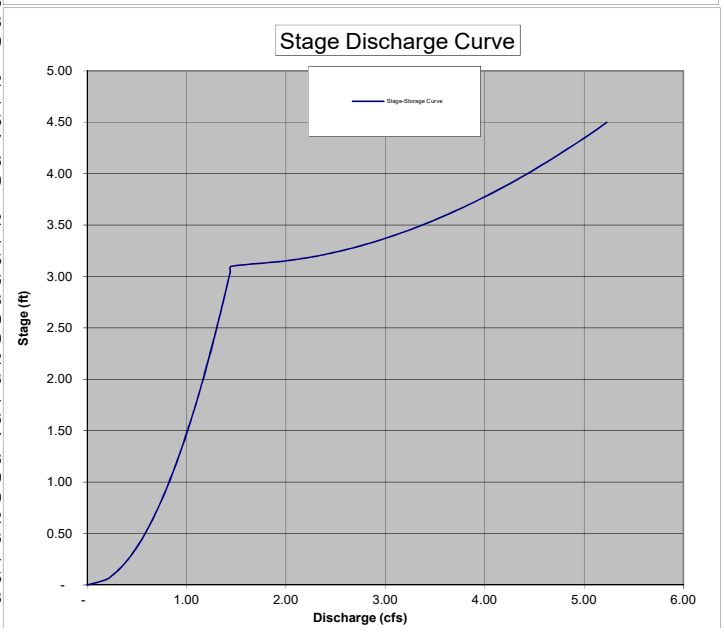

25-Year
25yr Developed Hyd
25-yr Outflow Hyd
Peak pre-dev
Flow (cfs)
Time (hr)
14.00
12.00
10.00
8.00
6.00
4.00
2.00
0.00
0.00
0.83
1.67
2.50
3.33
4.17
5.00
5.83
6.67
7.50
8.33
9.17
10.00
10.83
11.67
12.50
13.33
14.17
15.00
15.83
16.67
17.50
18.33
19.17
20.00
20.83
21.67
22.50
23.33

Project Name: The Bornstedt Views - Basin 1 Pond
Stage Storage Summary

Job # 19-268
Date: 7/26/2021

Stage ft	Storage cf	Discharge cfs
-	-	-
0.05	352.73	0.18
0.10	705.45	0.26
0.15	1,058.18	0.32
0.20	1,410.90	0.37
0.25	1,763.63	0.41
0.30	2,116.35	0.45
0.35	2,469.08	0.49
0.40	2,821.80	0.52
0.45	3,174.53	0.55
0.50	3,527.25	0.58
0.55	3,879.98	0.61
0.60	4,232.70	0.64
0.65	4,585.43	0.67
0.70	4,938.15	0.69
0.75	5,290.88	0.71
0.80	5,643.60	0.74
0.85	5,996.33	0.76
0.90	6,349.05	0.78
0.95	6,701.78	0.80
1.00	7,054.50	0.83
1.05	7,468.23	0.85
1.10	7,881.95	0.87
1.15	8,295.68	0.88
1.20	8,709.40	0.90
1.25	9,123.13	0.92
1.30	9,536.85	0.94
1.35	9,950.58	0.96
1.40	10,364.30	0.98
1.45	10,778.03	0.99
1.50	11,191.75	1.01
1.55	11,605.48	1.03
1.60	12,019.20	1.04
1.65	12,432.93	1.06
1.70	12,846.65	1.08
1.75	13,260.38	1.09
1.80	13,674.10	1.11
1.85	14,087.83	1.12
1.90	14,501.55	1.14
1.95	14,915.28	1.15
2.00	15,329.00	1.17
2.05	15,807.65	1.18
2.10	16,286.30	1.20
2.15	16,764.95	1.21
2.20	17,243.60	1.22
2.25	17,722.25	1.24
2.30	18,200.90	1.25
2.35	18,679.55	1.26
2.40	19,158.20	1.28
2.45	19,636.85	1.29
2.50	20,115.50	1.30
2.55	20,594.15	1.32
2.60	21,072.80	1.33
2.65	21,551.45	1.34
2.70	22,030.10	1.36
2.75	22,508.75	1.37
2.80	22,987.40	1.38
2.85	23,466.05	1.39
2.90	23,944.70	1.40
2.95	24,423.35	1.42
3.00	24,902.00	1.43
3.05	25,449.45	1.44
3.10	25,996.90	1.45
3.15	26,544.35	1.98
3.20	27,091.80	2.31





Stage ft	Storage cf	Discharge cfs
3.25	27,639.25	2.56
3.30	28,186.70	2.76
3.35	28,734.15	2.93
3.40	29,281.60	3.09
3.45	29,829.05	3.23
3.50	30,376.50	3.37
3.55	30,923.95	3.50
3.60	31,471.40	3.62
3.65	32,018.85	3.73
3.70	32,566.30	3.84
3.75	33,113.75	3.95
3.80	33,661.20	4.05
3.85	34,208.65	4.15
3.90	34,756.10	4.25
3.95	35,303.55	4.34
4.00	35,851.00	4.43
4.05	36,450.33	4.52
4.10	37,049.65	4.60
4.15	37,648.98	4.69
4.20	38,248.30	4.77
4.25	38,847.63	4.85
4.30	39,446.95	4.93
4.35	40,046.28	5.01
4.40	40,645.60	5.08
4.45	41,244.93	5.16
4.50	41,844.25	5.23

Project Name: The Bornstedt Views - Basin 1 Pond
Rectangular, Sharp Crested Weir Calculations

Job # 19-268
Date: 7/26/2021

Weir Equation: $Q = C(L-0.2H)H^{3/2}$

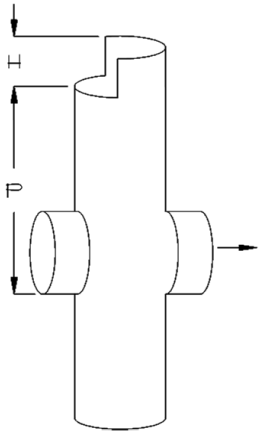
Q	= Flow over weir (cfs)
C	= 3.27 + 0.40 H/P (ft)
L	= Adjusted length of weir (La - 0.1H x 2) this is to account for side constraints
La	= Actual length of weir along pipes interior circumference (ft)
H	= Distance from bottom of weir to maximum head (ft)
P	= Distance from bottom of weir to outfall invert elevation (ft)
D	= Inside riser pipe diameter (in)
<	= Angle of opening for weir (maximum 180 degrees)

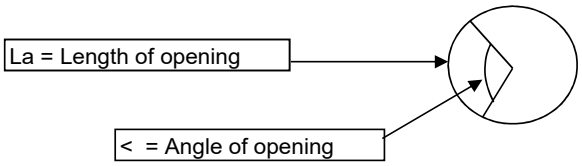
Given:

Q	2.78	cfs
H	0.88	ft
P	3.12	ft
D	12	in

Find:

C	3.38	ft
L	1.17	ft
La	**1.35**	**ft**
<	**154**	**degrees**





Appendix D

Water Quality Manhole Details

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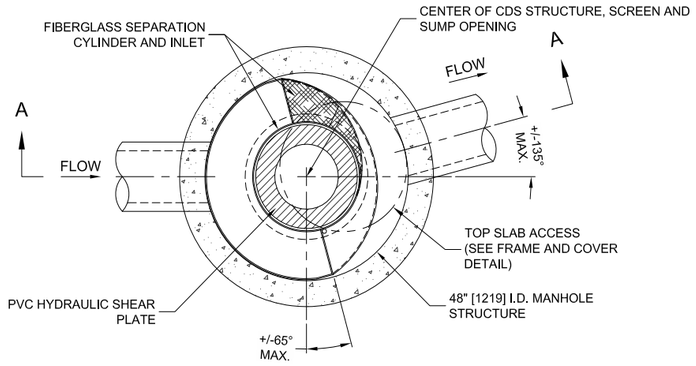
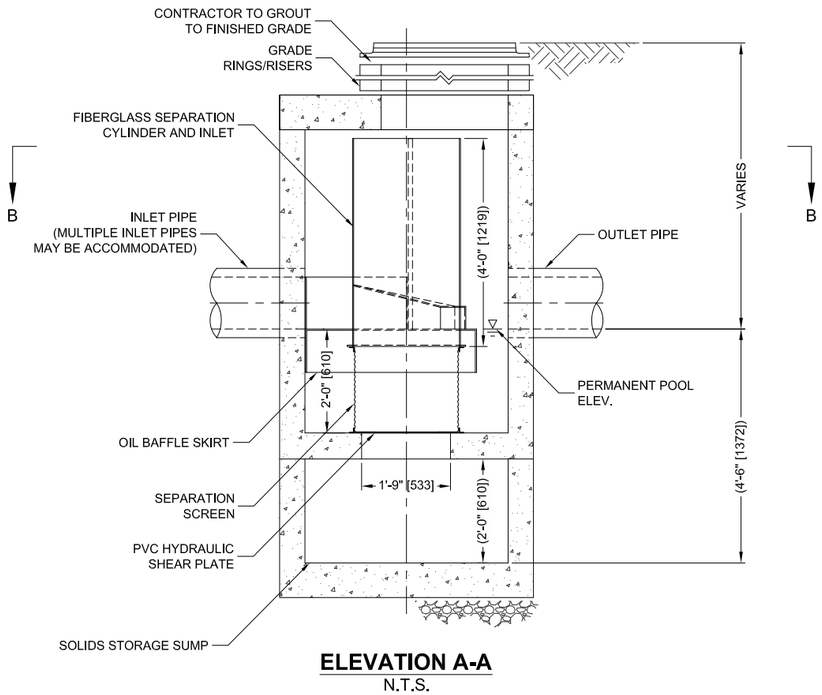


PLAN VIEW B-B
N.T.S.



ELEVATION A-A
N.T.S.

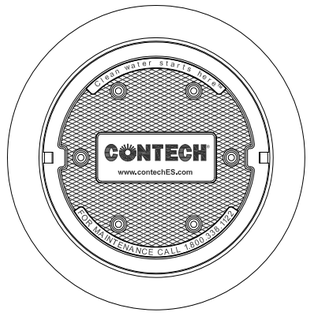
THIS PRODUCT MAY BE PROTECTED BY ONE OR MORE OF THE FOLLOWING U.S. PATENTS: 5,788,848; 6,641,720; 6,511,595; 6,581,782 RELATED FOREIGN PATENTS, OR OTHER PATENTS PENDING.

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



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.

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

EXHIBIT E

ARD ENGINEERING

BORNSTEDT VIEWS
TRAFFIC IMPACT STUDY

SANDY, OREGON

PREPARED FOR:
Mac Even

PREPARED BY:
Michael Ard, PE
Ard Engineering

DATE:
August 5, 2021

21370 SW Langer Farms Parkway, Suite 142, Sherwood, OR 97140 - (503)862-6960

TABLE OF CONTENTS

EXECUTIVE SUMMARY

1. A property located east of SE Bornstedt Road, west of SE Jacoby Road and south of Jerger Street is proposed for development with a 42-lot residential subdivision. The proposed development will take access via a new roadway intersecting SE Bornstedt Road and an extension of Averall Parkway from the north into the site.

2. Upon completion of development, the subject property is projected to generate 31 site trips during the morning peak hour, 42 trips during the evening peak hour, and 396 daily trips.

3. Based on the operational analysis, the intersections of Pioneer Boulevard at Highway 211 and Highway 211 at Bornstedt Road are projected to operate acceptably per ODOT and City of Sandy standards through 2023 either with or without the addition of site trips from the proposed development. The intersection of Highway 211 at Dubarko Road is projected to operate at level of service F during the evening peak hour under year 2023 traffic conditions either with or without the addition of site trips from the proposed development. If the intersection is converted to all-way stop control it is projected to operate at level of service E and with reduced delays for the highest-delay movement as compared to background (no-build) conditions.

4. The local streets in the project vicinity currently carry fewer than 1,000 vehicles per day, in accordance with the requirements of the city's development code. Following completion of the proposed development the local streets are projected to continue to carry fewer than 1,000 daily trips. Accordingly, operation of local streets is projected to meet city standards.

5. Crash data for the most recent five years shows no significant crash trends that may be indicative of design deficiencies for the intersections of Pioneer Boulevard at Highway 211 and Highway 211 at Bornstedt Road. The crash rate for the intersection of Highway 211 at Dubarko Road is in excess of the 90th percentile crash rate for similar intersections in the state of Oregon. Based on the crash data and the all-way stop control warrant analysis, it is recommended that the Dubarko Road intersection be converted to all-way stop control to improve safety in the site vicinity.

6. Based on the warrant analysis, no new traffic signals or turn lanes are recommended in conjunction with the proposed development.

PROJECT DESCRIPTION & LOCATION

INTRODUCTION

A property located east of SE Bornstedt Road, west of SE Jacoby Road and south of Jerger Street is proposed for development with a 42-lot residential subdivision. The proposed development will take access via a new roadway intersecting SE Bornstedt Road and an extension of Averall Parkway from the north into the site.

This report addresses the impacts of the proposed development on the surrounding street system. An operational and safety analysis was conducted for the proposed site access as well as the intersections of:

- Pioneer Boulevard (US 26 Eastbound) at Highway 211;
- Highway 211 at Dubarko Road; and
- Highway 211 at SE Bornstedt Road.

In addition to the intersection analysis, daily traffic volumes were examined for the local streets in the site vicinity that will be impacted by the proposed development. These included Averall Parkway extending north from the site, and Newton Street which provides a connection to Jacoby Road northeast of the subject property.

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 project site has an area of approximately 12.7 acres. It is located on the east side of SE Bornstedt Road, immediately south of Jerger Street and west of Jacoby Road in Sandy, Oregon. The site is surrounded by existing residential development to the north and west, and by low-density residential and agricultural land to the south and east.

Pioneer Boulevard is classified by the Oregon Department of Transportation as a Statewide Highway. In the vicinity of Highway 211 it is also classified as a Freight Route and Special Transportation Area. It is a one-way street which forms the eastbound side of the Highway 26 couplet within the City of Sandy's downtown street grid. It has two eastbound through travel lanes, with additional turn lanes added at major intersections. It has a posted speed limit of 25 mph. An eastbound bike lane is provided on the south side of the roadway, and sidewalks are in place along both sides of the road. On-street parking is generally available on both sides of the roadway within the study area, except where restrictions are needed to accommodate turn lanes.

Oregon Highway 211 is classified by the Oregon Department of Transportation as a District Highway; however, the segment of Highway 211 within the study area has been transferred to operate under the jurisdiction of the City of Sandy, where it is classified as a Major Arterial. It generally has one through travel lane in each direction. It has a posted speed limit of 45 mph at the intersections of Highway 211

at Bornstedt Road and Highway 211 at Dubarko Road. It has a posted speed limit of 40 mph on the south side of Pioneer Boulevard, transitioning to a 25-mph posted speed within the urban street grid on the north side of Pioneer Boulevard. Existing sidewalks are also in place on the vicinity of Pioneer Boulevard.

Dubarko Road is classified by the City of Sandy as a Minor Arterial. It generally has a two-lane cross-section with some added turn lanes at major intersections and bike lanes on each side of the roadway. Partial sidewalks are in place on each side of the roadway adjacent to developed properties. It has a posted residential speed limit of 25 mph.

Bornstedt Road is classified by the City of Sandy as a Minor Arterial. It has a two-lane cross-section, with one through lane in each direction. It has a posted speed limit of 45 mph. Partial sidewalks are in place on both sides of the roadway adjacent to developed properties, and some on-street parking is also available in these areas.

Averill Parkway is classified by the city of Sandy as a Local Street. It has a two-lane cross-section, with one through lane in each direction and no centerline striping. Existing sidewalks and on-street parking are in place on both sides of the roadway. Between Cascadia Village Drive and Newton Street, the roadway is divided into a couplet with the northbound and southbound lanes separated by a linear park space. This park space also has sidewalks in place along its length.

Newton Street is classified by the City of Sandy as a Local Street. It has a two-lane cross-section with one through lane in each direction and no centerline striping. Existing sidewalks and on-street parking are in place on both sides of the roadway.

EXISTING CONDITIONS

The intersection of Pioneer Boulevard/US Highway 26 at Highway 211 is a four-way intersection controlled by a traffic signal. The eastbound approach has a shared left/through lane, an exclusive through lane and a channelized right-turn lane which operates under yield control. The northbound approach has a through lane and an exclusive right-turn lane. The southbound approach has an exclusive left-turn lane and a through lane. All four legs of the intersection have marked crosswalks in place with pedestrian signals.

The intersection of Highway 211 at Dubarko Road is a four-way intersection controlled by stop signs on the eastbound and westbound Dubarko Road approaches. The southbound, eastbound, and westbound approaches each have a shared through/left lane, a bike lane, and a dedicated right-turn lane. The northbound approach has a single, shared lane for all motorized turning movements and a bike lane.

The intersection of Highway 211 at Bornstedt Road is a T-intersection operating under stop control for the northbound Bornstedt Road approach. Through vehicles traveling along Highway 211 are free flowing. The northeast-bound Highway 211 approach has through lane and a short, channelized right-turn lane feeding onto Dubarko Road. The southwest-bound Highway 211 approach has a left-turn lane and a dedicated through lane.

A vicinity map displaying the project site, vicinity streets, and study intersection including lane configurations is provided in Figure 1 on page 9.

TRAFFIC COUNT DATA

Traffic counts were conducted at the study intersections on Wednesday June 9th, 2021 from 7:00 to 9:00 AM and from 4:00 to 6:00 PM. Data was used from the highest-volume hour during each analysis period.

The observed traffic volumes were increased to account for the impacts of the COVID-19 pandemic on traffic volumes in the site vicinity. Based on data from ODOT's Weekly COVID-19 Traffic Reports, traffic volumes along Highway 26 are currently approximately 14.6 percent below the levels that would have otherwise been projected for this corridor in 2021. Similarly, statewide traffic volumes average approximately 9.6 percent lower than would otherwise be projected absent the impacts of the pandemic. Accordingly, the projected year 2021 peak-season traffic volumes were increased by 14.6 percent on Highway 26 and by 9.6 percent for all other roadways to estimate traffic volumes absent the impacts of the continuing pandemic.

Additionally, since the count data was collected during a non-peak period of the year, the observed traffic volumes were adjusted to account for seasonal traffic variations to represent the 30th-highest hour design volumes.

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.

To determine the portion of traffic attributable to each of the two primary travel types, data from ODOT's 2019 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, 8,771 vehicles per day (approximately 877 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 June, with 55 percent westbound and 45 percent eastbound. This volume represents 32.3 percent of the COVID-adjusted eastbound through traffic volumes on Highway 26 at Oregon Highway 211. Accordingly, it is expected that no more than 32.3 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 67.7 percent of through traffic volumes on Highway 26 at Highway 211 never reach Mt. Hood, it was assumed that these traffic volumes represent more typical commuter and local trips.

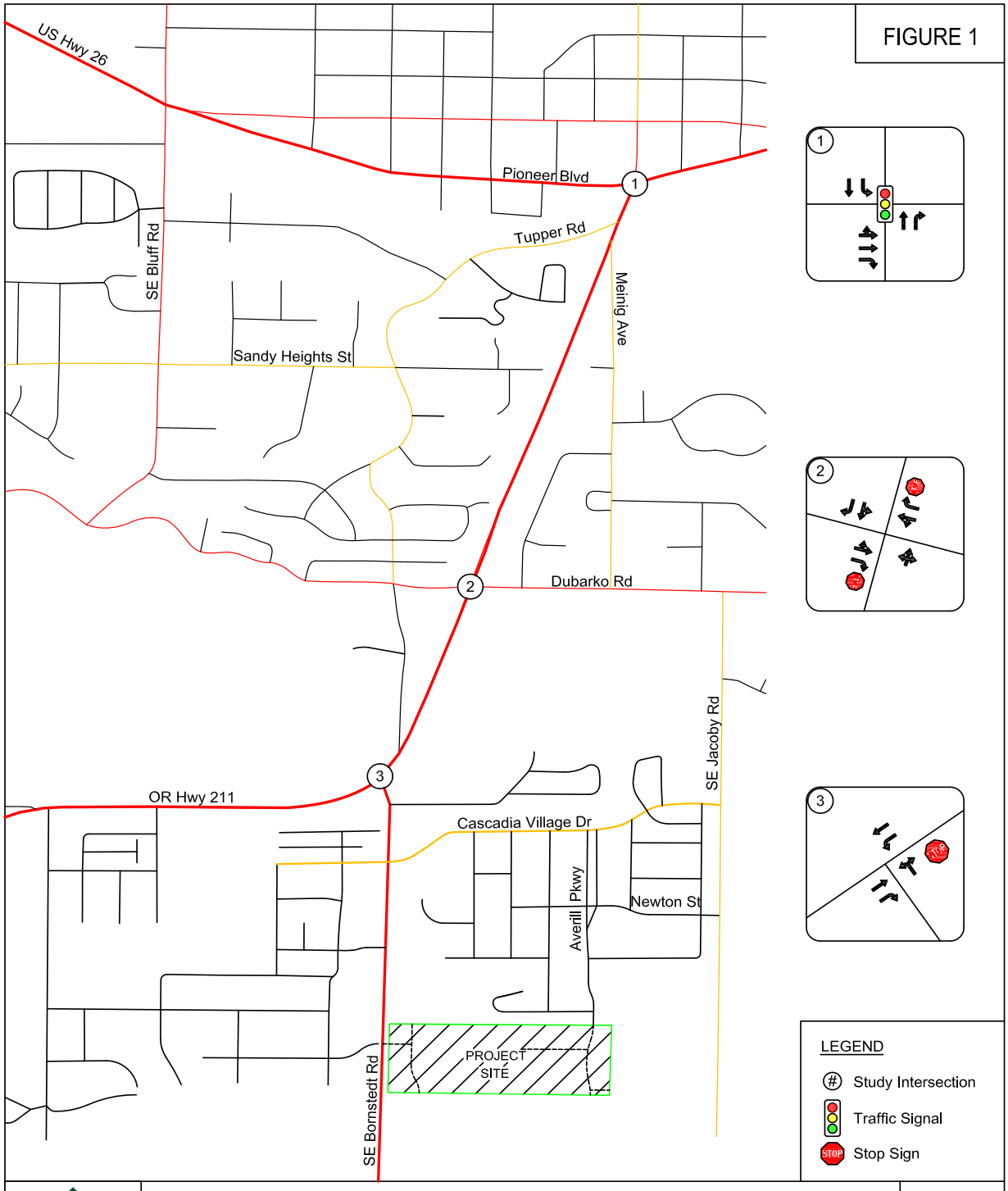
The ODOT data also showed that 10,810 vehicles were measured per day (approximately 1081 per hour during the peak hour) during the peak-season month of July at the ATR station near Rhododendron. This indicates that the seasonal recreational traffic volumes along the Highway 26 corridor increased by no more than 2,039 vehicles per day (10,810 vehicles per day in August - 8,771 vehicles per day in March). This equates to roughly 204 additional vehicles per hour during the peak hour of the peak recreational season. Accounting for directionality of trips, this is approximately 112 westbound vehicles and 92 eastbound vehicles.

To seasonally adjust the local and commuter traffic volumes, the eastbound through traffic volumes on Highway 26 were reduced by the amount of the assumed seasonal traffic (395 vehicles per hour during the evening peak hour), and a seasonal adjustment of 1.007 was applied to the remaining local and commuter traffic volumes. Following this adjustment, the 395 June eastbound recreational trips and the 92 eastbound recreational peak-season through trips were added to determine the total peak-season traffic volumes. These calculated through traffic volumes represent the anticipated eastbound traffic volumes on Highway 26 immediately east of Highway 211 during the 30th-highest hour in July. The morning peak hour traffic volumes along Highway 26 were then increased by the same overall percentage as the evening peak hour volumes (8.0 percent).

The observed traffic volumes on Highway 211 also had a commuter seasonal adjustment of 1.007 applied to represent peak-season traffic volumes.

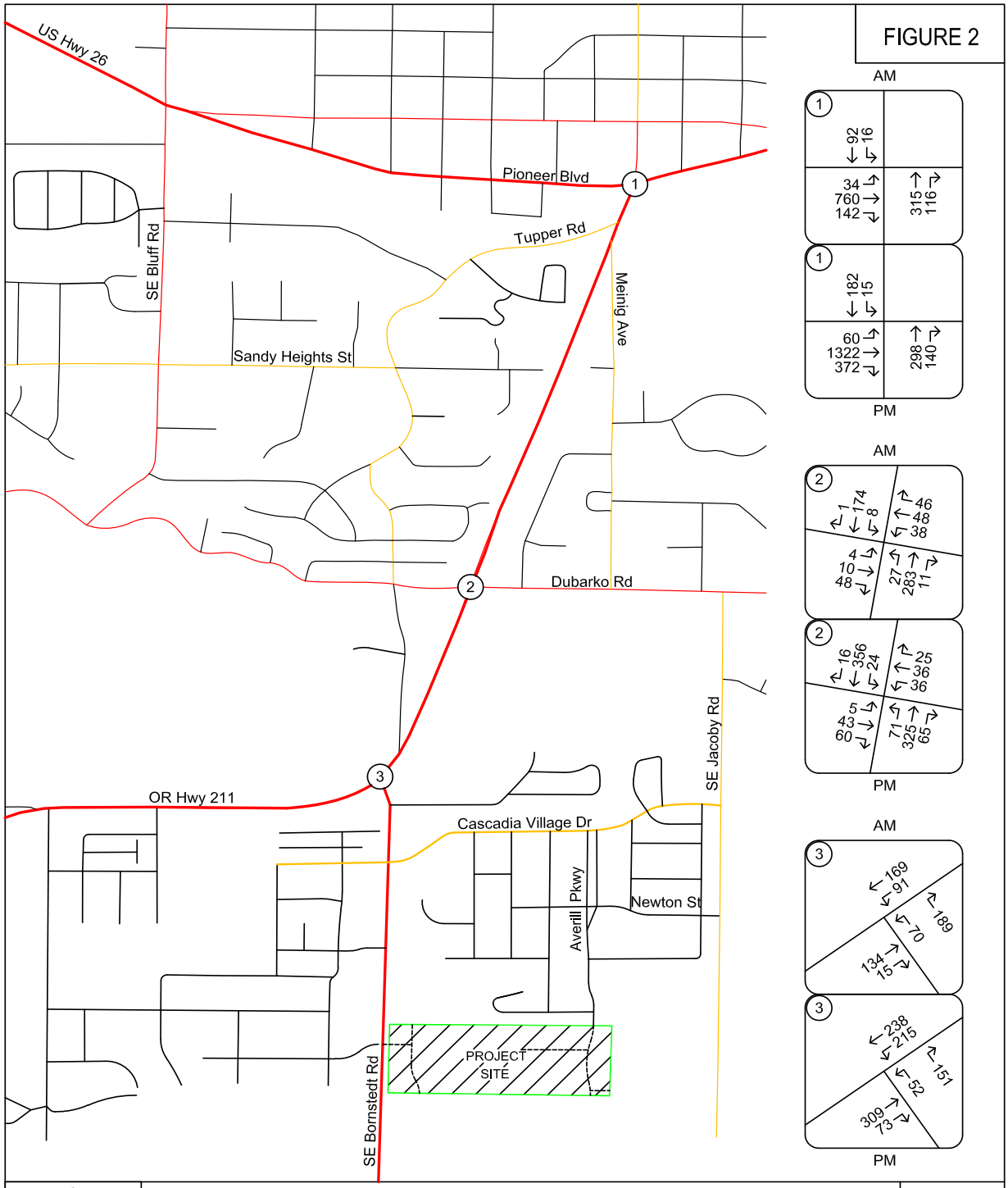
In addition to the turning movement count data, daily traffic volume data was collected on Newton Street between Amherst Street and Jacoby Road, and on Averill Parkway at three locations: immediately south of Cascadia Village Drive; immediately south of Newton Street; and immediately south of Amherst Street. Again, the recorded local-street daily traffic volumes were increased by 9.6 percent to account for the impacts of the ongoing pandemic.

Figure 2 on page 10 shows the existing year 2021 traffic volumes for the morning and evening peak hours at the study intersections. The existing traffic volumes for local streets in the site vicinity that would be impacted by the proposed development are provided in Table 2 on page 12.



VICINITY MAP
Study Intersections
Lane Configurations and Traffic Control

PAGE 9



TRAFFIC VOLUMES
2021 Existing 30th-Highest Hour Conditions
Morning and Evening Peak Hours

PAGE 10

OPERATIONAL ANALYSIS

An operational analysis was conducted for the study intersection using Synchro software. 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 the unsignalized study intersection, 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 signalized intersection of Highway 26 at Highway 211 operate with a v/c ratio of 0.90 or less during the peak hours.

Intersections operating under the jurisdiction of the City of Sandy are required to operate at level of service D or better. Since Oregon Highway 211 has been transferred to city jurisdiction, this operational standard applies to the intersections of Highway 211 at Dubarko Road and Highway 211 at SE Bornstedt Road.

A summary of the existing conditions operational analysis is provided in Table 1 below. For the signalized intersection of Pioneer Boulevard at Highway 211, the reported delays, levels-of-service, and v/c ratios represent the operation of the overall intersection. For the unsignalized intersections the reported delays, levels-of-service and v/c ratios represent the worst approach lane.

Based on the analysis, the intersections of Highway 26 at Highway 211 and Highway 211 at Bornstedt Road are currently operating acceptably per the respective ODOT and City of Sandy standards. The intersection of Highway 211 at Dubarko Road is currently operating at level of service E for the westbound left/through lane during the evening peak hour. Detailed capacity analysis worksheets are provided in the technical appendix.

Table 1 - Operational Analysis Summary: 2021 Existing Conditions

Intersection	AM Peak Hour			PM Peak Hour		
	Delay	LOS	v/c	Delay	LOS	v/c
Pioneer Boulevard at Highway 211	23.4	C	0.62	24.2	C	0.76
Highway 211 at Dubarko Road	21.9	C	0.34	35.9	E	0.39
Highway 211 at Bornstedt Road	14.8	B	0.47	20.0	C	0.47

The 24-hour count data collected on Newton Street between Amherst Street and Jacoby Road, and on Averill Parkway immediately south of Cascadia Village Drive; immediately south of Newton Street; and immediately south of Amherst Street was used to determine whether the existing local street segments are currently carrying fewer than 1,000 daily trips. This threshold is identified in the City of Sandy's Development Code, Section 17.10.30 "Street", Sub-section E "Local Streets", which reads in part:

> "Average daily traffic (ADT) shall not exceed 1,000 vehicles/day. Proposed projects that result in more than 1,000 ADT on an existing or proposed local street shall be modified to not exceed the 1,000 ADT threshold on the local street or the proposal may be processed through the procedures in Chapter 17.66 of the Sandy Development Code."

The results of the data collection (including an increase of 9.6 percent to account for COVID-19 impacts on traffic) are summarized in Table 2 below.

Table 2 - Existing Average Daily Traffic on Local Streets

Street Segment	ADT Volume
Newton Street west of Jacoby Road	148
Averill Parkway south of Cascadia Village Drive	300
Averill Parkway south of Newton Street	209
Averill Parkway south of Amherst Street	103

Based on the measured volumes, the local streets that will be impacted by the proposed development are currently operating with average daily traffic volumes well below the limit of 1,000 daily trips.

SITE TRIPS

The proposed subdivision will support development of 42 single-family homes. To estimate the number of trips that will be generated by the potential residential development within the proposed subdivision, trip rates from the *TRIP GENERATION MANUAL, 10th EDITION* were used. Data from land-use code 210, *Single-Family Detached* Housing was used. The trip estimate is based on the number of dwelling units.

A summary of the trip generation calculations is provided in Table 3 below. A detailed trip generation worksheet is also included in the technical appendix.

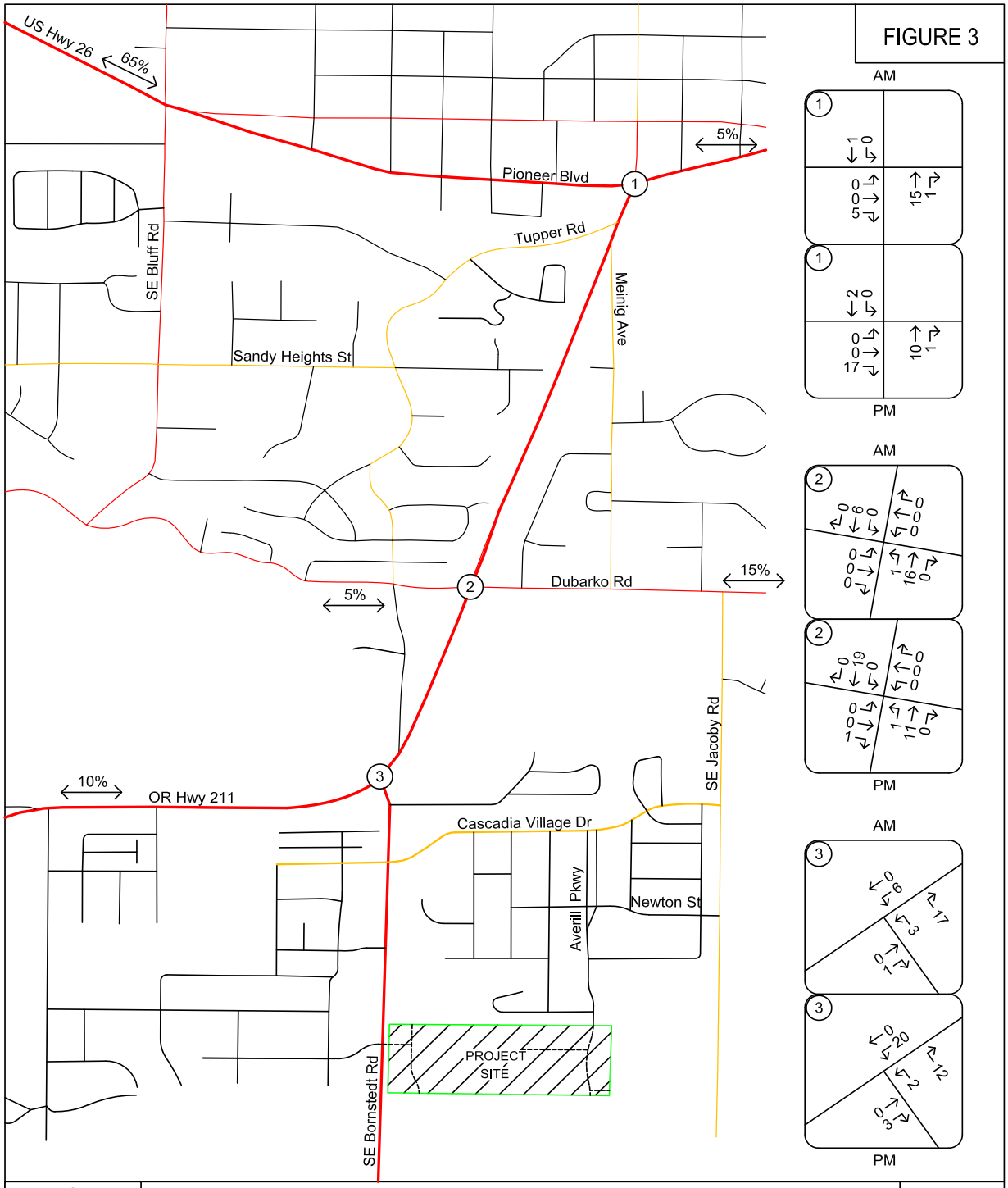
Table 3 - Site Trip Generation Summary

	AM Peak Hour			PM Peak Hour			Daily
	In	Out	Total	In	Out	Total	Total
42 Single-Family Homes	8	23	31	26	16	42	396

TRIP DISTRIBUTION

The directional distribution of primary site trips to and from the project site was estimated based the existing travel patterns in the site vicinity. Overall, 65 percent of site trips are projected to travel to and from the west on Highway 26, 20 percent are projected to travel to and from the east on Highway 26, 10 percent are projected to travel to and from the south on Highway 211, and the remaining 5 percent are projected to travel to and from the west on Dubarko Road. Since the project site is divided by wetlands in the middle, 13 homes will take access via Dubarko Road, while the remaining 29 homes will take access via an extension of Averill Parkway.

The trip distribution percentages and trip assignment for the primary site trips are shown in Figure 3 on page 14.



TRAFFIC VOLUMES
Proposed Development - Site Trips
Morning and Evening Peak Hours

PAGE 14

FUTURE CONDITIONS ANALYSIS

BACKGROUND VOLUMES

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 development cannot be constructed and occupied immediately, the comparison is made for future traffic conditions at the time of expected project completion. It is anticipated that the proposed homes can be completed and fully occupied within two years. Accordingly, the analysis was conducted for year 2023 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 2039 Future Volume Tables, an annual growth rate of 2.13 percent per year (linear) was calculated for Highway 26 in the project vicinity. For the other turning movements in the project vicinity a growth rate of 2.0 percent per year (exponential) was used to estimate the impacts of overall population growth within the City of Sandy.

In addition to these background growth rates, site trips from approved developments which have not yet been fully completed were added to the background traffic volumes. These "in-process" developments included include the Clackamas County Health Clinic, Mt. Hood Senior Living, The Pad, The Views, Shaylee Meadows, Mt. View Ridge, Marshall Ridge, Jacoby Heights, Trimble PD, and the Deer Meadows Subdivision. The projected site trips for these developments are shown in Figure 7 in the attached technical appendix.

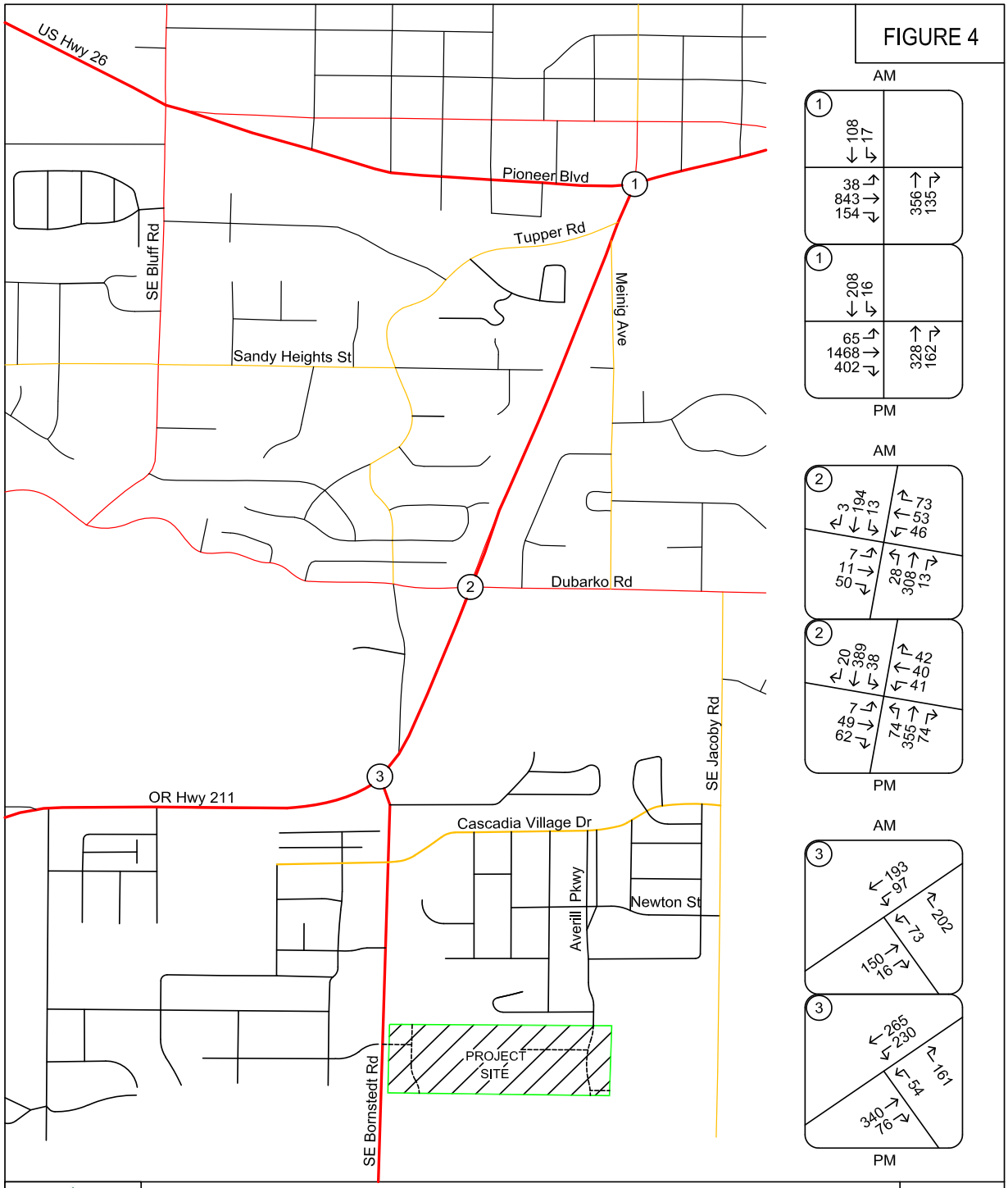
Figure 5 on page 16 shows the projected year 2023 background traffic volumes at the study intersections during the morning and evening peak hours.

BACKGROUND VOLUMES PLUS SITE TRIPS

Peak hour trips calculated to be generated by the proposed development were added to the projected year 2023 background traffic volumes to obtain the year 2023 total traffic volumes following completion of the proposed development.

Figure 6 on page 17 shows the projected year 2023 peak hour volumes including both background growth and site trips from the proposed development during the morning and evening peak hours.

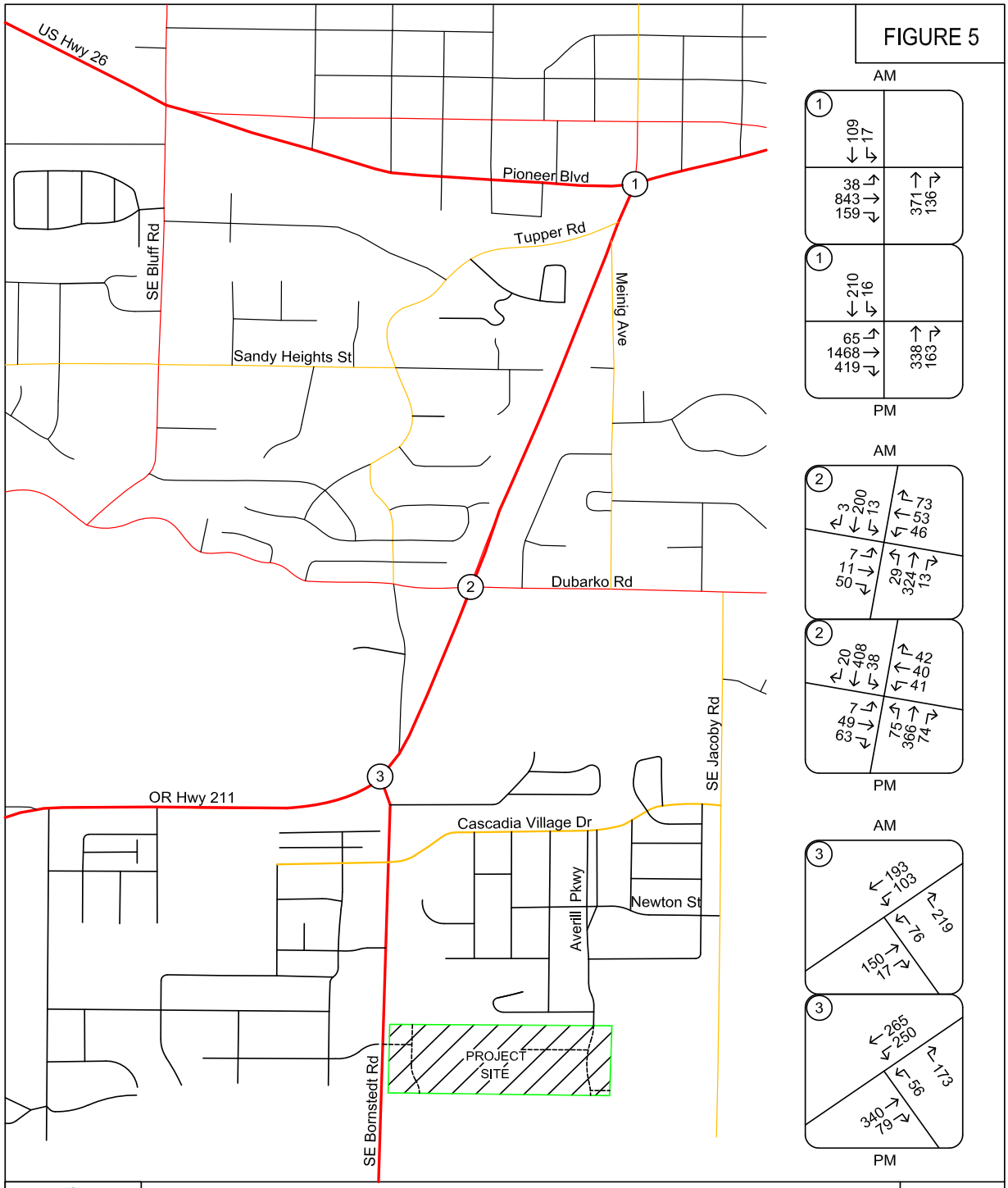
FIGURE 4



TRAFFIC VOLUMES
2023 Background Conditions
Morning and Evening Peak Hours

PAGE 16

FIGURE 5



TRAFFIC VOLUMES
2023 Background Plus Site Trips
Morning and Evening Peak Hours

PAGE 17

OPERATIONAL ANALYSIS

The future conditions operational analysis was again conducted using Synchro software, with outputs based on the analysis methodologies contained in the *HIGHWAY CAPACITY MANUAL*. The analysis was prepared for the intersection's morning and evening peak hours.

The results of the future conditions operational analysis are summarized in Table 4 below. Detailed analysis worksheets are included in the technical appendix.

Table 4 - Operational Analysis Summary: Year 2023 Future Conditions

Intersection	AM Peak Hour			PM Peak Hour		
	Delay	LOS	v/c	Delay	LOS	v/c
Pioneer Boulevard at Highway 211						
2023 Background Conditions	25.9	C	0.70	28.8	C	0.84
2023 Background plus Site	26.7	C	0.71	29.6	C	0.85
Highway 211 at Dubarko Road						
2023 Background Conditions	27.9	D	0.45	55.6	F	0.56
2023 Background plus Site	29.8	D	0.47	63.0	F	0.60
2023 Bkgd plus Site (All-Way Stop)	28.3	D	0.79	47.1	E	0.92
Highway 211 at Bornstedt Road						
2023 Background Conditions	16.5	C	0.52	23.8	C	0.55
2023 Background plus Site	17.5	C	0.56	26.8	D	0.60

Based on the results of the operational analysis, the intersections of Pioneer Boulevard at Highway 211 and Highway 211 at Bornstedt Road are projected to meet the respective operational standards of the Oregon Department of Transportation and the City of Sandy.

The intersection of Highway 211 at Dubarko Road is projected to operate at level of service F for the westbound left/through lane during the evening peak hour either with or without the addition of site trips from the proposed development. If the intersection is converted to all-way stop control, operation improves to level of service E, with average delays for the highest-delay approach lane reduced from 55.6 seconds to 47.1 seconds, indicating a minor improvement to operation of the worst movement with all-way stop control and the proposed development in place. This improvement would also be expected to reduce the risk of angle and turning-movement collisions at the intersection, as described in the safety analysis section of this report.

LOCAL STREET TRAFFIC VOLUMES

Local street traffic volumes were also examined to determine the projected traffic levels following completion of the proposed development. Site trips to and from the west side of the proposed development (the portion which takes access via Bornstedt Road) will not add to the local street traffic volumes. However, the homes on the east side will add traffic to all of the analyzed street segments. Table 5 below summarizes the projected future traffic levels on the impacted local streets following completion of the proposed development. Based on the analysis, all local streets in the site vicinity will continue to operate with average volumes below 1,000 vehicles per day.

Table 5 - Year 2023 Average Daily Traffic on Local Streets

Street Segment	ADT Volume
Newton Street west of Jacoby Road	198
Averill Parkway south of Cascadia Village Drive	540
Averill Parkway south of Newton Street	449
Averill Parkway south of Amherst Street	334

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 2015 through December 2019) was performed for the study intersections. The crash data was evaluated based on the number, type, and severity of collisions, as well as the intersection crash rate. Crash rates allow comparison of relative safety risks at intersections with different lane configurations, volumes, and traffic control devices by accounting for both the number of crashes that occur during the study period and the number of vehicles that traveled through the intersection during that period. Crash rates are calculated using the standard assumption that evening peak hour volumes are approximately 10 percent of the average daily traffic volume at an intersection. The crash rates were compared to statewide crash rates for similar intersection types to identify any locations with crash rates in excess of the 90th percentile.

The intersection of Highway 211 at Dubarko Road had 27 reported crashes during the five-year analysis period. These included 16 angle collisions, 4 turning-movement collisions, 4 rear-end collisions, 1 backing collision, 1 sideswipe-overtaking collision, and 1 pedestrian collision. The crashes resulted in one incapacitating injury and no fatalities. There were 10 “non-incapacitating” injuries reported and 19 reports of a “possible injury/complaint of pain”. The incapacitating injury occurred when a westbound driver failed to yield to a southbound vehicle and was struck in the intersection. The pedestrian collision occurred when a southbound pedestrian was struck by a westbound driver that failed to yield right-of-way to the pedestrian crossing, resulting in a report of a possible injury/complaint of pain by the pedestrian. The crash rate for the intersection was calculated to be 1.56 crashes per million entering vehicles. This is above the 90th percentile crash rate of 1.08 crashes per million entering vehicles for rural unsignalized four-way intersections in the state of Oregon.

The Oregon Department of Transportation recently undertook safety improvements at this intersection, including re-alignment of the minor-street approaches to intersect at a 90-degree angle and the addition of some striping and speed feedback signs along the major-street to increase driver awareness of speed. However, the crash data for subsequent years has shown no significant improvement in the crash frequency at this intersection. An examination of the current intersection configuration revealed no significant apparent hazards and adequate sight distance from the minor-street approaches, allowing drivers approaching the highway to select safe gaps when turning onto or crossing the highway.

As described in the Warrant Analysis section of this report below, the intersection currently meets all-way stop control warrants based on crash history. Accordingly, it is recommended that all-way stop control be installed at this intersection. No other safety mitigations are recommended at this time.

The intersections of Pioneer Boulevard at Highway 211 and Highway 211 at Bornstedt Road had no reported crashes during the five-year analysis period.

Based on the crash data, the majority of the study intersections are currently operating acceptably with respect to safety. The intersection of Highway 211 at Dubarko Road has a high historical crash rate which recent safety improvements have not significantly improved. It is recommended that

consideration be given to installing all-way stop control at this intersection. No other safety improvements are recommended for the study area intersections at this time.

Traffic Signal and All-Way Stop Control Warrants

Traffic signal warrants were examined for the unsignalized study intersections of Highway 211 at Dubarko Road and Highway 211 at Bornstedt Road. Based on the projected turning movement volumes, traffic signal warrants will not be satisfied for either intersection under any of the analysis scenarios. Accordingly, no new traffic signals are recommended in conjunction with the proposed development.

All-way stop control can be installed where there are "Five or more crashes in a 12-month period that are susceptible to correction by a multi-way stop installation. Such crashes include right-turn and left-turn collisions as well as right-angle collisions." Examination of the crash data shows that there were six angle collisions at the intersection in the most recent year for which complete data is available (2019). Accordingly, installation of all-way stop control is warranted based on crash history.

Turn Lane Warrants

Major-street turn lane warrants are primarily based on safety considerations. A major-street left-turn lane provides a refuge for drivers to move out of the through travel lane while waiting for a gap in the opposing through traffic stream prior to turning left. A major-street right-turn lane allows right-turning drivers to decelerate outside the through travel lane prior to turning.

The intersection of Highway 211 at Dubarko Road currently meets ODOT warrants for a northbound left-turn lane and a northbound right-turn lane. However, the need for these turn lanes is not meaningfully related to the proposed development. Further, if all-way stop control is installed at the intersection as recommended based on the safety analysis, the turn lane warrants will no longer be applicable. The need for additional lanes will be dictated by operational considerations rather than safety warrants, since all vehicles will stop prior to entering the intersection.

The intersection of Highway 211 at Bornstedt Road already has a southwest-bound left-turn lane in place. A short, channelized right-turn radius is also provided for the northeast-bound right turn movement. The proposed development will have no significant impact on the need for turn lanes at this intersection.

Intersection Sight Distance Analysis

Intersection sight distance was measured for the proposed access location on Bornstedt Road to verify whether the proposed access can operate safely and efficiently. The posted speed limit is 45 mph, requiring a minimum sight distance of 500 feet.

The available intersection sight distances are measured from a position 15 feet behind the edge of the traveled way with a driver's eye height 3.5 feet above the driveway surface to an oncoming driver's eye height of 3.5 feet above the surface of the oncoming travel lane. Existing vegetation and an

embankment on the east side of the roadway north of the proposed access currently limit sight distances to the north and south. However, upon development of the subject property and construction of improvements along the site frontage sight distances are projected to be well in excess of 500 feet in each direction.

Based on the detailed analysis, adequate sight distance is available in each direction for safe and efficient operation of the proposed access. No sight distance mitigations beyond clearing of vegetation, leveling the roadside embankment north of the site access, and construction of typical frontage improvements are necessary or recommended.

CONCLUSIONS

Based on the operational analysis, the intersections of Pioneer Boulevard at Highway 211 and Highway 211 at Bornstedt Road are projected to operate acceptably per ODOT and City of Sandy standards through 2023 either with or without the addition of site trips from the proposed development. The intersection of Highway 211 at Dubarko Road is projected to operate at level of service F during the evening peak hour under year 2023 traffic conditions either with or without the addition of site trips from the proposed development. If the intersection is converted to all-way stop control it is projected to operate at level of service E and with reduced delays for the highest-delay movement as compared to background (no-build) conditions.

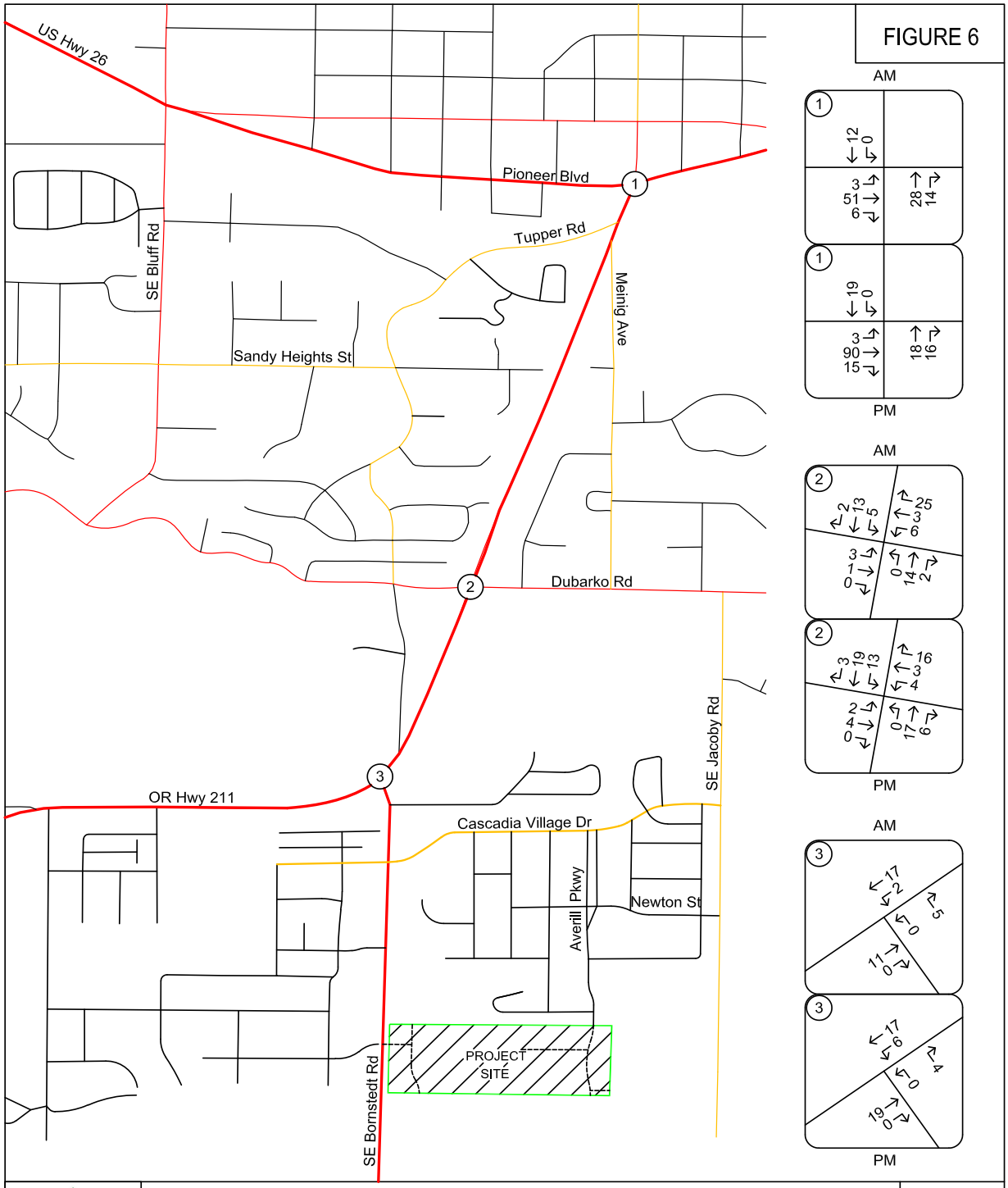
The local streets in the project vicinity currently carry fewer than 1,000 vehicles per day, in accordance with the requirements of the city's development code. Following completion of the proposed development the local streets are projected to continue to carry fewer than 1,000 daily trips. Accordingly, operation of local streets is projected to meet city standards.

Crash data for the most recent five years shows no significant crash trends that may be indicative of design deficiencies for the intersections of Pioneer Boulevard at Highway 211 and Highway 211 at Bornstedt Road. The crash rate for the intersection of Highway 211 at Dubarko Road is in excess of the 90th percentile crash rate for similar intersections in the state of Oregon. Based on the crash data and the all-way stop control warrant analysis, it is recommended that the Dubarko Road intersection be converted to all-way stop control to improve safety in the site vicinity.

Based on the warrant analysis, no new traffic signals or turn lanes are recommended in conjunction with the proposed development.

APPENDIX

FIGURE 6



TRAFFIC VOLUMES
In-Process Development - Site Trips
Morning and Evening Peak Hours

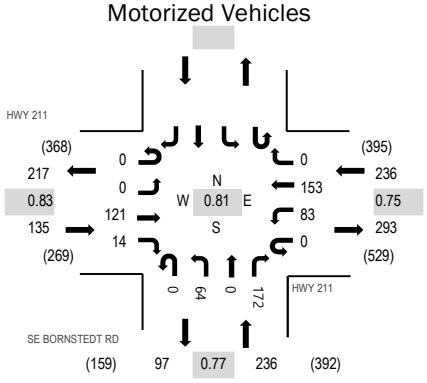
PAGE
APP1

ALL TRAFFIC DATA SERVICES
(303) 216-2439
www.alltrafficdata.net

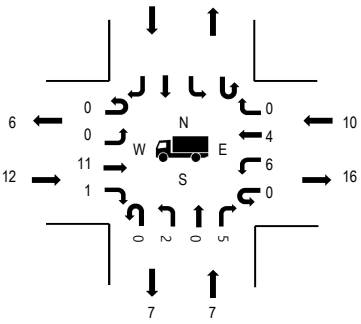
Location: SE BORNSTEDT RD & HWY 211 AM
Date: Wednesday, June 9, 2021
Peak Hour: 07:00 AM - 08:00 AM
Peak 15-Minutes: 07:20 AM - 07:35 AM

Peak Hour

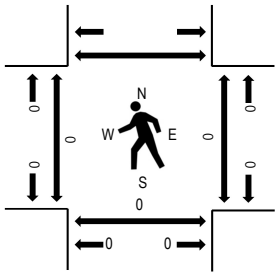
Motorized Vehicles



Heavy Vehicles



Pedestrians



Note: Total study counts contained in parentheses.

	HV%	PHF
EB	8.9%	0.83
WB	4.2%	0.75
NB	3.0%	0.77
SB		
All	4.8%	0.81

Traffic Counts - Motorized Vehicles

Interval Start Time	HWY 211 Eastbound				HWY 211 Westbound				SE BORNSTEDT RD Northbound				Southbound				Total	Rolling Hour
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right		
7:00 AM	0	0	7	0	0	5	16	0	0	4	0	18					50	607
7:05 AM	0	0	2	3	0	3	5	0	0	8	0	12					33	589
7:10 AM	0	0	8	1	0	3	15	0	0	2	0	15					44	586
7:15 AM	0	0	9	1	0	9	14	0	0	8	0	14					55	581
7:20 AM	0	0	14	0	0	6	16	0	0	2	0	20					58	567
7:25 AM	0	0	13	0	0	8	8	0	0	8	0	16					53	532
7:30 AM	0	0	16	0	0	12	18	0	0	8	0	23					77	515
7:35 AM	0	0	10	3	0	10	15	0	0	1	0	10					49	470
7:40 AM	0	0	12	2	0	9	15	0	0	7	0	16					61	460
7:45 AM	0	0	6	3	0	6	7	0	0	5	0	14					41	451
7:50 AM	0	0	12	0	0	5	12	0	0	7	0	7					43	453
7:55 AM	0	0	12	1	0	7	12	0	0	4	0	7					43	447
8:00 AM	0	0	7	2	0	4	4	0	0	4	0	11					32	449
8:05 AM	0	0	8	1	0	0	9	0	0	4	0	8					30	
8:10 AM	0	0	7	2	0	6	12	0	0	4	0	8					39	
8:15 AM	0	0	11	1	0	4	12	0	0	6	0	7					41	
8:20 AM	0	0	9	1	0	1	4	0	0	2	0	6					23	
8:25 AM	0	0	6	2	0	4	16	0	0	2	0	6					36	
8:30 AM	0	0	7	3	0	3	12	0	0	0	0	7					32	
8:35 AM	0	0	10	3	0	6	7	0	0	0	0	13					39	
8:40 AM	0	0	16	1	0	4	10	0	0	5	0	16					52	
8:45 AM	0	0	15	1	0	3	7	0	0	0	0	17					43	
8:50 AM	0	0	7	0	0	8	10	0	0	2	0	10					37	
8:55 AM	0	0	14	0	0	2	11	0	0	8	0	10					45	
Count Total	0	0	238	31	0	128	267	0	0	101	0	291					1,056	
Peak Hour	0	0	121	14	0	83	153	0	0	64	0	172					607	

Location: SE BORNSTEDT RD & HWY 211 AM

Traffic Counts - Heavy Vehicles, Bicycles on Road, and Pedestrians/Bicycles on Crosswalk

Interval Start Time	Heavy Vehicles					Interval Start Time	Bicycles on Roadway					Interval Start Time	Pedestrians/Bicycles on Crosswalk				
	EB	NB	WB	SB	Total		EB	NB	WB	SB	Total		EB	NB	WB	SB	Total
7:00 AM	2	0	0		2	7:00 AM	0	0	0		0	7:00 AM	0	0	0		0
7:05 AM	0	1	0		1	7:05 AM	0	0	0		0	7:05 AM	0	0	0		0
7:10 AM	2	1	0		3	7:10 AM	0	0	0		0	7:10 AM	0	0	0		0
7:15 AM	0	1	4		5	7:15 AM	0	0	0		0	7:15 AM	0	0	0		0
7:20 AM	1	0	0		1	7:20 AM	0	0	0		0	7:20 AM	0	0	0		0
7:25 AM	2	2	0		4	7:25 AM	0	0	0		0	7:25 AM	0	0	0		0
7:30 AM	2	0	1		3	7:30 AM	0	0	0		0	7:30 AM	0	0	0		0
7:35 AM	0	0	1		1	7:35 AM	0	0	0		0	7:35 AM	0	0	0		0
7:40 AM	0	0	2		2	7:40 AM	0	0	0		0	7:40 AM	0	0	0		0
7:45 AM	2	2	1		5	7:45 AM	0	0	0		0	7:45 AM	0	0	0		0
7:50 AM	1	0	0		1	7:50 AM	0	0	0		0	7:50 AM	0	0	0		0
7:55 AM	0	0	1		1	7:55 AM	0	0	0		0	7:55 AM	0	0	0		0
8:00 AM	2	0	0		2	8:00 AM	0	0	0		0	8:00 AM	0	0	0		0
8:05 AM	2	0	1		3	8:05 AM	0	0	0		0	8:05 AM	0	0	0		0
8:10 AM	0	1	0		1	8:10 AM	0	0	0		0	8:10 AM	0	0	0		0
8:15 AM	1	1	1		3	8:15 AM	0	0	0		0	8:15 AM	0	0	0		0
8:20 AM	2	0	0		2	8:20 AM	0	0	0		0	8:20 AM	0	0	0		0
8:25 AM	0	1	1		2	8:25 AM	0	0	0		0	8:25 AM	0	0	0		0
8:30 AM	1	0	0		1	8:30 AM	0	0	0		0	8:30 AM	0	0	0		0
8:35 AM	1	0	1		2	8:35 AM	0	0	0		0	8:35 AM	0	0	0		0
8:40 AM	0	1	1		2	8:40 AM	0	0	0		0	8:40 AM	0	0	0		0
8:45 AM	0	4	2		6	8:45 AM	0	0	0		0	8:45 AM	0	0	0		0
8:50 AM	0	0	3		3	8:50 AM	0	0	0		0	8:50 AM	0	0	0		0
8:55 AM	0	0	0		0	8:55 AM	0	0	0		0	8:55 AM	0	0	0		0
Count Total	21	15	20		56	Count Total	0	0	0		0	Count Total	0	0	0		0
Peak Hour	12	7	10		29	Peak Hour	0	0	0		0	Peak Hour	0	0	0		0

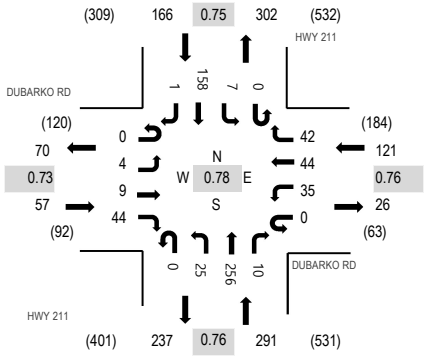
Location: HWY 211 & DUBARKO RD AM

ALL TRAFFIC DATA SERVICES
(303) 216-2439
www.alltrafficdata.net

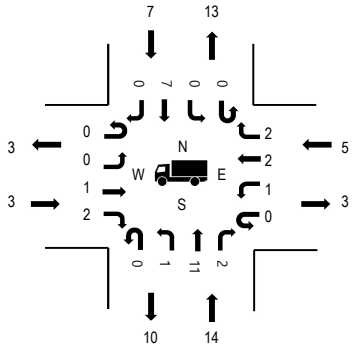
Location: HWY 211 & DUBARKO RD AM
Date: Wednesday, June 9, 2021
Peak Hour: 07:00 AM - 08:00 AM
Peak 15-Minutes: 07:25 AM - 07:40 AM

Peak Hour

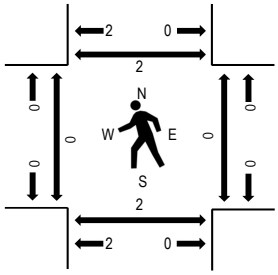
Motorized Vehicles



Heavy Vehicles



Pedestrians



Note: Total study counts contained in parentheses.

	HV%	PHF
EB	5.3%	0.73
WB	4.1%	0.76
NB	4.8%	0.76
SB	4.2%	0.75
All	4.6%	0.78

Traffic Counts - Motorized Vehicles

Interval Start Time	DUBARKO RD Eastbound				DUBARKO RD Westbound				HWY 211 Northbound				HWY 211 Southbound					Rolling Hour
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	Total	
7:00 AM	0	1	1	0	0	2	1	2	0	2	19	1	0	0	20	0	49	635
7:05 AM	0	0	1	3	0	2	5	2	0	1	19	0	0	0	4	0	37	617
7:10 AM	0	0	0	4	0	3	4	5	0	4	16	0	0	1	8	0	45	613
7:15 AM	0	0	1	6	0	2	5	4	0	1	22	0	0	0	15	0	56	612
7:20 AM	0	0	1	4	0	6	4	2	0	1	26	0	0	0	13	0	57	596
7:25 AM	0	0	1	3	0	1	6	9	0	2	33	1	0	0	14	0	70	564
7:30 AM	0	1	1	9	0	2	2	3	0	2	22	2	0	0	15	0	59	536
7:35 AM	0	0	0	3	0	4	6	7	0	4	26	4	0	2	19	0	75	514
7:40 AM	0	0	0	2	0	6	3	3	0	1	19	2	0	1	17	1	55	483
7:45 AM	0	2	1	2	0	0	3	1	0	5	22	0	0	1	10	0	47	465
7:50 AM	0	0	0	4	0	3	2	0	0	2	13	0	0	1	9	0	34	485
7:55 AM	0	0	2	4	0	4	3	4	0	0	19	0	0	1	14	0	51	491
8:00 AM	0	2	0	1	0	2	0	3	0	1	15	1	0	0	6	0	31	481
8:05 AM	0	0	2	2	0	0	1	3	0	2	14	1	0	1	7	0	33	
8:10 AM	0	0	0	0	0	3	1	1	0	1	20	1	0	2	15	0	44	
8:15 AM	0	1	2	1	0	3	4	0	0	2	13	2	0	1	11	0	40	
8:20 AM	1	0	0	0	0	1	3	1	0	3	9	0	0	1	5	1	25	
8:25 AM	0	1	1	1	0	1	1	3	0	3	12	1	0	0	18	0	42	
8:30 AM	0	2	2	1	0	3	1	2	0	0	14	0	0	0	12	0	37	
8:35 AM	0	0	2	1	0	0	2	3	0	2	20	1	0	0	12	1	44	
8:40 AM	0	1	0	3	0	2	1	2	0	2	15	3	0	1	6	1	37	
8:45 AM	0	0	2	0	0	1	5	2	0	5	34	4	0	0	14	0	67	
8:50 AM	0	0	1	1	0	1	0	2	0	5	13	0	0	1	16	0	40	
8:55 AM	0	1	3	0	0	3	1	1	0	0	20	1	0	0	11	0	41	
Count Total	1	12	24	55	0	55	64	65	0	51	455	25	0	14	291	4	1,116	
Peak Hour	0	4	9	44	0	35	44	42	0	25	256	10	0	7	158	1	635	

Location: HWY 211 & DUBARKO RD AM

Traffic Counts - Heavy Vehicles, Bicycles on Road, and Pedestrians/Bicycles on Crosswalk

Interval Start Time	Heavy Vehicles					Interval Start Time	Bicycles on Roadway					Interval Start Time	Pedestrians/Bicycles on Crosswalk				
	EB	NB	WB	SB	Total		EB	NB	WB	SB	Total		EB	NB	WB	SB	Total
7:00 AM	1	2	0	0	3	7:00 AM	0	0	0	0	0	7:00 AM	0	0	0	0	0
7:05 AM	0	0	1	0	1	7:05 AM	0	0	0	0	0	7:05 AM	0	0	0	0	0
7:10 AM	0	2	2	1	5	7:10 AM	0	0	0	0	0	7:10 AM	0	0	0	0	0
7:15 AM	2	0	0	2	4	7:15 AM	0	0	0	0	0	7:15 AM	0	0	0	0	0
7:20 AM	0	2	0	0	2	7:20 AM	0	0	0	0	0	7:20 AM	0	0	0	0	0
7:25 AM	0	1	0	0	1	7:25 AM	0	0	0	0	0	7:25 AM	0	0	0	0	0
7:30 AM	0	2	1	1	4	7:30 AM	0	0	0	0	0	7:30 AM	0	0	0	0	0
7:35 AM	0	1	0	1	2	7:35 AM	0	0	0	0	0	7:35 AM	0	0	0	0	0
7:40 AM	0	0	1	1	2	7:40 AM	0	0	0	0	0	7:40 AM	0	0	0	0	0
7:45 AM	0	3	0	1	4	7:45 AM	0	0	0	0	0	7:45 AM	0	0	0	2	2
7:50 AM	0	1	0	0	1	7:50 AM	0	0	0	0	0	7:50 AM	0	0	0	0	0
7:55 AM	0	0	0	0	0	7:55 AM	0	0	0	0	0	7:55 AM	0	2	0	0	2
8:00 AM	0	0	0	1	1	8:00 AM	0	0	0	0	0	8:00 AM	0	0	0	0	0
8:05 AM	0	1	0	1	2	8:05 AM	0	0	0	0	0	8:05 AM	0	0	0	0	0
8:10 AM	0	1	0	0	1	8:10 AM	0	0	0	0	0	8:10 AM	0	0	0	0	0
8:15 AM	0	0	0	1	1	8:15 AM	0	0	0	0	0	8:15 AM	0	0	0	0	0
8:20 AM	0	0	1	0	1	8:20 AM	0	0	0	0	0	8:20 AM	0	0	0	0	0
8:25 AM	0	3	0	1	4	8:25 AM	0	0	0	0	0	8:25 AM	0	0	0	0	0
8:30 AM	0	0	0	1	1	8:30 AM	0	0	0	0	0	8:30 AM	0	0	0	0	0
8:35 AM	0	0	1	1	2	8:35 AM	0	0	0	0	0	8:35 AM	0	0	0	0	0
8:40 AM	0	0	0	1	1	8:40 AM	0	0	0	0	0	8:40 AM	0	0	0	0	0
8:45 AM	0	4	1	3	8	8:45 AM	0	0	0	0	0	8:45 AM	0	0	0	0	0
8:50 AM	0	0	1	2	3	8:50 AM	0	0	0	0	0	8:50 AM	0	0	0	0	0
8:55 AM	0	0	0	0	0	8:55 AM	0	0	0	0	0	8:55 AM	0	0	0	0	0
Count Total	3	23	9	19	54	Count Total	0	0	0	0	0	Count Total	0	2	0	2	4
Peak Hour	3	14	5	7	29	Peak Hour	0	0	0	0	0	Peak Hour	0	2	0	2	4

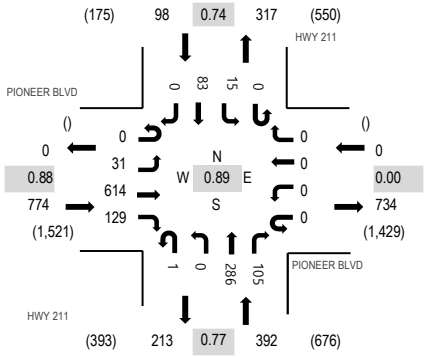
Location: HWY 211 & PIONEER BLVD AM

ALL TRAFFIC DATA SERVICES
(303) 216-2439
www.alltrafficdata.net

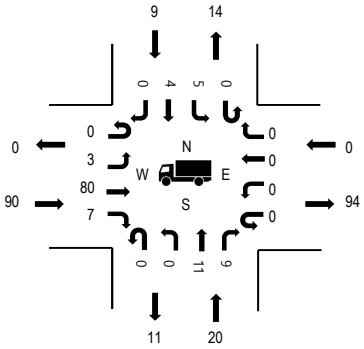
Location: HWY 211 & PIONEER BLVD AM
Date: Wednesday, June 9, 2021
Peak Hour: 07:15 AM - 08:15 AM
Peak 15-Minutes: 07:25 AM - 07:40 AM

Peak Hour

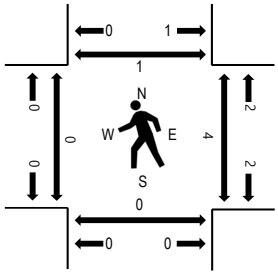
Motorized Vehicles



Heavy Vehicles



Pedestrians



Note: Total study counts contained in parentheses.

