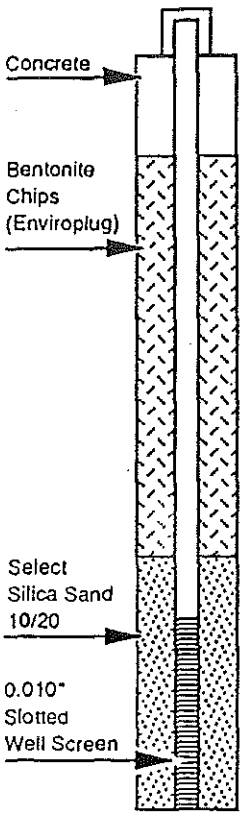
Appendix A

Boring Logs

MAUL FOSTER ALONGI

BORING NO.	SB-1	ELEVATION:	11.32 ft
LOCATION:		DATE STARTED:	3/28/91
DRILLING AGENCY:	Soil Sampling Service	DATE COMPLTED:	3/28/91
DRILLING EQUIPMENT:	All-terrain CME-50	DRILLER: W. Lindholm	LOGGED BY: K. Teague
DRILLING METHOD:	4" ID HSA	SAMPLER:	SPT

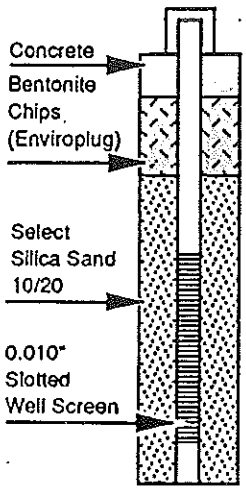


DEPTH (FEET)	BLOWS / 6 IN.	SAMPLE	GRAPHIC LOG	DESCRIPTION
5	1 4 2			(2.5 - 4.0) Loose, saturated, brown, medium grained sand (SP), trace of calcareous shell material (FILL)
10	1 0 0	AIR		(8.5 - 10.0) No recovery. Likely fine to medium grained saturated sand
15	0 0 4			(13.5 - 15.0) Very soft, plastic, saturated, clay (CL) with loose, saturated, gray, fine sand (SP)
20	7 11 16			(18.5 -20.0) Medium dense, saturated, gray, fine to medium sand (SP)

Screened in silt?
15 – 8.5 unknown

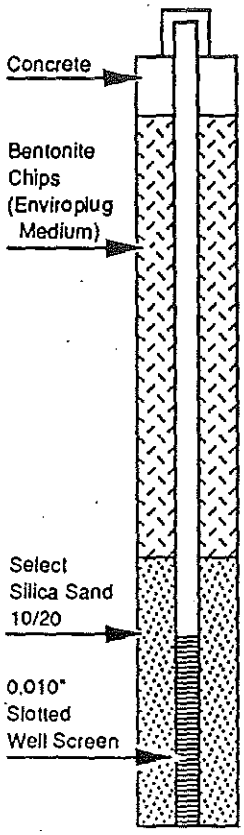
Project No. 91C0191A	Sithe Energies, U.S.A., Inc. Tacoma Cogeneration Project	LOG OF BORING SB-1	SHEET 1 of 7
Woodward-Clyde Consultants			

BORING NO. SB-1A	ELEVATION: 11.91 ft
LOCATION:	DATE STARTED: 3/28/91
DRILLING AGENCY: Soil Sampling Service	DATE COMPLTED: 3/28/91
DRILLING EQUIPMENT: All-terrain CME-50	DRILLER: W. Lindholm / LOGGED BY: K. Teague / D. Walker
DRILLING METHOD: 4" ID HSA	SAMPLER:



DEPTH (FEET)	BLOWS / 6 IN.	SAMPLE	GRAPHIC LOG	DESCRIPTION
5				Note: Not Sampled. Stratigraphic information from Well SB-1 except as noted (*) (2.3 - 4.0) Loose, saturated, brown, medium grained sand (SP) (FILL)
10				* (10.5) Clay encountered

BORING NO.	SB-2	ELEVATION:	10.91 ft
LOCATION:		DATE STARTED:	3/29/91
DRILLING AGENCY:	Soil Sampling Service	DATE COMPLETED:	3/29/91
DRILLING EQUIPMENT:	All-terrain CME-50	DRILLER: W. Lindholm / LOGGED BY:	K. Teague
DRILLING METHOD:	4" ID HSA	SAMPLER:	SPT

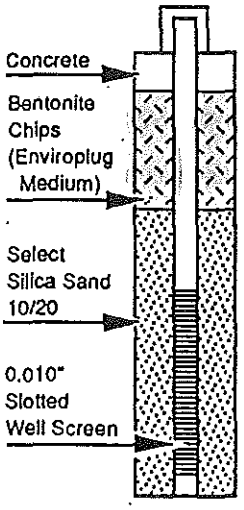


DEPTH (FEET)	BLOWS / 6 IN.	SAMPLE	GRAPHIC LOG	DESCRIPTION
5	2 2 2			(3.5 - 5.5) Loose, wet to saturated, dark gray to brown fine to medium sand (SP), trace of silt, trace of clayey blebs to 4mm diameter (FILL)
10	2 2 1			(8.5 - 10.5) Soft, saturated, gray-brown clay (CL) with abundant roots and rootlets
15	0			(13.5 - 15.5) Very soft, saturated, gray clay (CL)
20	1 8 14 12			(18.5 -20.5) Medium dense, saturated, dark gray, fine to medium sand (SP)

screened in silt/clay?
15.5 - 18.5 unknown.

Project No. 91C0191A	Sithe Energies, U.S.A., Inc. Tacoma Cogeneration Project	LOG OF BORING SB-2	SHEET 2 of 7
Woodward-Clyde Consultants			

BORING NO. SB-2A		ELEVATION: 11.78 ft	
LOCATION:		DATE STARTED: 3/29/91	
DRILLING AGENCY: Soil Sampling Service		DATE COMPLTED: 3/29/91	
DRILLING EQUIPMENT: All-terrain CME-50		DRILLER: W. Lindholm	LOGGED BY: K. Teague / D. Walker
DRILLING METHOD: 4" ID HSA		SAMPLER:	

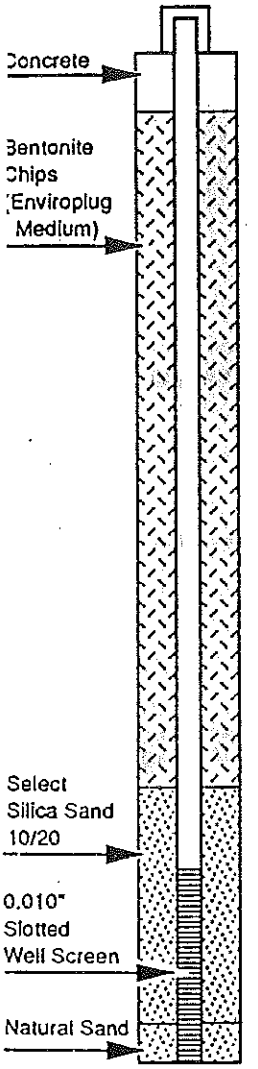


DEPTH (FEET)	BLOWS / 6 IN.	SAMPLE	GRAPHIC LOG	DESCRIPTION
				Note: Not Sampled. Stratigraphic information from Well SB-2, except as noted (*)
				(3.5 - 5.5) Loose, wet to saturated, dark gray to brown fine to medium sand (SP), trace of silt, trace of clayey blebs to 4mm diameter (FILL)
5				*(7.0 - 8.5) Refuse encountered
				(8.5 - 10.5) Soft, saturated, gray-brown clay (CL) with abundant roots and rootlets
10				

Screened in clay 8.5 - 10.5'

Project No. 91C0191A	Sithe Energies, U.S.A., Inc. Tacoma Cogeneration Project	LOG OF BORING SB-2A	SHEET 6 of 7
Woodward-Clyde Consultants			

BORING NO.	SB-3	ELEVATION:	14.07 ft
LOCATION:		DATE STARTED:	3/29/91
DRILLING AGENCY:	Soil Sampling Service	DATE COMPLTED:	3/29/91
DRILLING EQUIPMENT:	All-terrain CME-50	DRILLER: W. Lindholm / LOGGED BY:	K. Teague
DRILLING METHOD:	4" ID HSA	SAMPLER:	SPT

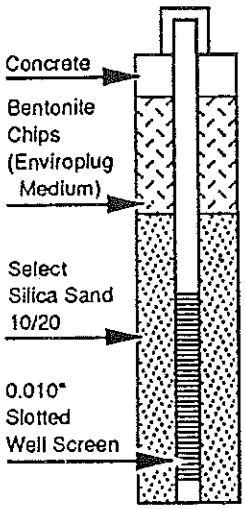


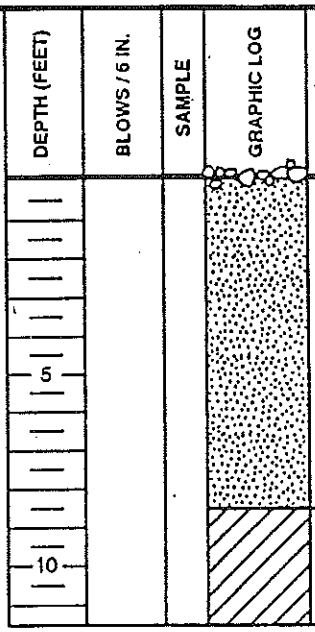
DEPTH (FEET)	BLOWS / 6 IN.	DESCRIPTION
		Surface: Coarse sandy gravel with cobbles mixed with white powdery lime
5	4 6 8	(3.5 - 5.5) Loose to medium, dense, saturated, medium sand (SP) trace of fine sand (FILL)
10	1 2 1-1/2	(8.5 - 10.5) Very soft, saturated, gray-tan clay (CL) with some darker gray vertically oriented streaks
15	0	(13.5 - 15.5) Very soft, saturated, gray clay (CL), trace to some silt in lower 3"
20	5 4 1 2	(18.5 -20.5) Very soft, saturated gray clay (2 layers, 4" and 7" thick) interbedded with loose, saturated, gray, medium sand
25	5 8 19	(23.5 - 25.5) Loose, saturated, poorly sorted gray silty fine sand (SW) with trace of clay, grading to dense, saturated, gray, medium sand (SP) with serveral white-tan clam shell fragments

screen in clay ?
20.5 - 23.5' unknown

Project No. 91C0191A	Sithe Energies, U.S.A., Inc. Tacoma Cogeneration Project	LOG OF BORING SB-3	SHEET 3 of 7
Woodward-Clyde Consultants			

BORING NO. SB-3A		ELEVATION: 13.26 ft	
LOCATION:		DATE STARTED: 3/29/91	
DRILLING AGENCY: Soil Sampling Service		DATE COMPLTED: 3/29/91	
DRILLING EQUIPMENT: All-terrain CME-50		DRILLER: W. Lindholm	LOGGED BY: K. Teague / D. Walker
DRILLING METHOD: 4" ID HSA		SAMPLER:	





DESCRIPTION

Note: Not Sampled. Stratigraphic information from Well SB-3

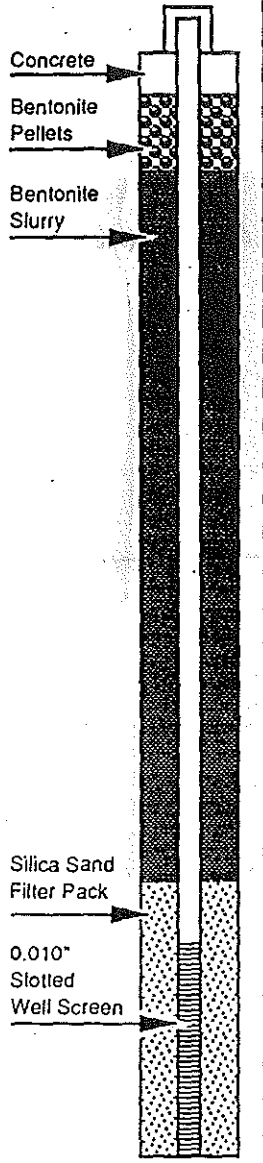
(3.5 - 5.5) Loose to medium, dense, saturated, medium sand (SP) trace of fine sand (FILL)

(8.5 - 10.5) Very soft, saturated, gray-tan clay (CL) with some darker gray vertically oriented streaks

Screen in clay 8.5-10.5' (at least)

Project No. 91C0191A	Sithe Energies, U.S.A., Inc. Tacoma Cogeneration Project	LOG OF BORING SB-3A	SHEET 7 of 7
Woodward-Clyde Consultants			

BORING NO.	SB-4	ELEVATION:	13.82 ft
LOCATION:		DATE STARTED:	4/1/91
DRILLING AGENCY:	Soil Sampling Service	DATE COMPLTED:	4/1/91
DRILLING EQUIPMENT:	All-terrain CME-50	DRILLER: W. Lindholm	LOGGED BY: K. Teague
DRILLING METHOD:	4" ID HSA	SAMPLER:	SPT



DEPTH (FEET)	BLOWS / 6 IN.	SAMPLE	GRAPHIC LOG	DESCRIPTION
				Surface - sandy gravel
				(1.0) Wood pulp & chunks of rubber
	3			(3.5 - 5.5) Tan wood, fibrous (FILL)
5	3			
	2			
	3			(8.5 - 10.5) Dark brown saturated, wood waste, with bits of black rubber material
	4			
10	3			
	0			(13.5 - 15.5) Very soft, saturated, gray clay (CL) uniform
15				
	3			(18.5 -20.5) Soft, saturated, interbedded gray clay (CL) and gray sandy silt (ML)
	2			
20	1			
	1			(23.5 - 25.5) Soft, saturated, gray silty clay (CL) grading at 25.0 to loose, saturated, gray fine to medium sand
	3			
25	3			
	9			(28.5 30.5) Dense, saturated, gray medium sand (SP) with thin 1/2" - 3/4" interbedded fine sand stringers and one 4" silt lense
	18			
30	14			

screened in clay at least 23.5 - 25',

Project No. 91C0191A	Sithe Energies, U.S.A., Inc. Tacoma Cogeneration Project	LOG OF BORING SB-4	SHEET 4 of 7
Woodward-Clyde Consultants			

PSC PHILIP SERVICES CORP

Soil Stratigraphy Field Log

Location ID: SRI-16
Facility: Tacoma
Project: Tacoma SRI-II

Date: 1/18/02
Field Geologist: Corey Johnson
Location Type: Temporary
X Soil Boring Only X Well _ Test Pit

Drilling Method: Geoprobe thru 4.25 in HSA
Sampling Method: 4' X 2" Acetate liner
Total Depth: 26'

Depth of Sample (ft bgs)	Sample ID	Blow Counts (per 6")	Total Organics (ppm)	Sample Recovery (Inches)	Geological Description: Sample interval, Unified Soil Class ID, Munsell Color, grain size, sorting, moisture, compaction, indication of contaminants (odor or sheen), and general stratigraphic description.
0.0'			Breathing Zone: In-Spoon: Headspace: 0.0 bgs 0.0	36"	0-5" SP Olive Black, fine sand with few medium sand, Moderately Sorted, moist, loose, root debris 5-9" SW, Moderate Olive Brown, fine sand with some medium and some fine gravel, poorly sorted, moist, loose, fine and coarse gravel size pieces of black charcoal 9-15" SM light olive gray with light olive brown patches, 50/50 silt/sand mix, moderately sorted, moist to dry, medium stiff 15-17" Brown Black wood/bark 17-20" SW, Moderate Olive Brown, medium and fine grain sand with fine gravel, poorly sorted, loose, some brown black wood debris 20-24" ML light olive Gray, Sandy Silt with fine sands, well sorted, dry, very stiff, 24-36 SM, Moderate Olive Brown/with light olive brown mixed throughout, silty sand, fine sand with some medium, one 2" x 1" Cobble, wood debris poorly sorted, moist, loose

0'
4'

Geologist's Signature _____ Date 1/18/02 Reviewer _____ Date ____ Pg 1 of 3

PHILIP SERVICES CORP.

Soil Stratigraphy Field Log

Location ID: SRI-16
Facility: Tacoma
Project: Tacoma SRI-II

Date: 1/18/02
Field Geologist: Corey Johnson
Location Type: Temporary — X Soil Boring Only — X Well — Test Pit
Drilling Method: Geoprobe thru 4.25in HSA
Sampling Method: 4'x2" Acetate liner
Total Depth: 26'

Depth of Sample (ft bgs)	Sample ID	Blow Counts (per 6")	Total Organics (ppm)	Sample Recovery (inches)	Geological Description: Sample interval, Unified Soil Class ID, Munsell Color, grain size, sorting, moisture, compaction, indication of contaminants (odor or sheen), and general stratigraphic description.
4' 0.0'			Breathing Zone: In-Spoon: Headspace: 0.0	34"	0-12" SR Olive Black, moderatly Sorted, fine sand with few fines, moderatly Sorted, Wet, loose 12-19" SM, Olive Black/moderate yellowish brown mixtures, Moderatly Sorted (fine sand) Wet, medium dense, Silty Sand. 19-34" SM, Olive Black, fine Sand with silt increasing with depth, moderatly sorted, moist to wet, loose-medium dense
8'			0.0	34"	0-19" SM/ML Olive Gray, Silt/fine grain mix with Silt increasing with depth 25/75 → 75/25 wet to moist with depth, Soft to medium stiff with depth, 19-34" SM Olive Black, moderatly Sorted, wet, medium dense, fine red grain sands
12			0.0	24"	0-4" SM Olive Black, moderatly Sorted, wet, medium dense, fine red grain Sands 4-24" ML Olive Gray with dark Gray Streaks from 0-10", Silt with very few fine sands, very well Sorted, moist, medium Stiff to soft with depth, root debris throughout
14'					

Geologist's Signature _____ Date 1/18/02 Reviewer _____ Date ____ Pg 2 of 3

4' & 8' Sample

PHILIP SERVICES CORP.

Soil Stratigraphy Field Log

Location ID: SBI-16D
Facility: Tacoma
Project: Tacoma SBI-II
Location Type: Temporary — X Soil Boring Only — X Well — Test Pit

Date: 1/18/02
Field Geologist: Corey Johnson
Total Depth: 26'
Drilling Method: Geoprobe thru 4.25 in HSA
Sampling Method: 4'x2" Acetate liners

Depth of Sample (ft bgs)	Sample ID	Blow Counts (per 6")	Total Organics (ppm)	Sample Recovery (inches)	Geological Description: Sample Interval, Unified Soil Class ID, Munsell Color, grain size, sorting, moisture, compaction, indication of contaminants (odor or sheen), and general stratigraphic description.
14' 0.0'			Breathing Zone: In-Spoon: Headspace: 0.0	46"	0-40" ML Olive Gray Silt with few fine Sand, Very well Sorted, Wet, Soft 40-43" ML olive Gray Silt with some fine Sand, Well Sorted, wet Soft 43-46" SM olive Black SP fine Sand with few Silt, moderately Sorted, Wet, loose,
18'			0.0	48"	0-48" SP/SW olive Black, fine Sand with few Silt, Moderatly Sorted, wet, loose, fine red sand grains throughout
22'			0.0	44"	0-13" SP/SW olive Black, fine sand with few Silt, moderatly Sorted, Wet, loose, fine red sand grains throughout 13-28" SM, olive Gray/olive black, fine Sand with silt mix (Mostly on outside of sample core) Moderatly Sorted, Wet, Soft/loose 28-44" SP/SW olive black, fine Sand with few Silt, moderatly Sorted, wet, loose, fine red sand grains throughout
26			0.0		

Geologist's Signature _____ Date 1/18/02 Reviewer _____ Date ____ Pg 3 of 3

PHILIP SERVICES CORP.

Soil Stratigraphy Field Log

Location ID: TT SRI-17/17D
Facility: Tacoma
Project: Tacoma SRI-II

Date: 1/16/02
Field Geologist: Corey Johnson
Location Type: Temporary
☒ Soil Boring Only ☒ Well ☐ Test Pit

Drilling Method: Geoprobe
Sampling Method: 4'x2" Acetate liner
Total Depth: 24'

Depth of Sample (ft bgs)	Sample ID	Blow Counts (per 6")	Total Organics (ppm)	Sample Recovery (inches)	Geological Description: Sample Interval, Unified Soil Class ID, Munsell Color, grain size, sorting, moisture, compaction, indication of contaminants (odor or sheen), and general stratigraphic description.
0'					
0.0'			Breathing Zone: In-Spoon: Headspace: 0.0 bag 0.0	42"	0-5" GW Dark Yellowish brown medium and coarse grain sand with fine and coarse gravel, loose, moist, Several Moderate brown gravels, poorly sorted 5-16" GW Light Gray/very light gray mix, medium and coarse grain sand with fine and coarse gravels Some fines, dry, loose, poorly sorted, looks like cement. 16-42" SM, Olive black, medium and fine sands with silt, ml silt in small pockets from 16-28", medium dense, moist, fine sands increasing with depth.
	SRI-17-S-2-4-0102				
4'					
			0.0 bag 0.0	36"	0-7" SM Moderate yellowish brown, fine sand with some medium sand and several pockets of ml silt, moderately sorted, medium dense, 2 moderate brown layers at 5", Pale Yellowish orange medium sands at 6"-6.5" moist - wet 7-36" SM Olive black, fine sand with increasing medium sands with depth, some fines, moderately sorted, loose - medium dense, white shells at 15"-22", red grains throughout, Wet
8'					

Geologist's Signature: _____ Date 1/16/02 Reviewer _____ Date ____ Pg 1 of 3

4-8' sample - 4-8' to wet/soft to stay in sampler

PHILIP SERVICES CORP.

Soil Stratigraphy Field Log

Location ID: SRI-17 / 17D
Facility: Tacoma
Project: Tacoma SRI-II

Date: 1/16/02
Field Geologist: Corey Johnson
Location Type: Temporary
☒ Soil Boring Only ☒ Well ☐ Test Pit

Drilling Method: Geoprobe
Sampling Method: 4' x 2" acetate liner
Total Depth: 24'

Depth of Sample (ft bgs)	Sample ID	Blow Counts (per 6")	Total Organics (ppm)	Sample Recovery (inches)	Geological Description: Sample Interval, Unified Soil Class ID, Munsell Color, grain size, sorting, moisture, compaction, indication of contaminants (odor or sheen), and general stratigraphic description.
0.0'			Breathing Zone: In-Spoon: Headspace: 0.0	24"	0-3" Sm Olive black medium and fine sand with increasing fines, medium dense, wet, moderatly sorted, 3-8" Sm same as 8-10 0-3 50% silt 50% medium and fine sand. 8-12" Sm, olive black, fine and medium sand, moderatly sorted, loose-medium dense, wet, 12-18" ML Olive gray, silt with some fine sand, well sorted, soft, moist-wet, 18-24" OL, Olive black silt with some fine sand, full of root debris, moderatly sorted, dry-moist, soft but bound together by roots
			0.0	24"	0-24" ML Olive gray with grayish black streaks, silt with few fine sand, several chunks (1"-2") of wood from 11-11.5' Soft, moist, well sorted
				44"	0-44 ML Olive gray with grayish black streaks, silt with few fines, sands, soft, moist, very well sorted

8'
10'
12'
16'

Geologist's Signature _____ Date 1/16/02 Reviewer _____ Date ____ Pg 2 of 3

PHILIP SERVICES CORP

Soil Stratigraphy Field Log

Location ID SB-17/17D
Facility Tacoma
Project Tacoma

Date: 1/16/02
Field Geologist: Corey Johnson
Location Type: Temporary — X Soil Boring Only — X Well — _ Test Pit

Drilling Method: geoprobe thru 4.25 in HSA
Sampling Method: 4' x 2" Acetate liner
Total Depth: 24'

Depth of Sample (ft bgs)	Sample ID	Blow Counts (per 6")	Total Organics (ppm)	Sample Recovery (inches)	Geological Description: Sample Interval, Unified Soil Class ID, Munsell Color, grain size, sorting, moisture, compaction, indication of contaminants (odor or sheen), and general stratigraphic description.
16					
0.0'			Breathing Zone: In-Spoon: Headspace: 0.0	36"	0-12" ML olive black silt with some fines, well sorted, 0-4 wet and soupy 4-12 wet, very soft, 12-36" SM, Olive black, fine and medium sands with some silt, moderatly sorted, loose, wet, red grains
20'				44"	0-44" SM, olive black, medium and fine sands, very few fines, moderatly sorted, medium dense sand, wet, red grains
24'					

Geologist's Signature _____ Date 1/16/02 Reviewer _____ Date ____ Pg 3 of 3

16-20 recovery from 17-20, 16-17 felt really soft and soupy
end of silt @ 18'

PHILIP SERVICES CORP

Soil Stratigraphy Field Log

Location ID: SAI-18
Facility: Tacoma
Project: Tacoma SAI-II
Location Type: Temporary — X Soil Boring Only — X Well — Test Pit

Date: 11/16/02
Field Geologist: Corey Johnson
Total Depth: 10'
Drilling Method: Geoprobe
Sampling Method: 4' X 2" acetate liners

Depth of Sample (ft bgs)	Sample ID	Blow Counts (per 6")	Total Organics (ppm)	Sample Recovery (Inches)	Geological Description: Sample Interval, Unified Soil Class ID, Munsell Color, grain size, sorting, moisture, compaction, indication of contaminants (odor or sheen), and general stratigraphic description.
0' 0.0'			Breathing Zone: In-Spoon: Headspace: 0.0 bag 0.0	36"	0-6" Sm olive black to black, fine grain sand with organic debris (roots, leaves, grass), moist, loose, moderatly sorted, some fines 6-29" Sm, Olive black, fine sand with some fines, moist, medium dense, moderate-well sorted, 29-36" Sm olive Black, medium sand with some fine sand and few fines, medium dense, moist-wet, moderatly sorted.
4'			0.0	24"	0-24" Sm grayish black, medium and fine sands with some fines, moderatly sorted, wet, medium dense, mixed pockets of ml silt from 10-13", white rocks and shells 6-15".
8'			0.0	24"	0-2" ml olive gray, silt with few fine sand, very well sorted soft, wet, 2-7" OL Olive black, silt with few fine sand, some organic debris (small roots) well sorted, moist 7-24" ml Olive gray, silt with few fine sands, very well sorted Dark gray/grayish black streaks from 7-20", medium stiff, most
10					

Geologist's Signature _____ Date 11/16/02 Reviewer _____ Date ____ Pg 1 of 1

0-4' Sample is 0-3' Top material was dense making 3-4' soil displaced
4-8' Sample is 4-8' foot of soil consolidated to 6-8', 4-6' was water from soils

PHILIP SERVICES CORP.

Soil Stratigraphy Field Log

Location ID: SRI-18D
Facility: Tacoma
Project: SRI-II

Date: 1/17/02
Field Geologist: Corey Johnson
Location Type: Temporary
☒ Soil Boring Only ☐ Well ☐ Test Pit

Drilling Method: Geoprobe thru 4.25 in HSA
Sampling Method: 4' x 2" Acetate liner
Total Depth: 22'

Depth of Sample (ft bgs)	Sample ID	Blow Counts (per 6")	Total Organics (ppm)	Sample Recovery (inches)	Geological Description: Sample Interval, Unified Soil Class ID, Munsell Color, grain size, sorting, moisture, compaction, indication of contaminants (odor or sheen), and general stratigraphic description.
10' 0.0'			Breathing Zone: In-Spoon: Headspace: 0.0	44"	0-23" ML olive gray, Silt with few fines, very well sorted, moist, soft, 23-25" SM, olive black, fine sand with some silt, moderately to well sorted, moist, loose-medium dense, 25-44" ML olive gray, Silt with few fines, very well sorted, moist, medium stiff
14'			0.0	44"	0-30" SM, Olive Black, medium and fine grain sands, some fines, wet, moderately sorted, red grains throughout 30-33" SM Olive Gray Silt with fine sand medium sand 50/50 silt sand, wet, Stiff, Dense 33-44" SM, olive Black, medium and fine sand, ~~some fine~~ few fines, wet, moderately sorted, red grains,
18'				46"	0-46" SM; olive Black, medium and fine sand, few fines, moderately sorted, wet, red grains throughout
22'					

Geologist's Signature _____ Date 1/17/02 Reviewer _____ Date ___ Pg 1 of 1

PHILIP SERVICES CORP

Soil Stratigraphy Field Log

Location ID: SRI-19/19D
Facility: Tacoma
Project: Tacoma SRI-II

Date: 1/17/02
Field Geologist: Corey Johnson
Location Type: Tacoma
X Soil Boring Only X Well _ Test Pit

Drilling Method: Geoprobe/ Geoprobe thin 4.25in HSA
Sampling Method:
Total Depth: 36'

Depth of Sample (ft bgs)	Sample ID	Blow Counts (per 6")	Total Organics (ppm)	Sample Recovery (Inches)	Geological Description: Sample Interval, Unified Soil Class ID, Munsell Color, grain size, sorting, moisture, compaction, indication of contaminants (odor or sheen), and general stratigraphic description.
0' 0.0'			Breathing Zone: In-Spoon: Headspace:	36"	0-3" SM, olive Black, fine grain sands with few fines, organic debris (roots, leaves), moist to wet, loose 3-15 SW, olive Black, medium and fine grain sand with few fines, moderatly sorted, wet, loose 15-18" SM, moderate Yellowish brown fine sand with medium sand and pocket of ml. Silt same color, wet, poorly-moderatly sorted, loose - medium dense 18-36" SW, Olive Black, medium and fine grain sand, few fines, Several small pockets of moderate Yellowish brown ml Silt, wet, poorly to moderatly Sorted, loose to medium dense
4'			0.0	40"	0-7" SW Olive Black medium and fine grain sand, few fines, Wet, medium dense, red grains 7-20" SW, Grayish Black, medium and fine Sand, few fines, Wet, Small white shells, red fine and med. grains, 20-32" SW, Grayish Black, fine sand with some medium and

Geologist's Signature _____ Date 1/17/02 Reviewer _____ Date ____ Pg 1 of 4

4-8' sample mostly 5-8'

PHILIP SERVICES CORP

Soil Stratigraphy Field Log

Location ID SRI-19/19D
Facility Tacoma
Project Tacoma SRI-II

Date 1/17/02
Field Geologist Corey Johnson
Location Type: Temporary
X Soil Boring Only X Well _ Test Pit

Drilling Method 6" geoprobe / 6" geoprobe thru 4.25 in HSA
Sampling Method 4' x 2" Acetate liner
Total Depth 36'

Depth of Sample (ft bgs)	Sample ID	Blow Counts (per 6")	Total Organics (ppm)	Sample Recovery (inches)	Geological Description: Sample Interval, Unified Soil Class ID, Munsell Color, grain size, sorting, moisture, compaction, indication of contaminants (odor or sheen), and general stratigraphic description.
1-6' cont.					
0.0'			Breathing Zone: In-Spoon: Headspace: 0.0		26-32" cont. Some fines, red fine grain sand through out, Wet, Medium dense, moderatly Sorted, 32-40" Sm, Olive Gray, fine grain Sand with silt, Wet, Dense, Wood piece 2" x 1" at 37-39", Moderatly Sorted
8'			0.0	18"	0-7" Sm, olive Gray, fine grain Sand with silt, Wet, dense, moderatly - well Sorted, 7-11" ml, Olive Gray, Silt with root debris, moist to wet, well Sorted, 7-18" OL, Olive Gray, Silt with few fines, moderate olive brown root debris through out Moist, Dark gray Streaks, Soft,
10'			0.0	47"	0-47 ml, ~~olive~~ light gray, Silt, Very well Sorted, moist, Medium stiff, Dark gray Streaks from 0-22"
14'			0.0	45"	0-24" ml, olive Gray, Silt, very well sorted, moist, Soft, 24-30 ml, olive Gray/Dark Gray, Silt with few fine grain sand Soft, moist, well Sorted

Geologist's Signature _____ Date 1/17/02 Reviewer _____ Date ___ Pg 2 of 4

PHILIP SERVICES CORP

Soil Stratigraphy Field Log

Location ID SRI-19D
Facility Tacoma
Project Tacoma SRI-II

Date 1/17/02
Field Geologist Corey Johnson
Location Type: ~~Tacoma~~ Temporary
X Soil Boring Only X Well _ Test Pit

Drilling Method 6 coprobe thru 4.25 HSA
Sampling Method 4' x 2" Acetate liner
Total Depth 36'

Depth of Sample (ft bgs)	Sample ID	Blow Counts (per 6")	Total Organics (ppm)	Sample Recovery (inches)	Geological Description: Sample Interval, Unified Soil Class ID, Munsell Color, grain size, sorting, moisture, compaction, indication of contaminants (odor or sheen), and general stratigraphic description.
14-18' cont 0.0'			Breathing Zone: In-Spoon: Headspace:		30-45" ml, Olive Gray, Silt with few fine Gray Sand, well Sorted, moist, stiff
18'			0.0	42"	0-42" ml, olive Gray, Silt with few fine Sands increasing with depth, well Sorted, medium stiff,
22'			0.0	48"	0-30" SM, Olive Gray, ~~Silt Sand~~ 50/50 Silt fine Sand mix, moderatly Sorted, moist, stiff 30-48" ml, Olive Gray, Silt with few fine Sand, moist, well Sorted, medium stiff, White Shells throughout.
26'			0.0	48"	0-48 ml, olive Gray/light Gray, Silt with few ~~fines~~ fine Sand, Sand increasing with depth to 50/50 Silt/fine Sand mix, well Sorted, Soft going to medium stiff with depth, White Shells 0-20"
30'			0.0	48"	0-48" SM, Olive Gray/Dark Gray, Silty Sand with fine grain Sand, moderatly Sorted, Wet, dense
34'					

Geologist's Signature _____ Date 1/17/02 Reviewer _____ Date ___ Pg 3 of 4

PHILIP SERVICES CORP.

Soil Stratigraphy Field Log

Location ID: SKI-19D
Facility: Tacoma
Project: Tacoma SKI-II

Date: 1/17/02
Field Geologist: Corey Johnson
Location Type: Temporary — X Soil Boring Only, X Well, _ Test Pit
Drilling Method: Geoprobe thru 4.25in HSA
Sampling Method: 4' x 2" Acetate liner
Total Depth: 36'

Depth of Sample (ft bgs)	Sample ID	Blow Counts (per 6")	Total Organics (ppm)	Sample Recovery (inches)	Geological Description: Sample Interval, Unified Soil Class ID, Munsell Color, grain size, sorting, moisture, compaction, indication of contaminants (odor or sheen), and general stratigraphic description.
34'					
0.0'			Breathing Zone: In-Spoon: Headspace: 0.0	24"	0-24" SW Dark gray, fine grain sand with few silt, Moderate well sorted, wet, dense, small white rocks/shells throughout
86'					

Geologist's Signature _____ Date 1/17/02 Reviewer _____ Date _____ Pg 4 of 4

PHILIP SERVICES CORP.

Soil Stratigraphy Field Log

Location ID: SRI-32/32D
Facility: Tacoma
Project: SRI-II

Date: 03 Feb 2002
Field Geologist: Joe Depner
Location Type: X Soil Boring Only X temp. Well _ Test Pit

Drilling Method: Direct-Push (Geoprobe)
Sampling Method: acetate liner
Total Depth: 29'

Depth of Sample (ft bgs)	Sample ID	Blow Counts (per 6")	Total Organics (ppm)	Sample Recovery (inches)	Geological Description: Sample Interval, Unified Soil Class ID, Munsell Color, grain size, sorting, moisture, compaction, indication of contaminants (odor or sheen), and general stratigraphic description.
0.0'			Breathing Zone: In-Spoon: Headspace:	48"	0-8": SM. Silty sand. (Fine to med. sand, with silt) Well mixed - poorly sorted. Moist. Moderately to highly compacted. Stems and rootlets throughout. Dark grayish brown. 8"-40": SW. Medium-grained sand. well sorted. Grayish brown. Moderately compacted. No roots visible. Moist. 40-48": Rust and gray-brown colored silt with ~~coarse~~ medium fine brown, poorly sorted sand mixed in. Moderately to highly compacted. ML? SC?
4.'				36"	0-16": Gray-brown, ~~coarse~~ medium, well-sorted sand, SP. Wet. Moderately compacted. Red fragments scattered throughout 16-36": SW. Dark gray, medium-grained well-sorted sand. Numerous white shell fragments (< 0.25 in.) and red particles. moderately compacted. Wet.
8'				36"	0-12": No recovery. Driller says sand was too soupy to collect in sampler. 12-20": Medium-Sand (SW), well-sorted, dark gray, Wet, mod. compacted, red particles and white shell frags throughout. Grading to SM - silty med. sand, dark gray, poorly sorted, wet, mod. compact, red particles and white frags. throughout. Fragments of plant stalks/stems, up to 1.5 inches long.

Geologist's Signature: Joe Depner Date 2/3/02 Reviewer: [illegible] Date 2/5/02 Pg 1 of 3

PHILIP SERVICES CORP.

Soil Stratigraphy Field Log

Location ID: SRT-32/32D
Facility: Tacoma
Project: SRT-II

Date: 03 Feb 2002
Field Geologist: Joe Depner
Location Type: X Soil Boring Only X temp Well _ Test Pit
Drilling Method: Direct-Push (Geoprobe)
Sampling Method: acetate liner
Total Depth: 29'

Depth of Sample (ft bgs)	Sample ID	Blow Counts (per 6")	Total Organics (ppm)	Sample Recovery (inches)	Geological Description: Sample Interval, Unified Soil Class ID, Munsell Color, grain size, sorting, moisture, compaction, indication of contaminants (odor or sheen), and general stratigraphic description.
0.0'			Breathing Zone: In-Spoon: Headspace:		20-48": CL. Olive-gray clay. Wet. Well sorted, fine, med. compacted, med. plasticity. Occasional hair-thin rootlets visible. Thin black stringers present throughout. At 42": Plant stems (grass?) mixed in. 42-48": Color is light gray and plant stems throughout. Otherwise same as 20-48".
12'				40"	0-8": Not recovered 8-48": CL. Light gray clay. Wet. fine, well-sorted, stiff, med. compact, med. plasticity. Occasional plant detritus (grass stalks?).
16'				48"	0-12": Med. sand, dk ~~olive~~ gray, SP, wet, well sorted, ~~—~~ loose, w/red particles present throughout, grading to SM silty sand, dk gray, med. to fine, poorly sorted, dense, w/red particles scattered throughout. [Heave?] 12-48": CL. Same as 8-48" in the 12-16 ft interval, except no plant detritus visible.
20'				48"	0-48": SP. Med. sand, dk gray, wet well sorted, loose, w/red particles throughout. 0-16" — with light (white?) shell fragments visible. 16-20" — with wood chips (~0.75 in.) visible, and shell frags. 20-48" — no wood chips or shell frags. visible.
24'					

Geologist's Signature: Joe Depner Date 2/3/02 Reviewer: [illegible] Date 2/5/02 Pg 2 of 3

17-18.5' + Geotech sample of silt. In acetate liner.

PHILIP SERVICES CORP

Soil Stratigraphy Field Log

Location ID: SRI-32/32D
Facility: Tacoma
Project: SRI-II

Date: 03 Feb 2002
Field Geologist: Joe Depner
Location Type: X Soil Boring Only X temp. Well _ Test Pit

Drilling Method: Direct-Push (Geoprobe)
Sampling Method: acetate liner
Total Depth: 29'

Depth of Sample (ft bgs)	Sample ID	Blow Counts (per 6")	Total Organics (ppm)	Sample Recovery (inches)	Geological Description: Sample Interval, Unified Soil Class ID, Munsell Color, grain size, sorting, moisture, compaction, indication of contaminants (odor or sheen), and general stratigraphic description.
24' (0.0')			Breathing Zone: In-Spoon: Headspace:	40"	0-8" - no recovery 8-42": SP. Dark gray, medium, well sorted sand, Wet, loose to moderately compact. Numerous red particles and light (white?) shell fragments scattered throughout. 42-48": ML. Gray silt. Fine. Well Sorted. Wet. Moderately compact. One large shell present (~0.75 in.) with irridescent sheen.
28'				12"	0-12": ML. Gray silt. Fine. Well sorted. Wet. Moderately compact. Low plasticity. Large (~0.5-in) shell fragments scattered throughout. Some plant stalks present (grass?).
29'					

Geologist's Signature: Joe Depner Date 2/3/02 Reviewer: [signature] Date 2/5/02 Pg 3 of 3

26-27' - Geotech. sample of sand. In acetate liner.

PHILIP SERVICES CORP.

Soil Stratigraphy Field Log

Location ID: SRI-33
Facility: Tacoma
Project: Tacoma SRI-II

Date: 2/2/02
Field Geologist: Corey Johnson
Location Type: Temporary
X Soil Boring Only X Well _ Test Pit

Drilling Method: Geoprobe
Sampling Method: 2" x 4' acetate liner
Total Depth: 12'

Depth of Sample (ft bgs)	Sample ID	Blow Counts (per 6")	Total Organics (ppm)	Sample Recovery (inches)	Geological Description: Sample Interval, Unified Soil Class ID, Munsell Color, grain size, sorting, moisture, compaction, indication of contaminants (odor or sheen), and general stratigraphic description.
0.0'			Breathing Zone: In-Spoon: Headspace: 0.0	30"	0-3" SM Olive brown, silty sand, fine sand with fines, moderately sorted, moist - wet, medium dense, grass and roots throughout, 3-30" SM, Olive black, fine and medium grain sand with few fines, moderately sorted, wet, medium dense,
			0.0	40"	0-7" SM, olive black, fine and medium grain sand with some fines, moderately sorted, wet, loose. 7-40" SM, Olive grayish black, fine and medium grain sand, few fines, moderately sorted wet, medium dense to dense red and white SM fine and medium grain sands
			0.0	26"	0-2" SM, Grayish black, sandy silt 50% silt with 50% fine sand, moderately sorted, moist to wet, medium dense, 2-8" ML, Grayish black, silt with some fine grain sand, moderately well sorted, moist, soft 8-26" ML, olive gray, silt with few fine sand, well sorted, moist, soft, Gray black streaking throughout, Root debris throughout,

0' 4' 8' 12'

Geologist's Signature _____ Date 2/2/02 Reviewer _____ Date ____ Pg 1 of 1

4' sample is 0-2.5' because silty sand on top is acting like a plug in the liner when it gets about half way in the liner.

8-12' sample is ~10-12' because 8-10 was to soupy to push piston in sampler.

PHILIP SERVICES CORP.

Soil Stratigraphy Field Log

Location ID: SRI-33D
Facility: Tacoma
Project: Tacoma SRI-II

Date: 2/2/02
Field Geologist: Corey Johnson
Location Type: Temporary — X Soil Boring Only — X Well — _ Test Pit
Drilling Method: Geoprobe thru 4.25 HSA
Sampling Method: 2" x 4' Acetate liner
Total Depth: 24'

Depth of Sample (ft bgs)	Sample ID	Blow Counts (per 6")	Total Organics (ppm)	Sample Recovery (inches)	Geological Description: Sample Interval, Unified Soil Class ID, Munsell Color, grain size, sorting, moisture, compaction, indication of contaminants (odor or sheen), and general stratigraphic description.
0.0'			Breathing Zone: In-Spoon: Headspace: 0.0	46"	0-43" ML Olive gray, Silt with few fine sand, very well sorted, moist to wet, soft, low plasticity 43-46" SM, olive gray/dark gray, sandy Silt, ML silt with 30% fine sand, moderately well sorted, moist to wet, soft to medium dense
12'			0.0	40"	0-13" SM, Olive gray/dark gray, Silty Sand, fine-grain sand with 20% ML Silt, Moderately Sorted, Medium dense, wet 13-40" SM, ~~Olive~~ grayish black, fine and medium sands with few fines, moderately sorted, wet, medium dense, fines increasing to 20% at 33"-40"
20'			0.0	37"	0-37" SM, grayish black, fine sand with some medium sand, medium grains increasing with depth, Moderately sorted, wet, medium dense to dense, red and white fine and medium grains throughout.
24'					

Geologist's Signature: _____ Date: 2/2/02 Reviewer: _____ Date: ___ Pg 1 of 1

16-20' sample is 16-19'

PHILIP SERVICES CORP.

Soil Stratigraphy Field Log

Location ID: SBT-34
Facility: Tacoma
Project: SBT - II

Date: 2/2/02
Field Geologist: Corey Johnson
Location Type: Temporary
X Soil Boring Only ___ Well ___ Test Pit

Drilling Method: Geoprobe
Sampling Method: 2" x 4' Acetate liner
Total Depth: 11'

Depth of Sample (ft bgs)	Sample ID	Blow Counts (per 6")	Total Organics (ppm)	Sample Recovery (inches)	Geological Description: Sample Interval, Unified Soil Class ID, Munsell Color, grain size, sorting, moisture, compaction, indication of contaminants (odor or sheen), and general stratigraphic description.
0' 0.0'			Breathing Zone: In-Spoon: Headspace: 0.0 bag 0.0	46"	0-2" SM olive black medium fine sand with fines, grass, roots, organic matter, cobbles, poorly sorted, moist, loose, 2-5" SM with SW, olive brown, fine sand with fines, cobbles, few fine gravel and coarse gravel, poorly sorted, moist, loose 5-28" SM, light gray, fine sand with some fines and few fine gravel, few cobbles, poorly sorted, dense to very dense, dry, pockets of white fines 28-46" SM, Olive black, fine sand with few fines, moderately sorted, moist loose, red and white fine grains throughout,
4'			0.0	38"	0-30" SM olive black, fine sand with few fines, moderately sorted, moist to wet, medium dense, red grains throughout fine sand 30-38" SM olive gray, fine sand with some fines, moderately sorted wet,
8'			0.0	22"	0-22" SM to ML with depth, olive gray, silty sand with silt increasing with depth, moderately sorted to well sorted with depth, loose to soft with depth, wet to moist with depth,
10' 11'			0.0	12"	0-12" ML, olive gray, silt with few fine sand, very well sorted, moist, organic debris (roots) throughout, soft

Geologist's Signature: _____ Date 2/2/02 Reviewer: _____ Date: ___ Pg 1 of 1

4-8' soil sample is 4-7' 7-8 really soft and soupy

PHILIP SERVICES CORP.