	HV%	PHF
EB	11.6%	0.88
WB	0.0%	0.00
NB	5.1%	0.77
SB	9.2%	0.74
All	9.4%	0.89

Traffic Counts - Motorized Vehicles

Interval Start Time	PIONEER BLVD Eastbound				PIONEER BLVD Westbound				HWY 211 Northbound				HWY 211 Southbound					Rolling Hour
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	Total	
7:00 AM	0	2	30	16	0	0	0	0	0	0	25	6	0	2	8	0	89	1,225
7:05 AM	0	3	29	3	0	0	0	0	0	0	18	4	0	0	1	0	58	1,215
7:10 AM	0	2	34	12	0	0	0	0	0	0	23	5	0	0	3	0	79	1,248
7:15 AM	0	1	39	10	0	0	0	0	0	0	29	12	0	1	10	0	102	1,264
7:20 AM	0	3	42	10	0	0	0	0	0	0	33	6	0	0	8	0	102	1,241
7:25 AM	0	6	55	7	0	0	0	0	1	0	37	12	0	0	8	0	126	1,231
7:30 AM	0	2	52	14	0	0	0	0	0	0	27	9	0	2	12	0	118	1,206
7:35 AM	0	2	46	17	0	0	0	0	0	0	30	6	0	2	8	0	111	1,175
7:40 AM	0	1	57	13	0	0	0	0	0	0	26	7	0	0	9	0	113	1,168
7:45 AM	0	3	57	13	0	0	0	0	0	0	25	12	0	3	4	0	117	1,169
7:50 AM	0	2	68	8	0	0	0	0	0	0	12	6	0	1	3	0	100	1,164
7:55 AM	0	2	61	12	0	0	0	0	0	0	17	10	0	4	4	0	110	1,158
8:00 AM	0	0	40	6	0	0	0	0	0	0	17	11	0	1	4	0	79	1,147
8:05 AM	0	4	52	6	0	0	0	0	0	0	18	6	0	0	5	0	91	
8:10 AM	0	5	45	13	0	0	0	0	0	0	15	8	0	1	8	0	95	
8:15 AM	0	2	41	6	0	0	0	0	0	0	17	5	0	1	7	0	79	
8:20 AM	0	3	63	7	0	0	0	0	0	0	9	8	0	0	2	0	92	
8:25 AM	0	3	57	12	0	0	0	0	0	0	10	9	0	0	10	0	101	
8:30 AM	0	3	50	8	0	0	0	0	0	0	11	9	0	1	5	0	87	
8:35 AM	0	5	55	9	0	0	0	0	0	0	22	6	0	1	6	0	104	
8:40 AM	0	1	69	8	0	0	0	0	0	0	23	8	0	0	5	0	114	
8:45 AM	0	2	65	16	0	0	0	0	0	0	12	8	0	2	7	0	112	
8:50 AM	0	6	54	8	0	0	0	0	0	0	13	6	0	1	6	0	94	
8:55 AM	0	4	51	8	0	0	0	0	0	0	14	13	0	2	7	0	99	
Count Total	0	67	1,212	242	0	0	0	0	1	0	483	192	0	25	150	0	2,372	
Peak Hour	0	31	614	129	0	0	0	0	1	0	286	105	0	15	83	0	1,264	

Location: HWY 211 & PIONEER BLVD AM

Traffic Counts - Heavy Vehicles, Bicycles on Road, and Pedestrians/Bicycles on Crosswalk

Interval Start Time	Heavy Vehicles					Interval Start Time	Bicycles on Roadway					Interval Start Time	Pedestrians/Bicycles on Crosswalk				
	EB	NB	WB	SB	Total		EB	NB	WB	SB	Total		EB	NB	WB	SB	Total
7:00 AM	8	1	0	1	10	7:00 AM	0	0	0	0	0	7:00 AM	0	0	0	0	0
7:05 AM	10	1	0	0	11	7:05 AM	0	0	0	0	0	7:05 AM	0	2	1	0	3
7:10 AM	5	2	0	0	7	7:10 AM	0	0	0	0	0	7:10 AM	0	0	2	0	2
7:15 AM	7	3	0	0	10	7:15 AM	0	0	0	0	0	7:15 AM	0	0	0	0	0
7:20 AM	9	2	0	1	12	7:20 AM	0	0	0	0	0	7:20 AM	0	0	0	0	0
7:25 AM	8	4	0	1	13	7:25 AM	0	0	0	0	0	7:25 AM	0	0	0	0	0
7:30 AM	8	0	0	2	10	7:30 AM	0	0	0	0	0	7:30 AM	0	0	0	0	0
7:35 AM	8	3	0	1	12	7:35 AM	0	0	0	0	0	7:35 AM	0	0	1	1	2
7:40 AM	8	1	0	0	9	7:40 AM	0	0	0	0	0	7:40 AM	0	0	1	0	1
7:45 AM	9	1	0	1	11	7:45 AM	0	0	0	0	0	7:45 AM	0	0	0	0	0
7:50 AM	8	3	0	0	11	7:50 AM	0	0	0	0	0	7:50 AM	0	0	0	0	0
7:55 AM	9	1	0	2	12	7:55 AM	0	0	0	0	0	7:55 AM	0	0	0	0	0
8:00 AM	5	0	0	1	6	8:00 AM	0	0	0	0	0	8:00 AM	0	0	0	0	0
8:05 AM	8	1	0	0	9	8:05 AM	0	0	0	0	0	8:05 AM	0	0	1	0	1
8:10 AM	3	1	0	0	4	8:10 AM	0	0	0	0	0	8:10 AM	0	0	1	0	1
8:15 AM	5	0	0	1	6	8:15 AM	0	0	0	0	0	8:15 AM	0	0	0	0	0
8:20 AM	10	0	0	0	10	8:20 AM	0	0	0	0	0	8:20 AM	0	0	0	0	0
8:25 AM	6	2	0	1	9	8:25 AM	0	0	0	0	0	8:25 AM	0	0	1	0	1
8:30 AM	10	0	0	0	10	8:30 AM	0	0	0	0	0	8:30 AM	0	0	0	0	0
8:35 AM	10	0	0	0	10	8:35 AM	0	0	0	0	0	8:35 AM	0	0	0	0	0
8:40 AM	11	1	0	1	13	8:40 AM	0	0	0	0	0	8:40 AM	0	0	0	0	0
8:45 AM	8	1	0	1	10	8:45 AM	0	0	0	0	0	8:45 AM	3	3	0	0	6
8:50 AM	6	1	0	0	7	8:50 AM	0	0	0	0	0	8:50 AM	1	1	1	1	4
8:55 AM	9	0	0	0	9	8:55 AM	0	0	0	0	0	8:55 AM	0	0	0	0	0
Count Total	188	29	0	14	231	Count Total	0	0	0	0	0	Count Total	4	6	9	2	21
Peak Hour	90	20	0	9	119	Peak Hour	0	0	0	0	0	Peak Hour	0	0	4	1	5

ALL TRAFFIC DATA SERVICES
(303) 216-2439
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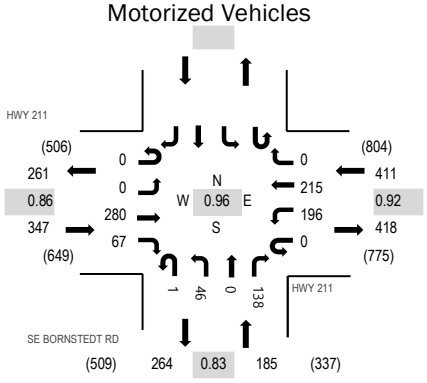
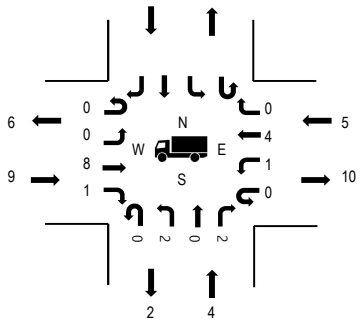
Location: SE BORNSTEDT RD & HWY 211 PM
Date: Wednesday, June 9, 2021
Peak Hour: 04:20 PM - 05:20 PM
Peak 15-Minutes: 04:25 PM - 04:40 PM

Peak Hour

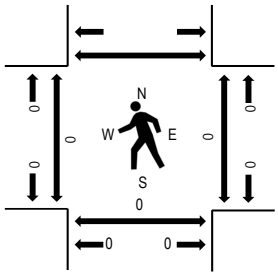
Motorized Vehicles



Heavy Vehicles



Pedestrians



Note: Total study counts contained in parentheses.

	HV%	PHF
EB	2.6%	0.86
WB	1.2%	0.92
NB	2.2%	0.83
SB		
All	1.9%	0.96

Traffic Counts - Motorized Vehicles

Interval Start Time	HWY 211 Eastbound				HWY 211 Westbound				SE BORNSTEDT RD Northbound				Southbound				Total	Rolling Hour
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right		
4:00 PM	0	0	18	3	0	8	14	0	0	1	0	9					53	896
4:05 PM	0	0	15	4	0	20	21	0	0	2	0	8					70	911
4:10 PM	0	0	15	3	0	18	35	0	0	4	0	8					83	933
4:15 PM	0	0	19	1	0	9	12	0	1	3	0	9					54	928
4:20 PM	0	0	29	4	0	20	15	0	0	3	0	13					84	943
4:25 PM	0	0	29	4	0	17	13	0	0	4	0	15					82	939
4:30 PM	0	0	20	6	0	13	23	0	0	5	0	7					74	940
4:35 PM	0	0	33	9	0	18	17	0	0	1	0	11					89	942
4:40 PM	0	0	14	3	0	16	18	0	0	1	0	13					65	915
4:45 PM	0	0	25	4	0	17	19	0	0	3	0	6					74	930
4:50 PM	0	0	23	4	0	12	23	0	0	6	0	18					86	921
4:55 PM	0	0	22	8	0	13	16	0	1	7	0	15					82	915
5:00 PM	0	0	24	5	0	15	15	0	0	3	0	6					68	894
5:05 PM	0	0	24	5	0	21	25	0	0	4	0	13					92	
5:10 PM	0	0	17	7	0	16	22	0	0	5	0	11					78	
5:15 PM	0	0	20	8	0	18	9	0	0	4	0	10					69	
5:20 PM	0	0	21	9	0	12	24	0	0	5	0	9					80	
5:25 PM	0	0	25	6	0	14	15	0	0	5	0	18					83	
5:30 PM	0	0	24	7	0	14	19	0	0	5	0	7					76	
5:35 PM	0	0	25	4	0	13	11	0	0	1	0	8					62	
5:40 PM	0	0	18	5	0	27	16	0	0	5	0	9					80	
5:45 PM	0	0	16	4	0	16	19	0	0	3	0	7					65	
5:50 PM	0	0	31	5	0	14	14	0	0	3	0	13					80	
5:55 PM	0	0	17	7	0	21	7	0	0	1	0	8					61	
Count Total	0	0	524	125	0	382	422	0	2	84	0	251					1,790	
Peak Hour	0	0	280	67	0	196	215	0	1	46	0	138					943	

Location: SE BORNSTEDT RD & HWY 211 PM

Traffic Counts - Heavy Vehicles, Bicycles on Road, and Pedestrians/Bicycles on Crosswalk

Interval Start Time	Heavy Vehicles					Interval Start Time	Bicycles on Roadway					Interval Start Time	Pedestrians/Bicycles on Crosswalk				
	EB	NB	WB	SB	Total		EB	NB	WB	SB	Total		EB	NB	WB	SB	Total
4:00 PM	0	0	3		3	4:00 PM	0	0	0		0	4:00 PM	0	0	0		0
4:05 PM	0	1	1		2	4:05 PM	0	0	0		0	4:05 PM	0	0	0		0
4:10 PM	0	0	0		0	4:10 PM	0	0	0		0	4:10 PM	0	0	0		0
4:15 PM	0	0	1		1	4:15 PM	0	0	0		0	4:15 PM	0	0	0		0
4:20 PM	2	0	0		2	4:20 PM	0	0	0		0	4:20 PM	0	0	0		0
4:25 PM	0	0	0		0	4:25 PM	0	0	0		0	4:25 PM	0	0	0		0
4:30 PM	1	0	0		1	4:30 PM	0	0	0		0	4:30 PM	0	0	0		0
4:35 PM	0	0	0		0	4:35 PM	0	0	0		0	4:35 PM	0	0	0		0
4:40 PM	1	0	0		1	4:40 PM	0	0	0		0	4:40 PM	0	0	0		0
4:45 PM	0	0	1		1	4:45 PM	0	0	0		0	4:45 PM	0	0	0		0
4:50 PM	0	1	3		4	4:50 PM	0	0	0		0	4:50 PM	0	0	0		0
4:55 PM	0	0	0		0	4:55 PM	0	0	0		0	4:55 PM	0	0	0		0
5:00 PM	1	0	0		1	5:00 PM	0	0	0		0	5:00 PM	0	0	0		0
5:05 PM	2	1	0		3	5:05 PM	0	0	0		0	5:05 PM	0	0	0		0
5:10 PM	1	1	1		3	5:10 PM	0	0	0		0	5:10 PM	0	0	0		0
5:15 PM	1	1	0		2	5:15 PM	0	0	0		0	5:15 PM	0	0	0		0
5:20 PM	0	0	0		0	5:20 PM	0	0	0		0	5:20 PM	0	0	0		0
5:25 PM	1	1	0		2	5:25 PM	0	0	0		0	5:25 PM	0	0	0		0
5:30 PM	1	0	2		3	5:30 PM	0	0	0		0	5:30 PM	0	0	0		0
5:35 PM	1	0	0		1	5:35 PM	0	0	0		0	5:35 PM	0	0	0		0
5:40 PM	0	0	1		1	5:40 PM	0	0	0		0	5:40 PM	0	0	0		0
5:45 PM	1	0	0		1	5:45 PM	0	0	0		0	5:45 PM	0	0	0		0
5:50 PM	0	0	1		1	5:50 PM	0	0	0		0	5:50 PM	0	0	0		0
5:55 PM	0	0	1		1	5:55 PM	0	0	0		0	5:55 PM	0	0	0		0
Count Total	13	6	15		34	Count Total	0	0	0		0	Count Total	0	0	0		0
Peak Hour	9	4	5		18	Peak Hour	0	0	0		0	Peak Hour	0	0	0		0

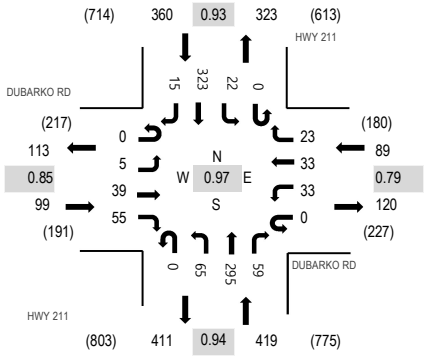
Location: HWY 211 & DUBARKO RD PM

ALL TRAFFIC DATA SERVICES
(303) 216-2439
www.alltrafficdata.net

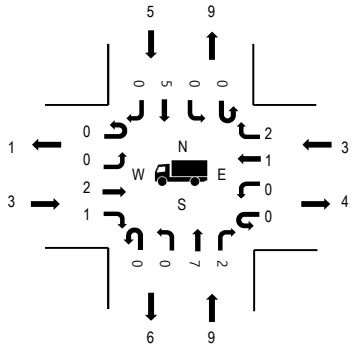
Location: HWY 211 & DUBARKO RD PM
Date: Wednesday, June 9, 2021
Peak Hour: 04:20 PM - 05:20 PM
Peak 15-Minutes: 05:05 PM - 05:20 PM

Peak Hour

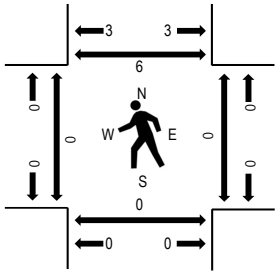
Motorized Vehicles



Heavy Vehicles



Pedestrians



Note: Total study counts contained in parentheses.

	HV%	PHF
EB	3.0%	0.85
WB	3.4%	0.79
NB	2.1%	0.94
SB	1.4%	0.93
All	2.1%	0.97

Traffic Counts - Motorized Vehicles

Interval Start Time	DUBARKO RD Eastbound				DUBARKO RD Westbound				HWY 211 Northbound				HWY 211 Southbound					Rolling Hour
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	Total	
4:00 PM	0	0	2	2	0	3	1	0	0	4	22	2	0	0	16	0	52	933
4:05 PM	0	0	5	6	0	1	5	2	0	3	15	3	0	1	38	0	79	949
4:10 PM	0	0	2	6	0	2	3	0	0	3	18	3	0	2	41	2	82	965
4:15 PM	0	1	4	3	0	1	2	8	0	1	23	7	0	1	17	2	70	961
4:20 PM	0	1	4	5	0	5	4	4	0	5	31	4	0	0	23	0	86	967
4:25 PM	0	0	2	4	0	1	3	2	0	5	30	7	0	4	28	1	87	954
4:30 PM	0	1	1	4	0	3	2	1	0	6	17	6	0	1	24	1	67	947
4:35 PM	0	0	5	6	0	3	2	2	0	5	28	8	0	1	31	0	91	961
4:40 PM	0	0	4	2	0	3	7	1	0	7	20	1	0	2	29	3	79	934
4:45 PM	0	0	5	4	0	0	4	2	0	3	19	6	0	1	31	0	75	950
4:50 PM	0	0	3	5	0	4	3	2	0	4	31	4	0	0	26	1	83	937
4:55 PM	0	1	2	2	0	4	1	2	0	5	31	7	0	3	22	2	82	933
5:00 PM	0	0	2	7	0	1	1	1	0	4	21	2	0	2	25	2	68	927
5:05 PM	0	0	5	6	0	1	1	3	0	10	27	3	0	4	33	2	95	
5:10 PM	0	0	1	7	0	6	4	1	0	4	16	8	0	3	27	1	78	
5:15 PM	0	2	5	3	0	2	1	2	0	7	24	3	0	1	24	2	76	
5:20 PM	0	0	4	2	0	4	2	2	0	2	19	7	0	1	30	0	73	
5:25 PM	0	1	4	4	0	1	3	1	0	11	29	5	0	1	20	0	80	
5:30 PM	0	2	1	2	0	0	4	6	0	4	19	7	0	2	33	1	81	
5:35 PM	0	0	1	1	0	1	3	2	0	5	22	3	0	1	24	1	64	
5:40 PM	0	0	4	8	0	3	6	3	0	4	23	5	0	1	34	4	95	
5:45 PM	0	1	3	6	0	3	1	3	0	2	15	2	0	1	24	1	62	
5:50 PM	0	0	2	5	0	0	5	1	0	8	28	3	0	4	23	0	79	
5:55 PM	0	1	4	5	0	0	5	4	0	4	19	6	0	3	23	2	76	
Count Total	0	11	75	105	0	52	73	55	0	116	547	112	0	40	646	28	1,860	
Peak Hour	0	5	39	55	0	33	33	23	0	65	295	59	0	22	323	15	967	

Location: HWY 211 & DUBARKO RD PM

Traffic Counts - Heavy Vehicles, Bicycles on Road, and Pedestrians/Bicycles on Crosswalk

Interval Start Time	Heavy Vehicles					Interval Start Time	Bicycles on Roadway					Interval Start Time	Pedestrians/Bicycles on Crosswalk				
	EB	NB	WB	SB	Total		EB	NB	WB	SB	Total		EB	NB	WB	SB	Total
4:00 PM	0	1	0	1	2	4:00 PM	0	0	0	0	0	4:00 PM	0	0	0	0	0
4:05 PM	0	0	0	3	3	4:05 PM	0	0	0	0	0	4:05 PM	0	0	0	0	0
4:10 PM	0	0	0	0	0	4:10 PM	0	0	0	0	0	4:10 PM	0	0	0	0	0
4:15 PM	0	0	1	1	2	4:15 PM	0	0	0	0	0	4:15 PM	0	0	0	0	0
4:20 PM	1	2	0	0	3	4:20 PM	0	0	0	0	0	4:20 PM	0	0	0	0	0
4:25 PM	0	0	1	0	1	4:25 PM	0	0	0	0	0	4:25 PM	0	1	0	3	4
4:30 PM	0	1	1	0	2	4:30 PM	0	0	0	0	0	4:30 PM	0	0	0	0	0
4:35 PM	1	0	0	0	1	4:35 PM	0	0	0	0	0	4:35 PM	0	0	0	0	0
4:40 PM	0	1	1	0	2	4:40 PM	0	0	0	0	0	4:40 PM	0	0	0	0	0
4:45 PM	0	0	0	1	1	4:45 PM	1	0	0	0	1	4:45 PM	0	0	0	0	0
4:50 PM	0	0	0	2	2	4:50 PM	0	0	0	0	0	4:50 PM	0	0	0	0	0
4:55 PM	0	0	0	1	1	4:55 PM	0	0	0	0	0	4:55 PM	0	0	0	0	0
5:00 PM	0	1	0	0	1	5:00 PM	0	0	0	0	0	5:00 PM	0	0	0	0	0
5:05 PM	0	1	0	0	1	5:05 PM	0	0	0	0	0	5:05 PM	0	0	0	0	0
5:10 PM	1	2	0	1	4	5:10 PM	0	0	0	0	0	5:10 PM	0	0	0	0	0
5:15 PM	0	1	0	0	1	5:15 PM	0	0	0	0	0	5:15 PM	0	0	0	3	3
5:20 PM	0	1	0	1	2	5:20 PM	0	0	0	0	0	5:20 PM	0	0	0	0	0
5:25 PM	0	1	0	0	1	5:25 PM	0	0	0	0	0	5:25 PM	0	0	0	3	3
5:30 PM	0	2	0	2	4	5:30 PM	0	0	0	0	0	5:30 PM	0	0	0	0	0
5:35 PM	0	1	0	0	1	5:35 PM	0	0	0	1	1	5:35 PM	0	0	0	1	1
5:40 PM	0	0	0	1	1	5:40 PM	0	0	0	0	0	5:40 PM	0	0	0	0	0
5:45 PM	0	0	0	0	0	5:45 PM	0	0	0	0	0	5:45 PM	0	0	0	0	0
5:50 PM	0	0	0	1	1	5:50 PM	0	0	0	0	0	5:50 PM	0	0	0	0	0
5:55 PM	1	1	1	0	3	5:55 PM	0	0	0	0	0	5:55 PM	0	0	0	0	0
Count Total	4	16	5	15	40	Count Total	1	0	0	1	2	Count Total	0	1	0	10	11
Peak Hour	3	9	3	5	20	Peak Hour	1	0	0	0	1	Peak Hour	0	1	0	6	7

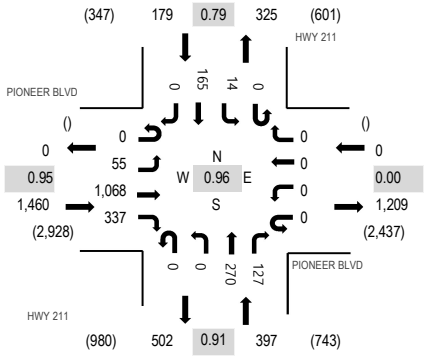
Location: HWY 211 & PIONEER BLVD PM

ALL TRAFFIC DATA SERVICES
(303) 216-2439
www.alltrafficdata.net

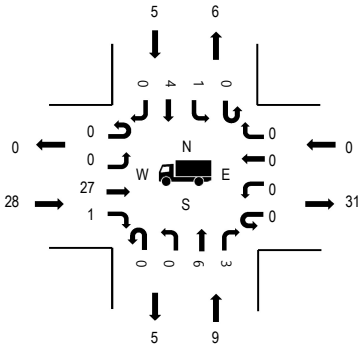
Location: HWY 211 & PIONEER BLVD PM
Date: Wednesday, June 9, 2021
Peak Hour: 04:20 PM - 05:20 PM
Peak 15-Minutes: 05:05 PM - 05:20 PM

Peak Hour

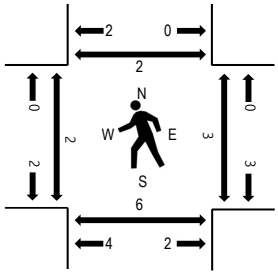
Motorized Vehicles



Heavy Vehicles



Pedestrians



Note: Total study counts contained in parentheses.

	HV%	PHF
EB	1.9%	0.95
WB	0.0%	0.00
NB	2.3%	0.91
SB	2.8%	0.79
All	2.1%	0.96

Traffic Counts - Motorized Vehicles

Interval Start Time	PIONEER BLVD Eastbound				PIONEER BLVD Westbound				HWY 211 Northbound				HWY 211 Southbound					Rolling Hour
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	Total	
4:00 PM	0	5	88	17	0	0	0	0	0	0	19	9	0	1	9	0	148	2,004
4:05 PM	0	7	86	31	0	0	0	0	0	0	19	6	0	1	13	0	163	2,017
4:10 PM	0	7	94	28	0	0	0	0	0	0	17	8	0	3	29	0	186	2,030
4:15 PM	0	2	103	13	0	0	0	0	0	0	12	14	0	4	14	0	162	2,023
4:20 PM	0	5	88	30	0	0	0	0	0	0	22	12	0	1	3	0	161	2,036
4:25 PM	0	7	85	27	0	0	0	0	0	0	28	15	0	1	11	0	174	2,032
4:30 PM	0	5	90	28	0	0	0	0	0	0	23	7	0	1	15	0	169	2,014
4:35 PM	0	4	93	33	0	0	0	0	0	0	19	9	0	0	8	0	166	2,032
4:40 PM	0	3	80	30	0	0	0	0	0	0	26	7	0	3	19	0	168	2,033
4:45 PM	0	5	80	27	0	0	0	0	0	0	25	7	0	0	18	0	162	2,023
4:50 PM	0	4	87	26	0	0	0	0	0	0	22	15	0	0	10	0	164	2,024
4:55 PM	0	8	98	26	0	0	0	0	0	0	23	11	0	3	12	0	181	2,016
5:00 PM	0	5	78	20	0	0	0	0	0	0	18	20	0	2	18	0	161	2,014
5:05 PM	0	4	76	29	0	0	0	0	0	0	27	10	0	2	28	0	176	
5:10 PM	0	4	111	24	0	0	0	0	0	0	16	9	0	1	14	0	179	
5:15 PM	0	1	102	37	0	0	0	0	0	0	21	5	0	0	9	0	175	
5:20 PM	0	5	82	24	0	0	0	0	0	0	16	15	0	0	15	0	157	
5:25 PM	0	3	78	25	0	0	0	0	0	0	22	15	0	0	13	0	156	
5:30 PM	0	2	109	33	0	0	0	0	0	0	18	14	0	1	10	0	187	
5:35 PM	0	5	97	25	0	0	0	0	0	0	18	12	0	1	9	0	167	
5:40 PM	0	6	77	36	0	0	0	0	0	0	21	8	0	1	9	0	158	
5:45 PM	0	4	93	30	0	0	0	0	0	0	16	8	0	1	11	0	163	
5:50 PM	0	6	91	27	0	0	0	0	0	0	13	7	0	0	12	0	156	
5:55 PM	0	5	86	38	0	0	0	0	0	0	28	11	0	4	7	0	179	
Count Total	0	112	2,152	664	0	0	0	0	0	0	489	254	0	31	316	0	4,018	
Peak Hour	0	55	1,068	337	0	0	0	0	0	0	270	127	0	14	165	0	2,036	

Location: HWY 211 & PIONEER BLVD PM

Traffic Counts - Heavy Vehicles, Bicycles on Road, and Pedestrians/Bicycles on Crosswalk

Interval Start Time	Heavy Vehicles					Interval Start Time	Bicycles on Roadway					Interval Start Time	Pedestrians/Bicycles on Crosswalk				
	EB	NB	WB	SB	Total		EB	NB	WB	SB	Total		EB	NB	WB	SB	Total
4:00 PM	5	1	0	0	6	4:00 PM	0	0	0	0	0	4:00 PM	1	0	0	0	1
4:05 PM	5	0	0	1	6	4:05 PM	0	0	0	0	0	4:05 PM	0	0	0	0	0
4:10 PM	4	0	0	0	4	4:10 PM	0	0	0	0	0	4:10 PM	0	0	0	0	0
4:15 PM	4	1	0	1	6	4:15 PM	0	0	0	0	0	4:15 PM	0	0	2	0	2
4:20 PM	3	0	0	0	3	4:20 PM	0	0	0	0	0	4:20 PM	0	0	1	0	1
4:25 PM	2	3	0	0	5	4:25 PM	0	0	0	0	0	4:25 PM	0	0	1	0	1
4:30 PM	2	1	0	0	3	4:30 PM	0	0	0	0	0	4:30 PM	0	0	0	1	1
4:35 PM	2	0	0	0	2	4:35 PM	0	0	0	0	0	4:35 PM	0	1	1	0	2
4:40 PM	2	0	0	0	2	4:40 PM	0	0	0	0	0	4:40 PM	0	1	0	0	1
4:45 PM	3	2	0	0	5	4:45 PM	0	0	0	0	0	4:45 PM	0	0	0	0	0
4:50 PM	1	0	0	2	3	4:50 PM	0	0	0	0	0	4:50 PM	1	1	1	1	4
4:55 PM	4	0	0	1	5	4:55 PM	0	0	0	0	0	4:55 PM	0	1	0	0	1
5:00 PM	1	0	0	1	2	5:00 PM	0	0	0	0	0	5:00 PM	0	0	0	0	0
5:05 PM	1	1	0	0	2	5:05 PM	0	0	0	0	0	5:05 PM	1	1	0	0	2
5:10 PM	3	1	0	1	5	5:10 PM	0	0	0	0	0	5:10 PM	0	1	0	0	1
5:15 PM	4	1	0	0	5	5:15 PM	0	0	0	0	0	5:15 PM	0	0	0	0	0
5:20 PM	1	1	0	1	3	5:20 PM	0	0	0	0	0	5:20 PM	1	0	0	0	1
5:25 PM	2	1	0	0	3	5:25 PM	0	0	0	0	0	5:25 PM	0	2	2	0	4
5:30 PM	4	2	0	1	7	5:30 PM	0	0	0	0	0	5:30 PM	0	0	0	1	1
5:35 PM	6	0	0	0	6	5:35 PM	0	0	0	0	0	5:35 PM	0	0	0	0	0
5:40 PM	1	1	0	2	4	5:40 PM	0	0	0	0	0	5:40 PM	0	1	0	0	1
5:45 PM	2	0	0	0	2	5:45 PM	0	0	1	0	1	5:45 PM	0	2	3	0	5
5:50 PM	7	0	0	0	7	5:50 PM	0	0	0	0	0	5:50 PM	0	0	0	2	2
5:55 PM	1	1	0	1	3	5:55 PM	0	0	0	0	0	5:55 PM	0	0	1	0	1
Count Total	70	17	0	12	99	Count Total	0	0	1	0	1	Count Total	4	11	12	5	32
Peak Hour	28	9	0	5	42	Peak Hour	0	0	0	0	0	Peak Hour	2	6	4	2	14

Table 1 provides traffic volumes by corridor for weekdays and weekends for the last five weeks of available data, May 31 to July 4, 2021. Corridor volumes are prepared by summing traffic volumes from ATRs across 13 corridors for years 2019, 2020 and 2021[5].

Overall statewide traffic volumes are close to pre-COVID traffic volumes. For the month of June, statewide average weekday traffic volumes ranged between 5% below and 5% above 2019 pre-COVID conditions, while weekend volumes ranged between 9% below and equal to 2019 levels. Recent forecast news from the Oregon DAS Office of Economic Analysis indicates economic recovery is expected to move faster than past recessions [6]

Table 1. Observed Year-Over-Year Difference in Traffic Volumes by Corridor 2019-2021

		2021 Volumes		2020 Volumes		2019 Volumes		2021 as % of 2020	
Date	Corridor	Average Weekday	Average Weekend	Average Weekday	Average Weekend	Average Weekday	Average Weekend	Weekday Diff	Weekend Diff
Week 23 May 31- June 6, 2021	I-5	558,510	483,914	466,638	356,866	588,873	519,086	20%	36%
	I-205	244,436	204,969	210,138	158,028	269,797	235,467	16%	30%
	I-405	121,681	101,902	103,291	66,692	143,769	119,357	18%	53%
	I-84	367,455	323,293	308,732	238,313	371,031	343,419	19%	36%
	US 97	158,986	135,404	146,823	118,339	168,151	143,367	8%	14%
	US197	3,578	3,120	2,959	2,583	3,325	2,777	21%	21%
	US20	28,808	24,285	23,669	19,012	25,683	24,331	22%	28%
	US26	54,746	48,449	45,634	41,742	52,260	55,722	20%	16%
	US30	13,271	11,148	10,584	9,625	11,896	11,960	25%	16%
	US395	27,000	22,600	25,703	19,130	29,165	21,212	5%	18%
	OR18	20,746	20,537	17,111	19,026	16,663	21,557	21%	8%
	OR22	31,732	25,749	28,307	20,870	31,838	27,314	12%	23%
	US101	89,221	76,993	69,722	62,523	85,138	78,636	28%	23%
Statewide Average		341,488	295,401	287,606	220,203	359,073	318,941	19%	34%
Week 24 June 7-13, 2021	I-5	563,778	506,995	482,153	403,769	604,078	557,050	17%	26%
	I-205	254,111	216,643	217,082	173,873	274,976	241,338	17%	25%
	I-405	130,579	103,765	106,251	67,900	138,162	111,721	23%	53%
	I-84	373,222	336,902	317,742	265,804	371,513	350,983	17%	27%
	US 97	162,982	143,270	151,426	128,987	167,322	144,049	8%	11%
	US197	3,279	3,081	2,875	2,874	3,300	2,984	14%	7%
	US20	26,872	24,396	23,035	21,125	27,478	26,848	17%	15%
	US26	49,816	50,297	44,922	46,867	54,733	59,844	11%	7%
	US30	11,968	11,572	10,544	10,341	12,629	12,870	14%	12%
	US395	28,230	24,050	25,522	19,638	27,868	21,759	11%	22%
	OR18	17,979	20,422	15,673	20,177	18,915	25,441	15%	1%
	OR22	32,004	25,896	27,696	23,442	32,686	29,214	16%	10%
	US101	90,358	75,148	68,825	67,046	90,295	84,241	31%	12%
Statewide Average		346,835	308,995	296,567	246,468	365,312	335,096	17%	25%

[5] Statewide average values are weighted by pre-COVID traffic volumes in order to monitor relative change in traffic volumes. Without weighting, the higher volume corridors would dominate the results.

[6] See latest post by OEA: https://oregoneconomicanalysis.com/2021/07/09/no-permanent-damage-expected/

Location	US26; MP 46.38; MT. HOOD HIGHWAY NO. 26; 0.30 mile east of Camp Creek Rd (USFS 28)	Site Name	Rhododendron (03-006)
		Installed	August, 1995

HISTORICAL ANNUAL TRAFFIC DATA

Year	Annual Average Daily Traffic (AADT)	Critical Values as percent of Annual Average Daily Traffic (AADT)				
		Max Day	Max Hour	10th Hour	20th Hour	30th Hour
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
2018	10291	199	20.4	19.5	19.0	18.5
2019	10218	204	20.5	19.5	19.1	18.6

2019 SEASONAL TRAFFIC DATA

Month	Weekday		Daily	
	Average	% AADT	Average	% AADT
January	8537	84	11650	114
February	7637	75	9937	97
March	7393	72	10238	100
April	6402	63	8476	83
May	7666	75	9670	95
June	8771	86	11100	109
July	10810	106	13605	133
August	10610	104	13497	132
September	8391	82	9937	97
October	6484	63	7998	78
November	5653	55	6971	68
December	7878	77	9535	93

SEASONAL TREND TABLE (Updated: 10/14/2020)											
TREND	15-Feb	1-Mar	15-Mar	1-Apr	15-Apr	1-May	15-May	1-Jun	15-Jun	1-Jul	Seasonal Trend Peak Period Factor
INTERSTATE URBANIZED	1.1160	1.0605	1.0050	0.9923	0.9796	0.9781	0.9767	0.9615	0.9463	0.9517	0.9463
INTERSTATE NONURBANIZED	1.4616	1.2645	1.0673	1.0382	1.0092	0.9798	0.9504	0.9005	0.8506	0.8322	0.8139
COMMUTER	1.1492	1.0880	1.0268	1.0014	0.9759	0.9705	0.9650	0.9503	0.9355	0.9470	0.9355
COASTAL DESTINATION	1.2289	1.1242	1.0194	1.0316	1.0437	1.0080	0.9723	0.9347	0.8972	0.8612	0.8159
COASTAL DESTINATION ROUTE	1.4968	1.2858	1.0747	1.0911	1.1076	1.0274	0.9473	0.8941	0.8409	0.7820	0.7205
AGRICULTURE	1.6700	1.4596	1.2492	1.1487	1.0482	0.9747	0.9011	0.8579	0.8146	0.8058	0.7670
RECREATIONAL SUMMER	1.9247	1.6595	1.3942	1.2973	1.2004	1.0517	0.9029	0.8256	0.7484	0.7018	0.6552
RECREATIONAL SUMMER WINTER	1.0135	1.0146	1.0158	1.1492	1.2825	1.1763	1.0700	0.9760	0.8821	0.8005	0.7190
RECREATIONAL WINTER	0.6733	0.7219	0.7704	1.0580	1.3455	1.3746	1.4038	1.2832	1.1625	0.9985	0.6389
SUMMER	1.3901	1.2520	1.1139	1.0620	1.0100	0.9718	0.9336	0.8976	0.8615	0.8457	0.8299
SUMMER < 2500	1.4448	1.2869	1.1289	1.0598	0.9906	0.9480	0.9053	0.8720	0.8387	0.8237	0.8086

*** Seasonal Trend Table factors are based on previous year ATR data. The table is updated yearly.**
*** Grey shading indicates months were seasonal factor is greater than or less than 30%**
*** February 2019 snow event causing lower seasonal factors**

June 1	0.9503	
June 15	0.9355	
Daily Adjustment	0.001057	
June 9 Value	0.941843	
Commuter Adjustment	=0.941843/0.9355	1.00678

Daily Volume Count Report

Study Name Newton Street west of Jacoby
Location 45.384363067727755 /-122.25832287805528
Roadway Orientation East /West
Site Code 8667515307
Study Date 6/15/2021
Direction

Start	6-14-2021		Tues		Wed		Thurs		Fri		Sat		Sun		Week Average	
Time	East	West	East	West	East	West	East	West	East	West	East	West	East	West	East	West
12:00 AM				1											0	1
01:00			1	1											1	1
02:00															0	0
03:00															0	0
04:00				1											0	1
05:00			4												4	0
06:00				3											0	3
07:00			1	1											1	1
08:00			2												2	0
09:00			4	3											4	3
10:00			4	6											4	6
11:00			3	3											3	3
12:00 PM			2	5											2	5
01:00			2	8											2	8
02:00			4	5											4	5
03:00			2	6											2	6
04:00			4	8											4	8
05:00			6	7											6	7
06:00			5	13											5	13
07:00			2	4											2	4
08:00			3	5											3	5
09:00			1	4											1	4
10:00			1												1	0
11:00															0	0
Lane	0	0	51	84	0	0	0	0	0	0	0	0	0	0	51	84
Day	0		135		0		0		0		0		0		135	
AM Peak			05:00	10:00											05:00	10:00
Vol.			4	6											4	6
PM Peak			05:00	06:00											05:00	06:00
Vol.			6	13											6	13

Daily Volume Count Report

Study Name Averill Pkwy S of Cascadia (Southbound)
Location 45.385346503017196 /-122.2603799967819
Roadway Orientation South /North

Site Code 4955566172
Study Date 6/15/2021
Direction Southbound

Start	6-14-2021		Tues		Wed		Thurs		Fri		Sat		Sun		Week Average	
Time	South	North	South	North	South	North	South	North	South	North	South	North	South	North	South	North
12:00 AM															0	0
01:00															0	0
02:00															0	0
03:00															0	0
04:00															0	0
05:00															0	0
06:00			1												1	0
07:00			5												5	0
08:00			8												8	0
09:00			8												8	0
10:00			9												9	0
11:00			2												2	0
12:00 PM			9												9	0
01:00			13												13	0
02:00			7												7	0
03:00			11												11	0
04:00			6												6	0
05:00			20												20	0
06:00			15												15	0
07:00			15												15	0
08:00			11												11	0
09:00			8												8	0
10:00			2												2	0
11:00			1												1	0
Lane	0	0	151	0	0	0	0	0	0	0	0	0	0	0	151	0
Day	0		151		0		0		0		0		0		151	
AM Peak			10:00												10:00	
Vol.			9												9	
PM Peak			05:00												05:00	
Vol.			20												20	

Daily Volume Count Report

Study Name Averill S of Cascadia (Northbound)
Location 45.38567367272235 /-122.26087689361204
Roadway Orientation North /South

Site Code 6855039561
Study Date 6/15/2021
Direction Northbound

Start	6-14-2021		Tues		Wed		Thurs		Fri		Sat		Sun		Week Average	
Time	North	South	North	South	North	South	North	South	North	South	North	South	North	South	North	South
12:00 AM															0	0
01:00															0	0
02:00															0	0
03:00															0	0
04:00															0	0
05:00															0	0
06:00			7												7	0
07:00			10												10	0
08:00			12												12	0
09:00			7												7	0
10:00			5												5	0
11:00			10												10	0
12:00 PM			12												12	0
01:00			11												11	0
02:00			7												7	0
03:00			6												6	0
04:00			7												7	0
05:00			7												7	0
06:00			14												14	0
07:00			4												4	0
08:00			1												1	0
09:00			3												3	0
10:00															0	0
11:00															0	0
Lane	0	0	123	0	0	0	0	0	0	0	0	0	0	0	123	0
Day	0		123		0		0		0		0		0		123	
AM Peak			08:00												08:00	
Vol.			12												12	
PM Peak			06:00												06:00	
Vol.			14												14	

Daily Volume Count Report

Study Name Averill S of Newton
Location 45.38425073389019 /-122.26118712663511
Roadway Orientation South /North

Site Code 1617971870
Study Date 6/16/2021
Direction

Start	6-14-2021		Tues		Wed		Thurs		Fri		Sat		Sun		Week Average	
Time	South	North	South	North	South	North	South	North	South	North	South	North	South	North	South	North
12:00 AM							2	1							2	1
01:00															0	0
02:00															0	0
03:00								1							0	1
04:00								4							0	4
05:00								4							0	4
06:00							2	2							2	2
07:00							5	7							5	7
08:00							9	9							9	9
09:00							5	7							5	7
10:00							1	5							1	5
11:00							4	6							4	6
12:00 PM							6	6							6	6
01:00					6	3									6	3
02:00					7	7									7	7
03:00					10	4									10	4
04:00					9	7									9	7
05:00					13	5									13	5
06:00					6	7									6	7
07:00					4	5									4	5
08:00					4										4	0
09:00					4										4	0
10:00					1	2									1	2
11:00					1										1	0
Lane	0	0	0	0	65	40	34	52	0	0	0	0	0	0	99	92
Day	0		0		105		86		0		0		0		191	
AM Peak							08:00	08:00							08:00	08:00
Vol.							9	9							9	9
PM Peak					05:00	02:00	12:00 PM								05:00	02:00
Vol.					13	7	6	6							13	7

Daily Volume Count Report

Study Name Averill S of Amherst
Location 45.38348042625627 /-122.26097579816569
Roadway Orientation South /North
Site Code 8553036648
Study Date 6/16/2021
Direction

Start	6-14-2021		Tues		Wed		Thurs		Fri		Sat		Sun		Week Average	
Time	South	North	South	North	South	North	South	North	South	North	South	North	South	North	South	North
12:00 AM							1								1	0
01:00															0	0
02:00															0	0
03:00								1							0	1
04:00								2							0	2
05:00								1							0	1
06:00							1								1	0
07:00							2	4							2	4
08:00							2	2							2	2
09:00							2	3							2	3
10:00								2							0	2
11:00							2	4							2	4
12:00 PM							4	3							4	3
01:00					4	4									4	4
02:00					6	4									6	4
03:00					5	5									5	5
04:00					3	4									3	4
05:00					6	4									6	4
06:00					2	2									2	2
07:00					2	1									2	1
08:00					2										2	0
09:00					2										2	0
10:00					1										1	0
11:00						1									0	1
Lane	0	0	0	0	33	25	14	22	0	0	0	0	0	0	47	47
Day	0		0		58		36		0		0		0		94	
AM Peak							07:00	07:00							07:00	07:00
Vol.							2	4							2	4
PM Peak					02:00	03:00	12:00 PM								02:00	03:00
Vol.					6	5	4	3							6	5

HCM Signalized Intersection Capacity Analysis
1: Highway 211/Meinig Avenue & Pioneer Blvd 07/13/2021

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	34	760	142	0	0	0	0	315	116	16	92	0
Future Volume (vph)	34	760	142	0	0	0	0	315	116	16	92	0
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Grade (%)		0%			0%			6%			0%	
Total Lost time (s)		4.5	4.5					4.5	4.5	4.5	4.5	
Lane Util. Factor		0.95	1.00					1.00	1.00	1.00	1.00	
Frpb, ped/bikes		1.00	1.00					1.00	0.98	1.00	1.00	
Flpb, ped/bikes		1.00	1.00					1.00	1.00	1.00	1.00	
Frt		1.00	0.85					1.00	0.85	1.00	1.00	
Flt Protected		1.00	1.00					1.00	1.00	0.95	1.00	
Satd. Flow (prot)		2962	1328					1617	1350	1525	1606	
Flt Permitted		1.00	1.00					1.00	1.00	0.34	1.00	
Satd. Flow (perm)		2962	1328					1617	1350	541	1606	
Peak-hour factor, PHF	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89
Adj. Flow (vph)	38	854	160	0	0	0	0	354	130	18	103	0
RTOR Reduction (vph)	0	0	39	0	0	0	0	0	94	0	0	0
Lane Group Flow (vph)	0	892	121	0	0	0	0	354	36	18	103	0
Confl. Peds. (#/hr)	1								4			
Heavy Vehicles (%)	12%	12%	12%	0%	0%	0%	5%	5%	5%	9%	9%	9%
Turn Type	Perm	NA	Perm					NA	Perm	pm+pt	NA	
Protected Phases		2						4		3	8	
Permitted Phases	2		2						4	8		
Actuated Green, G (s)		49.4	49.4					25.0	25.0	31.6	31.6	
Effective Green, g (s)		49.4	49.4					25.0	25.0	31.6	31.6	
Actuated g/C Ratio		0.55	0.55					0.28	0.28	0.35	0.35	
Clearance Time (s)		4.5	4.5					4.5	4.5	4.5	4.5	
Vehicle Extension (s)		3.0	3.0					3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)		1625	728					449	375	212	563	
v/s Ratio Prot								c0.22		0.00	c0.06	
v/s Ratio Perm		0.30	0.09						0.03	0.03		
v/c Ratio		0.55	0.17					0.79	0.10	0.08	0.18	
Uniform Delay, d1		13.1	10.1					30.1	24.1	27.6	20.2	
Progression Factor		1.00	1.00					1.00	1.00	1.00	1.00	
Incremental Delay, d2		1.3	0.5					8.9	0.1	0.2	0.2	
Delay (s)		14.4	10.6					39.0	24.2	27.8	20.4	
Level of Service		B	B					D	C	C	C	
Approach Delay (s)		13.9			0.0			35.0			21.5	
Approach LOS		B			A			D			C	

Intersection Summary			
HCM 2000 Control Delay	20.6	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.62		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	13.5
Intersection Capacity Utilization	49.4%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

HCM 6th Signalized Intersection Summary
1: Highway 211/Meinig Avenue & Pioneer Blvd 07/13/2021

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	34	760	142	0	0	0	0	315	116	16	92	0
Future Volume (veh/h)	34	760	142	0	0	0	0	315	116	16	92	0
Initial Q (Qb), veh	0	0	0				0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00				1.00		0.99	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00				1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No						No			No	
Adj Sat Flow, veh/h/ln	1586	1586	1586				0	1486	1486	1627	1627	0
Adj Flow Rate, veh/h	38	854	0				0	354	130	18	103	0
Peak Hour Factor	0.89	0.89	0.89				0.89	0.89	0.89	0.89	0.89	0.89
Percent Heavy Veh, %	12	12	12				0	5	5	9	9	0
Cap, veh/h	70	1658					0	401	337	126	553	0
Arrive On Green	0.56	0.56	0.00				0.00	0.27	0.27	0.02	0.34	0.00
Sat Flow, veh/h	126	2961	1344				0	1486	1250	1550	1627	0
Grp Volume(v), veh/h	478	414	0				0	354	130	18	103	0
Grp Sat Flow(s),veh/h/ln	1580	1507	1344				0	1486	1250	1550	1627	0
Q Serve(g_s), s	17.2	15.0	0.0				0.0	20.5	7.6	0.0	4.0	0.0
Cycle Q Clear(g_c), s	17.2	15.0	0.0				0.0	20.5	7.6	0.0	4.0	0.0
Prop In Lane	0.08		1.00				0.00		1.00	1.00		0.00
Lane Grp Cap(c), veh/h	885	844					0	401	337	126	553	0
V/C Ratio(X)	0.54	0.49					0.00	0.88	0.39	0.14	0.19	0.00
Avail Cap(c_a), veh/h	885	844					0	537	452	181	759	0
HCM Platoon Ratio	1.00	1.00	1.00				1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	0.00				0.00	1.00	1.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	12.5	12.0	0.0				0.0	31.5	26.8	42.5	20.9	0.0
Incr Delay (d2), s/veh	2.4	2.0	0.0				0.0	12.7	0.7	0.5	0.2	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0				0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	6.3	5.2	0.0				0.0	8.4	2.2	0.4	1.5	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	14.8	14.1	0.0				0.0	44.2	27.5	43.0	21.1	0.0
LnGrp LOS	B	B					A	D	C	D	C	A
Approach Vol, veh/h		892	A					484			121	
Approach Delay, s/veh		14.5						39.7			24.3	
Approach LOS		B						D			C	

Timer - Assigned Phs		2	3	4				8				
Phs Duration (G+Y+Rc), s		54.9	6.3	28.8				35.1				
Change Period (Y+Rc), s		4.5	4.5	4.5				4.5				
Max Green Setting (Gmax), s		39.0	5.0	32.5				42.0				
Max Q Clear Time (g_c+I1), s		19.2	2.0	22.5				6.0				
Green Ext Time (p_c), s		6.1	0.0	1.7				0.6				

Intersection Summary	
HCM 6th Ctrl Delay	23.4
HCM 6th LOS	C

Notes

Unsignalized Delay for [EBR] is excluded from calculations of the approach delay and intersection delay.

Intersection	
Int Delay, s/veh	4.9

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	4	10	48	38	48	46	27	283	11	8	174	1
Future Vol, veh/h	4	10	48	38	48	46	27	283	11	8	174	1
Conflicting Peds, #/hr	2	0	2	2	0	2	2	0	2	2	0	2
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	105	-	-	130	-	-	-	-	-	340
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	78	78	78	78	78	78	78	78	78	78	78	78
Heavy Vehicles, %	5	5	5	4	4	4	5	5	5	4	4	4
Mvmt Flow	5	13	62	49	62	59	35	363	14	10	223	1

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	748	694	227	725	688	374	226	0	0	379	0	0
Stage 1	245	245	-	442	442	-	-	-	-	-	-	-
Stage 2	503	449	-	283	246	-	-	-	-	-	-	-
Critical Hdwy	7.15	6.55	6.25	7.14	6.54	6.24	4.15	-	-	4.14	-	-
Critical Hdwy Stg 1	6.15	5.55	-	6.14	5.54	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.15	5.55	-	6.14	5.54	-	-	-	-	-	-	-
Follow-up Hdwy	3.545	4.045	3.345	3.536	4.036	3.336	2.245	-	-	2.236	-	-
Pot Cap-1 Maneuver	325	363	805	338	367	668	1325	-	-	1169	-	-
Stage 1	752	698	-	591	573	-	-	-	-	-	-	-
Stage 2	545	567	-	720	699	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	247	346	802	292	350	665	1322	-	-	1167	-	-
Mov Cap-2 Maneuver	247	346	-	292	350	-	-	-	-	-	-	-
Stage 1	725	690	-	570	552	-	-	-	-	-	-	-
Stage 2	425	547	-	645	691	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	11.6	18.1	0.7	0.4
HCM LOS	B	C		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	EBLn2	WBLn1	WBLn2	SBL	SBT	SBR
Capacity (veh/h)	1322	-	-	310	802	322	665	1167	-	-
HCM Lane V/C Ratio	0.026	-	-	0.058	0.077	0.342	0.089	0.009	-	-
HCM Control Delay (s)	7.8	0	-	17.3	9.9	21.9	10.9	8.1	0	-
HCM Lane LOS	A	A	-	C	A	C	B	A	A	-
HCM 95th %tile Q(veh)	0.1	-	-	0.2	0.2	1.5	0.3	0	-	-

Intersection	
Int Delay, s/veh	6.8

Movement	NBL	NBR	NET	NER	SWL	SWT
Lane Configurations						
Traffic Vol, veh/h	70	189	134	15	91	169
Future Vol, veh/h	70	189	134	15	91	169
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	Yield	-	None
Storage Length	0	-	-	30	150	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	81	81	81	81	81	81
Heavy Vehicles, %	3	3	9	9	4	4
Mvmt Flow	86	233	165	19	112	209

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	598	165	0	0	165	0
Stage 1	165	-	-	-	-	-
Stage 2	433	-	-	-	-	-
Critical Hdwy	6.43	6.23	-	-	4.14	-
Critical Hdwy Stg 1	5.43	-	-	-	-	-
Critical Hdwy Stg 2	5.43	-	-	-	-	-
Follow-up Hdwy	3.527	3.327	-	-	2.236	-
Pot Cap-1 Maneuver	464	877	-	-	1401	-
Stage 1	862	-	-	-	-	-
Stage 2	652	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	427	877	-	-	1401	-
Mov Cap-2 Maneuver	427	-	-	-	-	-
Stage 1	862	-	-	-	-	-
Stage 2	600	-	-	-	-	-

Approach	NB	NE	SW
HCM Control Delay, s	14.8	0	2.7
HCM LOS	B		

Minor Lane/Major Mvmt	NET	NER	NBLn1	SWL	SWT
Capacity (veh/h)	-	-	683	1401	-
HCM Lane V/C Ratio	-	-	0.468	0.08	-
HCM Control Delay (s)	-	-	14.8	7.8	-
HCM Lane LOS	-	-	B	A	-
HCM 95th %tile Q(veh)	-	-	2.5	0.3	-

HCM Signalized Intersection Capacity Analysis
1: Highway 211/Meinig Avenue & Pioneer Blvd 07/13/2021

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	60	1322	372	0	0	0	0	298	140	15	182	0
Future Volume (vph)	60	1322	372	0	0	0	0	298	140	15	182	0
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Grade (%)		0%			0%			6%			0%	
Total Lost time (s)		4.5	4.5					4.5	4.5	4.5	4.5	
Lane Util. Factor		0.95	1.00					1.00	1.00	1.00	1.00	
Frpb, ped/bikes		1.00	0.97					1.00	0.98	1.00	1.00	
Flpb, ped/bikes		1.00	1.00					1.00	1.00	1.00	1.00	
Frt		1.00	0.85					1.00	0.85	1.00	1.00	
Flt Protected		1.00	1.00					1.00	1.00	0.95	1.00	
Satd. Flow (prot)		3252	1408					1664	1391	1613	1699	
Flt Permitted		1.00	1.00					1.00	1.00	0.34	1.00	
Satd. Flow (perm)		3252	1408					1664	1391	584	1699	
Peak-hour factor, PHF	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Adj. Flow (vph)	62	1377	388	0	0	0	0	310	146	16	190	0
RTOR Reduction (vph)	0	0	61	0	0	0	0	0	93	0	0	0
Lane Group Flow (vph)	0	1440	327	0	0	0	0	310	53	16	190	0
Confl. Peds. (#/hr)	2		6						3	3		
Heavy Vehicles (%)	2%	2%	2%	0%	0%	0%	2%	2%	2%	3%	3%	3%
Turn Type	Perm	NA	Perm					NA	Perm	pm+pt	NA	
Protected Phases		2						4		3	8	
Permitted Phases	2		2						4	8		
Actuated Green, G (s)		55.0	55.0					20.5	20.5	26.0	26.0	
Effective Green, g (s)		55.0	55.0					20.5	20.5	26.0	26.0	
Actuated g/C Ratio		0.61	0.61					0.23	0.23	0.29	0.29	
Clearance Time (s)		4.5	4.5					4.5	4.5	4.5	4.5	
Vehicle Extension (s)		3.0	3.0					3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)		1987	860					379	316	180	490	
v/s Ratio Prot								c0.19		0.00	c0.11	
v/s Ratio Perm		0.44	0.23						0.04	0.02		
v/c Ratio		0.72	0.38					0.82	0.17	0.09	0.39	
Uniform Delay, d1		12.2	8.9					33.0	27.9	30.9	25.6	
Progression Factor		1.00	1.00					1.00	1.00	1.00	1.00	
Incremental Delay, d2		2.3	1.3					12.8	0.3	0.2	0.5	
Delay (s)		14.6	10.1					45.8	28.2	31.1	26.1	
Level of Service		B	B					D	C	C	C	
Approach Delay (s)		13.6			0.0			40.2			26.5	
Approach LOS		B			A			D			C	

Intersection Summary			
HCM 2000 Control Delay	19.5	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.76		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	13.5
Intersection Capacity Utilization	67.2%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

HCM 6th Signalized Intersection Summary
1: Highway 211/Meinig Avenue & Pioneer Blvd 07/13/2021

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	60	1322	372	0	0	0	0	298	140	15	182	0
Future Volume (veh/h)	60	1322	372	0	0	0	0	298	140	15	182	0
Initial Q (Qb), veh	0	0	0				0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00				1.00		0.99	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00				1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No						No			No	
Adj Sat Flow, veh/h/ln	1723	1723	1723				0	1527	1527	1709	1709	0
Adj Flow Rate, veh/h	62	1377	0				0	310	146	16	190	0
Peak Hour Factor	0.96	0.96	0.96				0.96	0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %	2	2	2				0	2	2	3	3	0
Cap, veh/h	83	1941					0	348	293	117	506	0
Arrive On Green	0.60	0.60	0.00				0.00	0.23	0.23	0.02	0.30	0.00
Sat Flow, veh/h	138	3214	1460				0	1527	1286	1628	1709	0
Grp Volume(v), veh/h	771	668	0				0	310	146	16	190	0
Grp Sat Flow(s),veh/h/ln	1716	1637	1460				0	1527	1286	1628	1709	0
Q Serve(g_s), s	29.1	24.6	0.0				0.0	17.7	8.9	0.0	7.9	0.0
Cycle Q Clear(g_c), s	29.1	24.6	0.0				0.0	17.7	8.9	0.0	7.9	0.0
Prop In Lane	0.08		1.00				0.00		1.00	1.00		0.00
Lane Grp Cap(c), veh/h	1036	988					0	348	293	117	506	0
V/C Ratio(X)	0.74	0.68					0.00	0.89	0.50	0.14	0.38	0.00
Avail Cap(c_a), veh/h	1036	988					0	399	336	178	627	0
HCM Platoon Ratio	1.00	1.00	1.00				1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	0.00				0.00	1.00	1.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	12.8	11.9	0.0				0.0	33.7	30.3	43.2	25.1	0.0
Incr Delay (d2), s/veh	4.8	3.7	0.0				0.0	19.6	1.3	0.5	0.5	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0				0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	11.5	9.2	0.0				0.0	8.1	2.7	0.4	3.3	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	17.7	15.6	0.0				0.0	53.3	31.6	43.7	25.5	0.0
LnGrp LOS	B	B					A	D	C	D	C	A
Approach Vol, veh/h		1439	A					456			206	
Approach Delay, s/veh		16.7						46.3			27.0	
Approach LOS		B						D			C	

Timer - Assigned Phs		2	3	4				8				
Phs Duration (G+Y+Rc), s		58.8	6.1	25.0				31.2				
Change Period (Y+Rc), s		4.5	4.5	4.5				4.5				
Max Green Setting (Gmax), s		48.0	5.0	23.5				33.0				
Max Q Clear Time (g_c+I1), s		31.1	2.0	19.7				9.9				
Green Ext Time (p_c), s		9.9	0.0	0.8				1.1				

Intersection Summary	
HCM 6th Ctrl Delay	24.2
HCM 6th LOS	C

Notes

Unsignalized Delay for [EBR] is excluded from calculations of the approach delay and intersection delay.

Intersection	
Int Delay, s/veh	5.2

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	5	43	60	36	36	25	71	325	65	24	356	16
Future Vol, veh/h	5	43	60	36	36	25	71	325	65	24	356	16
Conflicting Peds, #/hr	6	0	0	0	0	6	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	105	-	-	130	-	-	-	-	-	340
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	97	97	97	97	97	97	97	97	97	97	97	97
Heavy Vehicles, %	3	3	3	3	3	3	2	2	2	1	1	1
Mvmt Flow	5	44	62	37	37	26	73	335	67	25	367	16

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	969	965	367	993	948	375	383	0	0	402	0	0
Stage 1	417	417	-	515	515	-	-	-	-	-	-	-
Stage 2	552	548	-	478	433	-	-	-	-	-	-	-
Critical Hdwy	7.13	6.53	6.23	7.13	6.53	6.23	4.12	-	-	4.11	-	-
Critical Hdwy Stg 1	6.13	5.53	-	6.13	5.53	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.13	5.53	-	6.13	5.53	-	-	-	-	-	-	-
Follow-up Hdwy	3.527	4.027	3.327	3.527	4.027	3.327	2.218	-	-	2.209	-	-
Pot Cap-1 Maneuver	232	254	676	223	260	669	1175	-	-	1162	-	-
Stage 1	611	590	-	541	533	-	-	-	-	-	-	-
Stage 2	516	515	-	566	580	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	179	227	676	159	232	665	1175	-	-	1162	-	-
Mov Cap-2 Maneuver	179	227	-	159	232	-	-	-	-	-	-	-
Stage 1	562	574	-	497	490	-	-	-	-	-	-	-
Stage 2	419	473	-	462	564	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	17.6	29.4	1.3	0.5
HCM LOS	C	D		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	EBLn2	WBLn1	WBLn2	SBL	SBT	SBR
Capacity (veh/h)	1175	-	-	221	676	189	665	1162	-	-
HCM Lane V/C Ratio	0.062	-	-	0.224	0.092	0.393	0.039	0.021	-	-
HCM Control Delay (s)	8.3	0	-	25.9	10.9	35.9	10.6	8.2	0	-
HCM Lane LOS	A	A	-	D	B	E	B	A	A	-
HCM 95th %tile Q(veh)	0.2	-	-	0.8	0.3	1.7	0.1	0.1	-	-

Intersection	
Int Delay, s/veh	5.7

Movement	NBL	NBR	NET	NER	SWL	SWT
Lane Configurations						
Traffic Vol, veh/h	52	151	309	73	215	238
Future Vol, veh/h	52	151	309	73	215	238
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	Yield	-	None
Storage Length	0	-	-	30	150	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	96	96	96	96	96	96
Heavy Vehicles, %	2	2	3	3	2	2
Mvmt Flow	54	157	322	76	224	248

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	1018	322	0	0	322	0
Stage 1	322	-	-	-	-	-
Stage 2	696	-	-	-	-	-
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	263	719	-	-	1238	-
Stage 1	735	-	-	-	-	-
Stage 2	495	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	215	719	-	-	1238	-
Mov Cap-2 Maneuver	215	-	-	-	-	-
Stage 1	735	-	-	-	-	-
Stage 2	405	-	-	-	-	-

Approach	NB	NE	SW
HCM Control Delay, s	20	0	4.1
HCM LOS	C		

Minor Lane/Major Mvmt	NET	NER	NBLn1	SWL	SWT
Capacity (veh/h)	-	-	449	1238	-
HCM Lane V/C Ratio	-	-	0.471	0.181	-
HCM Control Delay (s)	-	-	20	8.5	-
HCM Lane LOS	-	-	C	A	-
HCM 95th %tile Q(veh)	-	-	2.5	0.7	-

Trip Generation Calculation Worksheet

Land Use Description: Single-Family Detached Housing
ITE Land Use Code: 210
Independent Variable: Dwelling Units
Quantity: 42 Dwelling Units

Summary of ITE Trip Generation Data

AM Peak Hour of Adjacent Street Traffic
Trip Rate: 0.74 trips per dwelling unit
Directional Distribution: 25% Entering 75% Exiting

PM Peak Hour of Adjacent Street Traffic
Trip Rate: 0.99 trips per dwelling unit
Directional Distribution: 63% Entering 37% Exiting

Total Weekday Traffic
Trip Rate: 9.44 trips per dwelling unit
Directional Distribution: 50% Entering 50% Exiting

Site Trip Generation Calculations

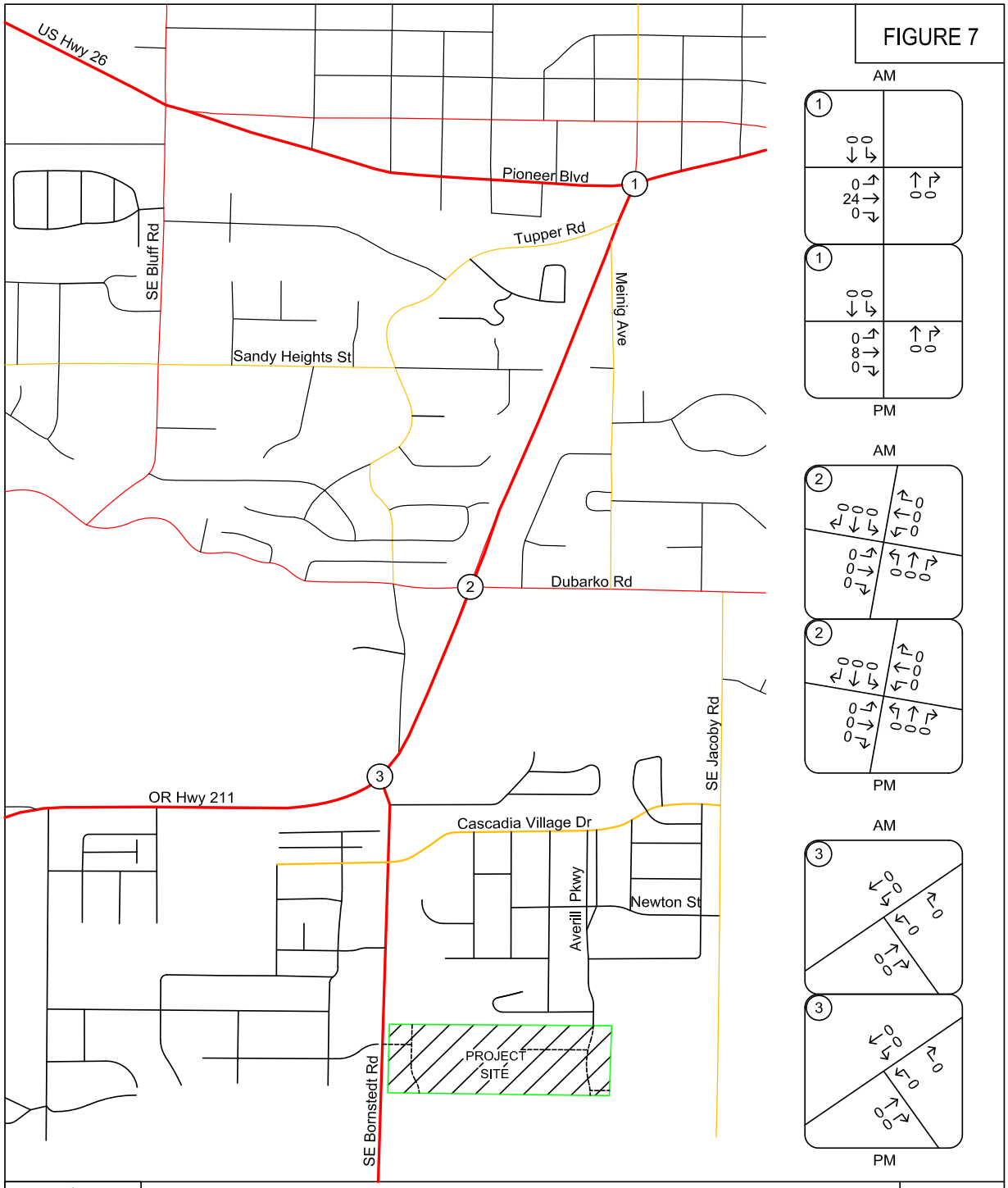
42 Dwelling Units

	Entering	Exiting	Total
AM Peak Hour	8	23	31
PM Peak Hour	26	16	42
Weekday	198	198	396

Data Source: *Trip Generation Manual, 10th Edition* , Institute of Transportation Engineers, 2017

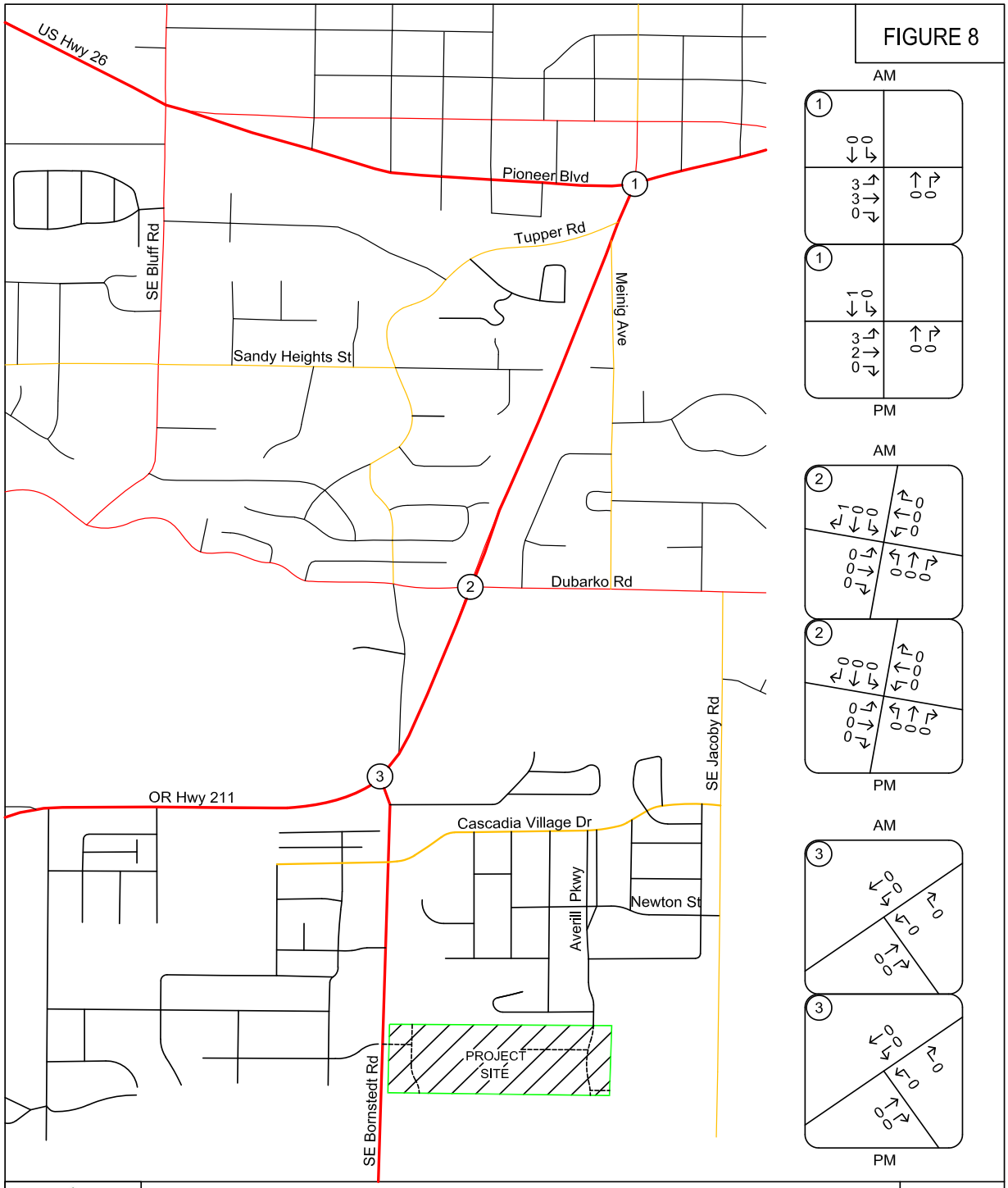
Site id	HWY	MP	DIR	HS	Description	2017	2018	2019	2039	RSQ
1760	026	9.96	1		0.09 mile east of SE 174th Avenue, west city limits of Gresham		20100		20900	MODEL
26003	026	14.36	1		Gresham Automatic Traffic Recorder, Sta. 26-003, 0.18 mile southeast of SE Powell Valley Road		33400		42900	MODEL
1774	026	14.80	1		0.05 mile south of SE Palmquist Road		28500		36100	MODEL
1775	026	18.30	1		0.05 mile northwest of SE Haley Road		25600		37100	MODEL
1776	026	19.24	1		0.30 mile northwest of Clackamas-Boring Highway (OR212)		25500		36900	MODEL
22590	026	20.60	1		0.50 mile northwest of SE Kelso Road		30300		43400	MODEL
1777	026	21.40	1		0.30 mile southeast of SE Kelso Road		30300		42500	MODEL
1778	026	22.72	1		0.02 mile northwest of SE 362nd Drive, west city limits of Sandy		33700		47300	MODEL
1779	026	23.85	1		0.02 mile west of Bluff Road		33300		47100	MODEL
1780	026	23.89	1		0.02 mile east of Bluff Road		15700		22400	MODEL
1781	026	24.02	1		0.02 mile west of Beers Avenue		16200		23100	MODEL
1782	026	24.35	1		0.05 mile west of Eagle Creek-Sandy Highway (OR211)		16000		23400	MODEL
1783	026	24.42	1		0.02 mile east of Eagle Creek-Sandy Highway (OR211)		12400		17700	MODEL
1784	026	24.59	1		0.02 mile west of Ten Eyck Road		12500		17800	MODEL
1785	026	23.89	2		0.02 mile east of Bluff Road		16600		23300	MODEL
1786	026	24.04	2		0.02 mile west of Beers Avenue		18300		25600	MODEL
1787	026	24.36	2		0.05 mile west of Eagle Creek-Sandy Highway (OR211)		15900		22700	MODEL
1788	026	24.40	2		0.02 mile east of Eagle Creek-Sandy Highway (OR211)		13700		19200	MODEL
1789	026	24.61	2		0.02 mile west of Ten Eyck Road		12600		17600	MODEL
1790	026	25.10	1		0.02 mile west of Langensand Road		20700		29200	MODEL
1791	026	25.66	1		0.10 mile east of Vista Loop Drive		23500		32900	MODEL
1792	026	26.76	1		0.10 mile west of SE Firwood Road		19000		26600	MODEL
1793	026	26.93	1		0.07 mile east of SE Firwood Road		17800		25200	MODEL
1794	026	29.66	1		0.23 mile west of Wagoneer Loop Drive (East Jct.)		16500		23400	MODEL
1795	026	34.87	1		0.10 mile west of E Sleepy Hollow Drive		15000		21500	MODEL

FIGURE 7



TRAFFIC VOLUMES
Clackamas County Health Clinic - Site Trips
Morning and Evening Peak Hours

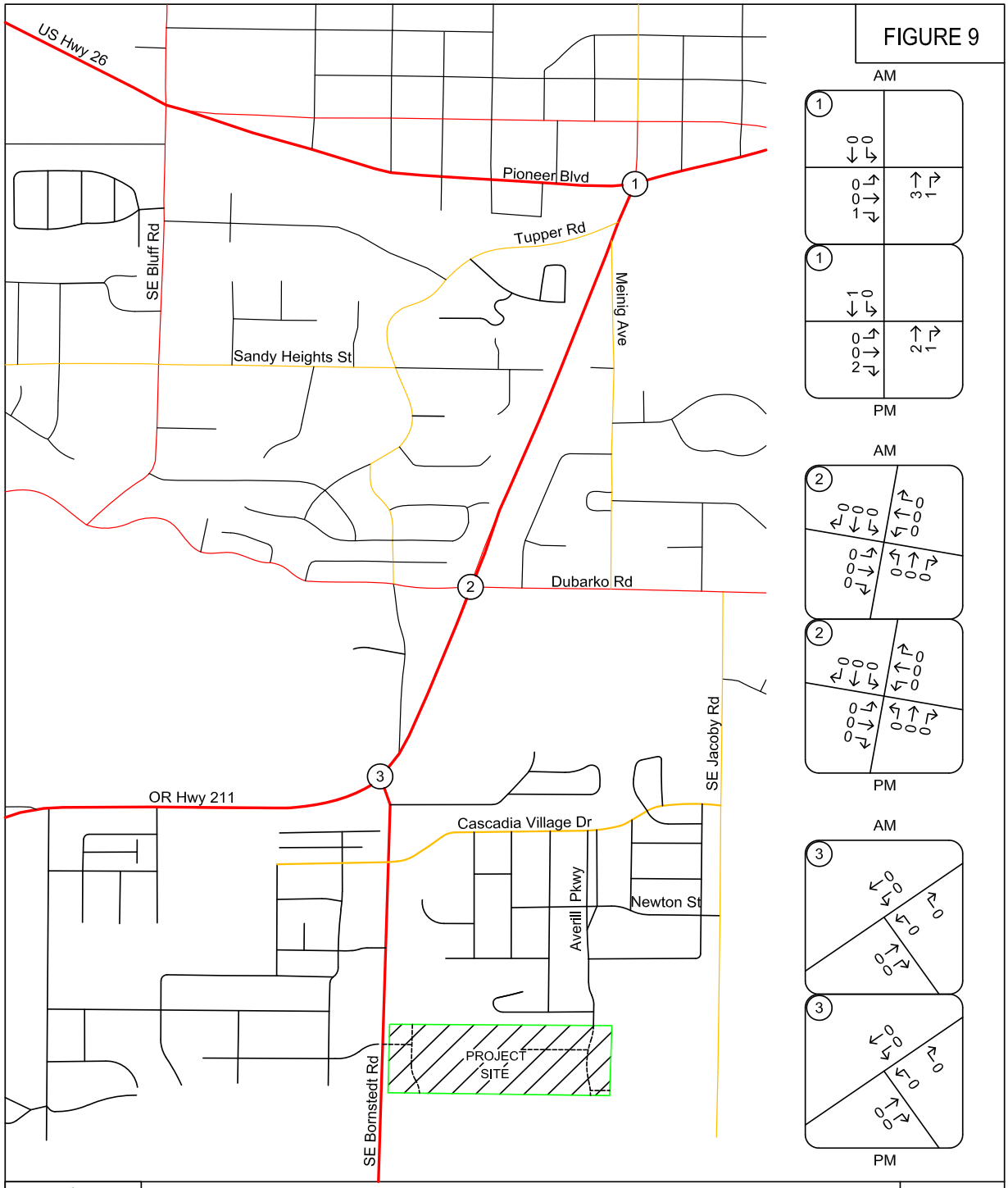
PAGE
IP1



TRAFFIC VOLUMES
Mt. Hood Senior Living Development - Site Trips
Morning and Evening Peak Hours