Soil Stratigraphy Field Log

Location ID: SRI-34D
Facility: Tacoma
Project: Tacoma SRI-II

Date: 2/2/02
Field Geologist: Corey Johnson
Location Type: Temporary — X Soil Boring Only — X Well — Test Pit

Drilling Method: Geoprobe thru 4.25 in HSA
Sampling Method: 2" x 4' Acetate liner
Total Depth: 26'

Depth of Sample (ft bgs)	Sample ID	Blow Counts (per 6")	Total Organics (ppm)	Sample Recovery (inches)	Geological Description: Sample Interval, Unified Soil Class ID, Munsell Color, grain size, sorting, moisture, compaction, indication of contaminants (odor or sheen), and general stratigraphic description.
10' 0.0'			Breathing Zone: In-Spoon: Headspace: 0.0	38"	0-32" ml olive Gray, silt with few fine sand, ~~Grey~~ well sorted, moist, medium stiff, Dark gray Streaks 0-6", organic debris from 8-19" 32-38" sm olive black, fine sand with ml silt mix, moderately sorted, moist, medium dense, red fine grain sands
14'			0.0	46"	0-31" ml olive Gray, silt with very few fine sand, soft, very well sorted, 31-46" sm olive Gray, sandy silt, ml silt with fine sands increasing with depth, wet, soft, moderately sorted
18'			0.0	40"	0-40" sm olive Black, fine sand with few fines, medium sand increasing with depth, moderately sorted, wet, medium dense, red fine grains throughout, white fine grains throughout,
22'			0.0	43"	0-43" sm olive Black, fine sand with some medium sand, few fines, moderately sorted, wet, medium dense, ml silt smeared on sample at 37-41", Coarse grain sand from 39-43"
26'					

Geologist's Signature: [signature] Date 2/2/02 Reviewer _____ Date _____ Pg 1 of 1

Project: Hylebos Marsh		Project Number:	Client: Port of Tacoma	Boring No. SB-1
Address, City, State 1212 Taylor Way			Drilling Contractor: Holt	Drill Rig Type: Geoprobe
Logged By: Jamie Stevens	Date	Started: 9/24/2019 9:40	Bit Type: Geoprobe	Diameter: 2 inch
Drill Crew: Lowie		Completed: 9/24/2019 10:35	Hammer Type: NA	
USA Ticket Number: 19408678		Backfilled: 9/24/2019	Hammer Weight: NA	Hammer Drop: NA
N: 47.27.41.23 W: 122.39.45.58		Groundwater Depth: 7 feet bgs	Elevation:	Total Depth of Boring: 10 feet

Depth (feet)	Sample Type	Sample Number	Blow Counts (blows/foot)	Graphic Log	Lithology **Soil Group Name:** modifier, color, moisture, density/consistency, grain size, other descriptors **Rock Description:** modifier color, hardness/degree of concentration, bedding and joint characteristics, solutions, void conditions.	Recovery %	Odor/Sheen	PID (PPM)
					Surface - grass	100	No	0
					Loose, dry dark brown to brown medium sand (SP)			
					trace of silt			0
5	S - 5-6				Dark gray/black/brown sand, little to no fines. (SP)		No	0
			▽		Damp at 5.5	100		
					Soft saturated, gray brown clay (CL) with roots and some			
	W- 3-8				sand (SP)			0
					Clay (CL) gray, wet, dense, saturated.			
							No	0
10					Boring terminated at 10 feet bgs			
					Backfilled with bentonite chips.			
15								
20								

Civil Engineering

Boring Log: Sheet _1_ of _1_

CRETE CONSULTING, INC.

Project: Hylebos Marsh	Project Number:	Client: Port of Tacoma	Boring No. SB-2
Address, City, State 1212 Taylor Way		Drilling Contractor: Holt	Drill Rig Type: Geoprobe
Logged By: Jamie Stevens	Date Started: 9/24/2019 12:50	Bit Type: Geoprobe	Diameter: 2 inch
Drill Crew: Lowie	Completed: 9/24/2019 13:30	Hammer Type: NA	
USA Ticket Number: 19408678	Backfilled: 9/24/2019	Hammer Weight: NA	Hammer Drop: NA
N: 47.16.22.3 W: 122.23.37.9	Groundwater Depth: 7.5 feet bgs	Elevation:	Total Depth of Boring: 10 feet

Depth (feet)	Sample Type	Sample Number	Blow Counts (blows/foot)	Graphic Log	Lithology **Soil Group Name:** modifier, color, moisture, density/consistency, grain size, other descriptors **Rock Description:** modifier color, hardness/degree of concentration, bedding and joint characteristics, solutions, void conditions.	Recovery %	Odor/Sheen	PID (PPM)
					Surface - grass	100	No	0
					Sand (SP) red, brown, white medium sand (SP)			
								0
					Very soft clay, gray, fine sand at 4.75, 1" thick			
5	S - 6.5-7				Dark gray/black/brown sand, little to no fines. (SP)		No	0
					Damp at 5.5, shell fragments	100		
	W- 3.5-8.5		▽					
					Soft saturated, gray brown clay (CL) with roots and some			0
					fine sand (SP)			
					Clay (CL) gray, wet, dense, saturated.		No	0
10					Boring terminated at 10 feet bgs			
					Backfilled with bentonite chips.			
15								
20								

Civil Engineering

Boring Log: Sheet _1_ of _1_

CRETE CONSULTING, INC.

Project: Hylebos Marsh		Project Number:	Client: Port of Tacoma	Boring No. SB-3
Address, City, State 1212 Taylor Way			Drilling Contractor: Holt	Drill Rig Type: Geoprobe
Logged By: Jamie Stevens	Date	Started: 9/24/2019 11:55	Bit Type: Geoprobe	Diameter: 2 inch
Drill Crew: Lowie		Completed: 9/24/2019 12:50	Hammer Type: NA	
USA Ticket Number: 19408678		Backfilled: 9/24/2019	Hammer Weight: NA	Hammer Drop: NA
N: 47.16.18.4 W: 122.23.38.3		Groundwater Depth: 7.5 feet bgs	Elevation:	Total Depth of Boring: 12 feet

Depth (feet)	Sample Type	Sample Number	Blow Counts (blows/foot)	Graphic Log	Lithology **Soil Group Name:** modifier, color, moisture, density/consistency, grain size, other descriptors **Rock Description:** modifier color, hardness/degree of concentration, bedding and joint characteristics, solutions, void conditions.	Recovery %	Odor/Sheen	PID (PPM)
					Surface - grass	100	No	0
					Loose, dry brown, black medium sand (SP)			
					trace of silt			0
					Damp at 4.5			
5	S - 6-7				Dark gray/black/brown sand, little to no fines, shells (SP)		No	0
						100		
	W- 3.5-8.5		▽		Soft saturated, gray brown clay (CL) w/roots and			0
					some sand (SP), layer of wood at 9-10			
							No	0
10	S - 9-10				Clay (CL) gray, wet, dense, saturated.			
					Through end of boring.			0
					Boring terminated at 12 feet bgs			
					Backfilled with bentonite chips.			
15								
20								

Civil Engineering

Boring Log: Sheet _1_ of _1_

CRETE CONSULTING, INC.

Project: Hylebos Marsh	Project Number:	Client: Port of Tacoma	Boring No. SB-4
Address, City, State 1212 Taylor Way		Drilling Contractor: Holt	Drill Rig Type: Geoprobe
Logged By: Jamie Stevens	Date Started: 9/24/2019 10:40	Bit Type: Geoprobe	Diameter: 2 inch
Drill Crew: Lowie	Completed: 9/24/2019 11:55	Hammer Type: NA	
USA Ticket Number: 19408678	Backfilled: 9/24/2019	Hammer Weight: NA	Hammer Drop: NA
N: 47.16.19.7 W: 122.23.35.6	Groundwater Depth: 7 feet bgs	Elevation:	Total Depth of Boring: 10 feet

Depth (feet)	Sample Type	Sample Number	Blow Counts (blows/foot)	Graphic Log	Lithology **Soil Group Name:** modifier, color, moisture, density/consistency, grain size, other descriptors **Rock Description:** modifier color, hardness/degree of concentration, bedding and joint characteristics, solutions, void conditions.	Recovery %	Odor/Sheen	PID (PPM)
					Surface - grass	100	No	0
					Loose, dry dark brown to brown fine to medium sand (SP)			
					trace of silt			0
5	S - 6.5-7.5		▽		Sand increases with depth, damp at 5		No	0
					Dark gray/black/brown sand, little to no fines. (SP)	100		
					Shell fragments			
		W- 3-8			Soft saturated, gray brown clay (CL)			0
10					Clay (CL) gray, wet, dense, saturated.		No	0
					Some black modeling at the bottom of the 4" of the boring			
					Boring terminated at 10 feet bgs			
					Backfilled with bentonite chips.			
15								
20								

Civil Engineering

Boring Log: Sheet _1_ of _1_

CRETE CONSULTING, INC.

Project: Hylebos Marsh	Project Number:	Client: Port of Tacoma	Boring No. TWA-5D
Address, City, State 1212 Taylor Way		Drilling Contractor: Holt	Drill Rig Type: Sonic
Logged By: Nick Waldo	Date Started: 9/24/2019 9:00	Bit Type: Sonic	Diameter: 4
Drill Crew: Holt	Completed: 9/25/2019 14:30	Hammer Type: NA	
USA Ticket Number: 19408678	Backfilled: 9/25/2019	Hammer Weight: NA	Hammer Drop: NA
N: To be measured W: To be measured	Groundwater Depth: 9 feet bgs	Elevation:	Total Depth of Boring: 60 feet

Depth (feet)	Sample Type	Sample Number	Blow Counts (blows/foot)	Graphic Log	Lithology **Soil Group Name:** modifier, color, moisture, density/consistency, grain size, other descriptors **Rock Description:** modifier color, hardness/degree of concentration, bedding and joint characteristics, solutions, void conditions.	Recovery %	Odor/Sheen	PID (PPM)
					Surface - grass		No	
					Moist weathered wood fill			
5							No	
10					9' - moist gray clay to 10 feet		No	
					Moist weathered wood fill with occasional gravel and chunks of wood			
15					16' discrete gay clay interbedded with weathered wood fill			
					0.5 to 2 inches thick			
					18.5 - wet gray clay			
20					8" conductor casing set - chipped with 1 bag of bentonite, hydrated, and pulled back about 3"			
					wet gray clayey silt			
					wet gray clayey silt with sea shells (at 23-24.5')			
25					24.5' wet gray med to coarse sand			
	W	TWA-5-1			water sample collected 25-30'			
30	S	TWA-5-30-S			wet gray clayey silt			0

Civil Engineering

CRETE CONSULTING, INC.

Project: Hylebos Marsh	Project Number:	Client: Port of Tacoma	Boring No. TWA-5D
Address, City, State 1212 Taylor Way		Drilling Contractor: Holt	Drill Rig Type: Sonic
Logged By: Nick Waldo	Date Started: 9/24/2019 9:00	Bit Type: Sonic	Diameter: 4
Drill Crew: Holt	Completed: 9/25/2019 14:30	Hammer Type: NA	
USA Ticket Number: 19408678	Backfilled: 9/25/2019	Hammer Weight: NA	Hammer Drop: NA
N: To be measured W: To be measured	Groundwater Depth: 9 feet bgs	Elevation:	Total Depth of Boring: 60 feet

Depth (feet)	Sample Type	Sample Number	Blow Counts (blows/foot)	Graphic Log	Lithology **Soil Group Name:** modifier, color, moisture, density/consistency, grain size, other descriptors **Rock Description:** modifier color, hardness/degree of concentration, bedding and joint characteristics, solutions, void conditions.	Recovery %	Odor/Sheen	PID (PPM)
30					No recovery, heaving sands.	100	No	0
								0
35							No	0
					Very wet silts and sands, poor recovery	100		
	s	TWA-5-38-s			wet grey clay			0
					wet grey silt			
					39.5 wet grey coarse sand		No	0
40	w	TWA-5-2			water sample collected 35-40'			
					Wet dark grey med to coarse med to coarse sand			0
					1" gray clay lens			
45	w	TWA-5-3			wet dark grey med to coarse Sand			
					water sample collected 45-50'			
50					wet dark grey med to coarse Sand			
55					wet dark grey med to coarse Sand with sea shells			
					57.5 - grey sand with white coarse sand/shell lens			0
					wet grey silt with shells			
	s	TWA-5-59-s						

CRETE CONSULTING, INC.

Project: Hylebos Marsh	Project Number:	Client: Port of Tacoma	Boring No. TWA-6D
Address, City, State 1212 Taylor Way		Drilling Contractor: Holt	Drill Rig Type: Sonic
Logged By: Nick Waldo	Date Started: 9/24/2019 9:00	Bit Type: Sonic	Diameter: 4
Drill Crew: Holt	Completed: 9/25/2019 14:30	Hammer Type: NA	
USA Ticket Number: 19408678	Backfilled: 9/25/2019	Hammer Weight: NA	Hammer Drop: NA
N: To be measured W: To be measured	Groundwater Depth: 6 feet bgs	Elevation:	Total Depth of Boring: 60 feet

Depth (feet)	Sample Type	Sample Number	Blow Counts (blows/foot)	Graphic Log	Lithology **Soil Group Name:** modifier, color, moisture, density/consistency, grain size, other descriptors **Rock Description:** modifier color, hardness/degree of concentration, bedding and joint characteristics, solutions, void conditions.	Recovery %	Odor/Sheen	PID (PPM)
					Surface - grass		No	
					Moist brown medium grain sand (SP)			
							No	
5					Moist dark gray sand with some shells (SP)			
					Wet layers of gray silts and sand			
					0.5 ' layer of wet gray clay (CL)			
					Moist brown and gray silts and clay with organics			
					Wet gray silt Clay with lots of embedded organics		No	
10					8" conductor casing set at 12- chipped with 1 bag of bentonite, hydrated, and pulled back about 3"			
					Gray Clay (CL)			
15	W	TWA-6-1			Water sample collected 15-20'			
					at 17' some sand mixed with clay			
					Gray clay			
					Gray clay with sandy silt			
					Wet dark gray medium sand.			
20	S	TWA-6-21-S			Wet gray sandy silt, 0.5 thick.			
					Wet dark gray medium sand.			
	W	TWA-6-2			Water collected at 25-30			
25					Wet dark gray medium sand.			
					Wet dark gray silty fine to medium sand.			
30								0

Civil Engineering

CRETE CONSULTING, INC.

Project: Hylebos Marsh	Project Number:	Client: Port of Tacoma	Boring No. TWA-6D
Address, City, State 1212 Taylor Way		Drilling Contractor: Holt	Drill Rig Type: Sonic
Logged By: Nick Waldo	Date Started: 9/24/2019 9:00	Bit Type: Sonic	Diameter: 4
Drill Crew: Holt	Completed: 9/25/2019 14:30	Hammer Type: NA	
USA Ticket Number: 19408678	Backfilled: 9/25/2019	Hammer Weight: NA	Hammer Drop: NA
N: To be measured W: To be measured	Groundwater Depth: 6 feet bgs	Elevation:	Total Depth of Boring: 60 feet

Depth (feet)	Sample Type	Sample Number	Blow Counts (blows/foot)	Graphic Log	Lithology **Soil Group Name:** modifier, color, moisture, density/consistency, grain size, other descriptors **Rock Description:** modifier color, hardness/degree of concentration, bedding and joint characteristics, solutions, void conditions.	Recovery %	Odor/Sheen	PID (PPM)
30					Wet gray fine to medium sand.	100	No	0
								0
35	W	TWA-6-3			water sample collected 35-40'		No	0
						100		
					Wet gray layer of sand, silt and clay (0.5' thick)			
					Wet gray fine to coarse sand.			0
							No	0
40					Wet gray medium sand.			
								0
	W	TWA-6-4			water sample collected 45-50'			
45								0
	S	TWA-6-48-S			Wet dark gray silty fine sand			0
					Wet gray medium to coarse sand.			
50								
55					Wet sand with coarse sand- white intact shells - 2" clay layer at 57.5			0
					Wet medium sand with shells			

Civil Engineering

CRETE CONSULTING, INC.

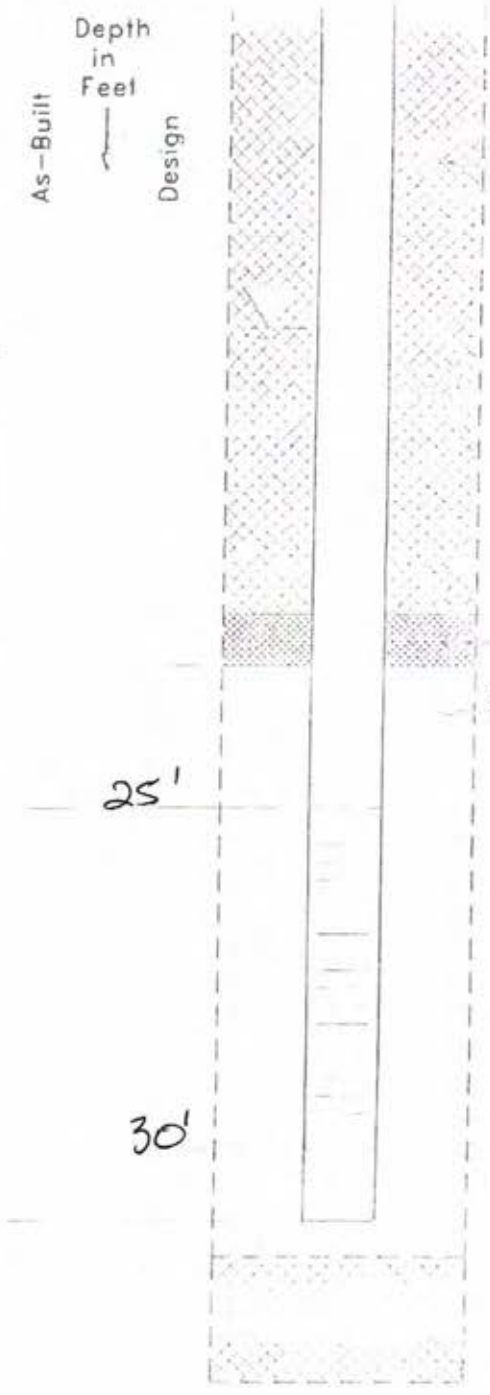
WELL INSTALLATION REPORT

Well No. TWA-5D Date 11.7.2019

Job Well tag ID# BLU-457 Job No.

Observer Waldo Drilling Method Sonic

Draw Appropriate Monument (Flush ⟷ or Above Ground)



Approx. Elevation

Type of Monument groundwater well

Stickup Monument X Well

0' feet Seal Material Drillers: Holocene Drilling

Borehole Diameter

Water Level Date ~6.0 11/7/2019

Riser Pipe Diameter 2 inch

Riser Pipe Material schedule 40 PVC

Type of Joints

"O"-Ring Seals? (Yes) No

Seal Material Bentonite to surface

23' Filter Pack Material 2/12 silica sand

Filter Pack Size

Screen Diameter 2 inch

Screen Material

Screen Slot Size 0.010 inch slotted

Screen Construction: Milled / Wire Wound

Tail Pipe Diameter 2"

Tail Pipe Length 4"

Tail Pipe Material

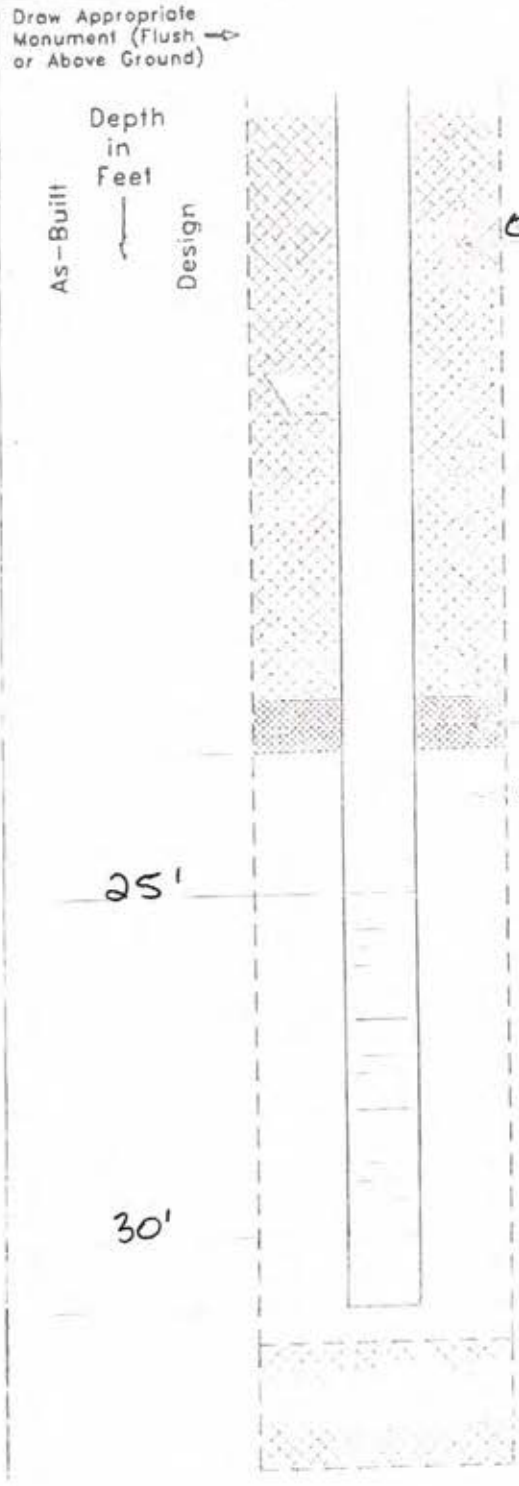
Bottom Seal Type

CONSULTING, INC

conductor casing set to 20' to seperate shallow and deep groundwater

WELL INSTALLATION REPORT

Well No. TWA-6D
Job well tag ID # BLU-456
Date 11.7.2019
Job No.
Observer Waldo
Drilling Method Sonic



Approx. Elevation
Type of Monument groundwater well
Stickup Monument — X — Well
Seal Material
Borehole Diameter
Drillers: Holocene Drilling
Water Level Date ~6.5 ~~6.7~~ 11.7.2019
Riser Pipe Diameter 2 inch
Riser Pipe Material schedule 40 PVC
Type of Joints
"O"-Ring Seals? (Yes) No
Seal Material Bentonite to surface
Filter Pack Material 2/12 silica sand
Filter Pack Size —
Screen Diameter 2 inch
Screen Material —
Screen Slot Size 0.010-inch slotted
Screen Construction: Milled / Wire Wound
Tail Pipe Diameter 2"
Tail Pipe Length 4"
Tail Pipe Material
Bottom Seal Type

conductor set at 9.5 to 12.5' to seperate shallow and deep groundwater

MAUL FOSTER ALONGI

330 E Mill Plain Blvd, Suite 405, Vancouver, Washington 98660 (360) 694-2691 www.maulfoster.com

Soil Field Sampling Data Sheet

Client Name	Port of Tacoma	**Sample Location**	TWA-HA-01
Project Number	M0615.20.014	**Sampler**	J. Hansen
Project Name	Hylebos Marsh Subsurface Investigation	**Sampling Date**	08/05/2024
Sampling Event	August 2024	**Sample Name**	
Sub Area		**Sample Depth (ft)**	
FSDS QA:	F. Bellows 09/30/2024	**Easting**	**Northing**	**TOC**

Sample Information

Sampling Method	Sample Type	Sample Category	PID/FID	Sampling Time	Container Code	#
(2) Hand Auger	Soil			10:35:00 AM	2 oz. soil	
					4 oz. soil	
					8 oz. soil	
					Other	
					Total Containers	0

Sample Description:

0 to 12 inches bgs: SILT (ML); brown; 100% fines; trace vegetation. Becomes reddish-brown with trace woodwaste @ 6 inches.
12 to 18 inches bgs: SILT (ML); brown to reddish-brown; 80% fines; 20% woodwaste.
18 to 24 inches bgs: WOODWASTE; brown; 25% fines; 75% woodwaste.

General Sampling Comments

0 to 24 inches: Hand auger encountered hard plastic at 6 inches. Significant woodwaste observed at depth.

No auto fluff encountered. No samples collected.
bgs = below ground surface.

Sampling Method Code:

(1) Backhoe, (2) Hand Auger, (3) Drill Bit Cutting Head, (4) Geoprobe, (5) Split Spoon, (6) Shelbey Tube, (7) Grab, (8) Other (Specify)

Signature _____

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Soil Field Sampling Data Sheet

Client Name	Port of Tacoma	**Sample Location**	TWA-HA-02
Project Number	M0615.20.014	**Sampler**	J. Hansen
Project Name	Hylebos Marsh Subsurface Investigation	**Sampling Date**	08/05/2024
Sampling Event	August 2024	**Sample Name**	
Sub Area		**Sample Depth (ft)**	
FSDS QA:	F. Bellows 09/30/2024	**Easting**	**Northing**	**TOC**

Sample Information

Sampling Method	Sample Type	Sample Category	PID/FID	Sampling Time	Container Code	#
(2) Hand Auger	Soil			10:15:00 AM	2 oz. soil	
					4 oz. soil	
					8 oz. soil	
					Other	
					Total Containers	0

Sample Description:

0 to 18 inches bgs: SAND (SP); gray; 90% sand; 10% gravel, rounded; trace roots; loose.
18 to 24 inches bgs: SILTY SAND (SM); gray; 30% fines; 60% sand; 10% gravel, rounded.

General Sampling Comments

0 to 18 inches bgs: Collected with hand trowel.
18 to 24 inches bgs: Collected with hand auger.

No auto fluff encountered. No samples collected.
bgs = below ground surface.

Sampling Method Code:

(1) Backhoe, (2) Hand Auger, (3) Drill Bit Cutting Head, (4) Geoprobe, (5) Split Spoon, (6) Shelbey Tube, (7) Grab, (8) Other (Specify)

Signature _____

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Soil Field Sampling Data Sheet

Client Name	Port of Tacoma	**Sample Location**	TWA-HA-03				
Project Number	M0615.20.014	**Sampler**	J. Hansen				
Project Name	Hylebos Marsh Subsurface Investigation	**Sampling Date**	08/05/2024				
Sampling Event	August 2024	**Sample Name**					
Sub Area		**Sample Depth (ft)**					
FSDS QA:	F. Bellows 09/30/2024	**Easting**		**Northing**		**TOC**	

Sample Information

Sampling Method	Sample Type	Sample Category	PID/FID	Sampling Time	Container Code	#
(2) Hand Auger	Soil			9:45:00 AM	2 oz. soil	
					4 oz. soil	
					8 oz. soil	
					Other	
					Total Containers	0

Sample Description:

0 to 12 inches bgs: SAND (SP); gray; 100% sand; trace roots; loose.
12 to 18 inches bgs: SAND with SILT (SP-SM); gray; 10% fines; 90% sand.
18 to 24 inches bgs: SILTY SAND (SM); gray; 30% fines; 70% sand.

General Sampling Comments

0 to 24 inches bgs: Collected with hand auger.

No auto fluff encountered. No samples collected.
bgs = below ground surface.

Sampling Method Code:

(1) Backhoe, (2) Hand Auger, (3) Drill Bit Cutting Head, (4) Geoprobe, (5) Split Spoon, (6) Shelbey Tube, (7) Grab, (8) Other (Specify)

Signature _____

Geologic Borehole Log

MAUL FOSTER ALONG

Project Number	Boring Number	Sheet
M0615.20.014	TWA-SB-09	1 of 1

Project Name	Hylebos Marsh Subsurface Investigation		
Project Location	Tacoma, Washington	Surface Elevation (feet)	
Start/End Date	8/12/2024 to 8/12/2024	Northing	
Driller/Equipment	Anderson Environmental Contracting, LLC/Geoprobe 7822DT	Easting	
Geologist/Engineer	C. Sifford	Total Depth of Borehole	15.0 feet
Sample Method	Macro-Core	Outer Hole Diam	2.25 inch

Depth (feet, bgs)	Water Levels	Sample Data: Percent Recovery	Sample Data: Sample ID	Sample Data: PID (ppm)	Lithologic Column	Soil Description
1				0		0.0 to 0.7 feet: GRAVELLY SAND (SP); tan; 60% sand, fine to medium; 40% gravel, medium, rounded; loose; no odor; dry.
						0.7 to 1.3 feet: GRAVELLY SAND WITH SILT (SP-SM); gray; 10% fines, nonplastic; 70% sand, medium; 20% gravel; loose; no odor; moist.
2				0		1.3 to 3.0 feet: WOODY DEBRIS; brown; 100% organic material (wood chips and fibers); medium; slight organic-like odor; moist.
3		60				
						3.0 to 5.0 feet: NO RECOVERY.
4						
5						
						5.0 to 6.7 feet: SAND (SP); dark gray; 100% sand, medium; loose; no odor; moist.
6				0		
	▽		TWA-SB-09-S-6.0			@ 6.4 to 6.7 feet: roots up to 0.5" in diameter.
7						@ 6.5 feet: becomes wet.
						6.7 to 7.3 feet: SILT WITH SAND (ML); gray; 80% fines, medium plasticity; 20% sand, fine; soft; no odor; wet.
		66		0		7.3 to 8.3 feet: ORGANICS WITH SILT; brownish-gray; 20% fines, nonplastic; 80% organic material (peat and rootlets); medium dense; slight sulfur-like odor; moist.
8						
9						8.3 to 10.0 feet: NO RECOVERY.
10						
						10.0 to 11.9 feet: SILT WITH SAND (ML); gray; 80% fines, medium plasticity; 20% sand, fine; soft; no odor; trace roots; wet.
11				3		
12						11.9 to 13.9 feet: ORGANICS WITH SILT; brownish-gray; 40% fines, medium plasticity; 60% organic material (peat and rootlets); organic-like odor; wet.
		78				
13				0		
14						13.9 to 15.0 feet: NO RECOVERY.
15						

Total Depth = 15.0 feet bgs

NOTES:

1) Depths are relative to feet bgs. 2) bgs = below ground surface. 3) ID = identification. 4) PID = photoionization detector. 5) ppm = parts per million.

Borehole Completion Details
0.0 to 15.0 feet: 2-inch-diameter borehole.
0.0 to 15.0 feet: Bentonite chips hydrated with potable water.

▽ **Soil becomes wet at approximately 6.5 feet as observed in the core liner at time of drilling.**

MFA BOREHOLE W/RECON SCREEN W:\GINT\GINTW\PROJECTS\0615.20.014\HYLEBOS SUBSURFACE INVESTIGATIONTWA-SB-09 TO TWA-SB-16.GPJ 10/14/24

Geologic Borehole Log

MAUL FOSTER ALONG

Project Number	Boring Number	Sheet
M0615.20.014	TWA-SB-10	1 of 2

Project Name	Hylebos Marsh Subsurface Investigation		
Project Location	Tacoma, Washington	Surface Elevation (feet)	
Start/End Date	8/12/2024 to 8/12/2024	Northing	
Driller/Equipment	Anderson Environmental Contracting, LLC/Geoprobe 7822DT	Easting	
Geologist/Engineer	C. Sifford	Total Depth of Borehole	20.0 feet
Sample Method	Macro-Core	Outer Hole Diam	2.25 inch

Depth (feet, bgs)	Water Levels	Percent Recovery	Sample Data: Sample ID	Sample Data: PID (ppm)	Lithologic Column	Soil Description
1				0		0.0 to 0.9 feet: SANDY GRAVEL (GW); tannish-gray; 35% sand, fine to coarse; 65% gravel, fine to coarse, subangular to rounded; loose; no odor; dry.
2				0		0.9 to 2.6 feet: GRAVELLY SAND (SW); tan; 70% sand, fine to coarse; 30% gravel, fine to coarse, subangular to rounded; very loose; no odor; dry.
3		54				@ 2.1 feet: becomes moist. @ 2.4 to 2.6 feet: cobbles, rounded. 2.6 to 2.7 feet: SILTY GRAVELLY SAND (SM); greenish-gray; 20% fines, nonplastic; 60% sand, medium to coarse; 20% gravel, fine to medium, subangular to subrounded; dense; no odor; moist. 2.7 to 5.0 feet: NO RECOVERY.
4						
5						
6				0		5.0 to 5.9 feet: SILTY GRAVELLY SAND (SM); greenish-gray; 20% fines, nonplastic; 60% sand, medium to coarse; 20% gravel, fine to medium, subangular to subrounded; dense; no odor; moist. 5.9 to 6.1 feet: WOODY DEBRIS; dark brown; 100% organic material (wood dust and fibers); medium dense; no odor; moist.
7			TWA-SB-10-2-6.5	0		6.1 to 6.8 feet: SILTY GRAVELLY SAND (SM); greenish-gray; 20% fines, nonplastic; 60% sand, medium to coarse; 20% gravel, fine to medium, subangular to subrounded; dense; no odor; moist. 6.8 to 7.4 feet: SANDY ORGANICS; dark gray brown; 60% sand, fine to medium; 40% organic material (wood chips and fibers); medium dense; no odor; moist.
8	▽	68		0		7.4 to 8.3 feet: WOODY DEBRIS; dark brown; 100% organic material (wood chips, dust, and fibers); medium dense; organic-like odor; moist. 8.3 to 8.4 feet: SAND (SP); dark gray; 100% sand, medium; medium dense; no odor; wet. 8.4 to 10.0 feet: NO RECOVERY.
9						
10						
11				0		10.0 to 12.8 feet: SAND (SP); dark gray; 100% sand, medium; medium dense; no odor; wet.
12				0		
13		76				12.8 to 15.0 feet: NO RECOVERY.
14						
15						

MFA BOREHOLE W/RECON SCREEN W:\GINT\GINTW\PROJECTS\0615.20.014\HYLEBOS SUBSURFACE INVESTIGATIONTWA-SB-09 TO TWA-SB-16.GPJ 10/14/24

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Geologic Borehole Log

Project Number	Boring Number	Sheet
M0615.20.014	**TWA-SB-10**	**2 of 2**

Depth (feet, bgs)	Water Levels	Sample Data: Percent Recovery	Sample Data: Sample ID	Sample Data: PID (ppm)	Lithologic Column	Soil Description
16				0		15.0 to 17.5 feet: SAND (SP); dark gray; 100% sand, medium; medium dense; no odor; wet.
17		90				
18				0		17.5 to 18.6 feet: SILT WITH SAND (ML); gray; 80% fines, nonplastic; 20% sand, fine; soft; no odor; wet.
19						18.6 to 19.5 feet: SILT (ML); gray; 100% fines, nonplastic; soft; no odor; wet.
20						19.5 to 20.0 feet: NO RECOVERY.

Total Depth = 20.0 feet bgs

NOTES:

1) Depths are relative to feet bgs. 2) bgs = below ground surface. 3) ID = identification. 4) PID = photoionization detector. 5) ppm = parts per million.

Borehole Completion Details
0.0 to 20.0 feet: 2-inch-diameter borehole.
0.0 to 20.0 feet: Bentonite chips hydrated with potable water.

▽ ***Soil becomes wet at approximately 8.4 feet as observed in the core liner at time of drilling.***

MFA BOREHOLE W/RECON SCREEN W:\GINT\GINTW\PROJECTS\0615.20.014\HYLEBOS SUBSURFACE INVESTIGATION\TWA-SB-09 TO TWA-SB-16.GPJ 10/14/24

Geologic Borehole Log

MAUL FOSTER ALONG

Project Number	Boring Number	Sheet
M0615.20.014	**TWA-SB-11**	**1 of 2**

Project Name	**Hylebos Marsh Subsurface Investigation**		
Project Location	**Tacoma, Washington**	Surface Elevation (feet)	
Start/End Date	**8/13/2024 to 8/13/2024**	Northing	
Driller/Equipment	**Anderson Environmental Contracting, LLC/Geoprobe 7822DT**	Easting	
Geologist/Engineer	**C. Sifford**	Total Depth of Borehole	**20.0 feet**
Sample Method	**Macro-Core**	Outer Hole Diam	**2.25 inch**

Depth (feet, bgs)	Water Levels	Sample Data: Percent Recovery	Sample Data: Sample ID	Sample Data: PID (ppm)	Lithologic Column	Soil Description
0				1		0.0 to 1.4 feet: GRAVELLY SAND (SP); tannish-gray; 70% sand, fine to medium; 30% gravel, fine to medium, rounded to subrounded; very loose; no odor; dry.
1						@ 0.7 feet: segment of wire and wire insulation. @ 0.8 to 1.4 feet: sand becomes medium to coarse; tan. @ 1.3 feet: pieces of copper wire, no insulation.
				0		@ 1.4 feet: 1.5" by 1.5" piece of rose-gold pleather.
2			**TWA-SB-11-S-1.7**			1.4 to 2.1 feet: SILTY SAND WITH GRAVEL (SM); bluish-gray; 20% fines, low plasticity; 70% sand, medium; 10% gravel, fine to medium, rounded to subrounded; dense; no odor; moist. @ 1.7 feet: piece of silver colored metal. @ 2.0 feet: piece of yellow foam.
		56				
3						2.1 to 2.8 feet: WASTE WITH SAND AND SILT; brown; 20% fines, nonplastic; 20% sand, fine; loose; 60% debris (fabric, foam, copper wire, pieces of plastic, chunks of silver metal), no odor; moist.
4						2.8 to 5.0 feet: NO RECOVERY.
5						5.0 to 5.6 feet: WASTE WITH SAND AND SILT; brown; 20% fines, nonplastic; 20% sand, fine; loose; 60% debris (fabric, foam, copper wire, pieces of plastic, chunks of silver metal), no odor; moist.
6				0		5.6 to 8.4 feet: WOODY DEBRIS; brown; 100% organic material (wood chips, fibers, and dust); loose; no odor; moist.
7	▽		**TWA-SB-11-S-6**			@ 7.2 feet: becomes wet.
		68		0		
8						
9						8.4 to 10.0 feet: NO RECOVERY.
10						
11				0		10.0 to 13.6 feet: WOODY DEBRIS; brown; 100% organic material (wood chips, fibers, and dust); loose; no odor; moist. @ 10.3 to 10.4 feet: black; no odor.
12						@ 11.3 to 11.6 feet: 100% wood chips.
		72				
13				0		
14						13.6 to 15.0 feet: NO RECOVERY.
15						

MFA BOREHOLE W/RECON SCREEN W:\GINT\GINTW\PROJECTS\0615.20.014\HYLEBOS SUBSURFACE INVESTIGATIONTWA-SB-09 TO TWA-SB-16.GPJ 10/14/24

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Geologic Borehole Log

Project Number	Boring Number	Sheet
M0615.20.014	**TWA-SB-11**	**2 of 2**

Depth (feet, bgs)	Water Levels	Sample Data: Percent Recovery	Sample Data: Sample ID	Sample Data: PID (ppm)	Lithologic Column	Soil Description
16			**TWA-SB-11-S-16**	**0**		*15.0 to 20.0 feet: SILT (ML); gray; 100% fines, medium to high plasticity; soft; trace roots; no odor; wet.*
17		**100**				*@ 15.9 feet: roots disappear.*
18				**0**		
19						
20						

Total Depth = 20.0 feet bgs

NOTES:

1) Depths are relative to feet bgs. 2) bgs = below ground surface. 3) ID = identification. 4) PID = photoionization detector. 5) ppm = parts per million.

Borehole Completion Details
0.0 to 20.0 feet: 2-inch-diameter borehole.
0.0 to 20.0 feet: Bentonite chips hydrated with potable water.

▽ ***Soil becomes wet at approximately 7.2 feet as observed in the core liner at time of drilling.***

MFA BOREHOLE W/RECON SCREEN W:\GINT\GINTW\PROJECTS\0615.20.014\HYLEBOS SUBSURFACE INVESTIGATION\TWA-SB-09 TO TWA-SB-16.GPJ 10/14/24

Geologic Borehole Log

MAUL FOSTER ALONG

Project Number	Boring Number	Sheet
M0615.20.014	TWA-SB-12	1 of 2

Project Name	Hylebos Marsh Subsurface Investigation		
Project Location	Tacoma, Washington	Surface Elevation (feet)	
Start/End Date	8/13/2024 to 8/13/2024	Northing	
Driller/Equipment	Anderson Environmental Contracting, LLC/Geoprobe 7822DT	Easting	
Geologist/Engineer	C. Sifford	Total Depth of Borehole	20.0 feet
Sample Method	Macro-Core	Outer Hole Diam	2.25 inch

Depth (feet, bgs)	Water Levels	Sample Data: Percent Recovery	Sample Data: Sample ID	Sample Data: PID (ppm)	Lithologic Column	Soil Description
1				0		0.0 to 3.3 feet: SAND WITH GRAVEL (SP); tan ; 90% sand, fine to medium; 10% gravel, fine to medium, subangular to rounded; very loose; no odor; dry.
						@ 0.4 to 0.5 feet: chunk of white powdery material.
2				0		
		66				@ 2.3 feet: chunk of white powdery material.
3						@ 3.0 feet: chunk of white powdery material.
						3.3 to 5.0 feet: NO RECOVERY.
4						
5						
						5.0 to 6.8 feet: SAND WITH GRAVEL (SP); tan ; 90% sand, fine to medium; 10% gravel, fine to medium, subangular to rounded; very loose; no odor; dry.
6						@ 6.1 feet: becomes gray.
				1		
7						6.8 to 7.1 feet: SAND WITH WASTE; gray; 80% sand, fine; loose; 20% debris (plastic, fabric, yellow foam chunks, copper wire), slight chemical-like odor; dry.
		94				7.1 to 8.2 feet: WASTE WITH SILTY SAND; dark gray; 10% fines; 20% sand, fine to medium; loose; 70% debris (fabric, yellow foam, abundant copper wires without insulation), moderate chemical-like odor; moist.
8				2		@ 7.4 to 7.5 feet: large chunks of rubber window gasket.
			TWA-SB-12-S-8			@ 7.7 feet: large piece of 1/8" thick rubbery plastic material.
						@ 7.9 feet: piece of glass.
9				3		8.2 to 8.5 feet: WASTE WITH SILTY SAND; black; 5% fines; 15% sand, fine; loose; 80% debris (sheets of rubber, large copper bar (2" wide), abundant fine metal wires, pieces of fabric and plastic), strong chemical-like odor; moist.
			TWA-SB-12-S-9			8.5 to 9.7 feet: SAND (SP); light gray; 100% sand, fine to medium; very dense; cemented together with white chalky material, strong rancid odor; dry.
10						@ 8.8 feet: brown fibers and white plastic.
						@ 9.4 feet: 4" long piece of 1/8" metal wire.
						9.7 to 10.0 feet: NO RECOVERY.
11				8		10.0 to 14.3 feet: SAND (SP); light gray; 100% sand, fine to medium; very dense; cemented together with white chalky material, strong rancid odor; dry.
						@ 10.3 to 10.6 feet: large chunks of black rubber material.
						@ 11.3 to 11.5 feet: white; 100% fine grained paste; nonplastic; soft; strong rancid odor; moist.
12						@ 11.4 feet: 1.5" rounds 1/2" thick black rubber O-ring.
		86				@ 12.4 feet: blue plastic chunk.
13				6		
						@ 13.3 feet: cluster of yellow fibers.
14						
						14.3 to 15.0 feet: NO RECOVERY.
15						

MFA BOREHOLE W/RECON SCREEN W:\GINT\GINTW\PROJECTS\0615.20.014\HYLEBOS SUBSURFACE INVESTIGATIONTWA-SB-09 TO TWA-SB-16.GPJ 10/14/24

MAUL FOSTER ALONG

Geologic Borehole Log

Project Number	Boring Number	Sheet
M0615.20.014	**TWA-SB-12**	**2 of 2**

Depth (feet, bgs)	Water Levels	Percent Recovery	Sample Data: Sample ID	Sample Data: PID (ppm)	Lithologic Column	Soil Description
16				3		15.0 to 16.2 feet: SAND (SP); light gray; 100% sand, fine; medium dense; cemented together with white chalky material, strong rancid odor; moist. @ 16.1 feet: piece of shredded plastic.
17		100	TWA-SB-12-S-16.9			16.2 to 17.5 feet: SILTY GRAVELLY SAND (SM); brown; 30% fines, low plasticity; 40% sand, fine to medium; 30% gravel, medium, rounded; medium dense; moderate chemical-like odor; moist. @ 16.9 feet: 3/4" lens of sticky/stringy tar-like material, with a copper wire.
18				1		17.5 to 19.4 feet: SAND (SP); light gray; 100% sand, fine to medium; very dense; cemented together with white chalky material, strong rancid odor, no debris observed; moist. @ 18.0 to 18.3 feet: white; 100% fine grained paste; nonplastic; soft; strong rancid odor; moist.
19	▽		TWA-SB-12-S-18.5			@ 18.8 to 19.1 feet: dark gray layer of 70% fines, low plasticity; 30% sand, fine; firm; some rootlets; strong rancid odor; moist.
20						19.4 to 20.0 feet: SAND (SP); dark gray; 100% sand, medium; loose; no odor; wet.

Total Depth = 20.0 feet bgs

NOTES:

1) Depths are relative to feet bgs. 2) bgs = below ground surface. 3) ID = identification. 4) PID = photoionization detector. 5) ppm = parts per million.

Borehole Completion Details
0.0 to 20.0 feet: 2-inch-diameter borehole.
0.0 to 20.0 feet: Bentonite chips hydrated with potable water.