PAGE
IP2

FIGURE 9



TRAFFIC VOLUMES
The Pad Development - Site Trips
Morning and Evening Peak Hours

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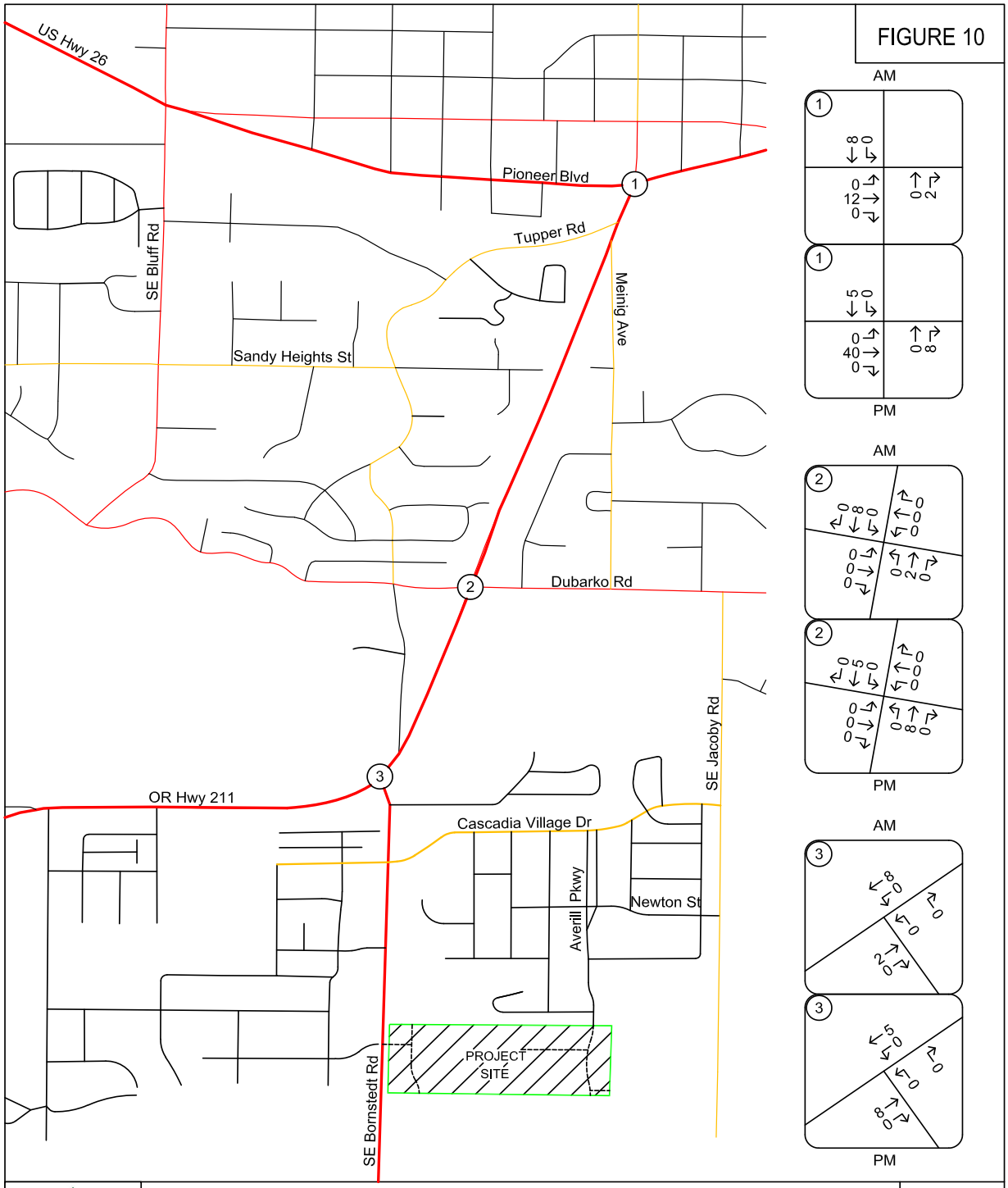

TRAFFIC VOLUMES
The Views - Site Trips
Morning and Evening Peak Hours

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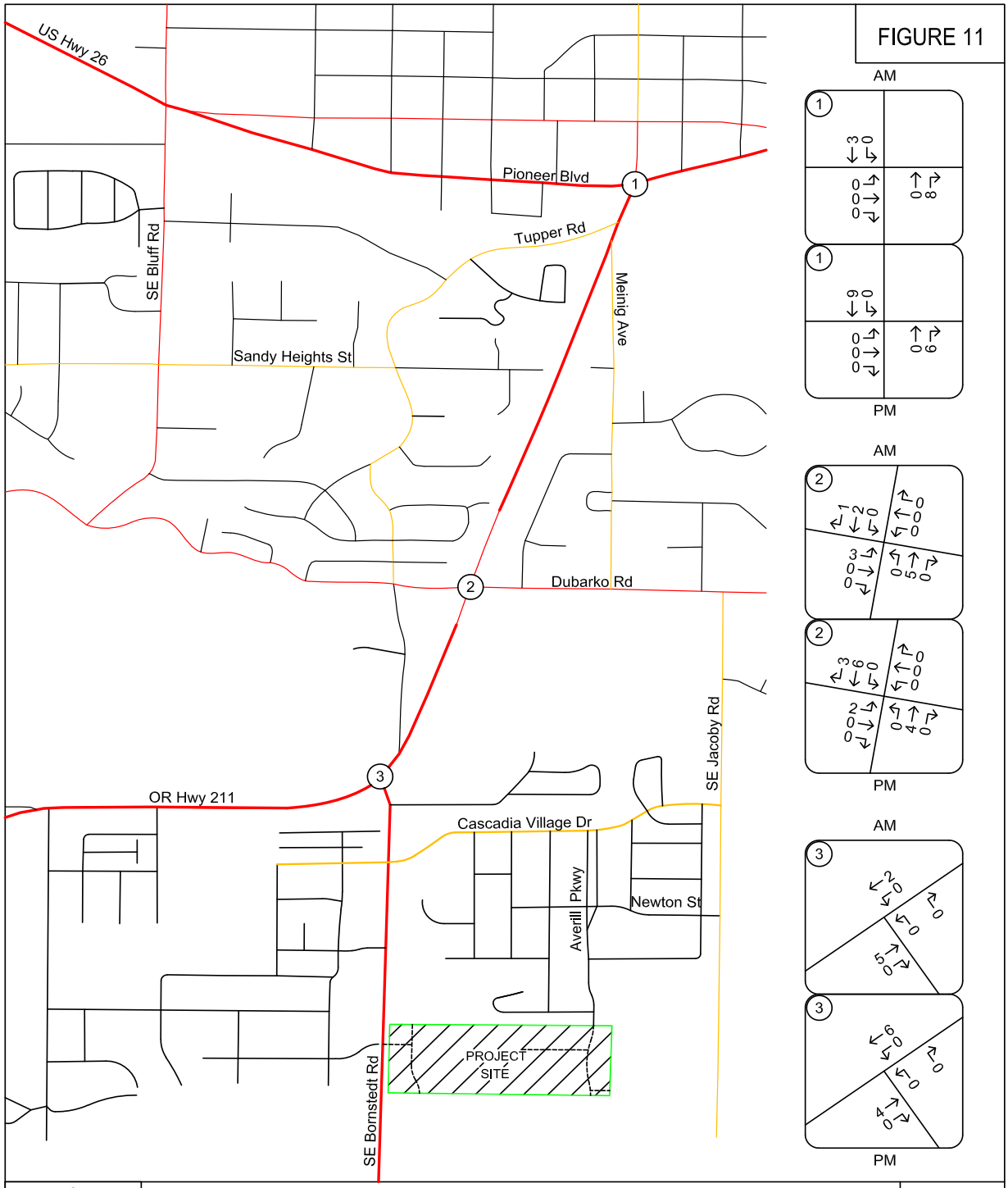
FIGURE 11



TRAFFIC VOLUMES
Shaylee Meadows - Site Trips
Morning and Evening Peak Hours

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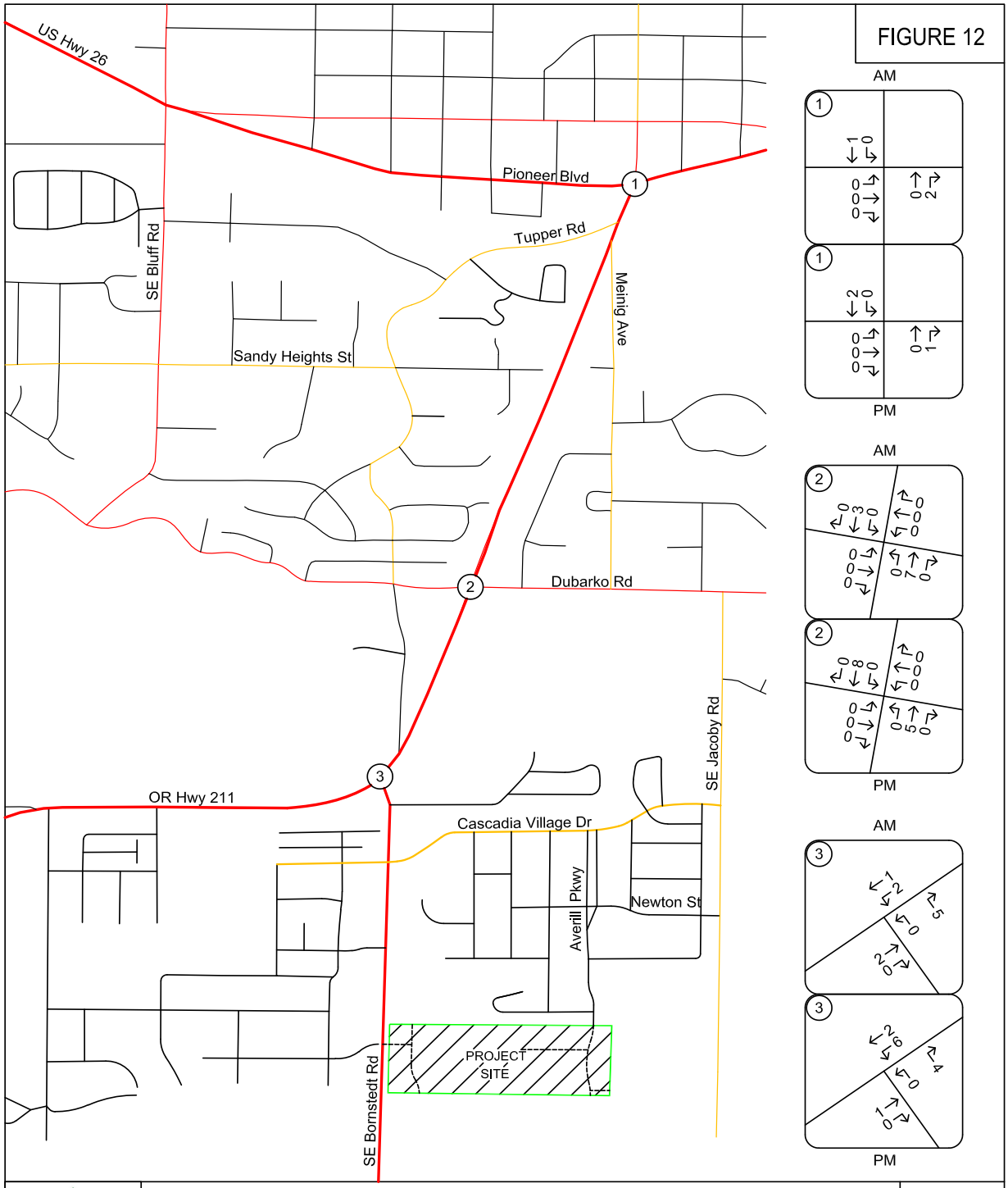
FIGURE 12



TRAFFIC VOLUMES
Mt. View Ridge / Marshall Ridge - Site Trips
Morning and Evening Peak Hours

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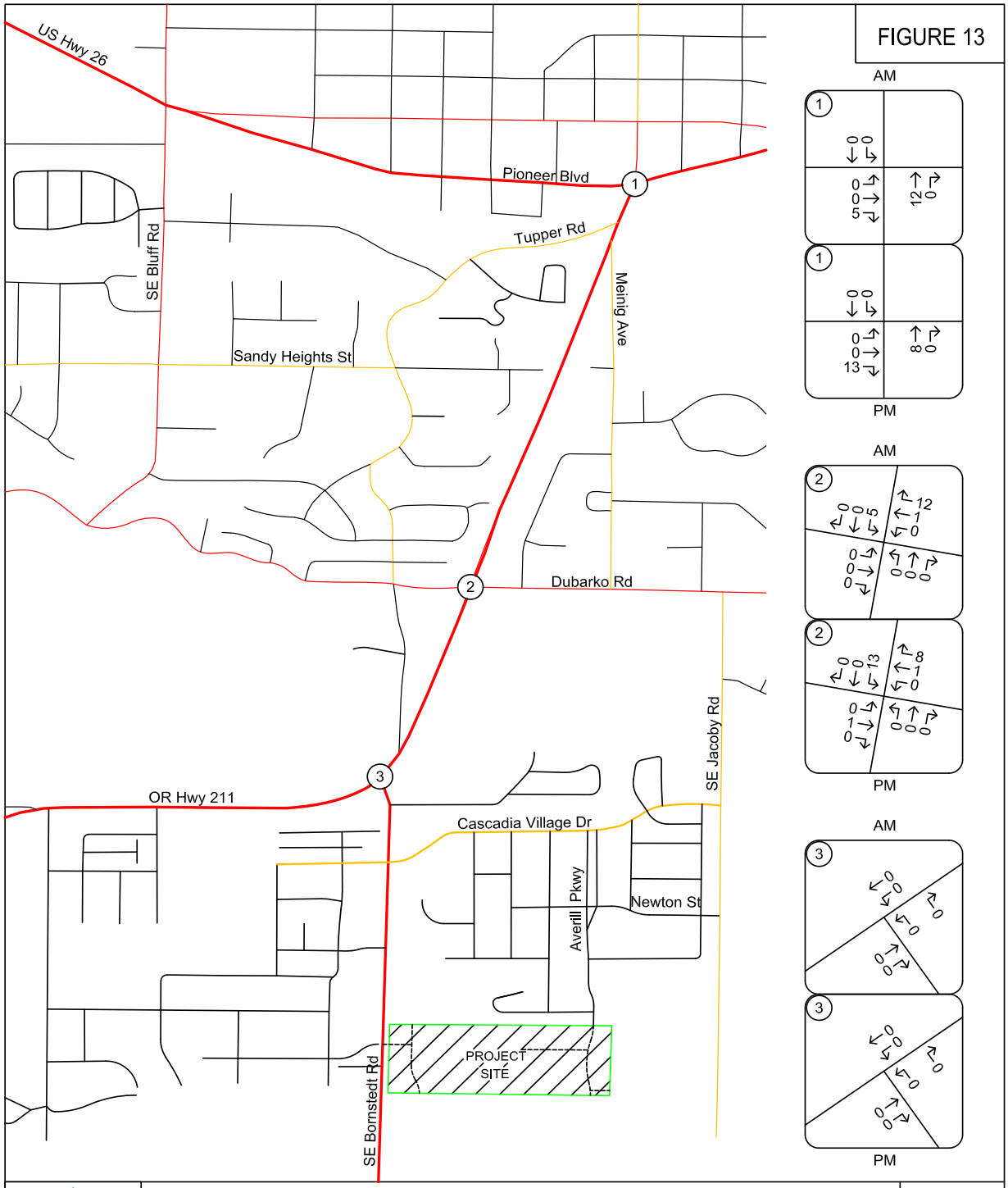
FIGURE 13



TRAFFIC VOLUMES
Jacoby Heights - Site Trips
Morning and Evening Peak Hours

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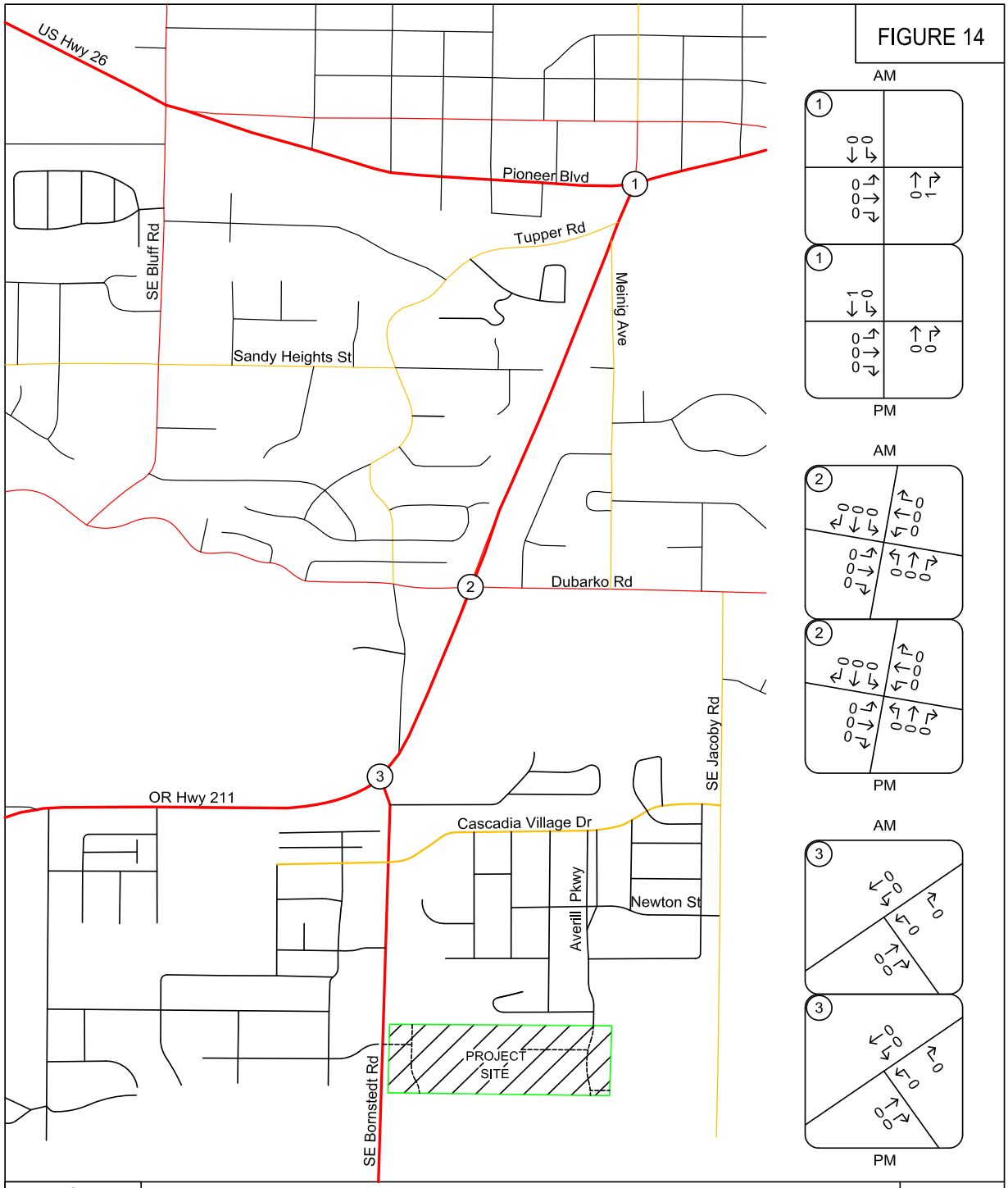
FIGURE 14



TRAFFIC VOLUMES
Trimble PD - Site Trips
Morning and Evening Peak Hours

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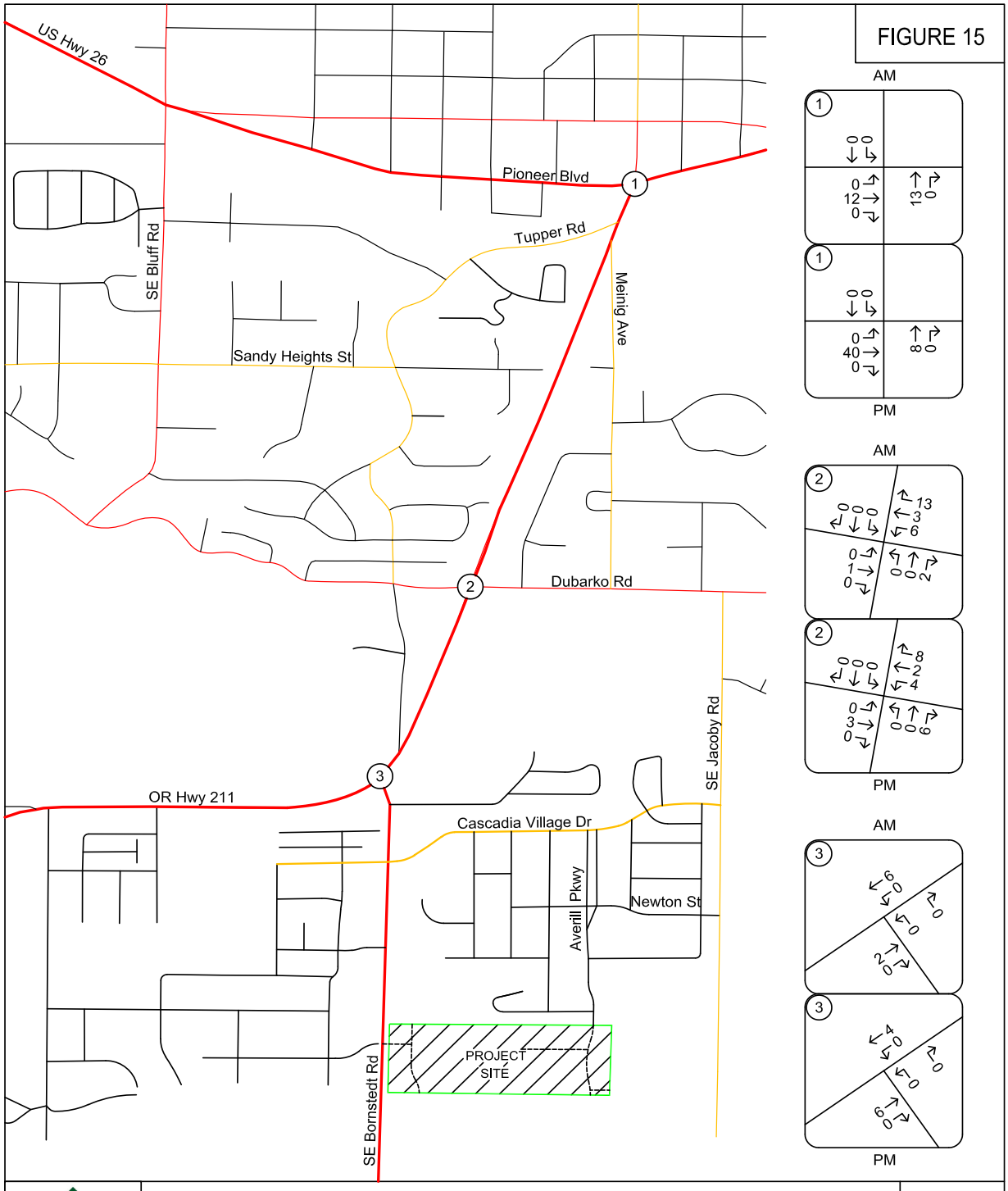

TRAFFIC VOLUMES
Deer Meadows - Site Trips
Morning and Evening Peak Hours

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HCM Signalized Intersection Capacity Analysis
1: Highway 211/Meinig Avenue & Pioneer Blvd 07/13/2021

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	38	843	154	0	0	0	0	356	135	17	108	0
Future Volume (vph)	38	843	154	0	0	0	0	356	135	17	108	0
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Grade (%)		0%			0%			6%			0%	
Total Lost time (s)		4.5	4.5					4.5	4.5	4.5	4.5	
Lane Util. Factor		0.95	1.00					1.00	1.00	1.00	1.00	
Frpb, ped/bikes		1.00	1.00					1.00	0.98	1.00	1.00	
Flpb, ped/bikes		1.00	1.00					1.00	1.00	1.00	1.00	
Frt		1.00	0.85					1.00	0.85	1.00	1.00	
Flt Protected		1.00	1.00					1.00	1.00	0.95	1.00	
Satd. Flow (prot)		2962	1328					1617	1350	1525	1606	
Flt Permitted		1.00	1.00					1.00	1.00	0.30	1.00	
Satd. Flow (perm)		2962	1328					1617	1350	483	1606	
Peak-hour factor, PHF	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89
Adj. Flow (vph)	43	947	173	0	0	0	0	400	152	19	121	0
RTOR Reduction (vph)	0	0	40	0	0	0	0	0	100	0	0	0
Lane Group Flow (vph)	0	990	133	0	0	0	0	400	52	19	121	0
Confl. Peds. (#/hr)	1								4			
Heavy Vehicles (%)	12%	12%	12%	0%	0%	0%	5%	5%	5%	9%	9%	9%
Turn Type	Perm	NA	Perm					NA	Perm	pm+pt	NA	
Protected Phases		2						4		3	8	
Permitted Phases	2		2						4	8		
Actuated Green, G (s)		47.4	47.4					27.0	27.0	33.6	33.6	
Effective Green, g (s)		47.4	47.4					27.0	27.0	33.6	33.6	
Actuated g/C Ratio		0.53	0.53					0.30	0.30	0.37	0.37	
Clearance Time (s)		4.5	4.5					4.5	4.5	4.5	4.5	
Vehicle Extension (s)		3.0	3.0					3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)		1559	699					485	405	204	599	
v/s Ratio Prot								c0.25		0.00	c0.08	
v/s Ratio Perm		0.33	0.10						0.04	0.03		
v/c Ratio		0.64	0.19					0.82	0.13	0.09	0.20	
Uniform Delay, d1		15.1	11.2					29.3	22.9	27.8	19.1	
Progression Factor		1.00	1.00					1.00	1.00	1.00	1.00	
Incremental Delay, d2		2.0	0.6					10.9	0.1	0.2	0.2	
Delay (s)		17.1	11.8					40.2	23.1	28.0	19.3	
Level of Service		B	B					D	C	C	B	
Approach Delay (s)		16.3			0.0			35.5			20.5	
Approach LOS		B			A			D			C	

Intersection Summary			
HCM 2000 Control Delay	22.4	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.70		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	13.5
Intersection Capacity Utilization	54.3%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

HCM 6th Signalized Intersection Summary
1: Highway 211/Meinig Avenue & Pioneer Blvd 07/13/2021

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	38	843	154	0	0	0	0	356	135	17	108	0
Future Volume (veh/h)	38	843	154	0	0	0	0	356	135	17	108	0
Initial Q (Qb), veh	0	0	0				0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00				1.00		0.99	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00				1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No						No			No	
Adj Sat Flow, veh/h/ln	1586	1586	1586				0	1486	1486	1627	1627	0
Adj Flow Rate, veh/h	43	947	0				0	400	152	19	121	0
Peak Hour Factor	0.89	0.89	0.89				0.89	0.89	0.89	0.89	0.89	0.89
Percent Heavy Veh, %	12	12	12				0	5	5	9	9	0
Cap, veh/h	68	1568					0	444	374	126	602	0
Arrive On Green	0.53	0.53	0.00				0.00	0.30	0.30	0.02	0.37	0.00
Sat Flow, veh/h	128	2959	1344				0	1486	1251	1550	1627	0
Grp Volume(v), veh/h	530	460	0				0	400	152	19	121	0
Grp Sat Flow(s),veh/h/ln	1580	1507	1344				0	1486	1251	1550	1627	0
Q Serve(g_s), s	21.4	18.6	0.0				0.0	23.2	8.7	0.0	4.6	0.0
Cycle Q Clear(g_c), s	21.4	18.6	0.0				0.0	23.2	8.7	0.0	4.6	0.0
Prop In Lane	0.08		1.00				0.00		1.00	1.00		0.00
Lane Grp Cap(c), veh/h	837	799					0	444	374	126	602	0
V/C Ratio(X)	0.63	0.58					0.00	0.90	0.41	0.15	0.20	0.00
Avail Cap(c_a), veh/h	837	799					0	537	452	180	759	0
HCM Platoon Ratio	1.00	1.00	1.00				1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	0.00				0.00	1.00	1.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	15.0	14.3	0.0				0.0	30.3	25.2	42.5	19.3	0.0
Incr Delay (d2), s/veh	3.6	3.0	0.0				0.0	16.1	0.7	0.5	0.2	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0				0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	8.1	6.7	0.0				0.0	9.8	2.5	0.4	1.7	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	18.6	17.3	0.0				0.0	46.4	25.9	43.1	19.5	0.0
LnGrp LOS	B	B					A	D	C	D	B	A
Approach Vol, veh/h		990	A					552			140	
Approach Delay, s/veh		18.0						40.8			22.7	
Approach LOS		B						D			C	

Timer - Assigned Phs		2	3	4				8				
Phs Duration (G+Y+Rc), s		52.2	6.4	31.4				37.8				
Change Period (Y+Rc), s		4.5	4.5	4.5				4.5				
Max Green Setting (Gmax), s		39.0	5.0	32.5				42.0				
Max Q Clear Time (g_c+I1), s		23.4	2.0	25.2				6.6				
Green Ext Time (p_c), s		6.2	0.0	1.7				0.7				

Intersection Summary	
HCM 6th Ctrl Delay	25.9
HCM 6th LOS	C

Notes

Unsignalized Delay for [EBR] is excluded from calculations of the approach delay and intersection delay.

Intersection	
Int Delay, s/veh	6

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↰	↱		↰	↱		↔			↰	↱
Traffic Vol, veh/h	7	11	50	46	53	73	28	308	13	13	194	3
Future Vol, veh/h	7	11	50	46	53	73	28	308	13	13	194	3
Conflicting Peds, #/hr	2	0	2	2	0	2	2	0	2	2	0	2
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	105	-	-	130	-	-	-	-	-	340
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	78	78	78	78	78	78	78	78	78	78	78	78
Heavy Vehicles, %	5	5	5	4	4	4	5	5	5	4	4	4
Mvmt Flow	9	14	64	59	68	94	36	395	17	17	249	4

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	844	771	253	804	767	408	255	0	0	414	0	0
Stage 1	285	285	-	478	478	-	-	-	-	-	-	-
Stage 2	559	486	-	326	289	-	-	-	-	-	-	-
Critical Hdwy	7.15	6.55	6.25	7.14	6.54	6.24	4.15	-	-	4.14	-	-
Critical Hdwy Stg 1	6.15	5.55	-	6.14	5.54	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.15	5.55	-	6.14	5.54	-	-	-	-	-	-	-
Follow-up Hdwy	3.545	4.045	3.345	3.536	4.036	3.336	2.245	-	-	2.236	-	-
Pot Cap-1 Maneuver	280	327	778	299	330	639	1293	-	-	1134	-	-
Stage 1	716	670	-	565	552	-	-	-	-	-	-	-
Stage 2	508	546	-	682	669	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	190	309	775	253	312	637	1291	-	-	1132	-	-
Mov Cap-2 Maneuver	190	309	-	253	312	-	-	-	-	-	-	-
Stage 1	689	657	-	544	531	-	-	-	-	-	-	-
Stage 2	364	525	-	601	656	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	13	21	0.6	0.5
HCM LOS	B	C		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	EBLn2	WBLn1	WBLn2	SBL	SBT	SBR
Capacity (veh/h)	1291	-	-	248	775	281	637	1132	-	-
HCM Lane V/C Ratio	0.028	-	-	0.093	0.083	0.452	0.147	0.015	-	-
HCM Control Delay (s)	7.9	0	-	21	10.1	27.9	11.6	8.2	0	-
HCM Lane LOS	A	A	-	C	B	D	B	A	A	-
HCM 95th %tile Q(veh)	0.1	-	-	0.3	0.3	2.2	0.5	0	-	-

Intersection	
Int Delay, s/veh	7.2

Movement	NBL	NBR	NET	NER	SWL	SWT
Lane Configurations						
Traffic Vol, veh/h	73	202	150	16	97	193
Future Vol, veh/h	73	202	150	16	97	193
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	Yield	-	None
Storage Length	0	-	-	30	150	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	81	81	81	81	81	81
Heavy Vehicles, %	3	3	9	9	4	4
Mvmt Flow	90	249	185	20	120	238

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	663	185	0	0	185	0
Stage 1	185	-	-	-	-	-
Stage 2	478	-	-	-	-	-
Critical Hdwy	6.43	6.23	-	-	4.14	-
Critical Hdwy Stg 1	5.43	-	-	-	-	-
Critical Hdwy Stg 2	5.43	-	-	-	-	-
Follow-up Hdwy	3.527	3.327	-	-	2.236	-
Pot Cap-1 Maneuver	425	855	-	-	1378	-
Stage 1	844	-	-	-	-	-
Stage 2	622	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	388	855	-	-	1378	-
Mov Cap-2 Maneuver	388	-	-	-	-	-
Stage 1	844	-	-	-	-	-
Stage 2	568	-	-	-	-	-

Approach	NB	NE	SW
HCM Control Delay, s	16.5	0	2.6
HCM LOS	C		

Minor Lane/Major Mvmt	NET	NER	NBLn1	SWL	SWT
Capacity (veh/h)	-	-	648	1378	-
HCM Lane V/C Ratio	-	-	0.524	0.087	-
HCM Control Delay (s)	-	-	16.5	7.9	-
HCM Lane LOS	-	-	C	A	-
HCM 95th %tile Q(veh)	-	-	3.1	0.3	-

HCM Signalized Intersection Capacity Analysis
1: Highway 211/Meinig Avenue & Pioneer Blvd 07/13/2021

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	65	1468	402	0	0	0	0	328	162	16	208	0
Future Volume (vph)	65	1468	402	0	0	0	0	328	162	16	208	0
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Grade (%)		0%			0%			6%			0%	
Total Lost time (s)		4.5	4.5					4.5	4.5	4.5	4.5	
Lane Util. Factor		0.95	1.00					1.00	1.00	1.00	1.00	
Frpb, ped/bikes		1.00	0.97					1.00	0.98	1.00	1.00	
Flpb, ped/bikes		1.00	1.00					1.00	1.00	1.00	1.00	
Frt		1.00	0.85					1.00	0.85	1.00	1.00	
Flt Protected		1.00	1.00					1.00	1.00	0.95	1.00	
Satd. Flow (prot)		3252	1408					1664	1391	1613	1699	
Flt Permitted		1.00	1.00					1.00	1.00	0.30	1.00	
Satd. Flow (perm)		3252	1408					1664	1391	513	1699	
Peak-hour factor, PHF	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Adj. Flow (vph)	68	1529	419	0	0	0	0	342	169	17	217	0
RTOR Reduction (vph)	0	0	64	0	0	0	0	0	83	0	0	0
Lane Group Flow (vph)	0	1597	355	0	0	0	0	342	86	17	217	0
Confl. Peds. (#/hr)	2		6						3	3		
Heavy Vehicles (%)	2%	2%	2%	0%	0%	0%	2%	2%	2%	3%	3%	3%
Turn Type	Perm	NA	Perm					NA	Perm	pm+pt	NA	
Protected Phases		2						4		3	8	
Permitted Phases	2		2						4	8		
Actuated Green, G (s)		53.4	53.4					21.1	21.1	27.6	27.6	
Effective Green, g (s)		53.4	53.4					21.1	21.1	27.6	27.6	
Actuated g/C Ratio		0.59	0.59					0.23	0.23	0.31	0.31	
Clearance Time (s)		4.5	4.5					4.5	4.5	4.5	4.5	
Vehicle Extension (s)		3.0	3.0					3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)		1929	835					390	326	181	521	
v/s Ratio Prot								c0.21		0.00	c0.13	
v/s Ratio Perm		0.49	0.25						0.06	0.03		
v/c Ratio		0.83	0.43					0.88	0.26	0.09	0.42	
Uniform Delay, d1		14.6	10.0					33.2	28.1	31.0	24.8	
Progression Factor		1.00	1.00					1.00	1.00	1.00	1.00	
Incremental Delay, d2		4.3	1.6					19.3	0.4	0.2	0.5	
Delay (s)		18.9	11.5					52.5	28.5	31.3	25.3	
Level of Service		B	B					D	C	C	C	
Approach Delay (s)		17.4			0.0			44.6			25.8	
Approach LOS		B			A			D			C	

Intersection Summary			
HCM 2000 Control Delay	23.1	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.84		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	13.5
Intersection Capacity Utilization	73.1%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

HCM 6th Signalized Intersection Summary
1: Highway 211/Meinig Avenue & Pioneer Blvd 07/13/2021

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	65	1468	402	0	0	0	0	328	162	16	208	0
Future Volume (veh/h)	65	1468	402	0	0	0	0	328	162	16	208	0
Initial Q (Qb), veh	0	0	0				0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00				1.00		0.99	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00				1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No						No			No	
Adj Sat Flow, veh/h/ln	1723	1723	1723				0	1527	1527	1709	1709	0
Adj Flow Rate, veh/h	68	1529	0				0	342	169	17	217	0
Peak Hour Factor	0.96	0.96	0.96				0.96	0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %	2	2	2				0	2	2	3	3	0
Cap, veh/h	80	1890					0	372	313	113	534	0
Arrive On Green	0.59	0.59	0.00				0.00	0.24	0.24	0.02	0.31	0.00
Sat Flow, veh/h	136	3216	1460				0	1527	1286	1628	1709	0
Grp Volume(v), veh/h	856	741	0				0	342	169	17	217	0
Grp Sat Flow(s),veh/h/ln	1716	1637	1460				0	1527	1286	1628	1709	0
Q Serve(g_s), s	36.9	30.7	0.0				0.0	19.6	10.3	0.0	9.0	0.0
Cycle Q Clear(g_c), s	36.9	30.7	0.0				0.0	19.6	10.3	0.0	9.0	0.0
Prop In Lane	0.08		1.00				0.00		1.00	1.00		0.00
Lane Grp Cap(c), veh/h	1008	962					0	372	313	113	534	0
V/C Ratio(X)	0.85	0.77					0.00	0.92	0.54	0.15	0.41	0.00
Avail Cap(c_a), veh/h	1008	962					0	382	322	173	608	0
HCM Platoon Ratio	1.00	1.00	1.00				1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	0.00				0.00	1.00	1.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	15.3	14.0	0.0				0.0	33.2	29.7	43.3	24.4	0.0
Incr Delay (d2), s/veh	8.9	6.0	0.0				0.0	26.8	1.7	0.6	0.5	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0				0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	15.6	12.0	0.0				0.0	9.6	3.2	0.4	3.7	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	24.1	20.0	0.0				0.0	60.0	31.4	43.9	24.9	0.0
LnGrp LOS	C	B					A	E	C	D	C	A
Approach Vol, veh/h		1597	A					511			234	
Approach Delay, s/veh		22.2						50.6			26.2	
Approach LOS		C						D			C	

Timer - Assigned Phs		2	3	4				8				
Phs Duration (G+Y+Rc), s		57.4	6.2	26.4				32.6				
Change Period (Y+Rc), s		4.5	4.5	4.5				4.5				
Max Green Setting (Gmax), s		49.0	5.0	22.5				32.0				
Max Q Clear Time (g_c+I1), s		38.9	2.0	21.6				11.0				
Green Ext Time (p_c), s		7.4	0.0	0.2				1.2				

Intersection Summary	
HCM 6th Ctrl Delay	28.8
HCM 6th LOS	C

Notes

Unsignalized Delay for [EBR] is excluded from calculations of the approach delay and intersection delay.

Intersection	
Int Delay, s/veh	7.1

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	7	49	62	41	40	42	74	355	74	38	389	20
Future Vol, veh/h	7	49	62	41	40	42	74	355	74	38	389	20
Conflicting Peds, #/hr	6	0	0	0	0	6	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	105	-	-	130	-	-	-	-	-	340
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	97	97	97	97	97	97	97	97	97	97	97	97
Heavy Vehicles, %	3	3	3	3	3	3	2	2	2	1	1	1
Mvmt Flow	7	51	64	42	41	43	76	366	76	39	401	21

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	1083	1073	401	1103	1056	410	422	0	0	442	0	0
Stage 1	479	479	-	556	556	-	-	-	-	-	-	-
Stage 2	604	594	-	547	500	-	-	-	-	-	-	-
Critical Hdwy	7.13	6.53	6.23	7.13	6.53	6.23	4.12	-	-	4.11	-	-
Critical Hdwy Stg 1	6.13	5.53	-	6.13	5.53	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.13	5.53	-	6.13	5.53	-	-	-	-	-	-	-
Follow-up Hdwy	3.527	4.027	3.327	3.527	4.027	3.327	2.218	-	-	2.209	-	-
Pot Cap-1 Maneuver	194	219	647	188	224	639	1137	-	-	1123	-	-
Stage 1	566	553	-	514	511	-	-	-	-	-	-	-
Stage 2	484	491	-	519	541	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	136	190	647	122	195	635	1137	-	-	1123	-	-
Mov Cap-2 Maneuver	136	190	-	122	195	-	-	-	-	-	-	-
Stage 1	515	528	-	468	465	-	-	-	-	-	-	-
Stage 2	372	447	-	404	517	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	22	40.4	1.2	0.7
HCM LOS	C	E		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	EBLn2	WBLn1	WBLn2	SBL	SBT	SBR
Capacity (veh/h)	1137	-	-	181	647	150	635	1123	-	-
HCM Lane V/C Ratio	0.067	-	-	0.319	0.099	0.557	0.068	0.035	-	-
HCM Control Delay (s)	8.4	0	-	33.9	11.2	55.6	11.1	8.3	0	-
HCM Lane LOS	A	A	-	D	B	F	B	A	A	-
HCM 95th %tile Q(veh)	0.2	-	-	1.3	0.3	2.8	0.2	0.1	-	-

Intersection	
Int Delay, s/veh	6.3

Movement	NBL	NBR	NET	NER	SWL	SWT
Lane Configurations						
Traffic Vol, veh/h	54	161	340	76	230	265
Future Vol, veh/h	54	161	340	76	230	265
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	Yield	-	None
Storage Length	0	-	-	30	150	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	96	96	96	96	96	96
Heavy Vehicles, %	2	2	3	3	2	2
Mvmt Flow	56	168	354	79	240	276

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	1110	354	0	0	354	0
Stage 1	354	-	-	-	-	-
Stage 2	756	-	-	-	-	-
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	232	690	-	-	1205	-
Stage 1	710	-	-	-	-	-
Stage 2	464	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	186	690	-	-	1205	-
Mov Cap-2 Maneuver	186	-	-	-	-	-
Stage 1	710	-	-	-	-	-
Stage 2	372	-	-	-	-	-

Approach	NB	NE	SW
HCM Control Delay, s	23.8	0	4.1
HCM LOS	C		

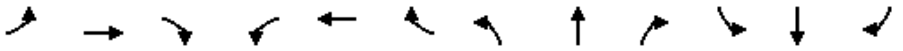
Minor Lane/Major Mvmt	NET	NER	NBLn1	SWL	SWT
Capacity (veh/h)	-	-	411	1205	-
HCM Lane V/C Ratio	-	-	0.545	0.199	-
HCM Control Delay (s)	-	-	23.8	8.7	-
HCM Lane LOS	-	-	C	A	-
HCM 95th %tile Q(veh)	-	-	3.2	0.7	-

HCM Signalized Intersection Capacity Analysis
1: Highway 211/Meinig Avenue & Pioneer Blvd 07/13/2021

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	38	843	159	0	0	0	0	371	136	17	109	0
Future Volume (vph)	38	843	159	0	0	0	0	371	136	17	109	0
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Grade (%)		0%			0%			6%			0%	
Total Lost time (s)		4.5	4.5					4.5	4.5	4.5	4.5	
Lane Util. Factor		0.95	1.00					1.00	1.00	1.00	1.00	
Frpb, ped/bikes		1.00	1.00					1.00	0.98	1.00	1.00	
Flpb, ped/bikes		1.00	1.00					1.00	1.00	1.00	1.00	
Frt		1.00	0.85					1.00	0.85	1.00	1.00	
Flt Protected		1.00	1.00					1.00	1.00	0.95	1.00	
Satd. Flow (prot)		2962	1328					1617	1350	1525	1606	
Flt Permitted		1.00	1.00					1.00	1.00	0.29	1.00	
Satd. Flow (perm)		2962	1328					1617	1350	461	1606	
Peak-hour factor, PHF	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89
Adj. Flow (vph)	43	947	179	0	0	0	0	417	153	19	122	0
RTOR Reduction (vph)	0	0	42	0	0	0	0	0	96	0	0	0
Lane Group Flow (vph)	0	990	137	0	0	0	0	417	57	19	122	0
Confl. Peds. (#/hr)	1								4			
Heavy Vehicles (%)	12%	12%	12%	0%	0%	0%	5%	5%	5%	9%	9%	9%
Turn Type	Perm	NA	Perm					NA	Perm	pm+pt	NA	
Protected Phases		2						4		3	8	
Permitted Phases	2		2						4	8		
Actuated Green, G (s)		46.9	46.9					27.6	27.6	34.1	34.1	
Effective Green, g (s)		46.9	46.9					27.6	27.6	34.1	34.1	
Actuated g/C Ratio		0.52	0.52					0.31	0.31	0.38	0.38	
Clearance Time (s)		4.5	4.5					4.5	4.5	4.5	4.5	
Vehicle Extension (s)		3.0	3.0					3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)		1543	692					495	414	198	608	
v/s Ratio Prot								c0.26		0.00	c0.08	
v/s Ratio Perm		0.33	0.10						0.04	0.03		
v/c Ratio		0.64	0.20					0.84	0.14	0.10	0.20	
Uniform Delay, d1		15.5	11.5					29.2	22.6	28.0	18.8	
Progression Factor		1.00	1.00					1.00	1.00	1.00	1.00	
Incremental Delay, d2		2.1	0.6					12.3	0.2	0.2	0.2	
Delay (s)		17.6	12.2					41.5	22.7	28.2	19.0	
Level of Service		B	B					D	C	C	B	
Approach Delay (s)		16.7			0.0			36.5			20.2	
Approach LOS		B			A			D			C	

Intersection Summary			
HCM 2000 Control Delay	23.0	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.71		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	13.5
Intersection Capacity Utilization	55.2%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			

HCM 6th Signalized Intersection Summary
1: Highway 211/Meinig Avenue & Pioneer Blvd 07/13/2021



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	38	843	159	0	0	0	0	371	136	17	109	0
Future Volume (veh/h)	38	843	159	0	0	0	0	371	136	17	109	0
Initial Q (Qb), veh	0	0	0				0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00				1.00		0.99	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00				1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No						No			No	
Adj Sat Flow, veh/h/ln	1586	1586	1586				0	1486	1486	1627	1627	0
Adj Flow Rate, veh/h	43	947	0				0	417	153	19	122	0
Peak Hour Factor	0.89	0.89	0.89				0.89	0.89	0.89	0.89	0.89	0.89
Percent Heavy Veh, %	12	12	12				0	5	5	9	9	0
Cap, veh/h	67	1538					0	459	387	125	619	0
Arrive On Green	0.52	0.52	0.00				0.00	0.31	0.31	0.02	0.38	0.00
Sat Flow, veh/h	128	2959	1344				0	1486	1252	1550	1627	0
Grp Volume(v), veh/h	530	460	0				0	417	153	19	122	0
Grp Sat Flow(s),veh/h/ln	1580	1507	1344				0	1486	1252	1550	1627	0
Q Serve(g_s), s	21.8	19.0	0.0				0.0	24.2	8.7	0.0	4.5	0.0
Cycle Q Clear(g_c), s	21.8	19.0	0.0				0.0	24.2	8.7	0.0	4.5	0.0
Prop In Lane	0.08		1.00				0.00		1.00	1.00		0.00
Lane Grp Cap(c), veh/h	821	783					0	459	387	125	619	0
V/C Ratio(X)	0.65	0.59					0.00	0.91	0.40	0.15	0.20	0.00
Avail Cap(c_a), veh/h	821	783					0	537	452	179	759	0
HCM Platoon Ratio	1.00	1.00	1.00				1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	0.00				0.00	1.00	1.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	15.6	14.9	0.0				0.0	29.9	24.5	42.6	18.7	0.0
Incr Delay (d2), s/veh	3.9	3.2	0.0				0.0	17.6	0.7	0.6	0.2	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0				0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	8.4	6.9	0.0				0.0	10.3	2.5	0.4	1.7	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	19.5	18.1	0.0				0.0	47.4	25.1	43.2	18.8	0.0
LnGrp LOS	B	B					A	D	C	D	B	A
Approach Vol, veh/h		990	A					570			141	
Approach Delay, s/veh		18.9						41.4			22.1	
Approach LOS		B						D			C	

Timer - Assigned Phs		2	3	4				8				
Phs Duration (G+Y+Rc), s		51.3	6.4	32.3				38.7				
Change Period (Y+Rc), s		4.5	4.5	4.5				4.5				
Max Green Setting (Gmax), s		39.0	5.0	32.5				42.0				
Max Q Clear Time (g_c+I1), s		23.8	2.0	26.2				6.5				
Green Ext Time (p_c), s		6.1	0.0	1.6				0.7				

Intersection Summary	
HCM 6th Ctrl Delay	26.7
HCM 6th LOS	C

Notes

Unsignalized Delay for [EBR] is excluded from calculations of the approach delay and intersection delay.

Intersection	
Int Delay, s/veh	6.1

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	7	11	50	46	53	73	29	324	13	13	200	3
Future Vol, veh/h	7	11	50	46	53	73	29	324	13	13	200	3
Conflicting Peds, #/hr	2	0	2	2	0	2	2	0	2	2	0	2
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	105	-	-	130	-	-	-	-	-	340
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	78	78	78	78	78	78	78	78	78	78	78	78
Heavy Vehicles, %	5	5	5	4	4	4	5	5	5	4	4	4
Mvmt Flow	9	14	64	59	68	94	37	415	17	17	256	4

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	873	800	260	833	796	428	262	0	0	434	0	0
Stage 1	292	292	-	500	500	-	-	-	-	-	-	-
Stage 2	581	508	-	333	296	-	-	-	-	-	-	-
Critical Hdwy	7.15	6.55	6.25	7.14	6.54	6.24	4.15	-	-	4.14	-	-
Critical Hdwy Stg 1	6.15	5.55	-	6.14	5.54	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.15	5.55	-	6.14	5.54	-	-	-	-	-	-	-
Follow-up Hdwy	3.545	4.045	3.345	3.536	4.036	3.336	2.245	-	-	2.236	-	-
Pot Cap-1 Maneuver	267	315	771	286	318	623	1285	-	-	1115	-	-
Stage 1	710	666	-	549	540	-	-	-	-	-	-	-
Stage 2	494	534	-	676	665	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	179	296	768	241	299	621	1283	-	-	1113	-	-
Mov Cap-2 Maneuver	179	296	-	241	299	-	-	-	-	-	-	-
Stage 1	682	653	-	527	518	-	-	-	-	-	-	-
Stage 2	350	513	-	594	652	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	13.2	22.2	0.6	0.5
HCM LOS	B	C		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	EBLn2	WBLn1	WBLn2	SBL	SBT	SBR
Capacity (veh/h)	1283	-	-	236	768	269	621	1113	-	-
HCM Lane V/C Ratio	0.029	-	-	0.098	0.083	0.472	0.151	0.015	-	-
HCM Control Delay (s)	7.9	0	-	21.9	10.1	29.8	11.8	8.3	0	-
HCM Lane LOS	A	A	-	C	B	D	B	A	A	-
HCM 95th %tile Q(veh)	0.1	-	-	0.3	0.3	2.4	0.5	0	-	-

Intersection	
Int Delay, s/veh	7.9

Movement	NBL	NBR	NET	NER	SWL	SWT
Lane Configurations						
Traffic Vol, veh/h	76	219	150	17	103	193
Future Vol, veh/h	76	219	150	17	103	193
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	Yield	-	None
Storage Length	0	-	-	30	150	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	81	81	81	81	81	81
Heavy Vehicles, %	3	3	9	9	4	4
Mvmt Flow	94	270	185	21	127	238

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	677	185	0	0	185	0
Stage 1	185	-	-	-	-	-
Stage 2	492	-	-	-	-	-
Critical Hdwy	6.43	6.23	-	-	4.14	-
Critical Hdwy Stg 1	5.43	-	-	-	-	-
Critical Hdwy Stg 2	5.43	-	-	-	-	-
Follow-up Hdwy	3.527	3.327	-	-	2.236	-
Pot Cap-1 Maneuver	417	855	-	-	1378	-
Stage 1	844	-	-	-	-	-
Stage 2	612	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	379	855	-	-	1378	-
Mov Cap-2 Maneuver	379	-	-	-	-	-
Stage 1	844	-	-	-	-	-
Stage 2	556	-	-	-	-	-

Approach	NB	NE	SW
HCM Control Delay, s	17.5	0	2.7
HCM LOS	C		

Minor Lane/Major Mvmt	NET	NER	NBLn1	SWL	SWT
Capacity (veh/h)	-	-	646	1378	-
HCM Lane V/C Ratio	-	-	0.564	0.092	-
HCM Control Delay (s)	-	-	17.5	7.9	-
HCM Lane LOS	-	-	C	A	-
HCM 95th %tile Q(veh)	-	-	3.5	0.3	-

HCM Signalized Intersection Capacity Analysis
1: Highway 211/Meinig Avenue & Pioneer Blvd 07/13/2021

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	65	1468	419	0	0	0	0	338	163	16	210	0
Future Volume (vph)	65	1468	419	0	0	0	0	338	163	16	210	0
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Grade (%)		0%			0%			6%			0%	
Total Lost time (s)		4.5	4.5					4.5	4.5	4.5	4.5	
Lane Util. Factor		0.95	1.00					1.00	1.00	1.00	1.00	
Frpb, ped/bikes		1.00	0.97					1.00	0.98	1.00	1.00	
Flpb, ped/bikes		1.00	1.00					1.00	1.00	1.00	1.00	
Frt		1.00	0.85					1.00	0.85	1.00	1.00	
Flt Protected		1.00	1.00					1.00	1.00	0.95	1.00	
Satd. Flow (prot)		3252	1408					1664	1391	1613	1699	
Flt Permitted		1.00	1.00					1.00	1.00	0.29	1.00	
Satd. Flow (perm)		3252	1408					1664	1391	498	1699	
Peak-hour factor, PHF	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Adj. Flow (vph)	68	1529	436	0	0	0	0	352	170	17	219	0
RTOR Reduction (vph)	0	0	67	0	0	0	0	0	83	0	0	0
Lane Group Flow (vph)	0	1597	369	0	0	0	0	352	87	17	219	0
Confl. Peds. (#/hr)	2		6						3	3		
Heavy Vehicles (%)	2%	2%	2%	0%	0%	0%	2%	2%	2%	3%	3%	3%
Turn Type	Perm	NA	Perm					NA	Perm	pm+pt	NA	
Protected Phases		2						4		3	8	
Permitted Phases	2		2						4	8		
Actuated Green, G (s)		53.0	53.0					21.5	21.5	28.0	28.0	
Effective Green, g (s)		53.0	53.0					21.5	21.5	28.0	28.0	
Actuated g/C Ratio		0.59	0.59					0.24	0.24	0.31	0.31	
Clearance Time (s)		4.5	4.5					4.5	4.5	4.5	4.5	
Vehicle Extension (s)		3.0	3.0					3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)		1915	829					397	332	179	528	
v/s Ratio Prot								c0.21		0.00	c0.13	
v/s Ratio Perm		0.49	0.26						0.06	0.03		
v/c Ratio		0.83	0.44					0.89	0.26	0.09	0.41	
Uniform Delay, d1		14.9	10.3					33.1	27.8	31.1	24.5	
Progression Factor		1.00	1.00					1.00	1.00	1.00	1.00	
Incremental Delay, d2		4.5	1.7					20.5	0.4	0.2	0.5	
Delay (s)		19.4	12.0					53.5	28.2	31.3	25.1	
Level of Service		B	B					D	C	C	C	
Approach Delay (s)		17.8			0.0			45.3			25.5	
Approach LOS		B			A			D			C	

Intersection Summary			
HCM 2000 Control Delay	23.6	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.85		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	13.5
Intersection Capacity Utilization	73.2%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

HCM 6th Signalized Intersection Summary
1: Highway 211/Meinig Avenue & Pioneer Blvd 07/13/2021

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	65	1468	419	0	0	0	0	338	163	16	210	0
Future Volume (veh/h)	65	1468	419	0	0	0	0	338	163	16	210	0
Initial Q (Qb), veh	0	0	0				0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00				1.00		0.99	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00				1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No						No			No	
Adj Sat Flow, veh/h/ln	1723	1723	1723				0	1527	1527	1709	1709	0
Adj Flow Rate, veh/h	68	1529	0				0	352	170	17	219	0
Peak Hour Factor	0.96	0.96	0.96				0.96	0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %	2	2	2				0	2	2	3	3	0
Cap, veh/h	79	1874					0	379	319	112	542	0
Arrive On Green	0.58	0.58	0.00				0.00	0.25	0.25	0.02	0.32	0.00
Sat Flow, veh/h	136	3216	1460				0	1527	1287	1628	1709	0
Grp Volume(v), veh/h	856	741	0				0	352	170	17	219	0
Grp Sat Flow(s),veh/h/ln	1716	1637	1460				0	1527	1287	1628	1709	0
Q Serve(g_s), s	37.4	31.1	0.0				0.0	20.3	10.3	0.0	9.0	0.0
Cycle Q Clear(g_c), s	37.4	31.1	0.0				0.0	20.3	10.3	0.0	9.0	0.0
Prop In Lane	0.08		1.00				0.00		1.00	1.00		0.00
Lane Grp Cap(c), veh/h	1000	953					0	379	319	112	542	0
V/C Ratio(X)	0.86	0.78					0.00	0.93	0.53	0.15	0.40	0.00
Avail Cap(c_a), veh/h	1000	953					0	382	322	171	608	0
HCM Platoon Ratio	1.00	1.00	1.00				1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	0.00				0.00	1.00	1.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	15.6	14.3	0.0				0.0	33.1	29.3	43.3	24.0	0.0
Incr Delay (d2), s/veh	9.3	6.2	0.0				0.0	28.7	1.7	0.6	0.5	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0				0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	15.9	12.2	0.0				0.0	10.1	3.2	0.4	3.7	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	25.0	20.5	0.0				0.0	61.7	31.0	43.9	24.5	0.0
LnGrp LOS	C	C					A	E	C	D	C	A
Approach Vol, veh/h		1597	A					522			236	
Approach Delay, s/veh		22.9						51.7			25.9	
Approach LOS		C						D			C	

Timer - Assigned Phs		2	3	4				8				
Phs Duration (G+Y+Rc), s		56.9	6.2	26.8				33.1				
Change Period (Y+Rc), s		4.5	4.5	4.5				4.5				
Max Green Setting (Gmax), s		49.0	5.0	22.5				32.0				
Max Q Clear Time (g_c+I1), s		39.4	2.0	22.3				11.0				
Green Ext Time (p_c), s		7.1	0.0	0.1				1.2				

Intersection Summary	
HCM 6th Ctrl Delay	29.6
HCM 6th LOS	C

Notes

Unsignalized Delay for [EBR] is excluded from calculations of the approach delay and intersection delay.

Intersection	
Int Delay, s/veh	7.6

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	7	49	63	41	40	42	75	366	74	38	408	20
Future Vol, veh/h	7	49	63	41	40	42	75	366	74	38	408	20
Conflicting Peds, #/hr	6	0	0	0	0	6	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	105	-	-	130	-	-	-	-	-	340
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	97	97	97	97	97	97	97	97	97	97	97	97
Heavy Vehicles, %	3	3	3	3	3	3	2	2	2	1	1	1
Mvmt Flow	7	51	65	42	41	43	77	377	76	39	421	21

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	1116	1106	421	1137	1089	421	442	0	0	453	0	0
Stage 1	499	499	-	569	569	-	-	-	-	-	-	-
Stage 2	617	607	-	568	520	-	-	-	-	-	-	-
Critical Hdwy	7.13	6.53	6.23	7.13	6.53	6.23	4.12	-	-	4.11	-	-
Critical Hdwy Stg 1	6.13	5.53	-	6.13	5.53	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.13	5.53	-	6.13	5.53	-	-	-	-	-	-	-
Follow-up Hdwy	3.527	4.027	3.327	3.527	4.027	3.327	2.218	-	-	2.209	-	-
Pot Cap-1 Maneuver	184	210	630	178	215	630	1118	-	-	1113	-	-
Stage 1	552	542	-	505	504	-	-	-	-	-	-	-
Stage 2	476	485	-	506	530	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	127	181	630	113	186	626	1118	-	-	1113	-	-
Mov Cap-2 Maneuver	127	181	-	113	186	-	-	-	-	-	-	-
Stage 1	501	517	-	458	457	-	-	-	-	-	-	-
Stage 2	364	440	-	390	505	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	23.1	45.3	1.2	0.7
HCM LOS	C	E		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	EBLn2	WBLn1	WBLn2	SBL	SBT	SBR
Capacity (veh/h)	1118	-	-	172	630	140	626	1113	-	-
HCM Lane V/C Ratio	0.069	-	-	0.336	0.103	0.596	0.069	0.035	-	-
HCM Control Delay (s)	8.5	0	-	36.2	11.4	63	11.2	8.4	0	-
HCM Lane LOS	A	A	-	E	B	F	B	A	A	-
HCM 95th %tile Q(veh)	0.2	-	-	1.4	0.3	3.1	0.2	0.1	-	-

Intersection	
Int Delay, s/veh	7.2

Movement	NBL	NBR	NET	NER	SWL	SWT
Lane Configurations						
Traffic Vol, veh/h	56	173	340	79	250	265
Future Vol, veh/h	56	173	340	79	250	265
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	Yield	-	None
Storage Length	0	-	-	30	150	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	96	96	96	96	96	96
Heavy Vehicles, %	2	2	3	3	2	2
Mvmt Flow	58	180	354	82	260	276

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	1150	354	0	0	354	0
Stage 1	354	-	-	-	-	-
Stage 2	796	-	-	-	-	-
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	219	690	-	-	1205	-
Stage 1	710	-	-	-	-	-
Stage 2	444	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	172	690	-	-	1205	-
Mov Cap-2 Maneuver	172	-	-	-	-	-
Stage 1	710	-	-	-	-	-
Stage 2	348	-	-	-	-	-

Approach	NB	NE	SW
HCM Control Delay, s	26.8	0	4.3
HCM LOS	D		

Minor Lane/Major Mvmt	NET	NER	NBLn1	SWL	SWT
Capacity (veh/h)	-	-	397	1205	-
HCM Lane V/C Ratio	-	-	0.601	0.216	-
HCM Control Delay (s)	-	-	26.8	8.8	-
HCM Lane LOS	-	-	D	A	-
HCM 95th %tile Q(veh)	-	-	3.8	0.8	-

Intersection	
Intersection Delay, s/veh	19.7
Intersection LOS	C

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	7	11	50	46	53	73	29	324	13	13	200	3
Future Vol, veh/h	7	11	50	46	53	73	29	324	13	13	200	3
Peak Hour Factor	0.78	0.78	0.78	0.78	0.78	0.78	0.78	0.78	0.78	0.78	0.78	0.78
Heavy Vehicles, %	5	5	5	4	4	4	5	5	5	4	4	4
Mvmt Flow	9	14	64	59	68	94	37	415	17	17	256	4
Number of Lanes	0	1	1	0	1	1	0	1	0	0	1	1

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	2	2	2	1
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	2	1	2	2
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	1	2	2	2
HCM Control Delay	10.4	11.6	28.3	14.6
HCM LOS	B	B	D	B

Lane	NBLn1	EBLn1	EBLn2	WBLn1	WBLn2	SBLn1	SBLn2
Vol Left, %	8%	39%	0%	46%	0%	6%	0%
Vol Thru, %	89%	61%	0%	54%	0%	94%	0%
Vol Right, %	4%	0%	100%	0%	100%	0%	100%
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	366	18	50	99	73	213	3
LT Vol	29	7	0	46	0	13	0
Through Vol	324	11	0	53	0	200	0
RT Vol	13	0	50	0	73	0	3
Lane Flow Rate	469	23	64	127	94	273	4
Geometry Grp	6	7	7	7	7	7	7
Degree of Util (X)	0.79	0.048	0.118	0.254	0.163	0.477	0.006
Departure Headway (Hd)	6.06	7.521	6.602	7.212	6.257	6.292	5.549
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Cap	596	473	538	495	569	571	641
Service Time	4.12	5.319	4.399	4.995	4.039	4.063	3.32
HCM Lane V/C Ratio	0.787	0.049	0.119	0.257	0.165	0.478	0.006
HCM Control Delay	28.3	10.7	10.3	12.5	10.3	14.7	8.4
HCM Lane LOS	D	B	B	B	B	B	A
HCM 95th-tile Q	7.6	0.2	0.4	1	0.6	2.6	0

Intersection	
Intersection Delay, s/veh	33.5
Intersection LOS	D

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	7	49	63	41	40	42	75	366	74	38	408	20
Future Vol, veh/h	7	49	63	41	40	42	75	366	74	38	408	20
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Heavy Vehicles, %	3	3	3	3	3	3	2	2	2	1	1	1
Mvmt Flow	7	51	65	42	41	43	77	377	76	39	421	21
Number of Lanes	0	1	1	0	1	1	0	1	0	0	1	1

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	2	2	2	1
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	2	1	2	2
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	1	2	2	2
HCM Control Delay	11.4	12	47.1	29.7
HCM LOS	B	B	E	D

Lane	NBLn1	EBLn1	EBLn2	WBLn1	WBLn2	SBLn1	SBLn2
Vol Left, %	15%	12%	0%	51%	0%	9%	0%
Vol Thru, %	71%	88%	0%	49%	0%	91%	0%
Vol Right, %	14%	0%	100%	0%	100%	0%	100%
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	515	56	63	81	42	446	20
LT Vol	75	7	0	41	0	38	0
Through Vol	366	49	0	40	0	408	0
RT Vol	74	0	63	0	42	0	20
Lane Flow Rate	531	58	65	84	43	460	21
Geometry Grp	6	7	7	7	7	7	7
Degree of Util (X)	0.929	0.128	0.13	0.189	0.086	0.81	0.032
Departure Headway (Hd)	6.299	7.995	7.206	8.159	7.172	6.34	5.584
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Cap	579	448	497	439	499	575	643
Service Time	4.314	5.75	4.961	5.913	4.926	4.055	3.298
HCM Lane V/C Ratio	0.917	0.129	0.131	0.191	0.086	0.8	0.033
HCM Control Delay	47.1	11.9	11	12.8	10.6	30.7	8.5
HCM Lane LOS	E	B	B	B	B	D	A
HCM 95th-tile Q	11.8	0.4	0.4	0.7	0.3	8	0.1

SER# / INVEST / RD DPT / UNLOC?	S P E D C	A L G S	D R U N V	M J I H L	S C O R K	W DATE / DAY / TIME / LAT	CLASS / DIST / FROM / LONG	CITY STREET / FIRST STREET / SECOND STREET / LRS	RD CHAR / DIRECT / LOCTN	INT-TYPE (MEDIAN) / LEGS (#LANES)	INT-REL / TRAF- / CONTL	OFFRD / RNDBT / DRVWY	WTHR / SURF / LIGHT	CRASH / COLL / SVRTY	SPCL USE / TRLR QTY / OWNER / V# TYPE	MOVE / FROM / TO	P# TYPE	PRTC / INJ / SVRTY	A G E	S E X	LICNS RES	PED LOC	ERROR	ACT EVENT	CAUSE
02296	N	N	N		N	07/06/2019	16	DUBARKO RD	INTER	CROSS	N	N	CLR	S-1STOP	01 NONE 9	STRGHT									27,29,32
CITY						SA		EAGLE CRK-SANDY HY	N		NONE	N	DRY	REAR	N/A	NE-SW							000	00
N						11A			06	0		N	DAY	PDO	PSNGR CAR		01 DRVR	NONE	00	Unk	UNK		000	000	00
N						45 23 22.65	-122 15 48.74	017200100S00														UNK				
															02 NONE 9	STOP									
															N/A	NE-SW							011	00
															PSNGR CAR		01 DRVR	NONE	00	Unk	UNK		000	000	00
																						UNK			
01165	N	N	N			03/10/2016	16	DUBARKO RD	INTER	CROSS	N	N	CLR	O-1STOP	01 NONE 0	BACK									10
NONE						TH		EAGLE CRK-SANDY HY	E		STOP SIGN	N	DRY	BACK	PRVTE	W -E							000	00
N						6P			06	0		N	DAY	INJ	PSNGR CAR		01 DRVR	NONE	22	M	OR-Y		011	000	10
N						45 23 22.76	-122 15 48.39	017200100S00														OR<25				
															02 NONE 0	STOP									
															PRVTE	E -W							012	00
															PSNGR CAR		01 DRVR	INJC	26	F	OR-Y		000	000	00
																						OR<25			
04008	N	N	N		N	11/02/2018	16	DUBARKO RD	INTER	CROSS	N	N	CLD	PED	01 NONE 0	STRGHT									02
CITY						FR		EAGLE CRK-SANDY HY	E		STOP SIGN	N	WET	PED	PRVTE	E -W							000	00
N						7P			06	0		N	DLIT	INJ	PSNGR CAR		01 DRVR	NONE	74	M	OR-Y		029	000	02
N						45 23 22.54	-122 15 48.5	017200100S00														OR<25				
																-									
																STRGHT	01 PED	INJC	36	M		I XWK?	000	034	00
																N S									
03026	N	N	N			07/27/2015	16	DUBARKO RD	INTER	CROSS	N	N	CLR	S-1STOP	01 NONE 0	STRGHT									07,29
CITY						MO		EAGLE CRK-SANDY HY	SW		NONE	N	DRY	REAR	PRVTE	SW-NE							000	00
N						8P			06	0		N	DUSK	INJ	PSNGR CAR		01 DRVR	INJC	19	M	OR-Y		043,026	000	07,29
N						45 23 22.76	-122 15 48.39	017200100S00														OR<25				
															02 NONE 0	STOP									
															PRVTE	SW-NE							012	00
															PSNGR CAR		01 DRVR	INJC	36	M	OR-Y		000	000	00
																						OR<25			
01095	N	N	N		N	03/04/2016	16	DUBARKO RD	INTER	CROSS	N	N	CLD	S-1STOP	01 NONE 0	STRGHT									27,07,32
CITY						FR		EAGLE CRK-SANDY HY	SW		STOP SIGN	N	DRY	SS-O	PRVTE	NE-SW							000	00
N						4P			06	0		N	DAY	INJ	PSNGR CAR		01 DRVR	NONE	30	M	OR-Y		016,043,052	010	27,07,32
N						45 23 22.76	-122 15 48.39	017200100S00														OR<25				
															01 NONE 0	STRGHT									
															PRVTE	NE-SW							000	00
															PSNGR CAR		02 PSNG	NO<5	01	F			000	000	00

SER# / INVEST / RD DPT / UNLOC?	S P E D	D A L C	M R G S	J U N V	S I H L	W C O K	DATE / DAY / TIME / LAT	CLASS / DIST / FROM / LONG	CITY STREET / FIRST STREET / SECOND STREET / LRS	RD CHAR / DIRECT / LOCTN	INT-TYPE (MEDIAN) / LEGS / (#LANES)	INT-REL / TRAF- / CONTL	OFFRD / RNDBT / DRVWY	WTHR / SURF / LIGHT	CRASH / COLL / SVRTY	V#	SPCL USE / TRLR QTY / OWNER / TYPE / TO	MOVE / FROM / TO	P#	PRTC TYPE	INJ SVRTY	A G E	S X	LICNS RES	PED LOC	ERROR	ACT EVENT	CAUSE
																02	NONE 0	STOP									
																	PRVTE	NE-SW								012	00
																	PSNGR CAR		01	DRVR	NONE	18	F	OR-Y OR<25		000	000	00
																03	NONE 0	STRGHT									
																	PRVTE	SW-NE								000	00
																	PSNGR CAR		01	DRVR	INJB	26	M	OR-Y OR<25		000	000	00
00763	N	N	N	N	N		02/17/2016	16	DUBARKO RD	INTER	CROSS	N	N	RAIN	S-1STOP	01	NONE 9	STRGHT									07
CITY						WE			EAGLE CRK-SANDY HY	SW		NONE	N	WET	REAR		N/A	S -N								000	00
N						5P				06	0		N	DLIT	PDO		PSNGR CAR		01	DRVR	NONE	00	Unk	UNK		000	000	00
N						45 23 22.76		-122 15 48.39	017200100S00															UNK				
																02	NONE 9	STOP									
																	N/A	S -N								012	00
																	PSNGR CAR		01	DRVR	NONE	00	Unk	UNK		000	000	00
01324	N	N	N	N	N		04/19/2018	16	DUBARKO RD	INTER	CROSS	N	N	CLR	S-1STOP	01	NONE 0	STRGHT									29
CITY						TH			EAGLE CRK-SANDY HY	SW		UNKNOWN	N	DRY	REAR		PRVTE	SW-NE								000	00
N						6P				06	0		N	DAY	INJ		PSNGR CAR		01	DRVR	NONE	19	M	OR-Y OR<25		026	000	29
N						45 23 22.55		-122 15 48.5	017200100S00																			
																02	NONE 0	STOP									
																	PRVTE	SW-NE								012	00
																	PSNGR CAR		01	DRVR	INJC	21	F	OR-Y OR<25		000	000	00
																02	NONE 0	STOP									
																	PRVTE	SW-NE								012	00
																	PSNGR CAR		02	PSNG	INJC	18	M			000	000	00
04952	N	N	N	N	N		11/22/2015	16	DUBARKO RD	INTER	CROSS	N	N	CLD	ANGL-OTH	01	NONE 0	TURN-L									03
CITY						SU			EAGLE CRK-SANDY HY	CN		STOP SIGN	N	DRY	TURN		PRVTE	W -NE								000	00
N						4P				03	0		N	DAY	INJ		PSNGR CAR		01	DRVR	INJB	53	F	OTH-Y OR<25		021	000	03
N						45 23 22.76		-122 15 48.39	017200100S00																			
																02	NONE 0	STRGHT									
																	PRVTE	NE-SW								000	00
																	PSNGR CAR		01	DRVR	NONE	19	F	OR-Y OR>25		000	000	00
																03	NONE 0	STRGHT									
																	PRVTE	SW-NE								000	00
																	PSNGR CAR		01	DRVR	NONE	41	M	OR-Y OR<25		000	000	00

SER# / INVEST / RD DPT / UNLOC?	S P E D	D A L C	M R G S	J U N V	S I H L	W C O K	DATE / DAY / TIME / LAT	CLASS / DIST / FROM / LONG	CITY STREET / FIRST STREET / SECOND STREET / LRS	RD CHAR / DIRECT / LOCTN	INT-TYPE (MEDIAN) / LEGS (#LANES)	INT-REL / TRAF- / CONTL	OFFRD / RNDBT / DRVWY	WTHR / SURF / LIGHT	CRASH / COLL / SVRTY	V#	SPCL USE / TRLR QTY / OWNER	MOVE / FROM / TO	P#	PRTC TYPE	INJ SVRTY	A G E	S E X	LICNS RES	PED LOC	ERROR	ACT EVENT	CAUSE
05614	N	N	N	N	N		12/25/2015	16	DUBARKO RD	INTER	CROSS	N	N	CLD	ANGL-OTH	01	NONE 0	STRGHT										02
CITY							FR		EAGLE CRK-SANDY HY	CN		STOP SIGN	N	WET	ANGL		PRVTE	N -S								000	00
N							6P			01	0		N	DLIT	INJ		PSNGR CAR		01	DRVR	NONE	58	M	OR-Y		000	000	00
N							45 23 22.76	-122 15 48.39	017200100S00															OR>25				
																02	NONE 0	STRGHT										
																	PRVTE	E -W								015	00
																	PSNGR CAR		01	DRVR	INJC	53	M	OR-Y	028	000	02
																								OR<25			
02172	N	N	N				06/05/2015	16	DUBARKO RD	INTER	CROSS	N	N	CLR	ANGL-OTH	01	NONE 0	STRGHT										02
NONE							FR		EAGLE CRK-SANDY HY	CN		STOP SIGN	N	DRY	TURN		PRVTE	W -E								015	00
N							7A			04	0		N	DAY	PDO		PSNGR CAR		01	DRVR	NONE	24	M	OR-Y	028	000	02
N							45 23 22.76	-122 15 48.39	017200100S00															OR<25			
																02	NONE 0	TURN-L										
																	PRVTE	SW-W								000	00
																	PSNGR CAR		01	DRVR	NONE	29	M	OR-Y	000	000	00
																								OR<25			
03589	N	N	N	N	N		08/05/2016	16	DUBARKO RD	INTER	CROSS	N	N	CLR	ANGL-OTH	01	NONE 0	STRGHT										02
CITY							FR		EAGLE CRK-SANDY HY	CN		STOP SIGN	N	DRY	ANGL		PRVTE	E -W								015	00
N							6P			01	0		N	DAY	INJ		PSNGR CAR		01	DRVR	INJC	77	M	OTH-Y	028	000	02
N							45 23 22.76	-122 15 48.39	017200100S00															N-RES			
																02	NONE 0	STRGHT										
																	PRVTE	N -S								000	00
																	PSNGR CAR		01	DRVR	NONE	40	M	OR-Y	000	000	00
																								OR<25			
03967	N	N	N	N	N		08/30/2016	16	DUBARKO RD	INTER	CROSS	N	N	CLR	ANGL-OTH	01	NONE 0	STRGHT										02
CITY							TU		EAGLE CRK-SANDY HY	CN		STOP SIGN	N	DRY	ANGL		PRVTE	W -E								015	00
N							12P			04	0		N	DAY	INJ		PSNGR CAR		01	DRVR	INJC	61	F	OTH-Y	028	000	02
N							45 23 22.76	-122 15 48.39	017200100S00															N-RES			
																01	NONE 0	STRGHT										
																	PRVTE	W -E								015	00
																	PSNGR CAR		02	PSNG	INJC	06	F		000	000	00
																02	NONE 0	STRGHT										
																	PRVTE	S -N								000	00
																	PSNGR CAR		01	DRVR	INJB	53	F	OR-Y	000	000	00
																								OR<25			
02427	N	N	N				05/31/2016	16	DUBARKO RD	INTER	CROSS	N	N	CLR	ANGL-OTH	01	NONE 9	STRGHT										03,32
CITY							TU		EAGLE CRK-SANDY HY	CN		STOP SIGN	N	UNK	ANGL		N/A	W -E								000	00
N							11A			03	0		N	DAY	PDO		PSNGR CAR		01	DRVR	NONE	00	Unk	UNK	000	000	00
N							45 23 22.76	-122 15 48.39	017200100S00															UNK			