▽ ***Soil becomes wet at approximately 19.4 feet as observed in the core liner at time of drilling.***

MFA BOREHOLE W/RECON SCREEN W:\GINT\GINTW\PROJECTS\0615.20.014\HYLEBOS SUBSURFACE INVESTIGATION\TWA-SB-09 TO TWA-SB-16.GPJ 10/14/24

Geologic Borehole Log

MAUL FOSTER ALONG

Project Number	Boring Number	Sheet
M0615.20.014	TWA-SB-13	1 of 2

Project Name	Hylebos Marsh Subsurface Investigation		
Project Location	Tacoma, Washington	Surface Elevation (feet)	
Start/End Date	8/13/2024 to 8/13/2024	Northing	
Driller/Equipment	Anderson Environmental Contracting, LLC/Geoprobe 7822DT	Easting	
Geologist/Engineer	C. Sifford	Total Depth of Borehole	20.0 feet
Sample Method	Macro-Core	Outer Hole Diam	2.25 inch

Depth (feet, bgs)	Water Levels	Sample Data: Percent Recovery	Sample Data: Sample ID	Sample Data: PID (ppm)	Lithologic Column	Soil Description
1				1		0.0 to 1.7 feet: SAND WITH SILT AND GRAVEL (SP-SM); tan; 10% fines; 80% sand, fine to medium; 10% gravel, fine, rounded to subrounded; very loose; occasional pieces of bark throughout; no odor; dry.
2				1		1.7 to 2.1 feet: SAND WITH SILT AND GRAVEL (SP-SM); black; 10% fines; 80% sand, fine to medium; 10% gravel, fine, rounded to subrounded; very loose; occasional pieces of bark throughout; no odor; dry.
3		56				@ 2.0 feet: piece of plastic textile. 2.1 to 2.5 feet: light gray; 100% cobbles; shattered. 2.5 to 2.8 feet: ORGANIC MATERIAL WITH SAND AND DEBRIS; brown; 40% sand, medium; 40% organic material (wood chunks and chips); loose; 20% debris (red and clear plastic sheeting, broken glass, and a chunk of black plastic); no odor; dry
4						2.8 to 5.0 feet: NO RECOVERY.
5						@ 5.0 feet: piece of yellow plastic at tip of core.
6				1		5.0 to 6.1 feet: SILT (ML); white; 90% fines, nonplastic; 10% gravel, medium, subrounded; soft; paste-like; no odor; moist. @ 6.0 to 6.1 feet: WOODY DEBRIS; rotten wood chunk.
7	▽		TWA-SB-13-S-7.5	8		6.1 to 7.5 feet: SAND (SP); dark gray; 100% sand, medium; loose; no odor; moist. @ 6.4 to 6.5 feet: tan; 30% fines, nonplastic; 70% sand; firm; medium dense; no odor; moist. @ 7.1 feet: becomes wet.
8		50		1		7.5 to 10.0 feet: NO RECOVERY.
9						
10						
11				2		10.0 to 12.1 feet: SAND (SP); dark gray; 100% sand, medium; medium dense; no odor; wet. @ 10.3 to 10.5 feet: tan; 30% fines, nonplastic; 70% sand; firm; medium dense; no odor; moist.
12						
13		70		0		12.1 to 13.5 feet: SANDY SILT (ML); gray; 50% fines, low plasticity; 50% sand, fine to medium; firm; occasional rootlets throughout; no odor; wet.
14						13.5 to 15.0 feet: NO RECOVERY.
15						

MFA BOREHOLE W/RECON SCREEN W:\GINT\GINTW\PROJECTS\0615.20.014\HYLEBOS SUBSURFACE INVESTIGATION\TWA-SB-09 TO TWA-SB-16.GPJ 10/14/24

MAUL FOSTER ALONG

Geologic Borehole Log

Project Number	Boring Number	Sheet
M0615.20.014	**TWA-SB-13**	**2 of 2**

Depth (feet, bgs)	Water Levels	Sample Data: Percent Recovery	Sample Data: Sample ID	Sample Data: PID (ppm)	Lithologic Column	Soil Description
16				1		15.0 to 16.1 feet: SAND (SP); dark gray; 100% sand, medium; loose; no odor; wet.
17						16.1 to 17.3 feet: SILTY SAND (SM); dark gray; 30% fines, low plasticity; 70% sand, medium; medium dense; no odor; wet.
18		46				17.3 to 20.0 feet: NO RECOVERY.
19						
20						

Total Depth = 20.0 feet bgs

NOTES:

1) Depths are relative to feet bgs. 2) bgs = below ground surface. 3) ID = identification. 4) PID = photoionization detector. 5) ppm = parts per million.

Borehole Completion Details
0.0 to 20.0 feet: 2-inch-diameter borehole.
0.0 to 20.0 feet: Bentonite chips hydrated with potable water.

▽ ***Soil becomes wet at approximately 7.1 feet as observed in the core liner at time of drilling.***

MFA BOREHOLE W/RECON SCREEN W:\GINT\GINTW\PROJECTS\0615.20.014\HYLEBOS SUBSURFACE INVESTIGATION\TWA-SB-09 TO TWA-SB-16.GPJ 10/14/24

Geologic Borehole Log

MAUL FOSTER ALONG

Project Number	Boring Number	Sheet
M0615.20.014	TWA-SB-14	1 of 2

Project Name	Hylebos Marsh Subsurface Investigation		
Project Location	Tacoma, Washington	Surface Elevation (feet)	
Start/End Date	8/13/2024 to 8/13/2024	Northing	
Driller/Equipment	Anderson Environmental Contracting, LLC/Geoprobe 7822DT	Easting	
Geologist/Engineer	C. Sifford	Total Depth of Borehole	20.0 feet
Sample Method	Macro-Core	Outer Hole Diam	2.25 inch

Depth (feet, bgs)	Water Levels	Sample Data: Percent Recovery	Sample Data: Sample ID	Sample Data: PID (ppm)	Lithologic Column	Soil Description
1				2		0.0 to 2.0 feet: GRAVELLY SAND (SP); tan; 80% sand, fine to medium; 20% gravel, fine to medium, rounded to subrounded; very loose; no odor; dry.
				3		@ 1.5 feet: piece of 1/8" thick rubber sheet.
2			TWA-SB-14-S-1.5			@ 1.6 feet: becomes light tan.
						@ 1.7 feet: chunk of wood, 3/4" thick.
						2.0 to 2.6 feet: SILT (ML); pure white; 100% fines, low plasticity; firm; paste-like; no odor; moist.
		68		2		
3						2.6 to 3.4 feet: SAND (SP); dark gray; 100% sand, medium; very loose; no odor; moist.
						@ 3.1 feet: shell.
4						3.4 to 5.0 feet: NO RECOVERY.
5	▽					
						5.0 to 5.5 feet: SILT (ML); pure white; 100% fines, low plasticity; very soft; paste-like; no odor; wet.
6				6		5.5 to 9.0 feet: SAND (SP); dark gray; 100% sand, medium; medium dense; no odor; wet.
7						
8				4		@ 8.1 to 8.3 feet: layer of gray; 100% fines, nonplastic; soft; no odor; wet.
9						9.0 to 10.0 feet: NO RECOVERY.
10		80				
						10.0 to 13.8 feet: SAND (SP); dark gray; 100% sand, medium; medium dense; no odor; wet.
11						
				1		
12						@ 11.7 to 11.9 feet: layer of gray; 100% fines, nonplastic; soft; no odor; wet.
						@ 12.0 feet: large shell.
		86				
13						@ 12.8 to 13.1 feet: layer of gray; 100% fines, nonplastic; soft; no odor; wet.
				1		
14						13.8 to 14.3 feet: SILT (ML); gray; 100% fines, nonplastic; soft; no odor; wet.
						14.3 to 15.0 feet: NO RECOVERY.
15						

MFA BOREHOLE W/RECON SCREEN W:\GINT\GINTW\PROJECTS\0615.20.014\HYLEBOS SUBSURFACE INVESTIGATION\TWA-SB-09 TO TWA-SB-16.GPJ 10/14/24

MAUL FOSTER ALONG

Geologic Borehole Log

Project Number	Boring Number	Sheet
M0615.20.014	**TWA-SB-14**	**2 of 2**

Depth (feet, bgs)	Water Levels	Sample Data: Percent Recovery	Sample Data: Sample ID	Sample Data: PID (ppm)	Lithologic Column	Soil Description
16				1		15.0 to 17.2 feet: SAND (SP); dark gray; 100% sand, medium; medium dense; no odor; trace fines; wet. @ 15.2 to 15.3 feet: layer of gray; 100% fines, nonplastic; soft; no odor; wet. @ 16.4 to 16.5 feet: layer of gray; 100% fines, nonplastic; soft; no odor; wet.
17						
18		100		1		17.2 to 18.7 feet: SILT (ML); gray; 100% fines, nonplastic; soft; no odor; wet. @ 17.3 feet: shell.
19						18.7 to 20.0 feet: SANDY SILT (ML); dark gray; 50% fines, medium plasticity; 50% sand, medium; soft; no odor; wet.
20						

Total Depth = 20.0 feet bgs

NOTES:

1) Depths are relative to feet bgs. 2) bgs = below ground surface. 3) ID = identification. 4) PID = photoionization detector. 5) ppm = parts per million.

Borehole Completion Details
0.0 to 20.0 feet: 2-inch-diameter borehole.
0.0 to 20.0 feet: Bentonite chips hydrated with potable water.

▽ ***Soil becomes wet at approximately 5.0 feet as observed in the core liner at time of drilling.***

MFA BOREHOLE W/RECON SCREEN W:\GINT\GINTW\PROJECTS\0615.20.014\HYLEBOS SUBSURFACE INVESTIGATION\TWA-SB-09 TO TWA-SB-16.GPJ 10/14/24

Geologic Borehole Log

MAUL FOSTER ALONG

Project Number	Boring Number	Sheet
M0615.20.014	TWA-SB-15	1 of 1

Project Name	Hylebos Marsh Subsurface Investigation		
Project Location	Tacoma, Washington	Surface Elevation (feet)	
Start/End Date	8/13/2024 to 8/13/2024	Northing	
Driller/Equipment	Anderson Environmental Contracting, LLC/Geoprobe 7822DT	Easting	
Geologist/Engineer	C. Sifford	Total Depth of Borehole	15.0 feet
Sample Method	Macro-Core	Outer Hole Diam	2.25 inch

Depth (feet, bgs)	Water Levels	Sample Data: Percent Recovery	Sample Data: Sample ID	Sample Data: PID (ppm)	Lithologic Column	Soil Description
1				1		0.0 to 2.3 feet: GRAVELLY SAND WITH SILT (SP-SM); tan; 10% fines; 65% sand, medium; 25% gravel, fine to medium, rounded to subrounded; loose; no odor; dry.
2			TWA-SB-15-S-1.7	2.5		@ 1.3 feet: becomes moist.
3		68		1		2.3 to 3.4 feet: SAND WITH SILT (SP-SM); dark gray with orange mottling; 10% fines; 90% sand, medium; dense; no odor; moist.
4						3.4 to 5.0 feet: NO RECOVERY.
5						
6	▽			1		5.0 to 8.3 feet: SAND WITH SILT (SP-SM); dark gray with orange mottling; 10% fines; 90% sand, medium; dense; no odor; moist. @ 5.7 feet: no more mottling; occasional shell fragments. @ 6.1 to 6.2 feet: layer of tan; 100% fines, medium plasticity; soft; no odor; wet. @ 6.2 feet: becomes wet.
7						
8		66		1		
9						8.3 to 10.0 feet: NO RECOVERY.
10						
11				1		10.0 to 11.5 feet: SAND WITH SILT (SP-SM); dark gray with orange mottling; 10% fines; 90% sand, medium; dense; no odor; wet.
12		96		1		11.5 to 13.2 feet: SILTY SAND (SM); dark gray; 40% fines, medium plasticity; 60% sand, medium; medium dense; no odor; wet.
13						
14				1		13.2 to 13.6 feet: CLAY (CL); dark gray; 100% fines, high plasticity; soft; no odor; wet. 13.6 to 14.8 feet: PEAT (PT); dark brown; 10% fines, low plasticity; 90% organic material (peat and rootlets); firm; no odor; wet. @ 14.2 feet: fines increase to 30%; becomes dark brown with black mottling.
15						14.8 to 15.0 feet: NO RECOVERY.

Total Depth = 15.0 feet bgs

NOTES:

1) Depths are relative to feet bgs. 2) bgs = below ground surface. 3) ID = identification. 4) PID = photoionization detector. 5) ppm = parts per million.

Borehole Completion Details
0.0 to 15.0 feet: 2-inch-diameter borehole.
0.0 to 15.0 feet: Bentonite chips hydrated with potable water.

▽ **Soil becomes wet at approximately 6.1 feet as observed in the core liner at time of drilling.**

MFA BOREHOLE W/RECON SCREEN W:\GINT\GINTW\PROJECTS\0615.20.014\HYLEBOS SUBSURFACE INVESTIGATION\TWA-SB-09 TO TWA-SB-16.GPJ 10/14/24

Geologic Borehole Log

MAUL FOSTER ALONG

Project Number	Boring Number	Sheet
M0615.20.014	TWA-SB-16	1 of 1

Project Name	Hylebos Marsh Subsurface Investigation		
Project Location	Tacoma, Washington	Surface Elevation (feet)	
Start/End Date	8/13/2024 to 8/13/2024	Northing	
Driller/Equipment	Anderson Environmental Contracting, LLC/Geoprobe 7822DT	Easting	
Geologist/Engineer	C. Sifford	Total Depth of Borehole	15.0 feet
Sample Method	Macro-Core	Outer Hole Diam	2.25 inch

Depth (feet, bgs)	Water Levels	Percent Recovery	Sample Data: Sample ID	Sample Data: PID (ppm)	Lithologic Column	Soil Description
1						0.0 to 2.0 feet: SAND (SP); gray; 100% sand, medium; very loose; rootlets present from 0.09'; no odor; dry.
						@ 0.9 to 1.4 feet: orange staining.
2	▽		TWA-SB-16-S-1.5	0		@ 1.7 feet: becomes moist.
		76				2.0 to 2.4 feet: SILT WITH SAND (ML); gray ; 80% fines, medium plasticity; 20% sand, fine; soft; no odor; wet.
3				0		2.4 to 3.8 feet: SAND (SP); dark gray; 100% sand, medium; medium dense; no odor; wet.
4						3.8 to 5.0 feet: NO RECOVERY.
5						
6				0		5.0 to 6.9 feet: SAND (SP); dark gray; 100% sand, medium; medium dense; no odor; wet.
7						6.9 to 7.7 feet: SILT WITH SAND (ML); gray; 80% fines, medium plasticity; 20% sand, fine; soft; trace rootlets; no odor; wet.
		82		0		
8						7.7 to 9.1 feet: SILT (ML); gray; 100% fines, medium plasticity; soft; no odor; wet.
9						
10						9.1 to 10.0 feet: NO RECOVERY.
						10.0 to 12.9 feet: SILT (ML); gray; 100% fines, medium plasticity; soft; no rootlets; no odor; wet.
11				0		
12				0		@ 11.4 feet: plasticity becomes high.
		58				
13						12.9 to 15.0 feet: NO RECOVERY.
14						
15						

Total Depth = 15.0 feet bgs

NOTES:

1) Depths are relative to feet bgs. 2) bgs = below ground surface. 3) ID = identification. 4) PID = photoionization detector. 5) ppm = parts per million.

Borehole Completion Details
0.0 to 15.0 feet: 2-inch-diameter borehole.
0.0 to 15.0 feet: Bentonite chips hydrated with potable water.

▽ **Soil becomes wet at approximately 2.0 feet as observed in the core liner at time of drilling.**

MFA BOREHOLE W/RECON SCREEN W:\GINT\GINTW\PROJECTS\0615.20.014\HYLEBOS SUBSURFACE INVESTIGATION\TWA-SB-09 TO TWA-SB-16.GPJ 10/14/24

Appendix B

Port Snail Eradication Documents

MAUL FOSTER ALONGI

WASHINGTON GRAIN COMMISSION
2702 W. Sunset Boulevard, Suite A
Spokane, WA 99224
509.456.2481

WA Association of WHEAT GROWERS
109 E First Ave, Ritzville, WA 99169
509.659.0610

January 30, 2024

Jason Jordan
Director, Environmental and Planning Programs
Port of Tacoma
One Sitcum Plaza
Tacoma, WA 98421

Dear Mr. Jordan:

We write in support of the Port of Tacoma's effort to eradicate the invasive snail species *Cernuella virgata* (Mediterranean vineyard snail). We appreciate the myriad of mitigation practices that have been employed by the Port of Tacoma and Washington Department of Agriculture over the last 15 years to contain this infestation. However, the serious risk of spreading remains, which puts our industry and state economy at great risk.

These snails create economic loss in three key ways: 1. They feed on and contaminate field crops including wheat, barley, oats, peas, and canola. 2. They clog machinery that results in costly repairs and halts time-sensitive work. 3. They provide overseas trading partners reason to restrict imports from Pacific Northwest ports to avoid contamination.

The Washington wheat industry alone contributed over $3.1 billion to the state's economy in 2022, with a heightened impact in rural areas. In the same year, total direct employment associated with Washington wheat production amounted to 3,672 jobs in 2022. Indirect and induced employment supported another 11,676 jobs.[1]

In 2022, Washington was the third largest wheat producing state in the country and approximately 90% of total production was exported. It isn't just Washington grain growers who are at risk if this invasive species were to spread. The Pacific Northwest is the top wheat export gateway in the nation, accounting for more than 55 percent of all U.S. wheat exports passing through on rail or

[1] Fortenbery, T. R., & Nadreau, T. P. (n.d.). Contribution of Wheat Production to the Washington Economy. https://acrobat.adobe.com/id/urn:aaid:sc:VA6C2:43500d5f-3bf2-4b1d-a6bc-670d94acc4b3

barge and valuing nearly $4 billion.[2] In addition, the PNW is the second largest gateway for soybean and corn exports coming from as far as the Midwest.

Over the last seventy years, growers and their federal government partners at the U.S. Department of Agriculture have invested billions of dollars and countless hours to build strong relationships with our trading partners. The U.S. Wheat industry differentiates itself by providing high-quality wheat and reliable delivery. Any disruption to that system would hurt our ability to consistently provide abundant, high-value food products and weaken the competitiveness of U.S. producers in global markets.

The U.S. grain industry today faces many challenges, including greater competition on the global market, more demanding customers and consumers, record high input costs, and agronomic obstacles like extreme weather, weed resistance and pests. If this species is allowed to become established in the PNW, it will be another serious risk to the livelihood of Washington grain producers and will very likely require the use of millions of pounds of additional pesticide to control it. It would be a missed opportunity not to eliminate the Mediterranean vineyard snails before they create grave economic problems for Washington. We respectfully request that you accept the Port of Tacoma's petition to eradicate this infestation of Mediterranean vineyard snail in Washington definitively and finally.

Respectfully,

Ben Barstow
Chairman
Washington Grain Commission

Anthony Smith
President
Washington Association of Wheat Growers

[2] US Wheat Associates Price Report Data. (2023). Wheat Export Data/Value of PNW Exports. https://acrobat.adobe.com/id/urn:aaid:sc:VA6C2:dec3a7ec-b213-4c44-b700-b4e86ba42131

USDA
United State Department of Agriculture

Animal and Plant
Health Inspection
Service

Plant Protection and
Quarantine

835 South 192nd Street
Suite 1600, Bldg D
SeaTac, WA 98148

Voice: 206-391-2025
Fax: 206-870-8043
Timothy.stgermain@usda.gov

February 1, 2024

Jason Jordan
Director, Environmental and Planning Programs
Port of Tacoma
One Sitcum Plaza
Tacoma, WA 98421

Mr. Jordan,

Invasive exotic mollusks have wide host ranges, including grain crops, nursery and floriculture products, fruit and nut crops, vegetable crops, and spices. Mollusks are excellent hitchhikers, frequently taking advantage of non-host conveyances such as railcars, maritime containers, trucks, and bulk goods to move into new areas. In November of 2005, Washington State Department of Agriculture (WSDA) survey staff detected the vineyard snail, *Cernuella virgata,* at the Port of Tacoma in Pierce County, Washington. The invasive snail is native to Mediterranean Europe and is considered a serious pest of cereal crops, legumes, pasture lands, and new growth of vines, shrubs and trees. The snails also contaminate grain during harvest and can clog and damage machinery.

The snail specifically threatens the wheat, barley, and hay industries of Washington State. The snail was also introduced to Australia, and the Australian grain industry estimates the vineyard snail costs growers $10 million annually. Australia and Washington State have similar annual rainfall in their wheat-growing areas which suggests the vineyard snail could quickly become established in the grain-growing regions of the state.

WSDA and the Animal and Plant Health Inspection Service (APHIS), Plant Protection and Quarantine (PPQ) initiated efforts to eradicate vineyard snail in 2007. These efforts are still underway and have been significantly effective. The original infestation of approximately 600 acres on multiple properties is now reduced to just under an acre on a single property. The eradication program has used several treatment options and found that a combination of outreach to inform landowners about vegetation management, debris disposal/sanitation to remove snail hiding places, and metaldehyde molluscicide treatments were the most effective. However, municipal regulations prohibiting pesticide use within the remaining "wetland" area create a refuge from molluscicide treatments for the snails. From 2020 to 2023, WSDA and Washington State University tested steam treatment methods in the remaining area to eradicate the snail. Areas containing snails were steamed at 56 degrees Celsius for half an hour during late summer when the snails were less active and aggregated, and the site was primarily dry. Unfortunately, this method has shown limited efficacy, and chemical treatment options for the remaining wetland area are limited and not guaranteed to work. WSDA needs approval to explore other creative management options (i.e. alternate chemicals, changes to land use) to eradicate this pest.

An Equal Opportunity Provider and Employer

APHIS PPQ supports the continued eradication and containment of this invasive mollusk while it is localized at the port to protect Washington's and the nation's agriculture and natural resources. In the last ten years alone, APHIS PPQ has contributed nearly $1.4 million to this eradication effort and invasive snail surveys, including the vineyard snail.

Sincerely,

Timothy St. Germain
State Plant Health Director, Field Operations
USDA APHIS PPQ

STATE OF WASHINGTON

DEPARTMENT OF AGRICULTURE

P.O. Box 42560 • Olympia, Washington 98504-2560 • (360) 902-1800

February 2, 2024

Jason Jordan
Director, Environmental and Planning Programs
Port of Tacoma
One Sitcum Plaza
Tacoma, WA 98421

In 2005, a population of highly invasive *Cernuella virgata* (Mediterranean vineyard snail) was discovered on several property parcels at the Port of Tacoma (Port). This nonnative snail is extremely destructive to crops, especially grains, and its presence at the Port posed a significant threat to Washington's agriculture.

In response, the Port, in coordination with the Washington State Department of Agriculture (WSDA) and the U.S. Department of Agriculture -Animal and Plant Health Inspection Service - Plant Health and Quarantine (USDA-APHIS-PPQ), initiated containment and eradication activities for this invasive pest. Strategies have included education and outreach in combination with debris removal, vegetation management, and chemical treatments.

Because of this ongoing effort to contain and eradicate *C. virgata*, the original infestation area has been significantly reduced from nearly 400 acres on the Blair-Hylebos Peninsula, approximately 300 acres of which are under Port ownership, to a single site that is less than one acre on a single parcel.

Completing the eradication on the final infested acre has proven to be a challenge. The last remaining portion of the snail population is located on the edge of a wetland where chemical treatment cannot be used. This population has been mostly contained on this sole site, thanks to continuous and costly efforts for almost 10 years. Unfortunately, further reduction has not been possible. An effort in 2019 to incorporate a new eradication strategy of steam treatment developed by WSU to complete the eradication was not successful, as the terrain and soil composition at the Port site do not seem to be able to reach the appropriate temperature required to kill the snails.

Despite containing the population to a small, one-acre site, the risk of escape and spread is an ongoing concern. One snail did manage to hitchhike to an adjacent property in 2019. This was an alarming reminder that a very real and dangerous risk for further spread outside the containment area still exists for this invasive pest due to the increased activity and vehicle movement at the Port.

More recently, WSDA detected a snail during a survey following a stream treatment in 2023. This snail was still on the contained site. However, it was approaching and extremely close to parked vehicles on the adjacent parcel, once again underscoring the significant risk of spread.

After this serious incident, WSDA and the USDA Terrestrial Mollusk Cross Functional Working Group met to re-evaluate the direction of Mediterranean Vineyard Snail eradication project. As a result of this meeting, the Port was contacted to discuss alternative eradication strategies. At this meeting the Port indicated their desire to develop the site in a manner that would result in rendering the infested site uninhabitable for the snails, thus completing the eradication.

WSDA fully supports this course of action for the reasons listed below:

1. Mediterranean Vineyard Snail poses a direct risk to National, Regional, and Washington grain industries as the snails are known to feed directly on grain commodities as well as clogging of harvesting machinery and contamination of harvested crops.

2. The snail constitutes a direct threat to the nation's food supply. Grain exports could be subject to costly restrictions by other states or nations if the snail becomes permanently or widely established in Washington.

3. It has been demonstrated that the snail cannot be eliminated on the remaining terrain type using the methods that were effective in reducing the population from 400 acres to 1 acre.

4. Containment and eradication activity costs have been significant and are not projected to end unless the snail population is eliminated. These costs are borne by the Port, and by federal taxpayers.

5. If the snail population is allowed to remain, the snail is capable of breaking containment and establishing new infestations in Washington, which could have significant ecological and environmental ramifications.

6. Maintaining the infested site as a wetland in a port environment significantly increases the risk of spreading snails. If passing wildlife is attracted to the wetland, this introduces another pathway for spread that cannot be controlled. Increased Port activity near the wetland also risks spreading the snails.

7. As long as this small wetland area contains these invasive snails, it should be considered contaminated and not an environmental asset.

Additionally, WSDA strongly recommends that legal barriers, mitigation requirements, and permits restricting development on this remaining site infested with snails be re-evaluated and ultimately relaxed or waived for this unique situation, as it is in the best interest of Washington's and the nation's food supply.

We thank you for your consideration of this matter and appreciate the Port's efforts to responsibly address this threat.

Respectfully,

Derek I. Sandison
Director

Vineyard Snail Eradication Activities Report 2022

This report covers the snail eradication activities from January 1, 2022 to December 31, 2022. The eradication zone is located from the north side of the 2000 block Lincoln Ave E., north to East 11th Street, Pierce County, 98421. East-west boundaries are Taylor Way and Alexander Avenue, respectively.

Port of Tacoma

Background

On November 15, 2005, initial detection of an invasive and very destructive snail, *Cernuella virgata* (Vineyard Snail) was made within the Port of Tacoma's (Port) industrial area. A formal survey was completed by WSDA and USDA in 2006 that delineated an infestation area of over 300 acres on the Blair-Hylebos Peninsula. The primary infestation was centered on Port, City of Tacoma and private property north of Lincoln Avenue.

In May 2007 that WSDA and USDA sought a voluntary eradication program with the Port to avoid a prolonged process of developing a state plan. Speed was—and is—essential to control the population and to avoid quarantines that could limit the flow of cargo from the Port area. Quarantines could limit movement within the Port area and potentially restrict over one billion dollars of agricultural products from export.

In 2007, WSDA and the Port delivered letters to Port tenants and other property owners within the eradication zone discussing the seriousness of the infestation and advised owners not to remove vegetation from their sites. In the summer of 2007, the Port and others removed excess vegetation from Port owned and non-Port owned properties, and the Port conducted controlled burns of the discarded vegetation.

On June 20, 2011, the Port received the "*Prescription to the Port of Tacoma for the Eradication of the Vineyard Snail on the Blair Peninsula*" (Prescription) memorandum from WSDA. The Prescription outlined the best practices to contain and eliminate the vineyard snail from the affected areas. In April 2013, the Port provided USDA and WSDA with a proposed prescription based on historical snail detections. This prescription is updated annually based on the number of years a property has been free of snail detections.

WSDA issued a letter in September 2014 stating changes to the Deadline pesticide label allowing for application in areas where no surface water is present. The City of Tacoma reissued a Critical Areas Preservation Ordinance Letter of Approval in 2018 to conduct vegetation management and limited seasonal bait application within the wetlands and buffers located at the site known as Port Parcel 117 (also known as TPU).

In 2019, WSDA proposed to eradicate *C. virgata* within the wetlands and wetland boundaries on Port Parcel 117 using steam to kill all life stages. The City of Tacoma issued LU19-0190, Voluntary Enhancement and Restoration, Activities Allowed with Staff Review on September 5, 2019, to the Port, which allowed WSDA to conduct steam treatments and restore the wetland and wetland boundary areas with a native grass seed mix after the treatments were completed. Steam treatments were conducted in 2019, 2020, 2021 and in August and September of 2022.

One snail was observed on Port Parcel 114, also known as PQ, in October 2019. This was the first detection in over 5 years. The site was heavily baited in October and November 2019 and additional surveys have resulted in no new *C. virgata* detections.

The following summarizes the specific activities associated with the Port's snail eradication program. This reporting period is from January 1, 2022 to December 31, 2022. This snail eradication activities report has decreased from semi-annually to annually, as agreed to by WSDA and the Port in early 2021.

Summary of Activities

Seventy *C. viragta* snails were collected on Port Parcel 117 during the 2022 survey season. This is a notable reduction from the 2021 survey season in which 329 snails were collected. This reduction may be in part due to the Port's ability to resume a more intensive vegetation management schedule. Maintenance hours for vegetation maintenance and debris removal at Port Parcel 117 increased from 126 hours in 2021 to 251.25 hours in 2022. Port maintenance activities at Port Parcel 117 also included the application of molluscicide. Metarex was applied on the southern fenceline and berm area on June 2, 2022. Deadline was applied along the perimeter and fence line on October 5, 2022.

Surveys were conducted by WSDA biweekly from May to June, weekly from August until November, and once in December. Vineyard snails were observed in concentrated, discrete populations located in and around the on-site wetlands and associated buffers. No snails were detected outside the wetlands or wetland buffers on Port Parcel 117. No snails were detected on any other Port properties located within the eradication zone. A map depicting the approximate locations and quantities of live *C. virgata* collected on Port property by WSDA in 2022 is included as part of this report. These areas are the focus of intensive vegetation management, baiting and steam treatments performed.

WSDA and WSU conducted steam treatments at 20 plots on Port Parcel 117 between August 10 and September 13, 2022. The targeted soil temperature and duration for snail mortality is 56°C for 30 minutes. Steaming was less effective at reaching the targeted temperature and time metrics at depth.

Mean percent of sensors that reached 56°C for 30 minutes	Soil Depth
93%	0 cm
66%	6 cm
41%	10 cm

Following the steam treatments, WSDA set 12 baited traps on Port Parcel 117 in the areas with the highest concentration of snail detections. Three baited traps were set on Parcel 114 (PQ site). The trap locations are depicted on the attached map. No *C. virgata* were captured in the traps. However, 34 snails were collected between October 13 to December 8, 2022.

The following Snail Eradication Reporting Form is specific to eradication activities at Port Parcel 117. It includes Port parcel number, address, size, location, and description. Eradication activities are organized by date, and include pesticides used and rates, hours spent on eradication efforts, any notes associated with the activity, and the costs incurred by the Port for these activities. Properties with three or more years without any snail detections are no longer included in this report. Routine vegetation management and debris removal are still being conducted within these sites but are no longer considered part of the snail eradication program. The PQ site where one snail was detected in 2019 is not included in this report, but vegetation management and surveys are ongoing. Since no additional snails have been detected at the PQ site, it will not be included in future reports unless site conditions change.

Costs to Date

Attached is a summary of expenditures for 2022 and total since the beginning of the eradication efforts. This information is used to budget for the following years' activities as well as reporting to Port management.

For comments or questions specific to this report or the vineyard snail eradication program, please contact Kristin Evered, Environmental Project Manager, Port of Tacoma, 253.888.4776.

Next Steps

The Port will meet with WSDA in the early spring of 2023 to discuss vegetation management and baiting schedules, and possible additional trapping efforts in order to maximize eradication effectiveness. If steam treatments are anticipated again for 2023, the Port will notify the City of Tacoma to ensure permit compliance for work in the wetlands and wetland buffers. If no steam treatments are proposed for 2023, the Port will continue with the vegetation management and baiting activities, concentrating on areas with higher detections to limit the snails' ability to expand its range and population size.

Cernuella virgata Detections in Port of Tacoma, June - December 2022

Datum: North America 1983
Coordinate System: StatePlane WA S. FIPS 4602 Ft.
Projection: Lambert Conformal Conic
Data Sources: WSDA, Pierce County, Port of Tacoma, NAIP

This Data is provided on an 'AS IS,' 'AS AVAILABLE,' and 'WITH ALL FAULTS' Basis. The Content of this map and data are from many sources and are NOT warranted to be complete, accurate, or current. All critical information should be independently verified. WSDA and its officials and employees assume no responsibility or legal liability for the accuracy, completeness, reliability, timeliness, or usefulness of any of the information presented here.

Creation Date: 1/3/2023

Project Total Costs															
MO/YR	2008	2009	2010	2011	2012	2013	2014	2015	2016**	2017***	2018****	2019	2020	2021	2022
JAN		$103,212.15			$7,214.86	$3,254.00	$990.00	$2,520.00	$2,045.00	$501.00	$584.50	$835.00	$1,593.00	$2,366.00	$1,086.00
FEB		$20,858.39			$25,588.61	$2,178.00	$624.00	$788.90*	$6,381.50	$1,002.00	$167.00	$501.00	$1,858.50	$0.00	$0.00
MAR		$13,036.01	$378.00		$7,044.50	$1,254.00	$8,936.40	$3,441.00	$3,454.50	$334.00	$417.50	$83.50	$2,743.50	$929.50	$905.00
APR		$685.00			$19,227.60	$264.00	$8,395.92	$6,726.36	$14,864.90	$4,032.50	$6,638.01	$7,127.50	$6,864.63	$253.50	$0.00
MAY		$2,484.37	$504.00		$7,905.10	$4,258.00	$7,516.26	$10,237.50	$434.00	$291.00	$5,229.50	$5,210.50	$3,789.18	$4,631.50	$452.50
JUN		$666.44	$1,476.00	$20,506.00	$32,994.46	$5,502.12	$13,444.25	$4,104.00	$37,650.93	$29,069.50	$25,295.00	$11,596.50	$4,002.84	$5,905.50	$14,457.96
JUL	$12,561.60	$1,427.00	$252.00	$22,440.06	$39,397.91	$32,760.70	$8,435.16	$20,121.66	$6,780.33	$1,670.00	$11,340.62	$4,760.00	$8,887.53	$10,645.50	$8,614.81
AUG	$14,242.20	$10,559.73	$126.00	$31,623.19	$11,736.26	$340.00	$18,494.49	$692.00	$157.00	$1,264.24	$5,444.50	$3,207.50	$5,790.60	$3,707.50	$11,926.37
SEP	$22,913.12	$19,163.81	$9,524.63	$24,054.43	$11,210.82	$22,428.00	$1,199.50	$7,311.75	$11,315.00	$2,004.00	$668.00	$3,492.50	$6,065.55	$3,061.50	$1,533.42
OCT	$55,376.78	$1,631.24	$4,833.00	$45,297.32	$6,659.70	$2,538.00	$4,235.50	$14,369.38	$5,594.00	$0.00	$0.00	$11,748.50	$2,549.18	$676.00	$4,448.02
NOV	$22,257.58		$7,284.77	$12,510.00	$15,933.03	$3,853.15	$330.00	$506.50	$529.00	$372.00	$417.50	$350.00	$3,220.96	$84.50	$0.00
DEC	$40,845.10	$750.00		$5,847.75	$332.50	$614.77	$1,237.50	$432.50	$1,347.00	$334.00	$2,032.00	$0.00	$88.50	$706.50	$905.00
YTD	**$168,196.38**	**$174,474.14**	**$24,378.40**	**$162,278.75**	**$185,245.35**	**$79,244.74**	**$73,838.98**	**$71,251.55**	**$90,553.16**	**$40,874.24**	**$58,234.13**	**$48,912.50**	**$47,453.97**	**$32,967.50**	**$44,329.08**
TOTAL ALL YEARS			**$1,302,232.87**												

*Port received reimbursement in February 2015; therefore, project costs are less than line item costs

**Spring 2016 charges also include coordination for Asian gypsy moth eradication.

***Spring 2017 charges also include coordination for WA Department of Health mosquito surveys

****Spring and summer 2018 charges also include PM time for noxious weed removal

Project Manager															
MO/YR	2008	2009	2010	2011	2012	2013	2014	2015	2016**	2017***	2018****	2019	2020	2021	2022
JAN	$0.00	$2,598.52	$0.00	$0.00	$7,214.86	$2,838.00	$990.00	$1,485.00	$1,805.50	$501.00	$584.50	$835.00	$1,593.00	$2,366.00	$1,086.00
FEB	$0.00	$862.13	$0.00	$0.00	$10,170.99	$2,178.00	$0.00	$1,038.00	$863.50	$1,002.00	$167.00	$501.00	$1,858.50	$0.00	$0.00
MAR	$0.00	$75.00	$378.00	$0.00	$7,044.50	$1,254.00	$165.00	$605.50	$2,276.50	$334.00	$417.50	$83.50	$2,743.50	$929.50	$905.00
APR	$0.00	$300.00	$0.00	$0.00	$7,461.08	$264.00	$577.50	$259.50	$2,276.50	$250.50	$668.00	$2,087.50	$619.50	$253.50	$0.00
MAY	$0.00	$0.00	$504.00	$0.00	$665.00	$462.00	$330.00	$928.50	$0.00	$167.00	$83.50	$1,920.50	$0.00	$0.00	$452.50
JUN	$0.00	$438.94	$864.00	$5,700.00	$4,023.25	$528.00	$577.50	$3,194.50	$0.00	$1,417.50	$167.00	$1,586.50	$354.00	$253.50	$0.00
JUL	$3,750.00	$790.00	$252.00	$12,750.00	$8,514.75	$660.00	$1,815.00	$1,896.50	$1,334.50	$1,670.00	$3,841.00	$0.00	$1,239.00	$676.00	$181.00
AUG	$1,800.00	$975.00	$126.00	$5,328.00	$2,048.50	$132.00	$742.50	$692.00	$157.00	$373.00	$918.50	$2,087.50	$177.00	$253.50	$1,448.00
SEP	$10,016.09	$525.00	$756.00	$7,696.00	$3,391.50	$1,056.00	$825.00	$865.00	$0.00	$2,004.00	$668.00	$2,372.50	$1,504.50	$0.00	$0.00
OCT	$21,991.44	$0.00	$1,008.00	$7,575.00	$332.50	$198.00	$330.00	$4,238.50	$1,099.00	$0.00	$0.00	$4,258.50	$619.50	$676.00	$724.00
NOV	$13,525.43	$0.00	$504.00	$5,100.00	$3,009.70	$264.00	$330.00	$346.00	$157.00	$0.00	$417.50	$0.00	$3,177.00	$84.50	$0.00
DEC	$5,115.10	$750.00	$0.00	$3,455.75	$332.50	$66.00	$1,237.50	$432.50	$1,099.00	$334.00	$668.00	$0.00	$88.50	$0.00	$905.00
YTD	**$56,198.06**	**$7,314.59**	**$4,392.00**	**$47,604.75**	**$54,209.13**	**$9,900.00**	**$7,920.00**	**$15,981.50**	**$11,068.50**	**$8,053.00**	**$8,600.50**	**$15,732.50**	**$13,974.00**	**$5,492.50**	**$5,701.50**
TOTAL ALL YEARS			**$272,142.53**												

**Spring 2016 charges also include coordination for Asian gypsy moth eradication.

***Spring 2017 charges also include coordination for WA Department of Health mosquito surveys

****Spring and summer 2018 charges also include PM time for noxious weed removal

Maintenance/Contractor/Equipment															
MO/YR	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022
JAN	$0.00	$100,613.63	$0.00	$0.00	$0.00	$416.00	$0.00	$1,035.00	$239.50	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00
FEB	$0.00	$19,996.26	$0.00	$0.00	$15,417.62	$0.00	$624.00	$0.00	$5,518.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00
MAR	$0.00	$12,961.01	$0.00	$0.00	$0.00	$0.00	$8,771.40	$2,835.50	$1,178.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00
APR	$0.00	$385.00	$0.00	$0.00	$11,766.52	$0.00	$7,818.42	$6,466.86	$12,588.40	$3,782.00	$5,970.01	$5,040.00	$6,245.13	$0.00	$0.00
MAY	$0.00	$2,484.37	$0.00	$0.00	$7,240.10	$3,796.00	$7,186.26	$9,309.00	$434.00	$124.00	$5,146.00	$3,290.00	$3,789.18	$4,631.50	$0.00
JUN	$0.00	$227.50	$612.00	$14,806.00	$28,971.21	$4,974.12	$12,866.75	$909.50	$37,650.93	$27,652.00	$25,128.00	$10,010.00	$3,648.84	$5,652.00	$14,457.96
JUL	$8,811.60	$637.00	$0.00	$9,690.06	$30,883.16	$32,100.70	$6,620.16	$18,225.16	$5,445.83	$0.00	$7,499.62	$4,760.00	$7,648.53	$9,969.50	$8,433.81
AUG	$12,442.20	$9,584.73	$0.00	$26,295.19	$9,687.76	$208.00	$17,751.99	$0.00	$0.00	$39.00	$4,526.00	$1,120.00	$5,613.60	$3,454.00	$10,478.37
SEP	$12,897.03	$18,638.81	$8,768.63	$16,358.43	$7,819.32	$21,372.00	$374.50	$6,446.75	$11,315.00	$930.00	$0.00	$1,120.00	$4,561.05	$3,061.50	$1,533.42
OCT	$33,385.34	$1,631.24	$3,825.00	$37,722.32	$6,327.20	$2,340.00	$3,905.50	$10,130.88	$4,495.00	$0.00	$0.00	$7,490.00	$1,929.68	$0.00	$3,724.02
NOV	$8,732.15	$0.00	$6,780.77	$7,410.00	$12,923.33	$3,589.15	$0.00	$160.50	$372.00	$372.00	$0.00	$350.00	$43.96	$0.00	$0.00
DEC	$35,730.00	$0.00	$0.00	$2,392.00	$0.00	$548.77	$0.00	$0.00	$248.00	$0.00	$1,364.00	$0.00	$0.00	$706.50	$0.00
YTD	**$111,998.32**	**$167,159.55**	**$19,986.40**	**$114,674.00**	**$131,036.22**	**$69,344.74**	**$65,918.98**	**$55,519.15**	**$79,484.66**	**$32,899.00**	**$49,633.63**	**$33,180.00**	**$33,479.97**	**$27,475.00**	**$38,627.58**
TOTAL ALL YEARS			**$1,030,417.20**												

Site Name	Parcel 117 - TPU	Size (Acres)	17
Address	1300 Taylor Way	Location	47°16'22.34"N/122°23'40.04"W
Description	vacant land, no improvements	Tenant	None

ACTIVITY

Date	Maintenance Hours	Vegetation Management	Debris Removal	Pesticide Application	Notes	Costs
6/2/2022	1.00			X	Metarex 25 lbs/ac	$146.04
6/6/2022	7.00	X	X			$1,022.28
6/6/2022	6.00	X	X			$876.24
6/6/2022	8.00	X	X			$1,168.32
6/7/2022	2.50	X	X			$365.10
6/7/2022	3.50	X	X			$511.14
6/7/2022	4.00	X	X			$584.16
6/8/2022	4.00	X	X			$584.16
6/9/2022	4.00	X	X			$584.16
6/24/2022	1.50	X	X			$219.06
6/28/2022	8.00	X	X			$1,168.32
6/28/2022	8.00	X	X			$1,168.32
6/28/2022	7.00	X	X			$1,022.28
6/28/2022	2.00	X	X			$292.08
6/28/2022	8.00	X	X			$1,168.32
6/29/2022	4.00	X	X			$584.16
6/29/2022	8.00	X	X			$1,168.32
6/29/2022	6.50	X	X			$949.26
6/30/2022	2.00	X	X			$292.08
6/30/2022	2.00	X	X			$292.08
6/30/2022	2.00	X	X			$292.08
7/1/2022	4.00	X	X			$584.16
7/1/2022	3.00	X	X			$438.12
7/1/2022	2.00	X	X			$292.08
7/7/2022	4.25	X	X			$620.67
7/8/2022	6.00	X	X			$876.24
7/14/2022	2.00	X	X			$292.08
7/14/2022	1.50	X	X			$219.06
7/18/2022	3.50	X	X			$511.14
7/14/2022	8.50	X	X			$1,241.34
7/21/2022	3.00	X	X			$438.12
7/22/2022	4.00	X	X			$584.16
7/26/2022	8.00	X	X			$1,168.32
7/26/2022	2.00	X	X			$292.08
7/27/2022	2.00	X	X			$292.08
7/26/2022	4.00	X	X			$584.16
8/9/2022	3.00	X	X			$438.12
8/9/2022	7.00	X	X			$1,022.28
8/9/2022	2.00	X	X			$292.08
8/10/2022	8.00	X	X			$1,168.32

Site Name	Parcel 117 - TPU	Size (Acres)	17
Address	1300 Taylor Way	Location	47°16'22.34"N/122°23'40.04"W
Description	vacant land, no improvements	Tenant	None

ACTIVITY

Date	Maintenance Hours	Vegetation Management	Debris Removal	Pesticide Application	Notes	Costs
8/10/2022	8.00	X	X			$1,168.32
8/10/2022	4.00	X	X			$584.16
8/11/2022	1.75				Water truck for steam treatment	$255.57
8/11/2022	8.00	X	X			$1,168.32
8/12/2022	8.00	X	X			$1,168.32
8/12/2022	1.00	X	X			$146.04
8/16/2022	2.00	X	X			$292.08
8/15/2022	1.00				Water truck for steam treatment	$146.04
8/15/2022	2.00	X	X			$292.08
8/17/2022	2.00	X	X			$292.08
8/18/2022	2.00	X	X			$292.08
8/22/2022	2.00	X	X			$292.08
8/23/2022	1.00	X	X			$146.04
8/24/2022	1.00				Water truck for steam treatment	$146.04
8/26/2022	2.00	X	X			$292.08
8/29/2022	2.00	X	X			$292.08
8/30/2022	2.00	X	X			$292.08
8/31/2022	2.00	X	X			$292.08
9/2/2022	1.50				Water truck for steam treatment	$219.06
9/6/2022	1.50				Water truck for steam treatment	$219.06
9/7/2022	1.50				Water truck for steam treatment	$219.06
9/8/2022	2.00	X	X			$292.08
9/9/2022	2.00				Water truck for steam treatment	$292.08
9/12/2022	2.00				Water truck for steam treatment	$292.08
10/5/2022	8.00	X	X			$1,168.32
10/5/2022	8.00	X	X			$1,168.32
10/5/2022	8.00	X	X	X	Deadline Bullets 25 lbs/ac	$1,168.32
10/5/2022	1.50	X	X			$219.06
TOTAL	**264.50**				**TOTAL**	**$38,627.58**

***Cernuella virgata* detection surveys in the Port of Tacoma TPU Unit, Sept. 18-21, 2023**

Monday, September 18, 2023:

One WSDA Terrestrial Mollusk Survey team member checked on the parcel at TPU in the port of Tacoma between 9:00am and 11:00am. The first heavy rain of the season had occurred in the early morning hours prior to sunrise. The sunlight had just reached the unit when the survey began, though the ground and vegetation was still very wet. Nearing the boundary of the first steam treatment area the ground and low foliage became covered in active *Xeroplexa intersecta*, both adults and juveniles. One active adult *Cernuella virgata* was soon discovered in the berm. Ten others were discovered in the next hour, primarily on or near the central berm both within and outside the recent steam treatments. One cluster of 6 adults was detected in a mound of vegetation left from mowing near the large eastern berm. The berm was checked, and no specimens were detected. 11 total active *C. virgata* were detected during this survey.