SER# / INVEST / RD DPT / UNLOC?	S P E D	A L C	D M R G S	J N V	S H L	W O R K	DATE / DAY / TIME / LAT	CLASS / DIST / FROM / LONG	CITY STREET / FIRST STREET / SECOND STREET / LRS	RD CHAR / DIRECT / LOCTN	INT-TYPE (MEDIAN) / LEGS (#LANES)	INT-REL / TRAF- / CONTL	OFFRD / RNDBT / DRVWY	WTHR / SURF / LIGHT	CRASH / COLL / SVRTY	V#	SPCL USE / TRLR QTY / OWNER	MOVE / FROM / TO	P#	PRTC TYPE	INJ SVRTY	A G E	S X	LICNS RES	PED LOC	ERROR	ACT	EVENT	CAUSE
																02	NONE 9	STRGHT										
																	N/A	N -S								000		00
																	PSNGR CAR			01 DRVR	NONE	00	Unk	UNK		000	000		00
																								UNK				
02031	N	N	N	N	N		05/06/2016	16	DUBARKO RD	INTER	CROSS	N	N	CLR	ANGL-OTH	01	NONE 9	STRGHT										02
CITY							FR		EAGLE CRK-SANDY HY	CN		STOP SIGN	N	DRY	ANGL		N/A	N -S								000		00
N							4P			01	0		N	DAY	PDO		PSNGR CAR			01 DRVR	NONE	00	Unk	UNK		000	000		00
N							45 23 22.76	-122 15 48.39	017200100S00															UNK				
																02	NONE 9	STRGHT										
																	N/A	E -W								000		00
																	PSNGR CAR			01 DRVR	NONE	00	Unk	UNK		000	000		00
																								UNK				
00805	N	N	N	N	N		03/01/2017	16	DUBARKO RD	INTER	CROSS	N	N	CLD	ANGL-OTH	01	NONE 0	STRGHT									082,013	02
CITY							WE		EAGLE CRK-SANDY HY	CN		STOP SIGN	N	DRY	ANGL		PRVTE	W -E								015		00
N							3P			04	0		N	DAY	INJ		PSNGR CAR			01 DRVR	INJC	17	F	OR-Y		028	000	082	02
N							45 23 22.76	-122 15 48.39	017200100S00															OR<25					
																02	NONE 0	STRGHT										
																	PRVTE	S -N								000	013	00
																	PSNGR CAR			01 DRVR	INJC	43	M	OR-Y		000	000		00
																								OR<25				
																03	NONE 0	STOP										
																	PRVTE	E -W								022		00
																	PSNGR CAR			01 DRVR	INJB	27	F	OR-Y		000	000		00
																								OR<25				
00846	N	N	N	N	N		03/04/2017	16	DUBARKO RD	INTER	CROSS	N	N	RAIN	ANGL-OTH	01	NONE 0	STRGHT										02
CITY							SA		EAGLE CRK-SANDY HY	CN		STOP SIGN	N	WET	ANGL		PRVTE	W -E								015		00
N							6P			04	0		N	DLIT	INJ		PSNGR CAR			01 DRVR	NONE	21	M	OR-Y		028	000		02
N							45 23 22.76	-122 15 48.39	017200100S00															OR<25					
																02	NONE 0	STRGHT										
																	PRVTE	N -S								000		00
																	PSNGR CAR			01 DRVR	INJC	21	F	OR-Y		000	000		00
																								OR<25				
02225	N	N	N				06/07/2017	16	DUBARKO RD	INTER	CROSS	N	N	CLR	ANGL-OTH	01	NONE 0	STRGHT										02
CITY							WE		EAGLE CRK-SANDY HY	CN		STOP SIGN	N	DRY	ANGL		PRVTE	S -N								000		00
N							4P			04	0		N	DAY	INJ		PSNGR CAR			01 DRVR	INJB	40	M	OR-Y		000	000		00
N							45 23 22.76	-122 15 48.39	017200100S00															OR<25					
																02	NONE 0	STRGHT										
																	PRVTE	W -E								015		00
																	PSNGR CAR			01 DRVR	INJC	38	M	OR-Y		028	000		02
																								OR<25				

SER# / INVEST / RD DPT / UNLOC?	S P E D	A L C	D R G S	M J N V	S I H L	W C O K	DATE / DAY / TIME / LAT	CLASS / DIST / FROM / LONG	CITY STREET / FIRST STREET / SECOND STREET / LRS	RD CHAR / DIRECT / LOCTN	INT-TYPE (MEDIAN) / LEGS (#LANES)	INT-REL / TRAF- / CONTL	OFFRD / RNDBT / DRVWY	WTHR / SURF / LIGHT	CRASH / COLL / SVRTY	V#	SPCL USE / TRLR QTY / OWNER / TYPE	MOVE / FROM / TO	P#	PRTC TYPE	INJ SVRTY	A G E	S E X	LICNS RES	PED LOC	ERROR	ACT	EVENT	CAUSE
02958	N	N	N	N	N	N	07/21/2017	16	DUBARKO RD	INTER	CROSS	N	N	CLR	O-1 L-TURN	01	NONE 0	TURN-L										02
CITY				FR					EAGLE CRK-SANDY HY	CN		STOP SIGN	N	DRY	TURN		PRVTE	S -W									000	00
N				8P						01	0		N	DAY	INJ		PSNGR CAR		01	DRVR	NONE	28	M	OR-Y		028	000		02
N				45 23 22.76			-122 15 48.39		017200100S00															OR<25					
																02	NONE 0	STRGHT									000		00
																	PRVTE	N -S											
																	PSNGR CAR		01	DRVR	INJB	29	F	OR-Y		000	000		00
																								OR<25					
00647	N	N	N	N	N	N	02/18/2017	16	DUBARKO RD	INTER	CROSS	N	N	RAIN	ANGL-OTH	01	NONE 9	STRGHT											03
CITY				SA					EAGLE CRK-SANDY HY	CN		STOP SIGN	N	WET	ANGL		N/A	W -E									000	00
N				7P						03	0		N	DLIT	PDO		PSNGR CAR		01	DRVR	NONE	00	Unk	UNK		000	000		00
N				45 23 22.76			-122 15 48.39		017200100S00															UNK					
																02	NONE 9	STRGHT									000		00
																	N/A	N -S											
																	PSNGR CAR		01	DRVR	NONE	00	Unk	UNK		000	000		00
																								UNK					
03467	N	N	N	N	N	N	08/23/2017	16	DUBARKO RD	INTER	CROSS	N	N	CLR	ANGL-OTH	01	NONE 9	STRGHT											02
CITY				WE					EAGLE CRK-SANDY HY	CN		STOP SIGN	N	DRY	ANGL		N/A	NE-SW									000	00
N				8A						01	0		N	DAY	PDO		PSNGR CAR		01	DRVR	NONE	00	Unk	UNK		000	000		00
N				45 23 22.76			-122 15 48.39		017200100S00															UNK					
																02	NONE 9	STRGHT									015		00
																	N/A	E -W											
																	PSNGR CAR		01	DRVR	NONE	00	Unk	UNK		000	000		00
																								UNK					
03265	N	N	N				09/14/2018	16	DUBARKO RD	INTER	CROSS	N	N	CLR	ANGL-OTH	01	NONE 0	TURN-L										082	02
CITY				FR					EAGLE CRK-SANDY HY	CN		FLASHBCN-R	N	DRY	TURN		PRVTE	W -N									015		00
N				9P						03	0		N	DARK	INJ		PSNGR CAR		01	DRVR	NONE	38	M	OR-Y		028	000	082	02
N				45 23 22.52			-122 15 48.53		017200100S00															OR<25					
																01	NONE 0	TURN-L											
																	PRVTE	W -N									015		00
																	PSNGR CAR		01	PSNG	INJC	35	F			000	000		00
																01	NONE 0	TURN-L											
																	PRVTE	W -N									015		00
																	PSNGR CAR		02	PSNG	NONE	02	F			000	000		00
																02	NONE 0	STRGHT											
																	PRVTE	N -S									000		00
																	PSNGR CAR		01	DRVR	NONE	62	M	OR-Y		000	000		00
																								OR<25					

SER# / INVEST / RD DPT / UNLOC?	S P E D	D M R J E A U G	S W I C N H	O DAY / TIME / LAT	CLASS / DIST / LONG	CITY STREET / FIRST STREET / SECOND STREET / LRS	RD CHAR / DIRECT / LOCTN	INT-TYPE (MEDIAN) / LEGS (#LANES)	INT-REL / TRAF- / CONTL	OFFRD / RNDBT / DRVWY	WTHR / SURF / LIGHT	CRASH / COLL / SVRTY	V#	SPCL USE / TRLR QTY / OWNER	MOVE / FROM / TO	P#	PRTC TYPE	INJ SVRTY	A G E	S E X	LICNS RES	PED LOC	ERROR	ACT	EVENT	CAUSE
03281	N N N	N N		09/23/2019	16	DUBARKO RD	INTER	CROSS	N	N	CLR	ANGL-OTH	01	NONE 0	STRGHT										02
CITY		MO				EAGLE CRK-SANDY HY	CN		STOP SIGN	N	DRY	ANGL		PRVTE	NE-SW									000	00
N		7A					02	0		N	DAWN	INJ		PSNGR CAR		01	DRVR	NONE	31 M		OR-Y		000	000		00
N		45 23 22.59		-122 15 48.49		017200100S00															OR<25					
													02	NONE 0	STRGHT											
														PRVTE	E -W									015		00
														PSNGR CAR		01	DRVR	INJC	17 F		OR-Y		028	000		02
																					OR<25					
													02	NONE 0	STRGHT											
														PRVTE	E -W									015		00
														PSNGR CAR		02	PSNG	INJA	12 F				000	000		00
00075	N N N	N N		01/08/2019	16	DUBARKO RD	INTER	CROSS	N	N	CLR	ANGL-OTH	01	NONE 0	STRGHT										013	27,02
CITY		TU				EAGLE CRK-SANDY HY	CN		STOP SIGN	N	DRY	ANGL		PRVTE	N -S									000	00
N		4P					03	0		N	DLIT	INJ		PSNGR CAR		01	DRVR	INJB	52 M		OR-Y		000	000		00
N		45 23 22.54		-122 15 48.5		017200100S00															OR<25					
													02	NONE 0	STRGHT											
														PRVTE	E -W									015	013	00
														PSNGR CAR		01	DRVR	INJC	16 F		OR-Y		028	000		27,02
																					OR<25					
													03	NONE 0	STOP											
														PRVTE	W -E									022		00
														PSNGR CAR		01	DRVR	NONE	21 M		OR-Y		000	000		00
																					OR<25					
00908	N N N			03/14/2019	16	DUBARKO RD	INTER	CROSS	N	N	CLR	ANGL-OTH	01	NONE 0	STRGHT											02
NO RPT		TH				EAGLE CRK-SANDY HY	CN		STOP SIGN	N	DRY	ANGL		PRVTE	S -N									000		00
N		2P					04	0		N	DAY	INJ		SEMI TOW		01	DRVR	INJC	58 M		OR-Y		000	000		00
N		45 23 22.76		-122 15 48.39		017200100S00															OR<25					
													02	NONE 0	STRGHT											
														PRVTE	W -E									015		00
														PSNGR CAR		01	DRVR	INJB	19 M		OR-Y		028	000		02
																					OR<25					
													02	NONE 0	STRGHT											
														PRVTE	W -E									015		00
														PSNGR CAR		02	PSNG	INJB	18 F				000	000		00
01291	N N N	N N		04/22/2019	16	DUBARKO RD	INTER	CROSS	N	N	CLD	ANGL-OTH	01	NONE 0	STRGHT											02
CITY		MO				EAGLE CRK-SANDY HY	CN		STOP SIGN	N	DRY	ANGL		PRVTE	S -N									000		00
N		5P					04	0		N	DAY	INJ		PSNGR CAR		01	DRVR	INJB	36 M		OR-Y		000	000		00
N		45 23 22.54		-122 15 48.5		017200100S00															OR<25					

SER# / INVEST / RD DPT / UNLOC?	S P E D	D M R A L C	J U G S	I N V	S H L	W O R K	DATE / DAY / TIME / LAT	CLASS / DIST / FROM / LONG	CITY STREET / FIRST STREET / SECOND STREET / LRS	RD CHAR / DIRECT / LOCTN	INT-TYPE (MEDIAN) / LEGS / (#LANES)	INT-REL / TRAF- / CONTL	OFFRD / RNDBT / DRVWY	WTHR / SURF / LIGHT	CRASH / COLL / SVRTY	V#	SPCL USE / TRLR QTY / OWNER / TYPE	MOVE / FROM / TO	P#	PRTC TYPE	INJ SVRTY	A G E	S E X	LICNS RES	PED LOC	ERROR	ACT EVENT	CAUSE
																02	NONE 0 PRVTE PSNGR CAR	STRGHT W -E	01	DRVR	NONE	37	M	OR-Y OR<25		028	015 000	00 02
03399	N	N N		N	N		10/03/2019 16	DUBARKO RD		INTER	CROSS	N	N	RAIN	ANGL-OTH	01	NONE	STRGHT										02
CITY							TH	EAGLE CRK-SANDY HY		CN		STOP SIGN	N	WET	ANGL		PRVTE	N -S									000	00
N							7P			03	2		N	DLIT	INJ		PSNGR CAR		01	DRVR	INJB	48	F	OR-Y		000	000	00
N							45 23 22.78 -122 15 48.4	017200100S00																OR<25				
																02	NONE PRVTE PSNGR CAR	STRGHT W -E	01	DRVR	NONE	19	M	OTH-Y N-RES		028	015 000	00 02
04270	N	N N					11/29/2019 16	DUBARKO RD		INTER	CROSS	N	N	CLR	ANGL-OTH	01	NONE 0	STRGHT										02
CITY							FR	EAGLE CRK-SANDY HY		CN		STOP SIGN	N	DRY	ANGL		PRVTE	N -S									000	00
N							5P			01	0		N	DLIT	INJ		PSNGR CAR		01	DRVR	NONE	49	F	OR-Y		000	000	00
N							45 23 22.55 -122 15 48.51	017200100S00																OR<25				
																02	NONE 0 PRVTE PSNGR CAR	STRGHT E -W	01	DRVR	INJC	59	F	OR-Y OR<25		028	015 000	00 02

CITY OF SANDY, CLACKAMAS COUNTY **PIONEER BLVD at EAGLE CRK-SANDY HY, City of Sandy, Clackamas County, 01/01/2015 to 12/31/2019**

	S		D	M																											
SER#	P		R	J	S	W	DATE	CLASS	CITY STREET		INT-TYPE						SPCL USE														
INVEST	E	A	U	I	C	O	DAY	DIST	FIRST STREET	RD CHAR	(MEDIAN)	INT-REL	OFFRD	WTHR	CRASH		TRLR QTY	MOVE				A	S								
RD DPT	E	L	G	N	H	R	TIME	FROM	SECOND STREET	DIRECT	LEGS	TRAF-	RNDBT	SURF	COLL		OWNER	FROM		PRTC	INJ	G	E	LICNS	PED					
UNLOC?	D	C	S	V	L	K	LAT	LONG	LRS	LOCTN	(#LANES)	CONTL	DRVWY	LIGHT	SVRTY	V#	TYPE	TO	P#	TYPE	SVRTY	E	X	RES	LOC	ERROR		ACT	EVENT		CAUSE

Preliminary Traffic Signal Warrant Analysis

Project Name: Bornstedt Views
Intersection: Highway 211 at Dubarko Road
Scenario: 2023 Background Plus Site Trips (30th-Highest Hour)
Number of Major Street Lanes: 1 PM Peak Hour Volume 1018 (sum of both approaches)
Number of Minor Street Lanes 1 PM Peak Hour Volume 83 (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 Anaylsis Calculations	8th Highest Hour[b]	Minimum Volume	Warrant Satisfied?
Condition A - Minimum Vehicular Volume			
Major Street Volume	575	350	
Minor Street Volume	47	105	**No**
Condition B - Interruption of Continuous Traffic			
Major Street Volume	575	525	
Minor Street Volume	47	53	**No**
Combination Warrant[c]			
Major Street Volume	575	420	
Minor Street Volume	47	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: Bornstedt Views
Intersection: Highway 211 at Bornstedt Road
Scenario: 2023 Background Plus Site Trips (30th-Highest Hour)
Number of Major Street Lanes: 1 PM Peak Hour Volume 941 (sum of both approaches)
Number of Minor Street Lanes 1 PM Peak Hour Volume 55 (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 Anaylsis Calculations	8th Highest Hour[b]	Minimum Volume	Warrant Satisfied?
Condition A - Minimum Vehicular Volume			
Major Street Volume	532	350	
Minor Street Volume	31	105	**No**
Condition B - Interruption of Continuous Traffic			
Major Street Volume	532	525	
Minor Street Volume	31	53	**No**
Combination Warrant[c]			
Major Street Volume	532	420	
Minor Street Volume	31	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.

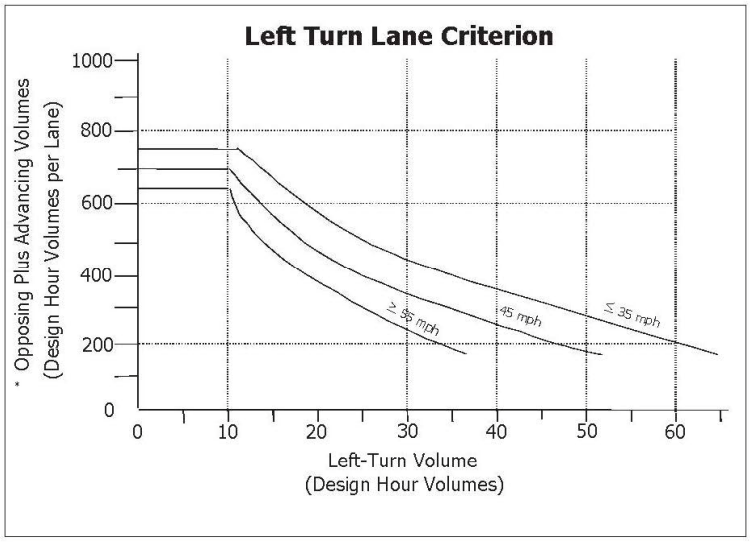
Left-Turn Lane Warrant Analysis (ODOT Methodology)

Project Name: Bornstedt Subdivision
Approach: Highway 211 NB at Dubarko Road
Scenario: 2021 Existing Conditions

Number of Advancing Lanes: 1
Number of Opposing Lanes: 1
Major-Street Design Speed: 45 mph

	AM Volume	PM Volume
Advancing Volume for Design Hour:	321	461
Opposing Volume for Design Hour:	183	396
Design Hour Volume Per Lane:	504	857
Number of Left Turns per Hour:	27	71
Left-turn lane warrants satisfied?	**YES**	**YES**

Exhibit 7-1 Left Turn Lane Criterion (TTI)



*(Advancing Volume/Number of Advancing Through Lanes) + (Opposing Volume/Number of Opposing Through Lanes)

Right-Turn Lane Warrant Analysis (ODOT Methodology)

Project Name: Bornstedt Views Subdivision
Approach: Highway 211 Northbound at Dubarko Road
Scenario: 2021 Existing Conditions

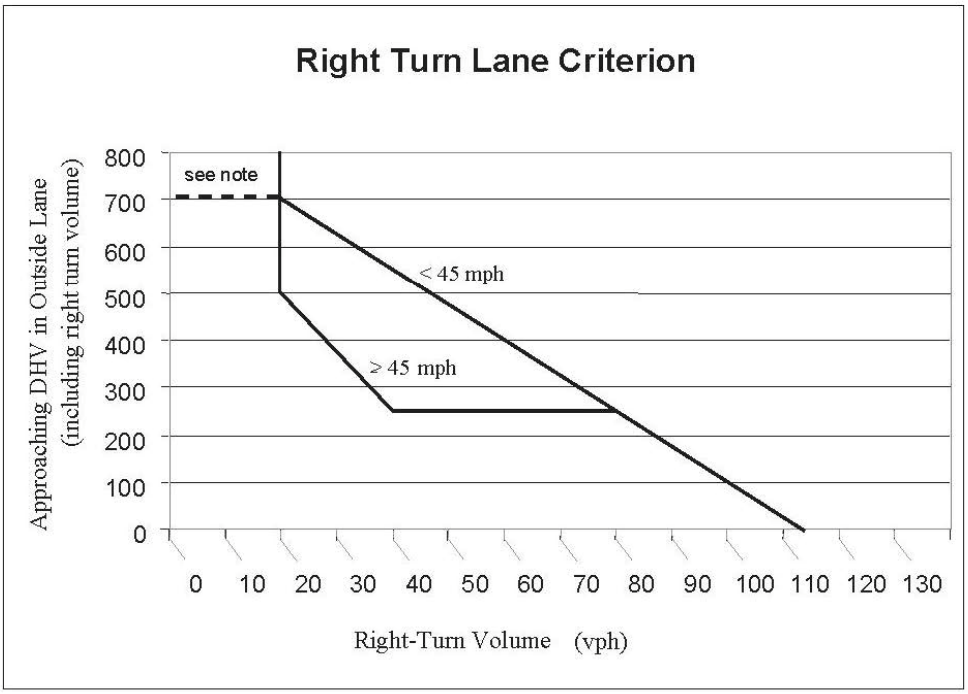
Major-Street Design Speed: 45 mph

	AM Volume	PM Volume
Number of Right Turns per Hour:	11	65
Approaching DVH in Outside Lane:	321	461
Calculated Turn Volume Threshold:	34	23
Right Turn Volume Exceeds Threshold?	**NO**	**YES**

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.

TERAGAN & ASSOCIATES, INC.
ARBORICULTURAL CONSULTANTS

MEMORANDUM **EXHIBIT F**

DATE: April 29, 2021

TO: Mac Even (Even Better Homes)

FROM: Todd Prager, RCA #597, ISA Board Certified Master Arborist

RE: Tree Plan for The Bornstedt Views Subdivision

Summary

This report includes tree removal, preservation, and protection recommendations for the proposed Bornstedt Views Subdivision in Sandy, Oregon.

Background

Even Better Homes is proposing to construct a 42-lot subdivision with new streets, sidewalks, and utilities at 19618 SE Bornstedt Road in Sandy, Oregon. The topographic survey of existing trees is provided in Attachment 1, the proposed site plan with the proposed tree removal and retention is provided in Attachment 2, and the inventory of existing trees is provided in Attachment 3.

The assignment requested of our firm for this project was to:

- Assess the trees within the development site;
- Identify the trees to be removed and retained; and
- Provide tree protection recommendations for the trees to be retained.

Tree Assessment

In July 2020 I completed the inventory of existing trees at the site.

The complete inventory data for each tree is provided in Attachment 3 and includes the tree number, common name, scientific name, trunk diameter (DBH), crown radius, health condition, structural condition, pertinent comments, and whether it is an onsite 11-inch DBH or greater tree in good condition.[1]

All County Surveyors and Planners added color coded labels to the inventory to denote trees that are 11-inch DBH or greater and in good condition (yellow), 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.

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that are not 11-inch DBH or greater and/or not in good condition (red), trees to be retained (green), and trees to be removed (salmon).

The tree numbers in the inventory in Attachment 3 correspond to the tree numbers on the plans in Attachments 1 and 2. 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 if 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.

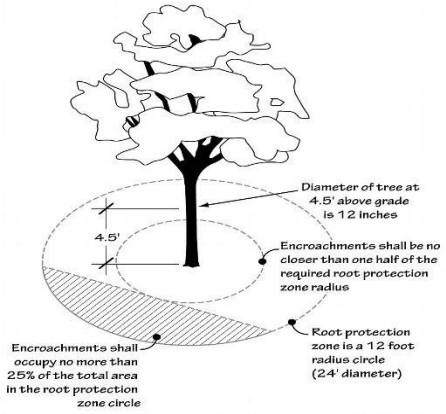

Figure 1: Alterative minimum protection zone

Using these criteria, while considering the tree conditions and their locations relative to construction and other site improvements, 709 of the assessed trees at the site are proposed for removal.

Tree Retention

A total of 38 trees are proposed to be retained. All 38 of these are in good condition, over 11-inch DBH, and not considered nuisance species according to the City of Sandy. 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 12.739 acres in size so 38 non-nuisance trees over 11-inch DBH in good condition are required to be retained. The proposed preservation includes 38 non-nuisance 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.

Finding: The retained trees are clustered at the north, central, and east ends of the site as shown in Attachment 2. 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 structural condition of all retained trees is fair to good. The proposed clustering of retained trees 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: Thirty-three (33) of the 38 non-nuisance 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 if 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 2. 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 4.

Conclusion

Thirty-eight (38) non-nuisance trees over 11-inch DBH in good condition are proposed to be retained at The Views Bornstedt Subdivision site. The required tree retention for the 12.739 acres site is 38 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

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 - Topographic Survey with Existing Trees
Attachment 2 - Site Plan w/ Tree Removal, Retention and Protection
Attachment 3 - Tree Inventory
Attachment 4 - Tree Protection Recommendations
Attachment 5 - Assumptions and Limiting Conditions

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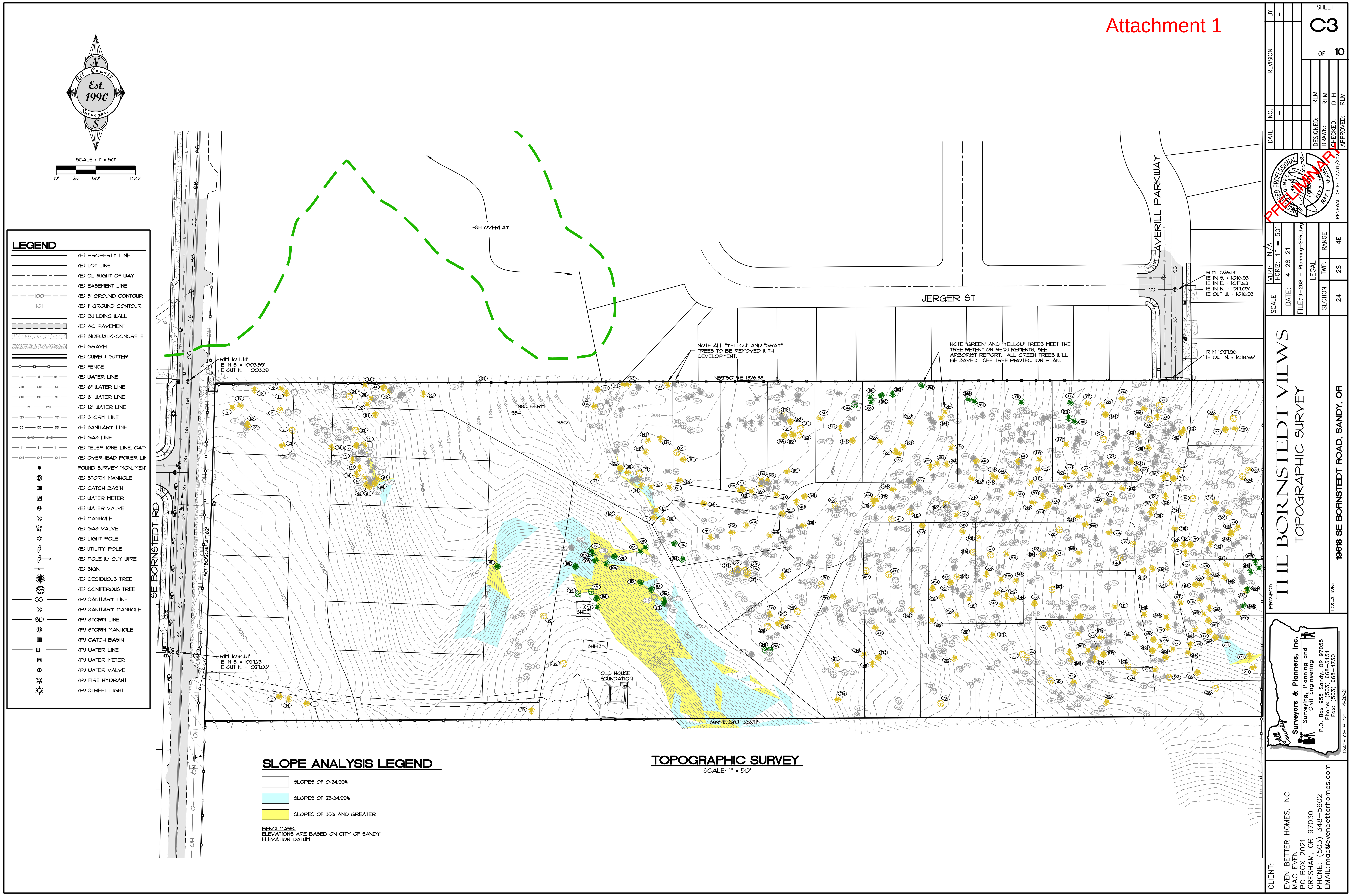

Attachment 1
All County Est. 1990 Surveyors
SCALE : 1" = 50'
0' 25' 50' 100'
LEGEND
(E) PROPERTY LINE
(E) LOT LINE
(E) CL RIGHT OF WAY
(E) EASEMENT LINE
(E) 5' GROUND CONTOUR
(E) 1' GROUND CONTOUR
(E) BUILDING WALL
(E) AC PAVEMENT
(E) SIDEWALK/CONCRETE
(E) GRAVEL
(E) CURB & GUTTER
(E) FENCE
(E) WATER LINE
(E) 6" WATER LINE
(E) 8" WATER LINE
(E) 12" WATER LINE
(E) STORM LINE
(E) SANITARY LINE
(E) GAS LINE
(E) TELEPHONE LINE, CATV
(E) OVERHEAD POWER LINE
FOUND SURVEY MONUMENT
(E) STORM MANHOLE
(E) CATCH BASIN
(E) WATER METER
(E) WATER VALVE
(E) MANHOLE
(E) GAS VALVE
(E) LIGHT POLE
(E) UTILITY POLE
(E) POLE W/ GUY WIRE
(E) SIGN
(E) DECIDUOUS TREE
(E) CONIFEROUS TREE
(P) SANITARY LINE
(P) SANITARY MANHOLE
(P) STORM LINE
(P) STORM MANHOLE
(P) CATCH BASIN
(P) WATER LINE
(P) WATER METER
(P) WATER VALVE
(P) FIRE HYDRANT
(P) STREET LIGHT
FSH OVERLAY
JERGER ST
AVERILL PARKWAY
SE BORNSTEDT RD
NOTE ALL "YELLOW" AND "GRAY" TREES TO BE REMOVED WITH DEVELOPMENT.
NOTE "GREEN" AND "YELLOW" TREES MEET THE TREE RETENTION REQUIREMENTS, SEE ARBORIST REPORT. ALL GREEN TREES WILL BE SAVED. SEE TREE PROTECTION PLAN.
RIM 1011.74'
IE IN S. = 1003.59'
IE OUT N. = 1003.39'
RIM 1026.13'
IE IN S. = 1016.93'
IE IN E. = 1017.63
IE IN N. - 1017.03'
IE OUT W. = 1016.93'
RIM 1027.96'
IE OUT N. = 1018.96'
RIM 1034.51'
IE IN S. = 1027.23'
IE OUT N. = 1027.03'
N89°50'19"E 1326.38'
S01°50'20"W 417.62'
S89°45'29"W 1338.71'
985 BERM
984
980
SHED
OLD HOUSE FOUNDATION
SLOPE ANALYSIS LEGEND
SLOPES OF 0-24.99%
SLOPES OF 25-34.99%
SLOPES OF 35% AND GREATER
BENCHMARK
ELEVATIONS ARE BASED ON CITY OF SANDY ELEVATION DATUM
TOPOGRAPHIC SURVEY
SCALE: 1" = 50'
SHEET C3 OF 10
DATE NO. REVISION BY
DESIGNED: RLM
DRAWN: RLM
CHECKED: DLH
APPROVED: RLM
REGISTERED PROFESSIONAL ENGINEER OREGON JULY 21, 1998 RAY L. MOORE
RENEWAL DATE: 12/31/2022
PRELIMINARY
SCALE VERT: N/A HORIZ: 1" = 50'
DATE: 4-28-21
FILE:19-268 - Planning-SFR.dwg
LEGAL SECTION 24 TWP. 2S RANGE 4E
PROJECT: THE BORNSTEDT VIEWS
TOPOGRAPHIC SURVEY
LOCATION: 19618 SE BORNSTEDT ROAD, SANDY, OR
All County Surveyors & Planners, Inc.
Surveying, Planning and Civil Engineering
P.O. Box 955 Sandy, OR 97055
Phone: (503) 668-3151
Fax: (503) 668-4730
DATE OF PLOT 4-28-21
CLIENT:
EVEN BETTER HOMES, INC.
MAC EVEN
PO BOX 2021
GRESHAM, OR 97030
PHONE: (503) 348-5602
EMAIL: mac@evenbetterhomes.com

Attachment 2

DATE	NO.	REVISION	BY
-	-	-	-

SHEET C7 OF 10

DESIGNED: RLM
DRAWN: RLM
CHECKED: DLH
APPROVED: RLM

REGISTERED PROFESSIONAL ENGINEER
OREGON
JULY 21, 1996
RAY L. MOORE
RENEWAL DATE: 12/31/2022
PRELIMINARY

SCALE: VERT: N/A HORIZ: 1" = 50'
DATE: 4-28-21
FILE:19-268 - Planning-SFR.dwg

LEGAL

SECTION	TWP.	RANGE
24	2S	4E

PROJECT:
THE BORNSTEDT VIEWS
TREE RETENTION AND PROTECTION PLAN

LOCATION:
19618 SE BORNSTEDT ROAD, SANDY, OR

All County Surveyors & Planners, Inc.
Surveying, Planning and Civil Engineering
P.O. Box 955 Sandy, OR 97055
Phone: (503) 668-3151
Fax: (503) 668-4730

DATE OF PLOT 4-28-21

CLIENT:
EVEN BETTER HOMES, INC.
MAC EVEN
PO BOX 2021
GRESHAM, OR 97030
PHONE: (503) 348-5602
EMAIL: mac@evenbetterhomes.com

"YES" INDICATES TREES THAT MEET TREE RETENTION REQUIREMENT. SEE NOTE 4.

"GREEN" HATCH INDICATES TREES THAT WILL BE PROTECTED.

TREE TO BE SAVED OR REMOVED

TREE No	COMMON NAME	SCIENTIFIC NAME	DBH	C-RAD	CONDITION	STRUCTURE	TREE RETENTION OPTION	COMMENTS
1	BITTER CHERRY	PRUNUS EMARGINATA	9	13	GOOD	FAIR	NO	ONE SIDED
2	BITTER CHERRY	PRUNUS EMARGINATA	11	15	GOOD	FAIR	YES	ONE SIDED
3	BITTER CHERRY	PRUNUS EMARGINATA	9	14	GOOD	FAIR	NO	ONE SIDED
4	BITTER CHERRY	PRUNUS EMARGINATA	12	15	GOOD	FAIR	YES	ONE SIDED, CODOMINANT AT 4' AND 6' WITH INCLUDED BARK
5	BITTER CHERRY	PRUNUS EMARGINATA	7	14	GOOD	FAIR	NO	ONE SIDED
6	BITTER CHERRY	PRUNUS EMARGINATA	6	12	GOOD	FAIR	NO	ONE SIDED
7	BITTER CHERRY	PRUNUS EMARGINATA	7	13	GOOD	FAIR	NO	ONE SIDED
8	BIGLEAF MAPLE	ACER MACROPHYLLUM	6	16	FAIR	FAIR	NO	ONE SIDED, OVERTOPPED BY ADJACENT TREES
9	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	35	20	GOOD	GOOD	YES	
10	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	18	12	GOOD	FAIR	YES	ONE SIDED
11	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	7	10	FAIR	FAIR	NO	OVERTOPPED BY ADJACENT TREES, MODERATELY SUPPRESSED
12	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	30	20	GOOD	FAIR	YES	ONE SIDED
13	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	42	20	GOOD	FAIR	YES	CODOMINANT AT 15' WITH INCLUDED BARK
14	N/A	N/A	N/A	N/A	N/A	N/A	N/A	NUMBER NOT USED
15	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	22	17	GOOD	FAIR	YES	MODERATELY ONE SIDED
16	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	24	18	GOOD	FAIR	YES	MODERATELY ONE SIDED, CODOMINANT AT 20' WITH INCLUDED BARK
17	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	14	9	GOOD	FAIR	YES	ONE SIDED, MARGINAL TRUNK TAPER
18	SCOULER'S WILLOW	SALIX SCOULERIANA	11	8	POOR	POOR	NO	EXTENSIVE TOP FAILURES
19	BIGLEAF MAPLE	ACER MACROPHYLLUM	14	17	GOOD	FAIR	YES	ONE SIDED
20	BIGLEAF MAPLE	ACER MACROPHYLLUM	29	25	FAIR	FAIR	NO	MULTIPLE LEADERS AT LOWER TRUNK WITH INCLUDED BARK, PAST BRANCH FAILURES WITH DECAY
21	BIGLEAF MAPLE	ACER MACROPHYLLUM	16,15,14,14	20	GOOD	FAIR	YES	MULTIPLE LEADERS AT GROUND LEVEL
22	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	38	20	GOOD	FAIR	YES	MODERATELY ONE SIDED
23	SCOULER'S WILLOW	SALIX SCOULERIANA	12,10	15	VERY POOR	VERY POOR	NO	EXTENSIVE DIEBACK AND DECAY
24	BIGLEAF MAPLE	ACER MACROPHYLLUM	20	20	POOR	POOR	NO	SCAFFOLD BRANCH DIEBACK
25	BIGLEAF MAPLE	ACER MACROPHYLLUM	15,12,12,11	22	FAIR	FAIR	NO	MULTIPLE LEADERS AT GROUND LEVEL, PAST STEM FAILURES AND SCAFFOLD DIEBACK
26	BIGLEAF MAPLE	ACER MACROPHYLLUM	18	25	FAIR	FAIR	NO	ONE SIDED, PREVIOUSLY LOST TOP
27	BIGLEAF MAPLE	ACER MACROPHYLLUM	27	18	FAIR	FAIR	NO	MULTIPLE LEADERS AT 2' WITH INCLUDED BARK, SCAFFOLD BRANCH DIEBACK
28	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	11	11	GOOD	FAIR	YES	OVERTOPPED BY ADJACENT TREES
29	SWEET CHERRY	PRUNUS AVIUM	10,10,8	18	FAIR	FAIR	NO	MULTIPLE LEADERS AT GROUND LEVEL, ONE SIDED, LOW VIGOR
30	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	30	18	GOOD	FAIR	YES	MODERATELY ONE SIDED
31	BIGLEAF MAPLE	ACER MACROPHYLLUM	27	20	FAIR	FAIR	NO	ONE SIDED, CODOMINANT AT 5' WITH INCLUDED BARK, SCAFFOLD BRANCH DIEBACK
32	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	10	12	GOOD	FAIR	NO	OVERTOPPED BY ADJACENT TREES
33	BIGLEAF MAPLE	ACER MACROPHYLLUM	15	15	GOOD	FAIR	YES	ONE SIDED, MARGINAL TRUNK TAPER
34	BIGLEAF MAPLE	ACER MACROPHYLLUM	20	18	GOOD	FAIR	YES	MULTIPLE LEADERS, HIGH CROWN
35	BIGLEAF MAPLE	ACER MACROPHYLLUM	14	14	FAIR	FAIR	NO	ONE SIDED, OVERTOPPED BY ADJACENT TREES, MODERATELY SUPPRESSED
36	BIGLEAF MAPLE	ACER MACROPHYLLUM	16,12,11	23	FAIR	FAIR	NO	MULTIPLE LEADERS AT GROUND LEVEL, SLOUGHING BARK AT LOWER TRUNK
37	N/A	N/A	N/A	N/A	N/A	N/A	N/A	NUMBER NOT USED
38	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	37	25	GOOD	FAIR	YES	MODERATELY ONE SIDED
39	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	19	14	GOOD	FAIR	YES	35% LIVE CROWN RATIO (LCR), MARGINAL TRUNK TAPER
40	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	18	15	GOOD	FAIR	YES	ONE SIDED
41	WESTERN REDCEDAR	THUJA PLICATA	14,10	0	VERY POOR	VERY POOR	NO	DEAD
42	WESTERN REDCEDAR	THUJA PLICATA	7,5	18	FAIR	FAIR	NO	OVERTOPPED BY ADJACENT TREES, SIGNIFICANT LEAN, CODOMINANT AT GROUND LEVEL, DECAY AT LOWER STEMS
43	WESTERN REDCEDAR	THUJA PLICATA	37	15	FAIR	FAIR	NO	SIGNIFICANT BARK DAMAGE AND DECAY AT LOWER TRUNK, MULTIPLE LEADERS AT 3' WITH INCLUDED BARK
44	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	24	16	GOOD	FAIR	YES	MODERATELY ONE SIDED
45	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	20	10	GOOD	FAIR	YES	ONE SIDED, MARGINAL TRUNK TAPER
46	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	8	11	GOOD	FAIR	NO	ONE SIDED, OVERTOPPED BY ADJACENT TREES
47	WESTERN REDCEDAR	THUJA PLICATA	14	12	FAIR	FAIR	NO	SIGNIFICANT BARK DAMAGE AT LOWER TRUNK
48	RED ALDER	ALNUS RUBRA	15	15	POOR	POOR	NO	ONE SIDED, PAST CODOMINANT STEM FAILURE
49	WESTERN REDCEDAR	THUJA PLICATA	12	8	VERY POOR	VERY POOR	NO	EXTENSIVE TOP DIEBACK
50	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	59	25	GOOD	FAIR	YES	CODOMINANT AT 2'
51	SWEET CHERRY	PRUNUS AVIUM	10	8	FAIR	FAIR	NO	ONE SIDED, THIN CROWN
52	SWEET CHERRY	PRUNUS AVIUM	6	5	GOOD	FAIR	NO	ONE SIDED, ON PROPERTY LINE?
53	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	28	18	GOOD	GOOD	YES	
54	WESTERN REDCEDAR	THUJA PLICATA	38	13	FAIR	FAIR	NO	LARGE SCAR AT LOWER TRUNK
55	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	30	20	GOOD	FAIR	YES	MODERATELY ONE SIDED
56	BIGLEAF MAPLE	ACER MACROPHYLLUM	8	15	POOR	POOR	NO	OVERTOPPED BY ADJACENT TREES, SIGNIFICANT LEAN, DECAY SEAM AT LOWER TRUNK
57	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	9	7	GOOD	FAIR	NO	MARGINAL TRUNK TAPER
58	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	7	7	FAIR	FAIR	NO	OVERTOPPED BY ADJACENT TREES, MODERATELY SUPPRESSED, MARGINAL TRUNK TAPER
59	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	20	11	GOOD	FAIR	YES	ONE SIDED, MARGINAL TRUNK TAPER
60	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	13	7	GOOD	FAIR	YES	MARGINAL TRUNK TAPER, CROWN EXTENSION SUPPRESSED BY ADJACENT TREES
61	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	32	17	GOOD	FAIR	YES	ONE SIDED
62	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	16	12	GOOD	FAIR	YES	ONE SIDED, MARGINAL TRUNK TAPER
63	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	17	18	GOOD	FAIR	YES	ONE SIDED
64	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	24	22	GOOD	FAIR	YES	ONE SIDED
65	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	14	6	FAIR	FAIR	NO	MODERATELY SUPPRESSED, POOR TRUNK TAPER
66	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	11	5	FAIR	FAIR	NO	MODERATELY SUPPRESSED, POOR TRUNK TAPER
67	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	25	14	FAIR	FAIR	NO	EXTENSIVE PORODAEDALEA PINI CONKS AT LOWER TRUNK
68	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	17	10	GOOD	FAIR	YES	ONE SIDED, CODOMINANT AT 15'
69	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	22	10	GOOD	FAIR	YES	ONE SIDED
70	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	15	13	FAIR	FAIR	NO	CODOMINANT STEM PREVIOUSLY REMOVED, MARGINAL TRUNK TAPER
71	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	9	9	GOOD	FAIR	NO	MODERATELY ONE SIDED
72	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	17	15	FAIR	FAIR	NO	MARGINAL TRUNK TAPER, RECENTLY EXPOSED
73	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	43	31	GOOD	FAIR	YES	ONE SIDED, MULTIPLE LEADERS AT 40'
74	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	35	27	GOOD	FAIR	YES	ONE SIDED, MULTIPLE LEADERS AT 40'
75	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	40	22	GOOD	FAIR	YES	ONE SIDED, MULTIPLE LEADERS AT 40'
76	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	6	9	GOOD	GOOD	NO	
77	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	9	11	GOOD	GOOD	NO	
78	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	8	10	GOOD	GOOD	NO	
79	GIANT SEQUOIA	SEQUOIADENDRON GIGANTEUM	85	28	GOOD	FAIR	YES	MULTIPLE LEADERS AT TOP OF CROWN
80	EUROPEAN MT. ASH	SORBUS AUCUPARIA	10	10	FAIR	FAIR	NO	CHLOROTIC, EXTENSIVE ROOT SUCKERS
81	ENGLISH HOLLY	ILEX AQUIFOLIUM	10,8,6	10	FAIR	FAIR	NO	MULTIPLE LEADERS AT GROUND LEVEL
82	ORCHARD APPLE	MALUS DOMESTICA	8	12	GOOD	GOOD	NO	
83	ORCHARD APPLE	MALUS DOMESTICA	14	11	FAIR	FAIR	NO	SIGNIFICANT DECAY AT LOWER TRUNK, CODOMINANT AT 1'
84	ORCHARD APPLE	MALUS DOMESTICA	12	13	FAIR	FAIR	NO	DECAY AT LOWER TRUNK
85	ORCHARD APPLE	MALUS DOMESTICA	10	8	POOR	POOR	NO	TOP FAILURE, SIGNIFICANT ROOT SUCKERS
86	ORCHARD APPLE	MALUS DOMESTICA	16	13	FAIR	FAIR	NO	SIGNIFICANT TRUNK DECAY, MULTIPLE LEADERS AT 1'
87	ORCHARD APPLE	MALUS DOMESTICA	9,9	10	VERY POOR	VERY POOR	NO	FALLEN OVER
88	ORCHARD PEAR	PYRUS SP.	6	8	GOOD	GOOD	NO	
89	ORCHARD PEAR	PYRUS SP.	7	7	GOOD	GOOD	NO	
90	ORCHARD APPLE	MALUS DOMESTICA	11	14	GOOD	GOOD	YES	
91	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	49	25	GOOD	FAIR	YES	CODOMINANT AT 30' WITH INCLUDED BARK
92	SCOULER'S WILLOW	SALIX SCOULERIANA	6,5,5,5,4,4	15	POOR	POOR	NO	MULTIPLE LEADERS AT GROUND LEVEL, BRANCH DIEBACK
93	ENGLISH HAWTHORN	CRATAEGUS MONOGYNA	18	18	GOOD	FAIR	YES	MULTIPLE LEADERS
94	BIGLEAF MAPLE	ACER MACROPHYLLUM	18	15	GOOD	FAIR	YES	ONE SIDED, MULTIPLE LEADERS AT 1'
95	BIGLEAF MAPLE	ACER MACROPHYLLUM	8,7,5	15	GOOD	FAIR	YES	MULTIPLE LEADERS AT GROUND LEVEL
96	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	22	20	GOOD	FAIR	YES	ONE SIDED
97	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	26	25	GOOD	FAIR	YES	ONE SIDED
98	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	32	30	GOOD	FAIR	YES	ONE SIDED
99	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	8	9	GOOD	GOOD	NO	
100	BIGLEAF MAPLE	ACER MACROPHYLLUM	6	8	GOOD	FAIR	NO	ONE SIDED, PREVIOUS LEADER FAILURE
101	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	31	25	GOOD	FAIR	YES	ONE SIDED, CODOMINANT WITH 6" STEM AT 3'
102	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	11	8	GOOD	FAIR	YES	ONE SIDED, OVERTOPPED BY ADJACENT TREES
103	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	32	25	GOOD	FAIR	YES	ONE SIDED, SUPPRESSED CROWN EXTENSION
104	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	35	20	GOOD	FAIR	YES	ONE SIDED, SUPPRESSED CROWN EXTENSION
105	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	7	5	GOOD	FAIR	NO	OVERTOPPED BY ADJACENT TREES
106	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	28	20	GOOD	FAIR	YES	ONE SIDED
107	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	40	30	GOOD	FAIR	YES	MODERATELY ONE SIDED
108	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	42	30	GOOD	FAIR	YES	ONE SIDED
109	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	46	30	GOOD	FAIR	YES	ONE SIDED
110	BIGLEAF MAPLE	ACER MACROPHYLLUM	9	20	GOOD	FAIR	NO	ONE SIDED, OVERTOPPED BY ADJACENT TREES
111	BIGLEAF MAPLE	ACER MACROPHYLLUM	6,5,5	20	GOOD	FAIR	NO	ONE SIDED, OVERTOPPED BY ADJACENT TREES, MULTIPLE LEADERS AT GROUND LEVEL
112	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	48	30	GOOD	FAIR	YES	ONE SIDED
113	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	50	30	GOOD	FAIR	YES	ONE SIDED
114	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	28	16	GOOD	FAIR	YES	ONE SIDED, BOWED LOWER TRUNK
115	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	18	12	FAIR	FAIR	NO	OVERTOPPED BY ADJACENT TREES, PISTOL BUTT
116	BIGLEAF MAPLE	ACER MACROPHYLLUM	6	15	GOOD	FAIR	NO	ONE SIDED, OVERTOPPED BY ADJACENT TREES
117	BIGLEAF MAPLE	ACER MACROPHYLLUM	6	15	GOOD	FAIR	NO	ONE SIDED, OVERTOPPED BY ADJACENT TREES
118	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	32	30	GOOD	FAIR	YES	ONE SIDED
119	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	27	22	GOOD	FAIR	YES	CROWN EXTENSION SUPPRESSED BY ADJACENT TREES
120	GRAND FIR	ABIES GRANDIS	10	12	GOOD	FAIR	NO	OVERTOPPED BY ADJACENT TREES
121	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	38	20	GOOD	FAIR	YES	MODERATELY ONE SIDED, PREVIOUS STEM FAILURE AT 4'
122	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	20	10	FAIR	FAIR	NO	MODERATELY SUPPRESSED, MARGINAL TRUNK TAPER
123	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	30	30	GOOD	FAIR	YES	ONE SIDED
124	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	21	15	GOOD	FAIR	YES	ONE SIDED, MARGINAL TRUNK TAPER
125	BIGLEAF MAPLE	ACER MACROPHYLLUM	8	15	GOOD	FAIR	NO	ONE SIDED, OVERTOPPED BY ADJACENT TREES
126	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	9	10	GOOD	FAIR	NO	MODERATELY ONE SIDED, OVERTOPPED BY ADJACENT TREES
127	BIGLEAF MAPLE	ACER MACROPHYLLUM	12	20	GOOD	FAIR	YES	ONE SIDED, OVERTOPPED BY ADJACENT TREES
128	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	6	8	GOOD	FAIR	NO	ONE SIDED, OVERTOPPED BY ADJACENT TREES
129	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	33	15	GOOD	FAIR	YES	ONE SIDED
130	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	28	25	GOOD	FAIR	YES	ONE SIDED
131	BIGLEAF MAPLE	ACER MACROPHYLLUM	6	15	GOOD	FAIR	NO	ONE SIDED
132	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	42	32	GOOD	FAIR	YES	ONE SIDED
133	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	12	10	FAIR	FAIR	NO	OVERTOPPED BY ADJACENT TREES, MODERATELY SUPPRESSED, SIGNIFICANT LEAN AT LOWER TRUNK
134	BIGLEAF MAPLE	ACER MACROPHYLLUM	7,6	8	FAIR	FAIR	NO	CODOMINANT AT GROUND LEVEL, UNDERSIZED LEAVES
135	BIGLEAF MAPLE	ACER MACROPHYLLUM	11	8	FAIR	FAIR	NO	CODOMINANT AT 2' WITH INCLUDED BARK, UNDERSIZED LEAVES
136	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	26	25	GOOD	FAIR	YES	ONE SIDED
137	SWEET CHERRY	PRUNUS AVIUM	6	7	GOOD	FAIR	NO	OVERTOPPED BY ADJACENT TREES
138	ENGLISH HOLLY	ILEX AQUIFOLIUM	6	8	GOOD	GOOD	NO	
139	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	40	30	GOOD	FAIR	YES	MODERATELY ONE SIDED
140	GRAND FIR	ABIES GRANDIS	23	0	VERY POOR	VERY POOR	NO	DEAD
141	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	32	30	GOOD	FAIR	YES	ONE SIDED
142	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	30	25	GOOD	FAIR	YES	ONE SIDED
143	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	34	30	FAIR	FAIR	NO	PORODAEDALEA PINI CONKS AT LOWER TRUNK
144	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	47	35	GOOD	FAIR	YES	PREVIOUS FILL FROM ADJACENT DEVELOPMENT

TREE TO BE SAVED OR REMOVED

TREE No	COMMON NAME	SCIENTIFIC NAME	DBH	C-RAD	CONDITION	STRUCTURE	TREE RETENTION OPTION	COMMENTS
145	PACIFIC YEW	TAXUS BREVIFOLIA	6	6	GOOD	GOOD	NO	
146	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	6	9	GOOD	GOOD	NO	
147	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	37	20	GOOD	FAIR	YES	MODERATELY ONE SIDED
148	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	38	30	GOOD	FAIR	YES	MODERATELY ONE SIDED
149	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	30	25	GOOD	FAIR	YES	MODERATELY ONE SIDED
150	BIGLEAF MAPLE	ACER MACROPHYLLUM	11	24	GOOD	FAIR	YES	MULTIPLE LEADERS AT 4', OVERTOPPED BY ADJACENT TREES
151	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	37	30	GOOD	FAIR	YES	MODERATELY ONE SIDED
152	RED ALDER	ALNUS RUBRA	8	15	GOOD	GOOD	NO	
153	RED ALDER	ALNUS RUBRA	8	6	VERY POOR	VERY POOR	NO	95% DEAD
154	RED ALDER	ALNUS RUBRA	11	15	GOOD	GOOD	YES	
155	BIGLEAF MAPLE	ACER MACROPHYLLUM	9	25	FAIR	FAIR	NO	OVERTOPPED BY ADJACENT TREES, MODERATELY SUPPRESSED
156	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	34	32	GOOD	FAIR	YES	MODERATELY ONE SIDED
157	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	30	25	GOOD	FAIR	YES	40% LCR
158	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	29	25	FAIR	FAIR	NO	PORODAEDALEA PINI CONKS AT LOWER TRUNK
159	WESTERN HEMLOCK	TSUGA HETEROPHYLLA	28	30	GOOD	GOOD	YES	
160	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	8	8	GOOD	FAIR	NO	ONE SIDED
161	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	7	7	GOOD	GOOD	NO	ONE SIDED
162	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	6	6	GOOD	FAIR	NO	ONE SIDED
163	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	8	10	GOOD	FAIR	NO	MODERATELY ONE SIDED
164	BIGLEAF MAPLE	ACER MACROPHYLLUM	6	10	GOOD	GOOD	NO	
165	WESTERN HEMLOCK	TSUGA HETEROPHYLLA	25	0	VERY POOR	VERY POOR	NO	DEAD
166	BIGLEAF MAPLE	ACER MACROPHYLLUM	36	40	FAIR	FAIR	NO	MULTIPLE LEADERS AT 2', MULTIPLE SCAFFOLD BRANCH FAILURES
167	WESTERN HEMLOCK	TSUGA HETEROPHYLLA	27	25	FAIR	FAIR	NO	MODERATELY THIN CROWN
168	WESTERN HEMLOCK	TSUGA HETEROPHYLLA	26	25	FAIR	FAIR	NO	MODERATELY THIN CROWN
169	WESTERN HEMLOCK	TSUGA HETEROPHYLLA	19	0	VERY POOR	VERY POOR	NO	DEAD
170	RED ALDER	ALNUS RUBRA	9	8	FAIR	FAIR	NO	SIGNIFICANT LEAN, EPICORMIC GROWTH AT LOWER TRUNK
171	GRAND FIR	ABIES GRANDIS	26	15	FAIR	FAIR	NO	MODERATELY THIN CROWN
172	SCOULER'S WILLOW	SALIX SCOULERIANA	14	0	VERY POOR	VERY POOR	NO	DEAD, ON PROPERTY LINE?
173	WESTERN HEMLOCK	TSUGA HETEROPHYLLA	14	8	FAIR	FAIR	NO	CODOMINANT AT 4', MODERATELY THIN CROWN
174	WESTERN HEMLOCK	TSUGA HETEROPHYLLA	22	15	FAIR	FAIR	NO	MODERATELY THIN CROWN
175	WESTERN HEMLOCK	TSUGA HETEROPHYLLA	17	15	GOOD	FAIR	YES	ONE SIDED
176	WESTERN HEMLOCK	TSUGA HETEROPHYLLA	11	0	VERY POOR	VERY POOR	NO	DEAD
177	WESTERN HEMLOCK	TSUGA HETEROPHYLLA	7	10	POOR	POOR	NO	SUPPRESSED
178	WESTERN HEMLOCK	TSUGA HETEROPHYLLA	11	8	POOR	POOR	NO	SUPPRESSED, CODOMINANT STEM AT 4' FAILED
179	WESTERN HEMLOCK	TSUGA HETEROPHYLLA	6	5	POOR	POOR	NO	SUPPRESSED
180	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	22	20	GOOD	FAIR	YES	35% LCR, MARGINAL TRUNK TAPER
181	BIGLEAF MAPLE	ACER MACROPHYLLUM	11	20	GOOD	FAIR	YES	ONE SIDED, OVERTOPPED BY ADJACENT TREES
182	BIGLEAF MAPLE	ACER MACROPHYLLUM	21	35	GOOD	FAIR	YES	CODOMINANT AT 4' WITH INCLUDED BARK, ONE SIDED, OVERTOPPED BY ADJACENT TREES
183	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	17	15	GOOD	FAIR	YES	ONE SIDED, OVERTOPPED BY ADJACENT TREES
184	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	30	30	GOOD	FAIR	YES	ONE SIDED
185	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	34	30	GOOD	FAIR	YES	MODERATELY ONE SIDED, PISTOL BUTT
186	WESTERN HEMLOCK	TSUGA HETEROPHYLLA	6	8	GOOD	FAIR	NO	OVERTOPPED BY ADJACENT TREES
187	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	37	32	GOOD	FAIR	YES	MODERATELY ONE SIDED
188	WESTERN HEMLOCK	TSUGA HETEROPHYLLA	6	10	GOOD	GOOD	NO	
189	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	35	30	GOOD	FAIR	YES	CROWN EXTENSION SUPPRESSED BY ADJACENT TREES
190	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	21	20	FAIR	POOR	NO	25% LCR
191	WESTERN HEMLOCK	TSUGA HETEROPHYLLA	8	8	GOOD	GOOD	NO	
192	GRAND FIR	ABIES GRANDIS	19	15	GOOD	FAIR	YES	ONE SIDED, MARGINAL TRUNK TAPER
193	GRAND FIR	ABIES GRANDIS	21	15	FAIR	POOR	NO	30% LCR
194	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	30	30	GOOD	FAIR	YES	ONE SIDED
195	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	13	15	GOOD	FAIR	YES	ONE SIDED, OVERTOPPED BY ADJACENT TREES, MARGINAL TRUNK TAPER
196	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	31	30	GOOD	FAIR	YES	CROWN EXTENSION SUPPRESSED BY ADJACENT TREES
197	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	42	40	GOOD	FAIR	YES	MODERATELY ONE SIDED
198	WESTERN HEMLOCK	TSUGA HETEROPHYLLA	13	20	GOOD	FAIR	YES	OVERTOPPED BY ADJACENT TREES
199	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	44	40	GOOD	FAIR	YES	MODERATELY ONE SIDED, DECAY POCKET AT LOWER TRUNK
200	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	9	0	VERY POOR	VERY POOR	NO	DEAD 20' SNAG
201	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	8	0	VERY POOR	VERY POOR	NO	DEAD 25' SNAG
202	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	11	5	POOR	POOR	NO	OVERTOPPED BY ADJACENT TREES, SUPPRESSED
203	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	51	30	GOOD	FAIR	YES	KINKED LOWER TRUNK
204	WESTERN HEMLOCK	TSUGA HETEROPHYLLA	10	10	GOOD	FAIR	NO	OVERTOPPED BY ADJACENT TREES
205	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	39	40	GOOD	FAIR	YES	50% LCR
206	WESTERN HEMLOCK	TSUGA HETEROPHYLLA	11	15	GOOD	FAIR	YES	CODOMINANT AT 12'
207	WESTERN HEMLOCK	TSUGA HETEROPHYLLA	27	18	FAIR	FAIR	NO	CODOMINANT AT 10', MODERATELY THIN CROWN
208	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	37	38	GOOD	GOOD	YES	
209	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	10	8	FAIR	FAIR	NO	OVERTOPPED BY ADJACENT TREES, MODERATELY SUPPRESSED
210	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	41	30	GOOD	FAIR	YES	MODERATELY ONE SIDED, 10" STEM AT 2'
211	BIGLEAF MAPLE	ACER MACROPHYLLUM	6	8	GOOD	GOOD	NO	
212	WESTERN HEMLOCK	TSUGA HETEROPHYLLA	9	9	GOOD	FAIR	NO	OVERTOPPED BY ADJACENT TREES
213	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	40	25	FAIR	FAIR	NO	PORODAEDALEA PINI CONKS AT LOWER TRUNK
214	GRAND FIR	ABIES GRANDIS	26	20	GOOD	FAIR	YES	ONE SIDED
215	BIGLEAF MAPLE	ACER MACROPHYLLUM	8	10	GOOD	FAIR	NO	ONE SIDED, OVERTOPPED BY ADJACENT TREES
216	BIGLEAF MAPLE	ACER MACROPHYLLUM	23	35	GOOD	FAIR	YES	ONE SIDED
217	BIGLEAF MAPLE	ACER MACROPHYLLUM	23	35	GOOD	FAIR	YES	ONE SIDED
218	WESTERN REDCEDAR	THUJA PLICATA	7	10	GOOD	GOOD	NO	
219	BIGLEAF MAPLE	ACER MACROPHYLLUM	7	12	GOOD	FAIR	NO	ONE SIDED, OVERTOPPED BY ADJACENT TREES
220	WESTERN HEMLOCK	TSUGA HETEROPHYLLA	14	10	FAIR	FAIR	NO	25% LCR, ONE SIDED
221	WESTERN HEMLOCK	TSUGA HETEROPHYLLA	24	15	FAIR	FAIR	NO	25% LCR, ONE SIDED
222	WESTERN HEMLOCK	TSUGA HETEROPHYLLA	22	0	VERY POOR	VERY POOR	NO	DEAD
223	WESTERN HEMLOCK	TSUGA HETEROPHYLLA	39	20	FAIR	FAIR	NO	CODOMINANT AT 3', MODERATELY THIN CROWN
224	BIGLEAF MAPLE	ACER MACROPHYLLUM	24	20	GOOD	FAIR	YES	ONE SIDED, CODOMINANT AT 2' WITH INCLUDED BARK
225	BIGLEAF MAPLE	ACER MACROPHYLLUM	10	7	FAIR	FAIR	NO	OVERTOPPED BY ADJACENT TREES, MODERATELY SUPPRESSED
226	GRAND FIR	ABIES GRANDIS	32	18	GOOD	FAIR	YES	50% LCR
227	GRAND FIR	ABIES GRANDIS	15	15	GOOD	FAIR	YES	ONE SIDED, OVERTOPPED BY ADJACENT TREES
228	BIGLEAF MAPLE	ACER MACROPHYLLUM	14	2	POOR	POOR	NO	TOP FAILURE AT 20'
229	BIGLEAF MAPLE	ACER MACROPHYLLUM	14	20	GOOD	FAIR	YES	ONE SIDED, MULTIPLE LEADERS AT 20'
230	BIGLEAF MAPLE	ACER MACROPHYLLUM	13	15	FAIR	FAIR	NO	ONE SIDED, OVERTOPPED BY ADJACENT TREES
231	BIGLEAF MAPLE	ACER MACROPHYLLUM	14	15	FAIR	FAIR	NO	ONE SIDED, OVERTOPPED BY ADJACENT TREES
232	BIGLEAF MAPLE	ACER MACROPHYLLUM	16	18	FAIR	FAIR	NO	ONE SIDED, OVERTOPPED BY ADJACENT TREES
233	BIGLEAF MAPLE	ACER MACROPHYLLUM	20	25	GOOD	FAIR	YES	ONE SIDED
234	BIGLEAF MAPLE	ACER MACROPHYLLUM	13	20	FAIR	FAIR	NO	ONE SIDED, OVERTOPPED BY ADJACENT TREES
235	SCOULER'S WILLOW	SALIX SCOULERIANA	10,8,6	0	VERY POOR	VERY POOR	NO	EXTENSIVE DIEBACK AND DECAY
236	BIGLEAF MAPLE	ACER MACROPHYLLUM	10	0	VERY POOR	VERY POOR	NO	DEAD
237	BIGLEAF MAPLE	ACER MACROPHYLLUM	6	15	GOOD	FAIR	NO	SIGNIFICANT LEAN, OVERTOPPED BY ADJACENT TREES, ONE SIDED
238	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	41	25	GOOD	FAIR	YES	MODERATELY ONE SIDED
239	BIGLEAF MAPLE	ACER MACROPHYLLUM	32	35	GOOD	FAIR	YES	MULTIPLE LEADERS AT 4', ONE SIDED, OVERTOPPED BY ADJACENT TREES
240	WESTERN HEMLOCK	TSUGA HETEROPHYLLA	32	25	FAIR	FAIR	NO	ONE SIDED
241	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	26	20	GOOD	FAIR	YES	ONE SIDED
242	BLACK HAWTHORN	CRATAEGUS DOUGLASII	13	15	POOR	POOR	NO	OVERTOPPED BY ADJACENT TREES, SIGNIFICANT LEAN, SUPPRESSED
243	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	33	20	GOOD	FAIR	YES	ONE SIDED
244	BLACK HAWTHORN	CRATAEGUS DOUGLASII	6	6	FAIR	FAIR	NO	ONE SIDED, OVERTOPPED BY ADJACENT TREES
245	BIGLEAF MAPLE	ACER MACROPHYLLUM	8	20	GOOD	FAIR	NO	ONE SIDED, OVERTOPPED BY ADJACENT TREES
246	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	40	25	GOOD	FAIR	YES	ONE SIDED
247	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	31	25	GOOD	FAIR	YES	ONE SIDED
248	BIGLEAF MAPLE	ACER MACROPHYLLUM	28	25	GOOD	FAIR	YES	CODOMINANT AT 1' WITH INCLUDED BARK, OVERTOPPED BY ADJACENT TREES
249	WESTERN HEMLOCK	TSUGA HETEROPHYLLA	6	5	FAIR	FAIR	NO	OVERTOPPED BY ADJACENT TREES, MODERATELY THIN CROWN
250	BIGLEAF MAPLE	ACER MACROPHYLLUM	8	8	FAIR	FAIR	NO	OVERTOPPED BY ADJACENT TREES, MODERATELY SUPPRESSED
251	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	37	20	GOOD	FAIR	YES	ONE SIDED
252	BIGLEAF MAPLE	ACER MACROPHYLLUM	18	15	FAIR	FAIR	NO	MODERATELY SUPPRESSED
253	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	14	15	FAIR	POOR	NO	25% LCR
254	BIGLEAF MAPLE	ACER MACROPHYLLUM	50	25	FAIR	POOR	NO	MULTIPLE LEADERS AT 2', TWO FAILED LEADERS, DECAY AT ROOT CROWN
255	RED ALDER	ALNUS RUBRA	42	20	FAIR	POOR	NO	MULTIPLE LEADERS AT 3' WITH INCLUDED BARK
256	SWEET CHERRY	PRUNUS AVIUM	7	5	FAIR	POOR	NO	15% LCR
257	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	14	15	GOOD	GOOD	YES	
258	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	26	20	GOOD	FAIR	YES	MODERATELY ONE SIDED
259	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	6	6	FAIR	FAIR	NO	OVERTOPPED BY ADJACENT TREES, MODERATELY THIN CROWN
260	SWEET CHERRY	PRUNUS AVIUM	9	9	FAIR	POOR	NO	MODERATELY THIN CROWN, 25% LCR
261	SWEET CHERRY	PRUNUS AVIUM	10	10	FAIR	FAIR	NO	MODERATELY THIN CROWN
262	BIGLEAF MAPLE	ACER MACROPHYLLUM	10	20	GOOD	GOOD	NO	
263	SCOULER'S WILLOW	SALIX SCOULERIANA	12	10	POOR	POOR	NO	SIGNIFICANT DIEBACK AND DECAY
264	SCOULER'S WILLOW	SALIX SCOULERIANA	8	8	POOR	POOR	NO	SIGNIFICANT DIEBACK AND DECAY
265	SCOULER'S WILLOW	SALIX SCOULERIANA	7	5	POOR	POOR	NO	TOP FAILED AT 20'
266	BIGLEAF MAPLE	ACER MACROPHYLLUM	8	8	GOOD	FAIR	NO	40% LCR
267	SWEET CHERRY	PRUNUS AVIUM	8	10	FAIR	FAIR	NO	MODERATELY SUPPRESSED, MODERATELY THIN CROWN
268	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	27	20	GOOD	FAIR	YES	MODERATELY ONE SIDED
269	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	34	20	GOOD	FAIR	YES	ONE SIDED
270	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	45	30	GOOD	FAIR	YES	ONE SIDED
271	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	36	20	GOOD	FAIR	YES	ONE SIDED
272	RED ALDER	ALNUS RUBRA	12	10	FAIR	FAIR	NO	OVERTOPPED BY ADJACENT TREES, SIGNIFICANT LEAN
273	RED ALDER	ALNUS RUBRA	16	15	FAIR	FAIR	NO	OVERTOPPED BY ADJACENT TREES, SIGNIFICANT LEAN
274	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	37	25	GOOD	FAIR	YES	MODERATELY ONE SIDED
275	SCOULER'S WILLOW	SALIX SCOULERIANA	25	15	POOR	POOR	NO	SIGNIFICANT DIEBACK AND DECAY
276	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	30	20	GOOD	FAIR	YES	MODERATELY ONE SIDED
277	BIGLEAF MAPLE	ACER MACROPHYLLUM	25	35	GOOD	FAIR	YES	CODOMINANT AT 15'
278	N/A	N/A	N/A	N/A	N/A	N/A	N/A	NUMBER NOT USED
279	N/A	N/A	N/A	N/A	N/A	N/A	N/A	NUMBER NOT USED
280	SWEET CHERRY	PRUNUS AVIUM	12	8	POOR	POOR	NO	TOP DIEBACK
281	BIGLEAF MAPLE	ACER MACROPHYLLUM	17	25	POOR	POOR	NO	SIGNIFICANT BARK DAMAGE AND DECAY AT LOWER TRUNK
282	BIGLEAF MAPLE	ACER MACROPHYLLUM	27	30	GOOD	GOOD	YES	
283	SWEET CHERRY	PRUNUS AVIUM	11	10	FAIR	FAIR	NO	ONE SIDED, MODERATELY THIN CROWN
284	BIGLEAF MAPLE	ACER MACROPHYLLUM	38	35	FAIR	FAIR	NO	MULTIPLE LEADERS AT LOWER TRUNK WITH INCLUDED BARK, BRANCH DIEBACK
285	SWEET CHERRY	PRUNUS AVIUM	9	5	POOR	POOR	NO	SIGNIFICANT DIEBACK AND DECAY
286	BIGLEAF MAPLE	ACER MACROPHYLLUM	15	15	FAIR	FAIR	NO	ONE SIDED, OVERTOPPED BY ADJACENT TREES, UNDERSIZED LEAVES
287	BIGLEAF MAPLE	ACER MACROPHYLLUM	27	30	FAIR	FAIR	NO	ONE SIDED, OVERTOPPED BY ADJACENT TREES, UNDERSIZED LEAVES
288	BIGLEAF MAPLE	ACER MACROPHYLLUM	24	25	FAIR	FAIR	NO	ONE SIDED, UNDERSIZED LEAVES, CODOMINANT AT 3' WITH INCLUDED BARK

TREE SURVEY COMPLETED BY: TERAGAN & ASSOCIATES, INC.

ATTENTION: TODD PRAGER, ASCA REGISTERED CONSULTING ARBORIST #597, ISA BOARD CERTIFIED MASTER ARBORIST, ISA TREE RISK ASSESSMENT QUALIFIED, AICP, AMERICAN PLANNING ASSOCIATION

1. DBH IS THE TRUNK DIAMETER IN INCHES MEASURED IN ACCORDANCE WITH INTERNATIONAL SOCIETY OF ARBORICULTURE STANDARDS.
2. C-RAD IS THE APPROXIMATE CROWN RADIUS IN FEET.
3. CONDITION AND STRUCTURE RATINGS RANGE FROM VERY POOR, POOR, FAIR, TO GOOD.
4. TREE MEETS THE REQUIREMENTS TO BE A RETENTION TREE PER 17.102.50.A-3 TREES PROPOSED FOR RETENTION SHALL BE HEALTHY AND LIKELY TO GROW TO MATURITY. PER CITY OF SANDY, ONLY TREES IN GOOD HEALTH CONDITION ARE ELIGIBLE TO MEET THIS STANDARD.

Attachment 3

SHEET C4 OF 10

DATE	NO.	REVISION	BY
-	-	-	-

DESIGNED: RLM
DRAWN: RLM
CHECKED: DLH
APPROVED: RLM

REGISTERED PROFESSIONAL ENGINEER, OREGON, JULY 21, 1998, RAY L. MOORE, 49710
RENEWAL DATE: 12/31/2022
PRELIMINARY

SCALE: VERT.: N/A HORIZ.: N/A
DATE: 4-28-21
FILE: 19-268 - Planning-SFR.dwg
LEGAL: SECTION 24, TWP. 2S, RANGE 4E

PROJECT: THE BORNSTEDT VIEWS
TREE INVENTORY LIST 1
LOCATION: 19618 SE BORNSTEDT ROAD, SANDY, OR

All County Surveyors & Planners, Inc.
Surveying, Planning and Civil Engineering
P.O. Box 955 Sandy, OR 97055
Phone: (503) 668-3151
Fax: (503) 668-4730
DATE OF PLOT 4-28-21

CLIENT:
EVEN BETTER HOMES, INC.
MAC EVEN
PO BOX 2021
GRESHAM, OR 97030
PHONE: (503) 348-5602
EMAIL: mac@evenbetterhomes.com

TREE TO BE SAVED OR REMOVED — "YES" INDICATES TREES THAT MEET TREE RETENTION REQUIREMENT. SEE NOTE 4.