Tuesday, September 19, 2023:

With rain forecast for the evening, three members of the survey team checked the area at dusk and during darkness the following night. Survey activities lasted from 1900H to 2200H, with no *C. virgata* detected. The rain did not materialize, though light sprinkles occurred during the survey though the ground remained dry.

Wednesday, September 20, 2023:

Four survey personnel arrived at the unit at 7:00am. A moderate rain was falling, and the ground and vegetation were saturated. Shortly after entering the unit and reaching the berm, several active adult *C. virgata* were immediately detected. Pink flags were placed at the location of each target snail to aid in visualizing the extent and density of activity. The majority of snails were found in an approximate 20m section of the main berm along the southeastern edge of the parcel, south of the raised berm/access road across the unit. While active snails were located dispersed throughout this immediate area, near the location known as “Jenni’s Rock”, and the adjacent flat wetland areas, none were found along the berm north of this area in the additional steamed area near the trees, nor anywhere else in the unit. Snail activity seemed to have ceased by 11:00am. 98 active *C. virgata* were detected during this survey.

Thursday, September 21, 2023:

One surveyor returned to the location and surveyed between 7:00am and 8:00am. No *C. virgata* were found, with all areas from the previous day checked. The ground and vegetation were wet from condensation during the survey; however, the sky was clear and the temperature was crisp (48F at end of survey). Minimal *X. intersecta* activity was detected. Most snails found during these surveys were large adults, many with thin and transparent lips to their shells rather than the developed rusty band in the inner lip.

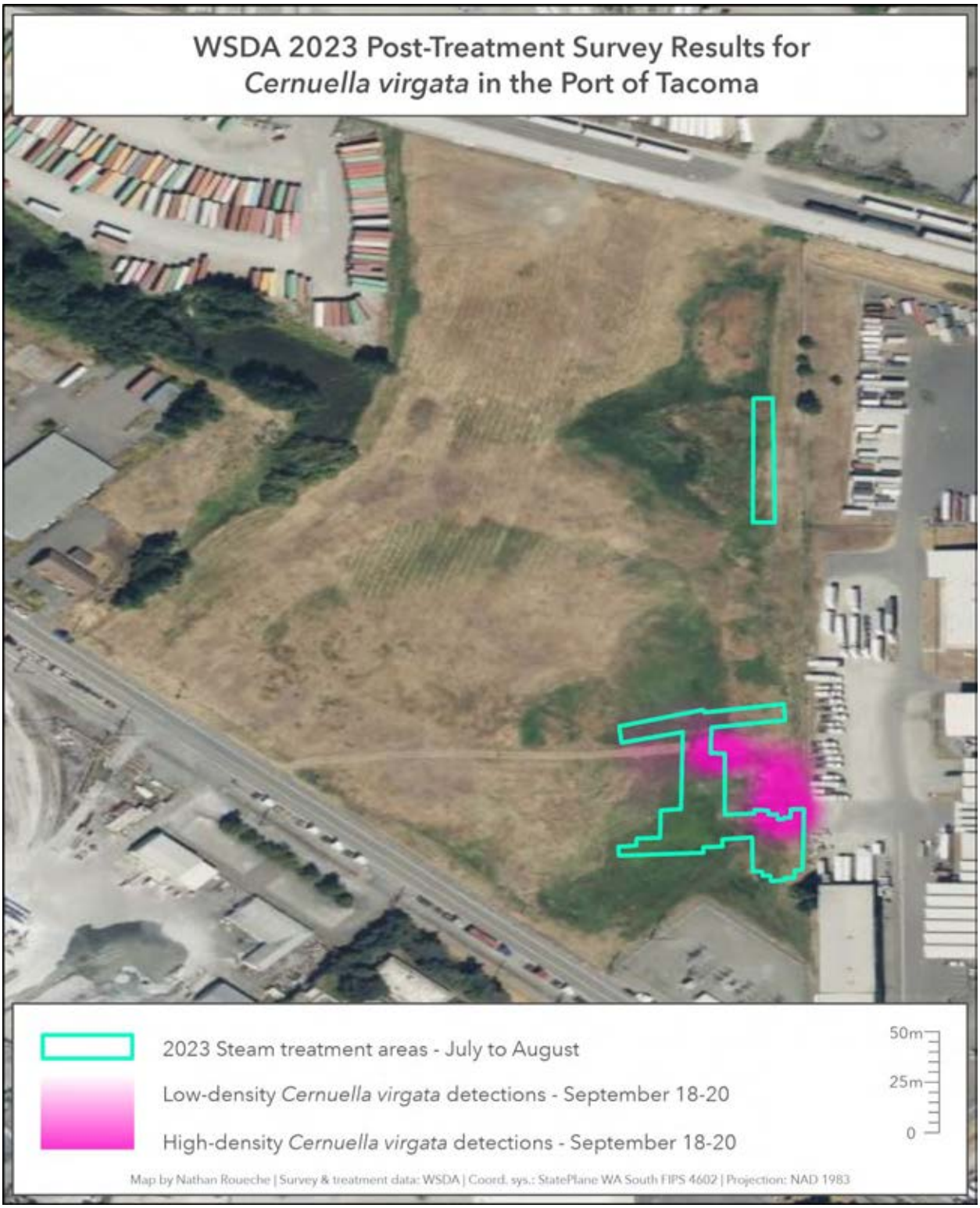


Figure 1. Overview of parcel with recent steam treatments and density gradient of September *C. virgata* detections; note central berm across parcel and green wetland areas for reference.

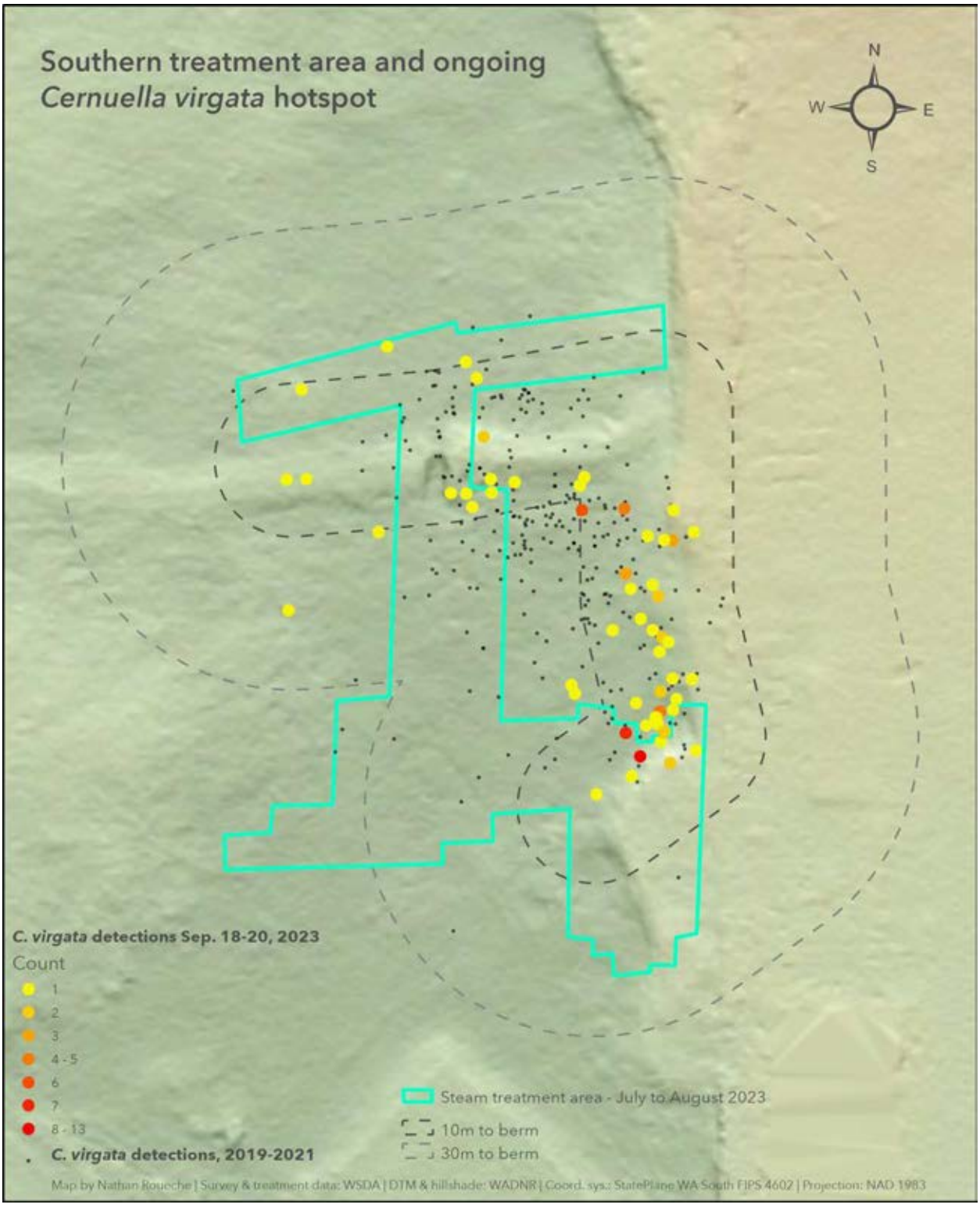


Figure 2: Recent detections of *C. virgata* in the southern hotspot, with recent steam treatments outlined, prior years' *C. virgata* detections, and approximate distance to berms (10 meters and 30 meters) shown for reference; 109 active specimens were detected during September 18-20, 2023, in the southern treatment area.

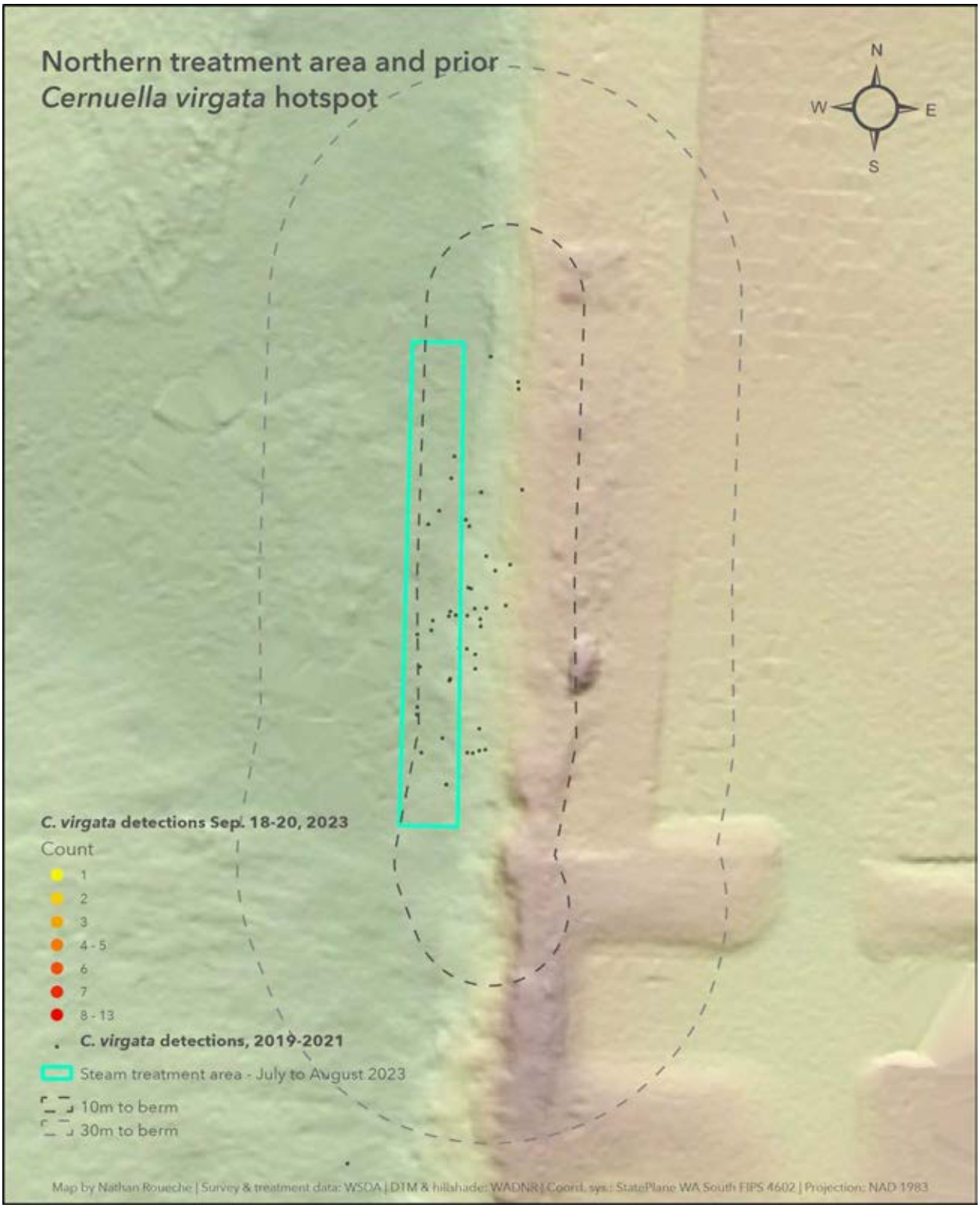


Figure 3. Recent detections of *C. virgata* in the northern hotspot, with recent steam treatments outlined, prior years' *C. virgata* detections, and approximate distance to berms (10 meters and 30 meters) shown for reference; no active specimens were detected during September 18-20, 2023, in the northern treatment area. Note one outlying specimen near the southern edge of the map frame.

Figure 4. Adult *C. virgata* showing thin clear lip of shell, many detected specimens exhibited this trait during this detection period.

Figure 5. Southeastern berm following survey of Sep. 20, 2023, with pink flags placed at each *C. virgata* detection; note edge of steam treatment in image foreground.

Vineyard Snail Eradication Activities Report 2023

This report covers the snail eradication activities from January 1, 2023 to December 31, 2023. The eradication zone is located from the north side of the 2000 block Lincoln Ave E., north to East 11th Street, Pierce County, 98421. East-west boundaries are Taylor Way and Alexander Avenue, respectively.

Port of Tacoma

Background

On November 15, 2005, initial detection of an invasive and very destructive snail, *Cernuella virgata* (vineyard snail) was made within the Port of Tacoma's (Port) industrial area. A formal survey was completed by WSDA and USDA in 2006 that delineated an infestation area of over 300 acres on the Blair-Hylebos Peninsula. The primary infestation was centered on Port, City of Tacoma and private property north of Lincoln Avenue.

In May 2007, WSDA and USDA sought a voluntary eradication program with the Port to avoid a prolonged process of developing a state plan. Speed was—and is—essential to control the population and to avoid quarantines that could limit the flow of cargo from the Port area. Quarantines could limit movement within the Port area and potentially restrict over one billion dollars of agricultural products from export.

In 2007, WSDA and the Port delivered letters to Port tenants and other property owners within the eradication zone discussing the seriousness of the infestation and advised owners not to remove vegetation from their sites. In the summer of 2007, the Port and others removed excess vegetation from Port owned and non-Port owned properties, and the Port conducted controlled burns of the discarded vegetation.

On June 20, 2011, the Port received the "*Prescription to the Port of Tacoma for the Eradication of the Vineyard Snail on the Blair Peninsula*" (Prescription) memorandum from WSDA. The Prescription outlined the best practices to contain and eliminate the vineyard snail from the affected areas. In April 2013, the Port provided USDA and WSDA with a proposed prescription based on historical snail detections. This prescription is updated annually based on the number of years a property has been free of snail detections.

WSDA issued a letter in September 2014 stating changes to the Deadline pesticide label allowing for application in areas where no surface water is present. The City of Tacoma reissued a Critical Areas Preservation Ordinance Letter of Approval in 2018 to conduct vegetation management and limited seasonal bait application within the wetlands and buffers located at the site known as Port Parcel 117 (also known as TPU).

In 2019, WSDA proposed to eradicate *C. virgata* within the wetlands and wetland boundaries on Port Parcel 117 using steam to kill all life stages. The City of Tacoma issued LU19-0190, Voluntary Enhancement and Restoration, Activities Allowed with Staff Review on September 5, 2019, to the Port, which allowed WSDA to conduct steam treatments and restore the wetland and wetland boundary areas with a native grass seed mix after the treatments were completed. Steam treatments were conducted annually from 2019 to 2023. Due to the abundance of snails located in the proximity of the steamed areas post treatment in 2023, the steam treatments have been determined to be ineffective and are no longer proposed as part of the eradication program.

One snail was observed on Port Parcel 114, also known as PQ, in October 2019. This was the first detection in over 5 years. The site was heavily baited in October and November 2019 and additional surveys have resulted in no new *C. virgata* detections since 2019.

The following summarizes the specific activities associated with the Port's snail eradication program. This reporting period is from January 1, 2023 to December 31, 2023. This snail eradication activities report has decreased from semi-annually to annually, as agreed to by WSDA and the Port in early 2021.

Summary of Activities

WSDA detected one hundred and forty-six (146) snails at Port Parcel 117 during the 2023 survey season. This is an increase from the seventy (70) snails detected during the 2022 survey season. No snails were detected on any other Port properties located within the eradication zone.

WSDA and WSU steamed 22 plots between July 25 to August 29, 2023. The plot locations were selected based on previous snail detections. Ninety-eight (98) of the one hundred and forty-six (146) snails were detected on September 20, which correlates with the first heavy rain of the season. The snails were concentrated in an approximate 20-meter section of the main berm along the southeastern edge of the parcel. This area is near steam treatment plots but was not steamed because the topography of the berm makes it challenging to create a seal to trap in the steam. It is unknown if the snails moved away from the steam treatments or estivated in the berm area. No live snails were detected after November 20. Maps depicting the approximate location and quantities of live *C. virgata* in relation to the steam treatments are included as part of this report. Due to the abundance of snails located in the proximity of the steamed areas, the steam treatments are no longer proposed as part of the eradication program.

Port maintenance resumed vegetation management and molluscicide application at Parcel 117 in 2023. Deadline pellets were applied on May 19, July 21 and September 28 along the Parcel 114 (PQ) fence line and Parcel 117 south fence line and burm areas. Bait traps were not set this year as they have not been effective in previous years.

The following Snail Eradication Reporting Form is specific to eradication activities at Port Parcel 117. It includes Port parcel number, address, size, location, and description. Eradication activities are organized by date, and include pesticides used and rates, hours spent on eradication efforts, any notes associated with the activity, and the costs incurred by the Port for these activities. Properties with three or more years without any snail detections are no longer included in this report. Routine vegetation management and debris removal are still being conducted within these sites but are no longer considered part of the snail eradication program.

Costs to Date

Attached is a summary of expenditures for 2023 and total since the beginning of the eradication efforts. This information is used to budget for the following years' activities as well as reporting to Port management.

For comments or questions specific to this report or the vineyard snail eradication program, please contact Kristin Evered, Environmental Project Manager, Port of Tacoma, 253.888.4776.

Next Steps

The Port has applied for a Voluntary Enhancement and Restoration Activities Allowed with Staff Review permit (application LU24-0010) to continue snail eradication activities including vegetation management, molluscicide application and the use of a salt barrier to limit snail movement at Parcel 117. A wetland delineation and a Critical Areas Report for Parcel 117 are pending. The Port will continue to coordinate with US/WSDA on vegetation management and baiting schedules until permanent eradication, such as the potential development of Parcel 117, occurs.

Project Total Costs																
MO/YR	**2008**	**2009**	**2010**	**2011**	**2012**	**2013**	**2014**	**2015**	**2016****	**2017*****	**2018******	**2019**	**2020**	**2021**	**2022**	**2023**
JAN		$103,212.15			$7,214.86	$3,254.00	$990.00	$2,520.00	$2,045.00	$501.00	$584.50	$835.00	$1,593.00	$2,366.00	$1,086.00	$3,778.00
FEB		$20,858.39			$25,588.61	$2,178.00	$624.00	$788.90*	$6,381.50	$1,002.00	$167.00	$501.00	$1,858.50	$0.00	$0.00	$2,327.00
MAR		$13,036.01	$378.00		$7,044.50	$1,254.00	$8,936.40	$3,441.00	$3,454.50	$334.00	$417.50	$83.50	$2,743.50	$929.50	$905.00	$2,744.39
APR		$685.00			$19,227.60	$264.00	$8,395.92	$6,726.36	$14,864.90	$4,032.50	$6,638.01	$7,127.50	$6,864.63	$253.50	$0.00	$340.60
MAY		$2,484.37	$504.00		$7,905.10	$4,258.00	$7,516.26	$10,237.50	$434.00	$291.00	$5,229.50	$5,210.50	$3,789.18	$4,631.50	$452.50	$0.00
JUN		$666.44	$1,476.00	$20,506.00	$32,994.46	$5,502.12	$13,444.25	$4,104.00	$37,650.93	$29,069.50	$25,295.00	$11,596.50	$4,002.84	$5,905.50	$14,457.96	$15,377.16
JUL	$12,561.60	$1,427.00	$252.00	$22,440.06	$39,397.91	$32,760.70	$8,435.16	$20,121.66	$6,780.33	$1,670.00	$11,340.62	$4,760.00	$8,887.53	$10,645.50	$8,614.81	$17,083.09
AUG	$14,242.20	$10,559.73	$126.00	$31,623.19	$11,736.26	$340.00	$18,494.49	$692.00	$157.00	$1,264.24	$5,444.50	$3,207.50	$5,790.60	$3,707.50	$11,926.37	$9,242.40
SEP	$22,913.12	$19,163.81	$9,524.63	$24,054.43	$11,210.82	$22,428.00	$1,199.50	$7,311.75	$11,315.00	$2,004.00	$668.00	$3,492.50	$6,065.55	$3,061.50	$1,533.42	$1,824.05
OCT	$55,376.78	$1,631.24	$4,833.00	$45,297.32	$6,659.70	$2,538.00	$4,235.50	$14,369.38	$5,594.00	$0.00	$0.00	$11,748.50	$2,549.18	$676.00	$4,448.02	$2,051.37
NOV	$22,257.58		$7,284.77	$12,510.00	$15,933.03	$3,853.15	$330.00	$506.50	$529.00	$372.00	$417.50	$350.00	$3,220.96	$84.50	$0.00	$358.00
DEC	$40,845.10	$750.00		$5,847.75	$332.50	$614.77	$1,237.50	$432.50	$1,347.00	$334.00	$2,032.00	$0.00	$88.50	$706.50	$905.00	$0.00
YTD	**$168,196.38**	**$174,474.14**	**$24,378.40**	**$162,278.75**	**$185,245.35**	**$79,244.74**	**$73,838.98**	**$71,251.55**	**$90,553.16**	**$40,874.24**	**$58,234.13**	**$48,912.50**	**$47,453.97**	**$32,967.50**	**$44,329.08**	**$55,126.06**
TOTAL ALL YEARS			**$1,357,358.93**													

*Port received reimbursement in February 2015; therefore, project costs are less than line item costs

**Spring 2016 charges also include coordination for Asian gypsy moth eradication.

***Spring 2017 charges also include coordination for WA Department of Health mosquito surveys

****Spring and summer 2018 charges also include PM time for noxious weed removal

Project Manager																
MO/YR	**2008**	**2009**	**2010**	**2011**	**2012**	**2013**	**2014**	**2015**	**2016****	**2017*****	**2018******	**2019**	**2020**	**2021**	**2022**	**2023**
JAN	$0.00	$2,598.52	$0.00	$0.00	$7,214.86	$2,838.00	$990.00	$1,485.00	$1,805.50	$501.00	$584.50	$835.00	$1,593.00	$2,366.00	$1,086.00	$3,778.00
FEB	$0.00	$862.13	$0.00	$0.00	$10,170.99	$2,178.00	$0.00	$1,038.00	$863.50	$1,002.00	$167.00	$501.00	$1,858.50	$0.00	$0.00	$2,327.00
MAR	$0.00	$75.00	$378.00	$0.00	$7,044.50	$1,254.00	$165.00	$605.50	$2,276.50	$334.00	$417.50	$83.50	$2,743.50	$929.50	$905.00	$1,342.50
APR	$0.00	$300.00	$0.00	$0.00	$7,461.08	$264.00	$577.50	$259.50	$2,276.50	$250.50	$668.00	$2,087.50	$619.50	$253.50	$0.00	$0.00
MAY	$0.00	$0.00	$504.00	$0.00	$665.00	$462.00	$330.00	$928.50	$0.00	$167.00	$83.50	$1,920.50	$0.00	$0.00	$452.50	$0.00
JUN	$0.00	$438.94	$864.00	$5,700.00	$4,023.25	$528.00	$577.50	$3,194.50	$0.00	$1,417.50	$167.00	$1,586.50	$354.00	$253.50	$0.00	$179.00
JUL	$3,750.00	$790.00	$252.00	$12,750.00	$8,514.75	$660.00	$1,815.00	$1,896.50	$1,334.50	$1,670.00	$3,841.00	$0.00	$1,239.00	$676.00	$181.00	$3,043.00
AUG	$1,800.00	$975.00	$126.00	$5,328.00	$2,048.50	$132.00	$742.50	$692.00	$157.00	$373.00	$918.50	$2,087.50	$177.00	$253.50	$1,448.00	$984.50
SEP	$10,016.09	$525.00	$756.00	$7,696.00	$3,391.50	$1,056.00	$825.00	$865.00	$0.00	$2,004.00	$668.00	$2,372.50	$1,504.50	$0.00	$0.00	$1,163.50
OCT	$21,991.44	$0.00	$1,008.00	$7,575.00	$332.50	$198.00	$330.00	$4,238.50	$1,099.00	$0.00	$0.00	$4,258.50	$619.50	$676.00	$724.00	$1,611.00
NOV	$13,525.43	$0.00	$504.00	$5,100.00	$3,009.70	$264.00	$330.00	$346.00	$157.00	$0.00	$417.50	$0.00	$3,177.00	$84.50	$0.00	$358.00
DEC	$5,115.10	$750.00	$0.00	$3,455.75	$332.50	$66.00	$1,237.50	$432.50	$1,099.00	$334.00	$668.00	$0.00	$88.50	$0.00	$905.00	$0.00
YTD	**$56,198.06**	**$7,314.59**	**$4,392.00**	**$47,604.75**	**$54,209.13**	**$9,900.00**	**$7,920.00**	**$15,981.50**	**$11,068.50**	**$8,053.00**	**$8,600.50**	**$15,732.50**	**$13,974.00**	**$5,492.50**	**$5,701.50**	**$14,786.50**
TOTAL ALL YEARS			**$286,929.03**													

**Spring 2016 charges also include coordination for Asian gypsy moth eradication.

***Spring 2017 charges also include coordination for WA Department of Health mosquito surveys

****Spring and summer 2018 charges also include PM time for noxious weed removal

Maintenance/Contractor/Equipment																
MO/YR	**2008**	**2009**	**2010**	**2011**	**2012**	**2013**	**2014**	**2015**	**2016**	**2017**	**2018**	**2019**	**2020**	**2021**	**2022**	**2023**
JAN	$0.00	$100,613.63	$0.00	$0.00	$0.00	$416.00	$0.00	$1,035.00	$239.50	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00
FEB	$0.00	$19,996.26	$0.00	$0.00	$15,417.62	$0.00	$624.00	$0.00	$5,518.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00
MAR	$0.00	$12,961.01	$0.00	$0.00	$0.00	$0.00	$8,771.40	$2,835.50	$1,178.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$1,401.89
APR	$0.00	$385.00	$0.00	$0.00	$11,766.52	$0.00	$7,818.42	$6,466.86	$12,588.40	$3,782.00	$5,970.01	$5,040.00	$6,245.13	$0.00	$0.00	$340.60
MAY	$0.00	$2,484.37	$0.00	$0.00	$7,240.10	$3,796.00	$7,186.26	$9,309.00	$434.00	$124.00	$5,146.00	$3,290.00	$3,789.18	$4,631.50	$0.00	$0.00
JUN	$0.00	$227.50	$612.00	$14,806.00	$28,971.21	$4,974.12	$12,866.75	$909.50	$37,650.93	$27,652.00	$25,128.00	$10,010.00	$3,648.84	$5,652.00	$14,457.96	$15,198.16
JUL	$8,811.60	$637.00	$0.00	$9,690.06	$30,883.16	$32,100.70	$6,620.16	$18,225.16	$5,445.83	$0.00	$7,499.62	$4,760.00	$7,648.53	$9,969.50	$8,433.81	$14,040.09
AUG	$12,442.20	$9,584.73	$0.00	$26,295.19	$9,687.76	$208.00	$17,751.99	$0.00	$0.00	$39.00	$4,526.00	$1,120.00	$5,613.60	$3,454.00	$10,478.37	$8,257.90
SEP	$12,897.03	$18,638.81	$8,768.63	$16,358.43	$7,819.32	$21,372.00	$374.50	$6,446.75	$11,315.00	$930.00	$0.00	$1,120.00	$4,561.05	$3,061.50	$1,533.42	$660.55
OCT	$33,385.34	$1,631.24	$3,825.00	$37,722.32	$6,327.20	$2,340.00	$3,905.50	$10,130.88	$4,495.00	$0.00	$0.00	$7,490.00	$1,929.68	$0.00	$3,724.02	$440.37
NOV	$8,732.15	$0.00	$6,780.77	$7,410.00	$12,923.33	$3,589.15	$0.00	$160.50	$372.00	$372.00	$0.00	$350.00	$43.96	$0.00	$0.00	$0.00
DEC	$35,730.00	$0.00	$0.00	$2,392.00	$0.00	$548.77	$0.00	$0.00	$248.00	$0.00	$1,364.00	$0.00	$0.00	$706.50	$0.00	$0.00
YTD	**$111,998.32**	**$167,159.55**	**$19,986.40**	**$114,674.00**	**$131,036.22**	**$69,344.74**	**$65,918.98**	**$55,519.15**	**$79,484.66**	**$32,899.00**	**$49,633.63**	**$33,180.00**	**$33,479.97**	**$27,475.00**	**$38,627.58**	**$40,339.56**
TOTAL ALL YEARS			**$1,070,756.76**													

Site Name	Parcel 117 - TPU	Size (Acres)	17
Address	1300 Taylor Way	Location	47°16'22.34"N/122°23'40.04"W
Description	vacant land, no improvements	Tenant	None

ACTIVITY

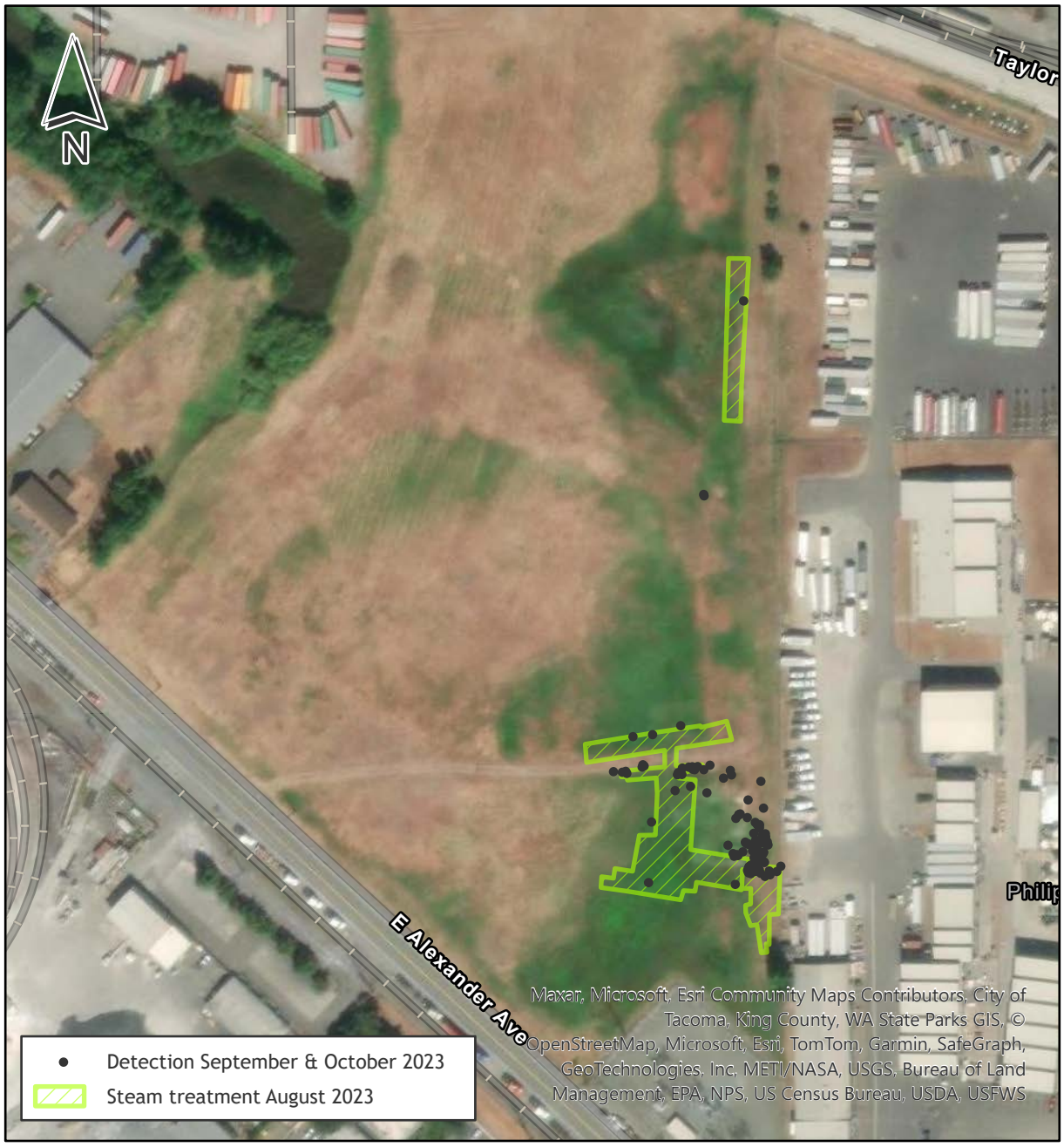
Date	Maintenance Hours	Vegetation Management	Debris Removal	Pesticide Application	Notes	Costs
3/28/2023	2.75				Placing construction barrels	$403.67
3/28/2023	4.25				Installing no parking signs	$623.86
4/4/2023	3.50				Installing no parking signs	$513.77
5/10/2023	8.00	x	x			$293.58
5/10/2023	2.00	x	x			$220.19
5/10/2023	1.50	x	x			$220.19
5/11/2023	8.00	x	x			$1,174.32
5/11/2023	8.00	x	x			$1,174.32
5/12/2023	6.00	x	x			$880.74
5/12/2023	8.00	x	x			$1,174.32
5/15/2023	6.00	x	x			$880.74
5/16/2023	4.00	x	x			$587.16
5/17/2023	9.00	x	x	x		$1,321.11
6/28/2023	6.00	x	x			$880.74
6/29/2023	20.00	x	x			$2,935.80
6/30/2023	17.00	x	x			$2,495.43
7/3/2023	24.00	x	x			$3,522.96
7/5/2023	10.00	x	x			$1,467.90
7/6/2023	17.00	x	x			$2,495.43
7/7/2023	8.00	x	x			$1,174.32
7/10/2023	14.00	x	x			$2,055.06
7/11/2023	8.00	x	x			$1,174.32
7/20/2023	8.00	x	x	x		$1,174.32
7/25/2023	1.00				Filling up steamer	$146.79
7/26/2023	2.00				Filling up steamer	$293.58
7/27/2023	1.00				Filling up steamer	$146.79
7/28/2023	1.00				Filling up steamer	$146.79
7/31/2023	1.00				Filling up steamer	$146.79
8/1/2023	1.50				Filling up steamer	$220.19
8/2/2023	1.50				Filling up steamer	$220.19
8/3/2023	12.00	x	x		Filling up steamer	$1,761.48
8/4/2023	1.00				Filling up steamer	$146.79
8/7/2023	1.00				Filling up steamer	$146.79
8/8/2023	1.00				Filling up steamer	$146.79
8/9/2023	1.00				Filling up steamer	$146.79
8/10/2023	1.00				Filling up steamer	$146.79
8/11/2023	1.00				Filling up steamer	$146.79
8/14/2023	1.00				Filling up steamer	$146.79
8/15/2023	1.50				Filling up steamer	$220.19
8/16/2023	1.00				Filling up steamer	$146.79

Site Name	Parcel 117 - TPU	Size (Acres)	17
Address	1300 Taylor Way	Location	47°16'22.34"N/122°23'40.04"W
Description	vacant land, no improvements	Tenant	None

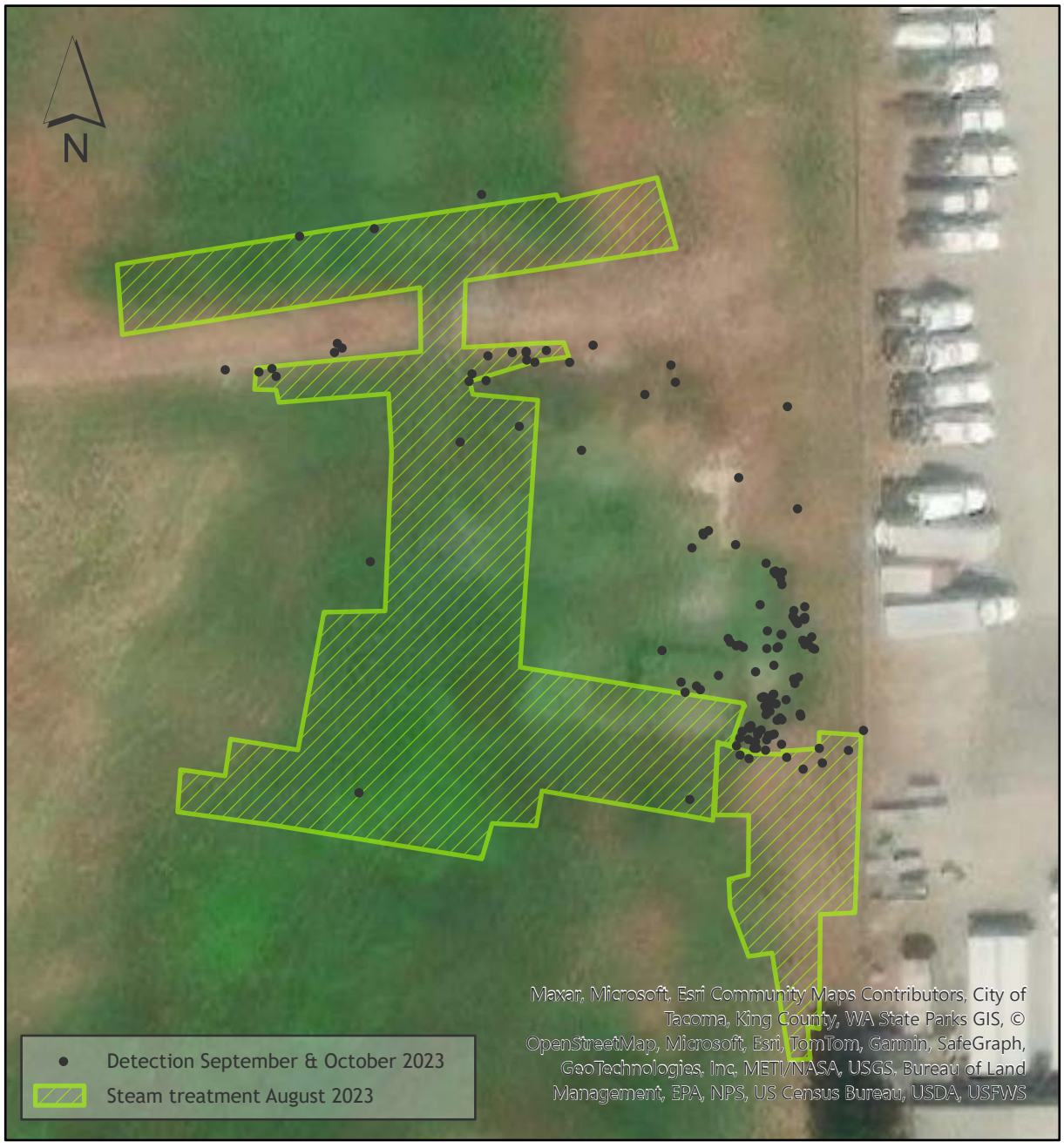
ACTIVITY

Date	Maintenance Hours	Vegetation Management	Debris Removal	Pesticide Application	Notes	Costs
8/17/2023	1.00				Filling up steamer	$146.79
8/18/2023	1.00				Filling up steamer	$146.79
8/21/2023	1.00				Filling up steamer	$146.79
8/22/2023	13.00	x	x		Filling up steamer	$1,908.27
8/23/2023	1.50				Filling up steamer	$220.19
8/24/2023	1.00				Filling up steamer	$146.79
8/28/2023	1.00				Filling up steamer	$146.79
9/28/2023	4.50	x	x	x		$660.56
10/12/2023	3.00	x	x			$440.37
TOTAL	**260.50**				**TOTAL**	**$37,284.66**

2023 Detection Locations of Vineyard Snail & Steam Treatments



2023 Detection Locations of Vineyard Snail & Steam Treatments at the Southern Treatment Area



Appendix C

Health and Safety Plan

MAUL FOSTER ALONGI

Health and Safety Plan

Taylor Way and Alexander Avenue Fill Area Site

Tacoma, Washington

Prepared for:

Port of Tacoma

January 26, 2026
Project No. M0615.20.015

Prepared by:

Maul Foster & Alongi, Inc.
2815 2nd Avenue, Suite 540, Seattle, WA 98121

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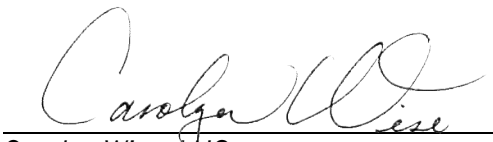
MAUL FOSTER ALONGI

Health and Safety Plan

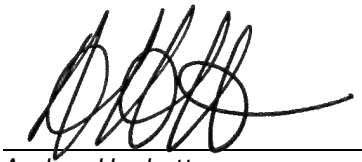
Taylor Way and Alexander Avenue Fill Area Site

The material and data in this plan were prepared under the supervision and direction of the undersigned.

Maul Foster & Alongi, Inc.



Carolyn Wise, LHG
Senior Hydrogeologist



Audrey Hackett
Principal Environmental Scientist

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Contents

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Appendixes

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Abbreviations

AED	automated external defibrillator
CFR	Code of Federal Regulations
COPC	chemical of potential concern
HASP	health and safety plan
HAZWOPER	Hazardous Waste Operations and Emergency Response
HSC	health and safety coordinator
JHA	job hazard analysis
MFA	Maul Foster & Alongi, Inc.
PIC	principal in charge
PPE	personal protective equipment
the Site	Taylor Way And Alexander Avenue Fill Area in Tacoma, Washington
TWAAFA	Taylor Way And Alexander Avenue Fill Area
SSO	site safety officer

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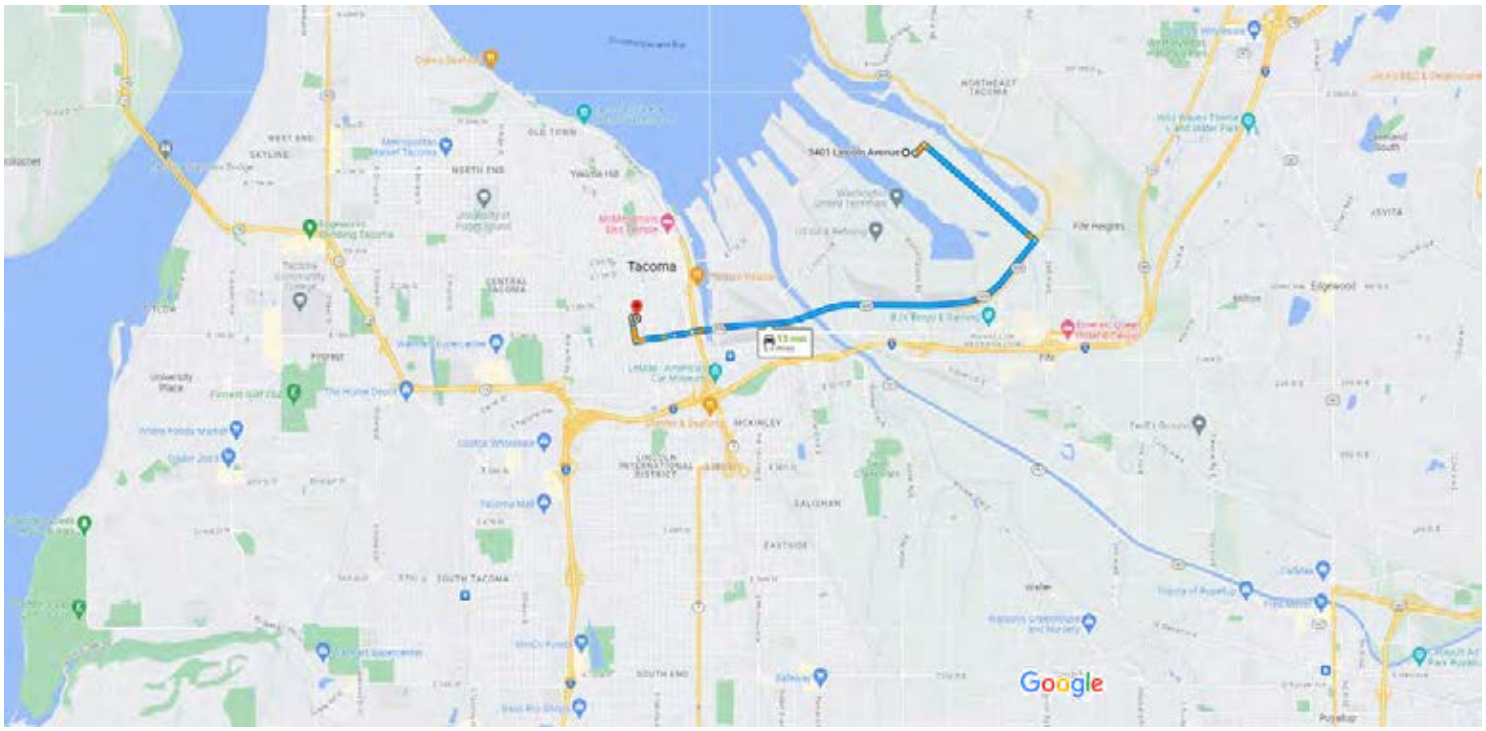
3401 Lincoln Avenue, Tacoma, WA to St. Joseph Medical Center

Drive 6.4 miles, 13 min



Map data ©2023 Google 2000 ft

3401 Lincoln Ave
Tacoma, WA 98421

Continue to WA-509 S

4 min (1.7 mi)

1. Head southeast toward Lincoln Ave

108 ft

2. Turn left onto Lincoln Ave

0.1 mi

3. Turn right onto Taylor Way

1.5 mi

4. Turn right onto WA-509 S

5 min (3.9 mi)

Follow S 21st St and S J St to your destination

4 min (0.9 mi)

5. Continue onto S 21st St

0.2 mi

6. Continue straight to stay on S 21st St

0.4 mi

7. Turn right onto S J St

0.2 mi

8. Turn right
Destination will be on the right

105 ft

St Joseph Medical Ctr
1717 S J St, Tacoma, WA 98405

1 Nearest Hospital/Emergency Medical Center

1.1 Nearest Hospital

St. Joseph Medical Center

1717 S J St, Tacoma, Washington 98405

Phone: (253) 426-4101

Distance: 6.4 miles

Travel Time: 13 minutes

1.2 Route to Hospital from Site

See the map on the first page of this document.

1.2.1 Driving Directions to Hospital from Site

1. Head southeast on Alexander Avenue E towards Lincoln Avenue. 108 feet.
2. Turn left on Lincoln Avenue. 0.1 miles.
3. Turn right onto Taylor Way. 1.5 miles.
4. Turn right onto WA-509 S. 3.9 miles.
5. Continue onto S 21st Street. 0.2 miles.
6. Continue straight to stay on S 21st Street. 0.4 miles.
7. Turn right onto S J Street. 0.2 miles.
8. Turn right. Destination will be on the right. 105 feet.

1.3 Emergency Phone Numbers

Ambulance, Police, Fire	Dial 911
Audrey Hackett Project Manager	Phone: 206-556-2015 Cell: 206-331-1835
Phil Wiescher Principal in Charge (PIC)	Phone: 360-594-6267 Cell: 503-407-1036

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Andy Vidourek Health and Safety Coordinator (HSC)	Phone: 360-837-9701 Cell: 541-760-9692

2 Plan Summary

This health and safety plan (HASP) was developed to describe the procedures and practices necessary for protecting the health and safety of Maul Foster & Alongi, Inc. (MFA), employees conducting activities at TWAAFA Site, generally located north of Lincoln Avenue and between Alexander Avenue and Taylor Way in the tideflats of Tacoma, Washington (the Site). The Hylebos Marsh property is located within the TWAAFA Site. Other employers, including contractors and subcontractors, are expected to develop and implement their own HASPs to manage the health and safety of their personnel.

MFA personnel conducting activities at the Site are responsible for understanding and adhering to this HASP. Before fieldwork begins, the on-Site personnel will designate a site safety officer (SSO) who is familiar with health and safety procedures and with the Site. Safety deficiencies should be immediately communicated to the SSO and, if necessary, to the project manager, PIC/program manager, or MFA's HSC.

All contractors and subcontractors have the primary responsibility for the safety of their own personnel on the Site. All personnel on the Site have stop work authority if they observe conditions that they believe create an imminent danger.

If MFA employees work on the Site for more than a year, this HASP will be reviewed at least annually. Additionally, this HASP will be updated as new or changed conditions are encountered to ensure that it reflects the current known hazards and requirements associated with the Site.

MFA personnel who will be working on the Site are required to read and understand this HASP. MFA personnel entering the work area must sign the personnel acknowledgment sheet (Section 17), certifying that they have read and that they understand this HASP and agree to abide by it.

3 Key Project Personnel

Name	Responsibility
Phil Wiescher	Program Manager
Audrey Hackett	Project Manager
Carolyn Wise	Secondary Project Manager
Christian Sifford	Field Personnel/SSO
Arthur Clauss	Field Personnel
Amanda Bixby	Field Personnel

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Name	Responsibility
Brenden Murphy	Field Personnel
Fiona Bellows	Field Personnel
Justin Hansen	Field Personnel
Andy Vidourek	HSC

4 Emergency Supplies and Equipment List

Equipment	Location and Notes
First Aid Kit	Inside work vehicle.
Fire Extinguishers	Inside work vehicle.
Mobile Phones	On MFA staff.
Traffic Cones	Inside work vehicle, will be used as needed.
Radios	On MFA staff, inside work vehicle.
Water and Other Fluid Replenishment	Inside work vehicle, in bed of work vehicle, inside food-only cooler in bed of work vehicle.
Eyewash	Available in office, if needed.
Spill Kit	Available in office, if needed.
Health and Safety Plan	On MFA staff and in work vehicle.
Dust Meter	Available for rental, if needed.

5 Site Description and Background

5.1 Type of Site

The Site is composed of several industrial properties owned by the Port of Tacoma. Staff anticipate entering the following properties comprising the TWAAFA site:

- Prologis Property: 1514 Taylor Way is currently occupied by Burkhart Dental Distribution Center, and MacMillan-Piper Inc. and used for warehousing/freight drayage.

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- Potter Property: 1801 Alexander Avenue, is currently occupied by Handan Containers and used for freight truck maintenance, scrapping, and rebuilding.
- Hylebos Marsh: 1212 Taylor Way, is currently undeveloped marsh land and was historically used for landfilling activities.

5.2 Buildings/Structures

The Prologis Property consists of two large commercial buildings (one 155,000-square feet and one 51,900-square feet). Both buildings were constructed with concrete tilt-up construction and are zoned for Port Maritime and Industrial use.

The Potter property consists of three structures: a shop building and conjoined Quonset Huts used in support of Handan Containers' business operations.

The Hylebos Marsh property is vacant, undeveloped land.

5.3 Topography

The Property is relatively level. A steep 6-foot-tall slope is present along the eastern property line of Hylebos Marsh property.

5.4 General Geologic/Hydrologic Setting

The Site is underlain by fill, silt, sand, and a deeper interbedded sand and silt unit, listed in order of increasing depth. A stormwater detention pond is present in the southern portion of the Site.

The regional aquifer system associated with the Site is referred to as the Tideflats area, with consolidated sediment over 1,600 feet thick. Three hydrogeologic units have been identified at the site, listed in order of increasing depth: shallow, silt, and deep. Shallow groundwater approximately 2 feet below ground surface has been observed in the shallow water-bearing zone.

5.5 Site Status

The Site is currently used by various industrial properties. The Prologis and Potter properties are active light industrial facilities. Hylebos Marsh property is inactive.

5.6 General Site History

One of the defining features of the TWAAFA site is the past use of the TWAAFA site properties as the Donald Oline owned and operated unpermitted landfill at the Site. Materials discarded and used as fill at the Landfill included lime waste, lime solvent sludge waste, byproducts of auto scrapping (auto fluff), and wood waste. The fill materials have been documented in previous reports to contain and be sources of the contaminants of concern present at the TWAFFA site. In addition to the former landfill, there are several other sources of contamination associated with the TWAAFA site including wood fill; waste oil LNAPL; slag, chemical and oil spills, and waste oil ponds on the CleanCare property; and miscellaneous filling including dredge spoils, wood products, and construction debris.

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The Hylebos Marsh property encompasses approximately 15.7 acres on the western portion of the TWAAFA site. Auto fluff placed on the neighboring Stericycle property extends onto the eastern portion of the Hylebos Marsh property. Further, a former road may have been used to transport fill materials across the Hylebos Marsh property for placement in other parts of the TWAAFA site.

6 Hazard Evaluation

6.1 Site Tasks and Operations

MFA has completed job hazard analyses (JHAs) for specific tasks that may be conducted on the Site, depending on the scope of work. JHAs are provided in Appendix A. The following list summarizes planned tasks and operations:

- General work near heavy equipment
- Work near excavations and trenches
- Collecting soil samples
- Collecting groundwater samples
- Collecting soil gas samples
- Collecting air samples
- Collecting sub-slab samples

The control measures that field personnel must implement to eliminate or minimize these hazards, such as air monitoring, personal protective equipment (PPE), engineering controls, and decontamination procedures, are detailed in the JHAs and in subsequent sections of this HASP.

6.2 Chemical Hazard Evaluation

Chemicals of potential concern (COPCs), are summarized in Appendix B. Air monitoring action levels and associated controls are specified in Appendix C.

6.3 Physical Hazards

The specific physical hazards and associated controls for work on the Site are described in the JHAs provided in Appendix A.

6.4 Other Hazards

Hazards may include the presence of the invasive and very destructive snail, the Mediterranean *Cernuella virgata,* on the Hylebos Marsh property. While there is no health and safety risk to staff working near these snails, the Port is required to mitigate and seek eradication of these snails. Staff and equipment must minimize contact with soil and vegetation to the extent possible. Large

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equipment (such as vehicles and drill rigs) must be pressure washed on a gravel pad on the marsh property. Smaller equipment, shoes, etc., must be visually inspected for the presence of all life stages of the snail and removed before leaving the site using gloved hands. An infographic describing the measures and visual depictions of the snail life cycles is attached as Appendix D.

7 Site-Control Measures

Control of access to the Site will be established before the work begins. Control measures may include fencing, gates, and signs limiting access to everyone except authorized personnel. Work/exclusion zones and contaminant reduction zones will be designated by the SSO. The exclusion zone is defined as the area of known or suspected contamination (e.g., the area where a well is being installed), and the contaminant reduction zone is where support activities take place (e.g., packing sample coolers, decontamination activities).

MFA requires the buddy system if personnel conducting the work may potentially be exposed to chemical or physical hazards that would require immediate medical attention or rescue. The buddy system may involve working with non-MFA personnel.

8 Health and Safety Training

MFA personnel who could be exposed to COPCs while conducting work on the Site will have completed training consistent with the Hazardous Waste Operations and Emergency Response (HAZWOPER) requirements in 29 Code of Federal Regulations (CFR) 1910.120(e) before beginning work on the Site. The training will include the following:

- Identification of an SSO, and other safety and health personnel, if applicable
- Identification of safety and health hazards specific to work being conducted
- Proper use of required PPE
- Safe work practices required (e.g., fall protection, confined-space entry procedures, hot-work permits, general safety rules)
- Safe use of engineering controls and equipment
- Medical surveillance requirements, including the recognition of signs and symptoms that might indicate overexposure to hazards
- The project-specific emergency response plan/spill containment plan

The HSC will oversee training for MFA personnel conducting fieldwork. Training records, including an outline, signoffs, and competency records, will be maintained by the HSC.

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While the HSC is responsible for maintaining training records, the project manager is responsible for verifying that the training status of field personnel is current before these personnel deploy to the field.

9 Safety Equipment

9.1 Personal Protective Equipment

Individuals on the Site must wear PPE to protect against physical hazards. PPE required on the Site is typically modified Level D, which consists of the following:

- Hard hat
- High-visibility vest
- Work boots
- Safety glasses with side shields
- Nitrile gloves or equivalent if handling media potentially impacted or known to be impacted and for invasive snail removal, if present.
- Work gloves (if handling materials that might have sharp edges, protrusions, or splinters)

Additional PPE may be necessary for specific tasks with additional hazards. The SSO will be responsible for designating additional PPE for specific tasks. Depending on the activity, additional PPE may include the following:

- Hearing protection (to be worn during high-noise tasks)
- Chemical-resistant clothing, (e.g., Tyvek coveralls)
- Chemical-resistant boots
- Chemical-resistant goggles
- Chemical-resistant gloves
- Faceshield
- Respiratory protection

Additional PPE may be required if workers discover unexpected contamination. Characteristics of unexpected contamination could include unusual odors, discolored media, or a visible sheen. MFA employees should contact the SSO and, if necessary, the project manager and/or the HSC as soon as possible after the discovery of unexpected contamination. The SSO and, if applicable, the project manager and/or HSC will determine any need for additional controls and/or training.

PPE used at the Site must meet the requirements of recognized consensus standards (e.g., American National Standards Institute, National Institute for Occupational Safety and Health), and respiratory protection will comply with the requirements set forth in 29 CFR 1910.134.

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Project personnel are not permitted to reduce the specified level of required PPE without approval from the SSO or the project manager and/or HSC.

9.2 Safety Equipment

The SSO will be responsible for ensuring that the following safety equipment is available during fieldwork and is properly inspected and maintained:

- Soap and water for decontamination
- First aid kit
- Fire extinguisher
- Fluids for hydration, (e.g., drinking water or sports drink)
- Canopy for shade
- Hand-washing station
- Eye-flushing station

9.3 Air Monitoring Equipment

The following air monitoring equipment will be available to identify conditions that may require additional controls. See Appendix C for specified action levels and follow-up response actions.

- Photoionization detector
- Confined-space or combustible-gas indicator (CGI) monitor (e.g., for detecting oxygen, lower explosive limit, carbon monoxide, hydrogen sulfide). A CGI is only anticipated being necessary when drilling on the Potter Parcel in the diesel non-aqueous phase liquid plume has been delineated and high methane concentrations are anticipated.

9.4 Communications Equipment

MFA personnel should have a mobile phone or a radio available in case of emergency.

10 Decontamination Procedures

10.1 Partial Decontamination Procedures

MFA employees will implement the following partial decontamination procedures when exiting the work/exclusion zone but remaining on the Site.

- Wash and rinse boots and outer gloves (if wearing two pairs) in containers in the contamination-reduction zone.

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- Inspect Tyvek suit for stains, rips, or tears. If the suit is contaminated but is to be reused, full decontamination will be performed as described in Section 9.2. If the suit is damaged, it should not be reused; discard it in a container labeled for disposable items.
- Remove and inspect outer gloves. If they are ripped or otherwise damaged, discard them in a container labeled for disposable items.
- Remove respirator, if worn, and clean with premoistened alcohol wipes. Discard used cartridges at the frequency established by the SSO, project manager, or HSC.
- Wash hands and face with soap and water.

10.2 Full Decontamination Procedures

When exiting the exclusion zone and leaving the Site (e.g., at the end of the work shift), MFA employees will follow the full decontamination procedures listed below.

- Wash and rinse boots and outer gloves in containers in the contamination-reduction zone.
- Remove outer gloves and Tyvek suit and deposit in a container labeled for disposable items.
- Remove respirator and discard used cartridges at the frequency dictated by the SSO, project manager, or HSC.
- Wash and rinse respirator in decontamination container labeled “respirators only.”
- Remove work boots and put on street shoes. Place work boots in a plastic bag or container.
- Remove inner gloves and deposit in a container labeled for disposable items.
- Wash hands and face with soap and water.
- Shower as soon after the work shift as practicable.

11 Medical Surveillance

MFA will ensure that its employees who meet the following criteria are enrolled in a medical surveillance program consistent with 29 CFR 1910.120(f):

- The employees are, or may be, exposed to hazardous substances or health hazards at or above established permissible exposure limits for 30 or more days per year.
- The employees are required to wear a respirator for 30 or more days per year.

MFA employees who exhibit signs or symptoms consistent with overexposure to COPCs will be offered medical surveillance consistent with HAZWOPER requirements.

MFA will ensure that its employees who are authorized to wear respirators are medically evaluated and approved for respirator use, consistent with the respiratory protection standard (29 CFR 1910.134). The HSC or administrative designee (e.g., human resources manager) will maintain medical evaluation records, including respirator clearance documentation.

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Personnel medically cleared for respirator use will undergo an annual qualitative fit test. The MFA HSC or administrative designee will conduct the annual qualitative fit tests and will manage the documentation.

If employees are required to wear a respirator on the Site, the project manager will verify that the employee has a current annual respirator fit test.

12 Air Monitoring

Based on Site conditions, it is not anticipated that air monitoring will be necessary; however, air monitoring equipment will be available in case workers encounter conditions, such as unusual odors, discolored media, or a visible sheen, that indicate the presence of unexpected contamination. If such conditions are discovered, workers will exit the area and contact the SSO and, as needed, the project manager or the HSC. If necessary, MFA will use the air monitoring equipment to evaluate the conditions and determine whether additional controls and/or training are required. Action levels and follow-up actions are provided in Appendix C.

If air monitoring is necessary, it must be performed by individuals familiar with the calibration, use, and care of the required instruments. Measurements will be documented, and the records must include the following information:

- The name of the person conducting the measurements
- The identity of workers, if any, who have exposure indicated by the measurement results
- Information about the instrument (e.g., type, make, model, serial number)
- The location where the measurement was taken
- The measurement date and start/stop time
- Conditions represented by the measurement, including applicable activities, work practices, weather conditions, Site conditions, and controls in place
- Measurement results
- Other relevant observations or notes

12.1 Air Monitoring Action Levels

If air monitoring is conducted, the results will be compared to the action levels provided in Appendix C. These levels have been established to comply with Occupational Safety and Health Administration permissible exposure limits, American Conference of Governmental Industrial Hygienists threshold limit values, and National Institute for Occupational Safety and Health recommendations for the chemicals that may be encountered on the Site. The action levels have been adjusted for the relative response of common photoionization detection instruments to motor-fuel vapors.

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12.2 Explosion Hazard Action Levels

MFA employees will take measurements when working near known or suspected sources of explosive gases or vapors. The instrument alarm should be set to sound at 10 percent of the lower explosive limit. When measurements exceed this level, MFA employees will:

1. Extinguish ignition sources and shut down powered equipment in the work area.
2. Move personnel at least 100 feet away from the work area.
3. Contact the SSO, the project manager, and/or the HSC as applicable.
4. At the instruction of the project manager and/or the HSC and after waiting 15 minutes for explosive gases to dissipate, the SSO may use the combustible-gas meter to safely approach the work site to measure combustible gases in the work area. The SSO will not enter (or allow any personnel to enter) any area where the combustible-gas meter readings exceed the explosivity action level, nor will the SSO approach if there is a potential for fire or explosion.
5. The SSO may authorize personnel to reenter the work area after the source of the combustible gases has been identified and controlled.

12.3 Instrument Calibrations

Instruments will be calibrated consistent with manufacturers' recommendations. Calibrations will be coordinated by the SSO and the project manager. Calibration and monitoring records will be maintained by the SSO and/or the project manager.

13 Emergency Response, Spill Containment, and Confined Space

MFA employees will follow the emergency response, spill response, and confined-space procedures described in the MFA Policies and Procedures Manual. Incidents will be documented on the incident report form included as Appendix E.

14 Pre-entry Briefing

MFA employees will conduct pre-entry briefings prior to beginning work on the Site (e.g., tailgate meetings; see the checklist provided as Appendix F). Additional briefings shall be conducted as the scope of work or conditions change throughout the project to ensure that employees are familiar with and are adhering to the appropriate safety and health protocol. Attendance and discussion topics will be documented on sign-in sheets that will be maintained by the SSO.

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15 Periodic Evaluation

The project manager or designee will evaluate the effectiveness of this HASP by conducting periodic HASP audits. A HASP audit form is included as Appendix G. In addition, HASP effectiveness will be evaluated by tracking ongoing health and safety feedback from field personnel working on the project. This feedback will be reviewed and incorporated into either immediate or annual updates of this HASP, as appropriate. This HASP will be reviewed and updated at least annually. Updating this HASP as necessary ensures that it reflects the known hazards, conditions, and requirements associated with the project. MFA will maintain HASP audit or other periodic evaluation records and track all revisions to this HASP.

16 Safe Work Practices

The following safe work practices are provided to supplement the other information in this HASP.

1. Eating, drinking, chewing gum or tobacco, smoking, or any practice that increases the probability of hand-to-mouth transfer and ingestion of materials is prohibited in areas with potentially contaminated materials.
2. Whenever practicable, field personnel will remain upwind of drilling rigs, open excavations, and other ground-disturbing activities.
3. Subsurface work will not be performed at any location until the area has been confirmed by a utility-locator firm to be free of underground utilities or other obstructions.
4. MFA will use a CGI monitoring when drilling on the Potter parcel in the area where the diesel NAPL plume has been encountered.

17 Acknowledgment

MFA cannot guarantee the health or safety of any person entering the Site. Because of the potentially hazardous nature of active sites, it is not possible to discover, evaluate, and provide protection against all possible hazards that may be encountered at the Site. Strict adherence to the health and safety guidelines set forth herein will reduce, but not eliminate, the potential for injury and illness. The health and safety guidelines in this HASP were prepared specifically for the Site and should not be used on any other site without prior evaluation by trained health and safety personnel.

MFA personnel who will work at the Site are to read, understand, and agree to comply with the specific practices and guidelines described in this HASP regarding field safety and health hazards.

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This HASP has been developed for the exclusive use of MFA personnel. MFA may make this HASP available for review by contracted or subcontracted personnel for information only. This HASP does not cover the activities performed by employees of any other employer on the project. All contracted or subcontracted personnel are responsible for implementing their own health and safety program, including generating and using their own HASP.

I have read and I understand this HASP and all attachments, and agree to comply with the requirements described herein:

Name	Title	Date

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Appendix A

Job Hazard Analyses

MAUL FOSTER ALONGI

Job Hazard Analysis

Task/Operation: Conducting Fieldwork		
Project Number: M0615.20.015		**Location/Site Where Task/Operation Performed:** 1205 Alexander Avenue and 1300 Taylor Way, Tacoma, Washington
Date Prepared: 12/19/2024 **Date Reviewed:** 12/30/2024	**Employee Preparing this Job Hazard Analysis (JHA):** Justin Hansen **Employee Reviewing and Certifying this JHA:** Audrey Hackett	

Job/Task Description
This JHA describes hazards and required safe-work practices that are common to most types of fieldwork. See the separate task-specific JHA for hazards and safe-work practices that are unique to certain tasks (e.g., sampling contaminated media, working in remote areas).

Physical Hazards		
Hazard/Risk	**Source of Hazard/Risk**	**Hazard/Risk Mitigation**
Heat/cold/sunburn	Weather.	Be aware of seasonal dangers, including frostbite, hypothermia, snow blindness, trench foot, and heat stress. Drink plenty of fluids, especially when perspiring. Wear sunscreen on exposed skin. Stop work if an employee feels symptoms of dehydration, overheating, or heat stroke. Move to a shaded area and drink water. During cold or wet conditions, wear adequate clothing to reduce the potential for hypothermia. If there is lightning in the area, seek indoor shelter immediately, if possible. If outdoors, get into a hard-topped vehicle and away from trees. Turn off all radios and electronic equipment.
Eye injury	Debris (e.g., soil, water) coming into contact with eyes. Working in areas with low, dense vegetation.	Wear eye protection with side shields. Identify the location of the eyewash station before beginning the work.
Head injury	Heavy equipment, tools, overhead hazards impacting the head.	Wear a hard hat. Do not work near moving or heavy equipment or under overhead hazards.
Foot injury	Sharp objects that could be stepped on; large objects falling on feet.	Wear protective boots (composite or steel-toe).

Task/Operation: Conducting Fieldwork		
Hand injury	Pinch points, sharp objects, stress from pulling rope, dermal contact with chemicals and contaminated media.	Wear protective gloves. Appropriate gloves should be identified in the HASP. Avoid placing hands near operating equipment.
Hearing loss	Noise generated by heavy equipment/machinery.	Wear hearing protection such as earplugs or earmuffs.
Bodily harm, including to bystanders and the public and pedestrians in the locality of work	Heavy equipment, excavators, tractors, support vehicles, trucks, traffic and public rights-of-way; potential to be struck, crushed, or impacted by moving objects.	Wear a safety vest for enhanced visibility. Use cones and caution tape to cordon off the work area as appropriate. Watch for and escort pedestrians away from the work area. Pause work if necessary. Ensure traffic control measures (e.g., traffic cones, signage) are in place. Do not work near moving or heavy equipment or under overhead hazards. Maintain eye contact with equipment operators. When working around vehicles or heavy equipment, know the locations of emergency equipment (e.g., fire extinguishers, emergency shutoff features).
Physical stress	Lifting heavy equipment and objects; conducting strenuous activities; kneeling on hard or gravel surfaces.	Use proper lifting techniques, i.e., bending and lifting with the legs and not the back. Do not twist at the waist when turning. Use the buddy system for heavy objects. Use knee pads or a kneeling pad. Take breaks and rest as needed.

Task/Operation: Conducting Fieldwork		
Accidents with equipment/tools	Sample-collection equipment/tools.	Verify that you have the appropriate equipment/tools for your tasks. Use equipment/tools as intended by the manufacturer. Only use open blades or sharp-edged tools for their intended purposes. Stow tools in the vehicle properly; use appropriate cases and bags. Secure equipment (including compressed-gas cylinders) in the vehicle with netting and straps; do not leave loose—it can cause property damage or serious injuries to others or yourself.
Slips, trips, and falls	Uneven or unstable ground.	Maintain good housekeeping in work areas to minimize or eliminate slip/trip/fall hazards from equipment and supplies. Walk around rather than over hazards on the ground. Use caution when walking on uneven ground or in snowy and/or icy conditions. Dense vegetation may obscure dangerous features including biological hazards, steep slopes, and excavations. Flagging or marking dangerous areas can help reduce the likelihood of injury.
Biological/Chemical Hazards		
Biological/Chemical Risk	**Source of Hazard/Risk**	**Hazard/Risk Mitigation**
Biological—animals	Biting or stinging insects and spiders; animal feces.	Use bug repellent. Insect nests should never be disturbed. Employees who are allergic to stings should not work in areas where there is a high risk of encountering stinging insects. Use a bar to clear spiders from objects. Avoid contact with animal feces.

Task/Operation: Conducting Fieldwork		
Biological—plants	Poisonous plants and other irritant vegetation (e.g., blackberry canes).	Do not touch or approach poisonous or irritant vegetation. Wear long pants and a long-sleeved shirt while on the site if poisonous plants and other irritant vegetation is present.
Exposure to chemicals in environmental media	Chemicals or hazardous materials in soil, groundwater, LNAPL, stormwater, outdoor air, soil vapors, and excavations.	See the task-specific JHA.
Additional Control Measures and Guidance		
Engineering Controls: No engineering controls specified. The need for engineering controls should be discussed with the project manager, health and safety coordinator, and subcontractors, and identified in the HASP or Safe Work Plan.		
General Safe-Work Practices and Guidance: • Employees should not eat or drink in the immediate area where work is being conducted. Employees should wash their hands and faces before eating or drinking. If used, nitrile gloves should be disposed of in a container labeled for disposable items. • Cones, barrier tape, or equivalent methods will be used to establish the work area, if feasible. • Tasks that must be conducted in the work area must be coordinated with equipment operators before work begins. Methods of communication, such as direct eye contact, hand signals, and/or verbal communication, will be established before work begins. • Employees should carry a cellular phone and/or a security radio.		
PPE: Hard hat (when working around heavy equipment, including excavators, or overhead hazards), work boots (protective composite or steel-toe boots when working around heavy equipment), high-visibility vest or outer garment, safety glasses with side shields, nitrile gloves (or other hand protection appropriate for the type of physical or chemical hazards present), hearing protection (earplugs or earmuffs) as needed. Chemical googles if there is a chemical splash hazard.		

Job Hazard Analysis

<table>
<tr><th colspan="3">Task/Operation: Task-Specific Hazards</th></tr>
<tr><td colspan="2">Project Number:
M0615.20.015</td><td>Location/Site Where Task/Operation Performed:
1205 Alexander Avenue and 1300 Taylor Way, Tacoma, Washington</td></tr>
<tr><td rowspan="2">Date Prepared:
12/19/2024
Date Reviewed:
12/30/2024</td><td colspan="2">Employee Preparing this Job Hazard Analysis (JHA):
Justin Hansen</td></tr>
<tr><td colspan="2">Employee Reviewing and Certifying this JHA:
Audrey Hackett</td></tr>
<tr><th colspan="3">Job/Task Description</th></tr>
<tr><td colspan="3">This JHA is specific to certain elements of fieldwork that have unique hazards and require specific safe-work practices to mitigate those hazards. See the separate General Fieldwork Hazards JHA for hazards and safe-work practices that are common to most types of fieldwork.</td></tr>
<tr><th colspan="3">Handling Potentially Contaminated Soil and Water</th></tr>
<tr><th>Hazard/Risk</th><th>Source of Hazard/Risk</th><th>Hazard/Risk Mitigation</th></tr>
<tr><td rowspan="2">Exposure to chemicals or hazardous substances (e.g., contaminated soil or water) via direct contact</td><td rowspan="2">Chemicals or hazardous materials in soil or groundwater.</td><td>See the chemical hazards summary table for applicable chemical hazards.</td></tr>
<tr><td>Wear Level D PPE.</td></tr>
<tr><th colspan="3">Working around or in Excavations</th></tr>
<tr><td rowspan="6">Bodily harm or death</td><td>Confined-space entry.</td><td>Excavations may be considered confined spaces. Contact the health and safety coordinator and the project manager if work in excavations will be necessary.</td></tr>
<tr><td rowspan="5">Falling into open excavation from heights; engulfment/burial from working in excavations.</td><td>Ensure the HASP identifies project-specific procedures and engineering controls to mitigate risk of fall, engulfment, and burial.</td></tr>
<tr><td>Never enter an excavation deeper than 4 feet without first coordinating with the health and safety coordinator and the project manager. Ensure the excavation slope is appropriate for entry (i.e., 34 degrees), shoring/sheet pile is installed, and appropriate ingress and egress points are established.</td></tr>
<tr><td>When working in an excavation, minimize time spent working near the excavation sidewall.</td></tr>
<tr><td>Stay a safe distance from the excavation area—generally defined as a horizontal distance no less than the depth of the excavation.</td></tr>
</table>

<table>
<tr><th colspan="3">Task/Operation: Task-Specific Hazards</th></tr>
<tr><td rowspan="4"></td><td rowspan="3"></td><td>If close observation of an excavation is required (e.g., for describing soil stratigraphy, taking photos), slope or bench one side of the excavation sidewall to minimize potential for collapse.</td></tr>
<tr><td>Use signs, cones, barrier tape, or equivalent methods to mark open excavations.</td></tr>
<tr><td>Backfill excavations as soon as work is complete; never leave excavations unattended or open overnight.</td></tr>
<tr><td>Exposure to chemicals in soil and groundwater.</td><td>See the “Handling Potentially Contaminated Soil and Water” task-specific hazards above.</td></tr>
<tr><th colspan="3">Additional Control Measures and Guidance</th></tr>
<tr><td colspan="3">Engineering Controls: No engineering controls specified. The need for engineering controls should be discussed with the project manager, health and safety coordinator, and subcontractors, and identified in the HASP.</td></tr>
<tr><td colspan="3">General Safe-Work Practices and Guidance:
See the General Fieldwork Hazards JHA for safe-work practices and guidance common to most types of fieldwork.
If additional safe-work practices are needed to address unique, task-specific hazards, these should be specified in the HASP.</td></tr>
</table>

Appendix B

Chemicals of Potential Concern

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Table
Chemical Hazards

Analyte	OSHA PEL (TWA)	ACGIH TLV (TWA)	NIOSH IDLH[1]	LEL (%)	IP (eV)	Other Hazard
TPH						
Gasoline-range organics	NA	300 ppm	NA	1.4	NA	C, E, F, P
Diesel-range organics	NA	100 mg/m^3	NA	NA	NA	E, F, P
Residual-range organics	NA	NA	NA	NA	NA	E, F, P
VOCs						
1,1-Dichloroethane	100 ppm	100 ppm	3,000 ppm	5.4	11.06	
1,2-Dichloroethane	50 ppm	NE	50 ppm	6.2	11.05	
cis-1,2-Dichloroethene	200 ppm	NE	1,000 ppm	5.6	9.32	P
Tetrachloroethene	100 ppm	25 ppm	150 ppm	NA	9.32	C
Trichloroethylene	100 ppm	300 ppm	1,000 ppm	NA	9.45	C, P
Vinyl chloride	1 ppm	5 ppm	NA	3.6	9.99	C, F
PAHs						
Anthracene	0.2 mg/m^3	0.2 mg/m^3	80 mg/m^3	0.6	NA	F, P
Acenaphthene	NE	NE	NE	0.6	NA	F, P
Acenaphthylene	NE	NE	NE	NA	NA	F, P
Benzo(a)anthracene	NE	NE	NE	NA	NA	C, P
Benzo(a)pyrene	0.2 mg/m^3	0.2 mg/m^3	80 mg/m^3	NA	NA	C, P
Benzo(b)fluoranthene	NE	NE	NE	NA	NA	C, P
Benzo(g,h,i)perylene	NE	NE	NE	NA	NA	P
Benzo(k)fluoranthene	NE	NE	NE	NA	NA	C, P
Chrysene	0.2 mg/m^3	0.2 mg/m^3	80 mg/m^3	NA	7.59	C, P
Dibenz(a,h)anthracene	NE	NE	NE	NA	NA	C, P
Fluoranthene	NE	NE	NE	NA	NA	SC, P
Fluorene	NE	NE	NE	NA	NA	
Indeno(1,2,3-cd)pyrene	NE	NE	NE	NA	NA	SC
Naphthalene	10 ppm	10 ppm	250 ppm	0.9	8.12	SC, E, F, P

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Table
Chemical Hazards

Analyte	OSHA PEL (TWA)	ACGIH TLV (TWA)	NIOSH IDLH[1]	LEL (%)	IP (eV)	Other Hazard
PAHs (continued)						
Phenanthrene	0.2 mg/m^3	0.2 mg/m^3	80 mg/m^3	NA	NA	
Pyrene	0.2 mg/m^3	0.2 mg/m^3	80 mg/m^3	NA	NA	P
1-Methylnaphthalene	NE	0.5 ppm	NE	NA	NA	SC, E, F, P
2-Methylnaphthalene	NE	0.5 ppm	NE	NA	NA	SC, E, F, P
Remaining PAH constituents	NA	NA	NA	NA	NA	NA
Metals						
Antimony	0.5 mg/m^3	NE	50 mg/m^3	NA	NA	
Arsenic	0.01 mg/m^3	0.01 mg/m^3	5 mg/m^3	NA	NA	C, P
Cadmium	0.0050 mg/m^3	0.002 mg/m^3	9 mg/m^3	NA	NA	C
Chromium	1 mg/m^3	0.5 mg/m^3	250 mg/m^3	NA	NA	R, P
Copper	1 mg/m^3	0.2 mg/m^3	100 mg/m^3	NA	NA	
Lead	0.05 mg/m^3	0.05 mg/m^3	100 mg/m^3	NA	NA	C, P
Manganese	5 mg/m^3	0.02 mg/m^3	500 mg/m^3	NA	NA	NA
Mercury	0.1 mg/m^3 (CE)	0.01 mg/m^3	2 mg/m^3	NA	NA	R, P
Nickel	0.1 mg/m^3	0.1 mg/m^3	10 mg/m^3	NA	NA	C
Selenium	0.2 mg/m^3	0.2 mg/m^3	1 mg/m^3	NA	NA	R, P
Zinc	10 mg/m^3	2 mg/m^3	500 mg/m^3	NA	NA	

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Table
Chemical Hazards

Analyte	OSHA PEL (TWA)	ACGIH TLV (TWA)	NIOSH IDLH[1]	LEL (%)	IP (eV)	Other Hazard
Additional						
Benzene	1 ppm	5 ppm	500 ppm	1.2	9.24	F, C, P, R
Bis(2-ethylhexyl)phthalate	5 mg/m^3	5 mg/m^3	5,000 mg/m^3	2	NA	SC, P, F
1,4-Dioxane	100 ppm	NE	500 ppm	2	9.13	F, C, P, R
Ethylbenzene	100 ppm	125 ppm	800 ppm	0.8	8.76	F, P
Hexane	500 ppm	NE	1,100 ppm	10	10.18	F
Methane	NE	NE	NE	5	None	F, P
Polychlorinated biphenyls	0.5 mg/m^3	1 mg/m^3	5 mg/m^3	NA	NA	C
Toluene	100 ppm	150 ppm	500 ppm	1.1	8.82	E, F, P, R
Xylenes	100 ppm	150 ppm	900 ppm	0.9	8.44–8.56	F, P

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Table
Chemical Hazards

Notes

ACGIH = American Conference of Governmental Industrial Hygienists.
C = carcinogen.
cc = cubic centimeter.
CE = ceiling concentration.
E = explosive.
F = flammable.
IDLH = immediately dangerous to life and health.
IP (eV) = ionization potential.
LEL = lower explosive limit.
mg/kg = milligrams per kilogram.
mg/m^3 = milligrams per cubic meter.
NA = not available.
NE = not established.
NIOSH = National Institute for Occupational Safety and Health.
OSHA = Occupational Safety and Health Administration.
P = poison.
PAH = polycyclic aromatic hydrocarbon.
PEL = permissible exposure level.
ppb = parts per billion.
ppm = parts per million.
R = reactive.
SC = suspected carcinogen.
TLV = threshold limit value.
TPH = total petroleum hydrocarbons.
TWA = time-weighted average.
VOC = volatile organic compound.

Reference

[1]CDC. 2019. "Immediately Dangerous to Life or Health (IDLH) Values." Centers for Disease Control and Prevention, The National Institute for Occupational Safety and Health (NIOSH). October 8. Accessed September 13, 2022. http://www.cdc.gov/niosh/idlh/intridl4.html.

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Appendix C

Chemical Action Levels

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Air Monitoring Procedures and Toxicity Action Levels

Instrument	Action Level	Initial Action	Follow-Up Action
PID[a]	Detection of 1 ppm (above ambient) or greater in breathing zone sustained for two minutes.	Dräger tube test for benzene and vinyl chloride and communications with HSC to evaluate additional initial actions, if needed. If 1 ppm benzene detected with Dräger tube, upgrade to level C. If 1 ppm vinyl chloride detected with Dräger tube, upgrade to level C.	Ventilate area; always work upwind.
PID[a]	Detection of 10 ppm (above ambient) in breathing zone and determined not to be benzene.	Upgrade to Level C and continue to monitor breathing zone with Dräger tube. If 50 ppm, leave exclusion zone. Return only if levels decrease to below 50 ppm.	Ventilate area; always work upwind.
CGI[b]—LEL	At or above 10 percent of LEL.	Cease activities; turn off all potential sources of ignition. Evacuate.	Determine source of flammable vapors.

Notes
Bold text indicates an action level.
CGI = combustible-gas indicator.
HSC = health and safety coordinator.
LEL = lower explosive limit.
PID = photoionization detector.
ppm = parts per million.
[a]Some PIDs do not work in high (e.g., greater than 90%) humidity or rainy weather. Under these atmospheric conditions, only PIDs certified for use in high humidity should be used.
[b]See Section 12.2 for complete explosion hazard action levels.

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Appendix D

Snail Mitigation

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Don’t let snails hide and ride

Stop invasive snails from hitchhiking on your truck.

Check your trucks and tires for snails that try to stow away on freight vehicles, tires, and cargo containers.

If you find snails or other potentially invasive pests, please send photos of them to the Washington State Department of Agriculture at PestProgram@agr.wa.gov or call 1-800-443-6684 if you have questions.

AGR PUB 809-756 (N/3/20)
Do you need this publication in an alternate format?
Contact WSDA at (360) 902-1976 or TTY Relay (800) 833-6388.

WSDA Washington State Department of Agriculture | PEST PROGRAM

Appendix E

Incident Report Form

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Health and Safety Incident Report

This report must be completed in full and submitted within 24 hours to the MFA health and safety coordinator.

Project Name: Port of Tacoma: TWAAFA Hylebos Marsh Interim Action

Project Number: M0615.20.015

Date and Time of Incident: _____

Location: _____

Type of Incident (check all applicable items):

☐ Illness	☐ Health and safety infraction	☐ Vehicular accident
☐ Injury	☐ Fire, explosion, flash	☐ Electric shock
☐ Property damage or theft	☐ Chemical exposure	☐ Near miss
☐ Spill	☐ Other (describe):	

Description of Incident

Describe what happened and the possible cause of the incident. If reporting a spill, include the quantity or estimated quantity. Identify individual(s) involved, witnesses, and their affiliations. Describe emergency or corrective action taken. Attach additional sheets, drawings, or photographs as needed.

Incident Reporter:

Name	Signature	Date

Health and Safety Coordinator:

Name	Signature	Date

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Appendix F

Tailgate Safety Meeting

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Tailgate Safety Meeting Checklist

Client Name:	Port of Tacoma
Project No.:	M0615.20.015
Communicated By:	
Date:	

Yes	NA	Information Reviewed
☐	☐	Emergency Response Procedures and Site Evacuation Routes
☐	☐	Route to Hospital
☐	☐	HASP Review and Location
☐	☐	Key Project Personnel
☐	☐	Emergency Phone Numbers
☐	☐	Stop Work Authority
☐	☐	General Site Description/History and Chemical Hazards
☐	☐	For Active Sites—Site Activities and Vehicular/Equipment Traffic
☐	☐	Site-Specific Physical Hazards
☐	☐	Required Personal Protective Equipment
☐	☐	Available Safety Equipment and Location
☐	☐	Daily Scope of Work (reference JHAs as applicable)
☐	☐	Decontamination Procedures
☐	☐	Identify Work Zones, Exclusion Zones, and Decontamination Zones
☐	☐	Hazardous Atmospheres
☐	☐	Air Monitoring Equipment and Procedures
☐	☐	Identify Potential Site-Specific Slip, Trip, and Fall Hazards
☐	☐	Dust and Vapor Control
☐	☐	Confined Space(s)
☐	☐	Open Pits and Excavation
☐	☐	Extreme Temperatures
☐	☐	Incident Reporting
☐	☐	Other: _____

Additional Health and Safety Practices and Considerations

Attendees		
Name	Signature	Company
1)		
2)		
3)		
4)		
5)		
6)		
7)		
8)		

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Appendix G

HASP Audit Checklist

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HASP Audit Checklist

Project Name: Port of Tacoma: Hylebos Marsh Interim Action
Project No.: M0615.20.015
Project Location:
Audit Date / Time:
Person / Persons Performing Audit:
MFA Personnel Interviewed or Conducting Fieldwork:

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	Status			Comment	Recommendation	Assigned to:	Scheduled Completion Date:	Actions Completed:	Person Who Completed Actions:	Date Completed:	Current Status / Notes:
	Yes	No	N/A								
Audit Checklist Item											
1. Is there a written HASP for this project? If so, what is the revision date?											
2. Is the HASP available to project personnel?											
3. Does the HASP appear accurate and complete? For example, are the directions to the hospital and the emergency contact numbers accurate? Are the site contaminants listed?											
4. Do the JHAs appear accurate and complete? For example, do there appear to be risks addressed for all of the applicable activities?											
5. Do you observe violations of the HASP requirements?											
6. If applicable, are employees adhering to the respirator program (see SOP 03, Respiratory Protection)?											
Interview Questions											
7. Where do you keep the HASP for this project?											
8. Have you reviewed the HASP for this project? If so, what was your review process?											
9. Can you tell me how you conduct your site activities? Note to auditor—pick a JHA activity and identify major discrepancies between the answer and the JHA, if any.											
10. Do you have any health and safety questions or concerns? For example, have you observed things on this project that you thought were unsafe? Note to auditor—make sure we come up with a plan to promptly address any listed concerns.											

Signature of Person / Persons Conducting Audit			
Name	Signature	Date	

Signature of Project Manager and Principal in Charge Acknowledging Review of Completed HASP Audit Checklist			
Name	Signature	Date	

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Appendix D

Inadvertent Discovery Plan and Supporting Documents

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INADVERTENT DISCOVERY PLAN

PLAN AND PROCEDURES FOR THE DISCOVERY OF CULTURAL RESOURCES AND HUMAN SKELETAL REMAINS

To request ADA accommodation, including materials in a format for the visually impaired, call Ecology at 360-407-6000 or visit https://ecology.wa.gov/accessibility. People with impaired hearing may call Washington Relay Service at 711. People with a speech disability may call TTY at 877-833-6341.

Site Name(s): Taylor Way & Alexander Ave Fill Area (CSID: 4692) Location: 1300 Taylor Way, Tacoma, WA 98421

Project Lead/Organization: Audrey Hackett / Maul Foster & Alongi, Inc. County: Pierce

If this Inadvertent Discovery Plan (IDP) is for multiple (batched) projects, ensure the location information covers all project areas.

1. INTRODUCTION

The IDP outlines procedures to perform in the event of a discovery of archaeological materials or human remains, in accordance with applicable state and federal laws. An IDP is required, as part of Agency Terms and Conditions for all grants and loans, for any project that creates disturbance above or below the ground. An IDP is not a substitute for a formal cultural resource review (Executive 21-02 or Section 106).

Once completed, **the IDP should always be kept at the project site** during all project activities. All staff, contractors, and volunteers should be familiar with its contents and know where to find it.

2. CULTURAL RESOURCE DISCOVERIES

A cultural resource discovery could be prehistoric or historic. Examples include (see images for further examples):

- An accumulation of shell, burned rocks, or other food related materials.
- Bones, intact or in small pieces.
- An area of charcoal or very dark stained soil with artifacts.
- Stone tools or waste flakes (for example, an arrowhead or stone chips).
- Modified or stripped trees, often cedar or aspen, or other modified natural features, such as rock drawings.
- Agricultural or logging materials that appear older than 50 years. These could include equipment, fencing, canals, spillways, chutes, derelict sawmills, tools, and many other items.
- Clusters of tin cans or bottles, or other debris that appear older than 50 years.
- Old munitions casings. ***Always assume these are live and never touch or move.***
- Buried railroad tracks, decking, foundations, or other industrial materials.
- Remnants of homesteading. These could include bricks, nails, household items, toys, food containers, and other items associated with homes or farming sites.