TREE No	COMMON NAME	SCIENTIFIC NAME	DBH	C-RAD	CONDITION	STRUCTURE	TREE RETENTION OPTION	COMMENTS
289	BIGLEAF MAPLE	ACER MACROPHYLLUM	15	20	FAIR	FAIR	NO	ONE SIDED, UNDERSIZED LEAVES
290	BIGLEAF MAPLE	ACER MACROPHYLLUM	17	15	POOR	POOR	NO	CODOMINANT AT 1' WITH INCLUDED BARK, CODOMINANT STEM FAILED
291	BIGLEAF MAPLE	ACER MACROPHYLLUM	25	25	FAIR	FAIR	NO	UNDERSIZED LEAVES
292	BIGLEAF MAPLE	ACER MACROPHYLLUM	20	25	FAIR	FAIR	NO	ONE SIDED, UNDERSIZED LEAVES
293	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	31	20	GOOD	FAIR	YES	ONE SIDED
294	SCOULER'S WILLOW	SALIX SCOULERIANA	15	8	POOR	POOR	NO	EXTENSIVE DIEBACK AND DECAY
295	BIGLEAF MAPLE	ACER MACROPHYLLUM	20	15	GOOD	FAIR	YES	ONE SIDED
296	SWEET CHERRY	PRUNUS AVIUM	12	8	FAIR	FAIR	NO	UNDERSIZED LEAVES, ONE SIDED
297	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	28	20	GOOD	FAIR	YES	MODERATELY ONE SIDED
298	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	32	25	GOOD	FAIR	YES	MODERATELY ONE SIDED
299	BIGLEAF MAPLE	ACER MACROPHYLLUM	21	20	GOOD	FAIR	YES	ONE SIDED, MULTIPLE LEADERS AT 10'
300	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	7	7	FAIR	FAIR	NO	OVERTOPPED BY ADJACENT TREES, SUPPRESSED
301	SWEET CHERRY	PRUNUS AVIUM	7	3	VERY POOR	VERY POOR	NO	90% DEAD
302	BIGLEAF MAPLE	ACER MACROPHYLLUM	30	30	FAIR	FAIR	NO	SIGNIFICANT DECAY AT ROOT CROWN, ONE SIDED
303	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	23	15	GOOD	FAIR	YES	MODERATELY ONE SIDED
304	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	26	18	GOOD	FAIR	YES	MODERATELY ONE SIDED
305	BIGLEAF MAPLE	ACER MACROPHYLLUM	16	20	GOOD	FAIR	YES	ONE SIDED
306	BIGLEAF MAPLE	ACER MACROPHYLLUM	11	15	FAIR	FAIR	NO	33% LCR, UNDERSIZED LEAVES, MARGINAL TRUNK TAPER
307	BIGLEAF MAPLE	ACER MACROPHYLLUM	18,15	20	FAIR	FAIR	NO	OVERTOPPED BY ADJACENT TREES, MULTIPLE LEADERS NEAR GROUND LEVEL
308	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	27	25	GOOD	FAIR	YES	60% LCR
309	BIGLEAF MAPLE	ACER MACROPHYLLUM	10	10	POOR	POOR	NO	OVERTOPPED BY ADJACENT TREES, TOP FAILED
310	BLACK HAWTHORN	CRATAEGUS DOUGLASII	8	10	FAIR	FAIR	NO	SIGNIFICANT LEAN, OVERTOPPED BY ADJACENT TREES, MODERATELY SUPPRESSED
311	BLACK COTTONWOOD	POPULUS TRICHOCARPA	12	10	FAIR	FAIR	NO	OVERTOPPED BY ADJACENT TREES, MODERATELY SUPPRESSED
312	BIGLEAF MAPLE	ACER MACROPHYLLUM	35	25	GOOD	FAIR	YES	MULTIPLE LEADERS AT LOWER TRUNK WITH INCLUDED BARK
313	BIGLEAF MAPLE	ACER MACROPHYLLUM	22	20	FAIR	FAIR	NO	CODOMINANT AT 4' WITH INCLUDED BARK, PAST SCAFFOLD BRANCH FAILURES
314	BIGLEAF MAPLE	ACER MACROPHYLLUM	14	15	GOOD	FAIR	YES	ONE SIDED, MARGINAL TRUNK TAPER
315	BIGLEAF MAPLE	ACER MACROPHYLLUM	27	25	GOOD	FAIR	YES	MULTIPLE LEADERS AT 2' WITH INCLUDED BARK, ONE SIDED
316	SWEET CHERRY	PRUNUS AVIUM	6	3	POOR	POOR	NO	SUPPRESSED
317	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	28	25	GOOD	GOOD	YES	
318	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	41	25	GOOD	FAIR	YES	SWEEP IN LOWER TRUNK
319	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	27	20	GOOD	FAIR	YES	MODERATELY ONE SIDED
320	RED ALDER	ALNUS RUBRA	8	8	POOR	POOR	NO	THIN CROWN
321	RED ALDER	ALNUS RUBRA	13	13	FAIR	FAIR	NO	ONE SIDED, MARGINAL TRUNK TAPER
322	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	6	5	FAIR	FAIR	NO	MODERATELY SUPPRESSED, OVERTOPPED BY ADJACENT TREES
323	RED ALDER	ALNUS RUBRA	10	15	FAIR	FAIR	NO	ONE SIDED, MARGINAL TRUNK TAPER
324	RED ALDER	ALNUS RUBRA	8	10	FAIR	FAIR	NO	ONE SIDED, MARGINAL TRUNK TAPER
325	RED ALDER	ALNUS RUBRA	8	5	POOR	POOR	NO	SUPPRESSED
326	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	28	25	GOOD	FAIR	YES	MODERATELY ONE SIDED
327	PACIFIC DOGWOOD	CORNUS NUTTALLII	7	2	POOR	POOR	NO	SUPPRESSED
328	WESTERN HEMLOCK	TSUGA HETEROPHYLLA	26	25	GOOD	FAIR	YES	GROWING ON OLD STUMP
329	SCOULER'S WILLOW	SALIX SCOULERIANA	8	7	POOR	POOR	NO	EXTENSIVE DIEBACK AND DECAY
330	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	8	5	GOOD	FAIR	NO	KINK AT LOWER TRUNK
331	BLACK HAWTHORN	CRATAEGUS DOUGLASII	6	8	FAIR	FAIR	NO	MODERATELY SUPPRESSED
332	SWEET CHERRY	PRUNUS AVIUM	9	5	FAIR	FAIR	NO	ONE SIDED, MODERATELY THIN CROWN
333	SWEET CHERRY	PRUNUS AVIUM	9	5	FAIR	FAIR	NO	ONE SIDED, MODERATELY THIN CROWN
334	SWEET CHERRY	PRUNUS AVIUM	11	10	FAIR	FAIR	NO	MODERATELY THIN CROWN
335	BIGLEAF MAPLE	ACER MACROPHYLLUM	16	20	FAIR	FAIR	NO	OVERTOPPED BY ADJACENT TREES, MODERATELY SUPPRESSED
336	WESTERN HEMLOCK	TSUGA HETEROPHYLLA	16	10	FAIR	FAIR	NO	CODOMINANT AT 1', OVERTOPPED BY ADJACENT TREES, MODERATELY SUPPRESSED
337	WESTERN HEMLOCK	TSUGA HETEROPHYLLA	21	15	FAIR	FAIR	NO	OVERTOPPED BY ADJACENT TREES, MODERATELY SUPPRESSED
338	WESTERN HEMLOCK	TSUGA HETEROPHYLLA	27	15	FAIR	FAIR	NO	ONE SIDED, CODOMINANT STEM PREVIOUSLY REMOVED AT LOWER TRUNK
339	WESTERN HEMLOCK	TSUGA HETEROPHYLLA	25	15	GOOD	FAIR	YES	ONE SIDED
340	WESTERN HEMLOCK	TSUGA HETEROPHYLLA	30	15	GOOD	FAIR	YES	ONE SIDED
341	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	41	30	GOOD	FAIR	YES	MODERATELY ONE SIDED
342	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	41	25	GOOD	FAIR	YES	MODERATELY ONE SIDED
343	SCOULER'S WILLOW	SALIX SCOULERIANA	14,10,9	15	POOR	POOR	NO	EXTENSIVE DIEBACK AND DECAY
344	WESTERN HEMLOCK	TSUGA HETEROPHYLLA	14	10	GOOD	FAIR	YES	GROWING ON OLD STUMP
345	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	8	10	GOOD	FAIR	NO	ONE SIDED, OVERTOPPED BY ADJACENT TREES
346	BIGLEAF MAPLE	ACER MACROPHYLLUM	24	25	GOOD	FAIR	YES	ONE SIDED
347	BIGLEAF MAPLE	ACER MACROPHYLLUM	21	20	GOOD	FAIR	YES	ONE SIDED
348	WESTERN HEMLOCK	TSUGA HETEROPHYLLA	7	10	GOOD	FAIR	NO	OVERTOPPED BY ADJACENT TREES, GROWING ON OLD STUMP
349	WESTERN HEMLOCK	TSUGA HETEROPHYLLA	20	18	GOOD	GOOD	YES	
350	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	16	15	GOOD	FAIR	YES	ONE SIDED, OVERTOPPED BY ADJACENT TREES
351	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	44	20	GOOD	FAIR	YES	ONE SIDED
352	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	27	20	GOOD	FAIR	YES	ONE SIDED
353	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	44	25	GOOD	FAIR	YES	ONE SIDED
354	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	45	30	GOOD	FAIR	YES	MODERATELY ONE SIDED
355	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	38	30	GOOD	FAIR	YES	MODERATELY ONE SIDED
356	BIGLEAF MAPLE	ACER MACROPHYLLUM	6	20	GOOD	GOOD	NO	
357	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	29	20	GOOD	FAIR	YES	ONE SIDED
358	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	33	20	GOOD	FAIR	YES	ONE SIDED
359	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	34	25	GOOD	FAIR	YES	ONE SIDED
360	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	56	30	GOOD	FAIR	YES	CODOMINANT AT 2', 16" CODOMINANT STEM SUPPRESSED
361	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	10	10	FAIR	FAIR	NO	ONE SIDED, MODERATELY SUPPRESSED, MARGINAL TRUNK TAPER
362	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	8	5	FAIR	FAIR	NO	ONE SIDED, MODERATELY SUPPRESSED, MARGINAL TRUNK TAPER
363	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	34	30	GOOD	FAIR	YES	ONE SIDED, 50% LCR
364	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	52	25	GOOD	FAIR	YES	CODOMINANT AT 1' WITH INCLUDED BARK
365	BIGLEAF MAPLE	ACER MACROPHYLLUM	7	15	FAIR	FAIR	NO	MODERATELY SUPPRESSED
366	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	40	30	GOOD	FAIR	YES	ONE SIDED
367	WESTERN HEMLOCK	TSUGA HETEROPHYLLA	17	15	GOOD	FAIR	YES	ONE SIDED, OVERTOPPED BY ADJACENT TREES
368	WESTERN HEMLOCK	TSUGA HETEROPHYLLA	41	25	FAIR	GOOD	NO	MODERATELY THIN CROWN
369	BIGLEAF MAPLE	ACER MACROPHYLLUM	12	10	FAIR	FAIR	NO	OVERTOPPED BY ADJACENT TREES, MODERATELY SUPPRESSED
370	WESTERN HEMLOCK	TSUGA HETEROPHYLLA	30	0	VERY POOR	VERY POOR	NO	DEAD
371	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	29	15	GOOD	FAIR	YES	40% LCR
372	BIGLEAF MAPLE	ACER MACROPHYLLUM	18,9	20	FAIR	FAIR	NO	CODOMINANT AT GROUND LEVEL, ONE SIDED, OVERTOPPED BY ADJACENT TREES, MODERATELY SUPPRESSED
373	BIGLEAF MAPLE	ACER MACROPHYLLUM	32	25	FAIR	FAIR	NO	SIGNIFICANT DECAY AT ROOT CROWN, OVERTOPPED BY ADJACENT TREES, MODERATELY SUPPRESSED
374	WESTERN HEMLOCK	TSUGA HETEROPHYLLA	14	0	VERY POOR	VERY POOR	NO	DEAD
375	WESTERN HEMLOCK	TSUGA HETEROPHYLLA	23	20	POOR	POOR	NO	THINNING CROWN
376	WESTERN HEMLOCK	TSUGA HETEROPHYLLA	23	15	GOOD	GOOD	YES	
377	WESTERN HEMLOCK	TSUGA HETEROPHYLLA	31	20	GOOD	FAIR	YES	MODERATELY ONE SIDED
378	WESTERN HEMLOCK	TSUGA HETEROPHYLLA	17	0	VERY POOR	VERY POOR	NO	DEAD
379	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	23	15	GOOD	FAIR	YES	ONE SIDED
380	WESTERN HEMLOCK	TSUGA HETEROPHYLLA	13	15	FAIR	FAIR	NO	ONE SIDED, OVERTOPPED BY ADJACENT TREES, BRANCH DIEBACK
381	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	16	15	GOOD	FAIR	YES	MODERATELY ONE SIDED, MARGINAL TRUNK TAPER
382	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	13	10	GOOD	FAIR	YES	OVERTOPPED BY ADJACENT TREES, MARGINAL TRUNK TAPER
383	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	30	20	GOOD	FAIR	YES	50% LCR
384	WESTERN HEMLOCK	TSUGA HETEROPHYLLA	21	15	GOOD	FAIR	YES	ONE SIDED
385	BIGLEAF MAPLE	ACER MACROPHYLLUM	14	15	FAIR	FAIR	NO	OVERTOPPED BY ADJACENT TREES, MODERATELY SUPPRESSED
386	WESTERN HEMLOCK	TSUGA HETEROPHYLLA	25	20	FAIR	FAIR	NO	ONE SIDED, MODERATELY THIN CROWN
387	BIGLEAF MAPLE	ACER MACROPHYLLUM	6	10	GOOD	GOOD	NO	
388	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	22	15	GOOD	FAIR	YES	50% LCR, MARGINAL TRUNK TAPER
389	BIGLEAF MAPLE	ACER MACROPHYLLUM	22	30	GOOD	FAIR	YES	ONE SIDED
390	BIGLEAF MAPLE	ACER MACROPHYLLUM	7	7	FAIR	FAIR	NO	OVERTOPPED BY ADJACENT TREES, MODERATELY SUPPRESSED
391	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	25	20	GOOD	FAIR	YES	50% LCR, MARGINAL TRUNK TAPER
392	BIGLEAF MAPLE	ACER MACROPHYLLUM	12	12	GOOD	FAIR	YES	OVERTOPPED BY ADJACENT TREES
393	BIGLEAF MAPLE	ACER MACROPHYLLUM	8	8	FAIR	FAIR	NO	OVERTOPPED BY ADJACENT TREES, MODERATELY SUPPRESSED
394	WESTERN HEMLOCK	TSUGA HETEROPHYLLA	22	15	POOR	POOR	NO	SIGNIFICANT DIEBACK
395	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	75	40	GOOD	FAIR	YES	CODOMINANT AT 1'
396	BIGLEAF MAPLE	ACER MACROPHYLLUM	6	10	FAIR	FAIR	NO	ONE SIDED, OVERTOPPED BY ADJACENT TREES
397	BIGLEAF MAPLE	ACER MACROPHYLLUM	15	20	GOOD	FAIR	YES	ONE SIDED, OVERTOPPED BY ADJACENT TREES
398	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	72	40	GOOD	FAIR	YES	CODOMINANT AT 1' WITH INCLUDED BARK
399	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	36	25	GOOD	FAIR	YES	ONE SIDED
400	SCOULER'S WILLOW	SALIX SCOULERIANA	10	10	FAIR	FAIR	NO	ONE SIDED
401	RED ALDER	ALNUS RUBRA	7	5	GOOD	FAIR	NO	ONE SIDED
402	RED ALDER	ALNUS RUBRA	8	10	GOOD	FAIR	NO	ONE SIDED
403	RED ALDER	ALNUS RUBRA	11	10	GOOD	FAIR	YES	ONE SIDED, CODOMINANT AT 5' WITH INCLUDED BARK
404	RED ALDER	ALNUS RUBRA	11	10	GOOD	FAIR	YES	EXTREME LEAN, CODOMINANT AT 1'
405	RED ALDER	ALNUS RUBRA	7	7	GOOD	FAIR	NO	MARGINAL TRUNK TAPER
406	RED ALDER	ALNUS RUBRA	9	10	FAIR	FAIR	NO	PREVIOUS TOP FAILURES
407	BIGLEAF MAPLE	ACER MACROPHYLLUM	8	15	FAIR	FAIR	NO	PREVIOUS TOP FAILURES
408	RED ALDER	ALNUS RUBRA	15	10	FAIR	FAIR	NO	DIEBACK, BOWED TRUNK
409	SCOULER'S WILLOW	SALIX SCOULERIANA	9	2	POOR	POOR	NO	TOP FAILED AT 10'
410	BIGLEAF MAPLE	ACER MACROPHYLLUM	9	10	FAIR	FAIR	NO	ONE SIDED, UNDERSIZED LEAVES
411	SCOULER'S WILLOW	SALIX SCOULERIANA	6	2	POOR	POOR	NO	SIGNIFICANT DIEBACK AND DECAY
412	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	32	25	GOOD	FAIR	YES	ONE SIDED
413	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	26	15	GOOD	FAIR	YES	ONE SIDED, 60% LCR
414	BIGLEAF MAPLE	ACER MACROPHYLLUM	11	10	FAIR	FAIR	NO	OVERTOPPED BY ADJACENT TREES, MODERATELY SUPPRESSED
415	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	10	5	POOR	POOR	NO	SUPPRESSED, DECAY AT LOWER TRUNK
416	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	18	10	FAIR	FAIR	NO	MODERATELY SUPPRESSED
417	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	28	20	FAIR	FAIR	NO	40% LCR, BOWED LOWER TRUNK
418	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	14	10	FAIR	FAIR	NO	MODERATELY SUPPRESSED, MARGINAL TRUNK TAPER
419	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	28	20	GOOD	FAIR	YES	50% LCR
420	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	12	6	POOR	POOR	NO	SUPPRESSED, KINKED TRUNK
421	BIGLEAF MAPLE	ACER MACROPHYLLUM	16	15	GOOD	FAIR	YES	MODERATELY SUPPRESSED, EPICORMIC GROWTH AT LOWER TRUNK
422	WESTERN HEMLOCK	TSUGA HETEROPHYLLA	11	10	POOR	POOR	NO	OVERTOPPED BY ADJACENT TREES, EXTENSIVE DIEBACK
423	WESTERN HEMLOCK	TSUGA HETEROPHYLLA	29	20	FAIR	GOOD	NO	MODERATELY THIN CROWN
424	WESTERN HEMLOCK	TSUGA HETEROPHYLLA	13	15	FAIR	FAIR	NO	ONE SIDED, MODERATELY THIN CROWN
424	BIGLEAF MAPLE	ACER MACROPHYLLUM	13	15	GOOD	FAIR	YES	ONE SIDED, MODERATELY THIN CROWN
425	WESTERN HEMLOCK	TSUGA HETEROPHYLLA	23	0	VERY POOR	VERY POOR	NO	DEAD
426	WESTERN HEMLOCK	TSUGA HETEROPHYLLA	10	0	VERY POOR	VERY POOR	NO	DEAD
427	WESTERN HEMLOCK	TSUGA HETEROPHYLLA	29	20	FAIR	FAIR	NO	ONE SIDED, MODERATELY THIN CROWN
428	BIGLEAF MAPLE	ACER MACROPHYLLUM	11	20	FAIR	FAIR	NO	OVERTOPPED BY ADJACENT TREES, EPICORMIC GROWTH ON LOWER TRUNK
429	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	39	20	GOOD	FAIR	YES	50% LCR
430	BIGLEAF MAPLE	ACER MACROPHYLLUM	11	8	FAIR	FAIR	NO	OVERTOPPED BY ADJACENT TREES, EPICORMIC GROWTH ON LOWER TRUNK
431	BIGLEAF MAPLE	ACER MACROPHYLLUM	8	3	POOR	POOR	NO	SUPPRESSED

"GREEN" HATCH INDICATES TREES THAT WILL BE PROTECTED.

TREE TO BE SAVED OR REMOVED — "YES" INDICATES TREES THAT MEET TREE RETENTION REQUIREMENT. SEE NOTE 4.

TREE No	COMMON NAME	SCIENTIFIC NAME	DBH	C-RAD	CONDITION	STRUCTURE	TREE RETENTION OPTION	COMMENTS
432	WESTERN HEMLOCK	TSUGA HETEROPHYLLA	27	20	FAIR	FAIR	NO	ONE SIDED, MODERATELY THIN CROWN
433	WESTERN HEMLOCK	TSUGA HETEROPHYLLA	26	20	FAIR	FAIR	NO	50% LCR, MODERATELY THIN CROWN
434	WESTERN HEMLOCK	TSUGA HETEROPHYLLA	22	0	VERY POOR	VERY POOR	NO	DEAD, LEANS ON TREE 432
435	WESTERN HEMLOCK	TSUGA HETEROPHYLLA	24	20	FAIR	FAIR	NO	ONE SIDED, MODERATELY THIN CROWN
436	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	8	8	FAIR	FAIR	NO	OVERTOPPED BY ADJACENT TREES, ONE SIDED, SUPPRESSED
437	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	40	20	GOOD	FAIR	YES	MODERATELY ONE SIDED
438	BIGLEAF MAPLE	ACER MACROPHYLLUM	9	10	FAIR	FAIR	NO	OVERTOPPED BY ADJACENT TREES, KINKED LOWER TRUNK, EPICORMIC GROWTH ON LOWER TRUNK
439	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	26	15	GOOD	FAIR	YES	40% LCR, MODERATELY ONE SIDED, MARGINAL TRUNK TAPER
440	WESTERN HEMLOCK	TSUGA HETEROPHYLLA	19	20	GOOD	GOOD	YES	
441	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	29	20	GOOD	FAIR	YES	40% LCR, MODERATELY ONE SIDED
442	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	23	20	FAIR	FAIR	NO	ONE SIDED, MODERATELY SUPPRESSED, , 35% LCR, MARGINAL TRUNK TAPER
443	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	32	20	GOOD	FAIR	YES	CROWN EXTENSION SUPPRESSED BY ADJACENT TREES
444	WESTERN HEMLOCK	TSUGA HETEROPHYLLA	6	8	FAIR	FAIR	NO	OVERTOPPED BY ADJACENT TREES, MODERATELY SUPPRESSED
445	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	32	20	GOOD	FAIR	YES	ONE SIDED
446	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	25	20	GOOD	FAIR	YES	ONE SIDED, MARGINAL TRUNK TAPER
447	BIGLEAF MAPLE	ACER MACROPHYLLUM	16	15	POOR	POOR	NO	SUPPRESSED, BRANCH DIEBACK
448	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	31	20	GOOD	FAIR	YES	MODERATELY ONE SIDED
449	WESTERN HEMLOCK	TSUGA HETEROPHYLLA	18	20	FAIR	FAIR	NO	OVERTOPPED BY ADJACENT TREES, MODERATELY THIN CROWN
450	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	31	22	GOOD	FAIR	YES	MODERATELY ONE SIDED
451	WESTERN HEMLOCK	TSUGA HETEROPHYLLA	6	0	VERY POOR	VERY POOR	NO	DEAD
452	WESTERN HEMLOCK	TSUGA HETEROPHYLLA	27	18	FAIR	FAIR	NO	MODERATELY ONE SIDED, MODERATELY THIN CROWN
453	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	34	22	GOOD	FAIR	YES	MODERATELY ONE SIDED
454	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	29	25	GOOD	FAIR	YES	CROWN EXTENSION SUPPRESSED BY ADJACENT TREES
455	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	32	22	GOOD	FAIR	YES	CROWN EXTENSION SUPPRESSED BY ADJACENT TREES
456	BIGLEAF MAPLE	ACER MACROPHYLLUM	9	15	FAIR	FAIR	NO	OVERTOPPED BY ADJACENT TREES, EPICORMIC GROWTH AT LOWER TRUNK
457	WESTERN HEMLOCK	TSUGA HETEROPHYLLA	9	0	VERY POOR	VERY POOR	NO	DEAD
458	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	17	15	FAIR	FAIR	NO	ONE SIDED, MODERATELY SUPPRESSED
459	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	28	18	GOOD	FAIR	YES	ONE SIDED, 40% LCR
460	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	35	20	GOOD	FAIR	YES	40% LCR
461	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	10	0	VERY POOR	VERY POOR	NO	DEAD
462	WESTERN HEMLOCK	TSUGA HETEROPHYLLA	8	8	FAIR	FAIR	NO	ONE SIDED, MODERATELY SUPPRESSED
463	BIGLEAF MAPLE	ACER MACROPHYLLUM	6	8	POOR	POOR	NO	SUPPRESSED, LOST TOP
464	BIGLEAF MAPLE	ACER MACROPHYLLUM	9	15	GOOD	FAIR	NO	ONE SIDED, OVERTOPPED BY ADJACENT TREES
465	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	34	25	GOOD	FAIR	YES	ONE SIDED
466	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	38	20	GOOD	FAIR	YES	ONE SIDED
467	WESTERN HEMLOCK	TSUGA HETEROPHYLLA	22	15	FAIR	FAIR	NO	CODOMINANT AT 25' WITH INCLUDED BARK, MODERATELY SUPPRESSED
468	WESTERN HEMLOCK	TSUGA HETEROPHYLLA	26	15	FAIR	FAIR	NO	ONE SIDED, MODERATELY THIN CROWN
469	WESTERN HEMLOCK	TSUGA HETEROPHYLLA	19	12	FAIR	FAIR	NO	MODERATELY THIN CROWN
470	BIGLEAF MAPLE	ACER MACROPHYLLUM	21	20	GOOD	FAIR	YES	50% LCR
471	BIGLEAF MAPLE	ACER MACROPHYLLUM	11	10	GOOD	FAIR	YES	35% LCR, MARGINAL TRUNK TAPER
472	WESTERN HEMLOCK	TSUGA HETEROPHYLLA	32	15	POOR	POOR	NO	SIGNIFICANTLY THIN CROWN
473	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	32	18	GOOD	FAIR	YES	ONE SIDED
474	WESTERN HEMLOCK	TSUGA HETEROPHYLLA	13	14	FAIR	FAIR	NO	ONE SIDED, OVERTOPPED BY ADJACENT TREES
475	WESTERN HEMLOCK	TSUGA HETEROPHYLLA	27	20	GOOD	FAIR	YES	ONE SIDED
476	BIGLEAF MAPLE	ACER MACROPHYLLUM	15	18	FAIR	FAIR	NO	ONE SIDED, UNDERSIZED LEAVES
477	BIGLEAF MAPLE	ACER MACROPHYLLUM	11	8	POOR	POOR	NO	SUPPRESSED, BARK DAMAGE AT LOWER TRUNK
478	BIGLEAF MAPLE	ACER MACROPHYLLUM	6	8	FAIR	FAIR	NO	OVERTOPPED BY ADJACENT TREES, MODERATELY SUPPRESSED
479	BIGLEAF MAPLE	ACER MACROPHYLLUM	8	12	FAIR	FAIR	NO	SIGNIFICANT LEAN, OVERTOPPED BY ADJACENT TREES, MODERATELY SUPPRESSED
480	BIGLEAF MAPLE	ACER MACROPHYLLUM	20	20	GOOD	FAIR	YES	ONE SIDED, CODOMINANT AT 2' WITH INCLUDED BARK
481	SWEET CHERRY	PRUNUS AVIUM	9	6	FAIR	POOR	NO	20% LCR
482	SWEET CHERRY	PRUNUS AVIUM	8	5	FAIR	POOR	NO	15% LCR
483	BIGLEAF MAPLE	ACER MACROPHYLLUM	19	22	GOOD	FAIR	YES	MODERATELY ONE SIDED
484	SWEET CHERRY	PRUNUS AVIUM	8	5	POOR	POOR	NO	10% LCR
485	BIGLEAF MAPLE	ACER MACROPHYLLUM	41	25	FAIR	FAIR	NO	HISTORY OF BRANCH FAILURE
486	BIGLEAF MAPLE	ACER MACROPHYLLUM	16	15	FAIR	FAIR	NO	ONE SIDED, 35% LCR, MARGINAL TRUNK TAPER
487	BIGLEAF MAPLE	ACER MACROPHYLLUM	7	12	FAIR	POOR	NO	OVERTOPPED BY ADJACENT TREES, MODERATELY SUPPRESSED, EXTREME LEAN
488	BIGLEAF MAPLE	ACER MACROPHYLLUM	10	12	FAIR	FAIR	NO	35% LCR, MARGINAL TRUNK TAPER
489	BIGLEAF MAPLE	ACER MACROPHYLLUM	20	23	GOOD	FAIR	YES	MODERATELY ONE SIDED
490	BIGLEAF MAPLE	ACER MACROPHYLLUM	12	25	FAIR	FAIR	NO	ONE SIDED, MODERATELY SUPPRESSED
491	SCOULER'S WILLOW	SALIX SCOULERIANA	8	6	POOR	POOR	NO	20% LCR, SIGNIFICANT DIEBACK
492	BIGLEAF MAPLE	ACER MACROPHYLLUM	16	20	GOOD	FAIR	YES	60% LCR
493	BIGLEAF MAPLE	ACER MACROPHYLLUM	41	30	FAIR	FAIR	NO	SIGNIFICANT DECAY AT LOWER TRUNK, MULTIPLE LEADERS WITH INCLUDED BARK AT 6'
494	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	30	25	GOOD	FAIR	YES	ONE SIDED
495	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	29	25	GOOD	FAIR	YES	ONE SIDED
496	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	33	25	GOOD	FAIR	YES	MODERATELY ONE SIDED
497	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	31	25	GOOD	FAIR	YES	MODERATELY ONE SIDED
498	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	10	0	VERY POOR	VERY POOR	NO	DEAD
499	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	12	10	FAIR	POOR	NO	33% LCR, POOR TRUNK TAPER
500	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	21	18	GOOD	FAIR	YES	ONE SIDED, MARGINAL TRUNK TAPER
501	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	6	0	VERY POOR	VERY POOR	NO	DEAD
502	BIGLEAF MAPLE	ACER MACROPHYLLUM	24	25	GOOD	FAIR	YES	ONE SIDED, CODOMINANT AT 3' AND 12'
503	WESTERN HEMLOCK	TSUGA HETEROPHYLLA	6	8	GOOD	GOOD	NO	
504	SCOULER'S WILLOW	SALIX SCOULERIANA	8	0	VERY POOR	VERY POOR	NO	DEAD 18' SNAG
505	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	33	24	GOOD	FAIR	YES	MODERATELY ONE SIDED
506	BIGLEAF MAPLE	ACER MACROPHYLLUM	7	0	VERY POOR	VERY POOR	NO	DEAD 18' SNAG
507	BIGLEAF MAPLE	ACER MACROPHYLLUM	16	20	GOOD	FAIR	YES	50% LCR
508	BIGLEAF MAPLE	ACER MACROPHYLLUM	13	0	VERY POOR	VERY POOR	NO	DEAD 30' SNAG
509	BIGLEAF MAPLE	ACER MACROPHYLLUM	12	18	FAIR	FAIR	NO	ONE SIDED, MODERATELY SUPPRESSED
510	BIGLEAF MAPLE	ACER MACROPHYLLUM	7	15	FAIR	FAIR	NO	ONE SIDED, OVERTOPPED BY ADJACENT TREES, MODERATELY SUPPRESSED
511	BIGLEAF MAPLE	ACER MACROPHYLLUM	21	22	POOR	POOR	NO	MULTIPLE LEADERS AT 4', TWO FAILED LEADERS
512	WESTERN HEMLOCK	TSUGA HETEROPHYLLA	22	0	VERY POOR	VERY POOR	NO	18' SNAG
513	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	35	30	GOOD	FAIR	YES	MODERATELY ONE SIDED, BOWED LOWER TRUNK
514	WESTERN HEMLOCK	TSUGA HETEROPHYLLA	7	10	GOOD	GOOD	NO	
515	WESTERN HEMLOCK	TSUGA HETEROPHYLLA	20	15	GOOD	GOOD	YES	
516	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	43	27	GOOD	FAIR	YES	60% LCR
517	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	6	5	POOR	POOR	NO	SUPPRESSED
518	WESTERN HEMLOCK	TSUGA HETEROPHYLLA	38	28	GOOD	FAIR	YES	CODOMINANT AT 2' WITH INCLUDED BARK
519	WESTERN HEMLOCK	TSUGA HETEROPHYLLA	15	0	VERY POOR	VERY POOR	NO	DEAD
520	WESTERN HEMLOCK	TSUGA HETEROPHYLLA	22	18	FAIR	FAIR	NO	BOWED LOWER TRUNK, MODERATELY THIN CROWN
521	WESTERN HEMLOCK	TSUGA HETEROPHYLLA	18	0	VERY POOR	VERY POOR	NO	DEAD
522	BIGLEAF MAPLE	ACER MACROPHYLLUM	10	12	FAIR	POOR	NO	25% LCR, POOR TRUNK TAPER
523	BIGLEAF MAPLE	ACER MACROPHYLLUM	22	15	FAIR	FAIR	NO	MULTIPLE LEADERS AT 4', BRANCH DIEBACK, MODERATELY SUPPRESSED
524	BIGLEAF MAPLE	ACER MACROPHYLLUM	8	6	FAIR	FAIR	NO	OVERTOPPED BY ADJACENT TREES, MODERATELY SUPPRESSED
525	BIGLEAF MAPLE	ACER MACROPHYLLUM	16	25	GOOD	FAIR	YES	ONE SIDED
526	BIGLEAF MAPLE	ACER MACROPHYLLUM	19	25	GOOD	FAIR	YES	ONE SIDED
527	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	18	12	GOOD	FAIR	YES	40% LCR, MARGINAL TRUNK TAPER
528	SWEET CHERRY	PRUNUS AVIUM	9	7	POOR	POOR	NO	33% LCR, POOR TRUNK TAPER
529	SWEET CHERRY	PRUNUS AVIUM	9	0	VERY POOR	VERY POOR	NO	DEAD
530	BIGLEAF MAPLE	ACER MACROPHYLLUM	9	12	FAIR	POOR	NO	33% LCR, MARGINAL TRUNK TAPER
531	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	14	15	GOOD	FAIR	YES	MARGINAL TRUNK TAPER
532	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	8	8	FAIR	POOR	NO	POOR TRUNK TAPER
533	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	14	16	FAIR	POOR	NO	33% LCR, MARGINAL TRUNK TAPER
534	BIGLEAF MAPLE	ACER MACROPHYLLUM	20	24	FAIR	FAIR	NO	CODOMINANT AT 2' WITH INCLUDED BARK, MODERATELY SUPPRESSED
535	WESTERN HEMLOCK	TSUGA HETEROPHYLLA	7	12	GOOD	GOOD	NO	
536	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	16	12	GOOD	FAIR	YES	40% LCR, MARGINAL TRUNK TAPER, ONE SIDED
537	BLACK COTTONWOOD	POPULUS TRICHOCARPA	12	8	FAIR	POOR	NO	25% LCR, POOR TRUNK TAPER
538	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	24	18	GOOD	FAIR	YES	BRANCH EXTENSION SUPPRESSED BY ADJACENT TREES
539	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	23	15	GOOD	FAIR	YES	BRANCH EXTENSION SUPPRESSED BY ADJACENT TREES
540	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	25	23	FAIR	GOOD	NO	MODERATELY THIN CROWN
541	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	24	20	GOOD	FAIR	YES	ONE SIDED
542	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	22	18	GOOD	FAIR	YES	35% LCR, MARGINAL TRUNK TAPER
543	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	28	24	GOOD	FAIR	YES	MODERATELY ONE SIDED
544	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	24	23	GOOD	FAIR	YES	MODERATELY ONE SIDED
545	RED ALDER	ALNUS RUBRA	9	10	FAIR	FAIR	NO	OVERTOPPED BY ADJACENT TREES, MODERATELY SUPPRESSED
546	RED ALDER	ALNUS RUBRA	11	10	FAIR	FAIR	NO	MODERATELY SUPPRESSED, EPICORMIC GROWTH AT LOWER TRUNK
547	RED ALDER	ALNUS RUBRA	6	0	VERY POOR	VERY POOR	NO	DEAD
548	RED ALDER	ALNUS RUBRA	9	6	GOOD	FAIR	NO	ONE SIDED
549	RED ALDER	ALNUS RUBRA	8	6	GOOD	FAIR	NO	ONE SIDED
550	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	32	20	GOOD	FAIR	YES	MODERATELY ONE SIDED
551	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	15	10	GOOD	FAIR	YES	MARGINAL TRUNK TAPER
552	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	10	8	GOOD	FAIR	NO	MODERATELY ONE SIDED
553	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	7	4	POOR	POOR	NO	SUPPRESSED
554	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	6	5	POOR	POOR	NO	SUPPRESSED
555	N/A	N/A	N/A	N/A	N/A	N/A	N/A	NUMBER NOT USED
556	BIGLEAF MAPLE	ACER MACROPHYLLUM	8	15	GOOD	FAIR	NO	OVERTOPPED BY ADJACENT TREES, MARGINAL TRUNK TAPER
557	BIGLEAF MAPLE	ACER MACROPHYLLUM	33	30	GOOD	FAIR	YES	CODOMINANT AT 6' WITH INCLUDED BARK
558	BIGLEAF MAPLE	ACER MACROPHYLLUM	6	10	POOR	POOR	NO	OVERTOPPED BY ADJACENT TREES, SUPPRESSED
559	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	36	28	GOOD	FAIR	YES	ONE SIDED
560	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	39	25	GOOD	FAIR	YES	ONE SIDED
561	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	13,10	15	FAIR	FAIR	NO	CODOMINANT AT GROUND LEVEL, OVERTOPPED BY ADJACENT TREES, MODERATELY SUPPRESSED
562	BIGLEAF MAPLE	ACER MACROPHYLLUM	8	15	POOR	POOR	NO	SUPPRESSED
563	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	20	18	GOOD	FAIR	YES	ONE SIDED
564	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	16	16	GOOD	FAIR	YES	ONE SIDED
565	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	30	25	GOOD	FAIR	YES	MODERATELY ONE SIDED
566	BIGLEAF MAPLE	ACER MACROPHYLLUM	8	18	POOR	POOR	NO	SUPPRESSED
567	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	20	18	GOOD	FAIR	YES	ONE SIDED, CROWN EXTENSION SUPPRESSED BY ADJACENT TREES
568	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	16	10	FAIR	POOR	NO	MODERATELY SUPPRESSED, POOR TRUNK TAPER
569	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	15	8	FAIR	POOR	NO	POOR TRUNK TAPER, 25% LCR
570	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	8	6	POOR	POOR	NO	SUPPRESSED
571	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	13	8	POOR	POOR	NO	SUPPRESSED
572	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	7	5	POOR	POOR	NO	SUPPRESSED
573	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	16	15	FAIR	FAIR	NO	ONE SIDED, MODERATELY SUPPRESSED
574	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	19	18	GOOD	FAIR	YES	ONE SIDED
575	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	26	18	GOOD	FAIR	YES	ONE SIDED

TREE SURVEY COMPLETED BY: TERAGAN & ASSOCIATES, INC.

ATTENTION: TODD PRAGER, ASCA REGISTERED CONSULTING ARBORIST #597, ISA BOARD CERTIFIED MASTER ARBORIST, ISA TREE RISK ASSESSMENT QUALIFIED, AICP, AMERICAN PLANNING ASSOCIATION

1. DBH IS THE TRUNK DIAMETER IN INCHES MEASURED IN ACCORDANCE WITH INTERNATIONAL SOCIETY OF ARBORICULTURE STANDARDS.
2. C-RAD IS THE APPROXIMATE CROWN RADIUS IN FEET.
3. CONDITION AND STRUCTURE RATINGS RANGE FROM VERY POOR, POOR, FAIR, TO GOOD.
4. TREE MEETS THE REQUIREMENTS TO BE A RETENTION TREE PER 17.102.50.A-3 TREES PROPOSED FOR RETENTION SHALL BE HEALTHY AND LIKELY TO GROW TO MATURITY. PER CITY OF SANDY, ONLY TREES IN GOOD HEALTH CONDITION ARE ELIGIBLE TO MEET THIS STANDARD.

Attachment 3

SHEET C5 OF 10

REVISION: DATE – NO. – BY –

DESIGNED: RLM
DRAWN: RLM
CHECKED: DLH
APPROVED: RLM

REGISTERED PROFESSIONAL ENGINEER — OREGON — JULY 21, 1995 — RAY L. MOORE — 49710
RENEWAL DATE: 12/31/2022
PRELIMINARY

SCALE: VERT.: N/A HORIZ.: N/A
DATE: 4-28-21
FILE: 19-268 - Planning-SFR.dwg
LEGAL: SECTION 24, TWP. 2S, RANGE 4E

PROJECT:
THE BORNSTEDT VIEWS
TREE INVENTORY LIST 2

LOCATION: 19618 SE BORNSTEDT ROAD, SANDY, OR

All County Surveyors & Planners, Inc.
Surveying, Planning and Civil Engineering
P.O. Box 955 Sandy, OR 97055
Phone: (503) 668-3151
Fax: (503) 668-4730

DATE OF PLOT 4-28-21

CLIENT:
EVEN BETTER HOMES, INC.
MAC EVEN
PO BOX 2021
GRESHAM, OR 97030
PHONE: (503) 348-5602
EMAIL: mac@evenbetterhomes.com

"YES" INDICATES TREES THAT MEET TREE RETENTION REQUIREMENT. SEE NOTE 4.

TREE No	COMMON NAME	SCIENTIFIC NAME	DBH	C-RAD	CONDITION	STRUCTURE	TREE RETENTION OPTION	COMMENTS
TREE TO BE SAVED OR REMOVED								
576	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	15	10	GOOD	FAIR	YES	ONE SIDED, MARGINAL TRUNK TAPER, 40% LCR
577	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	27	15	GOOD	FAIR	YES	35% LCR, MARGINAL TRUNK TAPER
578	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	12	10	FAIR	FAIR	NO	ONE SIDED, OVERTOPPED BY ADJACENT TREES, MODERATELY SUPPRESSED
579	BIGLEAF MAPLE	ACER MACROPHYLLUM	13	18	FAIR	FAIR	NO	MODERATELY SUPPRESSED, EPICORMIC GROWTH AT LOWER TRUNK, CODOMINANT AT 2' WITH INCLUDED BARK
580	BIGLEAF MAPLE	ACER MACROPHYLLUM	7	18	FAIR	FAIR	NO	MODERATELY SUPPRESSED, EPICORMIC GROWTH AT LOWER TRUNK
581	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	45	30	GOOD	GOOD	YES	
582	SCOULER'S WILLOW	SALIX SCOULERIANA	6	6	POOR	POOR	NO	25% LCR, SIGNIFICANT DIEBACK
583	BIGLEAF MAPLE	ACER MACROPHYLLUM	10	15	GOOD	FAIR	NO	ONE SIDED
584	BIGLEAF MAPLE	ACER MACROPHYLLUM	12	15	FAIR	FAIR	NO	ONE SIDED, OVERTOPPED BY ADJACENT TREES, MODERATELY SUPPRESSED
585	BIGLEAF MAPLE	ACER MACROPHYLLUM	18	20	GOOD	FAIR	YES	MODERATELY ONE SIDED
586	BIGLEAF MAPLE	ACER MACROPHYLLUM	10	16	FAIR	FAIR	NO	OVERTOPPED BY ADJACENT TREES, MODERATELY SUPPRESSED
587	WESTERN HEMLOCK	TSUGA HETEROPHYLLA	7	8	GOOD	FAIR	NO	ONE SIDED
588	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	21	18	GOOD	FAIR	YES	ONE SIDED, 60% LCR
589	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	44	30	GOOD	FAIR	YES	MODERATELY ONE SIDED
590	BIGLEAF MAPLE	ACER MACROPHYLLUM	11	8	POOR	POOR	NO	SUPPRESSED
591	BIGLEAF MAPLE	ACER MACROPHYLLUM	18	20	GOOD	FAIR	YES	ONE SIDED
592	WESTERN HEMLOCK	TSUGA HETEROPHYLLA	6	8	GOOD	FAIR	NO	ONE SIDED, OVERTOPPED BY ADJACENT TREES
593	WESTERN HEMLOCK	TSUGA HETEROPHYLLA	23	20	GOOD	FAIR	YES	ONE SIDED, PUSHING AGAINST ADJACENT TREE
594	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	37	20	GOOD	FAIR	YES	ONE SIDED, PUSHING AGAINST ADJACENT TREE
595	WESTERN HEMLOCK	TSUGA HETEROPHYLLA	7	8	GOOD	GOOD	NO	
596	BIGLEAF MAPLE	ACER MACROPHYLLUM	7	5	POOR	POOR	NO	OVERTOPPED BY ADJACENT TREES, SUPPRESSED
597	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	25	18	GOOD	FAIR	YES	ONE SIDED
598	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	43	25	GOOD	FAIR	YES	ONE SIDED
599	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	26	18	GOOD	FAIR	YES	40% LCR, MARGINAL TRUNK TAPER, CROWN EXTENSION SUPPRESSED BY ADJACENT TREES
600	WESTERN HEMLOCK	TSUGA HETEROPHYLLA	13	0	VERY POOR	VERY POOR	NO	25' SNAG
601	WESTERN HEMLOCK	TSUGA HETEROPHYLLA	31	25	GOOD	FAIR	YES	ONE SIDED
602	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	33	20	GOOD	FAIR	YES	ONE SIDED
603	WESTERN HEMLOCK	TSUGA HETEROPHYLLA	6	0	VERY POOR	VERY POOR	NO	7' SNAG
604	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	25	18	FAIR	POOR	NO	33% LCR, POOR TRUNK TAPER
605	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	27	15	GOOD	FAIR	YES	ONE SIDED, MARGINAL TRUNK TAPER
606	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	34	25	GOOD	FAIR	YES	40% LCR
607	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	11	10	GOOD	FAIR	YES	OVERTOPPED BY ADJACENT TREES, MODERATELY SUPPRESSED
608	BIGLEAF MAPLE	ACER MACROPHYLLUM	6	8	POOR	POOR	NO	SUPPRESSED, SIGNIFICANT LEAN, TOP FAILED
609	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	39	25	GOOD	FAIR	YES	MODERATELY ONE SIDED
610	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	11	0	VERY POOR	VERY POOR	NO	DEAD
611	WESTERN HEMLOCK	TSUGA HETEROPHYLLA	17	0	VERY POOR	VERY POOR	NO	DEAD
612	WESTERN HEMLOCK	TSUGA HETEROPHYLLA	10	8	POOR	POOR	NO	EXTENSIVE DIEBACK
613	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	16	10	POOR	POOR	NO	OVERTOPPED BY ADJACENT TREES, SUPPRESSED
614	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	42	25	GOOD	FAIR	YES	ONE SIDED
615	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	25	18	FAIR	FAIR	NO	MODERATELY SUPPRESSED
616	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	29	20	GOOD	FAIR	YES	ONE SIDED
617	BIGLEAF MAPLE	ACER MACROPHYLLUM	9	8	POOR	POOR	NO	OVERTOPPED BY ADJACENT TREES, SUPPRESSED
618	BIGLEAF MAPLE	ACER MACROPHYLLUM	12	15	FAIR	FAIR	NO	ONE SIDED, BRANCH DIEBACK
619	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	29	15	FAIR	FAIR	NO	35% LCR, MARGINAL TRUNK TAPER
620	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	9	0	VERY POOR	VERY POOR	NO	DEAD 20' SNAG
621	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	17	12	FAIR	POOR	NO	ONE SIDED, POOR TRUNK TAPER, 25% LCR
622	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	18	18	FAIR	FAIR	NO	OVERTOPPED BY ADJACENT TREES, TWO DEAD LEADERS AT 12'
623	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	34	15	GOOD	FAIR	YES	ONE SIDED, 40% LCR, MARGINAL TRUNK TAPER
624	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	26	16	FAIR	FAIR	NO	MODERATELY SUPPRESSED, MARGINAL TRUNK TAPER, CROWN EXTENSION SUPPRESSED BY ADJACENT TREES
625	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	10	6	FAIR	FAIR	NO	MODERATELY SUPPRESSED, MARGINAL TRUNK TAPER, CROWN EXTENSION SUPPRESSED BY ADJACENT TREES
626	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	8	0	VERY POOR	VERY POOR	NO	DEAD 7' SNAG
627	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	24	8	FAIR	FAIR	NO	MODERATELY SUPPRESSED, MARGINAL TRUNK TAPER, CROWN EXTENSION SUPPRESSED BY ADJACENT TREES
628	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	25	18	GOOD	FAIR	YES	MARGINAL TRUNK TAPER, CROWN EXTENSION SUPPRESSED BY ADJACENT TREES
629	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	25	18	GOOD	FAIR	YES	MARGINAL TRUNK TAPER, CROWN EXTENSION SUPPRESSED BY ADJACENT TREES, 40% LCR
630	BIGLEAF MAPLE	ACER MACROPHYLLUM	7	10	POOR	POOR	NO	MODERATELY SUPPRESSED, TOP FAILED
631	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	13	8	FAIR	FAIR	NO	MODERATELY SUPPRESSED, MARGINAL TRUNK TAPER
632	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	29	20	GOOD	FAIR	YES	50% LCR, CROWN EXTENSION SUPPRESSED BY ADJACENT TREES
633	WESTERN HEMLOCK	TSUGA HETEROPHYLLA	10	8	POOR	POOR	NO	SUPPRESSED, SIGNIFICANT DIEBACK
634	WESTERN HEMLOCK	TSUGA HETEROPHYLLA	26	18	GOOD	FAIR	YES	MODERATELY ONE SIDED
635	BIGLEAF MAPLE	ACER MACROPHYLLUM	9	4	FAIR	FAIR	NO	MODERATELY SUPPRESSED
636	WESTERN HEMLOCK	TSUGA HETEROPHYLLA	23	0	VERY POOR	VERY POOR	NO	DEAD
637	BIGLEAF MAPLE	ACER MACROPHYLLUM	16	16	GOOD	FAIR	YES	ONE SIDED, 35% LCR
638	BIGLEAF MAPLE	ACER MACROPHYLLUM	16	20	FAIR	FAIR	NO	STEM FAILURE AND DECAY
639	BIGLEAF MAPLE	ACER MACROPHYLLUM	9	12	GOOD	FAIR	NO	ONE SIDED, MARGINAL TRUNK TAPER
640	BIGLEAF MAPLE	ACER MACROPHYLLUM	11	15	GOOD	FAIR	YES	ONE SIDED, MARGINAL TRUNK TAPER
641	BIGLEAF MAPLE	ACER MACROPHYLLUM	10	8	FAIR	FAIR	NO	OVERTOPPED BY ADJACENT TREES, MODERATELY SUPPRESSED, CODOMINANT AT 2' WITH INCLUDED BARK
642	BIGLEAF MAPLE	ACER MACROPHYLLUM	12	10	FAIR	FAIR	NO	ONE SIDED, MODERATELY SUPPRESSED
643	BIGLEAF MAPLE	ACER MACROPHYLLUM	11	10	FAIR	FAIR	NO	ONE SIDED, MODERATELY SUPPRESSED
644	BIGLEAF MAPLE	ACER MACROPHYLLUM	9	8	FAIR	FAIR	NO	ONE SIDED, MODERATELY SUPPRESSED
645	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	46	25	GOOD	FAIR	YES	ONE SIDED
646	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	45	20	GOOD	FAIR	YES	ONE SIDED, 50% LCR
647	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	44	25	GOOD	FAIR	YES	40% LCR
648	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	42	25	GOOD	FAIR	YES	40% LCR
649	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	51	25	GOOD	FAIR	YES	MODERATELY ONE SIDED
650	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	9	12	FAIR	FAIR	NO	ONE SIDED, OVERTOPPED BY ADJACENT TREES, MODERATELY SUPPRESSED
651	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	23	13	GOOD	FAIR	YES	MARGINAL TRUNK TAPER
652	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	14	15	GOOD	FAIR	YES	ONE SIDED, MARGINAL TRUNK TAPER
653	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	23	15	GOOD	FAIR	YES	ONE SIDED, KINKED LOWER TRUNK
654	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	15	12	GOOD	FAIR	YES	CROWN EXTENSION SUPPRESSED BY ADJACENT TREES, MARGINAL TRUNK TAPER
655	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	7	5	POOR	POOR	NO	OVERTOPPED BY ADJACENT TREES, SUPPRESSED
656	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	23	15	GOOD	FAIR	YES	MARGINAL TRUNK TAPER
657	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	23	15	GOOD	FAIR	YES	MARGINAL TRUNK TAPER
658	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	16	10	GOOD	FAIR	YES	MARGINAL TRUNK TAPER, 35% LCR
659	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	24	12	GOOD	FAIR	YES	MARGINAL TRUNK TAPER, 40% LCR
660	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	10	10	FAIR	FAIR	NO	ONE SIDED, LARGE SCAR AT LOWER TRUNK
661	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	16	15	GOOD	FAIR	YES	MODERATELY ONE SIDED, MARGINAL TRUNK TAPER
662	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	14	12	GOOD	FAIR	YES	ONE SIDED, MARGINAL TRUNK TAPER
663	BIGLEAF MAPLE	ACER MACROPHYLLUM	8	15	GOOD	FAIR	NO	OVERTOPPED BY ADJACENT TREES
664	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	14	12	GOOD	FAIR	YES	ONE SIDED, MARGINAL TRUNK TAPER
665	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	23	18	GOOD	FAIR	YES	ONE SIDED, MARGINAL TRUNK TAPER
666	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	22	18	GOOD	FAIR	YES	MODERATELY ONE SIDED, MARGINAL TRUNK TAPER
667	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	14	14	GOOD	FAIR	YES	ONE SIDED, MARGINAL TRUNK TAPER
668	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	29	20	GOOD	FAIR	YES	ONE SIDED
669	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	19	18	GOOD	FAIR	YES	ONE SIDED, MARGINAL TRUNK TAPER
670	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	17	18	FAIR	FAIR	NO	MARGINAL TRUNK TAPER, MODERATELY SUPPRESSED
671	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	24	20	GOOD	FAIR	YES	ONE SIDED
672	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	26	18	FAIR	FAIR	NO	CODOMINANT AT 3' WITH INCLUDED BARK, MODERATELY SUPPRESSED
673	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	11	8	FAIR	FAIR	NO	MARGINAL TRUNK TAPER, MODERATELY SUPPRESSED
674	BIGLEAF MAPLE	ACER MACROPHYLLUM	9	22	GOOD	FAIR	NO	ONE SIDED
675	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	9	0	VERY POOR	VERY POOR	NO	DEAD
676	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	24	20	GOOD	FAIR	YES	ONE SIDED, MARGINAL TRUNK TAPER
677	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	16	15	GOOD	FAIR	YES	50% LCR, MARGINAL TRUNK TAPER
678	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	6	6	GOOD	FAIR	NO	ONE SIDED, MARGINAL TRUNK TAPER
679	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	6	6	FAIR	FAIR	NO	MODERATELY SUPPRESSED, OVERTOPPED BY ADJACENT TREES
680	BIGLEAF MAPLE	ACER MACROPHYLLUM	22	20	GOOD	FAIR	YES	CODOMINANT AT 2' WITH INCLUDED BARK, MODERATELY SUPPRESSED
681	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	19	15	GOOD	FAIR	YES	40% LCR, MARGINAL TRUNK TAPER
681	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	15	14	FAIR	POOR	NO	33% LCR, POOR TRUNK TAPER
682	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	15	14	FAIR	POOR	NO	33% LCR, POOR TRUNK TAPER
682	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	19	17	GOOD	FAIR	YES	40% LCR, MARGINAL TAPER
683	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	17	15	GOOD	FAIR	YES	40% LCR, MARGINAL TAPER, BOWED TRUNK
684	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	23	20	GOOD	FAIR	YES	MODERATELY ONE SIDED
685	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	19	15	GOOD	FAIR	YES	MARGINAL TRUNK TAPER, 40% LCR, PREVIOUS LEADER FAILURE AT 20'
686	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	13	18	GOOD	FAIR	YES	ONE SIDED
687	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	29	20	GOOD	FAIR	YES	MODERATELY ONE SIDED
688	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	27	20	GOOD	FAIR	YES	MODERATELY ONE SIDED
689	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	6	8	FAIR	FAIR	NO	OVERTOPPED BY ADJACENT TREES, MODERATELY SUPPRESSED
690	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	37	22	GOOD	FAIR	YES	MODERATELY ONE SIDED
691	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	24	15	GOOD	FAIR	YES	ONE SIDED
692	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	9	5	POOR	POOR	NO	SUPPRESSED
693	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	26	20	GOOD	FAIR	YES	ONE SIDED
694	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	22	16	GOOD	FAIR	YES	ONE SIDED
695	RED ALDER	PSEUDOTSUGA MENZIESII	25	18	GOOD	FAIR	YES	ONE SIDED
696	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	6	5	POOR	POOR	NO	SUPPRESSED
697	RED ALDER	ALNUS RUBRA	14	0	VERY POOR	VERY POOR	NO	DEAD
698	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	17	10	GOOD	FAIR	YES	ONE SIDED, MARGINAL TRUNK TAPER
699	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	19	12	GOOD	FAIR	YES	ONE SIDED, MARGINAL TRUNK TAPER
700	BIGLEAF MAPLE	ACER MACROPHYLLUM	13	10	FAIR	FAIR	NO	OVERTOPPED BY ADJACENT TREES, MODERATELY SUPPRESSED
701	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	28	22	GOOD	FAIR	YES	MODERATELY ONE SIDED
702	RED ALDER	ALNUS RUBRA	7	5	FAIR	FAIR	NO	SIGNIFICANT LEAN, THIN CROWN
703	SCOULER'S WILLOW	SALIX SCOULERIANA	13	18	POOR	POOR	NO	SIGNIFICANT LEAN, SIGNIFICANT DECAY
704	RED ALDER	ALNUS RUBRA	6	7	FAIR	FAIR	NO	THIN CROWN
705	RED ALDER	ALNUS RUBRA	6	7	FAIR	FAIR	NO	THIN CROWN
706	RED ALDER	ALNUS RUBRA	6	5	FAIR	FAIR	NO	THIN CROWN, CODOMINANT AT 6'
707	WESTERN REDCEDAR	THUJA PLICATA	28	18	GOOD	GOOD	YES	
708	WESTERN REDCEDAR	THUJA PLICATA	7	7	GOOD	GOOD	NO	
709	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	6	6	POOR	POOR	NO	SUPPRESSED
710	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	52	25	GOOD	GOOD	YES	
711	BIGLEAF MAPLE	ACER MACROPHYLLUM	6	15	FAIR	FAIR	NO	EXTREME LEAN, OVERTOPPED BY ADJACENT TREES, MODERATELY SUPPRESSED
712	BIGLEAF MAPLE	ACER MACROPHYLLUM	11	12	GOOD	FAIR	YES	OVERTOPPED BY ADJACENT TREES, MODERATELY SUPPRESSED
713	WESTERN HEMLOCK	TSUGA HETEROPHYLLA	30	0	VERY POOR	VERY POOR	NO	DEAD
714	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	44	20	GOOD	FAIR	YES	50% LCR
715	BIGLEAF MAPLE	ACER MACROPHYLLUM	14	15	GOOD	FAIR	YES	ONE SIDED, OVERTOPPED BY ADJACENT TREES
716	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	19	12	GOOD	FAIR	YES	ONE SIDED, MARGINAL TRUNK TAPER
717	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	25	18	GOOD	FAIR	YES	ONE SIDED, MARGINAL TRUNK TAPER, BOWED TRUNK

"GREEN" HATCH INDICATES TREES THAT WILL BE PROTECTED.

"YES" INDICATES TREES THAT MEET TREE RETENTION REQUIREMENT. SEE NOTE 4.

TREE No	COMMON NAME	SCIENTIFIC NAME	DBH	C-RAD	CONDITION	STRUCTURE	TREE RETENTION OPTION	COMMENTS
TREE TO BE SAVED OR REMOVED								
718	BIGLEAF MAPLE	ACER MACROPHYLLUM	12	8	POOR	POOR	NO	TOP FAILED, SUPPRESSED
719	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	23	10	FAIR	FAIR	NO	ONE SIDED, MARGINAL TRUNK TAPER, KINKED TRUNK, MODERATELY SUPPRESSED
720	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	9	5	POOR	POOR	NO	SUPPRESSED, EXTENSIVE PORODAEDALEA PINI CONKS
721	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	14	10	FAIR	FAIR	NO	ONE SIDED, MODERATELY SUPPRESSED, MARGINAL TRUNK TAPER
722	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	17	8	FAIR	FAIR	NO	ONE SIDED, MODERATELY SUPPRESSED, MARGINAL TRUNK TAPER
723	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	32	8	FAIR	FAIR	NO	ONE SIDED, MODERATELY SUPPRESSED, MARGINAL TRUNK TAPER, KINKED TRUNK
724	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	19	10	FAIR	FAIR	NO	ONE SIDED, MODERATELY SUPPRESSED, MARGINAL TRUNK TAPER
725	BIGLEAF MAPLE	ACER MACROPHYLLUM	10	15	FAIR	FAIR	NO	OVERTOPPED BY ADJACENT TREES, MODERATELY SUPPRESSED
726	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	13	8	FAIR	POOR	NO	MODERATELY SUPPRESSED, POOR TRUNK TAPER
727	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	11	7	FAIR	POOR	NO	MODERATELY SUPPRESSED, POOR TRUNK TAPER
728	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	19	22	GOOD	FAIR	YES	ONE SIDED, 35% LCR, MARGINAL TRUNK TAPER
729	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	24	18	GOOD	FAIR	YES	ONE SIDED, 60% LCR, MARGINAL TRUNK TAPER
730	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	30	18	GOOD	FAIR	YES	CROWN EXTENSION SUPPRESSED BY ADJACENT TREES, 50% LCR
731	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	35	20	GOOD	FAIR	YES	ONE SIDED
732	WESTERN HEMLOCK	TSUGA HETEROPHYLLA	27	18	FAIR	FAIR	NO	ONE SIDED, DECAY POCKET AT ROOT CROWN
733	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	27	12	FAIR	FAIR	NO	EXTREME KINK IN TRUNK
734	BIGLEAF MAPLE	ACER MACROPHYLLUM	13	13	GOOD	FAIR	YES	MODERATELY ONE SIDED
735	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	23	13	GOOD	FAIR	YES	MODERATELY ONE SIDED
736	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	17	13	GOOD	FAIR	YES	ONE SIDED, 40% LCR
737	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	15	13	GOOD	FAIR	YES	ONE SIDED, 50% LCR
738	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	15	10	GOOD	FAIR	YES	35% LCR, MARGINAL TRUNK TAPER
739	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	16	10	GOOD	FAIR	YES	35% LCR, MARGINAL TRUNK TAPER
740	BIGLEAF MAPLE	ACER MACROPHYLLUM	12	8	FAIR	FAIR	NO	OVERTOPPED BY ADJACENT TREES, MODERATELY SUPPRESSED
741	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	7	7	GOOD	FAIR	NO	ONE SIDED, OVERTOPPED BY ADJACENT TREES, MODERATELY SUPPRESSED
742	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	7	6	POOR	POOR	NO	SUPPRESSED
743	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	41	20	GOOD	FAIR	YES	MODERATELY ONE SIDED
744	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	9	12	GOOD	FAIR	NO	ONE SIDED, OVERTOPPED BY ADJACENT TREES, MODERATELY SUPPRESSED
745	BIGLEAF MAPLE	ACER MACROPHYLLUM	12	0	VERY POOR	VERY POOR	NO	DEAD
746	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	30	18	GOOD	FAIR	YES	ONE SIDED
747	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	25	10	FAIR	POOR	NO	ONE SIDED, SIGNIFICANT PORODAEDALEA PINI CONKS AT LOWER TRUNK
748	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	20	10	FAIR	POOR	NO	ONE SIDED, SIGNIFICANT PORODAEDALEA PINI CONKS AT LOWER TRUNK
749	ENGLISH WALNUT	JUGLANS REGIA	14,14,14	20	FAIR	FAIR	NO	MULTIPLE LEADERS AT GROUND LEVEL, THIN CROWN, NEAR TREE 89, COULD BE THREE TREES, NOT TAGGED AND SIZE ESTIMATED BECAUSE OF EXTENSIVE BLACKBERRY GROWTH

TREE SURVEY COMPLETED BY: TERAGAN & ASSOCIATES, INC.

ATTENTION: TODD PRAGER, ASCA REGISTERED CONSULTING ARBORIST #597, ISA BOARD CERTIFIED MASTER ARBORIST, ISA TREE RISK ASSESSMENT QUALIFIED, AICP, AMERICAN PLANNING ASSOCIATION

1. DBH IS THE TRUNK DIAMETER IN INCHES MEASURED IN ACCORDANCE WITH INTERNATIONAL SOCIETY OF ARBORICULTURE STANDARDS.
2. C-RAD IS THE APPROXIMATE CROWN RADIUS IN FEET.
3. CONDITION AND STRUCTURE RATINGS RANGE FROM VERY POOR, POOR, FAIR, TO GOOD.
4. TREE MEETS THE REQUIREMENTS TO BE A RETENTION TREE PER 17.102.50.A-3 TREES PROPOSED FOR RETENTION SHALL BE HEALTHY AND LIKELY TO GROW TO MATURITY. PER CITY OF SANDY, ONLY TREES IN GOOD HEALTH CONDITION ARE ELIGIBLE TO MEET THIS STANDARD.

TREE RETENTION ANALYSIS

- (yellow) TREES THAT MEET TREE RETENTION REQUIREMENT. SEE NOTE 4. (NUMBER OF TREES = 333)
- (red) TREES THAT DON'T MEET TREE RETENTION REQUIREMENT. SEE NOTE 4. (NUMBER OF TREES = 414)
- (green) TREES TO BE SAVED THAT MEET TREE RETENTION REQUIREMENT. = 38 TREES
- (pink) TREES TO BE REMOVED. (NUMBER OF TREES = 709)

PER CODE SECTION 17.102.50 A-1 "AT LEAST THREE TREES 11 INCHES DBH OR GREATER ARE TO BE RETAINED FOR EVERY ONE-ACRE OF CONTIGUOUS OWNERSHIP". THERE IS 12.739 ACRES (12.739 X 3 = 38.21). SO A MINIMUM OF 38 TREES NEED TO BE RETAINED. AS DEMONSTRATED ABOVE, 38 TREES WILL BE RETAINED MEETING THIS CODE REQUIREMENT.

Attachment 3

SHEET C6 OF 10

DATE	NO.	REVISION	BY
-	-	-	-

DESIGNED: RLM
DRAWN: RLM
CHECKED: DLH
APPROVED: RLM

REGISTERED PROFESSIONAL ENGINEER, OREGON, JULY 21, 1998, RAY L. MOORE, 49710
PRELIMINARY
RENEWAL DATE: 12/31/2022

SCALE: VERT: N/A HORIZ: N/A
DATE: 4-28-21
FILE: 19-268 - Planning-SFR.dwg
LEGAL: SECTION 24, TWP. 2S, RANGE 4E

PROJECT: THE BORNSTEDT VIEWS
TREE INVENTORY LIST 3
LOCATION: 19618 SE BORNSTEDT ROAD, SANDY, OR

All County Surveyors & Planners, Inc.
Surveying, Planning and Civil Engineering
P.O. Box 955 Sandy, OR 97055
Phone: (503) 668-3151
Fax: (503) 668-4730
DATE OF PLOT 4-28-21

CLIENT:
EVEN BETTER HOMES, INC.
MAC EVEN
PO BOX 2021
GRESHAM, OR 97030
PHONE: (503) 348-5602
EMAIL: mac@evenbetterhomes.com

Attachment 4
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 2.
    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.

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

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 5
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 the development site;
    - Identify the trees to be removed and retained; and
    - Provide tree protection recommendations for the trees to be retained.

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

EXHIBIT G

Jason Smith
Environmental Consulting
849 Woodpecker Dr
Kelso, WA 98626

Environmental Services
Planning & Permitting
Assessment & Analysis
Project Management

September 30, 2020

Even Better Homes, Inc.
Attn: Mac Even
PO Box 2021
Gresham, OR 97030

SUBJ: Stream and Wetland Presence Determination - 19618 Bornstedt Road, Sandy OR

Summary

No wetlands or streams are located on Clackamas County Parcel number 00677306 (19618 Bornstedt Road, Sandy OR 97055).

Scope

Wetland presence was evaluated using Level 3 Routine Wetland Determination in accordance with methods prescribed by the US Army Corps of Engineers 1987 Wetland Delineation Manual.

> *Section B. Preliminary Data Gathering and Synthesis*
> 53. This section discusses potential sources of information that may be helpful in making a wetland determination. When the routine approach is used, it may often be possible to make a wetland determination based on available vegetation, soils, and hydrology data for the area.
>
> *Level 3 - Combination of Levels 1 and 2.* This level should be used when there is sufficient information already available to characterize the vegetation, soils, and hydrology of a portion, but not all, of the project area. Methods described for Level 1 may be applied to portions of the area for which adequate information already exists, and onsite methods (Level 2) must be applied to the remainder of the area (see Section D, Subsection 3).

Stream presence determination followed guidance from the Oregon Dept. of State Lands (DSL) publication "A Guide to the Removal-Fill Permit Process" (2019). Procedures for Non-tidal Rivers, Intermittent and Perennial Streams, Lakes, and Ponds include determining whether a stream is perennial, intermittent or ephemeral using Ordinary High Water (OHW) mark and other field indicators:

Field indicators of OHW include:

- Clear, natural line impressed on the shore, including scour, shelving and exposed roots
- Change in plant community from riparian (e.g., willows) to upland (e.g., oak, fir) dominated. If the area is cropped, hydrophytic plants, or evidence of crop stress or damage from high flows would be indicative of high water.
- Textural change of depositional sediment or changes in the character of the soil (e.g. from sand, sand and cobble, cobble and gravel to upland soils). Sediments may appear stratified. This indicator may require careful evaluation on floodplains where certain farming practices regularly disturb the soil profile.

Phone: 360.353.3285 • Fax: 360.353.3286 • WWW: castle-rose.net • Email: jason@castle-rose.net

- Elevation below which no fine debris (needles, leaves, cones, seeds, soil organic matter) occurs
- Presence of water-borne litter and debris, wrack accumulation, water-stained leaves, water lines on tree trunks, flattened vegetation. Certain farming practices can obscure these indicators.

Findings

The project area in question is the small "valley" that runs through the center of the parcel. The area is mapped in the National Wetland Inventory with a 1.00 acre Freshwater Forested/Shrub Wetland habitat is classified as Palustrine (P), Forested (FO), Broad-Leaved Deciduous (1), Seasonally-Flooded (C) (PFO1C). The wetland is demarcated as a stream.

The NWI-mapped wetland is reflected in the Oregon Statewide Wetlands Inventory (SWI) database. The wetlands in this area were photo interpreted using 1:58,000 scale, color infrared imagery from 1981. The stream classification mapped in the National Hydrography Dataset is Intermittent.

The SWI database is a synthesis of NWI, National Hydrography Data Set and NRCS Soils data and generally meets Corps '87 manual requirements for preliminary data gathering and synthesis. Although the SWI shows the NWI-mapped wetland and associated intermittent stream, the area is not mapped with hydric soils (confirmed with the NRCS Soils Mapper database).

In addition, local knowledge indicates the mapped stream does not exist, and therefore the wetland does not exist. A field visit performed September 4, 2020 confirmed that no stream or associated wetland is present on the site.

Conditions at the bottom of the concave depression

- Page 3

- Page 4

The photographs confirm that no stream features are present on the site, and a stream channel was assumed to be the wetland.

Field indicators of OHW:

- Clear, natural line impressed on the shore, including scour, shelving and exposed roots
  - No channel present.

- Change in plant community from riparian (e.g., willows) to upland (e.g., oak, fir) dominated. If the area is cropped, hydrophytic plants, or evidence of crop stress or damage from high flows would be indicative of high water.
  - No change in vegetation. No riparian or wetland vegetation observed. Fir trees dominate overstory vegetation.
- Textural change of depositional sediment or changes in the character of the soil (e.g. from sand, sand and cobble, cobble and gravel to upland soils). Sediments may appear stratified. This indicator may require careful evaluation on floodplains where certain farming practices regularly disturb the soil profile.
  - No disturbed soils present. No depositional or other stream bed characteristics observed.
- Elevation below which no fine debris (needles, leaves, cones, seeds, soil organic matter) occurs
  - Not present.
- Presence of water-borne litter and debris, wrack accumulation, water-stained leaves, water lines on tree trunks, flattened vegetation. Certain farming practices can obscure these indicators.
  - No water-borne features present.

Conclusion

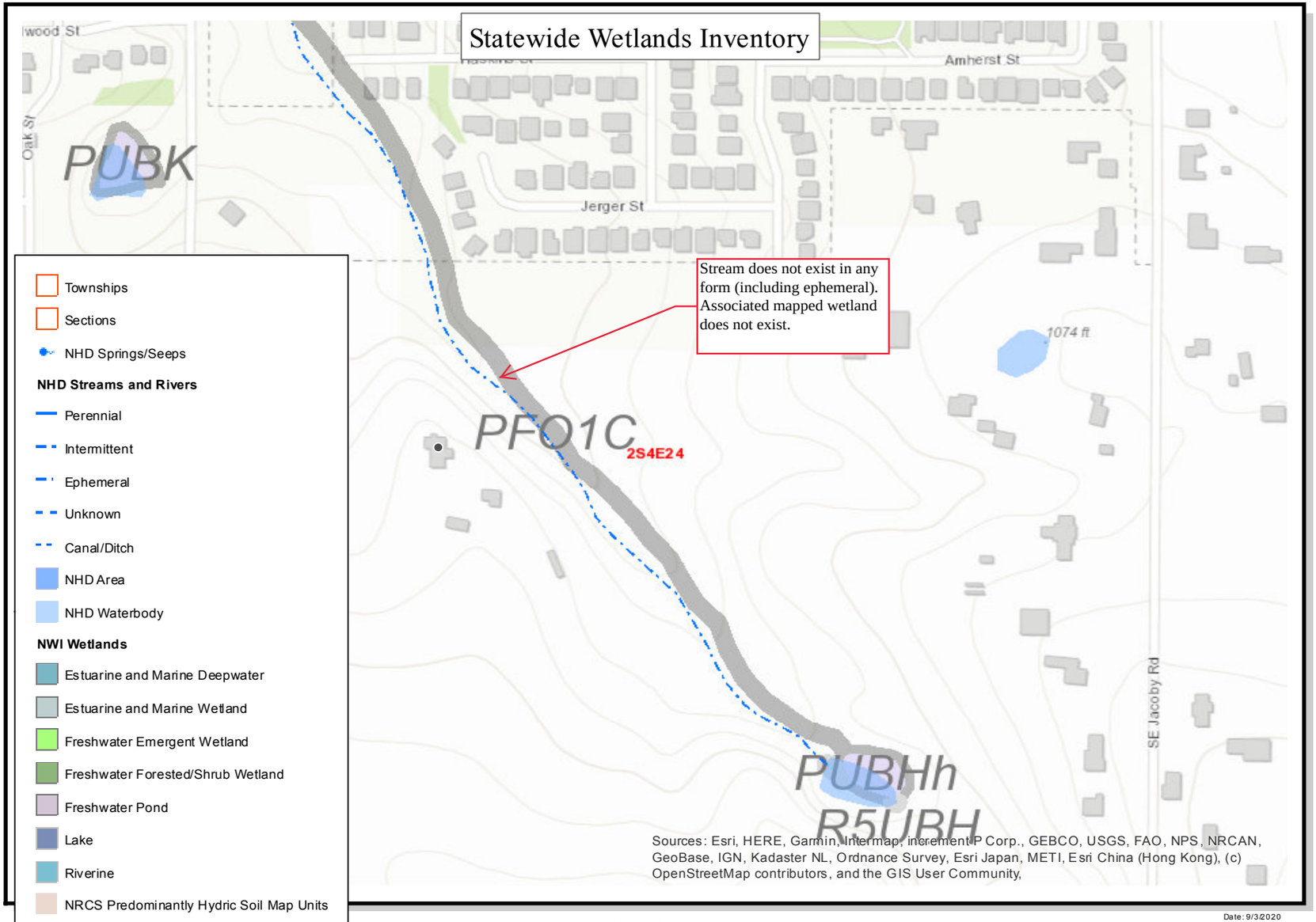
The mapped stream and associated wetland do not exist. No areas with field indicators for wetland hydrology or wetland vegetation were observed.

These findings and conclusions are subject to concurrence.

Jason Smith
Project Manager

ENCL: SWI Maps

Statewide Wetlands Inventory



1 inch = 0.07 miles

0 0.0275 0.055 0.11 0.165 0.22 mi

The Statewide Wetlands Inventory (SWI) represents the best data available at the time this map was published and is updated as new data becomes available. In all cases, actual field conditions determine the presence, absence and boundaries of wetlands and waters (such as creeks and ponds). An onsite investigation by a wetland professional can verify actual field conditions.

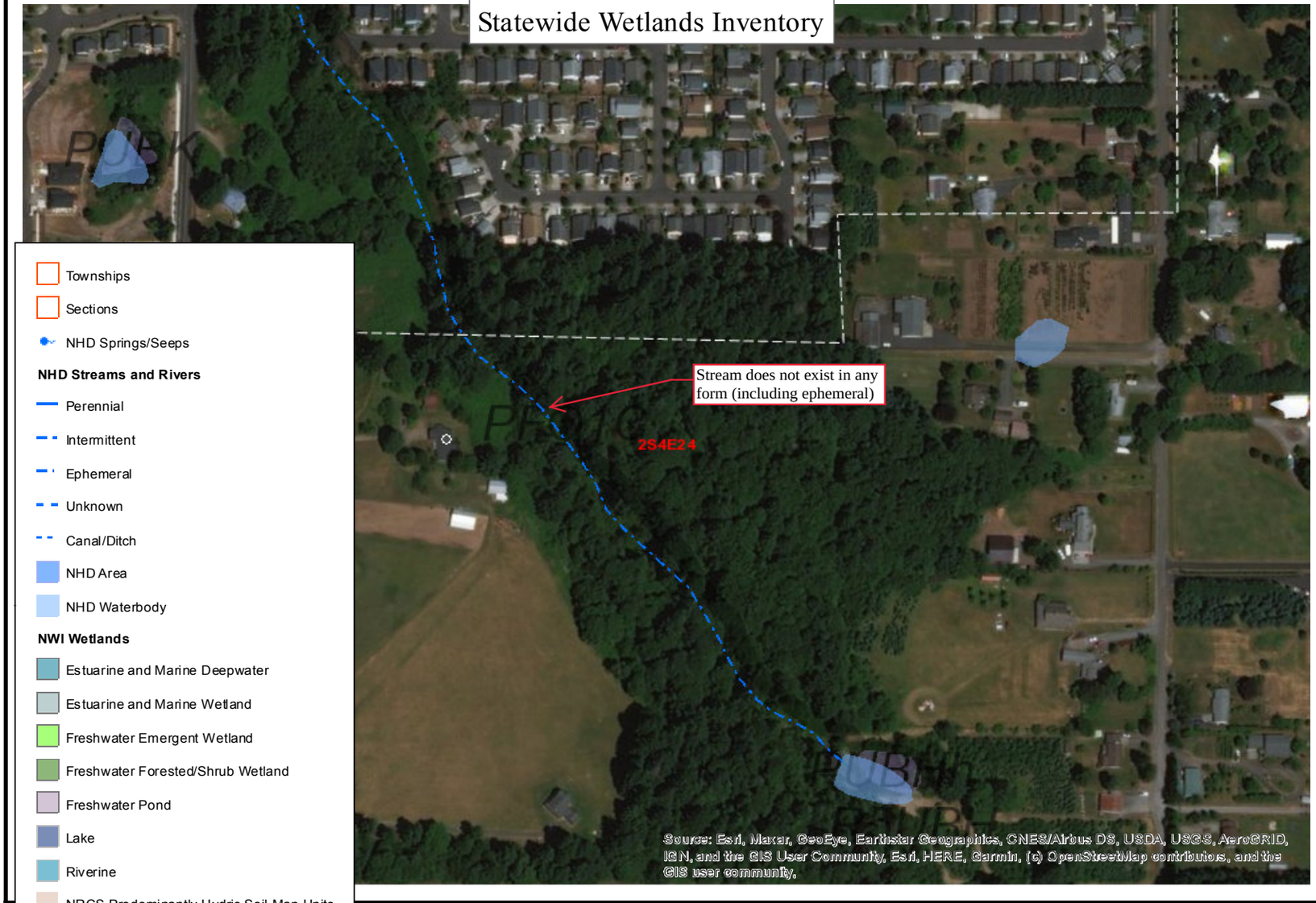
https://www.oregon.gov/dsl/WW/Pages/SWI.aspx

N

Date: 9/3/2020

State of Oregon
Department of State Lands
775 Summer Street, NE, Ste 100
Salem, OR. 97301-1279
(503) 986-5200

Statewide Wetlands Inventory



- Townships
- Sections
- NHD Springs/Seeps

NHD Streams and Rivers

- Perennial
- Intermittent
- Ephemeral
- Unknown
- Canal/Ditch
- NHD Area
- NHD Waterbody

NWI Wetlands

- Estuarine and Marine Deepwater
- Estuarine and Marine Wetland
- Freshwater Emergent Wetland
- Freshwater Forested/Shrub Wetland
- Freshwater Pond
- Lake
- Riverine
- NRCS Predominantly Hydric Soil Map Units
- NRCS Agate-Winlo Soils in Jackson County

https://www.oregon.gov/dsl/WW/Pages/SWI.aspx

1 inch = 0.07 miles

0 0.0275 0.055 0.11 0.165 0.22 mi

The Statewide Wetlands Inventory (SWI) represents the best data available at the time this map was published and is updated as new data becomes available. In all cases, actual field conditions determine the presence, absence and boundaries of wetlands and waters (such as creeks and ponds). An onsite investigation by a wetland professional can verify actual field conditions.