The above list does not cover every possible cultural resource. When in doubt, assume the material is a cultural resource.

3. ON-SITE RESPONSIBILITIES

If any employee, contractor, or subcontractor believes that they have uncovered cultural resources or human remains at any point in the project, take the following steps to ***Stop-Protect-Notify***. **If you suspect that the discovery includes human remains, also follow Sections 5 and 6.**

STEP A: Stop Work.

All work must stop immediately in the vicinity of the discovery.

STEP B: Protect the Discovery.

Leave the discovery and the surrounding area untouched and create a clear, identifiable, and wide boundary (30 feet or larger) with temporary fencing, flagging, stakes, or other clear markings. Provide protection and ensure integrity of the discovery until cleared by the Department of Archaeological and Historical Preservation (DAHP) or a licensed, professional archaeologist.

Do not permit vehicles, equipment, or unauthorized personnel to traverse the discovery site. Do not allow work to resume within the boundary until the requirements of this IDP are met.

STEP C: Notify Project Archaeologist (if applicable).

If the project has an archaeologist, notify that person. If there is a monitoring plan in place, the archaeologist will follow the outlined procedure.

STEP D: Notify Project and Washington Department of Ecology (Ecology) contacts.

Project Lead Contacts

Primary Contact		Alternate Contact	
Name:	Audrey Hackett	Name:	Carolyn Wise
Organization:	Maul Foster & Alongi, Inc.	Organization:	Maul Foster & Alongi, Inc.
Phone:	206-556-2015	Phone:	360-594-6255
Email:	ahackett@maulfoster.com	Email:	cwise@maulfoster.com

Ecology Contacts (completed by Ecology Project Manager)

Ecology Project Manager		Alternate or Cultural Resource Contact	
Name:	Steve Teel, LHG	Name:	Sydney Hanson
Program:	Toxics Cleanup Program	Program:	Ecology Cultural Resource Specialist
Phone:	360-890-0059	Phone:	564-999-1054
Email:	steve.teel@ecy.wa.gov	Email:	syha@ecy.wa.gov

STEP E: Ecology will notify DAHP.

Once notified, the Ecology Cultural Resource Contact or the Ecology Project Manager will contact DAHP to report and confirm the discovery. To avoid delay, the Project Lead/Organization will contact DAHP if they are not able to reach Ecology.

DAHP will provide the steps to assist with identification. DAHP, Ecology, and Tribal representatives may coordinate a site visit following any necessary safety protocols. DAHP may also inform the Project Lead/Organization and Ecology of additional steps to further protect the site.

Do not continue work until DAHP has issued an approval for work to proceed in the area of, or near, the discovery.

DAHP Contacts:

Name: Rob Whitlam, PhD
Title: State Archaeologist
Cell: 360-890-2615
Email: Rob.Whitlam@dahp.wa.gov
Main Office: 360-586-3065

Human Remains/Bones:

Name: Guy Tasa, PhD
Title: State Anthropologist
Cell: 360-790-1633 (24/7)
Email: Guy.Tasa@dahp.wa.gov

4. TRIBAL CONTACTS

In the event cultural resources are discovered, the following tribes will be contacted. See Section 10 for Additional Resources.

Tribe:	Puyallup Tribe of Indians	Tribe:	Muckleshoot Indian Tribe
Name:	Brandon Reynon	Name:	Laura Murphy
Title:	Director/Tribal Historic Preservation Officer	Title:	Archaeologist
Phone:	253-573-7965	Phone:	253-876-3272
Email:	brandon.reynon@PuyallupTribe-nsn.gov	Email:	laura.murphy@muckleshoot.nsn.us
Tribe:	Nisqually Indian Tribe	Tribe:	Squaxin Island Tribe
Name:	Brad Beach	Name:	Rhonda Foster
Title:	Tribal Historic Preservation Officer	Title:	Tribal Historic Preservation Officer
Phone:	360-528-1084	Phone:	360-432-3850
Email:	beach.brad@nisqually-nsn.gov	Email:	rfoster@squaxin.us

Please provide contact information for additional tribes within your project area, if needed, in Section 11.

5. FURTHER CONTACTS (if applicable)

If the discovery is confirmed by DAHP as a cultural or archaeological resource, or as human remains, and there is a partnering federal or state agency, Ecology or the Project Lead/Organization will ensure the partnering agency is immediately notified.

Federal Agency:		State Agency:	
Agency:		Agency:	Department of Archaeology & Historic Preservation
Name:		Name:	Guy Tasa
Title:		Title:	State Physical Anthropologist
Phone:		Phone:	360-790-1633
Email:		Email:	Guy.Tasa@dahp.wa.gov

6. SPECIAL PROCEDURES FOR THE DISCOVERY OF HUMAN SKELETAL MATERIAL

Any human skeletal remains, regardless of antiquity or ethnic origin, will at all times be treated with dignity and respect. Follow the steps under ***Stop-Protect-Notify.*** For specific instructions on how to handle a human remains discovery, see: *RCW 68.50.645: Skeletal human remains—Duty to notify—Ground disturbing activities—Coroner determination—Definitions*.

Suggestion: If you are unsure whether the discovery is human bone or not, contact Guy Tasa with DAHP, for identification and next steps. Do not pick up the discovery.

Guy Tasa, PhD State Physical Anthropologist
Guy.Tasa@dahp.wa.gov
(360) 790-1633 (Cell/Office)

For discoveries that are confirmed or suspected human remains, follow these steps:

1. Notify law enforcement and the Medical Examiner/Coroner using the contacts below. **Do not call 911** unless it is the only number available to you.

   Enter contact information below (required):
   - Local Medical Examiner or Coroner name and phone: Karen Cline-Parhamovich, 253-798-6494
   - Local Law Enforcement main name and phone: Tacoma Police Department, 253-591-5950
   - Local Non-Emergency phone number (911 if without a non-emergency number): Tacoma Police Department, 253-287-4455
2. The Medical Examiner/Coroner (with assistance of law enforcement personnel) will determine if the remains are human or if the discovery site constitutes a crime scene and will notify DAHP.
3. **DO NOT speak with the media, allow photography or disturbance of the remains, or release any information about the discovery on social media.**
4. If the remains are determined to be non-forensic, Cover the remains with a tarp or other materials (not soil or rocks) for temporary protection and to shield them from being photographed by others or disturbed.

Further activities:

- Per RCW 27.44.055, RCW 68.50, and RCW 68.60, DAHP will have jurisdiction over non-forensic human remains. Ecology staff will participate in consultation. Organizations may also participate in consultation.
- Documentation of human skeletal remains and funerary objects will be agreed upon through the consultation process described in RCW 27.44.055, RCW 68.50, and RCW 68.60.
- When consultation and documentation activities are complete, work in the discovery area may resume as described in Section 8.

If the project occurs on federal lands (such as a national forest or park or a military reservation) the provisions of the Native American Graves Protection and Repatriation Act of 1990 (NAGPRA) apply and the responsible federal agency will follow its provisions. Note that state highways that cross federal lands are on an easement and are not owned by the state.

If the project occurs on non-federal lands, the Project Lead/Organization will comply with applicable state and federal laws, and the above protocol.

7. DOCUMENTATION OF ARCHAEOLOGICAL MATERIALS

Archaeological resources discovered during construction are protected by state law RCW 27.53 and assumed eligible for inclusion in the National Register of Historic Places under Criterion D until a formal Determination of Eligibility is made.

The Project Lead/Organization must ensure that proper documentation and field assessment are made of all discovered cultural resources in cooperation with all parties: the federal agencies (if any), DAHP, Ecology, affected tribes, and the archaeologist.

The archaeologist will record all prehistoric and historic cultural material discovered during project construction on a standard DAHP archaeological site or isolate inventory form. They will photograph site overviews, features, and artifacts and prepare stratigraphic profiles and soil/sediment descriptions for minimal subsurface exposures. They will document discovery locations on scaled site plans and site location maps.

Cultural features, horizons, and artifacts detected in buried sediments may require the archaeologist to conduct further evaluation using hand-dug test units. They will excavate units in a controlled fashion to expose features, collect samples from undisturbed contexts, or to interpret complex stratigraphy. They may also use a test unit or trench excavation to determine if an intact occupation surface is present. They will only use test units when necessary to gather information on the nature, extent, and integrity of subsurface cultural deposits to evaluate the site's significance. They will conduct excavations using standard archaeological techniques to precisely document the location of cultural deposits, artifacts, and features.

The archaeologist will record spatial information, depth of excavation levels, natural and cultural stratigraphy, presence or absence of cultural material, and depth to sterile soil, regolith, or bedrock for each unit on a standard form. They will complete test excavation unit level forms, which will include plan maps for each excavation level and artifact counts and material types, number, and vertical provenience (depth below

surface and stratum association where applicable) for all recovered artifacts. They will draw a stratigraphic profile for at least one wall of each test excavation unit.

The archaeologist will screen sediments excavated for purposes of cultural resources investigation through 1/8-inch mesh, unless soil conditions warrant 1/4-inch mesh.

The archaeologist will analyze, catalogue, and temporarily curate all prehistoric and historic artifacts collected from the surface and from probes and excavation units. The ultimate disposition of cultural materials will be determined in consultation with the federal agencies (if any), DAHP, Ecology, and the affected tribe(s).

Within 90 days of concluding fieldwork, the archaeologist will provide a technical report describing any and all monitoring and resultant archaeological excavations to the Project Lead/Organization, who will forward the report to Ecology, the federal agencies (if any), DAHP, and the affected tribe(s) for review and comment.

If assessment activities expose human remains (burials, isolated teeth, or bones), the archaeologist and Project Lead/Organization will follow the process described in **Section 6**.

8. PROCEEDING WITH WORK

The Project Lead/Organization shall work with the archaeologist, DAHP, and affected tribe(s) to determine the appropriate discovery boundary and where work can continue.

Work may continue at the discovery location only after the process outlined in this plan is followed and the Project Lead/Organization, DAHP, any affected tribe(s), Ecology, and the federal agencies (if any) determine that compliance with state and federal laws is complete.

9. ORGANIZATION RESPONSIBILITY

The Project Lead/Organization is responsible for ensuring:

- This IDP has complete and accurate information.
- This IDP is immediately available to all field staff at the sites and available by request to any party.
- This IDP is implemented to address any discovery at the site.
- That all field staff, contractors, and volunteers are instructed on how to implement this IDP.

10. ADDITIONAL RESOURCES

Informative Video

Ecology recommends that all project staff, contractors, and volunteers view this informative video explaining the value of IDP protocol and what to do in the event of a discovery. The target audience is anyone working on the project who could unexpectedly find cultural resources or human remains while excavating or digging. The video is also posted on DAHP's inadvertent discovery language website.

Ecology's IDP Video (https://www.youtube.com/watch?v=ioX-4cXfbDY)

Informational Resources

DAHP (https://dahp.wa.gov)

Washington State Archeology (DAHP 2003)

(https://dahp.wa.gov/sites/default/files/Field%20Guide%20to%20WA%20Arch_0.pdf)

Association of Washington Archaeologists (https://www.archaeologyinwashington.com)

Potentially Interested Tribes

Interactive Map of Tribes by Area

(https://dahp.wa.gov/archaeology/tribal-consultation-information)

WSDOT Tribal Contact Website

(https://wsdot.wa.gov/tribal/TribalContacts.htm)

11. ADDITIONAL INFORMATION

Please add any additional contact information or other information needed within this IDP.

Snoqualmie Tribe of Indians
Steven Moses
Director, Archaeology and Historic Preservation
steve@snoqualmietribe.us, 425-495-6097

Suquamish Tribe
Stephanie Trudel
Tribal Historic Preservation Officer
strudel@Suquamish.nsn.us, 360-394-8533

Confederated Tribes and Bands of the Yakama Nation
Rose Ferri
Interim Tribal Historic Preservation Officer
Rose_Ferri@yakama.com,509-307-2009

Cowlitz Indian Tribe
James Gordon
THPO
jgordon@cowlitz.org, Office: 360-577-5680 ext 2222; Cell: 360-957-3004

Implement the IDP if you see…

Chipped stone artifacts.

Examples are:

- Glass-like material.
- Angular material.
- “Unusual” material or shape for the area.
- Regularity of flaking.
- Variability of size.

Stone artifacts from Oregon.

Stone artifacts from Washington.

Biface-knife, scraper, or pre-form found in NE Washington. Thought to be a well knapped object of great antiquity. Courtesy of Methow Salmon Rec. Foundation.

Implement the IDP if you see…

Ground stone artifacts.

Examples are:

- Unusual or unnatural shapes or unusual stone.
- Striations or scratching.
- Etching, perforations, or pecking.
- Regularity in modifications.
- Variability of size, function, or complexity.

Above: Fishing Weight - credit CRITFC Treaty Fishing Rights website.

Artifacts from unknown locations (left and right images).

Implement the IDP if you see…

Bone or shell artifacts, tools, or beads.

Examples are:

- Smooth or carved materials.
- Unusual shape.
- Pointed as if used as a tool.
- Wedge shaped like a “shoehorn”.
- Variability of size.
- Beads from shell (dentalium) or tusk.

Upper Left:*Bone Awls from Oregon.*

Upper Center: *Bone Wedge from California.*

Upper Right: *Plateau dentalium choker and bracelet, from Nez Perce National Historical Park, 19th century, made using Antalis pretiosa shells Credit: Nez Perce - Nez Perce National Historical Park, NEPE 8762, Public Domain.*

Above: *Tooth Pendants. Right: Bone Pendants. Both from Oregon and Washington.*

Implement the IDP if you see…

Culturally modified trees, fiber, or wood artifacts.

Examples are:

- Trees with bark stripped or peeled, carvings, axe cuts, de-limbing, wood removal, and other human modifications.
- Fiber or wood artifacts in a wet environment.
- Variability of size, function, and complexity.

Left and Below: *Culturally modified tree and an old carving on an aspen (Courtesy of DAHP).*

Right, Top to Bottom: *Artifacts from Mud Bay, Olympia: Toy war club, two strand cedar rope, wet basketry*.

Implement the IDP if you see…

Strange, different, or interesting looking dirt, rocks, or shells.

Human activities leave traces in the ground that may or may not have artifacts associated with them. Examples are:

- "Unusual" accumulations of rock (especially fire-cracked rock).
- "Unusual" shaped accumulations of rock (such as a shape similar to a fire ring).
- Charcoal or charcoal-stained soils, burnt-looking soils, or soil that has a "layer cake" appearance.
- Accumulations of shell, bones, or artifacts. Shells may be crushed.
- Look for the "unusual" or out of place (for example, rock piles in areas with otherwise few rocks).

Shell Midden pocket in modern fill discovered in sewer trench.

Underground oven. Courtesy of DAHP.

Shell midden with fire cracked rock.

Hearth excavated near Hamilton, WA.

Implement the IDP if you see…

Historic period artifacts (historic archaeology considered older than 50 years).

Examples are:

- Agricultural or logging equipment. May include equipment, fencing, canals, spillways, chutes, derelict sawmills, tools, etc.
- Domestic items including square or wire nails, amethyst colored glass, or painted stoneware.

Left: Top to Bottom: *Willow pattern serving bowl and slip joint pocket knife discovered during Seattle Smith Cove shantytown (45-KI-1200) excavation.*

Right: *Collections of historic artifacts discovered during excavations in eastern Washington cities.*

Implement the IDP if you see…

Historic period artifacts (historic archaeology considered older than 50 years).

Examples are:

- Railway tokens, coins, and buttons.
- Spectacles, toys, clothing, and personal items.
- Items helping to understand a culture or identity.
- Food containers and dishware.

Main Image: *Dishes, bottles, workboot found at the North Shore Japanese bath house (ofuro) site, Courtesy Bob Muckle, Archaeologist, Capilano University, B.C. This is an example of an above ground resource.*

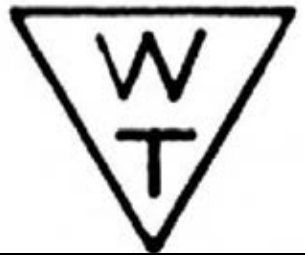
Right, from Top to Bottom: *Coins, token, spectacles and Montgomery Ward pitchfork toy discovered during Seattle Smith Cove shantytown (45-KI-1200) excavation.*

Implement the IDP if you see…

- Old munition casings – if you see ammunition of any type – ***always assume they are live and never touch or move!***
- Tin cans or glass bottles with an older manufacturer's technique – maker's mark, distinct colors such as turquoise, or an older method of opening the container.

Far Left: .303 British cartridge found by a WCC planting crew on Skagit River. Don't ever touch something like this!
Left: Maker's mark on bottom of old bottle.

Right: *Old beer can found in Oregon. ACME was owned by Olympia Brewery. Courtesy of Heather Simmons.*



Logo employed by Whithall Tatum & Co. between 1924 to 1938 (Lockhart et al. 2016).

Can opening dates, courtesy of W.M. Schroeder.

Implement the IDP if you see…

You see historic foundations or buried structures.

Examples are:

- Foundations.
- Railroad and trolley tracks.
- Remnants of structures.

Counter Clockwise, Left to Right: *Historic structure 45KI924, in WSDOT right of way for SR99 tunnel. Remnants of Smith Cove shantytown (45-KI-1200) discovered during Ecology CSO excavation, City of Spokane historic trolley tracks uncovered during stormwater project, intact foundation of historic home that survived the Great Ellensburg Fire of July 4, 1889, uncovered beneath parking lot in Ellensburg.*

Implement the IDP if you see...

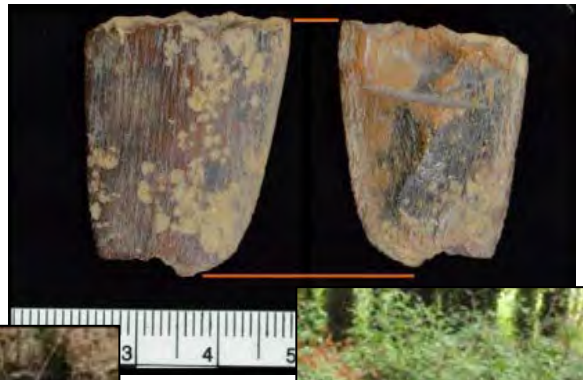
Potential human remains.

Examples are:

- Grave headstones that appear to be older than 50 years.
- Bones or bone tools--intact or in small pieces. It can be difficult to differentiate animal from human so they must be identified by an expert.
- These are all examples of animal bones and are not human.

Center: *Bone wedge tool, courtesy of Smith Cove Shantytown excavation (45KI1200).*

Other images (Top Right, Bottom Left, and Bottom) Center: Courtesy of DAHP.



Directly Above: This is a real discovery at an Ecology sewer project site.

What would you do if you found these items at a site? Who would be the first person you would call?

Hint: *Read the plan!*

From: Mike Shong
To: Evered, Kristin
Cc: Brandon.Reynon
Subject: RE: Neptune CRA
Date: Monday, November 24, 2025 9:10:21 AM
Attachments: ~WRD0000.jpg

CAUTION: This email originated from outside of the organization. Do not click links or open attachments unless you recognize the sender and know the content is safe. Report suspicious email using the Report Phish button in Outlook.

Good morning Kristin,

Sorry for the late reply. Thank you for uploading these two reports and the opportunity to review them. I have no substantive comments or concerns for the Neptune and Gog-le-hi-te CRAs.

Regards,

Mike

From: Evered, Kristin <kevered@portoftacoma.com>
Sent: Monday, November 24, 2025 8:14 AM
To: Mike Shong <Mike.Shong@PuyallupTribe-nsn.gov>
Cc: Brandon Reynon <Brandon.Reynon@PuyallupTribe-nsn.gov>
Subject: RE: Neptune CRA

Morning, Mike,

I am just checking in to see if you have any comments on the Neptune CRA for Parcel 117 and Gog-le-hi-te.

Best,
Kristin

From: Evered, Kristin
Sent: Thursday, November 6, 2025 12:09 PM
To: Mike.Shong <mike.shong@puyalluptribe-nsn.gov>
Cc: Brandon.Reynon <brandon.reynon@puyalluptribe-nsn.gov>
Subject: Neptune CRA

Hi Mike,

I uploaded the draft CRA for the Neptune Development project (Parcel 117 and Gog-le-hi-te) into your share folder. ATCRC is drafting a separate report for Parcel 12 which I will share with you once received. I anticipate receiving that draft by mid-December.

Thanks!

Kristin Evered
Environmental Project Manager
PORT OF TACOMA
O: 253.888.4776
www.portoftacoma.com

All e-mail communications with the Port of Tacoma are subject to disclosure under the Public Records Act and should be presumed to be public.

Appendix E

Supplemental Groundwater Sampling Plan

MAUL FOSTER ALONGI

Technical Memorandum

To:	Steve Teel, LHG	Date:	February 26, 2026
From:	Audrey Hackett and Carolyn Wise, LHG Maul Foster & Alongi, Inc.	Project No.:	M0615.20.016
Re:	Supplemental Groundwater Sampling Plan Hylebos Marsh - Taylor Way and Alexander Avenue Fill Area (TWAAFA) Site Facility Site ID 1403183, Cleanup Site ID 4692		

Background and Purpose

On behalf of the Port of Tacoma (the Port), Maul Foster & Alongi, Inc. (MFA) has prepared this supplemental groundwater sampling plan describing planned environmental characterization activities on the eastern portion of Hylebos Marsh (Pierce County tax parcels 0321263045 and 0321352064; the Property) (see Figure 1).

Subsurface investigation activities completed by MFA in August 2024, identified detections of tetrachloroethene (PCE) and trichloroethene (TCE) above soil to groundwater to surface water criteria in soil from boring, TWA-SB-12, colocated with lime waste located along the east boundary of the Property (see Figure 2). Concentrations of PCE and TCE colocated with lime waste is an indicator of lime solvent sludge for the TWAAFA site. The lime solvent sludge within TWA-SB-12 was observed between 8 and 18.5 feet bgs (ft bgs) with groundwater encountered at approximately 19.4 ft bgs. Because concentrations of PCE and TCE and other contaminants in soil exceed Ecology preliminary soil cleanup levels for protection of groundwater to marine surface water in TWA-SB-12, which are based on conservative transport assumptions, collection and analysis of groundwater is proposed as an empirical demonstration of whether migration into groundwater from soil is occurring due to lime solvent sludge. Therefore, assessment of PCE and TCE and other contaminant concentrations in groundwater within this area containing lime solvent sludge waste is proposed in this sampling plan.

This sampling plan summarizes the proposed advancement of two temporary groundwater monitoring wells to evaluate PCE and TCE and other contaminant concentrations in groundwater downgradient of and adjacent to boring TWA-SB-12 (see Figure 2) Proposed sample location TWA-SB-17 is located in an inferred downgradient position, approximately 35 feet west-northwest of TWA-SB-12; proposed sample location TWA-SB-18 is located adjacent, approximately 5 feet north-northwest of TWA-SB-12.

Field activities and analytical results will be conducted in accordance with the 2021 Quality Assurance Project Plan for the TWAAFA site, included as Appendix A of the Revised Groundwater Monitoring Plan (DOF 2022). Data will be validated in accordance with Washington State Department of Ecology (Ecology) data validation guidelines (Ecology 2024) and U.S. Environmental Protection Agency (EPA) national functional guidelines (EPA 2020).

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Geology and Hydrogeology

The following lithological units in order of increasing depth have been identified for the TWAAFA site, including the Property (DOF 2020, 2025):

- Fill unit: composed of heterogenous, anthropogenic fill materials. Depending on specific location within the TWAAFA site, the upper fill unit consists of a gravel road base, unconsolidated fill sediments, lime waste (consisting of light-colored, unconsolidated, fine-grained particles; some lime waste encountered has been impacted with PCE or TCE [referred to as lime solvent sludge]; other areas of lime waste contain no detections of PCE or TCE), auto fluff, wood waste, and demolition waste. At the Property, the upper fill unit is between 5 and 19.4 feet (ft) thick (CRETE 2020, MFA 2024, and DOF 2025). Lime solvent sludge waste was observed in the fill unit at TWA-SB-12 from approximately 8.5 to 18.5 ft bgs.
- Silt unit: brown to gray and soft, with local areas containing clay, sand, and organic matter, and appears to be laterally continuous across the TWAAFA site. Previous deep borings at the Property identified the silt unit as between 7 and 11.5 ft thick.
- Sand unit: Underlying the silt unit is a fine- to medium-grained sand deposit, with trace amounts of silt. The sand unit appears to be continuous across the TWAAFA site with thickness ranging from 11 to 14 ft.
- Deeper interbedded sand and silt unit: ranging from less than one inch thick to multiple ft thick. Material appears to be continuous across TWAAFA site and is organic-rich with peat noted in some historical borings.

The Property has three hydrogeological units (listed in order of increasing depth):

- Shallow aquifer: the saturated unconfined shallow groundwater unit thickness varies seasonally and is thickest in late winter or early spring. Groundwater mounds near the center of the TWAAFA site and generally flows northwest and southwest beneath the Property.
- Silt confining layer: the former mudflat, which underlies the shallow and deep aquifer units, is continuous and contains clay, sand, and organic matter as described above.
- Deep aquifer: deltaic sands are present throughout the tide flats, with silt layers encountered deeper than 50 feet below ground surface (ft bgs). The top of the deep aquifer was identified in previous borings at the Property as between 18.5 and 24.5 ft bgs; it extends to at least 60 ft bgs.

During the August 2024 field investigation at the Property, groundwater was encountered between 2 and 19.5 ft bgs, representing the significant topographic changes between boring locations due to the topographic slope along the eastern boundary of the Property (MFA 2024).

Field Activities

MFA will coordinate with subcontractors, including subsurface utility locators, a licensed driller, and an analytical laboratory, to complete the scope of work. Proposed sample locations, TWA-SB-17 and TWA-SB-18, will be advanced up to approximately 20 and 25 ft bgs, respectively, for collection of discrete groundwater samples at multiple depths within the shallow groundwater-bearing zone. The final depths of the two borings are anticipated to vary due to a difference in ground surface elevation and will not be advanced beyond the silt/clay aquitard into the deeper aquifer. Soils will be continuously logged during boring advancement for identification of silt confining layer (at least two feet in thickness) to ensure no potential of cross contamination between perched and/or unconfined groundwater and confined groundwater-bearing zones. If the silt confining layer is encountered at a shallower depth than anticipated and/or prior to encountering groundwater, contingency plans will

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be discussed with the Port of Tacoma (the Port) and Washington State Department of Ecology (Ecology).

The following sections describe the drilling and sampling procedures that will be followed during supplemental investigation activities.

General Drilling Approach

1. Proposed boring locations will be cleared of utilities in accordance with SOP 18.
2. Borings will be advanced using sonic drilling methods. The method advances a core barrel and sampler barrel into the ground without the use of rotary or hollow stem drilling, reducing the potential for cross contamination from carrying down contamination during advancement. MFA will log soils and conduct field screening in accordance with SOPs 02 and 03, respectively.
3. The licensed driller will advance borings using a six (6)-inch outer diameter core barrel until groundwater is encountered. Soils will be screened in the field to evaluate soil conditions and verify presence of groundwater.
4. MFA will collect depth-discrete groundwater samples in higher transmissive water-bearing units with a maximum completion depth of where the silt confining layer is encountered. It is anticipated that up to two samples will be collected at each temporary well from two depth intervals.
5. Groundwater at the Property is anticipated to be as shallow as 7 to 8 ft bgs at each proposed boring location. It is anticipated that up to two depth-discrete groundwater samples will be collected from each temporary well.
6. Well installation will be completed by advancing the core barrel to the depth correlated with the bottom of the well screen. The driller will install a pre-packed temporary monitoring well from one (1)-foot above the water table with two to three feet of well screen to coincide with the top of the water column and soil-water interface. The temporary monitoring well will be installed and the core barrel will be set at the top of the well screen.
7. MFA field staff will measure the water level in the temporary monitoring wells (see SOP 13 in Attachment A), and a minimum of one well volume will be purged. If the well goes dry during purging, a sample can be collected once the boring recharges enough water. During purging, the flow rates, water levels, and water quality parameters will be recorded on the groundwater field sampling data sheet (see Attachment B).
8. Reconnaissance groundwater samples will be collected from the temporary monitoring wells consistent with industry-standard techniques and SOPs 08 and 09 in Attachment A. Samples will be collected using a peristaltic pump and dedicated tubing.
9. Following groundwater sampling, the core barrel will be used to overdrill to the depth of the well screen. The temporary monitoring wells will be removed for permitted disposal and the sampler barrel will be advanced to depth to remove sloughed soils.
10. The core barrel and sampler barrel will be advanced in 5 feet increments and/or at significant hydrostratigraphic units for temporary well installation and discrete groundwater sample collection up to a depth of 15 to 20 ft bgs or to where the silt confining layer is encountered, whichever is shallower. Temporary well installation for each sampling interval will follow the same procedures described above.

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Groundwater Sampling

It is anticipated that MFA will collect up to four (4) groundwater samples from temporary monitoring well locations (TWA-SB-17, TWA-SB-18) using low-flow sampling procedures as described above. This assumes up to two (2) depth discrete groundwater samples collected at two intervals within each boring. If groundwater is encountered at shallower depths than anticipated, additional groundwater interval samples will be collected.

Groundwater monitoring samples will be analyzed for PCE and TCE, and other contaminants including:

- PCE and TCE by EPA Method 8260D,
- Gasoline-range hydrocarbons by Northwest Total Petroleum Hydrocarbons Method Gx,
- Diesel- and oil-range hydrocarbons by Northwest Total Petroleum Hydrocarbons Method Dx,
- Benzene, toluene, ethylbenzene, and xylenes by EPA Method 8260D, and
- Dissolved metals (arsenic, chromium, copper, lead, manganese, mercury, nickel and zinc) by EPA Method 6020B.

Sample fractions for dissolved metals analysis will be field-filtered using an in-line 45-micron filter during sample collection.

Samples will be labeled, preserved, and shipped to Friedman & Bruya, a laboratory accredited by the State of Washington and the National Environmental Laboratory Accreditation under standard chain of custody protocols.

Sample Nomenclature

Groundwater samples will be labeled with a prefix to describe the location identification number, an "GW" to indicate a sample matrix, and the sample depth in ft bgs. The depth interval should be specified as the middle of the sampling interval. The following location identification prefixes will be used:

- SB = temporary boring

For example, a groundwater sample collected from a temporary boring location TWA-SB-17 with a sampling interval from 8 to 10 ft bgs will have the sample nomenclature of TWA-SB-17-GW-9.0.

Equipment Decontamination

Non-disposable sampling equipment and reusable materials that contact the soil will be decontaminated on Property and before and after each sample collection (see SOP 01). Decontamination will consist of the following:

- Tap-water rinse. Visible soil to be removed by scrubbing.
- Non-phosphate detergent wash, consisting of a dilute mixture of Liqui-Nox (or equivalent) and tap water.
- Distilled-water rinse.
- Allow equipment to air dry or dry it with paper towels.

Decontamination fluids will be transferred to drums and managed as described below.

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Investigation-Derived Waste

Investigation-derived waste (IDW) will include soil cuttings, purged groundwater, and decontamination fluids. The IDW will be separated into solids and liquids and will be stored in a designated area on the Property in secure drums.

Each drum will include a label indicating what borings contained within the drum. Additionally, drums will be labeled with their contents (e.g., soil cuttings or purge water), the approximate volume of material, the date of collection, and the origin of the material. The drums will be sealed, secured, and transferred to a designated area on the Property, pending characterization. Analytical data from the soil and groundwater sampling activities may be used to characterize the IDW for disposal. IDW will be profiled, transported, and disposed of at an appropriate facility by an approved contractor. It is anticipated that specialized handling and disposal requirements will be required due to the potential presence of invasive snails.

Schedule and Reporting

Ecology will be provided 48 hours' notice prior to the commencement of fieldwork.

MFA will provide preliminary data deliverables to Ecology upon receipt, which is anticipated to be approximately 10 business days following submittal of data to the analytical laboratory. Following receipt of data, MFA will perform data quality review and validation consistent with DOF's Data Gaps Work Plan (Appendix L, DOF 2020) and EPA and Ecology data validation guidelines (EPA 2020, Ecology 2024).

MFA will prepare a report summarizing the field program and results of analysis, including screening the data against the applicable screening level criteria. All validated data will be uploaded to Ecology's environmental information management system within 30 days of receipt of data and no later than 120 days from the date of sampling.

Attachments

References

Limitations

Figures

Table

A—Standard Operating Procedures

B—Field Sampling Data Sheets

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References

CRETE. 2020. *Soil and Groundwater Data Report, Hylebos Marsh Property—1205 Alexander Avenue and 1300 Taylor Way, Taylor Way and Alexander Avenue Fill Area Site.* CRETE Consulting Inc.: Seattle, WA. March 27.

DOF. 2020. *Final Data Gaps Work Plan, Taylor Way and Alexander Avenue Fill Area Site, Tacoma, Washington.* Dalton, Olmsted & Fuglevand: Seattle, WA. July.

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Ecology. 2024. *Establishing Ecology Guidelines for Verification and Validation of Chemical Data*. Publication 24-03-023. Washington State Department of Ecology. September.

EPA. 2020. *National Functional Guidelines for Organic Superfund Methods Data Review.* EPA 540-R-20-005. U.S. Environmental Protection Agency, Office of Superfund Remediation and Technology Innovation: Washington, DC. November.

MFA. 2024. Audrey Hacket and Meaghan Pollock, LG, Maul Foster & Alongi, Inc. *Hylebos Marsh: Subsurface Investigation.* Letter to Steve Teel, LHG, Cleanup Project Manager/Hydrogeologist, Washington State Department of Ecology, Toxics Cleanup Program, Southwest. October 31.

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Limitations

The services undertaken in completing this technical memorandum were performed consistent with generally accepted professional consulting principles and practices. No other warranty, express or implied, is made. These services were performed consistent with our agreement with our client. This technical memorandum is solely for the use and information of our client unless otherwise noted. Any reliance on this report by a third party is at such party's sole risk.

Opinions and recommendations contained in this technical memorandum apply to conditions existing when services were performed and are intended only for the client, purposes, locations, time frames, and project parameters indicated. We are not responsible for the impacts of any changes in environmental standards, practices, or regulations subsequent to performance of services. We do not warrant the accuracy of information supplied by others, or the use of segregated portions of this technical memorandum.

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Figures

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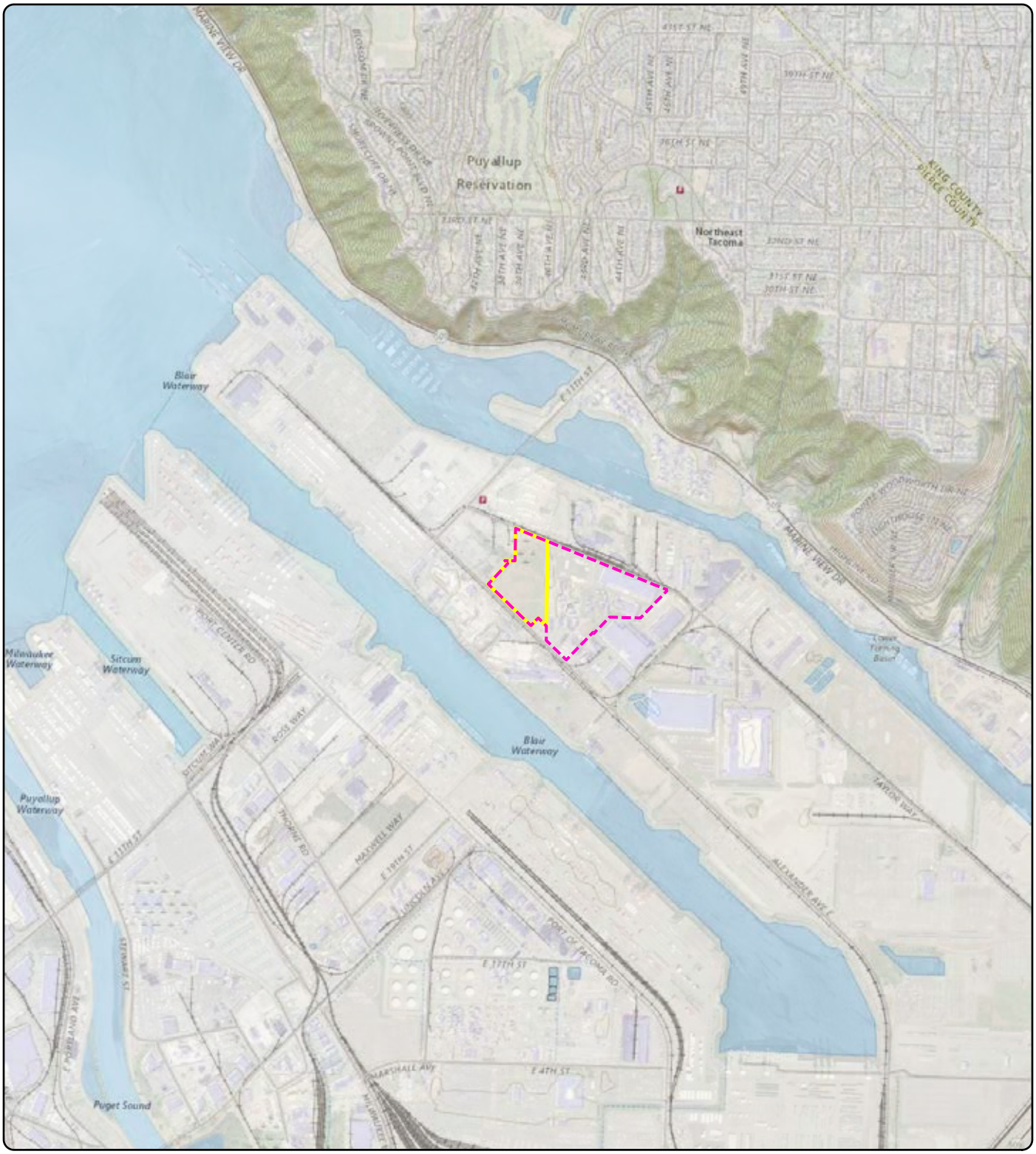

Notes
U.S. Geological Survey (2021) 7.5-minute topographic quadrangle: Tacoma.
Township 21 North, Range 3 East, Section 35.
TWAAFA = Taylor Way and Alexander Avenue Fill Area.

Data Source
Tax parcel obtained from Pierce County; TWAAFA site boundary obtained from Exhibit A of Agreed Order No. DE 14260.

Legend

- TWAAFA Boundary
- Hylebos Marsh Property

Figure 1
Property Location

Hylebos Marsh Property
1205 Alexander Avenue and
1300 Taylor Way
Tacoma, WA

0 1,000 2,000
Feet

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Path: X:\0615.20\10 Pro\M0615_20_010_100.aprx\Fig 1-1 Property Location
Print Date: 6/21/2023
Reviewed By: jlenahansen
Produced By: sturner
Project: M0615.20.010

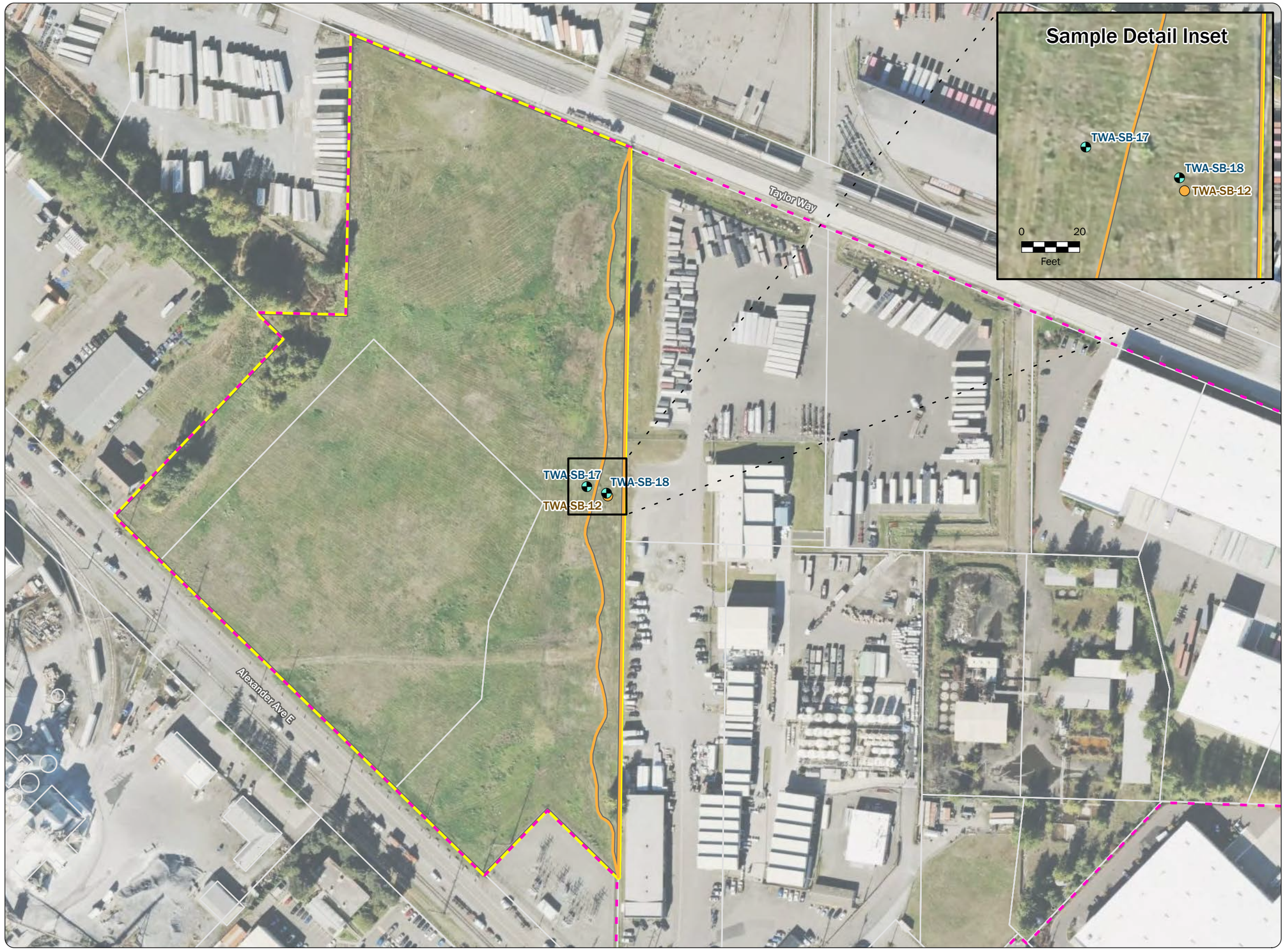

Figure 2
Sampling Plan

Hylebos Marsh Property
1212 Taylor Way
Tacoma, WA

Legend

- Proposed Temporary Monitoring Well
- Soil Boring
- Extent of Sloped Topography
- TWAAFA Site Boundary
- Hylebos Marsh Property
- Parcel

Note
TWAAFA = Taylor Way and Alexander Avenue Fill Area.

0 150
Feet

Data Sources
Parcels obtained from Pierce County; TWAAFA site boundary obtained from Exhibit A of Agreed Order No. DE 14260).

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Path: X:\0615.20\16\Pro\M0615_20_016_Hylebos_Development.aprx\Fig 2 Sampling Plan
Print Date: 2/18/2026
Reviewed By: aclauss
Produced By: joberts
Project: M0615.20.016

Attachment A

Standard Operating Procedures

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Standard Operating Procedure

Decontamination of Field Equipment

SOP Number: 1
Date: 02/24/2025
Revision Number: 0.2

Scope and Application

This standard operating procedure (SOP) describes the decontamination procedure for field equipment that may come in contact with contaminated media and that Maul Foster & Alongi, Inc. (MFA) staff may reuse at multiple sample locations or sites. Decontamination is performed to reduce the potential for cross-contamination of samples that will be collected with multiuse equipment and that will undergo physical or chemical analyses. Other equipment that is multiuse—not used specifically for sample collection (e.g., water level meter, pump used for well development)—also requires decontamination. Finally, decontamination is necessary to minimize the potential for MFA staff's exposure to chemicals.

Typically, decontamination is not necessary for field equipment that is disposable and intended to be used only once (e.g., disposable bailer). Additionally, this SOP does not apply to equipment used by subcontractors, such as drilling equipment. However, MFA staff should confirm that subcontractors are implementing appropriate decontamination procedures to minimize the potential for cross-contamination of samples or MFA staff's exposure to chemicals.

Equipment and Materials Required

The following materials are necessary for this procedure:

- Nonphosphate detergent solution (e.g., Alconox, Liquinox)
- Distilled and potable water
- Personal protective equipment (as specified in the site-specific health and safety plan)
- Buckets to contain rinsate, brushes, paper towels

Depending on the site conditions and the types of contaminants that may be present, the use of other decontamination materials, such as deionized water, methanol, hexane, or isopropyl alcohol, may be necessary. The need for other materials should be determined prior to fieldwork. The decontamination procedures using other materials should be described in a site-specific sampling and analysis plan (SAP).

Methodology

When the site-specific SAP specifies additional or different requirements for decontamination, it takes precedence over this SOP. In the absence of a SAP, the following procedures shall be used.

General Sampling Procedure:

1. Rinse the equipment with potable water to remove visible soil, petroleum sheen, or contamination.

2. Scrub the equipment with a brush and solution of distilled water and nonphosphate detergent.

3. Rinse the equipment with distilled water.

4. Allow equipment to air dry or dry it with clean paper towels.

5. At all times, ensure that the decontaminated equipment is stored so as to prevent it from becoming contaminated while not in use. Depending on the size of the equipment, it can be wrapped with new aluminum foil or placed in a new plastic bag.

Rinsate Storage:

All fluids resulting from equipment decontamination shall initially be contained in a bucket and then transferred to a Department of Transportation-approved container (e.g., 55-gallon drum) stored on site at a location that does not interfere with on-site activities (e.g., vehicle traffic, pedestrian areas). Place a label on each container and include the following information:

- The date on which fluids were placed in the container
- Contents (e.g., “water from equipment decontamination”)
- Contact information, including MFA staff or client phone number

Note that labels on containers exposed to sunlight or precipitation are prone to fading. Use a waterproof, indelible ink pen (e.g., Sharpie®) whenever possible. In the field notebook, keep a detailed inventory of all containers, including the number of containers, the approximate quantity of liquids generated, and a description of the source of the fluids. Provide this information to the MFA project manager. For future reference, take photographs of (1) each drum label, (2) the drum(s), and (3) the drum storage vicinity on site.