N

Date: 9/3/2020

State of Oregon
Department of State Lands
775 Summer Street, NE, Ste 100
Salem, OR. 97301-1279
(503) 986-5200

REDMOND GEOTECHNICAL SERVICES

EXHIBIT H

Geotechnical Investigation and Consultation Services

Proposed The Bornstedt Views Development Site

Tax Lot No. 100

SE Bornstedt Road and SE Averill Parkway

Sandy (Clackamas County), Oregon

for

Even Better Homes, Inc.

Project No. 1666.003.G
May 3, 2021

REDMOND GEOTECHNICAL SERVICES

May 3, 2021

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 Bornstedt Views Development Site, Tax Lot No. 100,
SE Bornstedt Road and SE Averill Parkway, Sandy (Clackamas County), Oregon

Submitted herewith is our report entitled "Geotechnical Investigation and Consultation Services, Proposed The Bornstedt Views Development Site, Tax Lot No. 100, SE Bornstedt Road and SE Averill Parkway, 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 July 10, 2020. Authorization of our services was provided by Mr. Mac Even on September 16, 2020.

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

REGISTERED PROFESSIONAL ENGINEER
12,309
OREGON
July 15, 1983
DANIEL M. REDMOND
Exp 12-31-22

Cc: Mr. Ray Moore
All County Surveyor's & Planners, Inc.

PO Box 20547 • Portland, Oregon 97294 • Fax 503/286-7176 • Phone 503/285-0598

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GEOTECHNICAL INVESTIGATION AND CONSULTATION SERVICES PROPOSED THE BORNSTEDT VIEWS DEVELOPMENT SITE TAX LOT NO. 100 SE BORNSTEDT ROAD AND SE AVERILL PARKWAY SANDY (CLACKAMAS COUNTY) OREGON

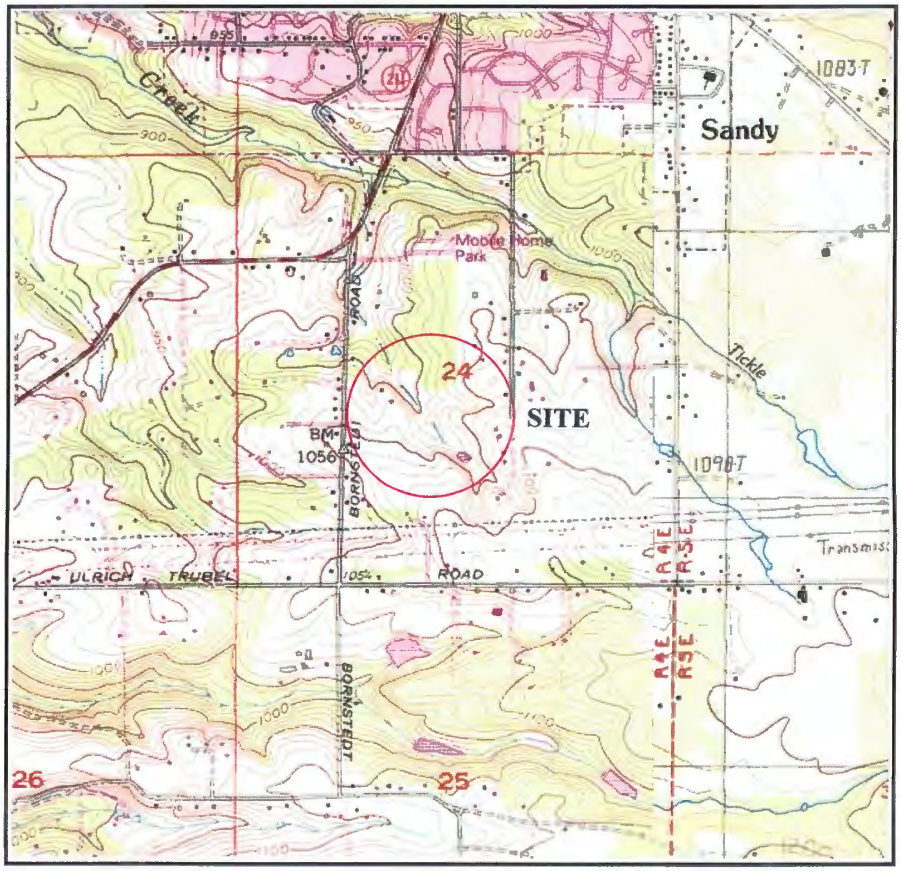
INTRODUCTION

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 Bornstedt Views residential development project located to the east of SE Bornstedt Road and to the west of SE Averill Parkway 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 Bornstedt Views residential 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 residential subdivision development. Reportedly, the project will consist of the development and/or construction of approximately four-two (42) new single-family residential home sites and/or lots ranging in size from about 7,500 to 12,000 square feet. We understand that the lots will primarily be developed with new two-story wood-frame residential structures.

Support of the new single-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-family residential structures will likely be constructed with raised wooden post and beams floors although some concrete slab-on-grade floors are also possible. 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 levels. 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 two-story wood-frame structure and is expected to result in maximum dead plus live continuous (strip) and individual (column) footing loads on the order of about 2.0 to 3.5 kips per lineal foot (klf) and 10 to 35 kips, respectively.



SANDY QUADRANGLE
OREGON
7.5-MINUTE SERIES

SCALE 1:24 000

1 0.5 0 KILOMETERS 1 2
1000 500 0 METERS 1000 2000
1 0.5 0 1
MILES
1000 0 1000 2000 3000 4000 5000 6000 7000 8000 9000 10000
FEET

CONTOUR INTERVAL 40 FEET
NORTH AMERICAN VERTICAL DATUM OF 1988

SITE VICINITY MAP

Project No. 1666.003.G	**THE BORNSTEDT VIEWS** **TL 100, SE BORNSTEDT ROAD**	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 five (5) and ten (10) 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 The Bornstedt Views 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.

2. A detailed field reconnaissance and subsurface exploration program of the soil and ground water conditions underlying the site by means of ten (10) exploratory test pit excavations. The exploratory test pits were excavated to depths ranging from about five (5) to seven (7) 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, Atterberg Limits and gradational characteristics as well as direct shear strength and "R"-value tests.

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 inturn 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 volcaniclastic 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 Bornstedt Views residential development property consists of one (1) generally rectangular shaped tax lot (TL 100) which encompass a total plan area of approximately 12.74 acres. The proposed The Bornstedt Views residential development property is roughly located to the east of SE Bornstedt Road and to the west of SE Averill Parkway. The subject property is presently improved and contains an existing single-family residential home as well as various detached wooden outbuildings.

Surface vegetation across the site generally consists of a light to moderate growth of grass, weeds and brush as well as numerous small to large sized trees. Additionally, the central portion of the subject property contains an existing seasonal drainage basin and/or tributary to Tickle Creek.

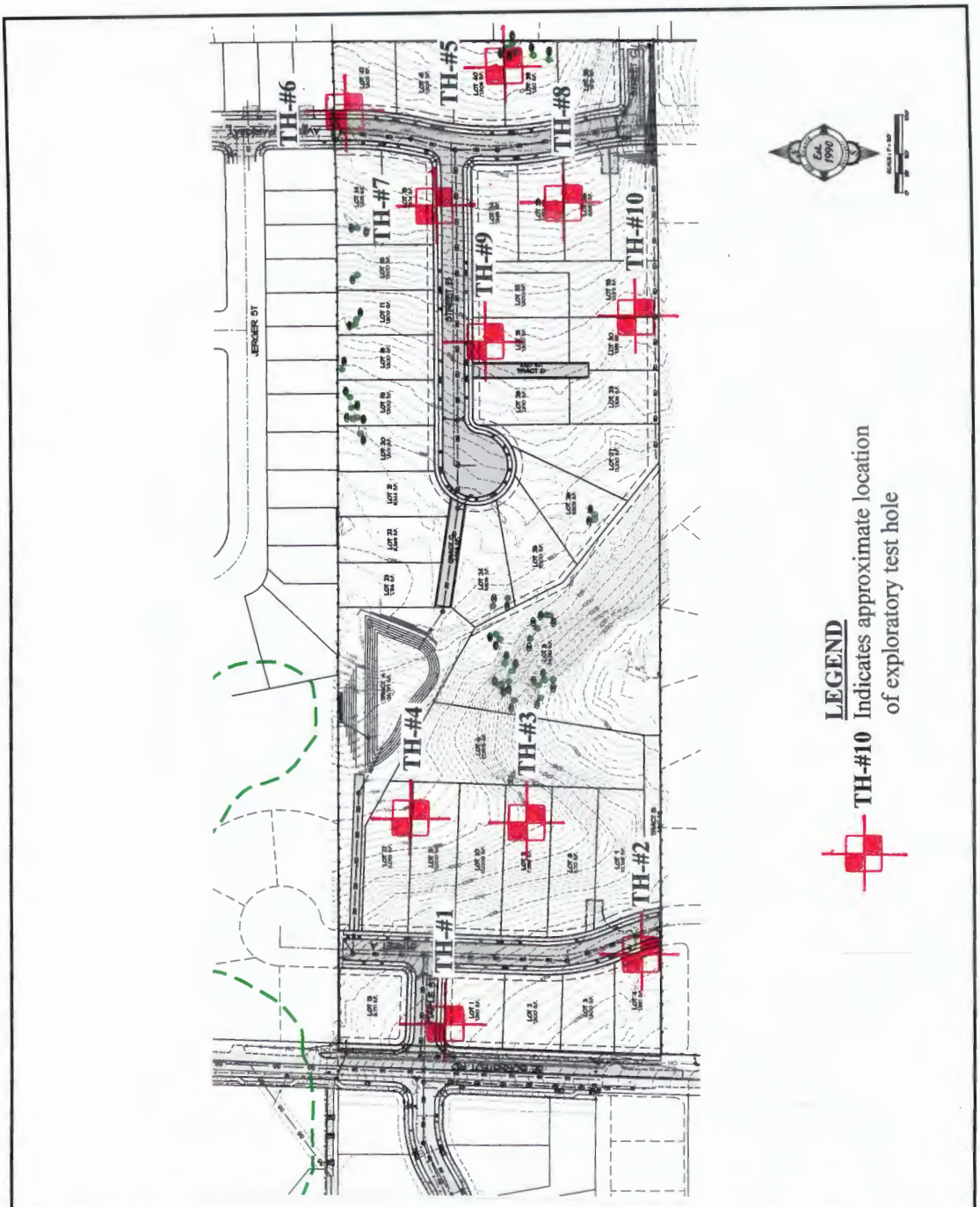
Topographically, the subject site is generally characterized as gently sloping terrain (i.e., 5 to 10 percent) descending downwards from the east and the west towards the central portion of the site associated with the seasonal tributary of Tickle Creek. Overall topographic relief across the entire site estimated at about sixty-eight (68) feet and ranges from a low about Elevation 978 feet near the northerly end of the existing seasonal drainage basin to a high of about Elevation 1046 near the easterly portion of the site.

Subsurface Soil Conditions

Our understanding of the subsurface soil conditions underlying the site was developed by means of ten (10) exploratory test pits excavated to depths ranging from about five (5) to seven (7) feet beneath existing site grades on October 1, 2020 with portable Geoprobe equipment. 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. 2. 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-8.

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 prepared by All County Surveyor's & Planners, Inc. 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.

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 inturn underlain by residual soils composed of reddish-brown, very moist to wet, soft to medium stiff, sandy, clayey silt to silty clay to depths of about four (4) to six (6) feet beneath the existing site and/or surface grades. These clayey silt to silty clay soils are best characterized by relatively low t moderate strength and moderate compressibility. These upper residual soils were inturn underlain by light reddish- to orangish-brown, very moist, very stiff to dense, sandy, clayey silt to highly weathered bedrock deposits to the maximum depth explored of about seven (7) feet beneath the existing site and/or surface grades. These sandy, clayey silt to highly weathered bedrock deposits are best characterized by relatively moderate strength and low to moderate compressibility.



SITE EXPLORATION PLAN

Project No. 1666.003.G	**THE BORNSTEDT VIEWS TL 100, SE BORNSTEDT ROAD**	Figure No. 2

Groundwater

Groundwater was not encountered within any of the exploratory test pit explorations (TH-#1 through TH-#10) at the time of excavation to depths of at least 7.0 feet beneath existing surface grades except. However, the central portion of the subject property contains and existing seasonal drainage basin.

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 October 1, 2020. The infiltration tests were performed in test holes TH-#4 and TH-#10 at depths of between four (4) and five (5) feet beneath the existing site and/or surface grades. The subgrade soils encountered in the infiltration test hole consisted of sandy, clayey silt to silty clay. 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 posses an ultimate infiltration rate on the order of about 0.1 to 0.2 inches per hour (in/hr).

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, Atterberg Limits and gradation analyses 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-9 through A-13.

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 (Mw) 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 Mw 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 Mw 9 earthquake and a probability of 0.33 for a Mw 8.3 earthquake. For the purpose of this study an earthquake of Mw 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. 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 lose, 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-#10) and laboratory test results indicate that the site is generally underlain by medium stiff to very stiff, sandy, clayey silt to silty clay and/or dense highly weathered bedrock deposits to depths of at least 7.0 feet beneath existing site grades. Additionally, groundwater was generally not encountered within any of the exploratory test pit excavations (TH-#1 through TH-#10) at the site during our field exploration work.

As such, due to the medium stiff to very stiff and/or cohesive nature of the sandy, clayey silt to silty clay subgrade soils and/or dense, highly weathered bedrock deposits beneath the site, it is our opinion that the native clayey, sandy silt to silty clay 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.

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 Bornstedt Views residential development and its associated site improvements provided that the recommendations contained within this report are properly incorporated into the design and construction of the The Bornstedt Views residential development project.

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 clay 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 ten (10) 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 above existing slopes which exceed about 20 percent. In addition to the above, we recommend that each lot which borders the easterly moderately steep slope (Lots 1 through 12) engage a Geotechnical Engineer to provide site specific design and construction recommendations for the proposed single-family residential structures. 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, sandy, clayey silt ro silty clayey 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 Bornstedt Views residential development project.

Site Preparation

As an initial step in site preparation, we recommend that the proposed new The Bornstedt Views residential 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 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 Key and Bench Fill Slope Detail, Figure No. 3).

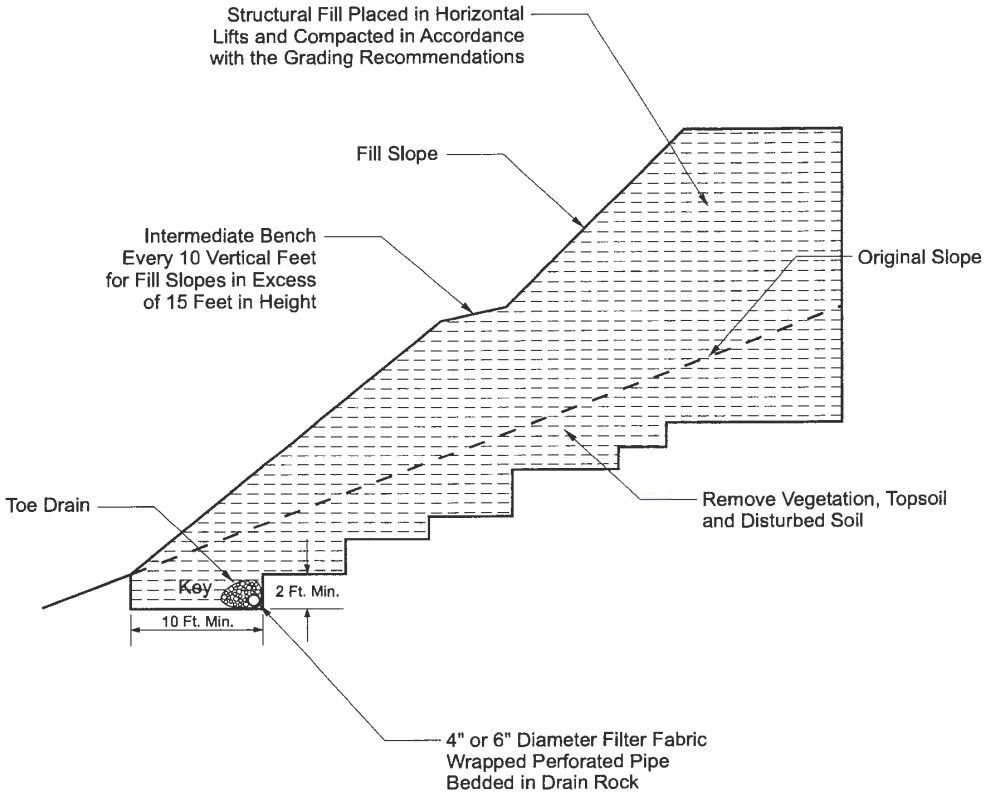
However, the actual bench width and keyway depth should be determined at the time of construction by the Geotechnical Engineer. Further, all fill slopes should be constructed with a finish slope surface gradient no steeper than about 2H:1V. All aspects of the site grading, including a review of the proposed 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 Bornstedt Views residential development is suitable for support of the planned two-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 residential 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).



TYPICAL BENCH AND KEY FILL SLOPE DETAIL

Project No. 1666.003.G	**THE BORNSTEDT VIEWS TL 100, SE BORNSTEDT ROAD**	Figure No. 3

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	55	50
3H:1V	75	70
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. For seismic loading, we recommend an additional uniform pressure of 6H where H is the height of the wall in feet.

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-14).

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:

Material Type	Pavement Section (inches)
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:

Material Type	Pavement Section (inches)
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:

	Asphaltic Concrete Thickness (inches)	Crushed Base Rock Thickness (inches)
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.

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.

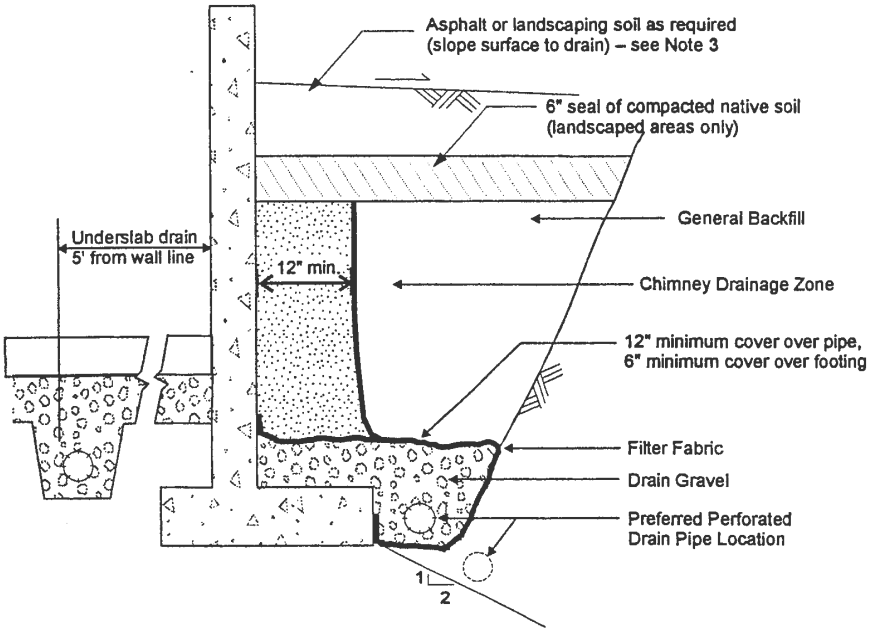
Trench stabilization materials should consist of 1-foot of well-graded gravel, crushed gravel, or crushed rock with a maximum particle size of 4 inches and less than 5 percent fines passing the No. 200 sieve. The material should be free of organic matter and other deleterious material and placed in a 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-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 7.0 feet beneath existing site grades. However, the central portion of the site contains an existing seasonal drainage basin. 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 single-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.



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.

TYPICAL PERIMETER FOOTING/RETAINING WALL DRAIN DETAIL

Project No. 1666.003.G	**THE BORNSTEDT VIEWS** **TL 100, SE BORNSTEDT ROAD**	Figure No. 4

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), ASCE 7-16 and/or Amendments to the 2018 International Building Code (IBC). 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 2015 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 2018 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	Ss	S1	Fa	Fv	SMS	SM1	SDS	SD1
D	0.702	0.314	1.239	1.986	0.867	0.6123	0.579	0.416

Notes: 1. Ss and S1 were established based on the ASCE 7-16 mapped maximum considered earthquake spectral acceleration maps for 2% probability of exceedence in 50 years.

2. Fa and Fv were established based on the ASCE 7-16 using the selected Ss and S1 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 Bornstedt Views residential 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-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. 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 constriction 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 ten (10) exploratory test pits (TH-#1 through TH-#10) on October 1, 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. 2.

The test pits were excavated using Geoprobe 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 7.0 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-8. 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-#10) at the time of excavating to depths of up to 7.0 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.

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-9.

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-10.

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-11.

Direct Shear Strength Test

One (1) Direct Shear Strength test was performed on a undisturbed and/or remolded sample of the sandy, clayey silt to silty clay 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-12.

"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-13.

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-8	Log of Test Pits
Figure No. A-9	Maximum Dry Density
Figure No. A-10	Atterberg Limits Test Results
Figure No. A-11	Gradation Test Results
Figure No. A-12	Direct Shear Strength Test Results
Figure No. A-13	Results of "R"-Value Tests
Figure No's. A-14 and A-14	Field Infiltration Test Results

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

RELATIVE DENSITY

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

CONSISTENCY

†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.

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KEY TO EXPLORATORY TEST PIT LOGS
Unified Soil Classification System (ASTM D-2487)

THE BORNSTEDT VIEWS
TL 100, SE Bornstedy Road

PROJECT NO.	DATE	Figure
1666.003.G	10/26/20	

BACKHOE COMPANY: Inland Company BUCKET SIZE: 6 inches DATE: 10/01/20

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 1,025'±
0					ML	Dark brown, wet, soft, organic, sandy, clayey SILT (Topsoil)
	X			36.6	ML/CL	Reddish-brown, very moist to wet, soft to medium stiff, sandy, clayey SILT to silty CLAY (Residual Soil)
5	X			30.9	ML/RK	Light reddish- to orangish-brown, very moist, very stiff to dense, sandy, clayey SILT to highly weathered bedrock
						Total Depth = 6.0 feet No groundwater encountered at time of exploration
10						
15						
						TEST PIT NO. TH-#2 ELEVATION 1,030'±
0					ML	Dark brown, wet, soft, organic, sandy, clayey SILT (Topsoil)
	X			38.8	ML/CL	Reddish-brown, very moist to wet, soft to medium stiff, sandy, clayey SILT to silty CLAY (Residual Soil)
5						Total Depth = 6.0 feet No groundwater encountered at time of exploration
10						
15						

LOG OF TEST PITS

PROJECT NO. 1666.003.G THE BORNSTEDT VIEWS FIGURE NO. A-4

REDMOND GEOTECHNICAL SERVICES

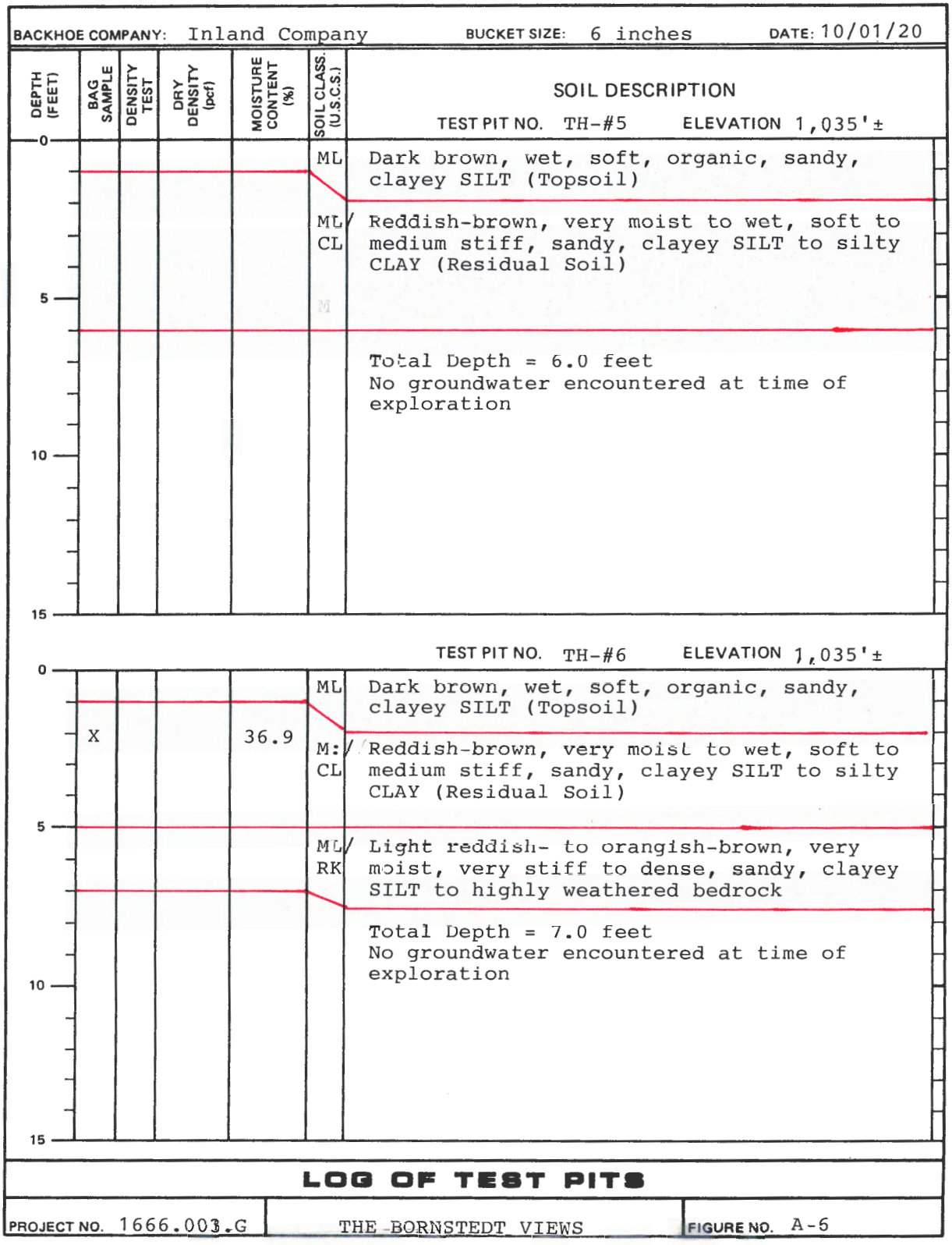
BACKHOE COMPANY: Inland Company BUCKET SIZE: 6 inches DATE: 10/01/20

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 1,000'±
0					ML	Dark brown, wet, soft, organic, sandy, clayey SILT (Topsoil)
	X			37.1	ML/CL	Reddish-brown, very moist to wet, soft to medium stiff, sandy, clayey SILT to silty CLAY (Residual Soil)
5					ML/RK	Light reddish- to orangish-brown, very moist, very stiff to dense, sandy, clayey SILT to highly weathered bedrock
						Total Depth = 7.0 feet No groundwater encountered at time of exploration
10						
15						
						TEST PIT NO. TH-#4 ELEVATION 995'±
0					ML	Dark brown, wet, soft, organic, sandy, clayey SILT (Topsoil)
					ML/CL	Reddish-brown, very moist to wet, soft to medium stiff, sandy, clayey SILT to silty CLAY (Residual Soil)
5						Total Depth = 5.0 feet No groundwater encountered at time of exploration
10						
15						

LOG OF TEST PITS

PROJECT NO. 1666.003.G | THE BORNSTEDT VIEWS | FIGURE NO. A-5

REDMOND GEOTECHNICAL SERVICES



REDMOND GEOTECHNICAL SERVICES

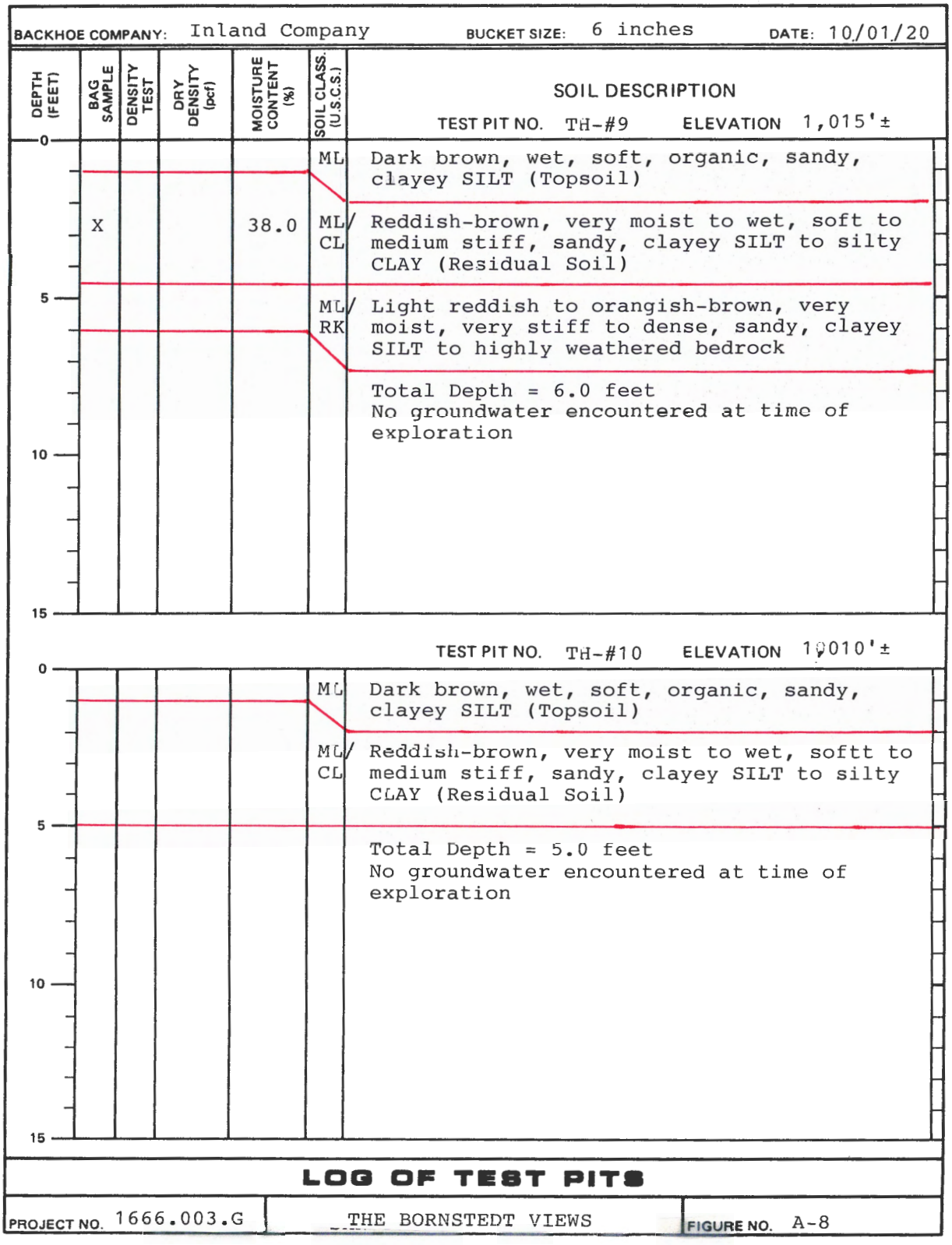
BACKHOE COMPANY: Inland Company BUCKET SIZE: 6 inches DATE: 10/01/20

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 1,025'±
0					ML	Dark brown, wet, soft, organic, sandy, clayey SILT (Topsoil)
					ML/CL	Reddish-brown, very moist to wet, soft to medium stiff, sandy, clayey SILT to silty CLAY (Residual Soil)
5						Total Depth = 5.0 feet No groundwater encountered at time of exploration
10						
15						
						TEST PIT NO. TH-#8 ELEVATION 1,020'±
0					ML	Dark brown, wet, soft, organic, sandy, clayey SILT (Topsoil)
	X			39.5	ML/CL	Reddish-brown, very moist to wet, soft to medium stiff, sandy, clayey SILT to silty CLAY (Residual Soil)
5	X			38.8	ML/RK	Light reddish- to orangish-brown, very moist, very stiff to dense, sandy, clayey SILT to highly weathered bedrock
						Total Depth = 7.0 feet No groundwater encountered at time of exploration
10						
15						

LOG OF TEST PITS

PROJECT NO. 1666.003,G _THE BORNSTEDT_VIEWS FIGURE NO. A-7

REDMOND GEOTECHNICAL SERVICES



REDMOND GEOTECHNICAL SERVICES

MAXIMUM DENSITY TEST RESULTS

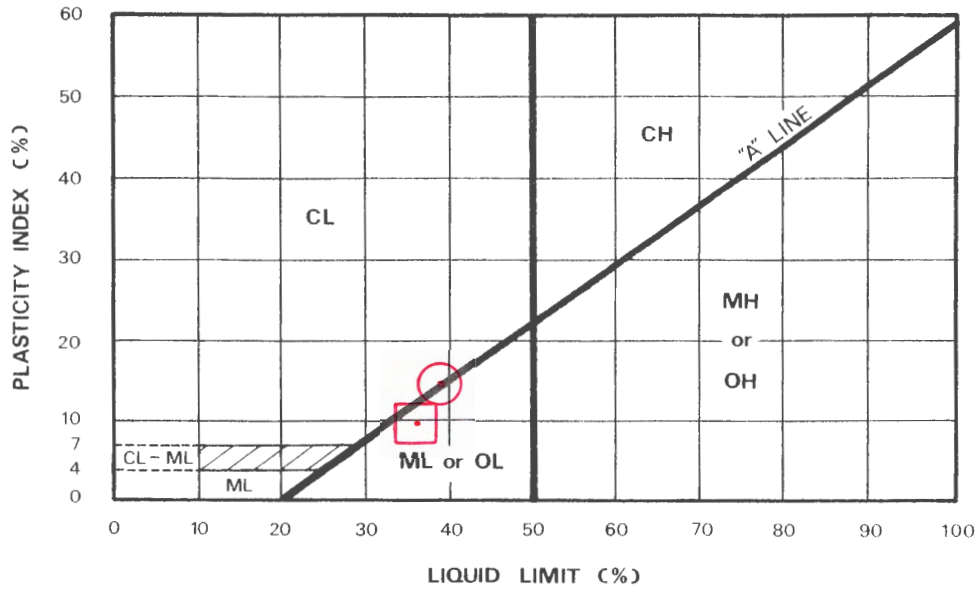
SAMPLE LOCATION	SOIL DESCRIPTION	MAXIMUM DRY DENSITY (pcf)	OPTIMUM MOISTURE CONTENT (%)
TH-#1 @ 2.0'	Reddish-brown, sandy, clayey SILT to silty CLAY (ML/CL)	100.0	34.0
TH-#6 @ 2.0'	Reddish-brown, sandy, clayey SILT to silty CLAY (ML/CL)	99.0	35.0

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. 1666.003.G | THE BORNSTEDT VIEWS | FIGURE NO.: A-9



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	36.6	36.1	9.9	85.1		ML/CL
⊙	TH-#6	2.0	36.9	39.4	14.2	90.3		ML/CL

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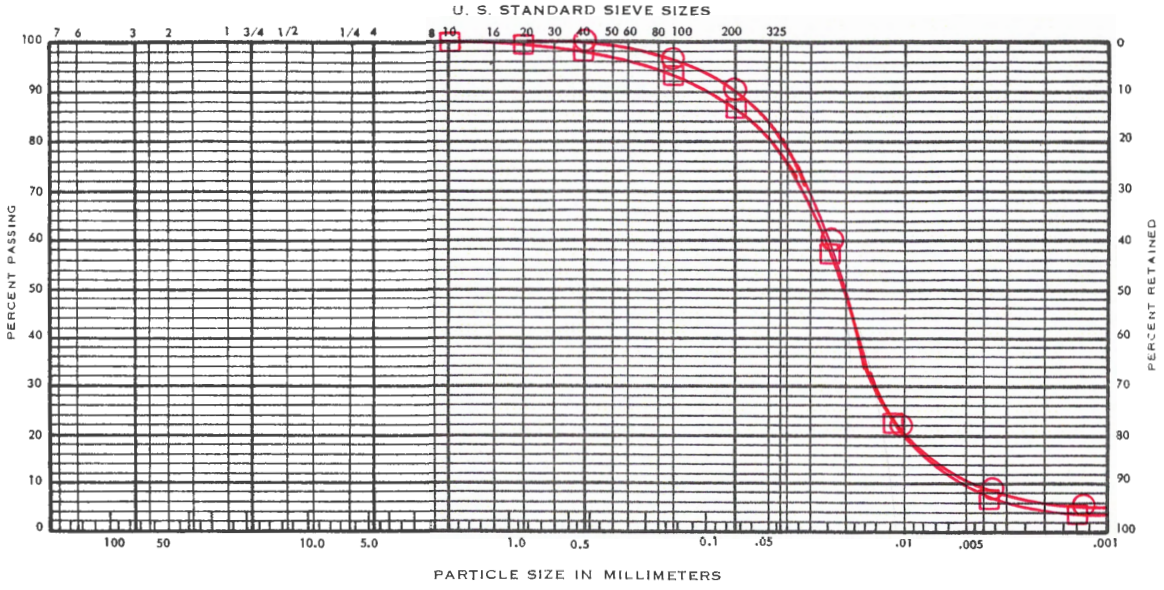
THE BORNSTEDT VIEWS
PLASTICITY CHART AND DATA

THE BORNSTEDT VIEWS
TL 100, SE Bornstedt Road

PROJECT NO.	DATE	
1666.003.G	10/26/20	Figure A-10

UNIFIED SOIL CLASSIFICATION SYSTEM

(ASTM D 422-72)



COBBLES	GRAVEL		SAND			SILT AND CLAY
	COARSE	FINE	COARSE	MEDIUM	FINE	

KEY SYMBOL	BORING NO.	SAMPLE DEPTH (feet)	ELEV. (feet)	UNIFIED SOIL CLASSIFICATION SYMBOL	SAMPLE DESCRIPTION
⊟	TH-#1	2.0		ML/CL	Reddish-brown, sandy, clayey SILT to silty CLAY
⊖	TH-#6	2.0		ML/CL	Reddish-brown, sandy, clayey SILT to silty CLAY

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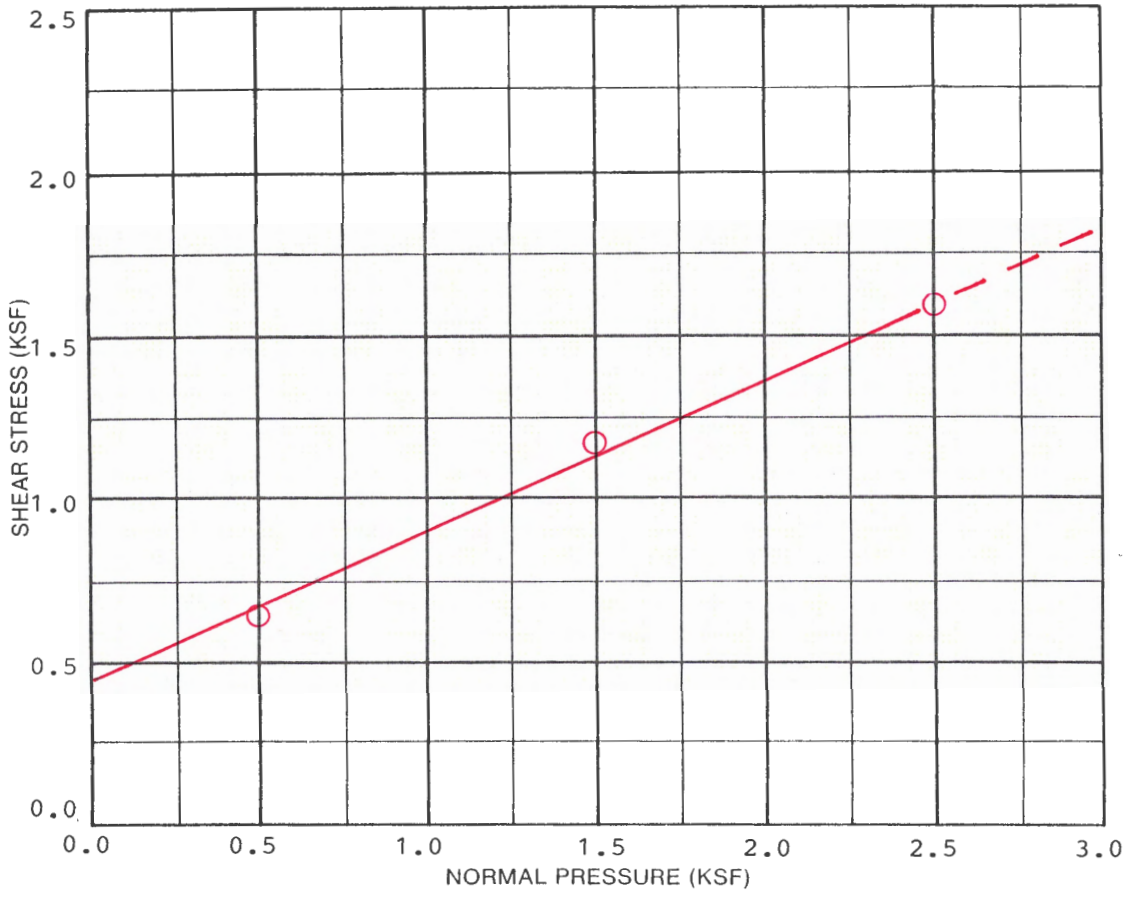
GRADATION TEST DATA

THE BORNSTEDT VIEWS
TL 1000, SE Bornstedt Road

PROJECT NO.	DATE	FIGURE
1666.003.G	10/26/20	A-11



SAMPLE DATA	
DESCRIPTION: Reddish-brown, sandy, clayey SILT to silty CLAY (ML/CL)(Remolded)	
BORING NO.: TH-#1	
DEPTH (ft.): 2.0	ELEVATION (ft):
TEST RESULTS	
APPARENT COHESION (C): 450 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	1.1	1.6	
INITIAL H_2O CONTENT (%)	34.0	34.0	34.0	
FINAL H_2O CONTENT (%)	35.1	29.5	23.3	
INITIAL DRY DENSITY (PCF)	92.0	92.0	92.0	
FINAL DRY DENSITY (PCF)	92.8	95.5	99.7	
STRAIN RATE: 0.02 inches per minute				

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DIRECT SHEAR TEST DATA

THE BORNSTEDT VIEWS
TL 100, SE Bornstedt Road

PROJECT NO.	DATE	Figure
1666.003.G	10/26/20	A-12

RESULTS OF R (RESISTANCE) VALUE TESTS

SAMPLE LOCATION: TH-#1

SAMPLE DEPTH: 2.0 feet bgs

Specimen	A	B	C
Exudation Pressure (psi)	219	329	431
Expansion Dial (o.ooo1")	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: 2.0 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 Bornstedt Views	**Date:** October 1, 2020	**Test Hole:** TH-#4
Depth to Bottom of Hole: 4.0 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
1.0-4.0	Reddish-brown, sandy, clayey SILT to silty CLAY (ML/CL)

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-14

Division 004 Appendix C - Infiltration Testing

Location: The Bornstedt Views	**Date:** October 1, 2020	**Test Hole:** TH-#10
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

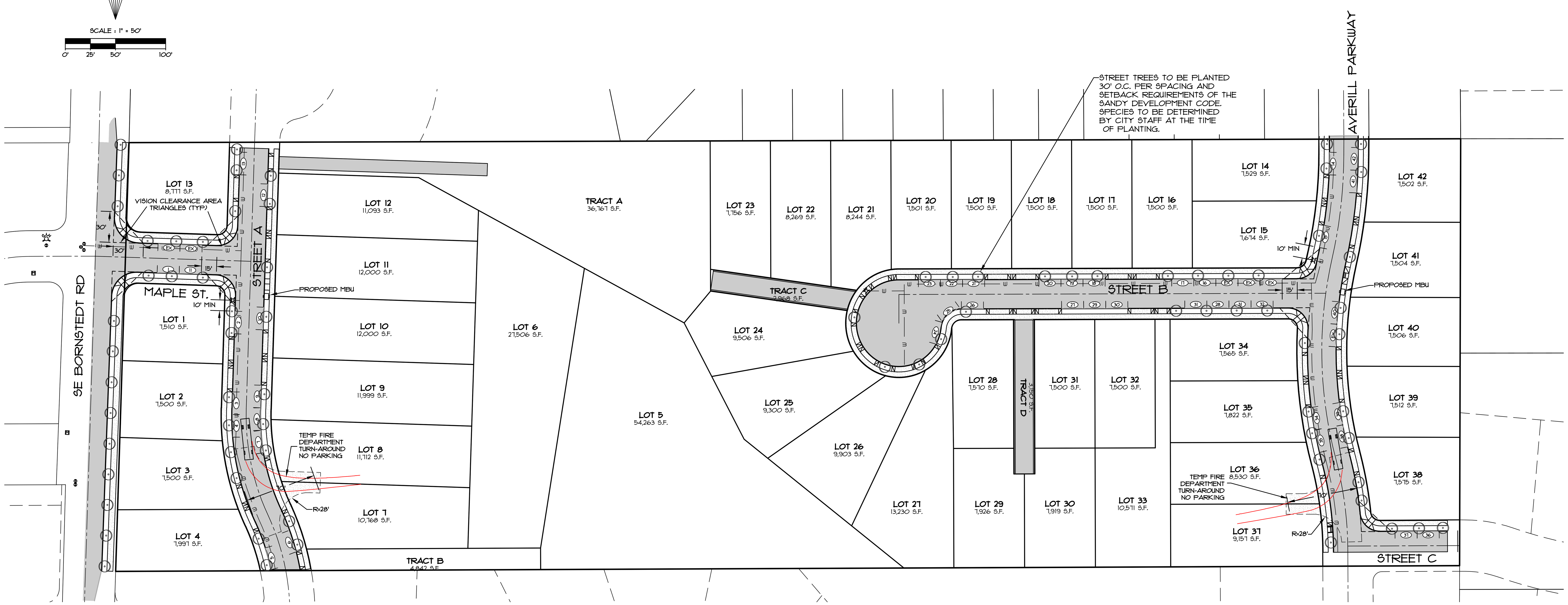
Depth (feet)	Soil Characteristics
0-1.0	Dark brown Topsoil
1.0-5.0	Reddish-brown, sandy, clayey SILT to silty CLAY (ML/CL)

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-15

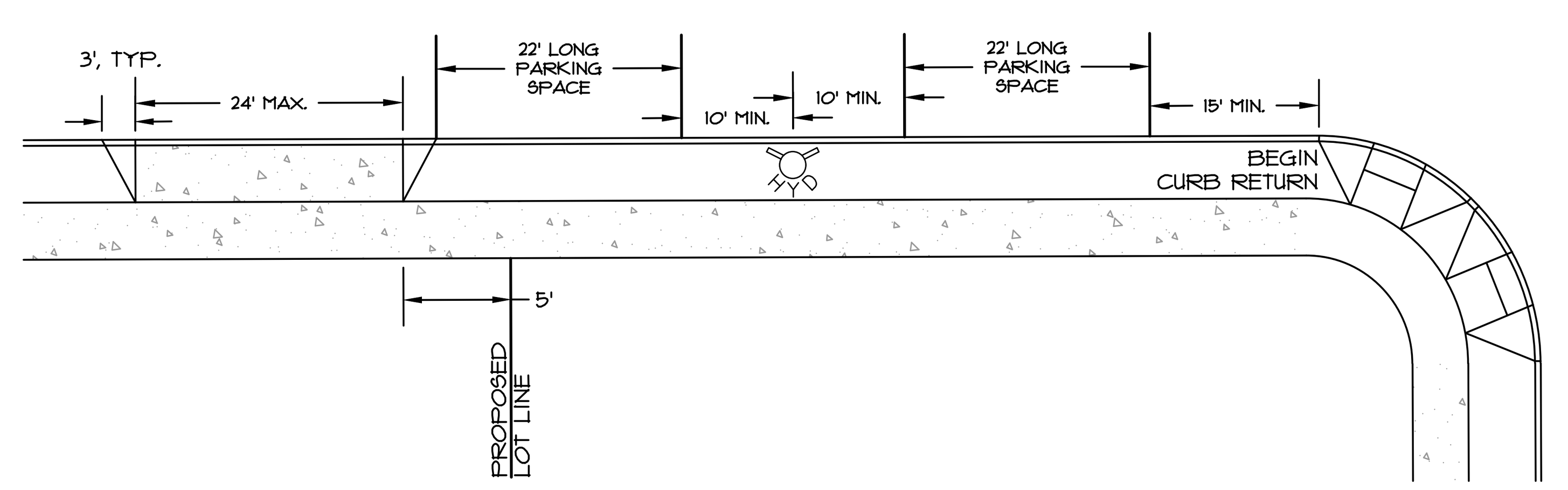
EXHIBIT I



TYPICAL ON-STREET CAR PARKING TOTAL
ON-STREET SPACES PROPOSED = 48
MINIMUM REQUIRED = 42

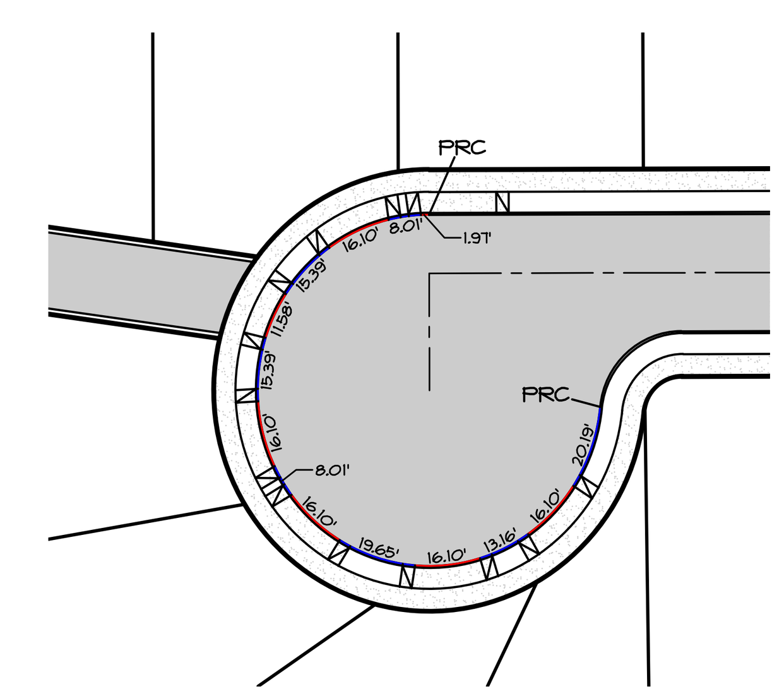
TYPICAL ON-STREET PARKING REQUIREMENT DIMENSIONS

NTS



LEGEND

- SUBJECT PROPERTY BOUNDARY LINE
- PROPOSED LOT LINE
- PROPOSED CURB AND PAVEMENT
- PROPOSED SIDEWALK
- PROPOSED UNSTRIPED 22' LONG ON-STREET PARKING SPACE
- PARKING SPACE NUMBER CORRESPONDING TO LOT NUMBER (EACH SPACE IS WITHIN 300' OF EACH DWELLING
- PARKING SPACE THAT EXCEEDS THE REQUIREMENT
- PROPOSED FIRE HYDRANT
- PROPOSED MBU



TOTAL CIRCUMFERENCE FROM PRC TO PRC = 193.85'
TOTAL GAPS = 99.80' (51%)
TOTAL DRIVEWAY LENGTH = 94.85' (49%)
(49% IS LESS THAN 51%. MEETS CODE)

SCALE : 1" = 40'
0' 40' 80'

DATE	NO.	REVISION	BY
7-26-21	1	ADDED FIRE TURN TEMPLATE	RLM

SHEET C10 OF 10

DESIGNED: RLM
DRAWN: RLM
CHECKED: DLH
APPROVED: RLM

REGISTERED PROFESSIONAL ENGINEER 49710 OREGON JULY 21, 1992 RAY L. MOORE
RENEWAL DATE: 12/31/2022
PRELIMINARY

SCALE VERT: N/A HORIZ: 1" = 50'
DATE: 7-26-21
FILE:19-268 - Planning-SFR.dwg
LEGAL

SECTION	TWP.	RANGE
24	2S	4E

PROJECT:
THE BORNSTEDT VIEWS
ON-STREET PARKING PLAN

LOCATION:
19618 SE BORNSTEDT ROAD, SANDY, OR

All County Surveyors & Planners, Inc.
Surveying, Planning and Civil Engineering
P.O. Box 955 Sandy, OR 97055
Phone: (503) 668-3151
Fax: (503) 668-4730
DATE OF PLOT 7-26-21

CLIENT:
EVEN BETTER HOMES, INC.
MAC EVEN
PO BOX 2021
GRESHAM, OR 97030
PHONE: (503) 348-5602
EMAIL: mac@evenbetterhomes.com

EXHIBIT J

From: Hassan Ibrahim
Sent: Monday, January 27, 2020 11:46 AM
To: Ray Moore
Cc: Mike Walker ; Mac Even ; Kelly O'Neill Jr.
Subject: RE: 19-268 - The Bornstedt Views

Ray,

With the north end of street A terminating with a cul de sac and in the future another access to Bornstedt will be 5 lots to the south and another 4 lots further south and given the topographic challenge, Street A being a 100 feet to the east provides a stacking of 4 cars length exiting to Bornstedt Rd. Having said that, I don't have much grief with the proposed alignment to the north.

Hassan Ibrahim, P.E.
CURRAN-McLEOD, INC.
6655 SW Hampton St, Ste. 210
Portland, OR 97223
Tel: 503-684-3478
Fax: 503-624-8247
Cell: 503-807-2737
email: hai@curran-mcleod.com

From: Kelly O'Neill Jr.
Sent: Monday, January 27, 2020 11:30 AM
To: Ray Moore <raym@allcountysurveyors.com>
Cc: Mike Walker <mwalker@ci.sandy.or.us>; Hassan Ibrahim <hai@curran-mcleod.com>; Mac Even <mac@evenbetterhomes.com>
Subject: Re: 19-268 - The Bornstedt Views

BTW on the design we discussed this morning I would encourage a 15 foot pedestrian tract at the north end of the rowhouses. Alternatively providing a 10 foot setback would be great. The further we can keep proposed housing from existing homes achieves outstanding design IMO and reduces negative feedback from the existing neighborhood.

On Mon, Jan 27, 2020, 11:23 AM Ray Moore <raym@allcountysurveyors.com> wrote:
Mike, These are going to be skinny lots (+/- 44' wide) now that I have to turn them to run east/west. The 15' easement will make it difficult to build on the

most north lot. Plus if you look at the existing grade at the north end of Street A (if it were shifted 50 more feet to the east) The existing ground elevation +/- 1,000. So you would need a +/- 15' to 20' wall at the end of the street. The current street alignment will still need a +/- 10' tall wall.

Thanks,

Ray Moore, PE, PLS
All County Surveyors & Planners, Inc.
PO Box 955, Sandy, OR 97055
Phone: 503-668-3151
Fax: 503-668-4730
email: raym@allcountysurveyors.com

From: MW
Sent: Monday, January 27, 2020 11:09 AM
To: Ray Moore
Cc: Hassan Ibrahim ; Kelly O'Neill Jr. ; Mac Even
Subject: Re: 19-268 - The Bornstedt Views

Ray,

It appears you could pick up 8 or so feet on the sewer invert if you drain to the existing MH in Bornstedt at the common line of Zion Meadows and Marshall Ridge instead of the one at the intersection of Maple and Bornstedt. The easement would have to be 15 ft. wide for a single utility. It might be easier to vary that standard than the separation.

On Mon, Jan 27, 2020 at 10:59 AM Ray Moore <raym@allcountysurveyors.com> wrote:

Hi Hassan. We had a pre pre-app meeting today with Mike and Kelly. Mike was concerned about the location of Street A as shown on the attached sketch Maps. Street A is shown 100' East of Bornstedt and Mike said this should be 150'. We have modified the street a bit so that the 150' can be accommodated as Street A extends south.

We cannot shift the Street A at our entrance, do to the steep slope that breaks off fast to the east. We are just barely able to get the gravity sewer to work at 100'. Please let me know what you think.

Thanks!

Ray Moore, PE, PLS
All County Surveyors & Planners, Inc.
PO Box 955, Sandy, OR 97055
Phone: 503-668-3151
Fax: 503-668-4730
email: raym@allcountysurveyors.com

--

Mike Walker
Director of Public Works
City of Sandy
39250 Pioneer Blvd.
Sandy, OR 97055
503-489-2162 V
503-668-8714 F
www.ci.sandy.or.us

This e-mail is a public record of the City of Sandy and is subject to the State of Oregon Retention Schedule and may be subject to public disclosure under the Oregon Public Records Law. This e-mail, including any attachments, is for the sole use of the intended recipient(s) and may contain confidential and privileged information. Any unauthorized review, use, disclosure, or distribution is prohibited. If you are not the intended recipient, please send a reply e-mail to let the sender know of the error and destroy all copies of the original message.

Date: August 17, 2021

EXHIBIT K

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

Re: File No. 20-21 SUB/TREE - Response to 6/3/2021 Bornstedt Views Incompleteness Letter

Dear Emily:

This letter and its attachments contain some but not all of the missing materials identified in the City's June 3, 2021 letter notifying the Applicant of the Application's incompleteness. The Applicant is submitting some but not all of the missing information for the purposes of making the application complete under ORS 227.178(2)(b). The receipt by the City of some but not all of the missing information starts the 120-day period for a final decision by the City on the application under ORS 227.178(1) on the day that the letter and its attachments are received by the City. The Application has been made complete within 180 days of the submittal date of May 6, 2021. The only clear and objective standards that will apply to the Application are those in effect on the submittal date of May 6, 2021. The only construction standards that will apply to the subdivision are those in effect on the submittal date of May 6, 2021, unless the Applicant elects otherwise. ORS 92.040(2).The Applicant reserves the right to submit additional argument and evidence regarding the Application.

1. **Stormwater Report (referenced as Exhibit B in your submittal, but not actually included in the submittal items).**
   Response: *A Stormwater Report is attached.*

2. **Arborist Report (referenced as Exhibit C in your submittal, but not actually included in the submittal items).**
   Response: *An Arborist Report is attached.*

3. **Transportation Impact Analysis. The TPR findings conducted as part of the annexation application do not qualify for the exemption in Section 17.84.50(B.6.b).**
   Response: *A Transportation Impact Analysis is attached.*

4. **Update the entire plan set to detail 150 feet of spacing between Bornstedt Road and proposed Street A in compliance with Section 17.84.50(E.2).**
   Response: *The Applicant is not providing the requested information relating to Sandy Development Code ("SDC") 17.84.50(E)(2), which provides as follows:*

"E. 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:

****

"2. Local streets should typically intersect in "T" configurations rather than four-way intersections to minimize conflicts and discourage through traffic. Adjacent "T" intersections shall maintain a minimum of 150 feet between the nearest edges of the two rights-of-way."

The Application requests approval of a tentative plat for single-family lots under SDC 17.100.60(B) for property with the Sandy Urban Growth Boundary (the "UGB"). The City has a population exceeding 2500 persons and has not taken an exception to ORS 197.303. Therefore, the Application qualifies as a "Needed Housing" application under ORS 197.303(1). Because the application is for Needed Housing, ORS 197.307(4) applies to the Application and it provides that the City may apply only clear and objective standards, conditions and procedures to the Application except as provided for in ORS 197.307(6). ORS 197.307(6) does not apply to this Application because the City did not have a clear and objective path available to the Applicant on the May 6, 2021 submittal date.

*SDC 17.84.50(E)(2) is not a clear and objective standard. The standard uses the words "discourage," "excessive," "intended," "typically" and "minimize." The standard also introduces a mandatory procedure that is not clear and objective because it requires that "other designs intended to discourage traffic" **shall** be considered. The standard is subjective because it uses the word "discourage." The words identified above are not clear and objective because the City cannot apply them without applying discretion and judgment.*

Alternatively, the Sandy City Engineer sent an email to the Applicant's Engineer (attached) stating he approves of the Applicant's design.

5. **Update the entire plan set to detail Maple Street continuing east-west through the property in compliance with Section 17.100.100, specifically subsections A, D, and F, with sufficient north-south streets to meet to block length standards of Section 17.100.120. After initial conversations with the Public Works Director and review of the development code, Maple Street shall extend to the east property boundary. The necessity for Maple Street to extend through the subject property will necessitate reconfiguration of proposed lots, utilities, and tracts.**

Response: *The subject property does not lend itself to an interconnected and gridded street pattern due to the topographic constraints. As shown on Sheet C3 of the plan set, the site contains a north-south ravine with slopes in excess of 35 percent. The applicant is not opposed to constructing a pedestrian path between Street A on the west side of the ravine and Street B on the east side but is strongly opposed to constructing a road through this area. SDC 17.100.100(A), (D) and (F) provide as follow:*

> *"No subdivision or partition shall be approved unless the development has frontage or approved access to an existing public street. In addition, all streets shall be graded and improved in conformance with the City's construction standards, approved by the City Engineer, in accordance with the construction plans.*
>
> > *A. Street Connectivity Principle. The pattern of streets established through land divisions should be connected to: (a) provide safe and convenient options for cars, bikes and pedestrians; (b) create a logical, recognizable pattern of circulation; and (c) spread traffic over many streets so that key streets (particularly U.S. 26) are not overburdened.*
> >
> > ****
> >
> > *D. Street Spacing. Street layout shall generally use a rectangular grid pattern with modifications as appropriate to adapt to topography or natural conditions.*
> >
> > *F. 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 that have no future street plan. Streets shall terminate at other streets or at parks, schools or other public land within a neighborhood.*
> >
> > *Local streets shall align and connect with other roads when crossing collectors and arterials per the criteria in Section 17.84.50.K.5.e. (NOTE: THE SDC DOES NOT CONTAIN SDC 17.84.50.K.e.)*
> >
> > *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."*

For the same reasons explained in Item 4, the words and phrases "safe, "convenient", "logical", "recognizable", "spread traffic over many streets", "key streets", "generally", "modifications as appropriate", "to adapt to topography or natural conditions", "logical", "connected" and "where development may

practically occur" are not clear and objective and may not be applied to the application.

Additionally, SDC 17.100.100 contains many subjective words and phrases and the Applicant reserves the right to specifically identify such subjective words and phrases to demonstrate why the City may not apply them to the Application under ORS 197.307(4).

For the reasons explained above, SDC 17.100.120 is subjective and may not be applied to the Application. SDC 17.100.120 provides as follows:

> *"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.*
>
> *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.*
>
> *****
>
> *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 ten 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."*

SDC 17.100.120(A), (B) and (D) use the following subjective words and phrases: "sufficient," "appropriate," "unless topographic, natural resource, or other similar physical conditions justify longer blocks," "minimum," "to enhance public convenience and mobility," and "may" are not clear and objective and may not be applied to this application.

6. **Demonstrate the turning radius with a turning template for fire apparatus at the two turnarounds.**
   ***Response**: A turning template is attached.*

7. **Demonstrate how the proposal complies with Section 17.100.220(B).**
   ***Response**: Lot 5 (54,263 square feet) and Lot 6 (27,506 square feet) are proposed to contain more than double the 7,500 square foot minimum Lot size. The size of these lots is due to the topography of the site and the difficulty in serving this area of the development with street access. Both of these large lots are*

proposed to be accessed by Tract B, a private drive. As required by Section 17.100.150 - Residential Shared Private Drives, a private drive is not allowed to provide access to more than two lots. With this restriction and site limitations, division of Lots 5 and 6 further in the future is not possible.

8. **$1,500 third party review fee for review of stream and wetland determination.**
***Response**: The submitted application included a Stream and Wetland Presence Determination by an Environmental Consultant. This report was prepared by following guidance from the Oregon Department of State Lands for determining the presence of stream and wetland resources. The conclusion of this work is the stream and associated wetland mapped on the site "do not exist". With this conclusion, the applicant finds the City's request to provide an additional $1,500 third party review fee is not appropriate and the applicant has decided not to pay this fee.*

9. **Details on all proposed retaining walls (location, height, architectural finish).**
***Response**: No retaining walls are proposed or required with the development.*

Sincerely,

Tracy Brown
Tracy Brown Planning Consultants, LLC

Cc via Email:
- Mac Even, Even Better Homes (applicant)
- Michael Robinson, Schwabe, Williamson, and Wyatt
- Ray Moore, All County Surveyors and Planners

Attachments:
- Stormwater Report
- Arborist Report
- Transportation Impact Analysis
- Email correspondence: Hassan Ibrahim, City Engineer to Ray Moore, Project Engineer
- Fire Apparatus Turning Templates

Schwabe
WILLIAMSON & WYATT®

EXHIBIT L

September 24, 2021

Michael C. Robinson
Admitted in Oregon
T: 503-796-3756
C: 503-407-2578
mrobinson@schwabe.com

VIA E-MAIL

Mr. Kelly O'Neill, Jr., Director
City of Sandy Development Services Department
Sandy City Hall
39250 Pioneer Blvd.
Sandy, OR 97055

RE: City of Sandy (the "City") File No. 21-021 SUB/TREE, Bornstedt Views Single Family Subdivision Application (the "Application"); Applicant's Objection to Use of Subjective Procedures

Dear Mr. O'Neill:

This office represents Even Better Homes, the Applicant. The Applicant has asked me to write you concerning two issues in the City's September 1, 2021 letter (the "Letter") deeming the Application complete (**Exhibit 1**). Please place this letter in the official Planning Department file for the Application.

The Application is a Needed Housing application as defined in ORS 197.303(1)(a). The Application land is zoned for residential uses. The City's population exceeds 2,500 persons and the City has not taken an exception to the definition of "needed housing" as evidenced by a lack of an exception in the City's acknowledged Comprehensive Plan.

The Application is also subject to ORS 197.307(4), (6) and (7) regulating housing, including needed housing. These sections collectively require the City to apply only clear ***and*** objective standards, conditions and procedures to the regulation of housing unless a clear and objective approval process is available (no such process was available in the Sandy Development Code (the "SDC") for a subdivision application submitted on May 6, 2021 based on the "Goal Post Rule" in ORS 227.178(3)) and under ORS 92.040(2) and the City's approval procedures for the Application are subject to the clear ***and*** objective requirements in ORS 197.307(4). The Application land is not subject to ORS 197.307(5) because it is not in a formally adopted central city plan nor is it in an historic area.

Other statutes applicable to the Application include ORS 197.522(1)-(3), 227.173(2) and 227.175(4)(b)-(e).

The Letter deemed the Application complete but also stated that the Director elevated the Application to a Type III procedure and that unspecified Type III variance applications, not requested by the Applicant, are the basis for the Director's subjective decision. The Applicant explained in its completeness submittal why all of the relevant clear and objective approval criteria were satisfied.

The Director does not have the authority to subjectively elevate the Application from a Type II to a Type III procedure because doing so is not subject to clear and objective standards and procedures. The Letter's sole reason for doing so is the lack of Type III variances not requested by the Applicant.

SDC 17.12.20.D (**Exhibit 2**) provides that a subdivision application in compliance with the SDC is a Type II application and authorizes the Director to elevate the Application to a Type III procedure under limited situations in SDC 17.12.30. SDC 17.12.30 is referred to as a "discretionary process." Neither standard is clear and objective but even if one were, the elevation provision is dependent upon a subjective standard-"***if*** the Director ***contemplates persons other than the applicant*** can be ***expected*** to question the application's ***compliance*** with the ***Code***"-which is contrary to the Director's authority under ORS 197.307(4). Moreover, the Letter shows that the Director elevated the Application because of the lack of requested Type III variances, which is ***not*** a basis for elevation under SDC 17.12.30, thus demonstrating the Director's use of unknown and subjective standards to elevate the Application. In addition to improperly applying a subjective standard to the Application, the Director exceeded his authority to do so under the relevant SDC standard for elevation under a Type II procedure.

The Director has no authority to apply Type III variances for the Application not requested by the Applicant. ORS 227.178(1)-(3). If the City finds that the Application does not meet applicable clear and objective approval standards, the Applicant has the unfettered right to either propose a modification to the Application or to propose a condition of approval to make the application consistent with the relevant clear and objective standard. ORS 197.522(3) (**Exhibit 3**). Further, the Director failed to identify in the Letter the relevant standards subject to the variances and thus did not meet the City's burden of showing that such standards meet ***both*** ORS 197.307(4) and 197.195(1).

The Applicant respectfully requests that the Director apply the Type II procedure to the Application and not apply unknown variances not requested by the Applicant in the Application. Failure to do so violates ORS 197.307(4) by applying a subjective process which has the cumulative effect of discouraging needed housing through unreasonable cost and delay.

Very truly yours,

Michael C. Robinson

MCR:jmhi
Enclosures

cc: Mr. Mac Even *(via email) (w/enclosures)*
Mr. Tracy Brown *(via email) (w/enclosures)*
Mr. Ray Moore *(via email) (w/enclosures)*
Mr. Mike Ard *(via email) (w/enclosures)*
Mr. Chris Crean *(via email) (w/enclosures)*
Mr. Garrett Stephenson *(via email) (w/enclosures)*

PDX\137019\262784\MCR\31714841.1

WHERE INNOVATION MEETS ELEVATION

39250 Pioneer Blvd
Sandy, OR 97055
503-668-5533

September 1, 2021

Mac Even
PO Box 2021
Gresham, OR 97030

All County Surveyors & Planners, Inc.
PO Box 955
Sandy, OR 97055

William Bloom
PO Box 1283
Wrangell, AK 99929

Tracy Brown Planning Consultants
17075 Fir Drive
Sandy, OR 97055

RE: NOTICE REGARDING INCOMPLETION OF SUBMISSION
FILE NUMBER: 21-021 SUB/TREE
PROJECT NAME: Bornstedt Views Subdivision

☒ Application accepted as complete on: **August 17, 2021**

☐ Application incomplete. The additional information necessary to consider your application is listed below. The application will be deemed complete upon submission of one of the following options:

1. All of the missing information;
2. Some of the missing information and written notice that no other information will be provided; or
3. Written notice that none of the missing information will be provided.

If one of the above listed options is not received by the city by the 180th day following submittal of your application, the application will be void per state law (ORS 227.178 (4)).

☐ Requested additional information filed on: _____

Following submission of your land use application (received on 5/06/2021), staff found the application incomplete on June 3, 2021. On August 17, 2021, the applicant submitted some of the missing information and written notice that no other information will be provided. The applicant further requested that the application be deemed complete effective August 17, 2021 for the purpose of beginning the "120-day clock." Thus, staff finds the application complete as of August 17, 2021 for the purpose of beginning the "120-day clock."

The applicant submitted the application as a Type II Subdivision and did not apply for any variances. However, as explained in the incompleteness letter from June 3, 2021 staff finds that several Type III variances are required to process the subdivision request as submitted. Therefore, staff has elevated the subdivision request to the Planning Commission for review. A Planning Commission hearing will be scheduled.

Please call me at (503) 783-2585 or email emeharg@ci.sandy.or.us if you have any questions.

Sincerely,

Emily Meharg,
Senior Planner

Sec. 17.12.20. Type II—Noticed administrative review.

Type II decisions are made by the Planning Director or designee with public notice, and an opportunity for a public hearing if appealed. An appeal of a Type II decision is heard by the Planning Commission according to the provisions of Chapter 17.28. Notification of a Type II decision is sent according to the requirements of Chapter 17.22. If the Director contemplates persons other than the applicant can be expected to question the application's compliance with the Code, the Director may elevate an application to a Type III review.

Types of Applications:

A. Design Review, except Type I Design Reviews under Subsection 17.12.10.B. and Type III Design Reviews under 17.12.30.

B. Historic Preservation Provisions Procedures for Alteration of an Historic Resource.

C. Adjustments and Variances of up to 20 percent of a Quantifiable Dimension which does not increase density.

D. Subdivisions in compliance with all standards of the Development Code.

E. Partitions and Minor Replats.

F. Flood, Slope and Hillside Development and Density Transfer-Uses listed in 17.60.40.

G. Request for Interpretation.

H. Tree Removal Permit (greater than 50 trees).

I. Minor Conditional Use Permit.

Comprehensive Land Use Planning

ORS 197.522
Local government to approve subdivision, partition or construction

- **conditions**

(1) As used in this section:

(a) "Needed housing" has the meaning given that term in ORS 197.303 ("Needed housing" defined).

(b) "Partition" has the meaning given that term in ORS 92.010 (Definitions for ORS 92.010 to 92.192).

(c) "Permit" means a permit as defined in ORS 215.402 (Definitions for ORS 215.402 to 215.438 and 215.700 to 215.780) and a permit as defined in ORS 227.160 (Definitions for ORS 227.160 to 227.186).

(d) "Subdivision" has the meaning given that term in ORS 92.010 (Definitions for ORS 92.010 to 92.192).

(2) A local government shall approve an application for a permit, authorization or other approval necessary for the subdivision or partitioning of, or construction on, any land for needed housing that is consistent with the comprehensive plan and applicable land use regulations.

(3) If an application is inconsistent with the comprehensive plan and applicable land use regulations, the local government, prior to making a final decision on the application, shall allow the applicant to offer an amendment or to propose conditions of approval that would make the application consistent with the plan and applicable regulations. If an applicant seeks to amend the application or propose conditions of approval:

(a) A county may extend the time limitation under ORS 215.427 (Final action on permit or zone change application) for final action by the governing body of a county on an application for needed housing and may set forth a new time limitation for final action on the consideration of future amendments or proposals.

(b) A city may extend the time limitation under ORS 227.178 (Final action on certain applications required within 120 days) for final action by the governing body of a city on an application for needed housing and may set forth a new time limitation for final action on the consideration of future amendments or proposals.

(4) A local government shall deny an application that is inconsistent with the comprehensive plan and applicable land use regulations and that cannot be made consistent through amendments to the application or the imposition of reasonable conditions of approval. [1999 c.838 §4; 2015 c.374 §3]

Note: 197.522 (Local government to approve subdivision, partition or construction) was added to and made a part of ORS chapter 197 by legislative action but was not added to any smaller series therein. See Preface to Oregon Revised Statutes for further explanation.

Location: https://texas.public.law/statutes/tex._occ._code_title_3_subtitle_h.

SANDY FIRE DISTRICT NO. 72
Fire Prevention Division

EXHIBIT M

E-mail Memorandum

To: planning@ci.sandy.or.us

From: Gary Boyles

Date: September 18, 2021

Re: Bornstedt Views Subdivision File No. 21-021 SUB/TREE

Review and comments are based upon the current version of the Oregon Fire Code (OFC) as adopted by the Oregon Office of State Fire Marshal. The scope of this review is typically limited to fire apparatus access and water supply, although the applicant shall comply with all applicable OFC requirements. When buildings are completely protected with an approved automatic fire sprinkler system, the requirements for fire apparatus access and water supply may be modified as approved by the fire code official. References, unless otherwise specified, include provisions found in the Metro Code Committee's Fire Code Applications Guide, OFC Chapter 5 and appendices B, C and D.

COMMENTS:

General

1. Construction documents detailing compliance with fire apparatus access and fire protection water supply requirements shall be provided to Sandy Fire District for review and approval prior to building permit submittal.

2. Approved fire apparatus access roadways and an approved water supply for fire protection, either temporary or permanent, shall be installed and operational prior to any combustible construction or storage of combustible materials on site in accordance with OFC Chapter 33.

3. Buildings shall be provided with approved address identification. The address identification shall be legible and placed in a position that is visible from the street or road fronting the property, including monument signs.

Fire Apparatus Access

FIRE APPARATUS ACCESS ROAD (as defined by the OFC). A road that provides fire apparatus access from a fire station to a facility, building or portion thereof. This is a general term inclusive of all other terms such as *fire lane*, public street, private street, parking lot lane and access roadway.

1. Fire apparatus access roads shall be within 150 feet of all portions of the exterior wall of the first story of any building as measured by an approved route around the exterior of the building. An approved turnaround will be required if the remaining distance to an approved intersecting roadway, as measured along the fire apparatus access road, is greater than 150 feet.

2. Dead end fire apparatus access roads in excess of 150 feet in length shall be provided with an approved turnaround.

3. Dead-end streets in excess of 150 ft., resulting from a phased project, are to be provided with an approved temporary turnaround.

4. For developments of one- and two-family dwellings where the number of dwelling units exceed 30, or multiple-family residential projects having more than 100 dwelling units and where vehicle congestion, adverse terrain conditions or other factors that could limit access, as determined by the fire code official, shall be provided with not less than two approved means of access.

5. Where two access roads are required, they shall be placed a distance apart equal to not less than one half of the length of the maximum overall diagonal dimension of the property or area to be served, measured in a straight line between accesses.

6. Fire apparatus access roadway grades shall not exceed 10 percent. Intersections and turnarounds shall be as level as possible and have a maximum of 5 percent grade with the exception of crowning for water run-off. Considerations of grades up to 15 percent may be allowed with a proposed alternate in accordance with the provisions of ORS 455.610(5).