Note that some clients and site owners have specific requirements for labeling and storage of containers. The requirements should be determined in advance of the fieldwork.

Standard Operating Procedure

Lithologic Logging

SOP Number: 2
Date: 03/09/2021
Revision Number: 0.1

Scope and Application

This standard operating procedure (SOP) describes the methods for observing and documenting the physical characteristics of unconsolidated geologic materials (soil and sediment) encountered during field investigations. If a Maul Foster & Alongi, Inc. (MFA) project requires hard rock drilling and description of rock core or cuttings, procedures for describing rock should be specified in a project-specific sampling and analysis plan (SAP).

Equipment and Materials Required

The following materials are necessary for this procedure:

- Blank field forms (e.g., boring logs) for documenting observations
- Dry-erase board
- Camera
- Munsell soil color chart (where required)
- MFA field logging checklist

Methodology

When the project-specific SAP specifies additional or different requirements for lithologic logging, it takes precedence over this SOP. In the absence of a SAP, the procedures in this SOP shall be used. MFA uses a combination of the Unified Soil Classification System (USCS) and the ASTM International method D2487 for describing and classifying soil and sediment by visual and manual examination. Before beginning fieldwork, verify with the project manager the logging standard to be used.

Logging Process:

The objective of lithologic logging is to document the physical characteristics of soil and sediment encountered and the changes in characteristics with depth. Typically, changes with depth will define the strata encountered. Therefore, each stratum encountered should be identified and the following characteristics described in the order given:

- Depth interval of each stratum to the nearest tenth of a foot below ground surface
- USCS classification Group Name and Symbol
- Color, using the Munsell color chart
- Grain-size distribution, as percentages of fines (silt and clay combined), sand, and gravel
- Percentages of larger gravels (cobbles and boulders) if present.
- Consistency when the content of fines is 50 percent or greater

- Density when the combined percentage of sand and gravel is 50 percent or greater
- Sand and gravel grain shapes
- Chemical odors, if noticeable
- Structures, if present (e.g., laminae, pores)
- Presence of organic matter (e.g., roots, leaves, twigs, wood fragments)
- Moisture content as “dry,” “moist,” or “wet”
- If possible, a description of the origin of each stratum (e.g., fill, alluvium)

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Standard Operating Procedure

Field Screening for VOCs in Soil

SOP Number: 3
Date: 03/09/2021
Revision Number: 0.1

Scope and Application

This standard operating procedure (SOP) describes the use of a photoionization detector (PID) to field screen soil for evidence of organic vapors. The PID measures the organic vapor concentration in parts per million, is not compound-specific.

Never rely on a stand-alone PID reading to identify organic chemical contamination in soil. Always collect multiple PID readings (e.g., at multiple depths along the length of a soil core), since it is the relative difference in concentration between multiple readings (e.g., a sudden increase in concentration at a certain depth interval) that is the typical indictor of contamination. Additionally, PID readings should always be accompanied by observation of the soil samples for other indictors of contamination, such as soil staining or chemical odors, so that these multiple lines of evidence can be used together to identify potential organic chemical contamination in the field.

Equipment and Materials Required

The following materials are necessary for this procedure:

- Personal protective equipment (as specified in the health and safety plan)
- PID with calibration gas
- Ziploc®-type bags
- Field forms or notebook for documenting PID readings

Methodology

When the project-specific sampling and analysis plan (SAP) specifies additional or different requirements for organic vapor field screening, it takes precedence over this SOP. In the absence of a SAP, the procedures in this SOP shall be used.

The electron volt (eV) rating for the PID lamp (e.g., 9.8, 10.6, 11.7) must be greater than the ionization potential (in eV) of a compound in order for the PID to detect the compound. A lamp of at least 9.8 eV should be used for petroleum hydrocarbons. A lamp of at least 10.6 eV should be used for typical chlorinated alkenes. If the project health and safety plan does not specify the lamp size, verify the compatibility of the lamp size with the anticipated compounds expected to be present in soil prior to the field activities, and confirm with the project manager.

General Sampling Procedure:

Calibration:

- The PID should be calibrated daily (or more frequently, as needed).
- Calibrate the PID according to the manufacturer's instructions.

- Document the calibration activities and results in the field notebook.

Measuring organic vapor content:

- Place a representative volume (generally, a "handful") of freshly exposed soil into a Ziploc-type bag.
- Seal the bag and gently knead the bag to loosen the soil.
- Let the bag set for several minutes to allow organic vapors, if present, to volatilize from the soil into the headspace of the bag.
- Partially open the bag so that the tip of the PID intake tube can be inserted into the bag but is not in contact with the soil, then close the bag seal around the intake tube.
- Record the PID measurement and document results in the field notes or boring log.

Static Sheen Test Procedure and Observations:

Sheen Test Procedure:

- Following the PID screen discussed above, add enough water to cover the soil in the container.
- Observe the water for signs of discoloration/sheen and characterize per the table below.

When static sheen testing is required or when making observations of a water surface the following table presents descriptions to be used (consistent with Department of Ecology Guidance)[1].

No Sheen (NS)	No visible sheen on the water surface
Slight Sheen (SS)	Light, colorless, dull sheen; spread is irregular, not rapid. Natural organic oils or iron bacteria in the soil may produce a slight sheen.
Moderate Sheen (MS)	Pronounced sheen over limited area; probably has some color/iridescence; spread is irregular, may be rapid; sheen does not spread over entire water surface.
Heavy Sheen (HS)	Heavy sheen with pronounced color/iridescence; spread is rapid; the entire water surface is covered with sheen.
Biogenic Film (BF)	False positive results may be generated by the presence of decaying organic matter and iron bacteria, which can produce a rainbow-like sheen similar to an oil sheen. These sheens, unlike oil sheens, can typically be broken up creating platy or blocky fragments when agitated or disturbed. Biogenic films can also be foamy.

[1] Department of Ecology. 2016. Guidance for remediation of petroleum contaminated sites. June.

Standard Operating Procedure

Sonic Drilling

SOP Number: 8
Date: 03/09/2021
Revision Number: 0.1

Scope and Application

This standard operating procedure (SOP) describes the use of a sonic drilling rig to observe subsurface conditions and collect samples of various environmental media (e.g., soil, sediment, groundwater) for laboratory analysis. The sonic drilling method is ideal for sites with excessively gravelly/rocky soils or for drilling in bedrock.

Sonic drilling can be used for a variety of purposes, including:

- Retrieving cores to document subsurface soil, sediment, or bedrock conditions and to obtain samples for physical and/or chemical evaluation
- Collecting reconnaissance groundwater samples from temporary well screens
- Installing permanent monitoring wells

Equipment and Materials Required

The following materials are necessary for this procedure:

- Sonic drill rig and operator provided by a subcontractor to MFA. Ensure that the subcontractor is licensed to perform the drilling work.
- Sampling equipment appropriate for the media to be sampled (e.g., water level meter, pumps, hand tools, and pump tubing).
- Laboratory-supplied sample containers.
- Traffic cones, measuring tape, buckets.
- Department of Transportation (DOT)-approved containers (e.g., 55-gallon drum) for storing excess soil and decontamination water; the drums are typically provided by the drilling subcontractor.
- Boring log form and notebook.
- Equipment decontamination supplies if sampling equipment will be reused between sample locations (see SOP 1 for equipment decontamination procedures).
- Personal protective equipment (as required by the project health and safety plan).

Methodology

When the project-specific sampling and analysis plan (SAP) provides additional or different requirements for sonic drilling, it takes precedence over this SOP. In the absence of a SAP, the procedures in this SOP shall be used.

Utility Locate:

- Before beginning the fieldwork, assess the proposed drilling location(s) for the presence of overhead and underground utilities, and adjust the locations, as needed, to avoid identified utilities.
- See SOP 18 for the utility-locating procedures.

Sonic Drilling Process:

- The sonic drilling rig is equipped with a core barrel that retrieves a continuous soil core. A combination of high-frequency vibration and rotation is used to advance the core barrel into the subsurface.
- The core barrel is typically driven in 10-foot intervals. When each interval depth is reached, the core barrel is removed from the ground and vibrated to extrude the soil core from the core barrel. Plastic bags are placed over the end of the core barrel to collect and store the core in approximately 2-foot-long segments.
- After core retrieval, a temporary steel outer casing is driven to the bottom of the boring to prevent sloughing or collapse of the boring. The core barrel is then inserted into the casing and advanced to the next depth interval. This process is repeated until the targeted depth is reached.
- Ensure that the drilling subcontractor decontaminates all subsurface equipment before and after each boring. Document the decontamination procedures in the field notebook. Store decontamination water in DOT-approved containers for later off-site disposal.

Logging and Soil Sampling Process:

- Open each bagged segment of soil core for field screening, description, and sampling.
- Describe the lithology in accordance with SOP 2.
- Confirm the required depth interval(s) for soil sample collection and field screening with the MFA project manager, or conduct the work in accordance with the SAP. The sample interval may require adjustment based on core recovery, soil stratigraphy and characteristics, and evidence of contamination. Confirm any adjustments to the sample intervals with the project manager.
- If the project requires field screening for organic vapor, conduct it in accordance with SOP 3.
- If the project requires laboratory analyses for gasoline-range petroleum hydrocarbons or volatile organic compounds, conduct the sampling in accordance with SOP 5.
- Contain all soil core remaining after sample collection in DOT-approved containers for later off-site disposal. See SOP 1 for drum storage, labeling, and documentation procedures.

Reconnaissance Groundwater Sampling Process:

- Typically, reconnaissance groundwater samples are collected at the first occurrence of groundwater in a boring. Confirm the required depth and procedures for groundwater sample collection with the MFA project manager, or conduct the work in accordance with the SAP. If the project requires use of the low-flow sampling method, refer to SOP 9 for the low-flow sampling procedures.

- Reconnaissance groundwater samples are collected using a decontaminated stainless steel or disposable polyvinyl chloride temporary well screen placed in the boring. If the soils in the boring are fine-grained and may cause excessive turbidity in groundwater, consider using a filter pack around the screen to reduce turbidity. Alternatively, purging the well screen of groundwater before sample collection may also reduce the turbidity. See SOP 9 for purging procedures.
- Purging and sampling will be conducted using a peristaltic pump unless otherwise specified in the SAP. New tubing will be used for each boring. Field parameters (e.g., temperature, conductivity, and pH) will be recorded in accordance with SOP 9 during purging and sampling.

Monitoring Well Installation:

- If the project requires installation of a monitoring well in the boring, refer to SOP 11 for the well installation procedures. Confirm the procedures with the MFA project manager.
- If potable water was placed into the boring during drilling (e.g., to cool the core barrel), document the total volume of water placed in the boring; this information will be needed for well development (see SOP 12).

Borehole Abandonment Process:

- Abandon each borehole in accordance with local and state regulations/procedures. The abandonment will be performed by the drilling subcontractor.
- The abandonment procedure typically consists of backfilling the boring with granular bentonite and hydrating the bentonite with potable water.
- If the boring was advanced through concrete or asphalt, backfill the boring to about 6 inches below grade to allow for placement of asphalt or concrete in the remaining 6 inches to match the surface conditions.

Standard Operating Procedure

Low-Flow Groundwater Sampling

SOP Number: 9
Date: 07/25/2023
Revision Number: 0.3

Scope and Application

This standard operating procedure (SOP) describes use of the low-flow sampling method for collection of reconnaissance groundwater samples from borings and groundwater samples from monitoring wells. The method uses low pumping rates during purging and sample collection to minimize water-level drawdown and hydraulic stress at the well-aquifer interface.

Equipment and Materials Required

The following materials are necessary for this procedure:

- Personal protective equipment (as specified in the health and safety plan)
- Water quality meter (e.g., Oakton, YSI Inc. multiparameter meter)
- Turbidity meter
- Water-level meter
- Peristaltic pump and tubing
- Laboratory-supplied sample containers
- Laboratory chain-of-custody form and cooler with ice
- Filter if dissolved analyses will be performed
- Well construction logs documenting the screen depth and interval for all wells to be sampled
- Equipment decontamination supplies if sampling equipment will be reused between sample locations (see SOP 1 for equipment decontamination procedures)
- 5-gallon buckets with lids
- Department of Transportation-approved storage containers (e.g., drums, totes)
- Groundwater field sampling datasheet and notebook

Methodology

When the project-specific sampling and analysis plan (SAP) provides additional or different requirements for low-flow groundwater sampling, it takes precedence over this SOP. In the absence of a SAP, the procedures in this SOP shall be used.

General Sampling Procedure:

Water Level Measurement

- Water-level measurement procedures are described in detail in SOP 13.

- Open the well cap to allow the water level to equilibrate (approximately ten minutes).
- Measure the water level in the well, using an electronic water-level meter to the nearest 0.01 foot to determine the depth to groundwater below the top of the well casing.
- If light nonaqueous-phase liquid (LNAPL)is present (typically indicated by a dark, oily sheen on the top of the water level meter), discuss with the MFA project manager how to proceed.

Purging

- If the water level is above the top of the well screen, place the end of the sample tubing in the middle of the well screen interval. If the water level is below the top of the screen, place the end of the sample tubing at the midpoint between the water level and the bottom of the well screen.
- Typical low-flow sampling pumping rates range from 0.1 to 0.5 liters per minute, depending on the hydrogeologic characteristics at the site. The objective of the rate selected is to minimize excessive drawdown (<0.3 feet) of the water level.
- Measure water quality parameters (dissolved oxygen, pH, electrical conductivity, turbidity, and temperature) using a flow-through cell connected to the discharge end of the peristaltic pump tubing. Purging will be considered complete when the water quality parameters stabilize per the following for three consecutive readings taken over 3-minute intervals (consistent with EPA guidance)[1]:

Turbidity (10% for values greater than 5 NTU; if three Turbidity values are less than 5 NTU, consider the values as stabilized),
Dissolved Oxygen (10% for values greater than 0.5 mg/L, if three Dissolved Oxygen values are less than 0.5 mg/L, consider the values as stabilized),
Specific Conductance (3%),
Temperature (3%),
pH (± 0.1 unit),
Oxidation/Reduction Potential (±10 millivolts).

- Document the purge procedures, including pumping rates, water quality parameter measurements, and the water level during purging, on the groundwater field sampling datasheet.
- Place purge water in Department of Transportation-approved containers (e.g., 55-gallon drum) stored on site. See SOP 1 for drum storage, labeling, and documentation procedures.

Sample Collection

- Following the purging process, collect groundwater samples in laboratory-supplied containers.
- Confirm the laboratory analytical methods and sample container requirement with the MFA project manager or project chemist. If analysis for gasoline-range petroleum hydrocarbons or volatile organic compounds (VOCs) is proposed, fill the sample containers for gasoline and VOC analysis before filling sample containers for other analytical methods. Sample containers for gasoline and VOC analysis shall be filled to capacity without overfilling and capped so that no headspace or air bubbles remain in the container.

[1] EPA. 2017. Low stress (low flow) purging and sampling procedure for the collection of groundwater samples from monitoring wells. September 19.

Low Yield (Alternate Method)

- If drawdown of the water table cannot be avoided by reducing the pumping rate, and the well goes dry during purging, discontinue pumping and water quality parameter measurements.
- Collect the groundwater sample after the water level above the well bottom recovers to 90 percent of the prepurge water level. For example, if the water level was 10 feet above the well bottom before purging, begin sampling when the water level has recovered to 9 feet or more above the well bottom.
- If the water column volume is insufficient to meet the sample volume requirement, allow the water level to again recover to 90 percent before continuing sampling. Repeat this procedure until all sample containers are filled.

Standard Operating Procedure

Monitoring Well—Water Elevation

SOP Number: 13
Date: 03/09/2021
Revision Number: 0.1

Scope and Application

This standard operating procedure (SOP) describes the methods for obtaining groundwater level measurements and light nonaqueous-phase liquid (LNAPL) measurements from monitoring wells. Measurement may be collected as an independent event or in conjunction with groundwater sampling or sampling of removed LNAPL.

Equipment and Materials Required

The following materials are necessary for this procedure:

- Personal protective equipment (as specified in the health and safety plan)
- Equipment decontamination supplies if equipment will be reused between well locations (see SOP 1 for equipment decontamination procedures)
- Field notebook
- Water-level meter or oil/water interface probe if water levels and LNAPL levels will be measured
- Bailers or tape/paste to confirm LNAPL detections if required; see SOP 10 for procedures for managing LNAPL when removing LNAPL from a well

Methodology

When the project-specific sampling and analysis plan (SAP) provides additional or different requirements for water-level and LNAPL measurements, it takes precedence over this SOP. In the absence of a SAP, the procedures in this SOP shall be used.

General Sampling Procedure:

Review well construction details and historical groundwater and LNAPL levels and thicknesses if available.

During groundwater sampling events, measurements should be collected before, during, and after purging and sampling. During purging and low-flow sampling, water-level measurements are conducted to ensure that drawdown is not occurring. Low-flow sampling methods are described in SOP 9. The following procedures should be followed when collecting groundwater-level and LNAPL measurements from wells.

Water Level Measurement

1. Test the water-level meter to ensure proper instrument response. This can be accomplished by immersing the probe tip in a small container of water.
2. Open the well cover and cap and allow the water level to equilibrate with atmospheric pressure for several minutes so that a static water level is attained. Audible air movement into or out of

the well upon loosening of the well cap is an indication that the water level is not in equilibrium with atmospheric pressure.

3. Locate the measurement reference point at the top of the well casing. Typically, this is a small notch in the casing or a point marked with a pen. If no measure point is present, measure the water level from the north side of the casing and note the result in the field notebook.
4. Lower the water-level meter probe into the well casing until the probe signal indicates that water has been contacted.
5. Observe the depth-to-water (DTW) reading from the measurement reference point at the top of the well casing to the nearest 0.01 foot. Over the course of about a minute, raise and re-lower the probe and observe the resulting DTW reading. If the reading remains unchanged to within 0.01 foot, this is an indication that the water level has equilibrated with atmospheric pressure; the reading can then be recorded in the field notebook as the static water level reading. If the reading changes, allow more time for the water level to become static.
6. If the work scope or SAP requires measurement of the depth-to-bottom (DTB), lower the probe to the bottom of the well and record the DTB reading from the reference point to the nearest 0.01 foot.
7. Remove the probe and decontaminate the probe and the portion of the probe tape inserted into the well casing.

Water Level and LNAPL Measurement

1. Repeat above steps 1 through 7.
2. Lower the interface probe into the well casing until the probe signal indicates that LNAPL has been contacted. Typically, the interface probe will signal by a repeating beep when LNAPL is present. A steady signal indicates that LNAPL is absent and that the probe is recording the DTW.
3. Observe the LNAPL reading as described in step 5 above until a static reading to the nearest 0.01 foot is achieved, and record the reading in the field notebook.
4. Lower the probe until a steady signal indicates that water has been contacted. Observe the water-level reading as described in step 5 above to confirm a static water level, and record the reading in the field notebook.
5. If LNAPL is detected in a well with no prior history of LNAPL presence, or the LNAPL thickness is greater than in prior observations, verify the presence and thickness using an alternative technique (e.g., bailer, tape, and water/petroleum colorimetric paste). See SOP 10 for procedures for managing LNAPL when removing LNAPL from a well.
6. Remove the interface probe and decontaminate the probe and the portion of the probe tape inserted into the well casing.

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Standard Operating Procedure

Underground Utility Locates

SOP Number: 18
Date: 03/09/2021
Revision Number: 0.1

Scope and Application

This standard operating procedure (SOP) describes the practices for locating underground utilities. Refer to the MFA health and safety plan (HASP) for additional information regarding communication procedures to be followed when an inadvertent utility strike occurs, as well as regarding methods for mitigating hazards during a utility strike.

Equipment and Materials Required

The following materials are necessary for this procedure:

- Personal protective equipment (as specified in the HASP)
- Marking materials (e.g., marking paint, stakes, flags)
- Field documentation materials

Methodology

When the project-specific sampling and analysis plan (SAP) specifies additional or different requirements for underground utility locates, it takes precedence over this SOP. In the absence of a SAP, the procedures in this SOP shall be used.

Before Conducting Utility Locates:

- Ensure that the locate will be conducted reasonably soon before the excavation work begins, e.g., within 48 hours. There may be project-specific conditions, e.g., weather and/or ground features that could cause markings to fade, which would require scheduling of the excavation work sooner than 48 hours after the locate.
- Clearly define the boundary of the work and the locations of all proposed excavations. Prepare a map of the project area showing the excavation locations.
- Interview site managers/property owners and obtain plans or drawings, if available, showing on-site utilities.
- For project work that will not take place in the public right-of-way, ensure that the public rights-of-way nearest to the project are identified and communicated during the one-call notification.
- Identify the township and range of the project area. This information can be easily attained by a quick email to MFA's GIS Exchange.
- If feasible, conduct a site visit to identify site conditions that could cause fading or disruption of marking paint. Such conditions could include gravel or ground sensitive to erosion and high traffic.
- Check the weather forecast to assess the potential for snow or rain to make marking utilities difficult or cause the markings to fade.

One-Call Utility Notification:

- If possible, initiate the one-call utility notification at least one week before the proposed work begins.
- Include a map or GPS coordinates when submitting the notification.
- Before conducting any excavation activities, confirm with each public utility that the utility locate has been completed.
- On remote or complicated sites, consider meeting public locators on site.
- Document the one-call ticket number and results in the project files.
- Provide the one-call ticket number to subcontractors who will be doing the excavations.

Private Utility Locate:

- Conduct the private utility locate only after confirmation that the public utility locate has been completed and all public utilities have been marked and the results reviewed by MFA staff who will be overseeing the excavations.
- Meet the private locator on site and participate in the entire private utility locate. Be engaged in the process, ask questions, and take time to walk the site thoroughly with the locator.
- Bring a copy of the one-call utility ticket and results of the one-call utility locater to check against the utility markings on the ground.
- If possible, have a site/property representative knowledgeable of on-site utilities participate in the private utility locate.
- If paint alone may not suffice to ensure clear marking of utilities, add vertical markers such as stakes or flags.
- Visually assess the area of the proposed excavation(s) to identify features potentially indicative of buried utilities. Have the private utility locator examine each feature identified below to assess the presence of buried utilities.
  - Examine adjacent public rights-of-way where public utilities have been marked for evidence of utilities that may extend onto the project site.
  - Identify nearby light poles, telephone poles, electrical utility poles, or other overhead utility poles with wires or conductors that run from the overhead utility, down the pole, and into the ground.
  - Identify the location of gas meters, water meters, or other aboveground junction boxes for evidence of utilities extending from these features into the ground.
  - Examine asphalt and concrete ground surfaces for discontinuities in the surface indicative of utility installations. Discontinuities may include recent patches of asphalt or concrete inlaid within older concrete or asphalt surfaces.
  - Identify manholes and catch basins indicative of buried storm or sanitary sewer pipes. Open manholes to examine the orientation of associated pipes to assess whether the utilities may be present near proposed excavations.
  - Identify tank ports and vent pipes.

- Identify irrigation systems and associated features such as valve boxes and controllers.
- Identify any other signs indicating the presence of buried utilities.
- Be wary of utility marks that suddenly begin or dead end.

Preparing to Perform Subsurface Activities after a Locate:

- Ensure that the markings are still visible when the work begins.
- Adjust locations, as needed, to avoid identified utilities, or use alternative methods such as nonmechanical excavation means (i.e., manual excavation or air-knifing) to a minimum depth of 5 feet.

Table
APWA UNIFORM COLOR CODE

	WHITE—Proposed Excavation
	PINK—Temporary Survey Markings
	RED—Electric Power Lines, Cables, Conduit and Lighting Cables
	YELLOW—Gas, Oil, Steam, Petroleum or Gaseous Materials
	ORANGE—Communication, Alarm or Signal Lines, Cables or Conduit
	BLUE—Potable Water
	PURPLE—Reclaimed Water, Irrigation and Slurry Lines
	GREEN—Sewers and Drain Lines

Source: Uniform Color Codes, ANSI Standard Z535.1. American Public Works Association. Revised 1999.

Attachment B

Field Sampling Data Sheets

MAUL FOSTER ALONGI

Maul Foster & Alongi, Inc.

Geologic Borehole Log/Well Construction

Project Number	Well Number	Sheet

Project Name
Project Location
Start/End Date
Driller/Equipment
Geologist/Engineer
Sample Method

TOC Elevation (feet)
Surface Elevation (feet)
Northing
Easting
Hole Depth
Outer Hole Diam

Depth (feet, BGS)	Well Details	Sample Data: Interval	Sample Data: Percent Recovery	Sample Data: Collection Method	Sample Data: Number	Sample Data: Name (Type)	Sample Data: Blows/6"	Lithologic Column	Soil Description
1									
2									
3									
4									
5									
6									
7									
8									
9									
10									
11									
12									
13									
14									
15									
16									
17									
18									
19									
20									

NOTES:

GBLWC W:\GINT\GINTW\BLANK_TEST\BLANK_TEST.GPJ 9/11/15

Groundwater Field Sampling Data Sheet

MAUL FOSTER ALONGI

Project Information

Project No.	Client Name	Project Name	Sampling Event	Sampler(s)

Well Information

Location ID	Well Type	Monument Type	Depth Measuring Point	Well Diameter (in)	Screen Interval (ft)	Sample Depth (ft)

Hydrology/Level Measurements

Date	Time	Depth to Bottom (ft)	Depth to Product (ft)	Depth to Water (ft)	Product Thickness (ft)	Water Column (ft)	Well Casing Volume (gal)	
		DTB	*DTP*	*DTW*	*DTW - DTP*	*DTB - DTW*	*(gal/ft x water column)*	*0.75" = 0.023 gal/ft* *1" = 0.041 gal/ft* *1.5" = 0.092 gal/ft* *2" = 0.163 gal/ft* *3" = 0.367 gal/ft* *4" = 0.653 gal/ft* *6" = 1.469 gal/ft* *8" = 2.611 gal/ft*

Water Quality Data

Purge Method		*Purge/Sampling Methods: peristaltic pump, submersible pump, vacuum pump, inertia pump, dedicated pump, disposable bailer, bladder pump, other*						
Purge Start Time		*ideally < 0.3 ft drawdown*	*± 0.1*	*± 3%*	*± 3%*	*± 10% if > 0.5*	*± 10*	*< 5 or ± 10% if > 5*

Time	Cumulative Purge Volume	Flowrate	Water Level	pH	Temperature	Conductivity	Dissolved Oxygen	ORP	Turbidity
	gal	*L/min*	*ft*	*SU*	*degrees C*	*uS/cm*	*mg/L*	*mV*	*NTU*

Last row of water quality data are considered final field parameters unless otherwise noted.

Water Quality Observations *(clarity, tint, odor, sheen, etc.)*

Sample Information

Sampling Method			
Sample Name			
Sample Date		**Sample Time**	
Container Type	**Preservative**	**Filtered (Y/N)**	**No. Containers**
VOA			
Amber glass			
Poly			
		Total No. Containers:	0

General Comments

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Appendix F

Preliminary Design Drawings

MAUL FOSTER ALONGI

PORT OF TACOMA

PARCEL 117 SNAIL ERADICATION

1229 ALEXANDER AVE

TACOMA, WA 98421

PROJECT INFORMATION:

SITE DATA:

ZONING:	PORT MARITIME INDUSTRIAL (PMI)
NEW IMPERVIOUS SURFACE:	695,970 SF (15.97 ACRES)
REPLACED IMPERVIOUS SURFACE:	0 SF (0.00 ACRES)
SCOPE OF WORK:	INSTALL CRUSH SURFACING BASE COURSE (CSBC) THROUGHOUT THE ENTIRE SITE AND ASSOCIATED STORM IMPROVEMENTS. THE PURPOSE IS TO ERADICATE SNAILS ON SITE.
SITE ADDRESS:	1229 E ALEXANDER AVE TAOMCA, WA 98421
PARCEL NUMBERS:	032135-2064 (5.52 ACRES) 032126-3045 (10.16 ACRES)
ESTIMATED EARTHWORK:	
(FOR PERMITTING PURPOSES ONLY)	CUT: 17,900 CY (0 CY EXPORT) FILL: 27,925 CY (10,025 CY IMPORT OF CSTC) TOTAL: 45,825 CY (10,025 CY NET IMPORT)
ESTIMATED CONSTRUCTION COST:	$XX

SURVEY DATA:

SEE NOTES ON SHEET SV1.00

PREPARED FOR:

Port of Tacoma

P.O. BOX 1837 TACOMA, WA 98401 (253)383-5841

CONTACT: ELLY BULEGA

EMIAL: EBULEGA@PORTOFTACOMA.COM

PREPARED BY:

sitts&hill

CIVIL | STRUCTURAL | SURVEY

4815 CENTER STREET | TACOMA, WA. 98409

PHONE: (253) 474-9449 | FAX: (253) 474-0153

http://www.sittshill.com/

CONTACT: DON DAVIS, PROJECT MANAGER

EMAIL: DOND@SITTSHILL.COM

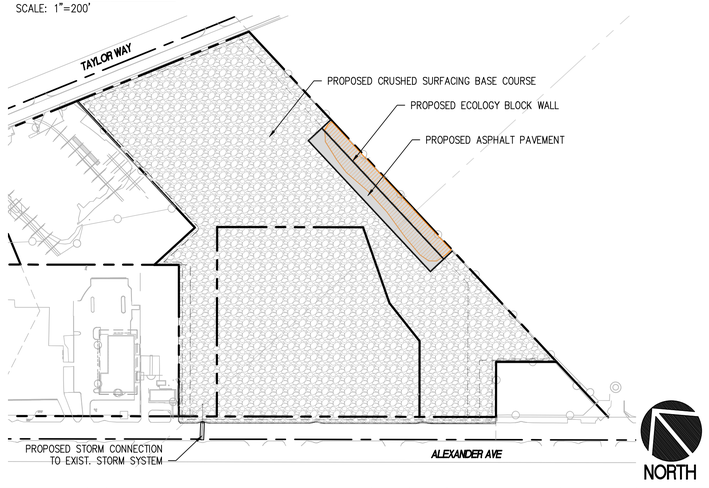
INDEX OF DRAWINGS:

SHEET	DWG NO.	DRAWING TITLE
1 OF 24	T1.00	COVER SHEET
2 OF 24	G1.01	CIVIL LEGEND AND GENERAL NOTES
3 OF 24	G1.02	COT RIGHT OF WAY GENERAL NOTES
4 OF 24	G1.03	CIVIL GENERAL NOTES
5 OF 24	SV1.00	BOUNDARY & TOPOGRAPHIC SURVEY
6 OF 24	SV1.01	BOUNDARY & TOPOGRAPHIC SURVEY
7 OF 24	SV1.02	BOUNDARY & TOPOGRAPHIC SURVEY
8 OF 24	SV1.03	BOUNDARY & TOPOGRAPHIC SURVEY
9 OF 24	SV1.04	BOUNDARY & TOPOGRAPHIC SURVEY
10 OF 24	SV1.05	BOUNDARY & TOPOGRAPHIC SURVEY
11 OF 24	SV1.06	BOUNDARY & TOPOGRAPHIC SURVEY
12 OF 24	SV1.07	BOUNDARY & TOPOGRAPHIC SURVEY
13 OF 24	SV1.08	BOUNDARY & TOPOGRAPHIC SURVEY
14 OF 24	SV1.09	BOUNDARY & TOPOGRAPHIC SURVEY
15 OF 24	SV1.10	BOUNDARY & TOPOGRAPHIC SURVEY
16 OF 24	SV1.11	BOUNDARY & TOPOGRAPHIC SURVEY
17 OF 24	SV1.12	BOUNDARY & TOPOGRAPHIC SURVEY
18 OF 24	C1.00	DEMOLTION AND TESC PLAN
19 OF 24	C2.00	SURFACING AND LAYOUT PLAN
20 OF 24	C3.00	SUBGRADE PLAN
21 OF 24	C3.01	FINAL GRADING AND DRAINAGE PLAN
22 OF 24	C3.02	SITE PROFILES
23 OF 24	C4.00	PROJECT DETAILS
24 OF 24	C4.01	PROJECT DETAILS

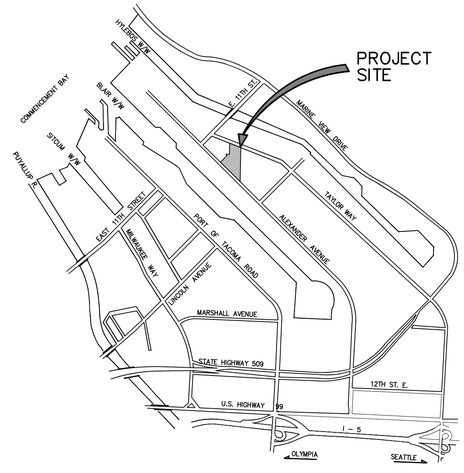
TOPOGRAPHIC SURVEY WILL BE PROVIDED IN A LATER SUBMITTAL.

OVERALL SITE PLAN:

SCALE: 1"=200'



VICINITY MAP:



30% DESIGN REVIEW

PREPARED BY: sitts&hill — CIVIL | STRUCTURAL | SURVEY — 4815 CENTER STREET | TACOMA, WA, 98409 — PHONE: (253) 474-9449 | FAX: (253) 474-0153 — http://www.sittshill.com/

PREPARED FOR: Port of Tacoma — P.O. BOX 1837 TACOMA, WA 98401 (253)383-5841

NO	REVISION	DATE	APPD

FINAL CONSTRUCTION CHECKED BY / DATE / FIELD BOOKS

DATE 11/18/25	SCALE AS NOTED
DESIGNED DCD	CHECKED DCD
DRAWN KNL	FILE NAME T1.00

DONALD C. DAVIS — STATE OF WASHINGTON — 46449 — REGISTERED PROFESSIONAL ENGINEER — PRELIMINARY

CITY OF TACOMA
DEPARTMENT OF PUBLIC WORKS
ENVIRONMENTAL SERVICES SCIENCE & ENGINEERING

PORT OF TACOMA
PARCEL 117 SNAIL ERADICATION
CIVIL COVER SHEET

-- / 20618

SHEET NO. T1.00
SHEET 1 OF 24

GENERAL CIVIL NOTES

1. SEE SURVEY NOTES ON SHEET SV1.00.
2. THE CONTRACTOR IS RESPONSIBLE FOR FIELD VERIFICATION OF ALL EXISTING FEATURES, ELEVATIONS, AND PROPERTY LINES SHOWN. IF DISCREPANCIES OCCUR, THE CONTRACTOR SHALL NOTIFY THE ENGINEER IMMEDIATELY.
3. WHERE CONFLICTS OCCUR BETWEEN EXISTING FEATURES AND THE PLACEMENT OF NEW FACILITIES, THEY SHALL BE BROUGHT TO THE ATTENTION OF THE ENGINEER BY THE CONTRACTOR, AND WILL BE RESOLVED BY THE ENGINEER.
4. THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE PROTECTION OF ALL EXISTING SURVEY MONUMENTS AND OTHER SURVEY MARKERS DURING CONSTRUCTION. ALL SUCH MONUMENTS OR MARKERS DESTROYED DURING CONSTRUCTION SHALL BE REPLACED AT THE CONTRACTOR'S EXPENSE.
5. THE CONTRACTOR FOR THIS PROJECT SHALL MAINTAIN A CLEAN, LEGIBLE SET OF THESE PLANS AND NOTE ALL DEVIATIONS THEREON. UPON COMPLETION OF CONSTRUCTION, THESE DRAWINGS SHALL BE DELIVERED TO THE OWNER FOR THE PREPARATION OF RECORD DRAWINGS. IF REQUIRED BY THE CITY OF TACOMA ENVIRONMENTAL SERVICES, THE ENGINEER SHALL SUBMIT RECORD DRAWINGS TO THE CITY OF TACOMA UPON COMPLETION OF THE PROJECT.
6. THE CONTRACTOR SHALL HAVE A CURRENT COPY OF THE WASHINGTON STATE DEPARTMENT OF TRANSPORTATION (WSDOT) STANDARD PLANS AND SPECIFICATIONS FOR ROAD, BRIDGE AND MUNICIPAL CONSTRUCTION (PUBLICATIONS M21-01 AND M41-10) AT THE JOB SITE AT ALL TIMES DURING CONSTRUCTION.
7. THE CONTRACTOR SHALL PROVIDE ALL NECESSARY EQUIPMENT TO PREVENT UTILITY INTERRUPTION. NOTIFY PORT OF TACOMA ONE WEEK IN ADVANCE OF EACH UTILITY CONNECTION.
8. THE CONTRACTOR SHALL BE RESPONSIBLE FOR ALL TRAFFIC CONTROL ON-SITE AND OFF-SITE SHALL COORDINATE HIS ACTIVITIES WITH THE OWNER AND ENGINEER A MINIMUM OF TWO (2) WEEKS IN ADVANCE OF THE BEGINNING OF WORK. THE CONTRACTOR IS RESPONSIBLE FOR PROVIDING ALL TRAFFIC CONTROL SIGNS. SAFE VEHICULAR AND PEDESTRIAN ACCESS SHALL BE PROVIDED AT ALL TIMES DURING CONSTRUCTION. SHUTDOWN OF OWNER OPERATION OR ACCESS WILL NOT BE PERMITTED.
9. PRIOR TO BIDDING, IT SHALL BE THE CONTRACTORS RESPONSIBILITY TO MAKE ALL NECESSARY SITE INSPECTIONS AND DETERMINATIONS OF ITEMS AND QUANTITIES OF WORK TO ENSURE THAT ALL ITEMS OF WORK NECESSARY TO PERFORM A COMPLETE AN ACCEPTABLE JOB HAVE BEEN TAKEN INTO CONSIDERATION.
10. DEWATERING AND PUMPING MAY BE REQUIRED AND SHALL BE CONSIDERED PART OF THE CONTRACTORS BID PRICE. CONTRACTOR SHALL ASSUME GROUNDWATER WILL BE ENCOUNTERED AT A DEPTH OF 4'-0" BENEATH EXISTING GRADE. CONTRACTOR IS RESPONSIBLE FOR PROVIDING NECESSARY EQUIPMENT AND COORDINATING WITH PORT OF TACOMA FOR DISCHARGE LOCATIONS.

DEMOLITION NOTES

1. REMOVE ALL DELETERIOUS MATERIAL FOUND ON-SITE INCLUDING SCRAP WOOD, TRASH, ETC. AND DISPOSE OF AT AN APPROVED OFF-SITE LOCATION. MATERIALS, SUCH AS VEGETATION AND SOILS, SHALL REMAIN ONSITE AND BE RELOCATED WITHIN PROJECT LIMITS.
2. AT ALL TIMES THE CONTRACTOR SHALL MAINTAIN SIGNS, BARRICADES, FENCING, OR OTHER MEASURES TO ENSURE CONTINUOUS PROTECTION OF THE PUBLIC AND TO PREVENT UNAUTHORIZED ENTRY TO THE CONSTRUCTION AREA. AT A MINIMUM FENCING SHALL BE 6.0 FEET HIGH. COORDINATE SAFETY AND SECURITY MEASURES WITH ADJACENT WORK.
3. DAMAGE TO ANY PROPERTY, INCLUDING BUT NOT LIMITED TO, BUILDINGS, UTILITIES, VEHICLES, FENCING, OR LANDSCAPING AS A RESULT OF CONTRACTORS ACTIVITIES WILL BE REPAIRED OR REPLACED AT THE CONTRACTORS EXPENSE.
4. THE CONTRACTOR IS FINANCIALLY RESPONSIBLE FOR THE MAINTENANCE AND REPAIR OF OFF-SITE AND ON-SITE PAVED SURFACES WHERE DAMAGE HAS BEEN SUSTAINED BECAUSE OF CONSTRUCTION TRAFFIC.
5. ALL CONCRETE, PAVEMENT, CURBS, SIDEWALKS AND RAMPS INDICATED TO BE REMOVED OR REPLACED SHALL BE REMOVED TO THE NEAREST EXPANSION JOINT AS IDENTIFIED DURING CONSTRUCTION. WHERE THIS IS NOT POSSIBLE DUE TO CONFLICTS OR ADJACENT DAMAGED CONCRETE / ASPHALT, THE CONTRACTOR SHALL MAKE A FULL PAVEMENT DEPTH SAWCUT AT THE PROPOSED JOINT IN SOUND PAVEMENT. PROPOSED CONCRETE / ASPHALT SHALL EXTEND TO THE SAWCUT EDGE AND BE APPROPRIATELY JOINED / SEALED. THE CONTRACTOR SHALL MAKE SAWCUTS AT EXISTING CONTRACTION JOINTS WHERE POSSIBLE.
6. TO THE MAXIMUM EXTENT POSSIBLE, THE CONTRACTOR SHALL SALVAGE AND RETURN TO OWNER ALL CATCH BASIN FRAMES, GRATES, COVERS, MANHOLE LIDS AND ANY OTHER EXISTING METAL WORKS IN PAVEMENTS DESIGNATED FOR REMOVAL / REPLACEMENT. COORDINATE STORAGE LOCATION WITH OWNER.

DEMOLITION DEFINITIONS

DEMOLISH:	CAREFULLY REMOVE EXISTING ITEM AS INDICATED AND LEGALLY DISPOSE OF SAME OFF-SITE.
REUSE:	CAREFULLY REMOVE EXISTING ITEM/FEATURE, INTACT, AS INDICATED. TEMPORARILY STORE (IF NECESSARY) AND PROTECT FOR REINSTALLATION, INTACT, AS INDICATED.
SALVAGE:	CAREFULLY REMOVE EXISTING ITEM/FEATURE, INTACT, AS INDICATED. DELIVER ITEM/FEATURE TO OWNER, AS INSTRUCTED.
PROTECT:	LEAVE EXISTING ITEM/FEATURE INTACT, AS INDICATED, AND PROTECT FROM DAMAGE. THIS ACTION SHOULD BE ASSUMED FOR ALL ITEMS/FEATURES ON-SITE NOT SPECIFICALLY IDENTIFIED FOR DEMOLITION.

STANDARD TESC NOTES (2021 CITY OF TACOMA SWMM)

1. THE IMPLEMENTATION OF THESE TESC PLANS AND THE CONSTRUCTION, MAINTENANCE, REPLACEMENT, AND UPGRADING OF TESC FACILITIES IS THE RESPONSIBILITY OF THE APPLICANT/CONTRACTOR UNTIL ALL CONSTRUCTION IS COMPLETED AND APPROVED, VEGETATION/LANDSCAPING IS ESTABLISHED AND THE ENTIRE SITE IS STABILIZED.
2. 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 MARKING SHALL BE MAINTAINED BY THE APPLICANT/CONTRACTOR FOR THE DURATION OF CONSTRUCTION.
3. THE TESC FACILITIES SHOWN ON THIS PLAN SHALL BE CONSTRUCTED PRIOR TO AND/OR IN CONJUNCTION WITH ALL CLEARING AND GRADING ACTIVITIES, AND IN SUCH A MANNER AS TO ENSURE THAT SEDIMENT AND SEDIMENT LADEN WATER DO NOT ENTER THE DRAINAGE SYSTEM OR ROADWAYS, OR VIOLATE APPLICABLE WATER STANDARDS.
4. THE TESC FACILITIES SHOWN ON THIS PLAN ARE THE MINIMUM REQUIREMENTS FOR ANTICIPATED SITE CONDITIONS. DURING THE CONSTRUCTION PERIOD, TESC FACILITIES SHALL BE UPGRADED AS NEEDED FOR UNEXPECTED STORM EVENTS AND TO ENSURE THAT SEDIMENT AND SEDIMENT-LADEN WATER DO NOT LEAVE THE SITE.
5. THE CESCL, CPESC, OR ESC LEAD SHALL BE IDENTIFIED IN THE SWPPP AND SHALL BE ONSITE OR ON-CALL AT ALL TIMES.
6. THE CESCL, CPESC, OR ESC LEAD MUST BE KNOWLEDGEABLE IN THE PRINCIPLES AND PRACTICES OF EROSION AND SEDIMENT CONTROL AND HAVE THE SKILLS TO ASSESS:
   A. SITE CONDITIONS AND CONSTRUCTION ACTIVITIES THAT COULD IMPACT THE QUALITY OF STORMWATER.
   B. EFFECTIVENESS OF EROSION AND SEDIMENT CONTROL MEASURES USED TO CONTROL THE QUALITY OF STORMWATER DISCHARGES.
7. THE CESCL, CPESC, OR ESC LEAD MUST EXAMINE STORMWATER VISUALLY FOR THE PRESENCE OF SUSPENDED SEDIMENT, TURBIDITY, DISCOLORATION, AND OIL SHEEN AND EVALUATE THE EFFECTIVENESS OF BMPS TO DETERMINE IF IT IS NECESSARY TO INSTALL, MAINTAIN, OR REPAIR BMPS.
8. THE CESCL, CPESC, OR ESC LEAD MUST INSPECT ALL AREAS DISTURBED BY CONSTRUCTION ACTIVITIES, ALL BMPS, AND ALL STORMWATER DISCHARGE POINTS AT LEAST ONCE EVERY CALENDAR WEEK AND WITHIN 24 HOURS OF ANY DISCHARGE FROM THE SITE. (INDIVIDUAL DISCHARGE EVENTS THAT LAST MORE THAN ONE DAY DO NOT REQUIRE DAILY INSPECTIONS). THE CESCL OR INSPECTOR MAY REDUCE THE INSPECTION FREQUENCY FOR TEMPORARY STABILIZED, INACTIVE SITES TO ONCE EVERY CALENDAR MONTH.
9. CONSTRUCTION SITE OPERATORS MUST CORRECT ANY PROBLEMS IDENTIFIED BY THE CESCL, CPESC, OR ESC LEAD BY:
   A. REVIEWING THE SWPPP FOR COMPLIANCE WITH THE 13 CONSTRUCTION SWPPP ELEMENTS AND MAKING APPROPRIATE REVISIONS WITHIN 7 DAYS OF THE INSPECTION.
   B. FULLY IMPLEMENT AND MAINTAIN APPROPRIATE SOURCE CONTROL AND/OR TREATMENT BMPS AS SOON AS POSSIBLE BUT CORRECTING THE PROBLEM WITHIN 10 DAYS.
   C. DOCUMENTING BMP IMPLEMENTATION AND MAINTENANCE IN THE SITE LOG BOOK. (REQUIRED FOR SITES LARGER THAN 1 ACRE BUT RECOMMENDED FOR ALL SITES).