7. Fire apparatus access roads shall have an unobstructed driving surface width of not less than 20 feet and an unobstructed vertical clearance of 13 feet 6 inches is to be maintained.

8. When the vertical distance between the grade plane and a building's highest roof surface exceeds 30 feet, approved aerial fire apparatus access roads shall be provided. For purposes of this requirement, the highest roof surface shall be determined by measurements to the eave of a pitched roof, the intersection of the roof to the exterior wall, or the top of parapet walls, whichever is greater. If buildings are more than 30 feet in height, as measured above, the following requirements apply:
    a. Aerial fire apparatus access roads shall be provided and have a minimum unobstructed width of 26 feet exclusive of shoulders or parking, in the immediate vicinity of the building or portion thereof that will accommodate aerial operations.
    b. The aerial fire apparatus access road shall be located not less than 15 feet nor greater than 30 feet from the building and shall be positioned parallel to one entire side of the building.
    c. The side of the building on which the aerial fire apparatus access road is positioned shall be approved by the fire code official.
    d. Overhead utility and power lines shall not be located within the aerial fire apparatus access road or between the aerial fire apparatus access road and the building.

9. The inside turning radius and outside turning radius for fire apparatus access roads shall be not less than 28 feet and 48 feet respectively, measured from the same center point.

10. The installation of security gates or barricades across a fire apparatus access road shall comply with the following:
    a. Minimum unobstructed width shall be 16-feet, or two 12-foot sections with a center post or island.
    b. Gates or barricades shall be set back a minimum of 30 feet from the intersecting roadway.
    c. Gates shall be of the swinging or sliding type. Barricades using cables or similar methods may be approved.
    d. Construction of gates or barricades shall be of materials that allows manual operation by one person.
    e. Locking devices shall be approved.
    f. Electric gates shall be equipped with an approved means of emergency operation. A KNOX box or KNOX key switch may be required.
    g. The security gates or barricades and the emergency operation shall be maintained in an operative condition at all times and replaced when defective.

11. Where fire apparatus roadways are not of sufficient width to accommodate parked vehicles and 20 feet of unobstructed driving surface, "NO PARKING-FIRE LANE" signs shall be placed on one or both sides of the roadway and in turnarounds as needed.

12. Streets and roads shall be identified with approved signs. Temporary signs shall be installed at each street intersection when construction of new roadways allows passage by vehicles.

<u>Firefighting Water Supplies</u>

1. The minimum available fire flow for one- and two-family dwellings served by a municipal water supply shall be 1,000 gpm at 20 psi residual provided the fire area of the dwelling(s) does not exceed 3,600 square feet. For dwellings that exceed 3,600 square feet, the required fire-flow shall be determined in accordance with OFC Appendix B, Table B105.1(2).

2. Fire flow testing will be required to determine available fire flow. Testing will be the responsibility of the applicant. Applicant to contact the City of Sandy Public Works for testing information and requirements and notify the Fire Marshal prior to fire flow testing.

3. For one- and two-family dwellings served by a municipal water system, all portions of the dwellings shall be located within 600 feet from a fire hydrant on a fire apparatus access road, as measured in an approved route that is approved by the fire code official.

4. Prior to the start of combustible construction, required fire hydrants shall be operational and accessible.

5. Fire hydrants installed within the Sandy Fire District shall comply with the following requirements:
    a. Flow requirements and location of fire hydrants will be reviewed and approved by Sandy Fire upon building permit submittal.
    b. **Each new fire hydrant installed shall be ordered in an OSHA safety red finish and have a 4-inch non-threaded metal faced hydrant connection with cap installed on the steamer port.** If a new building, structure, or dwelling is already served by an existing hydrant, the existing hydrant shall also be OSHA safety red and have a 4-inch non-threaded metal faced hydrant connection with cap installed.

6. The minimum number and distribution of fire hydrants shall be in accordance with City of Sandy requirements and OFC Appendix C.

NOTE:

Sandy Fire District comments may not be all inclusive based on information provided. A more detailed review may be needed for future development to proceed.

Please do not hesitate to contact Fire Marshal Gary Boyles at 503-891-7042 or fmboyles.sandyfire@gmail.com should you have any questions or concerns.

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

EXHIBIT N

To: Planning Commission

Date: September 20, 2021

From: Sarah Richardson, Staff Liaison Parks and Trails Advisory Board

Subject: Bornstedt Views Proposed Development

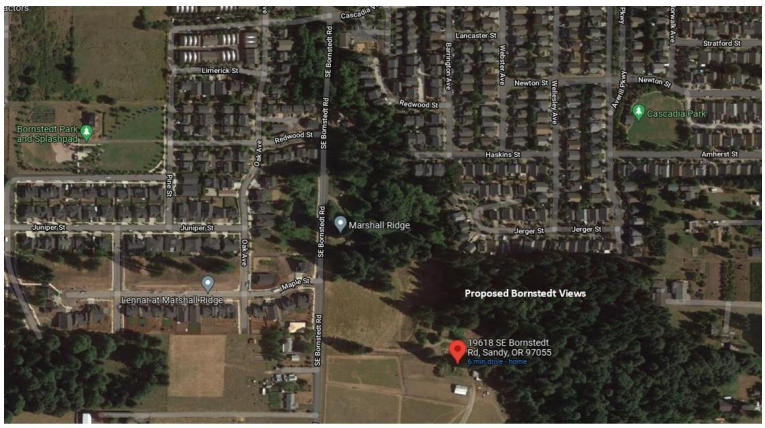
Attachments: None

I am sending this communication on behalf of the Sandy Parks and Trails Advisory Board.

The board met on August 11th, 2021 and reviewed the proposed development Bornstedt Views.

The property is located close to two existing neighborhood parks, approximately .3 miles from Bornstedt Park and .7 miles from Cascadia Park.

The current Parks and Trails Master Plan (i.e. the 1997 Parks Master Plan) states that "Neighborhood parks…serve a radius of approximately ½ mile…and eighty percent of all dwellings shall be located within one quarter mile of a Neighborhood Park".



Recommendation: The Parks and Trails Advisory Board recommends Fee in Lieu of Parkland Dedication given the size of the development, and its proximity to both Bornstedt Park and Cascadia Park.

We thank you for your consideration in this matter.

Staff Contact:
Sarah Richardson
503-489-2150
srichardson@cityofsandy.com

REPLINGER & ASSOCIATES LLC
TRANSPORTATION ENGINEERING

EXHIBIT O

September 27, 2021

Mr. Kelly O'Neill
City of Sandy
39250 Pioneer Blvd.
Sandy, OR 97055

SUBJECT: REVIEW OF TRANSPORTATION IMPACT STUDY – BORNSTEDT VIEWS SUBDIVISION

Dear Kelly:

In response to your request, I have reviewed materials submitted in support of the Bornstedt Views Subdivision in the south part of Sandy. The Transportation Impact Study (TIS), dated August 5, 2021, was prepared under the direction of Michael Ard, PE of Ard Engineering. A future street plan and preliminary plat, dated 4/30/2021, were also provided.

The 12.7-acre site, located east of SE Bornstedt Road, west of SE Jacoby Road and south of Jerger Street is proposed for development with a 42-lot residential subdivision. The proposed development is in two distinct parts; the westerly portion will take access via a new roadway intersecting SE Bornstedt Road; the easterly part will include an extension of Averill Parkway from the north. There are provisions for future connections to adjacent parcels.

Overall

I find the TIS addresses the city's requirements and provides an adequate basis to evaluate impacts of the proposed development.

Comments

1. ***Study Area.*** The study addresses the appropriate intersections. It includes analyses of:

    - Pioneer Boulevard (US 26 Eastbound) at Highway 211;
    - Highway 211 at Dubarko Road; and
    - Highway 211 at SE Bornstedt Road

In addition, the study addresses the impact of the proposed subdivision on the following local streets:

- Averill Parkway extending north from the site; and
- Newton Street, which provides a connection to Jacoby Road northeast of the subject property.

2. ***Traffic Counts.*** The AM and PM peak hour traffic counts and daily counts were conducted during June 2021. According to the TIS, these counts were adjusted by increasing US 26 counts by 14.6 percent and all other locations by 9.6 percent to account for influences of the on-going COVID pandemic. The engineer used a combination approach to account for seasonal variation of recreational traffic and separately for commuter traffic on US 26. The methodology appears consistent with the procedures defined by the Oregon Department of Transportation (ODOT). The adjusted counts appear reasonable.

3. ***Trip Generation.*** The TIS uses trip generation for single-family dwellings (land use code 210) from the Institute of Transportation Engineers' (ITE) *Trip Generation Manual*. The engineer calculates that the subdivision would produce 31 total AM peak hour trips; 42 total PM peak hour trips; and 396 total daily trips. The calculation of trips generated by the development appears reasonable.

4. ***Trip Distribution.*** The TIS provided information about trip distribution from the site. According to the TIS, the project site was estimated based the existing travel patterns in the site vicinity. The engineer assumed 65 percent of site trips would travel to and from the west on Highway 26; 20 percent would travel to and from the east on Highway 26; 10 percent would travel to and from the south on Highway 211; and the remaining 5 percent would travel to and from the west on Dubarko Road. Since the project site is divided by wetlands in the middle, 13 homes will take access via Bornstedt Road, while the remaining 29 homes will take access via an extension of Averill Parkway. The trip distribution seems reasonable.

5. ***Traffic Growth.*** The TIS uses a 2.13 percent annual growth rate for Highway 26 and a 2.0 percent annual growth rate for other facilities. In addition, the TIS accounts for background traffic growth by including traffic from the following developments: Clackamas County Health Clinic, Mt. Hood Senior Living, The Pad, The Views, Shaylee Meadows, Mt. View Ridge, Marshall Ridge, Jacoby Heights, Trimble PD, and the Deer Meadows Subdivision. These assumptions account for future traffic and appear reasonable.

6. Analysis. Traffic volumes were calculated for the intersections cited in #1, above. Intersection level-of-service (LOS) and the volume-to-capacity (v/c) ratio were provided. The intersection of Pioneer Boulevard and Highway 211 is signalized; the other two intersections are stop-controlled with stop signs on the minor street approaches. The analyses were conducted for existing 2021 conditions, 2023 background conditions, and 2023 with the development.

The engineer calculates that the intersection of Pioneer Boulevard and Highway 211 is currently meeting the v/c standards specified by ODOT and will meet the ODOT standard in 2023 without and with the development in both the AM and PM peak hours. The maximum v/c is predicted to be 0.85, which is calculated to occur during the PM peak hour with the development. This meets ODOT standards.

Likewise, the intersection of Highway 211 at Bornstedt Road is calculated to meet the City of Sandy's LOS standard under current conditions and is calculated to meet the city's standard in 2023 without and with the development. The poorest performance is predicted to be LOS D, which is predicted during the PM peak hour with the development. This meets the city's standard.

According to the TIS, intersection of Highway 211 at Dubarko Road is currently operating at LOS E during the PM peak hour. This does not meet the city's performance standard. Long delays are encountered for the westbound Dubarko Road approach. The intersection performance is projected to deteriorate and is calculated to operate at level of service F for the westbound left/through lane during the evening peak hour either with or without the addition of site trips from the proposed development. The engineer calculates that if the intersection were converted to all-way stop control, operation would improve to level of service E, with average delays for the highest-delay approach lane (Dubarko Road, westbound) reduced from 55.6 seconds to 47.1 seconds, indicating a minor improvement to operation of the worst movement with all-way stop control and the proposed development in place. According to the engineer, the conversion to all-way stop control would also be expected to reduce the risk of angle and turning-movement collisions at the intersection.

The analysis of the intersection of Highway 211 and Dubarko Road in this TIS is consistent with other analyses of this intersection prepared in support of other developments.

The TIS also assessed traffic volumes on local streets to assure compliance with Section 17.10.30 of the Sandy Development Code. The TIS provided current and projected traffic volumes on Newton Street between Amherst Street and Jacoby Road; and on Averill Parkway immediately south of Cascadia Village Drive; immediately south of Newton Street; and immediately south of Amherst Street. The current counts and predicted traffic volumes from the development were used to determine whether the existing local street segments are currently carrying fewer than 1,000 daily trips and would continue to do so with the development. According to the engineer, the highest predicted daily volume will be 540 vehicles per day on Averill Parkway south of Cascadia Village Drive. He concludes that all impacted local streets will continue to operate with volumes below 1,000 vehicles per day.

7. ***Crash Information.*** The TIA provides information from ODOT on crashes for the five-year period from 2015 through 2019. The intersections of Pioneer Boulevard at Highway 211 and Highway 211 at Bornstedt Road had no reported crashes during the five-year analysis period.

   The intersection of Highway 211 at Dubarko Road has a high historical crash rate, which has not been significantly altered by recent improvements. The intersection of Highway 211 at Dubarko Road had 27 reported crashes during the five-year analysis period. Angle crashes and turning-movement crashes predominate. There was one reported incapacitating injury; ten reported "non-incapacitating" injuries; and 19 reports of a "possible injury/complaint of pain." The crash rate for the intersection was calculated to be 1.56 crashes per million entering vehicles. This is above the 90th percentile crash rate of 1.08 crashes per million entering vehicles for rural unsignalized four-way intersections in the state.

   According to the engineer, all-way stop control can be installed where there are "Five or more crashes in a 12-month period that are susceptible to correction by a multi-way stop installation. Such crashes include right-turn and left-turn collisions as well as right-angle collisions." The engineer concludes that the crash data shows that there were six angle collisions at the intersection in the most recent year for which complete data is available (2019). Accordingly, he recommends installation of all-way stop control based on crash history.

8. ***Site Plan and Access.*** The site plan provides for two access points. The westerly portion of the subdivision would have access to Bornstedt Road opposite Maple Street; the easterly portion of the subdivision would have access via an extension of Averill Parkway. The site plan shows stub streets affording the potential for

connection to adjacent parcels when they are subdivided. The locations proposed for access appear appropriate.

9. ***Sight Distance.*** The engineer analyzed sight distance at the proposed access to Bornstedt Road. Based on the posted speed of 45 mph, sight distance of 500 feet is required. The engineer notes that sight distance to the north is currently limited by vegetation and by an embankment to the north of the site. He indicates that frontage improvements "will result in sight distances well in excess of 500 feet in each direction." He concludes that no further mitigation for sight distance will be necessary.

10. ***Left-Turn Lane and Signal Warrants.*** The engineer also evaluated the need for turn lanes and addressed traffic signal warrants.

    TIS indicates that the intersection of Highway 211 at Bornstedt Road already has a southwest-bound left-turn lane.

    The engineer concludes that intersection of Highway 211 at Dubarko Road currently meets ODOT warrants for a northbound left-turn lane and a northbound right-turn lane. He concludes, however, the need for these turn lanes is not related to the proposed development. Furthermore, he concludes that if all-way stop control is installed at the intersection as recommended based on his safety analysis, the turn lane warrants will no longer be applicable.

    The engineer's analysis indicates traffic signal warrants are not met for Highway 211 either Bornstedt Road or Dubarko Road.

11. ***Conclusions and Recommendations.*** The engineer concludes that the intersections the intersections of Pioneer Boulevard at Highway 211 and Highway 211 at Bornstedt Road are projected to operate acceptably per ODOT and City of Sandy standards through 2023 either with or without the addition of site trips from the proposed development.

    He calculates that the intersection of Highway 211 at Dubarko Road will operate at level of service F during the evening peak hour under year 2023 traffic conditions either with or without the trips from the proposed development. To improve performance of the intersection, he recommends the intersection be converted all-way stop control, which, he concludes, will improve operations to LOS E and reduce

delays for the highest-delay movement as compared to background, no-build conditions.

The TIS indicates that local streets, including Averill Parkway, will meet the city's local street standard of having fewer than 1000 daily trips.

The engineer recommends all-way stop control for the intersection of Highway 211 and Dubarko Road to improve safety.

Conclusion and Recommendations

Based on the information provided by the applicant, I find the TIS meets City requirements. The engineer used appropriate data and methods in his analysis and makes reasonable conclusions and recommendations.

The TIS indicates that the intersections of Pioneer Boulevard and Highway 211 and the intersection of Highway 211 and Bornstedt Road will meet applicable ODOT and city operational standards.

Like other analyses conducted for developments, the TIS concludes that the intersection of Highway 211 and Dubarko Road will experience poor performance and continues to have a safety problem. The engineer recommends conversion to all-way stop control to improve intersection performance and to improve safety. He indicates a portion of the reported crashes are susceptible to reduction by the conversion to all-way stop control.

The TIS indicates that local streets, notably Averill Parkway, will not exceed the 1000 vehicle per day threshold established by city code.

If you have any questions or need any further information concerning this review, please contact me at replinger-associates@comcast.net.

Sincerely,

John Replinger

John Replinger, PE
Principal

BornstedtViewsTIS092721

EXHIBIT P

Marisol Martinez <mmartinez@ci.sandy.or.us>

Bornstedt Views Subdivision (File No. 21-021 SUB/TREE)

1 message

'Belt,Charlene R (BPA) - TERR-ROSS MHQA' via Planning <planning@ci.sandy.or.us> Wed, Sep 29, 2021 at 11:00 AM
Reply-To: "Belt,Charlene R (BPA) - TERR-ROSS MHQA" <crbelt@bpa.gov>
To: "planning@ci.sandy.or.us" <planning@ci.sandy.or.us>

Hi Emily,

BPA has reviewed the materials submitted for File No. 21-021 SUB/TREE and found no impact to our facilities. Thank you for the opportunity to comment.

Charlene Belt

Realty Specialist / COR

Real Property Field Services, Ross MHQA

Bonneville Power Administration
1211 NE Minnehaha St, Vancouver, WA 98665
(503) 230-5518 (office) / crbelt@bpa.gov

EXHIBIT Q

M E M O R A D U M

TO: EMILY MEHARG, ASSOCIATE PLANNER
FROM: MIKE WALKER, DIRECTOR OF PUBLIC WORKS
RE: PUBLIC WORKS COMMENTS - FILE NO. 21-021
DATE: OCTOBER 5, 2021

The following are Public Works' comments on the above-referenced application.

Transportation
Street "B", a cul-de-sac is 450 feet in length feet measured from the west right-of-way line of Averill Parkway to the end of the cul-de-sac bulb, approximately 50 feet greater than the dimensional standard in section 17.84.50(3)e which states that "Cul-de-sacs shall not exceed 400 feet in length".

Vehicle Non-Access Reserve (VNAR) strips shall be depicted on the plat for the Bornstedt Road frontage of lots 1 through 4 and lot 13 to comply with section 17.98.80(A) of the Code.

Street improvements on tract A and lots 13, 37 and 38 frontages shall extend to the property line per 17.84.50(F)2 and 17.84.50(G) SMC. Retaining walls or slope easements on adjacent parcels may be required to accomplish this.

The location, number and width of all driveway approaches shall not exceed the spacing and dimensional standards in section 17.98.100 SMC.

The street improvements proposed on tract A and lots 13, 37 and 38 do not extend to the edge of the adjacent properties as required in 17.84.50(F)3 and 17.84.50(G) of the Code.

The Planning Commission or Director should require the extension of Maple ST. east though the site to connect to proposed street B as a logical extension of an existing street network per 17.84.50(H) SMC.

Utilities
The proposed 15' wide public storm drainage easement depicted at the rear of lots 24 through 27 does not collect or convey water from existing or proposed public streets. If based on the stream and wetland presence determination there is no seasonal drainage then there should be no need for a public easement to convey off site runoff from property outside the city. The City will not accept a public storm drain easement in this area.

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.

The applicant is proposing at least eighteen separate, private pressure mains in the public utility easement adjacent Street B to serve lots 16 to 23 and lots 24 to 33. These lines are proposed as private and to be located in a public utility easement adjacent to the street frontage of lots 16 to 23 and 24 to 33.

It is unclear whether private pressure sewers as proposed will comply with the Oregon Plumbing Specialty Code or Oregon Department of Environmental Quality requirements. The City would not accept private force mains for ownership or maintenance.

Lumping as many as 9 private force mains in a PUE with other utilities (power, telecom, gas, fiber, CATV, etc.) is a recipe for disaster. If there is a leak on any line or lines there will be no way to identify which line(s) is/are leaking from the surface. There is no proposed method proposed for maintenance or repair of these lines. While as many as nine of the property owners may debate whose line is leaking and who is responsible for repairing a leaking line untreated sewage could continue pool under the ground and on the surface until the responsible party is identified and the pipe repaired.

The applicant could construct a gravity sewer line connecting to the existing public sewer line in Jerger St. to serve lots 16 – 33. There are existing 10-foot wide public utility easements between any of the lots on the south side of Jerger St. adjacent to Street B that could be used to access the public sewer line in Jerger.

Plans for public and private sewer collection and conveyance facilities shall be submitted to the Oregon Department of Environmental Quality for review and approval per ORS Chapters 454, 468 and 4868B and OAR 340-052 and in particular OAR 340-052-0040(2).

The applicant shall be conditioned to construct gravity sewers draining to the public sewer line in Jerger to serve lots 16 to 33.

General

The existing right-of-way of Bornstedt Road adjacent to the applicant's site is not accurately depicted on the proposed tentative plat. The recorded plat for Marshall Ridge shows the Bornstedt Road right-of-way varying between XX feet and XX feet (north to south). The tentative plat does not appear to comply with the minimum accuracy requirements in 17.100.XX

Public utility and street plans for land use applications are submitted to comply with the requirements in 17.100.60 SMC. Land use approval does not connote approval of utility or street construction plans which are subject to a separate submittal and review process.

EXHIBIT R

Emily Meharg <emeharg@ci.sandy.or.us>

Second fire access question

Gary Boyles <fmboyles.sandyfire@gmail.com> Mon, Oct 4, 2021 at 10:36 AM
To: Emily Meharg <emeharg@ci.sandy.or.us>
Cc: "Kelly O'Neill Jr." <koneill@ci.sandy.or.us>

Great question Emily. Multiple access roads would be triggered if the development of one-and two-family dwellings **exceeded** 30. Therefore, if two or more of the 29 eastern lots converted to duplexes then a second means of access to the new development would be required. I am taking the existing lots in the area into account and crediting Averill and Wellosby as meeting the intent of the fire code to get multiple fire apparatus to the scene of an emergency. However, the proposed new development will need adequate turnarounds, fire hydrants and will not be able to exceed 30 one-and two-family dwellings.

Gary Boyles
Fire Marshal
Sandy Fire District No. 72
PO Box 518
17460 SE Bruns Ave.
Sandy, Oregon 97055

Business line: 503-668-8093
Cell number: 503-891-7042

[Quoted text hidden]

> [Quoted text hidden]
> This e-mail is a public record of the City of Sandy and is subject to the State of Oregon Retention Schedule and may be subject to public disclosure under the Oregon Public Records Law. This e-mail, including any attachments, is for the sole use of the intended recipient(s) and may contain confidential and privileged information. Any unauthorized review, use, disclosure, or distribution is prohibited. If you are not the intended recipient, please send a reply e-mail to let the sender know of the error and destroy all copies of the original message.

Rebecca Casey <rcasey@ci.sandy.or.us>

EXHIBIT S

Fwd: New Development Near Cascadia Village

2 messages

Jeff Aprati <japrati@ci.sandy.or.us> Thu, Oct 7, 2021 at 1:43 PM
To: Planning <planning@ci.sandy.or.us>

Jeff Aprati
Assistant to the City Manager / City Recorder
City of Sandy
503-489-0938
japrati@ci.sandy.or.us
www.ci.sandy.or.us

---------- Forwarded message ---------
From: **'Lori Pyles' via City Recorder** <recorder@ci.sandy.or.us>
Date: Thu, Oct 7, 2021 at 1:35 PM
Subject: New Development Near Cascadia Village
To: jcrosby@ci.sandy.or.us <jcrosby@ci.sandy.or.us>, dcarlton@ci.sandy.or.us <dcarlton@ci.sandy.or.us>, rlesowski@ci.sandy.or.us <rlesowski@ci.sandy.or.us>, jlee@ci.sandy.or.us <jlee@ci.sandy.or.us>, shook@ci.sandy.or.us <shook@ci.sandy.or.us>, cmayton@ci.sandy.or.us <cmayton@ci.sandy.or.us>, hmacleanwenzel@ci.sandy.or.us <hmacleanwenzel@ci.sandy.or.us>, recorder@ci.sandy.or.us <recorder@ci.sandy.or.us>

All,

I would like to address the attached letter proposing opening up Averill as a way to get to the new development that will be coming to Jacoby and Barrington area. I do not feel that this street would be a good fit as it is close to the park in our neighborhood where our children play and the extra traffic from other homes would put the children at a higher risk. Not only that but the street is very packed with cars and would be hard to get through both ways.

Honestly, I believe this would be the same for all of the streets in the Cascadia Village neighborhood. They are basically one way streets where cars are parked on both sides making it very difficult for vehicles to come through. There are plenty of children on each street that play outside and those that walk their dogs who have to use the road at times to get around and I feel this would be more of a danger with extra traffic.

I recommend only using Jacoby and Barrington as ways to get into the new development and keep our streets in Cascadia Village as they are now.

Thank you
Lori Pyles

image0.jpeg
82K

Plat 4603

BOOK 151 PAGE 014

EXHIBIT T

MARSHALL RIDGE

LOCATED IN THE SW 1/4 SEC 24, T 2S, R 4E, W.M.
CITY OF SANDY, COUNTY OF CLACKAMAS, OREGON
DECEMBER 7, 2018

LEGEND

●	FOUND MONUMENT AS NOTED HEREON
o	SET 5/8" BY 30" IR W/YPC MARKED "ACS&P 503-668-3151" SET ON 10-02-19
⌀	SET 5/8" BY 30" IR W/YPC MARKED "ACS&P 503-668-3151" IN MONUMENT BOX, SET ON 10-02-19
△	SET 5/8" BY 30" IR W/ALUMINUM CAP MARKED "ACS&P 503-668-3151", SET ON 10-02-19
⌘	SET 1" BRASS DISC WITH PUNCH STAMPED "ACS&P 668-3151", SET ON 10-02-19
FD	FOUND MONUMENT
W/YPC	INDICATES WITH YELLOW PLASTIC CAP
IR	INDICATES IRON ROD
IP	INDICATES IRON PIPE, INSIDE DIAMETER
ALUM	INDICATES ALUMINUM CAP MARKED
()P1	INDICATES RECORD OR CALCULATED VALUE PER PLAT NO. 4483 "ZION MEADOWS", CLACKAMAS COUNTY PLAT RECORDS. MONUMENT IS A 5/8" IR W/YPC MARKED "ACS&P 503-668-3151", HELD, UNLESS OTHERWISE NOTED
()P2	INDICATES RECORD OR CALCULATED VALUE PER PLAT NO. 4583 "MT. VIEW RIDGE", CLACKAMAS COUNTY PLAT RECORDS. MONUMENT IS A 5/8" IR W/YPC MARKED "ACS&P 503-668-3151", HELD, UNLESS OTHERWISE NOTED
()R1	INDICATES RECORD OR CALCULATED VALUE PER SN 2018-037. MONUMENT IS A 5/8" IR W/YPC MARKED "ACS&P 503-668-3151" UNLESS OTHERWISE NOTED
()R2	INDICATES RECORD OR CALCULATED VALUE PER SN 11464. MONUMENT IS A 5/8" IR NO CAP UNLESS OTHERWISE NOTED
()R3	INDICATES RECORD OR CALCULATED VALUE PER SN2016-163
()R4	INDICATES RECORD OR CALCULATED VALUE PER SN11533
SN	INDICATES SURVEY NUMBER, CLACKAMAS COUNTY SURVEY RECORDS
SDE	INDICATES PRIVATE STORM DRAINAGE EASEMENT, BENEFITING LOTS AS NOTED HEREON
SSE	INDICATES PRIVATE SANITARY SEWER EASEMENT, BENEFITING LOTS AS NOTED HEREON
PUE	PUBLIC UTILITY EASEMENT
VNAR	VEHICULAR NON-ACCESS RESTRICTION, GRANTED TO CITY OF SANDY JURISDICTION
PSDE	INDICATES PUBLIC STORM DRAIN EASEMENT
PSSE	INDICATES PUBLIC SANITARY SEWER EASEMENT
TPR	TREE PRESERVATION RESTRICTION, SEE NOTE 8, SHEET 5
SAE	INDICATES SHARED ACCESS EASEMENT, BENEFITING LOTS AS NOTED HEREON
DNR	INDICATES DESTROYED NOT REPLACED

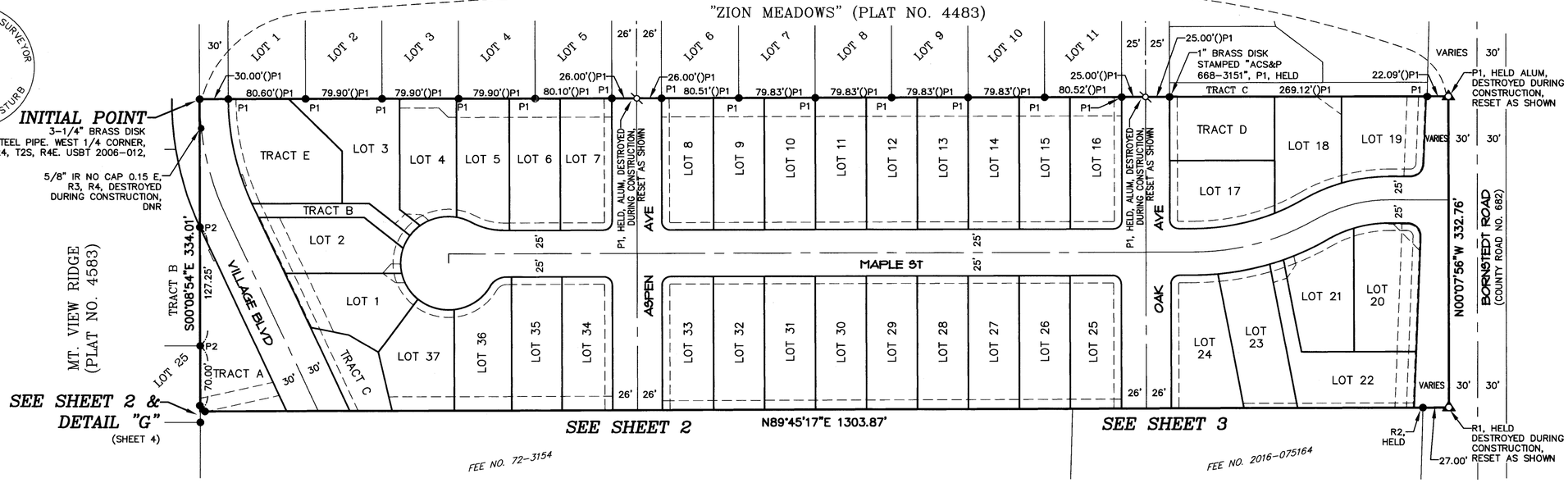
All County Surveyors Est. 1990

SCALE : 1" = 80'

0' 40' 80' 160'

SHEET INDEX

CLACKAMAS COUNTY SURVEYOR
T2S R4E
1/4
S23 S24
2006
UNLAWFUL TO DISTURB



SURVEYOR'S CERTIFICATE

I, DALE L HULT, DO HEREBY CERTIFY THAT I HAVE CORRECTLY SURVEYED AND MARKED WITH PROPER MONUMENTS THE LAND REPRESENTED ON THE ATTACHED PLAT, BEING DESCRIBED IN DOCUMENT NUMBER 2018-053570, CLACKAMAS COUNTY DEED RECORDS, LOCATED IN THE SW 1/4 OF SECTION 24, T2S, R4E, W.M., CITY OF SANDY, CLACKAMAS COUNTY, OREGON, BEING MORE PARTICULARLY DESCRIBED AS FOLLOWS:

BEGINNING AT THE INITIAL POINT, THE WEST ONE-QUARTER CORNER OF SAID SECTION 24, BEING MARKED WITH A 3 1/4" BRASS DISK; THENCE S00°08'54"E ALONG THE EAST LINE OF "MT. VIEW RIDGE" (PLAT NO. 4583) A DISTANCE OF 334.01 FEET TO TO THE NORTHWEST CORNER OF THAT ADJOINING TRACT RECORDED AS FEE NO. 72-3154, CLACKAMAS COUNTY DEED RECORDS; THENCE N89°45'17"E ALONG THE NORTH LINE THEREOF, AND THE NORTH LINE OF TRACT PER FEE NO. 2016-075164, A DISTANCE OF 1303.87 FEET TO THE WEST RIGHT OF WAY LINE OF SE BORNSTEDT ROAD (60 FOOT WIDE RIGHT OF WAY); THENCE N00°07'56"W ALONG THE WEST RIGHT OF WAY THEREOF A DISTANCE OF 332.76 FEET TO A POINT ON THE NORTH LINE OF THE SOUTHWEST ONE QUARTER OF SAID SECTION 24; THENCE S89°48'35"W ALONG SAID NORTH LINE OF THE SOUTHWEST ONE QUARTER OF SAID SECTION 24 AND THE SOUTH LINE OF ADJOINING "ZION MEADOWS" (PLAT NO. 4483) A DISTANCE OF 1303.96 FEET TO THE INITIAL POINT.

CONTAINING AN AREA OF 434,705 SQUARE FEET (9.98 ACRES), MORE OR LESS.

REGISTERED PROFESSIONAL LAND SURVEYOR
OREGON
JANUARY 23, 1990
DALE L. HULT
2427
RENEWS 07/01/21

CLIENT: STAFFORD DEVELOPMENT COMPANY

All County Surveyors & Planners, Inc.
Surveying, Planning and Civil Engineering
P.O. Box 955 Sandy, OR 97055
Phone: (503) 668-3151
Fax: (503) 668-4730

SHEET 1 OF 5

DRAWN: DRR	CHECKED: MSR	APPROVED: DLH

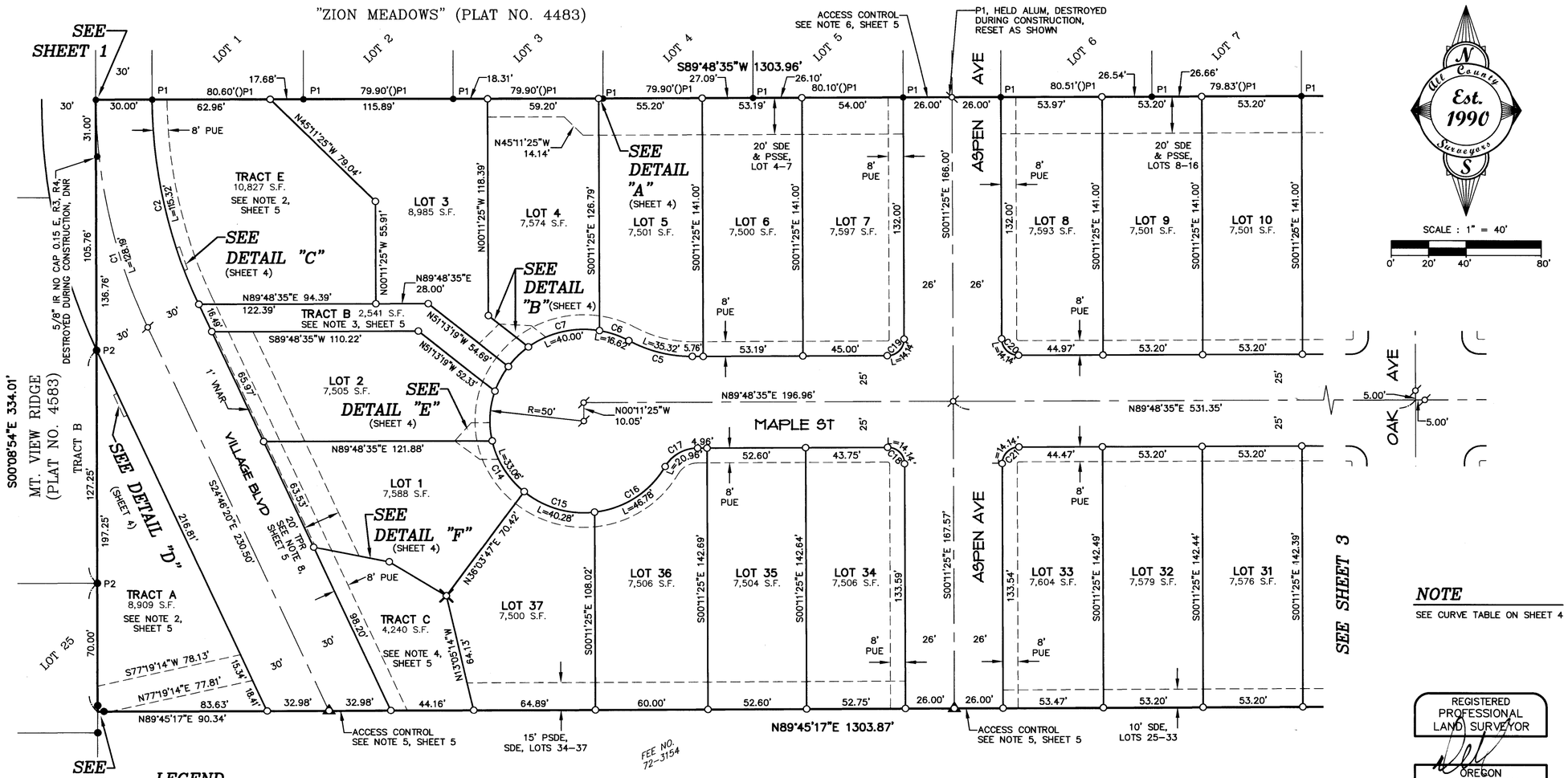
DWG NUMBER: 17-025 Plat.dwg
DATE OF PLOT: 11-14-19

Plat 4603

MARSHALL RIDGE

BOOK 151 PAGE 014

LOCATED IN THE SW 1/4 SEC 24, T 2S, R 4E, W.M.
CITY OF SANDY, COUNTY OF CLACKAMAS, OREGON
DECEMBER 7, 2018



NOTE

SEE CURVE TABLE ON SHEET 4

REGISTERED PROFESSIONAL LAND SURVEYOR
OREGON
JANUARY 23, 1990
DALE L. HULT
2427
RENEWS 07/01/21

LEGEND

●	FOUND MONUMENT AS NOTED HEREON	ALUM	INDICATES ALUMINUM CAP MARKED	()R3	INDICATES RECORD OR CALCULATED VALUE PER SN 2016–163	TPR	TREE PRESERVATION RESTRICTION, SEE NOTE 8, SHEET 5
o	SET 5/8" BY 30" IR W/YPC MARKED "ACS&P 503–668–3151" SET ON 10–02–19	()P1	INDICATES RECORD OR CALCULATED VALUE PER PLAT NO. 4483 "ZION MEADOWS", CLACKAMAS COUNTY PLAT RECORDS. MONUMENT IS A 5/8" IR W/YPC MARKED "ACS&P 503–668–3151", HELD, UNLESS OTHERWISE NOTED	()R4	INDICATES RECORD OR CALCULATED VALUE PER SN 11533	SAE	INDICATES SHARED ACCESS EASEMENT, BENEFITING LOTS AS NOTED HEREON
⊘	SET 5/8" BY 30" IR W/YPC MARKED "ACS&P 503–668–3151" IN MONUMENT BOX, SET ON 10–02–19	()P2	INDICATES RECORD OR CALCULATED VALUE PER PLAT NO. 4583 "MT. VIEW RIDGE", CLACKAMAS COUNTY PLAT RECORDS. MONUMENT IS A 5/8" IR W/YPC MARKED "ACS&P 503–668–3151", HELD, UNLESS OTHERWISE NOTED	SN	INDICATES SURVEY NUMBER, CLACKAMAS COUNTY SURVEY RECORDS	DNR	INDICATES DESTROYED NOT REPLACED
△	SET 5/8" BY 30" IR W/ALUMINUM CAP MARKED "ACS&P 503–668–3151", SET ON 10–02–19	()R1	INDICATES RECORD OR CALCULATED VALUE PER SN 2018–037. MONUMENT IS A 5/8" IR W/YPC MARKED "ACS&P 503–668–3151" UNLESS OTHERWISE NOTED	SDE	INDICATES PRIVATE STORM DRAINAGE EASEMENT, BENEFITING LOTS AS NOTED HEREON		
⊠	SET 1" BRASS DISC STAMPED "ACS&P 668–3151", SET ON 10–02–19	()R2	INDICATES RECORD OR CALCULATED VALUE PER SN 11464. MONUMENT IS A 5/8" IR NO CAP UNLESS OTHERWISE NOTED	SSE	INDICATES PRIVATE SANITARY SEWER EASEMENT, BENEFITING LOTS AS NOTED HEREON		
FD	FOUND MONUMENT			PUE	PUBLIC UTILITY EASEMENT		
W/YPC	INDICATES WITH YELLOW PLASTIC CAP			VNAR	VEHICULAR NON–ACCESS RESTRICTION, GRANTED TO CITY OF SANDY JURISDICTION		
IR	INDICATES IRON ROD			PSDE	INDICATES PUBLIC STORM DRAIN EASEMENT		
IP	INDICATES IRON PIPE, INSIDE DIAMETER			PSSE	INDICATES PUBLIC SANITARY SEWER EASEMENT		

SHEET 2 OF 5

DRAWN: DRR	CHECKED: MSR	APPROVED: DLH

CLIENT: STAFFORD LAND COMPANY

All County Surveyors & Planners, Inc.
Surveying, Planning and Civil Engineering
P.O. Box 955 Sandy, OR 97055
Phone: (503) 668–3151
Fax: (503) 668–4730

DWG NUMBER: 17–025 Plat.dwg
DATE OF PLOT: 11–14–19

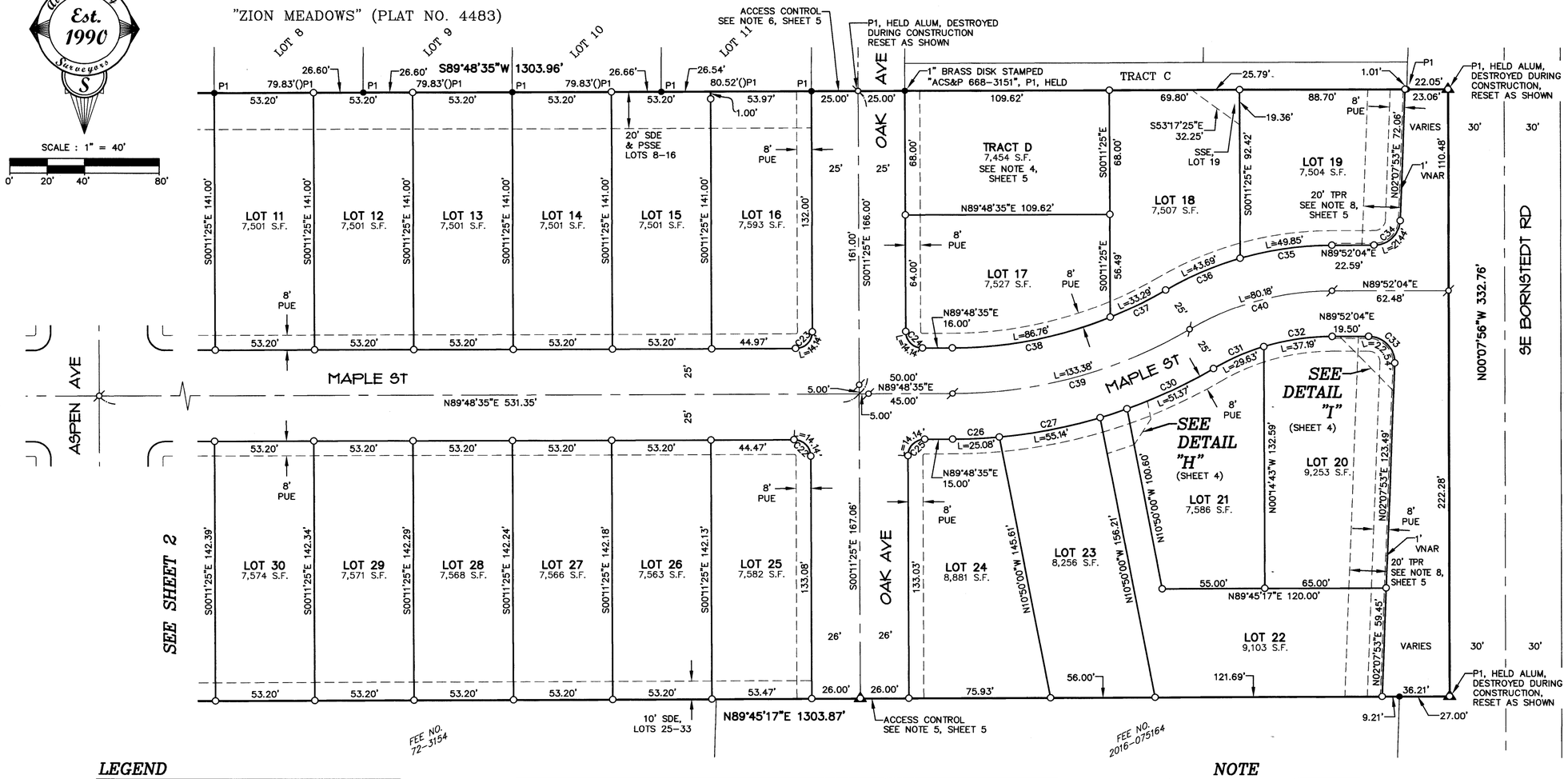
Plat 41603

MARSHALL RIDGE

BOOK 151 PAGE 014

LOCATED IN THE SW 1/4 SEC 24, T 2S, R 4E, W.M.
CITY OF SANDY, COUNTY OF CLACKAMAS, OREGON
DECEMBER 7, 2018

SCALE : 1" = 40'



LEGEND

●	FOUND MONUMENT AS NOTED HEREON
o	SET 5/8" BY 30" IR W/YPC MARKED "ACS&P 503-668-3151" SET ON 10-02-19
⌀	SET 5/8" BY 30" IR W/YPC MARKED "ACS&P 503-668-3151" IN MONUMENT BOX, SET ON: 10-02-19
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⌘	SET 1" BRASS DISC STAMPED "ACS&P 668-3151", SET ON 10-02-19
FD	FOUND MONUMENT
W/YPC	INDICATES WITH YELLOW PLASTIC CAP
IR	INDICATES IRON ROD
IP	INDICATES IRON PIPE, INSIDE DIAMETER
ALUM	INDICATES ALUMINUM CAP MARKED
()P1	INDICATES RECORD OR CALCULATED VALUE PER PLAT NO. 4483 "ZION MEADOWS", CLACKAMAS COUNTY PLAT RECORDS. MONUMENT IS A 5/8" IR W/YPC MARKED "ACS&P 503-668-3151", HELD, UNLESS OTHERWISE NOTED
()R1	INDICATES RECORD OR CALCULATED VALUE PER SN 2018-037. MONUMENT IS A 5/8" IR W/YPC MARKED "ACS&P 503-668-3151" UNLESS OTHERWISE NOTED
()R2	INDICATES RECORD OR CALCULATED VALUE PER SN 11464. MONUMENT IS A 5/8" IR NO CAP UNLESS OTHERWISE NOTED
()R3	INDICATES RECORD OR CALCULATED VALUE PER SN2016-163
()R4	INDICATES RECORD OR CALCULATED VALUE PER SN11533
SN	INDICATES SURVEY NUMBER, CLACKAMAS COUNTY SURVEY RECORDS
SDE	INDICATES PRIVATE STORM DRAINAGE EASEMENT, BENEFITING LOTS AS NOTED HEREON
SSE	INDICATES PRIVATE SANITARY SEWER EASEMENT, BENEFITING LOTS AS NOTED HEREON
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NOTE

SEE CURVE TABLE ON SHEET 4

REGISTERED PROFESSIONAL LAND SURVEYOR
OREGON
JANUARY 23, 1990
DALE L. HULT
2427
RENEWS 07/01/21

CLIENT: STAFFORD LAND COMPANY

All County Surveyors & Planners, Inc.
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SHEET 3 OF 5

DRAWN: DRR	CHECKED: MSR	APPROVED: DLH

DWG NUMBER: 17-025 Plat.dwg
DATE OF PLOT: 11-14-19

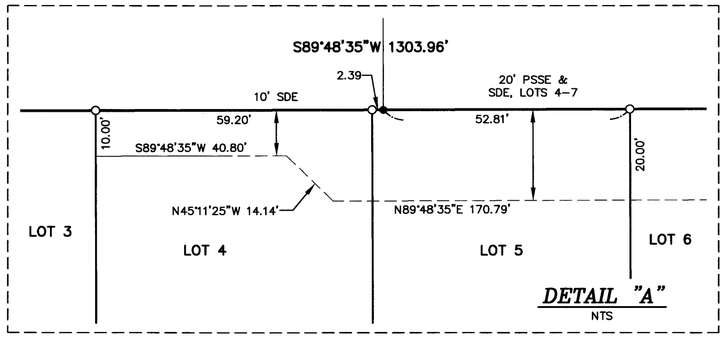
Plat 4603

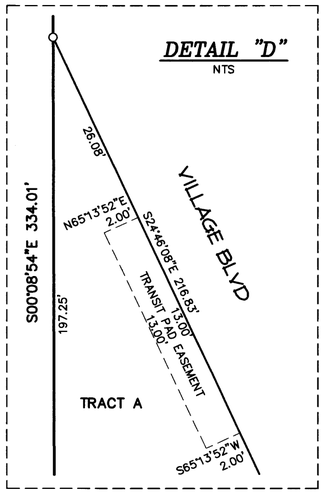
BOOK 151 PAGE 014

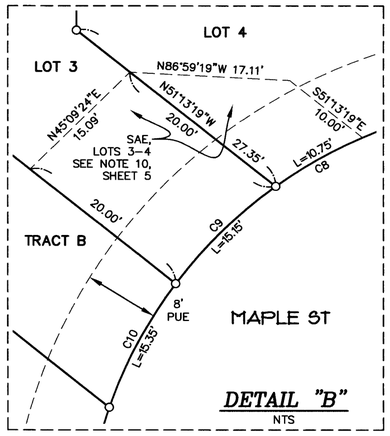
MARSHALL RIDGE

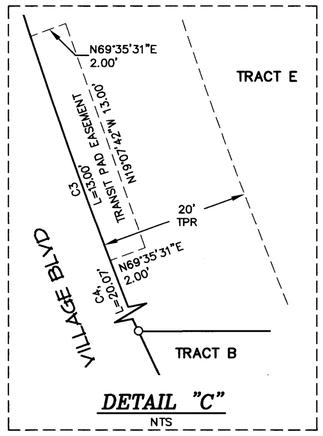
LOCATED IN THE SW 1/4 SEC 24, T 2S, R 4E, W.M.
CITY OF SANDY, COUNTY OF CLACKAMAS, OREGON
DECEMBER 7, 2018

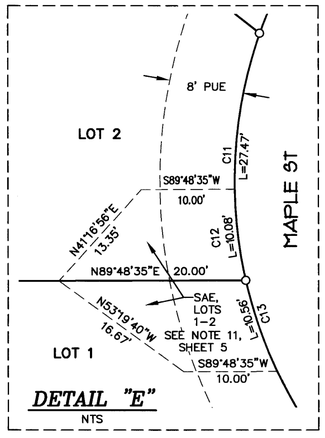
CURVE TABLE				
CURVE	LENGTH	RADIUS	DELTA	CHORD
C1	128.19'	300.00'	24°28'58"	S12°31'38"E 127.22'
C2	115.32'	270.00'	24°28'18"	S12°31'56"E 114.45'
C3	13.00'	270.00'	2°45'35"	S19°07'42"E 13.00'
C4	20.07'	270.00'	4°15'35"	S22°38'17"E 20.07'
C5	35.32'	70.00'	28°54'21"	S75°44'14"E 34.94'
C6	16.62'	50.00'	19°02'28"	N70°48'18"W 16.54'
C7	40.00'	50.00'	45°50'12"	S76°45'22"W 38.94'
C8	10.75'	50.00'	12°18'58"	S59°59'45"W 10.73'
C9	15.15'	50.00'	17°21'44"	S45°09'24"W 15.09'
C10	15.35'	50.00'	17°35'06"	S27°41'00"W 15.29'
C11	27.47'	50.00'	31°28'59"	S03°08'57"W 27.13'
C12	10.08'	50.00'	11°33'21"	S06°48'52"E 10.07'
C13	10.56'	50.00'	12°06'10"	S18°38'37"E 10.54'
C14	33.06'	50.00'	37°53'09"	S31°32'07"E 32.46'
C15	40.28'	50.00'	46°09'08"	S73°33'15"E 39.20'
C16	46.78'	50.00'	53°36'25"	S56°33'58"W 45.09'
C17	20.96'	20.00'	60°02'49"	S59°47'10"W 20.01'
C18	14.14'	9.00'	90°00'00"	N45°11'25"W 12.73'
C19	14.14'	9.00'	90°00'00"	N44°48'35"E 12.73'
C20	14.14'	9.00'	90°00'00"	S45°11'25"E 12.73'
C21	14.14'	9.00'	90°00'00"	S44°48'35"W 12.73'
C22	14.14'	9.00'	90°00'00"	N45°11'25"W 12.73'
C23	14.14'	9.00'	90°00'00"	N44°48'35"E 12.73'
C24	14.14'	9.00'	90°00'00"	S45°11'25"E 12.73'
C25	14.14'	9.00'	90°00'00"	S44°48'35"W 12.73'
C26	25.08'	275.00'	5°13'28"	N87°11'51"E 25.07'
C27	55.14'	275.00'	11°29'18"	N78°50'28"E 55.05'
C28	15.14'	275.00'	3°09'13"	N71°31'12"E 15.13'
C29	11.69'	275.00'	2°26'12"	N68°43'30"E 11.69'
C30	51.37'	275.00'	10°42'09"	N64°35'31"E 51.29'
C31	29.63'	125.00'	13°34'46"	S66°01'50"W 29.56'
C32	37.19'	125.00'	17°02'51"	S81°20'39"W 37.05'
C33	22.54'	14.00'	92°15'49"	N44°00'01"W 20.19'
C34	21.44'	14.00'	87°44'11"	N45°59'59"E 19.40'
C35	49.85'	175.00'	16°19'21"	S81°42'23"W 49.69'
C36	43.69'	175.00'	14°18'16"	S66°23'35"W 43.58'
C37	33.29'	225.00'	8°28'37"	N63°28'45"E 33.26'
C38	86.76'	225.00'	22°05'32"	N78°45'49"E 86.22'
C39	133.38'	250.00'	30°34'08"	N74°31'31"E 131.81'
C40	80.18'	150.00'	30°37'37"	S74°33'15"W 79.23'

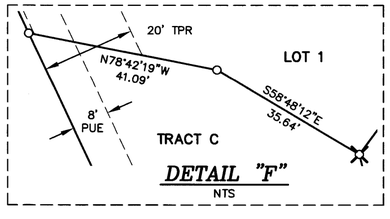


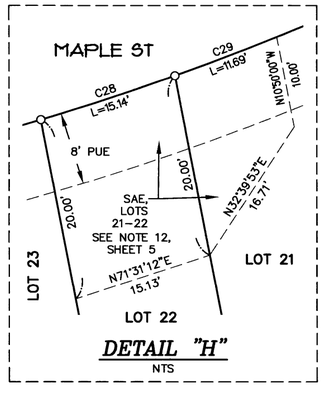


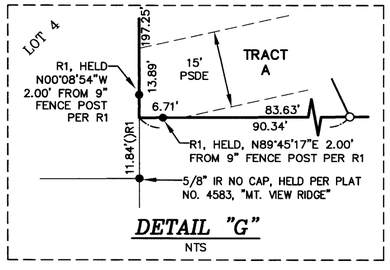


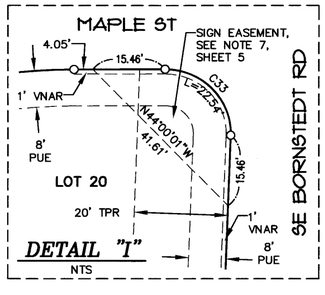












SHEET 4 OF 5

LEGEND

●	FOUND MONUMENT AS NOTED HEREON
o	SET 5/8" BY 30" IR W/YPC MARKED "ACS&P 503-668-3151" SET ON 10-02-19
⌀	SET 5/8" BY 30" IR W/YPC MARKED "ACS&P 503-668-3151" IN MONUMENT BOX, SET ON: 10-02-19
△	SET 5/8" BY 30" IR W/ALUMINUM CAP MARKED "ACS&P 503-668-3151", SET ON 10-02-19
⌖	SET 1" BRASS DISC STAMPED "ACS&P 668-3151", SET ON 10-02-19
FD	FOUND MONUMENT
W/YPC	INDICATES WITH YELLOW PLASTIC CAP
IR	INDICATES IRON ROD
IP	INDICATES IRON PIPE, INSIDE DIAMETER
ALUM	INDICATES ALUMINUM CAP MARKED
()P1	INDICATES RECORD OR CALCULATED VALUE PER PLAT NO. 4483 "ZION MEADOWS", CLACKAMAS COUNTY PLAT RECORDS. MONUMENT IS A 5/8" IR W/YPC MARKED "ACS&P 503-668-3151", HELD, UNLESS OTHERWISE NOTED
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DNR	INDICATES DESTROYED NOT REPLACED

REGISTERED PROFESSIONAL LAND SURVEYOR
OREGON
JANUARY 23, 1990
DALE L. HULT
2427
RENEWS 07/01/21

CLIENT: STAFFORD LAND COMPANY

All County Surveyors & Planners, Inc.
Surveying, Planning and Civil Engineering
P.O. Box 955 Sandy, OR 97055
Phone: (503) 668-3151
Fax: (503) 668-4730
Subject to General Conditions 2006 ©

DRAWN: DRR | CHECKED: MSR | APPROVED: DLH

DWG NUMBER: 17-025 Plat.dwg
DATE OF PLOT: 11-14-19

Plat 4603

MARSHALL RIDGE

BOOK 151 PAGE 014

LOCATED IN THE SW 1/4 SEC 24, T 2S, R 4E, W.M.
CITY OF SANDY, COUNTY OF CLACKAMAS, OREGON
DECEMBER 7, 2018

NARRATIVE

THE PURPOSE OF THIS PLAT IS TO SUBDIVIDE THE SUBJECT TRACT AS DESCRIBED IN DEED DOC. NO 2008-014936, CLACKAMAS COUNTY DEED RECORDS. THE BOUNDARY RESOLUTION IS PER SN2018-037, CLACKAMAS COUNTY SURVEY RECORDS. THE BASIS OF BEARINGS IS ALONG THE NORTH LINE PER R1 AS SHOWN.

PLAT NOTES

1. THIS PLAT IS SUBJECT TO CONDITIONS OF APPROVAL AS STATED IN THE CITY OF SANDY PLANNING FILE NO. NO. 17-066 SUB/VAR.
2. A TREE PRESERVATION RESTRICTION SHALL BE ACROSS THE ENTIRETY OF TRACTS A AND E GRANTED TO THE CITY OF SANDY. SAID TRACTS ARE CONVEYED TO THE MARSHALL RIDGE HOME OWNERS ASSOCIATION RECORDED IN DOCUMENT NO. 2019-075520, CLACKAMAS COUNTY DEED RECORDS.
3. TRACT B IS A PUBLIC PEDESTRIAN ACCESS TRACT CONVEYED TO THE CITY OF SANDY RECORDED IN DOCUMENT NO. 2019-075521, CLACKAMAS COUNTY DEED RECORDS AND IS SUBJECT TO A PUBLIC PEDESTRIAN EASEMENT.
4. TRACTS C AND D ARE CONVEYED TO THE CITY OF SANDY RECORDED IN DOCUMENT NO. 2019-075521, CLACKAMAS COUNTY DEED RECORDS, FOR PUBLIC STORM WATER DETENTION FACILITIES TO BE OWNED AND MAINTAINED BY THE CITY OF SANDY.
5. ACCESS FROM ADJACENT PROPERTIES SHALL BE CONTROLLED BY THE CITY OF SANDY BY THE RECORDING OF THIS PLAT. THIS ACCESS CONTROL WILL BE AUTOMATICALLY TERMINATED UPON THE ACCEPTANCE OF PUBLIC RIGHT-OF-WAY DEDICATION OR THE RECORDING OF A PLAT EXTENDING THE RIGHT-OF-WAY ONTO ADJACENT PROPERTY.
6. THE ACCESS CONTROL RESTRICTION GRANTED TO THE CITY OF SANDY PER NOTE 13, SHEET 4 OF "ZION MEADOWS" WILL AUTOMATICALLY TERMINATE ALONG OAK AVENUE, ASPEN AVENUE, AND A PORTION OF VILLAGE BOULEVARD UPON THE DEDICATION OF RIGHT-OF-WAY AND RECORDING OF THIS PLAT.
7. LOT 20 CONTAINS A SIGN EASEMENT, BENEFITING THE MARSHALL RIDGE HOME OWNERS ASSOCIATION.
8. LOTS 1-3, 6, 9, 11, 12, 14-16, 19, 20, 22 AND 23 ARE SUBJECT TO A RESTRICTIVE COVENANT FOR TREE PROTECTION RECORDED AS DOCUMENT NO. 2019-075523, CLACKAMAS COUNTY DEED RECORDS.
9. THIS PLAT IS SUBJECT TO DECLARATION OF COVENANTS, CONDITIONS, AND RESTRICTIONS PER DOCUMENT NO. 2019-075522, CLACKAMAS COUNTY DEED RECORDS.
10. A PRIVATE DRIVEWAY MAINTENANCE AGREEMENT FOR COMMON ACCESS FOR LOTS 3 AND 4 IS RECORDED UNDER FEE NO. 2019-075524, CLACKAMAS COUNTY DEED RECORDS.
11. A PRIVATE DRIVEWAY MAINTENANCE AGREEMENT FOR COMMON ACCESS FOR LOTS 1 AND 2 IS RECORDED UNDER FEE NO. 2019-075525, CLACKAMAS COUNTY DEED RECORDS.
12. A PRIVATE DRIVEWAY MAINTENANCE AGREEMENT FOR COMMON ACCESS FOR LOTS 21 AND 22 IS RECORDED UNDER FEE NO. 2019-075526, CLACKAMAS COUNTY DEED RECORDS.

FENCE NOTE

FENCES ARE EITHER ON THE PROPERTY LINE OR NON-EXISTENT AT THE TIME OF THIS PLAT.

DECLARATION

KNOW ALL MEN BY THESE PRESENTS, THAT STAFFORD DEVELOPMENT COMPANY, LLC IS THE OWNER OF THE LAND DESCRIBED IN THE ACCOMPANYING SURVEYOR'S CERTIFICATE AND HAS CAUSED THE SUBDIVISION TO BE PREPARED AND THE PROPERTY DIVIDED IN ACCORDANCE WITH O.R.S. CHAPTER 92, AS SHOWN ON THE ANNEXED MAP AND DOES HEREBY DEDICATE TO THE PUBLIC FOREVER ALL RIGHT-OF-WAYS DEPICTED FOR PUBLIC STREET PURPOSES AND HEREBY GRANTING RESTRICTIONS AND PUBLIC AND PRIVATE EASEMENTS WHERE NOTED AND DOES NOT CLAIM OWNERSHIP BEYOND THE PLAT BOUNDARIES. THE PROPERTY IS SUBJECT TO ANY EXISTING EASEMENTS AND RESTRICTIONS SHOWN AS NOTED IN THE PLAT NOTES HEREON.

GORDON ROOT - MANAGER

ACKNOWLEDGMENT

COUNTY OF CLACKAMAS
STATE OF OREGON SS

KNOW ALL MEN BY THESE PRESENTS THAT ON November 15, 2019 BEFORE ME A NOTARY PUBLIC IN AND FOR SAID COUNTY AND STATE PERSONALLY APPEARED GORDON ROOT AS MANAGER OF STAFFORD DEVELOPMENT COMPANY, LLC, WHOM BEING FIRST DULY SWORN DID SAY HE IS THE IDENTICAL PERSON NAMED IN THE FOREGOING INSTRUMENT, AND THAT SAID INSTRUMENT WAS EXECUTED FREELY AND VOLUNTARILY.

NOTARY SIGNATURE Tracy M. Hayden
Tracy M. Hayden
NOTARY PUBLIC- OREGON
COMMISSION NO. 984279
MY COMMISSION EXPIRES: March 7, 2023

CONSENT AFFIDAVIT

A SUBDIVISION PLAT CONSENT AFFIDAVIT FROM COMMUNITY FINANCIAL CORPORATION, AN OREGON CORPORATION, A TRUST DEED BENEFICIARY PER DOCUMENT NO. 2018-053571, HAS BEEN EXECUTED AND RECORDED AS DOCUMENT NO. 2019-075518, CLACKAMAS COUNTY DEED RECORDS.

A SUBDIVISION PLAT CONSENT AFFIDAVIT FROM BLUM FAMILY DYNASTY, INC., AN OREGON CORPORATION, A TRUST DEED BENEFICIARY PER DOCUMENT NO. 2018-053572, HAS BEEN EXECUTED AND RECORDED AS DOCUMENT NO. 2019-075517, CLACKAMAS COUNTY DEED RECORDS.

APPROVALS

CITY OF SANDY

CITY OF SANDY FILE NO. 17-066 SUB/VAR

APPROVED THIS 21st DAY OF November, 2019

BY: CITY OF SANDY PLANNING DIRECTOR

APPROVED THIS 22nd DAY OF November, 2019

BY: CITY OF SANDY ENGINEER, CURRAN MCLEOD, INC.

CLACKAMAS COUNTY

APPROVED THIS 26TH DAY OF NOVEMBER, 2019

BY: CLACKAMAS COUNTY SURVEYOR; AND CLACKAMAS COUNTY BOARD OF COMMISSIONERS DELEGATE PER COUNTY CODE 11.02

ALL TAXES, FEES, ASSESSMENTS OR OTHER CHARGES AS PROVIDED BY O.R.S. 92.095 HAVE BEEN PAID THROUGH June 30, 2020

APPROVED THIS 26 DAY OF November, 2019

CLACKAMAS COUNTY ASSESSOR & TAX COLLECTOR

BY: DEPUTY

STATE OF OREGON
COUNTY OF CLACKAMAS S.S

I DO HEREBY CERTIFY THAT THE ATTACHED PLAT WAS RECEIVED FOR RECORD AND RECORDED ON THE
26th DAY OF November, 2019
AT 3:28 O'CLOCK P. M
AS PLAT NUMBER 4603
DOCUMENT NO. 2019-075519

SHERRY HALL, CLACKAMAS COUNTY CLERK
BY: Cindy Swick DEPUTY

SHEET 5 OF 5

REGISTERED PROFESSIONAL LAND SURVEYOR
OREGON
JANUARY 23, 1990
DALE L. HULT
2427
RENEWS 07/01/21

CLIENT: STAFFORD LAND COMPANY

All County Surveyors & Planners, Inc.
Surveying, Planning and Civil Engineering
P.O. Box 955 Sandy, OR 97055
Phone: (503) 668-3151
Fax: (503) 668-4730
Subject to General Conditions 2006 ©

DRAWN: DRR	CHECKED: MSR	APPROVED: DLH

DWG NUMBER: 17-025 Plat.dwg
DATE OF PLOT: 11-14-19

EXHIBIT U

NO. 2019-16

AN ORDINANCE APPROVING ANNEXATION OF ONE PROPERTY TOTALING APPROXIMATELY 12.84 ACRES AND ASSIGNMENT OF SFR, SINGLE FAMILY RESIDENTIAL ZONING IN CONFORMANCE WITH THE 2017 URBAN GROWTH BOUNDARY EXPANSION ANALYSIS.

Whereas, William Bloom as the property owner submitted an application (File No. 18-026 ANN) requesting approval to annex one parcel totaling approximately 12.84 acres known as T2S R4E Section 24 C, Tax Lot 100 and requested that SFR (Single Family Residential) zoning be assigned in conformance with the 2017 Urban Growth Boundary Expansion Analysis;

Whereas, Sandy Municipal Code Chapter 17.78, Annexation identifies the procedures to be followed by the City for annexations;

Whereas, in 2016, the Oregon Legislature passed Senate Bill 1573, effective March 15, 2016 that requires a city whose charter requires annexations to be approved by voters to annex the property without submitting it to the voters if the proposal meets certain criteria;

Whereas, the City received a letter dated August 27, 2018 from the Housing Land Advocates ("HLA") and the Fair Housing Council of Oregon ("FHCO") regarding the annexation's compliance with Goal 10. To the extent it is necessary, the City finds that the decision to annex the subject property complies with Goal 10 and its implementing rule at OAR Chapter 660, division 8. In 2014, the City completed an "urbanization study." That study was deemed acknowledged in 2015. The study included an analysis and update of the city's comprehensive plan with respect to Goal 10 and concluded the existing UGB did not contain sufficient residential lands to meet the city's housing needs to 2034. The urbanization study contained a buildable lands inventory ("BLI") and a housing needs projection ("HNP"), both of which followed the methodologies required by ORS 197.296, Goal 10, OAR Chapter 660, division 8 and OAR Chapter 660, division 24;

Whereas, in 2017, the city completed its UGB expansion in accordance with the urbanization study. The Department of Land Conservation and Development approved the UGB expansion in a letter dated June 2, 2017. No parties objected to the UGB expansion and it is now acknowledged in accordance with Oregon law. The property that is the subject of this annexation was included in the UGB expansion to satisfy part of the land needs identified in the urbanization study and its HNP. The property is being annexed in accordance with its conceptual zoning in the UGB expansion, Single Family Residential (SFR). The HNP concluded that the city had a need of approximately 277 acres of low density residential land through 2034. This property contains approximately 12.84 developable acres and therefore increases the city's identified low density residential land. Therefore, Goal 10 is satisfied;

Whereas, original notification of the proposed annexation was sent to the Department of Land Conservation and Development on July 17, 2019 and was updated on June 10, 2019. A separate notice was sent to the property owners and other property owners within 300 feet of the subject property on July 10, 2018 and July 30, 2019 with a legal description of the request being published in the in the August 15, 2018 and August 7, 2019 editions of the Sandy Post;

Whereas, the Sandy Planning Commission reviewed the request at a public hearing on July 22, 2019 and recommended City Council approve the annexation with the recommended conditions identified by staff in the staff report; and

Whereas, the Sandy City Council reviewed the request at a public hearing on September 3, 2019 and determined the proposal complies with both the criteria in SB 1573 and the criteria in the Sandy Municipal Code Chapter 17.78, Annexation.

NOW, THEREFORE, THE CITY OF SANDY ORDAINS AS FOLLOWS,

Section 1: The City Council directs staff to amend the city limits boundary and to provide notice of the annexation to other agencies and organizations as required by state law.

Section 2: The City Council adopts the September 3, 2019 staff report as findings supporting the approval of this annexation and incorporates the report into this ordinance by reference, including the conditions of approval stated in the report.

Section 3: Following adoption of this Ordinance, the Zoning designation for the subject properties will be changed to SFR, Single Family Residential as shown on the adopted zoning map.

Section 4: A legal description and map of the property is attached as Exhibit A to this ordinance.

This ordinance is adopted by the Common Council of the City of Sandy and approved by the Mayor this 03 day of September 2019

Stan Pulliam, Mayor

#2019-16

ATTEST:

Karey Milne, City Recorder

#2019-16

Exhibit 'A'

Parcel 3 of Partition Plat 2018-045

A tract of land located in the Northeast 1/4 of the Southwest 1/4 of Section 24 Township 2 South, Range 4 East, Willamette Meridian, County of Clackamas, State of Oregon and being more particularly described as follows:

Beginning at the 2-inch Iron Pipe marking the center of said Section 24;

Thence South 01°21'13 West 415.49 Feet along the centerline of said Section 24 to an Iron Rod with Pink Plastic Cap "45th P.GEO PLS90079";

Thence leaving said center section line, North 89°02'23" West along the North line of Parcel 4 of Partition Plat 2018-045, Clackamas County Survey Records, and a Westerly extension of said line 1398.64 Feet to the Westerly Right of Way of Southeast Bornstedt Road (County Road No. 682);

Thence North 03°03'52" East along the Westerly Right of Way of said Road 75.94 Feet;

Thence leaving said Westerly Right of Way line South 89°02'26" East 60.01 Feet to a point on the Easterly Right of Way of said road;

Thence North 03°03'54" East along the Easterly Right of Way of said Road 341.59 Feet to an Iron Rod with Pink Plastic Cap "45th P.GEO PLS90079";

Thence leaving said Easterly Right of Way, South 88°57'48" East 1326.15 Feet along the North line of the Northwest 1/4 of the Southwest 1/4 of Section 24 to said Point of Beginning.

Containing 12.84 Acres, more or less

Refer to Exhibit B for map of described tract

Exhibit A - PARCEL 3.docx PP 2018-045

EXHIBIT 'B'

PARCEL 3 OF PARTITION PLAT 2018-045 AND A PORTION OF SE BORNSTEDT ROAD LOCATED IN THE NORTHEAST 1/4 OF THE SOUTHWEST 1/4 OF SECTION 24 TOWNSHIP 2 SOUTH, RANGE 4 EAST, WILLAMETTE MERIDIAN, COUNTY OF CLACKAMAS, STATE OF OREGON

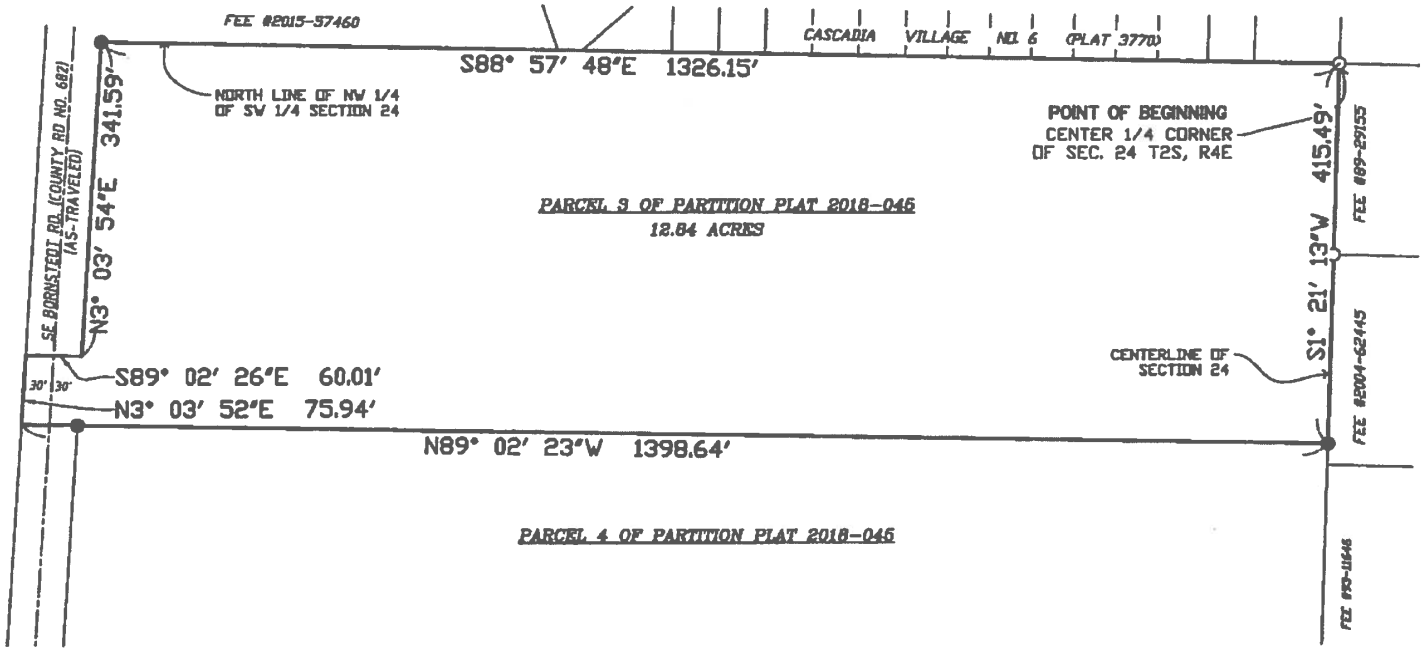
JUNE 2018 *CLIENT NAME: WILLIAM K. BLOOM*

N

W E

S

NOT TO SCALE



○ 2-INCH IRON PIPE

● 5/8" BY 30" IRON ROD WITH PINK PLASTIC CAP MARKED "45TH P.GEO PLS90079"

REGISTERED PROFESSIONAL LAND SURVEYOR

OREGON
MAY 23, 2015
SAMANTHA RAY TANNER
90079

RENEWS 6/30/20

FDG

Firwood Design Group, LLC

SURVEYING ✦ ENGINEERING ✦ PLANNING

359 E COLUMBIA RIVER HWY
TROUTDALE, OREGON 97060
BUS: (503) 668-3737 ✦ FAX: (503) 668-3788

THE PURPOSE OF THIS EXHIBIT IS TO SHOW THE BOUNDARY OF A TRACT OF LAND AND A PORTION OF SE BORNSTEDT ROAD TO BE ANNEXED INTO THE CITY OF SANDY

BornstedtPLA.dwg

WHERE INNOVATION MEETS ELEVATION

39250 Pioneer Blvd
Sandy, OR 97055
503-668-5533

CITY COUNCIL
ANNEXATION PROPOSAL
STAFF REPORT

SUBJECT: File No. 18-026 ANN – Bloom Annexation

AGENDA DATE: September 3, 2019

DEPARTMENT: Planning Division

STAFF CONTACT: James A. Cramer, Associate Planner

Application Complete: June 28, 2018
120-Day Deadline: April 5, 2019 (additional details within I.G. of this report)
Heard by Planning Commission: July 22, 2019

EXHIBITS:

Applicant's Submittals

A. Land Use Application
B. Supplemental Land Use Application No. 1 & 2
C. Mailing Labels for Notifying Property Owners
D. Notification Map
E. Parcel 3 of Partition Plat No. 2018-045 (Sheet 1 and 2)
F. Replat of Parcel 1 of Partition Plat 2015-029 and The Adjoining Tract of Land Described in Deed Document No. 2008-049728
G. Z0023-17-PLA Site Plan
H. Project Narrative
I. Site Photos

Public Comments

J. Darcy and Dennis Jones (July 19, 2018 & August 15, 2019)
K. Doug Gabbert (August 21, 2018)
L. Darcy and Dennis Jones (June 1, 2019)

Agency Comments

M. City Traffic Engineer (October 5, 2019)
N. ODOT (August 22, 2018)
O. ODOT (October 15, 2018)

Supplemental Documents provided by Applicant

P. Transportation Planning Rule Analysis (October 4, 2018)

Supplemental Documents Provided by Staff

Q. Applicant's Extension Request Letter (August 27, 2018)
R. Clackamas County Notice of Land Use Decision (May 20, 2019)
S. Notice of a Proposed Change to a Comprehensive Plan or Land Use Regulation
T. Fair Housing Council of Oregon (August 27, 2018)
U. Planning Commission Staff Report

V. Clackamas County Confirmation

I. BACKGROUND

A. APPLICABLE CRITERIA & REVIEW STANDARDS

Sandy Development Code: Chapter 17.12 Procedures for Decision Making; 17.18 Processing Applications; 17.22 Notices; 17.28 Appeals; 17.34 Single Family Residential; 17.78 Annexations

Urban Growth Boundary Expansion Analysis: Chapter 4 Expansion Alternative Justification

B. PROCEEDING

In conformance with the standards of Chapter 17 of the Sandy Municipal Code (SMC) and the voter annexation requirements, this application is processed as a Type IV, Quasi-Judicial Land Use Decision.

C. FACTUAL INFORMATION

1. APPLICANT/PROPERTY OWNER: William Bloom

2. LEGAL DESCRIPTION: T2S R4E Section 24 C, Tax Lot 100

3. PROPOSAL: The applicant, William Bloom, requests a Type A Annexation for a parcel totaling approximately 12.84 acres into the City of Sandy. The current Clackamas County Comprehensive Plan Designation of this property is Rural (R) and the current zoning of the property is Rural Residential Farm Forest 5-Acre (RRFF-5) with a Historic District (HD) Overlay and Historic Landmark (HL) Overlay. The applicant proposes to zone the property as Single Family Residential (SFR) and designate the property as Low Density Residential (LDR) on the Sandy Comprehensive Plan Map.

4. SITE LOCATION: To the south of the adjacent Cascadia Village neighborhood. Fronting SE Bornstedt Road on the east side of the right-of-way.

5. SITE SIZE: property is 12.84 acres

6. SITE DESCRIPTION: The site contains approximately 12.74 acres of land with approximately .10 acres of right-of-way for a total land area of 12.84 acres. The subject property is currently outside the city limits; however, the property is contiguous to city limits on its north and west property lines.

7. COUNTY COMPREHENSIVE PLAN/ZONING: The existing Clackamas County Comprehensive Plan Designation of the property is Rural (R) and the current zoning of

the property is Rural Residential Farm Forest 5-Acre (RRFF-5) with a Historic District (HD) Overlay.

8. PROPOSED CITY COMPREHENSIVE PLAN DESIGNATION/ZONING: The applicant proposes to reclassify the property to Low Density Residential (LDR) on the Sandy Comprehensive Plan Map and zone the property to Single Family Residential (SFR) on the Sandy Zoning Map.

9. VICINITY DESCRIPTION:
   North: Low Density Residential (R-1)
   South: Rural Residential Farm Forest 5-Acre (RRFF-5)
   East: Rural Residential Farm Forest 5-Acre (RRFF-5)
   West: Single Family Residential (SFR)

10. SERVICE CONSIDERATIONS: The subject property has an existing 1,056 square foot historic barn and a well house. The site previously had a single-family residence which was demolished via a practice burn by the Sandy Fire Department on May 19, 2018. Future development of the property will require connection to city water and sewer service. Storm drainage, including retention, detention, and water quality treatment will also be required. Any future development will require conformance with storm detention and water quality requirements.

11. RESPONSE FROM GOVERNMENTAL AGENCIES, UTILITY PROVIDERS, AND CITY DEPARTMENTS: No comments received.

D. PUBLIC COMMENT

- Darcy and Dennis Jones of 38884 Jerger St. – were told when they purchased their home that the space behind their home would never be developed and do not want to see their views or the existing trees be removed. Suffer from migraines and nervous additional construction noise would "set them off."
- Doug Gabbert of 19404 Oak Ave. – concerns regarding additional traffic on Bornstedt Rd. including the noise it may produce.
- Darcy and Dennis Jones of 38884 Jerger St. – would like the "greenspace" to remain.

E. PREVIOUS LAND USE DECISIONS: The site previously had a single-family residence which was demolished via a practice burn by the Sandy Fire Department on May 19, 2018. The subject property is currently under the jurisdiction of Clackamas County where a Historic Landmark (HL) Overlay was previously placed on the Fisher Root Cellar, (SHOP #1190) located upon the subject property. The land owner requested demolition (Case File No. Z0169-19-HL) of the root cellar and therefore removing the HL overlay designation. The Clackamas County Historic Review Board (HRB) met on May 9, 2019 to consider the proposal. At this hearing the HRB determined the cellar to be deteriorated to the point of being unsafe and recommended approval of the demolition request to which the Clackamas County Planning Department approved with the conditions identified within Exhibit V.

F. SENATE BILL 1573: Senate Bill 1573 was passed by the legislature and became effective on March 15, 2016 requiring city's whose charter requires annexation to be approved by voters to annex the property without submitting it to the voters if the proposal meets certain criteria:

(a) The territory is included within an urban growth boundary adopted by the city or Metro, as defined in ORS 197.015; ***RESPONSE:*** As shown on the attached Vicinity Map, the subject property is located within the city's Urban Growth Boundary (UGB).

(b) The territory is, or upon annexation of the territory into the city will be, subject to the acknowledged comprehensive plan of the city; ***RESPONSE:*** The subject property is identified to have a Low Density Residential designation as identified on the adopted Comprehensive Plan map.

(c) At least one lot or parcel within the territory is contiguous to the city limits or is separated from the city limits only by a public right of way or a body of water; ***RESPONSE:*** The subject parcel is contiguous to city limits along the north and west property lines.

(d) The proposal conforms to all other requirements of the city's ordinances. ***RESPONSE:*** An evaluation of each of the city criteria follows.

G. PROCEDURAL CONSIDERATIONS

This request is being processed as a Type A Annexation which is processed as a Type IV review. The proposal was initially scheduled to be heard by Planning Commission on August 27, 2018. Notifications were mailed to property owners within 300 feet of the subject property and to affected agencies on July 10, 2018 as well as a Notice of a Proposed Change to a Comprehensive Plan or Land Use Regulation (Exhibit S) was submitted to the Oregon Department of Land Conservation and Development on July 17, 2018. In addition staff published the legal notice in the August 15, 2018 edition of the Sandy Post.

This land use file (18-026 ANN) was continued at the August 27, 2018 Planning Commission hearing to an undisclosed date due to additional analysis (Transportation Planning Rule and Historic Landmark) being required prior to a recommendation being rendered. The applicant's representative, Kristina Molina, worked closely with staff to provide the materials needed with the understanding that the application would remain open until the documents were received and a hearing could be scheduled. The City received the additional materials needed (Exhibits O, P and R) to complete analysis and the proposal was then scheduled to be heard by Planning Commission on July 22, 2019. Notifications were mailed to property owners within 300 feet of the subject property and to affected agencies on June 18, 2019, a legal notice was published on June 26, 2019 in the local newspaper (Sandy Post) and the Notice of a Proposed Change to a Comprehensive Plan or Land Use Regulation was updated on the Oregon Department of Land Conservation and Development's website on June 10, 2019. In addition, Staff sent an additional notice to neighboring property owners regarding the pending September 3, 2019 City Council hearing associated with the proposed annexation on July 30, 2019 and published the legal notice in the August 7, 2019 edition of

the Sandy Post.

II. ANALYSIS OF CONFORMANCE – DEVELOPMENT CODE

SANDY DEVELOPMENT CODE

1. Chapter 17.26 Zoning District Amendments

In association with the annexation request, the applicant requests Single Family Residential (SFR) zoning to apply the underlying conceptual zoning designation determined in the 2017 Urban Growth Boundary Expansion Analysis.

2. Zoning

The Zoning Map depicts a conceptual zoning designation for the property of SFR, Single Family Residential. Density will be evaluated during land use review (i.e. subdivision) of the subject property.

The applicant submitted a Trip Generation (TG) & Transportation Planning Rule (TPR) Analysis (Exhibit P), which analyzes a reasonable "worst-case" development scenario for the proposed zoning. The analysis determined the change in zoning from RRFF-5 (Clackamas County) to SFR (City of Sandy) will result in a potential increase of up to 31 trips during the morning peak hour, 41 trips during the evening peak hour and 388 daily trips. It was determined by the engineer completing this analysis that this traffic increase is insufficient to result in a significant effect as defined under Oregon's Transportation Planning Rule, therefore the TPR was satisfied and no mitigation is necessary or recommended.

Upon review of the submitted TG & TPR by the City's third-party Transportation Engineer, it was determined that the analysis completed by the applicant is sufficient to show compliance with TPR analysis and traffic impact analysis should be completed at time of a future development proposal (i.e. subdivision) to determine considerations as they apply to a specific proposal (Exhibit M). Upon review of the submitted TG & TPR by ODOT it was recommended the City include a condition to limit future development of the site to no more than 43 single family lots or 388 average daily trips (Exhibit P).

3. Chapter 17.78 Annexation

Section 17.78.20 requires that the following conditions must be met prior to beginning an annexation request:

A. The requirements of Oregon Revised Statutes, Chapters 199 and 222, for initiation of the annexation process are met; and

B. The site must be within the City of Sandy Urban Growth Boundary; and

C. The site must be contiguous to the city or separated from it only by a public right of way or a stream, bay, lake or other body of water; and

D. The site has not violated Section 17.78.25.

RESPONSE: *Oregon Revised Statute Section 199 pertains to Local Government Boundary Commissions and City-County Consolidation. Oregon Revised Statute Section 222 pertains to City Boundary Changes; Mergers; Consolidations and Withdrawals. The proposal complies with applicable requirements at this time and all notices were mailed as necessary.*

The site is located within the Urban Growth Boundary (UGB). The north property line is contiguous with city limits and the west property line is contiguous with city limits for 417 feet along the SE Bornstedt Road right-of-way. The proposed annexation would not create an island, cherry stem, or shoestring annexation.

Section 17.78.25 requires review of tree retention requirements per SMC 17.102 and SMC 17.60 at the time of annexation to discourage property owners from removing trees prior to annexing as a way of avoiding Urban Forestry Ordinance provisions.

A. Properties shall not be considered for annexation for a minimum of five (5) years if any of the following apply:

1. Where any trees six (6) inches or greater diameter at breast height (DBH) have been removed within 25 feet of the high water level along a perennial stream in the five years prior to the annexation application.

2. Where more than two (2) trees (six (6) inches or greater DBH) per 500 linear feet have been removed in the area between 25 feet and 80 feet of the high water level of Tickle Creek in the five years prior to the annexation application.

3. Where more than two (2) trees (six (6) inches or greater DBH) per 500 linear feet have been removed in the area between 25 feet and 50 feet of the high water level along other perennial streams in the five years prior to the annexation application.

4. Where any trees six (6) inches or greater DBH have been removed on 25 percent or greater slopes in the five years prior to the annexation application.

5. Where more than ten (10) trees (11 inches or greater DBH) per gross acre have been removed in the five years prior to the annexation application, except as provided below:

    a. Sites under one (1) acre in area shall not remove more than five (5) trees in the five years prior to the annexation application.

b. Sites where removal of ten (10) or fewer trees will result in fewer than three (3) trees per gross acre remaining on the site. Tree removal may not result in fewer than three (3) trees per gross acre remaining on the site. At least three (3) healthy, non-nuisance trees 11 inches DBH or greater must be retained for every one-acre of contiguous ownership.

c. For properties in or adjacent to the Bornstedt Village Overlay (BVO), tree removal must not result in fewer than six (6) healthy 11 inch DBH or greater trees per acre. For properties in or adjacent to the BVO and within 300 feet of the FSH Overlay District, tree removal must not result in fewer than nine (9) healthy 11 inch DBH or greater trees per acre.

Rounding: Site area shall be rounded to the nearest half acre and allowed tree removal shall be calculated accordingly. For example, a 1.5 acre site will not be allowed to remove more than fifteen (15) trees in the five years prior to the annexation application. A calculation of 1.2 acres is rounded down to one (1) acre and a calculation of 1.8 is rounded up to two (2) acres.

Cumulative Calculation: Total gross acreage includes riparian areas and other sensitive habitat. Trees removed under SMC 17.78.25(A) 2. and 3. shall count towards tree removal under SMC 17.78.25(A) 5.

B. Exceptions. The City Council may grant exceptions to this section where:

1. The property owner can demonstrate that Douglas Fir, Western Red Cedar, or other appropriate native trees were planted at a ratio of at least two trees for every one tree removed no less than five years prior to the submission of the annexation application, and at least 50 percent of these trees have remained healthy; or

2. The Council finds that tree removal was necessary due to hazards, or utility easements or access; or

3. The trees were removed because they were dead, dying, or diseased and their condition as such resulted from an accident or non-human cause, as determined by a certified arborist or other qualified professional; or

4. The trees removed were nuisance trees; or

5. The trees were removed as part of a stream restoration and enhancement program approved by the Oregon Department of Fish and Wildlife as improving riparian function; or

6. The trees removed were orchard trees, Christmas trees, or commercial nursery trees grown for commercial purposes; or

7. The application of this section will create an island of unincorporated area.

RESPONSE: *The subject property is 12.74 acres with .10 acres of right-of-way. The applicant has not proposed any development at this time and therefore have not completed an arborist report; however, review of aerial photography reveals the property is heavily forested on the east half of the property with a cluster of trees in the northwest corner of the property. A review of historic aerial photos from 1995 to the present reveals no significant tree removal from the property.*

Section 17.78.50 contains required annexation criteria. Requests for annexation should not have an adverse impact on the citizens of Sandy, either financially or in relation to the livability of the city or any neighborhoods within the annexation area. Generally, it is desirable for the city to annex an area if the annexation meets **any** of the following criteria:

A. A necessary control for development form and standards of an area adjacent to the city; or

B. A needed solution for existing problems, resulting from insufficient sanitation, water service, or other urban service related problems; or

C. Land for development to meet urban needs and that meets a logical growth pattern of the city and encourages orderly growth; or

D. Needed routes for utility and transportation networks.

RESPONSE: *The applicant's narrative indicates they believe annexation of the subject property meets Criterion C and D above. Staff generally agrees with the applicant that the property provides a logical growth pattern for the city and encourages orderly growth. The site is bordered by city limits on the entire north property line and the property to the north has been developed into a single-family dwelling neighborhood known as Cascadia Village. Cascadia Village was designed to include a stubbed street, Averill Parkway, that intersects the subject site to allow for future connection between Cascadia Village and future development on the subject property. Property to the west of the subject site was approved for development by Planning Commission (File No. 17-066 SUB/VAR) on March 26, 2018. The approval granted the property to be subdivided into 37 residential lots for development of single-family homes as well as six variances to the Sandy Development Code.*

Currently, there are utility connections available within Averill Parkway north of the subject property and in SE Bornstedt Road right-of-way to the west of the subject property. Annexation of the subject property will allow for future development which will in turn lead to extension of utility services providing needed utility infrastructure to serve future development within the city's urban growth boundary. Future

development of the subject property and improvements to SE Bornstedt Road right-of-way will add to the existing and future transportation network within the urban growth boundary.

Per Section 17.78.60 (F)3. the applicant was supposed to map the location of areas subject to regulation under Chapter 17.60, Flood and Slope Hazard (FSH) Overlay District. Prior to future development of this property the City will require that the FSH Overlay is mapped and required setback areas per Section 17.60.30 are identified on the subject property.

4. Urban Growth Boundary Expansion Analysis

Chapter 4 Expansion Alternative Justification
Goal 12 – Transportation contains policies to ensure sufficient and adequate transportation facilities and services are available. This goal states that Oregon Administrative Rule (OAR) 660-024-0020(1)(d) does not require the City to conduct an analysis pursuant to the transportation planning rule ("TPR") prior to adding lands to expand the UGB. This is because the lands that are being added to the UGB will retain their existing county zoning until the owners of the lands choose to annex into the City. At that time, the City will conduct a TPR analysis relative to those lands.

RESPONSE: *Upon receiving the application, staff did not require TPR findings to be submitted. After additional analysis of code requirements, conversations with the Oregon Department of Transportation (ODOT) and confirmation from the City's attorney, it was determined that TPR findings shall be submitted for review prior to final approval of any proposed annexations of lands brought into the UGB with the 2017 UGB Expansion. All TPR analysis shall consider a 'reasonable worst case' development scenario consistent with the type of development allowable under the City of Sandy Development Code for the zoning district the conceptual zoning map defines for the subject property. The analysis shall be based on the trip rates presented in the Institute of Transportation Engineers' Trip Generation Manual – 10th Edition. The analysis conducted by the applicant shall also be reviewed by the City of Sandy transportation engineer which requires the payment of a $1,500 third-party review fee. Until TPR findings are complete and the analysis determines either an insignificant or significant effect on transportation facilities the City of Sandy staff cannot provide a recommendation on approval for this application.*

Upon review of the submitted TPR findings by the City's third-party Transportation Engineer, it was determined that the analysis completed by the applicant is sufficient to show compliance with TPR analysis and traffic impact analysis should be completed at time of a future development proposal (i.e. subdivision) to determine considerations as they apply to a specific proposal (Exhibit M). Upon review of the submitted trip generation & TPR by ODOT it was recommended the City include a condition to limit future development of the site to no more than 43 single family lots or 388 average daily trips (Exhibit P).

III. SUMMARY

The broad purpose of the City is to provide for the health, safety, and welfare of Sandy's residents. As a means of working to accomplish this purpose, the City regulates development to ensure it occurs in appropriate locations with access to services and is consistent with the values of the community. In addition, the City must ensure that an adequate level of urban services, such as sanitary sewer, can be provided before permitting annexation and subsequent development.

The proposed annexation is located within the city's urban growth boundary with the anticipation of being included in city limits. As noted above, the subject property complies with the criteria contained in Chapter 17.78 of the Sandy Development Code and complies with the requirements found in Senate Bill 1573 passed by the Oregon Legislature in 2016.

Following annexation, the subject property would be zoned Single Family Residential (SFR) as shown on the conceptual zoning map with a comprehensive land designation of Low Density Residential.

IV. PLANNING COMMISSION ACTION

The proposed annexation was presented to the City of Sandy's Planning Commission on Monday July 22, 2019. At that meeting the Planning Commission unanimously voted, 7:0, to forward the proposed annexation to City Council with the recommendation of approval with the following conditions:

1. Prior to the future development of the subject property the standards and criteria of the Flood & Slope Hazard (FSH) Overlay District (Chapter 17.60) shall be applied to the subject property.
2. Prior to the future development of the subject property the Flood & Slope Hazard (FSH) Overlay District map shall be updated to include the subject property.
3. Prior to the future development of the subject property the development shall be limited to no more than 43 single family lots or 388 average daily trips.
4. Prior to the future development of the subject property an applicant, or representative, shall confirm the conditions associated with Case File No. Z0169-19-HL have been fulfilled (Exhibit V).

 EXHIBIT V

Emily Meharg <emeharg@ci.sandy.or.us>

FILE# 21-021 SUB/TREE

jbmamoyer@outlook.com <jbmamoyer@outlook.com> Sat, Oct 16, 2021 at 4:30 PM
To: city <planning@ci.sandy.or.us>

Hi,

We live adjacent to the proposed development at 19618. Our address is 19880. We've lived here since 2004. My grandparents, then my father owned the 19618 property for at least 60 years. There ARE wetlands on that property! I see the decision made that there weren't any wetlands was done in September, of last year, during the dry/fire season. Every fall and winter, after our pond fills up, it overflows, and runs through our property, and through 19618, over the hill, behind the old house. The whole area is soggy. Also, when it's REALLY raining, a creek comes down the property line, from the back fence, and joins this creek.
I'm adding photos of the seasonal creek where it goes through our property, so you can see how much water there is.

Barb Moyer

3 attachments

ATT00213.png
278K

ATT00225.png
1179K

ATT00237.png
251K

EXHIBIT W

CLACKAMAS COUNTY

DAN JOHNSON
DIRECTOR

DEPARTMENT OF TRANSPORTATION AND DEVELOPMENT
DEVELOPMENT SERVICES BUILDING
150 BEAVERCREEK ROAD OREGON CITY, OR 97045

MEMORANDUM

TO: City of Sandy, Planning Department
FROM: Kenneth Kent, Clackamas County Engineering
DATE: October 19, 2021
RE: 21-021 SUB – Bornstedt View Subdivision
Legal: 24E24C 00100

This office has the following comments pertaining to this proposal:

1. The proposed 44-lot subdivision includes frontage on SE Bornstedt Road, which is a County maintained minor arterial roadway. Based on this, access and improvements along the frontage of the project site on SE Bornstedt Road requires approval by Clackamas County.

2. County standards limit access onto arterial roadways, requiring that access is taken from lower functional classification roads when available. The proposed access with a new roadway, SE Maple Street, opposite the existing SE Maple Street of the west side of SE Bornstedt Road is consistent with county standards.

3. The existing right-of-way width of SE Bornstedt Road includes a one half width of 30 feet from centerline along the project site frontage. The standard width of an urban arterial roadway calls for a total right-of-way width of 70 feet. The applicant will be required to dedicate approximately 5 feet to provide a minimum one half width of 35 feet.

4. The minimum improvements on the SE Bornstedt Road frontage consistent with the Clackamas County Roadway Standards include, but are not limited to, up to an 20-foot wide half-street improvement, 6-inch Curb, 5-foot wide landscape strip, and a 5-foot wide sidewalk.

5. Clackamas County Roadway Standards (Section 240) requires that intersections with County roads provide minimum intersection sight distance based on the travel speed of the roadway. SE Bornstedt Road has a posted speed limit of 45 miles per hour, which requires a minimum of 500 feet of sight distance to the north and south. The applicant will be required to verify minimum sight distance at the time of development and construction of the new intersection if SE Bornstedt Road.

CONCLUSION

If the City of Sandy approves the request, the following conditions of approval are recommended. If the applicant is advised to or chooses to modify the proposal in terms of access

P. 503.742.4400 F. 503.742.4272 WWW.CLACKAMAS.US

location and/or design following the preparation of these comments this office requests an opportunity to review and comment on such changes prior to a decision being made.

1. All frontage improvements in, or adjacent to Clackamas County right-of-way, shall be in compliance with *Clackamas County Roadway Standards*.
2. Prior to commencement of site work and recording of the plat the applicant shall obtain a Development Permit from the Clackamas County Engineering Division for design and construction of required improvements, utility installation and access to SE Bornstedt Road. To obtain the Permit, the applicant shall submit plans prepared and stamped by an Engineer registered in the State of Oregon. **Prior to final plat approval**: all required improvements shall be constructed and inspected, or financially guaranteed in the form of a performance bond when access has met minimum Substantial Completion requirements, per Roadway Standards Section 190. Performance bonds shall be in the amount of 125% of the approved engineer's cost estimate of the required improvements.
3. The applicant shall dedicate approximately 5 feet of public right-of-way along the entire SE Bornstedt Road frontage to provide a minimum 35-foot one half right-of-way width. The right-of-way centerline and width shall be verified by a professional survey to the satisfaction of DTD Engineering and Survey Departments.
4. The applicant shall grant an 8-foot wide public easement for signs, slope and public utilities along the entire SE Bornstedt Road right-of-way frontage.
5. Minimum improvements on the SE Bornstedt Road frontage consistent with *Clackamas County's Roadway Standards* include, but are not limited to, up to a one half-street improvement, including:
    a. Up to a minimum 20-foot wide, one half-street improvement shall be constructed along the entire site frontage to arterial roadway standards, with a structural section per Clackamas County Roadway Standards Standard Drawing C100.
    b. The half street improvement design shall include cross sections every 25 feet per Roadway Standards Section 250.7.5. The design shall demonstrate that the new curb line and cross slope to the existing centerline allow for construction of a curb on the opposite side of the road with cross slopes that meet minimum standards.
    c. Lane transitions shall be provided per Roadway Standards Section 250.6.4 based on a 45 MPH design speed.
    d. Standard curb, or curb and gutter if curbline slope is less than one percent.
    e. Adjacent to the curb, a 5-foot landscape strip, including street trees shall be constructed along the entire site frontage.
    f. A minimum 5-foot wide unobstructed sidewalk shall be constructed along the entire site frontage, per Standard Drawing S960. If the sidewalk does not connect to sidewalk on adjacent property, the end of the sidewalk shall require the construction of a concrete

ramp, adjacent to the end of the sidewalk, providing a transition from the new sidewalk to the edge of the pavement. The ramps shall meet ADA guidelines.

g. Dual curb ramps shall be constructed per Oregon Standard Drawing (RD 900 Series) at the SE Maple Street intersection with SE Bornstedt Road.

h. The intersection SE Maple Street with SE Bornstedt Road shall be constructed at a 90 degree angle, per Section 250.8.2 and 250.8.4 of the Roadway Standards. A minimum 50-foot long landing shall be constructed with an average grade of no more than 5 percent, per Roadway Standards Section 250.7.3.

i. Provide minimum intersection sight distance of 500 feet north and south at the SE Maple adequate intersection sight distance per Section 240 of the Clackamas County Roadway Standards. Profile and survey information shall be provide demonstrating adequate intersection sight distance.

j. Drainage facilities shall be provided in conformance with Clackamas County Roadway Standards, Chapter 4.

6. A note shall be placed on the plat indicating an access restriction along the SE Bornstedt Road frontage of Lots 1, 2, 3, 4 and 13.

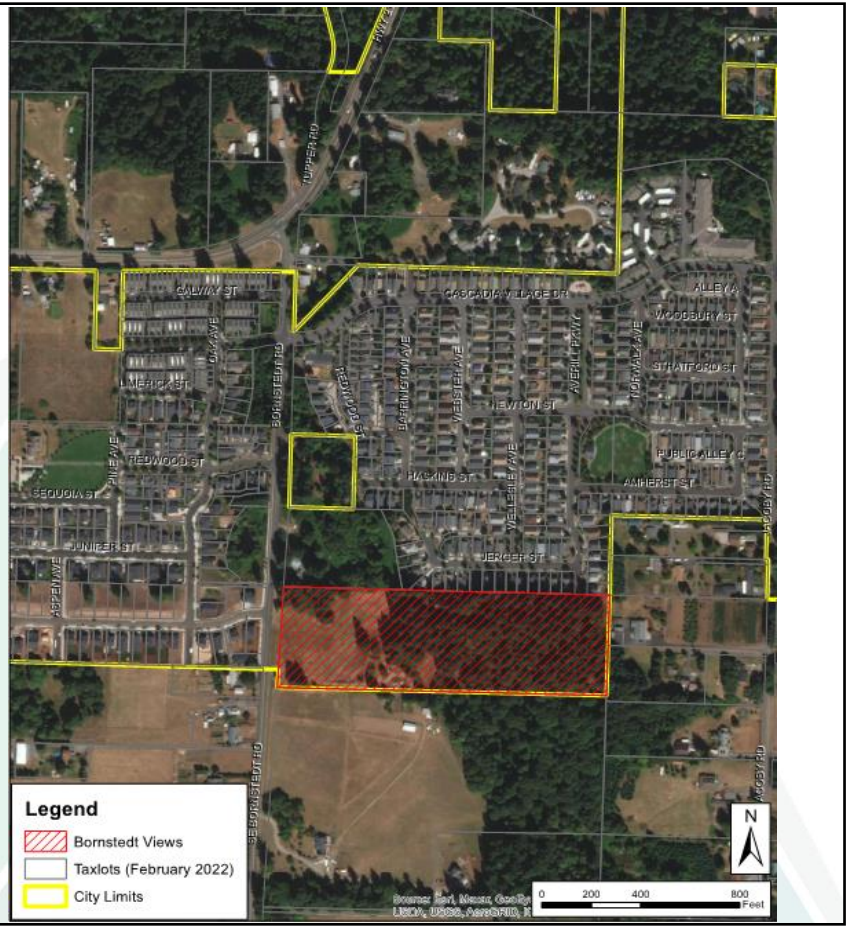
WHERE INNOVATION MEETS ELEVATION

File # 21-021
SUB/VAR/TREE/HD

Bornstedt Views Subdivision

Planning Commission
June 27, 2022

Vicinity Map



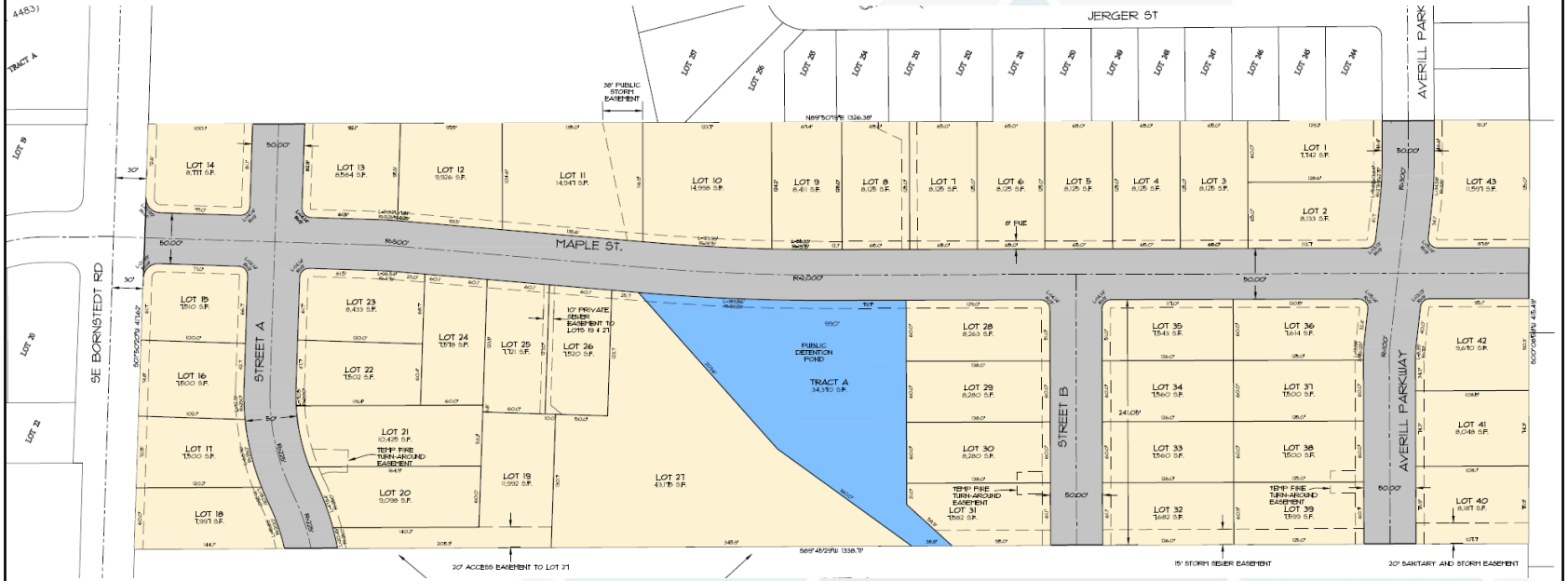

Jerger St
SE Bornstedt Rd
SE Bornstedt Rd
Maple St
Oak Ave

Proposal

- 43-lot subdivision on 12.64-acre parcel
- Lots will contain single family homes or duplexes and range in size from 7,500 square feet to 43,175 square feet
- Extension of Maple Street to the east and Averill Parkway to the south
- Connection to sewer main in Jerger Street
- Removal of 709 trees

SANDY
WHERE INNOVATION MEETS ELEVATION

Plat Map


JERGER ST
AVERILL PARK
MAPLE ST.
SE BORNSTEDT RD
STREET A
STREET B
AVERILL PARKWAY
PUBLIC DETENTION POND
TRACT A
34,310 S.F.
LOT 1
LOT 2
LOT 3
LOT 4
LOT 5
LOT 6
LOT 7
LOT 8
LOT 9
LOT 10
LOT 11
LOT 12
LOT 13
LOT 14
LOT 15
LOT 16
LOT 17
LOT 18
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LOT 30
LOT 31
LOT 32
LOT 33
LOT 34
LOT 35
LOT 36
LOT 37
LOT 38
LOT 39
LOT 40
LOT 41
LOT 42
LOT 43
TEMP FIRE TURN-AROUND EASEMENT
20' ACCESS EASEMENT TO LOT 21
15' STORM SEWER EASEMENT
20' SANITARY AND STORM EASEMENT

Review Procedure

- Type III Subdivision
- Type III Hillside Development
- Type II Tree Removal
- 6 Type III Variances

Notices

- Transmittal sent to agencies asking for comments on May 24, 2022.
- Notification was mailed to affected property owners within 500 feet of the subject property on May 24, 2022.
- A legal notice was published in the Sandy Post on June 8, 2022.

SANDY
WHERE INNOVATION MEETS ELEVATION

Public Comments

- 6 public comments were received in response to the original notice for a 42-lot subdivision last fall.
- 1 additional public comment was received in response to the updated notice for a 43-lot subdivision.

- Main topics:
  - Increased traffic
  - Presence of creek and wetland
  - Loss of trees and nature
  - Infrastructure concerns

SANDY
WHERE INNOVATION MEETS ELEVATION

Annexation Ordinance

- Annexed in 2019 - Ordinance 2019-16
- Included 4 conditions of annexation approval prior to the future development of the subject property:

1. The standards and criteria of the Flood & Slope Hazard (FSH) Overlay District (Chapter 17.60) shall be applied to the subject property.
2. The Flood & Slope Hazard (FSH) Overlay District map shall be updated to include the subject property.
3. The development shall be limited to no more than 43 single family lots or 388 average daily trips.
4. An applicant, or representative, shall confirm the conditions associated with Case File No. Z0169-19-HL have been fulfilled.

SANDY
WHERE INNOVATION MEETS ELEVATION

Application Timeline

- Original 42-lot subdivision proposal submitted May 6, 2021.
- Planning Commission hearing scheduled for October 25, 2021.
- Staff recommended denial of the original proposal.
- The applicant asked for the hearing to be postponed so they could submit an updated proposal.
- The applicant submitted updated 43-lot subdivision proposal on April 29, 2022, with additional items received May 19, 20, 23, and 26, 2022.

SANDY
WHERE INNOVATION MEETS ELEVATION

Goalpost Rule

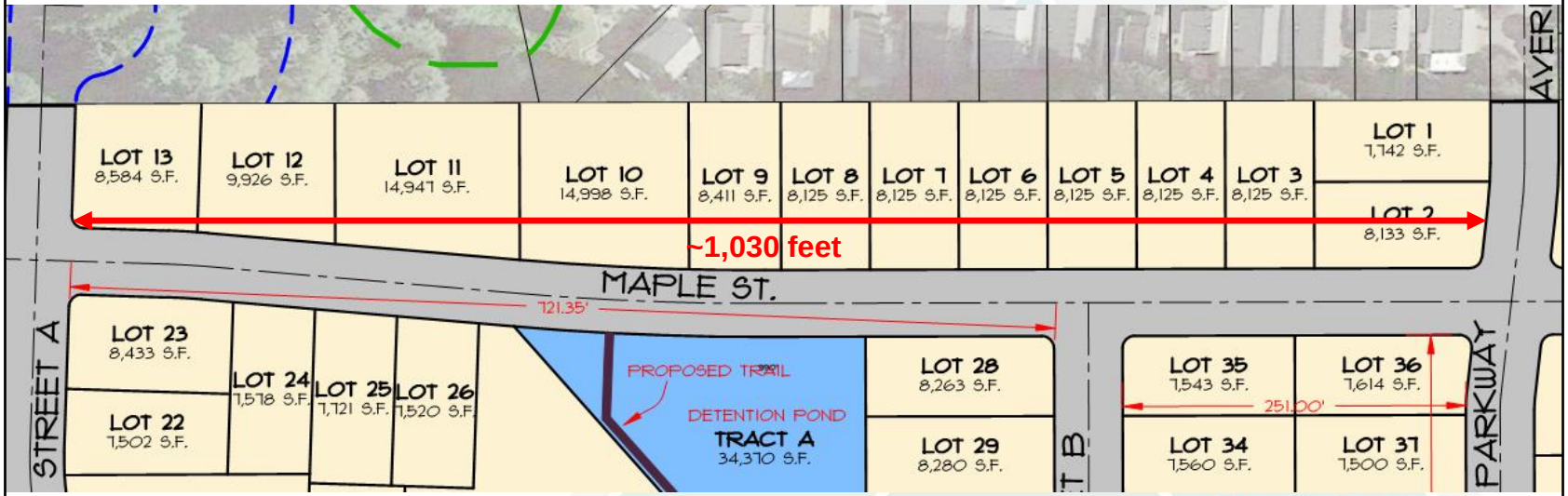
- Analysis based on code in place at time of submittal (May 6, 2021)
- Four ordinances with code amendments adopted since original submittal date *(these do not apply)*
  - HB 2001
  - Chapter 17.100, Land Division
  - Chapter 17.86, Parkland and Open Space
  - Repeal of Chapter 17.64, Planned Development

SANDY
WHERE INNOVATION MEETS ELEVATION

SIX (6) TYPE III VARIANCES

SANDY
WHERE INNOVATION MEETS ELEVATION

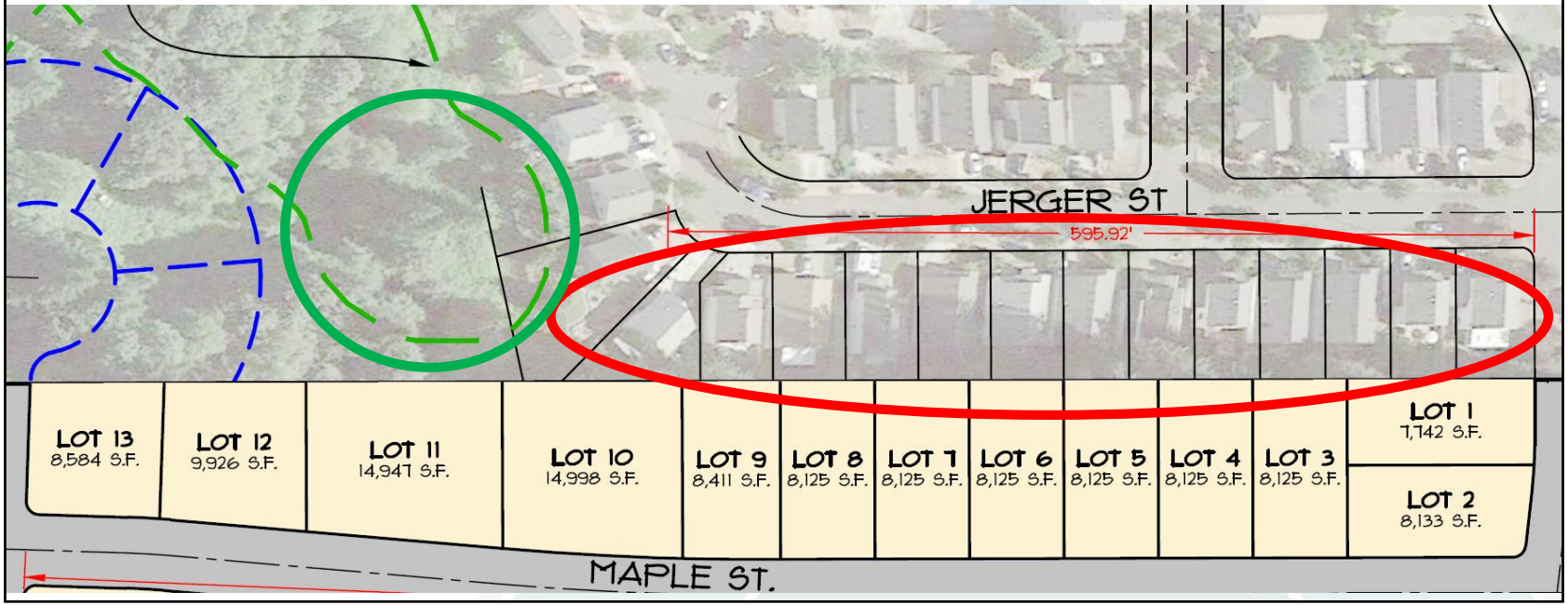
VARIANCE A. Variance to Section 17.100.120(B) to allow the north side of Maple Street between Street A and Averill Parkway to exceed 400 feet.



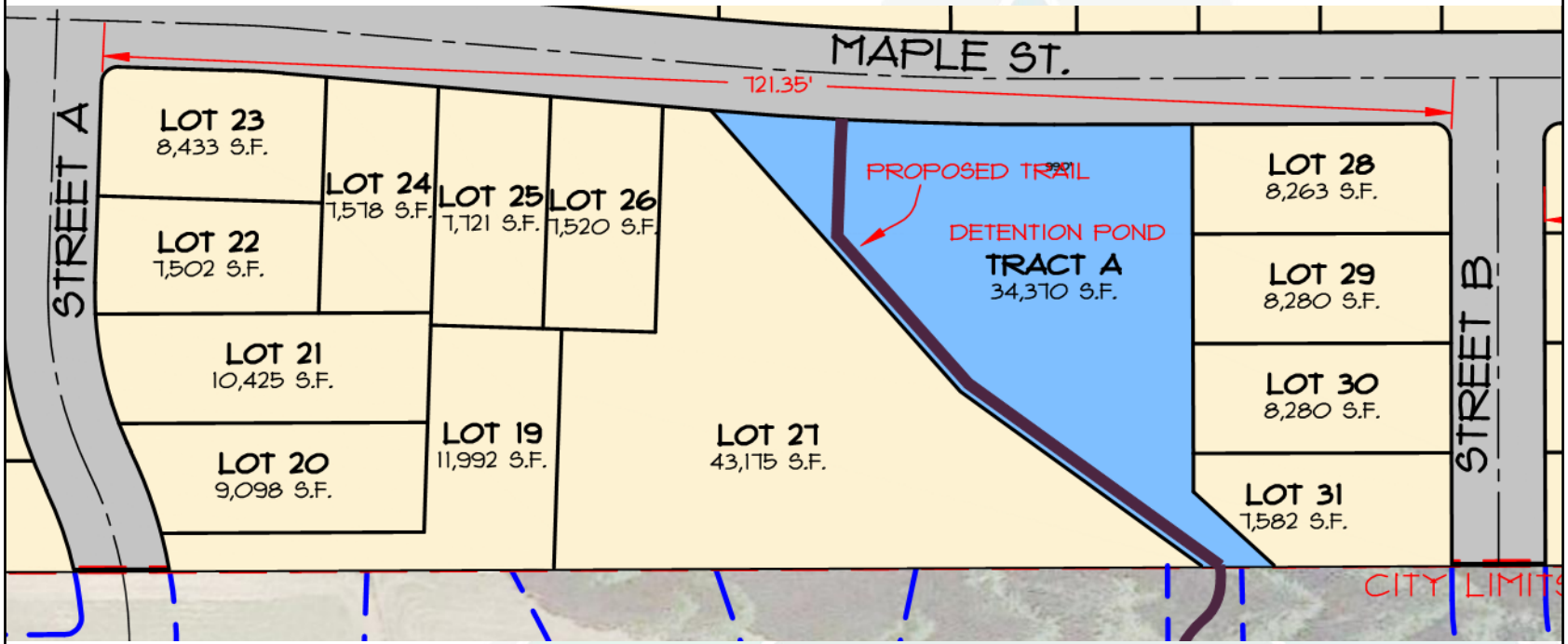
SANDY
WHERE INNOVATION MEETS ELEVATION

Recommendation

Staff recommends the Planning Commission **approve** the requested variance to Section 17.100.120(B) to allow the north side of Maple Street between Street A and Averill Parkway to exceed 400 feet.

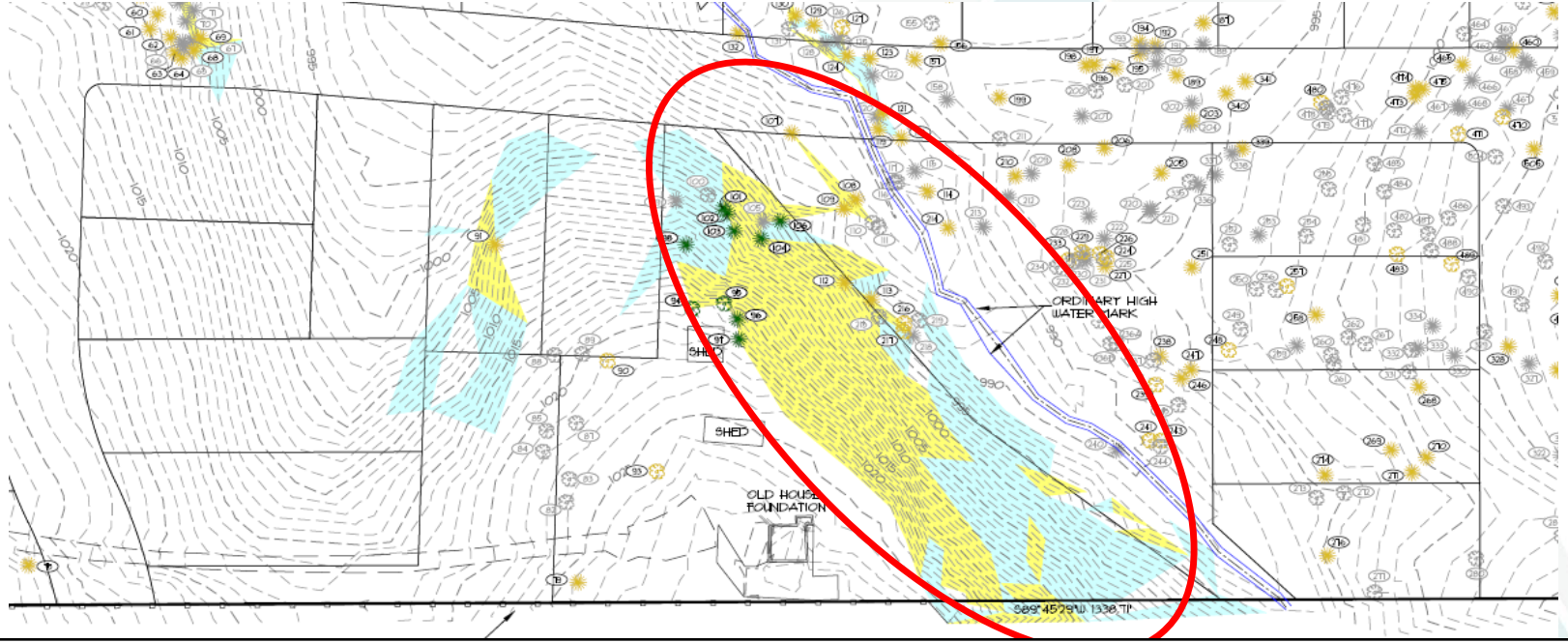


VARIANCE B. Variance to Section 17.100.120(B) to allow the south side of Maple Street between Street A and Street B to exceed 400 feet.

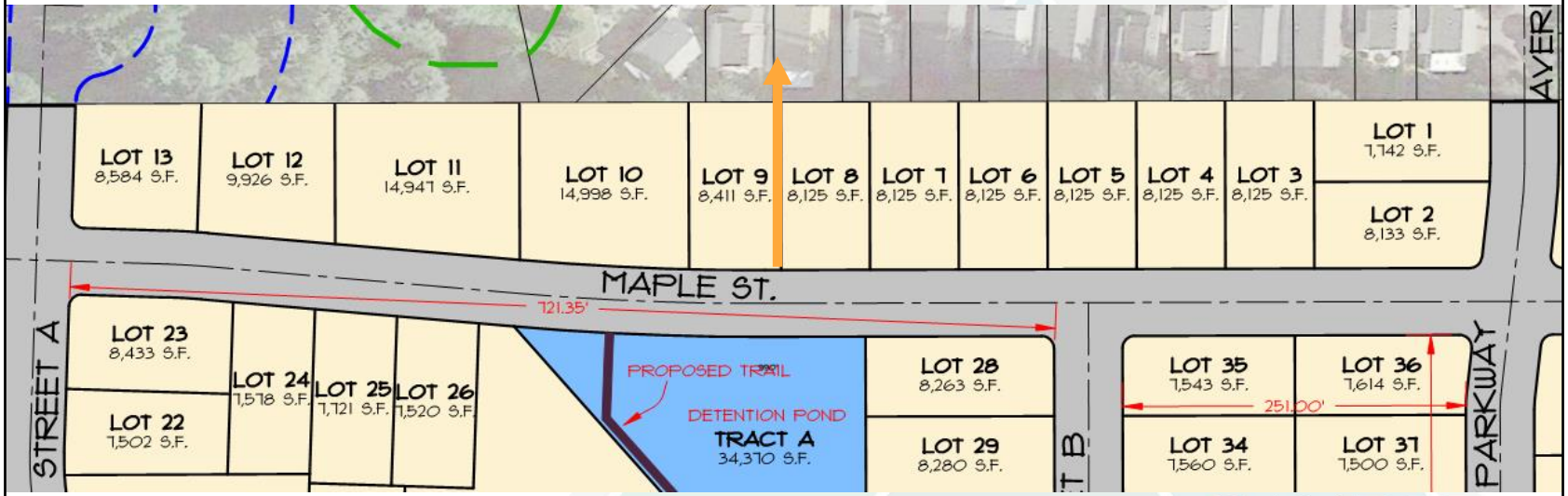


Recommendation

Staff recommends the Planning Commission **approve** the requested variance to Section 17.100.120(B) to allow the south side of Maple Street between Street A and Street B to exceed 400 feet.



VARIANCE C. Special Variance to Section 17.100.120(D) to not include a bike/ped accessway on the north side of Maple Street between Street A and Averill Parkway, which exceeds 600 feet.

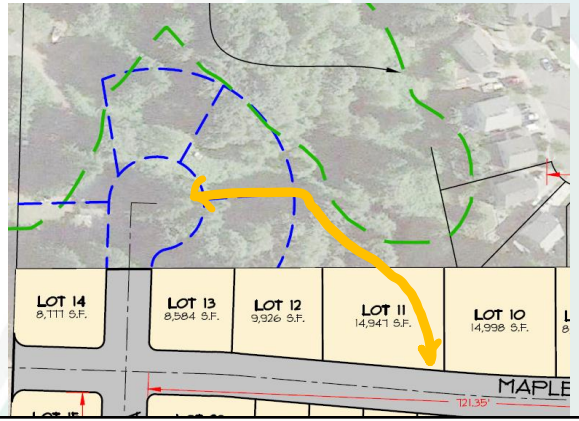


SANDY
WHERE INNOVATION MEETS ELEVATION

Recommendation

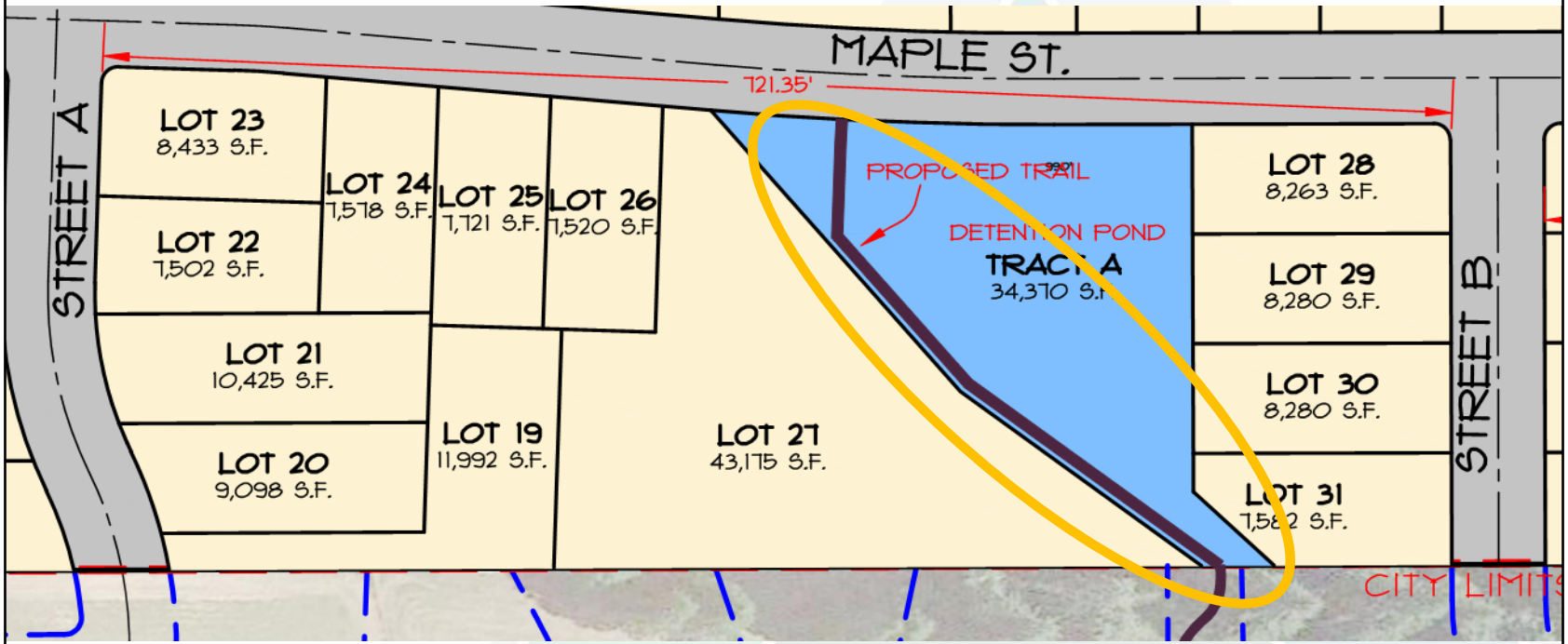
Staff recommends the Planning Commission **approve** the requested Special Variance to Section 17.100.120(D) to not include a bike/ped accessway on the north side of Maple Street between Street A and Averill Parkway, which exceeds 600 feet.

- **RECOMMENDED CONDITION:** Include a pedestrian easement and provide sufficient width for a pedestrian path through the stream, wetland, and tree protection tract between Lots 10 and 11 such that it can connect north to the cul-de-sac detailed on the future street plan upon development of the property to the northwest (Tax Lot 3600).



SANDY
WHERE INNOVATION MEETS ELEVATION

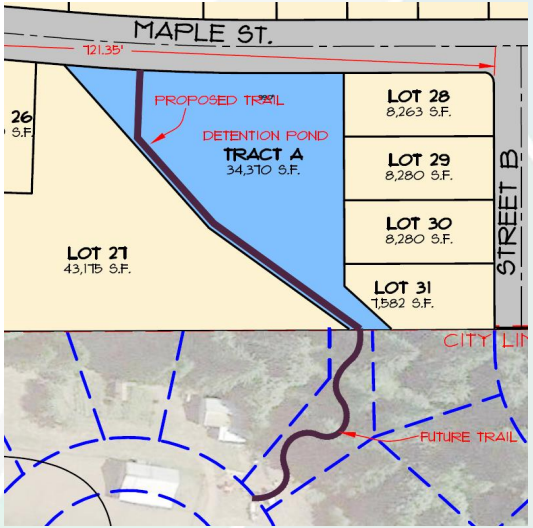
VARIANCE D. Special Variance to Section 17.100.120(D) to not include a bike/ped accessway on the south side of Maple Street between Street A and Street B, which exceeds 600 feet.



Recommendation

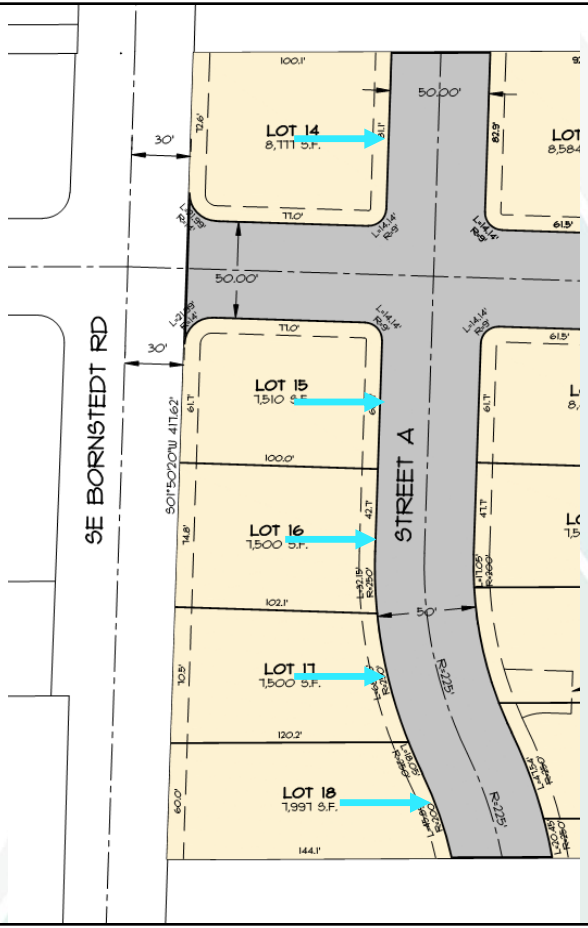
Staff recommends the Planning Commission **approve** the requested Special Variance to Section 17.100.120(D) to not include a bike/ped accessway on the south side of Maple Street between Street A and Street B, which exceeds 600 feet.

- **RECOMMENDED CONDITION:** Require a six-foot-wide soft-surface trail through Tract A as proposed.



SANDY
WHERE INNOVATION MEETS ELEVATION

VARIANCE E. Special Variance to Section 17.82.20 to allow Lots 14-18 to face the internal street network rather than Bornstedt Road.

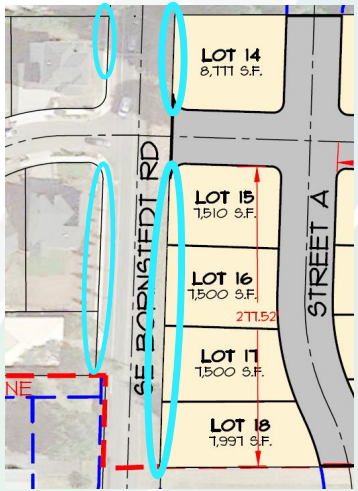


SANDY
WHERE INNOVATION MEETS ELEVATION

Recommendation

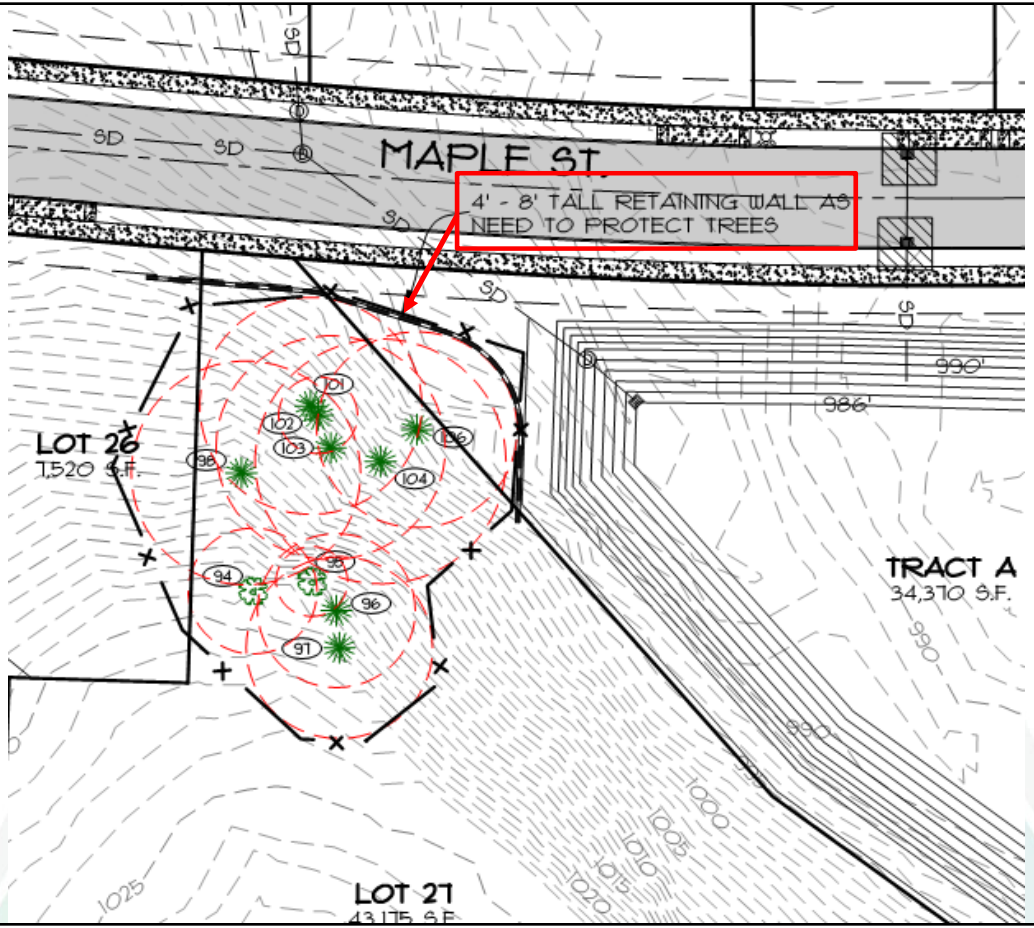
Staff recommends the Planning Commission **approve** the requested Special Variance to Section 17.82.20 to allow Lots 14-18 to face the internal street network rather than Bornstedt Road.

- **RECOMMENDED CONDITION:** Require the applicant to add additional design elements and decorative fencing along the Bornstedt Road facing sides of Lots 14-18.



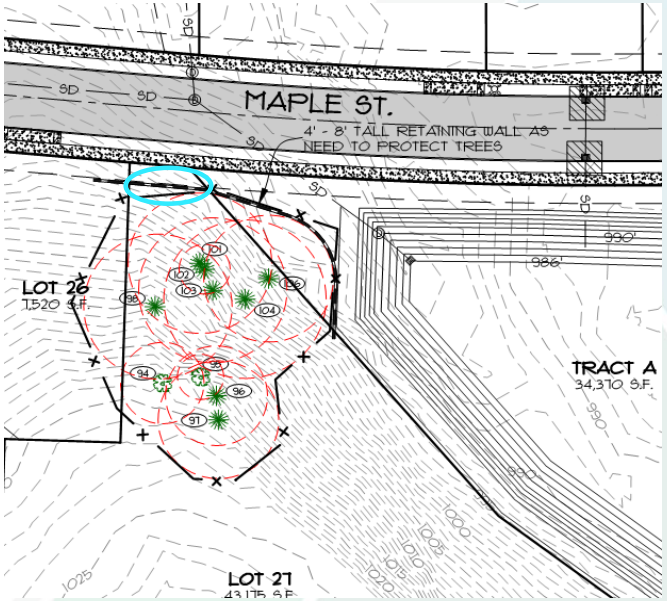
SANDY
WHERE INNOVATION MEETS ELEVATION

VARIANCE F. Special Variance to allow up to an 8-foot-tall retaining wall in the front yard of Lot 27.



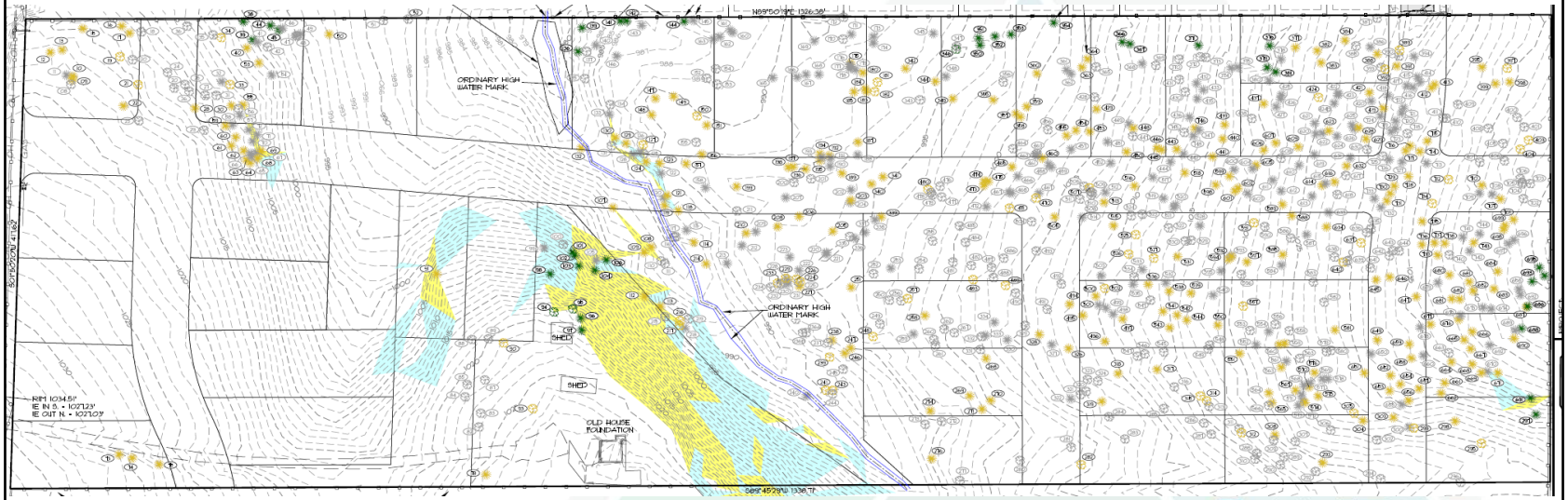
Recommendation

Staff recommends the Planning Commission **approve** the requested Special Variance to Section 17.74.40(A.2) to allow up to an 8-foot-tall retaining wall in the front yard of Lot 27.



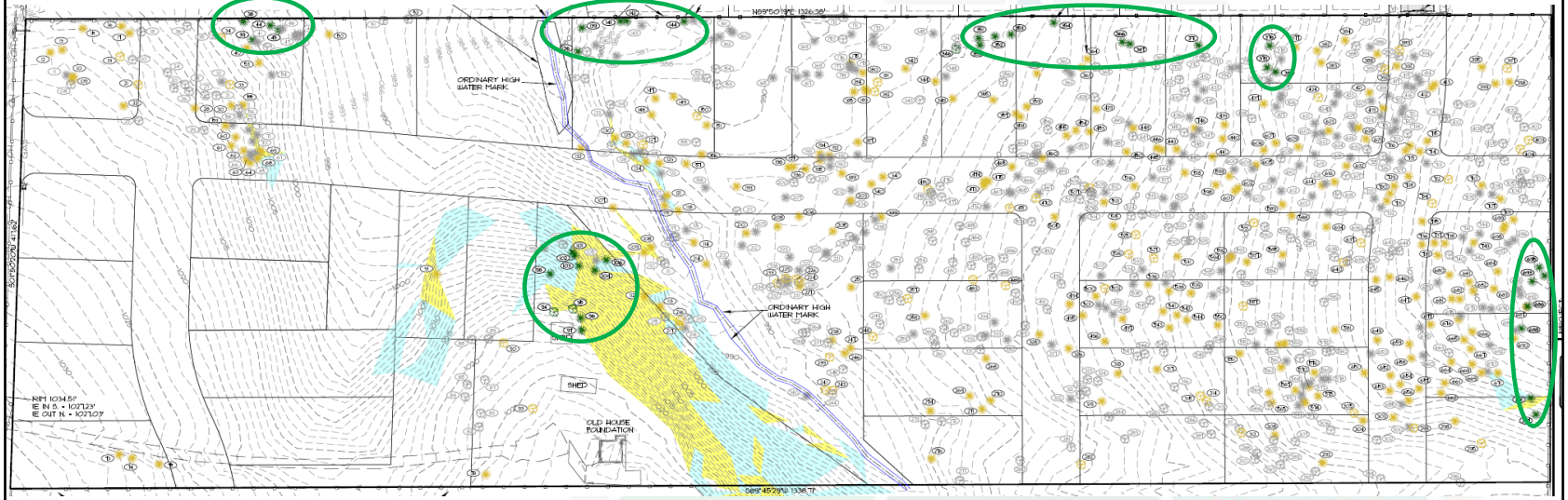
SANDY
WHERE INNOVATION MEETS ELEVATION

Existing Trees



SANDY
WHERE INNOVATION MEETS ELEVATION

Retention Trees – Proposed to be preserved



SANDY
WHERE INNOVATION MEETS ELEVATION

Retention Trees with CRZs

Tree Summary

- Minimum retention requirement = 38 healthy trees, 11” DBH or greater, and likely to grow to maturity
- Applicant’s proposal is to retain 38 trees
- Inventory conducted in July 2020
- Third party arborist evaluated applicant’s 38 trees June 2022
  - 1 dead
  - 13 additional trees cannot be adequately protected by the root protection zone on the subject property
- Updated tree retention plan needed

SANDY
WHERE INNOVATION MEETS ELEVATION

RECOMMENDATION

Staff recommends the Planning Commission **approve** the subdivision request **with conditions.**

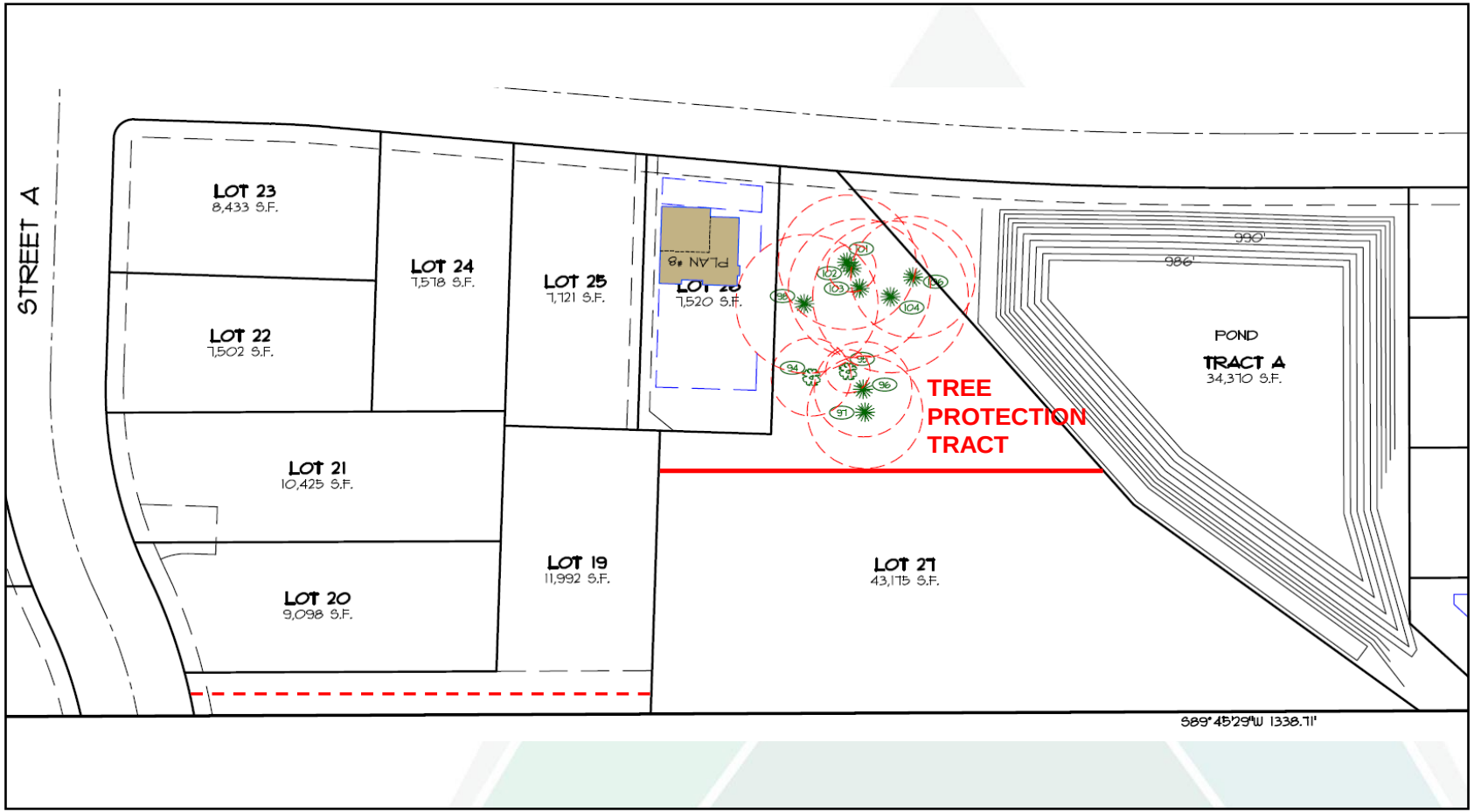
Staff recommends the Planning Commission **approve** the six requested Type III variances **with conditions.**

SANDY
WHERE INNOVATION MEETS ELEVATION

ADDITIONAL RECOMMENDATIONS

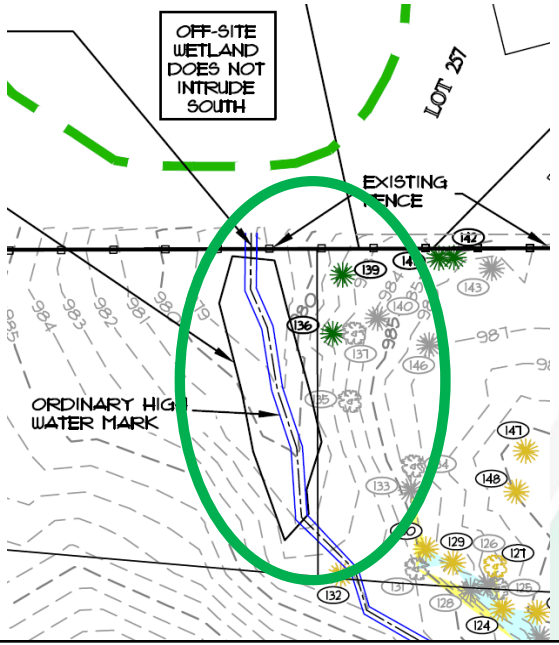
1. Majority of retention trees located in a separate tree retention tract.
2. Increase Tract A to include the clump of retention trees on the north end of Lot 27 such that Tract A becomes a joint storm detention facility and tree protection tract dedicated to the City – OR – create a separate tree protection tract to be owned and maintained by an HOA or other private owner.
    - To accomplish this, staff recommends the Planning Commission approve 2 variances to Section 17.34.30(C) to allow Tax Lots 19 and 27 to each have only 10 feet of frontage on a public street (Street A) for a total combined width of 20 feet. This is effectively the same as the applicant's proposal in which Tax Lot 19 has a 20-foot-wide flagpole with an access easement to Tax Lot 27.

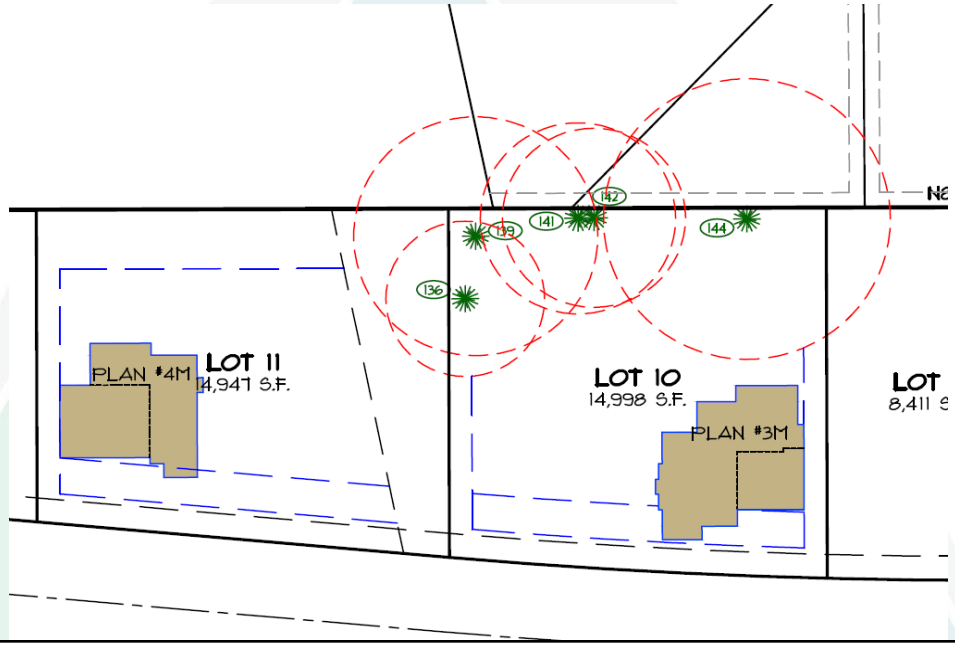
SANDY
WHERE INNOVATION MEETS ELEVATION


STREET A
LOT 23
8,433 S.F.
LOT 22
7,502 S.F.
LOT 24
7,578 S.F.
LOT 25
7,721 S.F.
PLAN #8
LOT 26
7,520 S.F.
LOT 21
10,425 S.F.
LOT 20
9,098 S.F.
LOT 19
11,992 S.F.
LOT 27
43,175 S.F.
TREE
PROTECTION
TRACT
990'
986'
POND
TRACT A
34,370 S.F.
S89°45'29"W 1338.71'

ADDITIONAL RECOMMENDATIONS

3. Joint tree protection and stream/wetland protection tract between Lots 10 and 11 either to be dedicated to the City or owned and maintained by an HOA or other private owner.





ADDITIONAL RECOMMENDATIONS

4. Require the applicant to submit a cash payment to cover half the estimated cost of terminating the temporary fire turnaround easements, removing the paved fire turnarounds on the private lots and replacing with landscaping, and removing the driveway approaches and replacing them with curb, planter strip, and street trees.