   SAMPLING AND ANALYSIS OF THE STORMWATER DISCHARGES FROM A CONSTRUCTION SITE MAY BE NECESSARY ON A CASE-BY-CASE BASIS TO ENSURE COMPLIANCE WITH STANDARDS. ECOLOGY OR THE CITY WILL ESTABLISH THESE MONITORING AND ASSOCIATED REPORTING REQUIREMENTS.
10. AT NO TIME SHALL MORE THAN ONE FOOT OF SEDIMENT BE ALLOWED TO ACCUMULATE WITHIN A CATCH BASIN SEDIMENT TRAP.
11. ALL CATCH BASINS AND CONVEYANCE LINES SHALL BE CLEANED PRIOR TO PAVING. THE CLEANING OPERATION SHALL NOT FLUSH SEDIMENT-LADEN WATER INTO THE DOWNSTREAM SYSTEM.
12. STABILIZED CONSTRUCTION ENTRANCES SHALL BE INSTALLED AT THE BEGINNING OF CONSTRUCTION AND MAINTAINED FOR THE DURATION OF THE PROJECT. ADDITIONAL MEASURES MAY BE REQUIRED TO ENSURE THAT ALL PAVED AREAS ARE KEPT CLEAN FOR THE DURATION OF THE PROJECT.

CB PROTECTION NOTES

1. CATCH BASIN INSERTS SHALL BE PROVIDED IN THE CATCH BASINS NOTED ON THE PLANS.
2. AT ALL PROPOSED CATCH BASINS, CATCH BASIN PROTECTION SHALL BE INSTALLED IMMEDIATELY UPON CATCH BASIN INSTALLATION AND SHALL REMAIN UNTIL FINAL SITE STABILIZATION.
3. CATCH BASIN INSERT SHALL BE STREAMGUARD SEDIMENT CATCH BASIN INSERT #3003, ULTRA-DRAIN GUARD #9217, OR APPROVED EQUAL.
4. CATCH BASIN INSERTS SHALL BE INSTALLED IN ACCORDANCE WITH MANUFACTURER'S RECOMMENDATIONS, AND MAINTAINED TO OPERATE PROPERLY.
5. CATCH BASIN INSERTS SHALL BE REMOVED FOLLOWING COMPLETION OF CONSTRUCTION AND STABILIZATION OF ALL CLEARED AREAS.

SILT FENCE NOTES (AS REQUIRED)

1. FILTER FABRIC SHALL BE PURCHASED IN A CONTINUOUS ROLL AND CUT TO THE LENGTH OF THE BARRIER TO AVOID USE OF JOINTS. WHEN JOINTS ARE NECESSARY, FILTER CLOTH SHALL BE SPLICED TOGETHER ONLY AT A SUPPORT POST, WITH A MINIMUM 6-INCH OVERLAP, AND SECURELY FASTENED AT BOTH ENDS TO POSTS.
2. POSTS SHALL BE SPACED A MAXIMUM OF 6 FEET APART AND DRIVEN SECURELY INTO THE GROUND (MINIMUM OF 30 INCHES).
3. A TRENCH SHALL BE EXCAVATED APPROXIMATELY 8 INCHES WIDE AND 12 INCHES DEEP ALONG THE LINE OF POSTS AND UPSLOPE FROM THE BARRIER. THIS TRENCH SHALL BE BACKFILLED WITH WASHED GRAVEL.
4. WHEN STANDARD STRENGTH FILTER FABRIC IS USED, A WIRE MESH SUPPORT FENCE SHALL BE FASTENED SECURELY TO THE UPSLOPE SIDE OF THE POSTS USING HEAVY-DUTY WIRE STAPLES AT LEAST 1 INCH LONG, TIE WIRES OR HOG RINGS. THE WIRE SHALL EXTEND INTO THE TRENCH A MINIMUM OF 4 INCHES AND SHALL NOT EXTEND MORE THAN 24 INCHES ABOVE THE ORIGINAL GROUND SURFACE.
5. THE STANDARD STRENGTH FILTER FABRIC SHALL BE STAPLED OR WIRED TO THE FENCE, AND 20 INCHES OF THE FABRIC SHALL BE EXTENDED INTO THE TRENCH. THE FABRIC SHALL NOT EXTEND MORE THAN 24 INCHES ABOVE THE ORIGINAL SURFACE. FILTER FABRIC SHALL NOT BE STAPLED TO EXISTING TREES.
6. WHEN EXTRA-STRENGTH FILTER FABRIC AND CLOSER POST SPACING IS USED, THE WIRE MESH SUPPORT FENCE MAY BE ELIMINATED. IN SUCH CASE, THE FILTER FABRIC IS STAPLED OR WIRED DIRECTLY TO THE POSTS WITH ALL OTHER PROVISION OF ABOVE NOTES APPLYING.
7. FILTER FABRIC FENCES SHALL NOT BE REMOVED BEFORE THE UPSLOPE AREA HAS BEEN PERMANENTLY STABILIZED.
8. FILTER FABRIC FENCES SHALL BE INSPECTED IMMEDIATELY AFTER EACH RAINFALL AND AT LEAST DAILY DURING PROLONGED RAINFALL. ANY REQUIRED REPAIRS SHALL BE MADE IMMEDIATELY.
9. SILT FENCES WILL BE INSTALLED PARALLEL TO ANY SLOPE CONTOURS.
10. CONTRIBUTING LENGTH TO FENCE WILL NOT BE GREATER THAN 100 FEET.
11. DO NOT INSTALL BELOW AN OUTLET PIPE OR WEIR.
12. INSTALL DOWNSLOPE OF EXPOSED AREAS.
13. DO NOT DRIVE OVER OR FILL OVER SILT FENCES.
14. PLACE 1' OF 3/4" - 1-1/2" WASHED ROCK OR PEA-GRAVEL ON BOTH SIDES OF FENCE TO CREATE A BEVEL SHAPE.
15. FABRIC SHALL COVER BOTTOM OF 6"x6" TRENCH AND EXTEND BEYOND THE LIMITS OF THE GRAVEL IN ORDER TO MAINTAIN AN EXCESS OVERLAP OF 2" MINIMUM AS SHOWN IN TYPICAL CROSS-SECTION.

STOCKPILE NOTES

1. STOCKPILES SHALL BE STABILIZED (WITH PLASTIC COVERING OR OTHER APPROVED DEVICE) DAILY BETWEEN NOVEMBER 1 AND MARCH 31.
2. IN ANY SEASON, SEDIMENT LEACHING FROM STOCK PILES MUST BE PREVENTED.
3. TOPSOILS SHALL NOT BE PLACED WHILE IN A FROZEN OR MUDDY CONDITION OR WHEN THE SUBGRADE IS EXCESSIVELY WET OR WHEN CONDITIONS EXIST THAT MAY OTHERWISE BE DETRIMENTAL TO PROPER GRADING OR PROPOSED SODDING OR SEEDING.
4. PREVIOUSLY ESTABLISHED GRADES ON THE AREAS TO BE TOPSOILED SHALL BE MAINTAINED ACCORDING TO THE APPROVED PLAN.

PLASTIC COVERING NOTES

1. PLASTIC SHEETING SHALL HAVE A MINIMUM THICKNESS OF 6 MILS AND SHALL MEET THE REQUIREMENTS OF WSDOT STANDARD SPECIFICATIONS SECTION 9-14.5(3).
2. COVERING SHALL BE INSTALLED AND MAINTAINED TIGHTLY IN PLACE BY USING SANDBAGS OR TIRES ON ROPES WITH A MAXIMUM 10-FOOT GRID SPACING IN ALL DIRECTIONS. ALL SEAMS SHALL BE TAPED OR WEIGHTED DOWN FULL LENGTH AND THERE SHALL BE AT LEAST A 12-INCH OVERLAP OF ALL SEAMS.
3. CLEAR PLASTIC COVERING SHALL BE INSTALLED IMMEDIATELY ON AREAS SEEDED BETWEEN NOVEMBER 1 AND MARCH 31 AND REMAIN UNTIL VEGETATION IS FIRMLY ESTABLISHED.
4. WHEN THE COVERING IS USED ON UN-SEEDED SLOPES, IT SHALL BE KEPT IN PLACE UNTIL THE NEXT SEEDING PERIOD.
5. PLASTIC COVERING SHEETS SHALL BE BURIED TWO FEET AT THE TOP OF SLOPES IN ORDER TO PREVENT SURFACE WATER FLOW BENEATH SHEETS.
6. PROPER MAINTENANCE INCLUDES REGULAR CHECKS FOR RIPS AND DISLODGED ENDS.

WATTLE NOTES (AS REQUIRED)

1. WATTLES SHALL BE IN ACCORDANCE WITH WSDOT STANDARD SPECIFICATION 9-14.5(5). INSTALL WATTLES ALONG CONTOURS. INSTALLATION SHALL BE IN ACCORDANCE WITH WSDOT STANDARD SPECIFICATION 8-01.3(10).
2. SECURELY KNOT EACH END OF WATTLE, ABUT ADJACENT WATTLES TIGHTLY, END TO END, WITHOUT OVERLAPPING THE ENDS.
3. PILOT HOLES MAY BE DRIVEN THROUGH THE WATTLES AND INTO THE SOIL WHEN CONDITIONS REQUIRE.
4. WATTLES SHALL BE INSPECTED REGULARLY, AND IMMEDIATELY AFTER A RAINFALL PRODUCES RUNOFF, TO ENSURE THEY REMAIN THOROUGHLY ENTRENCHED AND IN CONTACT WITH THE SOIL.
5. PERFORM MAINTENANCE IN ACCORDANCE WITH WSDOT STANDARD SPECIFICATION 8-01.3(15).
6. STRAW WATTLES MAY BE LAID DIRECTLY UPON PAVED AREAS DOWNHILL OF PAVED TEMPORARY EXCAVATIONS AND DISTURBED AREAS. STABILIZE WATTLES BY INSTALLING SANDBAGS OVER THE WATTLE AT EVERY 6 LINEAL FEET.

CIVIL CONSTRUCTION SEQUENCE

WORK ITEMS BELOW SHALL BE PERFORMED WITHIN THE IDENTIFIED PROJECT WORK LIMITS. THE CONTRACTOR SHALL BE RESPONSIBLE TO COORDINATE, SCHEDULE, AND SEQUENCE WORK. ON-SITE CONSTRUCTION EFFORTS SHALL BE CLOSELY COORDINATED WITH OFF-SITE IMPROVEMENTS.

1. PRIOR TO STARTING ANY WORK, ARRANGE & ATTEND PRE-CONSTRUCTION CONFERENCE WITH THE CITY OF TACOMA, AN ESC SUPERVISOR WILL BE DESIGNATED AT THE MEETING.
2. POST A SIGN W/THE NAME AND PHONE NUMBER OF THE ESC SUPERVISOR.
3. FLAG OR OTHERWISE DELINEATE ALL CLEARING AND CONSTRUCTION LIMITS AS SHOWN ON THE PLANS.
4. INSTALL EROSION AND SEDIMENTATION CONTROL MEASURES AS IDENTIFIED ON THE APPROVED EROSION CONTROL PLANS AND CITY OF TACOMA REQUIREMENTS.
5. DEMOLISH/REMOVE EXISTING FEATURES IN ACCORDANCE WITH APPROVED EROSION CONTROL/DEMOLITION PLANS AND CITY OF TACOMA REQUIREMENTS.
6. CONTRACTOR SHALL DETERMINE WATER TABLE ELEVATION PRIOR TO EXCAVATION. IF WATER TABLE IS WITHIN PROPOSED EXCAVATION LIMITS, DEWATERING EFFORTS SHALL BE IN PLACE PRIOR TO GRADING. SEE PROJECT NOTES ON G1.03 FOR MORE INFORMATION ON DEWATERING.
7. BEGIN EXCAVATION AND MASS GRADING TO ESTABLISH SUBGRADE OF PROPOSED IMPROVEMENTS.
8. INSTALL ECOLOGY BLOCK WALL AROUND THE BOUNDARIES OF THE IDENTIFIED AUTOFLUFF CONTAMINATION AND STORMWATER UTILITIES.
9. COMPLETE SUBGRADE PREPARATION AND IMPORT CRUSHED SURFACING TOP COURSE.
10. INSTALL ASPHALT PAVEMENT.
11. MAINTAIN EROSION CONTROL MEASURES IN ACCORDANCE WITH CITY OF TACOMA SURFACE WATER DESIGN MANUAL AND MANUFACTURER'S RECOMMENDATIONS.
12. COVER ALL AREAS THAT WILL BE UNWORKED FOR MORE THAN SEVEN DAYS DURING THE DRY SEASON OR TWO DAYS DURING THE WET SEASON WITH PLASTIC SHEETING OR EQUIVALENT.
13. REMOVE EROSION CONTROL AND POLLUTION PREVENTION MEASURES UPON APPROVAL FROM CITY INSPECTOR.
14. CLEANUP PROJECT SITE. CLEAN ALL CATCH BASINS AND PIPING WITH VACTOR TRUCK. PROVIDE INVOICE TO ENGINEER UPON COMPLETION.
15. REMOVE EROSION CONTROL, AND POLLUTION PREVENTION MEASURES UPON APPROVAL FROM CITY INSPECTOR.

LEGEND

EXISTING FEATURES-

- FOUND MONUMENT AS NOTED
- SANITARY SEWER MANHOLE
- SANITARY SEWER CLEANOUT
- STORM CATCH BASIN
- STORM MANHOLE
- ROOF DRAIN
- STORM CULVERT
- WATER VAULT
- WATER METER
- WATER VALVE
- IRRIGATION CONTROL VALVE
- WATER BLOW OFF VALVE
- FIRE HYDRANT
- FIRE DEPARTMENT CONNECTION
- POST INDICATOR VALVE
- WATER MANHOLE
- MONITORING WELL
- GUY ANCHOR
- UTILITY POLE
- TRANSMISSION LINE POWER POLE
- LIGHT POLE
- POWER VAULT
- JUNCTION BOX
- ELECTRIC METER OR PANEL
- POWER MANHOLE
- TRANSFORMER
- TELEPHONE VAULT
- TELEPHONE RISER
- GAS VALVE
- GAS METER
- UTILITY VAULT
- SIGN
- GATE POST
- BOLLARD
- MAIL BOX
- RAILROAD SWITCH
- COLUMN
- CLEANOUT

- ASPHALT SURFACE
- CONCRETE SURFACE
- GRAVEL SURFACE
- BOUNDARY LINE
- RIGHT OF WAY LINE
- EASEMENT LINE
- QUARTER SECTION LINE
- BURIED STORM LINE (SD)
- BURIED SANITARY SEWER LINE (SS)
- BURIED WATER LINE (W)
- BURIED TELECOMMUNICATIONS LINE (TEL)
- BURIED NATURAL GAS LINE (GAS)
- BURIED PETROLEUM/OIL LINE (FL)
- BURIED POWER LINE (BP)
- RECORD CABLE LINE (TV)
- RECORD STORM LINE (SD)
- RECORD SANITARY SEWER LINE (SS)
- RECORD WATER LINE (W)
- DITCH CENTERLINE
- OVERHEAD UTILITY LINE (OHP)
- GUARD RAIL
- RAILROAD TRACK
- CHAIN LINK FENCE
- BARBED WIRE FENCE
- EDGE OF VEGETATION/LANDSCAPING
- 12"FIR EVERGREEN TREE
- 12"MAPLE DECIDUOUS TREE

PROPOSED FEATURES-

- 12 CONTOUR W/ ELEVATION
- SD STORM DRAIN PIPE
- GRADE BREAK
- FLOW LINE
- TYPE 1 CATCH BASIN
- TYPE 2 CATCH BASIN
- TC TOP OF CONCRETE/CURB
- BC BOTTOM OF CONCRETE/CURB
- F/C FACE OF CONCRETE/CURB
- TP TOP OF PAVEMENT
- S SCOPE
- FL FLOWLINE
- 2% SLOPE ARROW
- 12.85 SPOT ELEVATION

- CATCH BASIN PROTECTION
- SILT FENCE
- DEMOLITION
- SAWCUT LINE
- PROJECT LIMITS
- STOCKPILE AREA
- ASPHALT PAVEMENT
- RAIL ROAD BALLAST
- BOLLARD
- SIGN

30% DESIGN REVIEW

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NO	REVISION	DATE	APPD

FINAL CONSTRUCTION CHECKED BY / DATE / FIELD BOOKS

DATE 11/18/25 | SCALE AS NOTED
DESIGNED DCD | CHECKED DCD
DRAWN KNL | FILE NAME G1.01

DONALD C. DAVIS — STATE OF WASHINGTON — 16440 — REGISTERED PROFESSIONAL ENGINEER — PRELIMINARY

CITY OF TACOMA
DEPARTMENT OF PUBLIC WORKS
ENVIRONMENTAL SERVICES SCIENCE & ENGINEERING

PORT OF TACOMA
PARCEL 117 SNAIL ERADICATION
CIVIL LEGEND AND GENERAL NOTES

-- | 20618 | SHEET NO. G1.01 | SHEET 2 OF 24

CITY OF TACOMA RIGHT OF WAY GENERAL NOTES

GENERAL

A.The following special provisions are to be used in conjunction with the City of Tacoma Special Provisions, City of Tacoma Standard Plans and City of Tacoma Right-of-Way Design Manual, " 2022 Standard Specifications for Road, Bridge and Municipal Construction" and "Standard Plans for Road, Bridge and Municipal Construction" as prepared by the Washington State Department of Transportation (WSDOT).
B.Any inconsistency between these work order drawings and the 2022 Standard Specifications or the WSDOT Standard Plans shall be resolved by the following order of precedence (e.g., 1 presiding over 2, 3, and so forth):

1. Approved Work Order Drawings
2. City of Tacoma Special Provisions, including APWA General Special Provisions, as applicable
3. City of Tacoma Right-of-Way Design Manual
4. Amendments to WSDOT Standard Specifications
5. 2020 WSDOT Standard Specifications
6. City of Tacoma Standard Plans
7. WSDOT Standard Plans

C.Any revisions to these plans must be submitted as a Field Revision through Planning Development Services, reviewed and approved by the City of Tacoma prior to any implementation in the field.
D.Contractors shall familiarize themselves with the site and shall bring any discrepancies to the attention of the Engineer of Record prior to undertaking the affected work.
E.Any discrepancy in these drawings, specifications, these notes, and the site conditions shall be reported to the Engineer of Record, who shall correct such discrepancy in writing after reviewing any changes. Any work done by the Contractor after the discovery of such discrepancy shall be done at the Contractor's risk. The Contractor shall verify and coordinate the dimensions among all drawings with their field survey and measurements prior to proceeding with any work.
F.A pre-construction meeting, if required shall be held between the City of Tacoma, the applicant, contractor, and City inspectors prior to issuance of a Work Order permit.
G.No traffic shall be allowed on any newly placed pavement without the approval of the City Inspector.
H.Cold Weather Concrete Work. The following requirements for placing concrete shall be in effect from November 1 to April 1:

1. The Inspector shall be notified at least 24 hours prior to any concrete placement.
2. Weather permitting, all concrete placement shall be completed no later than 2:00 p.m. each day.
3. Where forms have been placed and the subgrade has been subjected to severe frost, no concrete shall be placed until the ground is completely thawed.

At that time, the forms shall be adjusted and subgrade repaired as determined by the Engineer.

ADDITIONAL PERMITS

A.Separate site development and building permits are required for on-site work including all retaining walls, grading, and erosion control. Adherence to all conditions of these permits is required as a part of this plan.
B.Separate right-of-way construction permits are required for sidewalk installation, as well as, curb and gutter removal and driveway construction when constructed under a site development permit and not a work order.
C.Separate storm and sanitary sewer connection permits are required for each individual connections to the stormwater or wastewater systems and/or each individual treatment device, whichever total is greater. These are over the counter permits.
D.New franchise site services require separate right-of-way utility permits to serve the site. Final restoration shall be coordinated by the project.

SAFETY/EXCAVATION

A.The existing underground utilities shown hereon are based upon available existing record drawings and are not guaranteed to be accurate, nor all-inclusive.
B. All utilities must be verified prior to construction. If the project requires any excavation, the developer/contractor is required to call the Utility Underground Location Center at (800) 424-5555 at least two business days before starting such excavation in accordance with RCW 19.122.
C.It shall be the Contractor's responsibility to protect, in place, all utilities and/or structures whether shown or not shown on this plan. Damage due to the Contractor's operations shall be repaired at the Contractor's expense. A preliminary walk through with photos shared with the inspector prior to the start of work is advised.
D.If workers enter any trench or other excavation four feet or more in depth that does not meet the open pit requirements of Section 2-09.3(3)B, it shall be shored and cribbed. All trench safety systems shall meet the requirements of the Washington Industrial Safety and Health Act, Chapter 49.17 RCW. The Contractor alone shall be responsible for all worker safety, and neither the City of Tacoma nor the Engineer of Record assumes any responsibility.

PAVEMENT PREPARATION / RESTORATION

A. Additional removal and replacement of pavement may be required to provide proper transition/crown as directed by the City of Tacoma Inspector in the field. Final restoration limits shall be determined in the field by the City of Tacoma Inspector.
B. The street sections shown on this plan are designed to be placed upon a firm and unyielding base.
C. Subgrade compaction shall be tested by a testing professional prior to placing base material.
D.Pavement Preparation shall meet all applicable requirements of City of Tacoma Right-of-Way Design Manual Chapter 4 Sections 5.4 and 5.5.
E. Mix design shall be based on Standard Plan PD-01-Pavement Design Standards and PD-02 Pavement Design Worksheet.
F.Pavement restoration shall be constructed in accordance with the City of Tacoma Restoration Policy and applicable Standard Plans.
G. Unsuitable material to be removed and replaced.
H.All permanent traffic channelization, such as but not limited to legends, raised pavement markings, paint, and signage, shall be restored to current Tacoma Standards. Temporary striping shall be maintained as indicated on the plans or as directed by the City of Tacoma Inspector.

HOT MIX ASPHALT

A. All standard hot mix asphalt shall be compacted to a minimum of 92 percent of the maximum density as determined by AASHTO T209. All standard hot mix asphalt utilized shall be considered compactable. The level of compaction attained will be determined as the average of not less than 5 nuclear density gauge tests taken on the day the mix is placed (after completion of the finish rolling) at randomly selected locations within each lot. The quantity represented by each lot will be no greater than a single day's production or approximately 400 tons, whichever is less.
B. All testing results shall be provided to the City Inspector within 48 hours of the test.
C. Control lots not meeting the minimum density standard shall be removed and replaced with satisfactory material.
D. In addition to the randomly selected locations for test of the control lot, the City Inspector reserves the right to test any area which appears defective and to require further compaction of areas that fall below acceptable density readings. These additional tests shall not impact the compaction evaluation of the entire control lot.
E. Hot mix asphalt pavement shall not be placed on any traveled way between October 1 and April 1, without written approval from a Planning and Development Services Review Engineer.

CONCRETE

A.Curing of concrete shall be in accordance with Section 5-05.3(13) of the Standard Specifications.
B.The slump for standard concrete used for sidewalks shall not exceed four inches +/- one inch.
C.Sidewalks and curb ramps shall be constructed in accordance with ADA Standards for Accessible Design, 28 CFR, Part 35 and as supplemented by the Public Works Right of Way Accessibility Guidelines (PROWAG).

SANITARY AND STORM SEWERS

A. 7-08.3(2)F Plugs and Connections:
Rigid Couplings, manufactured by Romac Industries, Inc., or City of Tacoma approved equal, shall be used at any pipe joint in which bell and spigot or fused joints are not used. Flexible couplings are not permitted.
B. 7-08.3(2)G Jointing of Dissimilar Pipe:
Dissimilar pipes shall be joined by use of rigid couplings manufactured by Romac Industries, Inc., or City of Tacoma approved equal, except for side sewer installation.
C.Sewers and appurtenances shall be cleaned and tested after backfilling by either exfiltration or low-pressure air method at the option of the Contractor, except where the ground water table is such that the Engineer may require the infiltration test.
D. All abandoned pipes encountered during construction and new stormwater and wastewater stub outs shall be sealed with a watertight pipe plug.
E. All frames and grates for standard catch basin inlets on this project shall be "vaned" type and shall conform to that shown on WSDOT Standard Plan No. B-30.10-03, B-30.30-03, and B-30.40-03.
F. Where existing catch basins are modified, grates may be required to be replaced with vaned grates. The City will make the final determination based on the condition of the existing grate and structure.
G. Recycled concrete aggregate shall not be used as gravel backfill where stormwater or groundwater may come into contact with the concrete aggregate, be collected and discharged to the stormwater system or receiving waterbody (such as underdrain systems.). Recycled materials used shall meet the requirements of all applicable local, state, and federal regulations including the City's SWMM, Right-of-Way Design Manual, and Tacoma Municipal Code as applicable to the give application.
H. New connections to brick manholes may be allowed on a case-by-case basis and will be assessed by City staff if it can be structurally cored. Manhole replacement may be required by the Environmental Services Department based upon the condition of the existing manhole.
I. The property side ends of the side sewers shall be marked in the field by means of a 2-inch by 4-inch board and locate wire that extends from the flow line of the side sewer to at least 1 foot above the finished lot grade.
J. After any new stormwater and/or wastewater pipes have been cleaned and the manholes channeled, the main(s) shall be televised for video inspection to provide a record of the constructed conditions and for the wastewater system to verify side sewer connection locations. The City of Tacoma will coordinate this inspection.

MISCELLANEOUS

A.Fences and structures replaced and/or relocated shall be maintained and remain functional.
B.Independent quality assurance sampling and testing will be provided by a certified independent laboratory for all improvements within the right-of-way. All special inspection reports shall be forwarded to the Site Development Group on a monthly basis consistent with the directions given in the preconstruction meeting, and/or as requested by the City of Tacoma inspector.
C. If hydrant water is needed the contractor is required to contact Tacoma Public Utilities, Water department, at (253) 502-8247, to obtain a permit. TPU may impose a fine for use of a non-registered water meter and/or backflow device.

EARTHWORKS, GRADING, EXCAVATION, AND EROSION CONTROL NOTES

A.All work is to be done in accordance with the approved grading plan, soils report, the most current WSDOT Standard Specifications For Road, Bridge And Municipal Construction, the 2021 City of Tacoma Stormwater Management Manual, City of Tacoma Standard Plans, and TMC 2.0.
B.When construction operations are such that debris from the work is deposited on the streets, the Contractor shall immediately remove any deposits or debris which may accumulate on the roadway surface. If the Contractor fails to keep the streets free from deposits and debris resulting from the work, the Contractor shall, upon order of the City of Tacoma Inspector, clean the streets and provide facilities for the removal of all rock and sediment from the tires and between wheels before trucks or other equipment will be allowed to travel over paved streets. Should the Contractor fail or refuse to clean the streets in question, or the trucks or equipment in question, the City of Tacoma Inspector may order the work suspended at the Contractor's risk until compliance with the Contractor's obligations is assured, or the City of Tacoma Inspector may order the streets in question cleaned by others and such costs incurred by the City in achieving compliance with these requirements, including cleaning of the streets, shall be charged to the work order account.
C.The Contractor shall protect existing drainage structures using acceptable methods and materials as shown on this plan. If the methods and materials as shown on this plan are not adequate, the City of Tacoma Inspector may require additional/alternative methods for erosion control and/or protection of existing drainage structures. Additional or alternative methods shall be submitted by the design engineer and accepted by the City of Tacoma Inspector. Any damage caused to the City of Tacoma stormwater system as a result of the work outlined on this plan shall be the sole responsibility of the Contractor. Resolving said damage may include, but not be limited to, the cleaning of the drainage system in question by the Contractor.
D.Watering provisions when applicable must be in place to prevent dust from becoming air borne. Violation of this condition will result in a stop work order until corrected.
E.Fill that will support a street section or other structures shall be placed under the inspection of a Washington State licensed Professional Engineer. Soil to be placed shall be tested and compacted to 95 percent of its maximum density. Engineer shall document existing site conditions, soil and its placement and allowable bearing capacity submitted. Standard requirements for cuts and fill are contained in the WSDOT Standard Specifications For Road, Bridges, and Municipal Construction.
F. A Construction Stormwater Pollution Prevention Plan (SWPPP) in accordance with the 2021 City of Tacoma Stormwater Management Manual is required for all projects with over 2,000 square feet of impervious surface.
G. Soil shall not remain unworked or exposed for more than 2 days.
H. Per TMC 10.22.140.C, no construction shall be performed nor shall any traffic lane be closed to traffic between Thanksgiving day and New Year's day within the downtown core and outlying business districts unless otherwise approved by the Director. View maps of these areas online:
https://www.cityoftacoma.org/government/city_departments/community_and_economic_development/neighborhood_business_districts

INSPECTIONS

A.All erosion control shall be in place prior to clearing except for that clearing necessary to install said erosion control measures. The contractor shall schedule an inspection for the City of Tacoma Inspector for initial erosion control inspection prior to start of work, per item E. below.
B.Erosion control measures shall be maintained at all times to the approval of the City of Tacoma Inspector.
C.Should temporary erosion and sedimentation control measures, as shown on plans become inadequate, the contractor shall install facilities as necessary to protect adjacent properties and the City of Tacoma drainage system, meeting approval of the City of Tacoma Inspector.
D.Not considered a complete list of inspections required. Call for inspection of the City of Tacoma Inspector upon completion of:

- Erosion control measures and ongoing regular maintenance
- Compaction reports on trenches prior to placement of crushed rock/backfill
- Channeling of manholes
- Air-testing of sewer mains
- Compaction reports for crushed rock prior to placing asphalt
- Any concrete work: inspection is required for subgrade, forms, and finish
- Adjustments of Utilities
- Monumentation
- Stand Alone Permits: such as driveways, sidewalk, SEWER, STORM, RUTI, street lighting
- WATER permits – these cover the connection from the meter to the house
- Hydroseeding of cuts/fills and slope stabilization
- Final clean-up and project completion
- Construction Deficiency List (Punchlist)

E. All material removed from site shall be placed only at a permitted site. Verify location of destination of material prior to exportation. Material excavated from the site shall be discarded at an approved facility per Pierce County Health, Ecology.
F. All wastewater and stormwater pipes shall be video inspected by City Forces prior to paving where paving occurs over sewers. All other sewers will be video inspected prior to final acceptance of new mains.
G. If contaminated soils are suspected and/or encountered within the project contact your inspector. For more information contact the Department of Ecology.
H. All work performed by contractor shall comply with the procedures required WAC 296-62 and WAC 296-65. Contractor shall contact the Puget Sound Air Pollution Control Authority in Seattle at 206-344-7330 for information regarding removal and packaging and Pierce County Environmental Health Department in Tacoma, WA at 253-591-6571 for information regarding transportation and disposal.
I. Contractor shall conform to Department of Ecology's guidelines for contamination cleanup for projects within the Tacoma Smelter Plume Project Area. For more information contact the Department of Ecology at 360-407-7096.

TREE REMOVAL/PROTECTION

A. All areas that are cleared and grubbed, graded, excavated or filled are subject to stabilization. Any of these areas that are left unpaved or lack landscaping shall be hydroseeded or otherwise fully stabilized under the direction and approval of the Construction Inspector.
B. Hydroseeding may occur only during the periods of April 1 though May 31 or September 1 though October 15. Hydroseeding may be allowed during the months of June through August if irrigation is provided.
C. Monitor and maintain hydroseeded areas throughout the winter wet season to ensure that no erosion occurs.
D. Trees to be removed shall be clearly marked for removal. Trees to be saved shall be fenced with barricade fence at the drip line (outer edge of tree branches) to keep construction vehicles from compacting root zone and killing trees. This fencing shall be maintained until construction ends.
E . Tree protection measures to be installed with initial TESC measures and shall be maintained throughout the duration of site work. Refer to City of Tacoma Std. Plans LS-08 through LS-11.

TRAFFIC CONTROL

A. Per TMC 10..22.140.C, no construction shall be performed nor shall any traffic lane be closed to traffic between Thanksgiving day and New Year's day within the downtown core and outlying business districts unless otherwise approved by the Director. View maps of these areas online:
https://www.cityoftacoma.org/government/city_departments/community_and_economic_development/neighborhood_business_districts
B.Prior to the start of any work within the City of Tacoma ROW a complete TCP set shall be on site in addition to a complete set of approve drawing.

MONUMENT REMOVAL PERMIT PROCESS

A. "No survey monument shall be removed or destroyed (the physical disturbance or covering of a monument such that the survey point is no longer visible or readily accessible) before a permit is obtained from the Department of Natural Resources (DNR)." WAC 332-120-030(2) states "It shall be the responsibility of those performing construction work or other activity (including road and street resurfacing projects) to adequately search the records and the physical area of the proposed construction work or other activity for the purpose of locating and referencing any known or existing survey monuments." Construction shall not commence until WAC outlined in Chapter 332-120 is complied with.
B. Monuments on the plans shall be protected in place or the plans will call out the identified DNR permit for removal and replacement.

HORIZONTAL CONTROL AND VERTICAL CONTROL

Work in the right-of-way will be performed using construction staking established from two (2) City monuments for establishing control and basis of bearing. A list of survey monuments can be found at https://cms.cityoftacoma.org/PublicWorks/Engineering/LandSurvey/SurveyMons.pdf

HORIZONTAL AND VERTICAL CURVES

For all infrastructure constructed using horizontal and/or vertical curves, grade stakes must be set every 25 feet and at grade breaks with a minimum of 3 stakes for each curve. Stakes shall be placed at radius points on street returns.

STAKING REQUIREMENTS

A. Construction staking shall be per Standard Plan SU-26.
B. SANITARY SEWER AND STORMWATER

1. Clearing stakes if needed.
2. Stakes every 50 feet plus grade breaks. Try to maintain 12 foot offsets in streets and 8 foot offsets in alleys.
3. Double offsets at manholes and catch basins (ahead and back stakes at angle points).
4. Catch basin station shall be to the centerline of the basin. Catch basin offsets shall be to the face of the curb.

C. RESIDENTIAL STREETS AND PRIVATE ACCESSWAYS

1. Clearing stakes as needed.
2. Slope stakes every 50 feet and grade breaks if cuts or fills exceed 2 feet.
3. Curb stakes every 50 feet and grade breaks, on 4 foot offset to the face of curb. Curb stakes are set to the top of curb grade (Blue Tops).
4. Also stake the beginning and end of all approaches.
5. No centerline of street grades unless the street grade is warped. If street grades are needed, set blue tops for each course.

D. ARTERIAL STREETS

1. Clearing stakes as needed.
2. Slope stakes every 50 feet and grade breaks if cuts or fills exceed 2 feet.
3. Curb stakes every 50 feet and grade breaks, on 4 foot offset to the face of curb.
4. Curb stakes are set to the top of curb grade (Blue Tops). Also stake the beginning and end of all approaches.
5. Stake centerline and quarterline grade every 50 feet and grade breaks at grade for each course.

E. ALLEYS

1. Stake both sides every 50 feet and grade breaks, on a 2 foot offset to the edge of paving, with a cut or fill to edge of paving on high side and flow line on low side.

F. SIDEWALKS

1. Offsets for walks are set on 50' intervals and grade breaks normally at 2 foot to edge of walk and at edge of walk grade (Blue Tops).
2. Sidewalk alignment is normally at 5 feet from the face of curb. No walk grades are needed if curbs are built but running slope and cross slope per American with Disabilities must be met for all new walk meeting the design.

RECORD DRAWINGS CRITERIA FOR ACCEPTANCE OF ALL PRIVATE WORK ORDERS

A. Record drawings shall be received and accepted prior to issuing utility connection permits or release of performance bonds.
B. All revisions to the approved plans must be approved by the City of Tacoma prior to implementation of the changes.
C. A determination at the time of proposal to the Site Review Engineer shall be made whether the revision can be addressed with red line drawings submitted as a part of the record drawings or if it will require formal submission for approval.
D. Record drawings shall show the station, offset, centerline and gutter flowline elevations, to nearest 0.01 foot; for all horizontal and vertical roadway alignment changes, at the intersection end of radius points and at the beginning and end of new paving.
E. Record drawings shall show the station, offset, invert, and rim elevations to the nearest 0.01 foot for all stormwater and wastewater structures. (i.e.: manholes, catch basins, etc.)
F. Record drawings shall show all side sewers and shall locate them by measurements from permanent objects. (i.e.: curb, property corner, etc.) In addition, the depth of all side sewers shall be noted on the record drawings and locate board.
G. Record drawings shall show vertical and horizontal datum for survey monuments (existing or new construction) within the limits of the project.
H. Record drawings shall consist of a clean set of approved work order drawings with all changes noted above shown in red.
I. Record drawings, including the Engineer's Certification, as applicable, must be submitted within 30 days of substantial completion and prior to release of the performance bond or assignment of funds or City survey crews will collect the necessary data and bill against the work order.

BOND RELEASE

The following are required to be collected for the performance bond to be release to the owner:

- Punchlist Completion.
- Record Drawings
- Engineer Certification for Stormwater Facilities

Revised: January 26, 2023

30% DESIGN REVIEW

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Tacoma

NO	REVISION	DATE	APPD

FINAL CONSTRUCTION CHECKED
BY
DATE
FIELD BOOKS

DATE 11/18/25 | SCALE AS NOTED
DESIGNED DCD | CHECKED DCD
DRAWN KNL | FILE NAME G1.02

DONALD C. DAVIS — 46449 — REGISTERED PROFESSIONAL ENGINEER — STATE OF WASHINGTON — PRELIMINARY

CITY OF TACOMA
DEPARTMENT OF PUBLIC WORKS
ENVIRONMENTAL SERVICES SCIENCE & ENGINEERING

PORT OF TACOMA
PARCEL 117 SNAIL ERADICATION
COT RIGHT OF WAY GENERAL NOTES

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20618
SHEET NO. G1.02
SHEET 3 OF 24

GENERAL STORMWATER NOTES

1. ALL WORKMANSHIP AND MATERIALS SHALL BE IN ACCORDANCE WITH CITY STANDARDS AND THE MOST CURRENT COPY OF THE STATE OF WASHINGTON STANDARD SPECIFICATIONS FOR ROAD, BRIDGE AND MUNICIPAL CONSTRUCTION (WSDOT/APWA) AND AS AMENDED BY THE CITY.

2. TEMPORARY EROSION/WATER POLLUTION PREVENTION MEASURES SHALL BE REQUIRED IN ACCORDANCE WITH SECTION 1-07.15, AS MODIFIED BY THE APWA SUPPLEMENT, OF THE CURRENT STATE OF WASHINGTON STANDARD SPECIFICATIONS AND THE CITY OF TACOMA STORMWATER MANAGEMENT MANUAL. SHOULD THE TEMPORARY EROSION AND SEDIMENTATION CONTROL MEASURES AS SHOWN ON THIS DRAWING NOT PROVE ADEQUATE TO CONTROL EROSION AND SEDIMENTATION, THE CONTRACTOR SHALL INSTALL ADDITIONAL FACILITIES AS NECESSARY TO PROTECT ADJACENT PROPERTIES, SENSITIVE AREAS, NATURAL WATER COURSES AND/OR STORM DRAINAGE SYSTEMS.

3. CALL THE UNDERGROUND LOCATE LINE 1-800-424-5555 A MINIMUM OF 48 HOURS PRIOR TO ANY EXCAVATIONS.

4. THE STORM DRAINAGE SYSTEM SHALL BE CONSTRUCTED ACCORDING TO APPROVED PLANS ON FILE WITH THE MUNICIPALITY. ANY SIGNIFICANT DEVIATION FROM THE APPROVED PLANS WILL REQUIRE WRITTEN APPROVAL FROM THE MUNICIPALITY.

5. A COPY OF THE APPROVED STORMWATER PLANS MUST BE ON THE JOB SITE WHENEVER CONSTRUCTION IS IN PROGRESS.

6. ALL EROSION CONTROL AND STORMWATER FACILITIES SHALL BE REGULARLY INSPECTED AND MAINTAINED BY THE CONTRACTOR DURING CONSTRUCTION.

7. IT SHALL BE THE SOLE RESPONSIBILITY OF THE CONTRACTOR TO OBTAIN STREET USE AND OTHER RELATED OR REQUIRED PERMITS PRIOR TO ANY CONSTRUCTION ACTIVITY IN THE MUNICIPALITY'S RIGHT-OF-WAY. IT SHALL ALSO BE THE RESPONSIBILITY OF THE CONTRACTOR TO OBTAIN ALL REQUIRED PERMITS PRIOR TO ANY CONSTRUCTION. THE CONTRACTOR SHALL ABIDE BY ALL REQUIREMENTS FOR TRAFFIC CONTROL AND SAFETY WHEN WORKING IN THE ROAD RIGHT-OF-WAY.

8. THE CONTRACTOR SHALL NOTIFY THE PROJECT ENGINEER IN THE EVENT OF DISCOVERY OF POOR SOILS, STANDING GROUNDWATER OR SEVERE DISCREPANCIES FROM SOIL LOG DESCRIPTIONS AS NOTED ON THE PLANS.

9. FOR PUBLIC SYSTEMS, THE CONTRACTOR SHALL CALL FOR INSPECTION 48 HOURS PRIOR TO COVERING ANY DRAINAGE STRUCTURE.

10. ALL DRAINAGE STRUCTURES, SUCH AS CATCH BASINS AND MANHOLES, NOT LOCATED WITHIN A TRAVELED ROADWAY OR SIDEWALK, SHALL HAVE SOLID LOCKING LIDS.

11. BARE GALVANIZED METAL SHALL NOT BE USED FOR MATERIALS THAT CONVEY STORMWATER, SUCH AS ROOFS, CANOPIES, SIDING, GUTTERS, DOWNSPOUTS, ROOF DRAINS, AND PIPES. ANY GALVANIZED MATERIALS SHALL HAVE AN INERT, NON-LEACHABLE FINISH, SUCH AS A BAKED ENAMEL, FLUOROCARBON PAINT (SUCH AS KYNAR® OR HYLAR®), FACTORY-APPLIED EPOXY, PURE ALUMINUM, OR ASPHALT COATING. ACRYLIC PAINT, POLYESTER PAINT, FIELD-APPLIED, AND PART ZINC (SUCH AS GALVALUME®)COATINGS ARE NOT ACCEPTABLE.

12. THE ENGINEER OF RECORD SHALL PROVIDE AN ENGINEER'S CERTIFICATION TO THE CITY OF TACOMA AFTER THE FACILITY INSTALLATION AND PRIOR TO PERMIT FINAL INSPECTION AND/OR CLOSEOUT. THE ENGINEER'S CERTIFICATION SHALL INCLUDE:

    A. THE PERMIT NUMBER
    B. STATEMENTS TO ATTEST:

    1.1. THAT ALL STORMWATER FACILITIES HAVE BEEN INSTALLED ACCORDING TO THE APPROVED PERMIT DOCUMENTS. CHANGES TO THE APPROVED PERMIT SET THAT ARE REQUIRED DURING CONSTRUCTION SHALL BE SUBMITTED TO CITY OF TACOMA B.L.U.S. FOR E.S.S.E. TO REVIEW AND APPROVE DURING THE CONSTRUCTION PHASE AND PRIOR TO THE CHANGE BEING CONSTRUCTED.

DEWATERING NOTES

1. THE CONTRACTOR SHALL BE RESPONSIBLE FOR DEWATERING ALL EXCAVATIONS. ALL WATER GENERATED FROM DEWATERING OPERATIONS SHALL BE DISPOSED OF IN MANNER AND LOCATION APPROVED BY PORT OF TACOMA.

2. CONTRACTOR TO ANTICIPATE GROUNDWATER WITHIN 5 FEET OF SURFACE AND PROVIDE ALL EQUIPMENT NECESSARY TO DE-WATER EXCAVATIONS. COORDINATE DISCHARGE WITH OWNER IN TRAFFIC AREAS AND NEAR OPERATIONAL FACILITIES (I.E. SURFACE PIPING IS NOT ACCEPTABLE WITHOUT APPROPRIATE, APPROVED TRAFFIC CONTROL MEASURES).

3. ALL GROUNDWATER OR INCIDENTAL SURFACE RUNOFF COLLECTED SHALL BE DISCHARGED TO THE MILL STORMWATER SYSTEM FOLLOWING APPROPRIATE TREATMENT UNTIL CONSTRUCTION IS COMPLETE.

4. NO SEDIMENT, TURBID WATER, OR OTHER POLLUTANTS (HEAVY METALS, OIL SHEEN, ETC.) SHALL BE DISCHARGED TO THE MILL STORMWATER SYSTEM. ANY TREATMENT OF COLLECTED WATER SHALL BE APPROVED BY PORT OF TACOMA PRIOR TO DISCHARGE.

5. ANY DISCHARGE TO THE STORM SEWER SYSTEM WILL REQUIRE PRIOR COORDINATION WITH PORT OF TACOMA TO ESTABLISH SAMPLING PROTOCOL, DISCHARGE VOLUMES, AND NOTIFICATION TO CITY OF TACOMA.

6. A LOG OF ALL DISCHARGED STORMWATER SHALL BE KEPT ON-SITE AT ALL TIMES DURING CONSTRUCTION. AT A MINIMUM, THE LOG SHALL CONTAIN THE FOLLOWING ITEMS:
    - DATE DISCHARGED
    - SOURCE OF WATER (VAULT, PIPE, ETC.)
    - TYPE OF WATER DISCHARGED (GROUNDWATER, STORMWATER, ETC.)
    - METHOD OF COLLECTION (PUMP TO TANK, ETC.)
    - METHOD OF DISCHARGE (DRAIN FROM TANK, PUMPED DISCHARGE, ETC.)
    - VOLUME OF WATER DISCHARGED
    - DISCHARGE LOCATION
    - RECEIVING SYSTEM (ON-SITE STORM SYSTEM, OFF-SITE FACILITY, ETC.)
    - DURATION OF DISCHARGE

7. ANY STORMWATER COLLECTED INTO A TRUCK SHALL NOT BE DISCHARGED TO THE STORMWATER SYSTEM. THE CONTRACTOR SHALL OBTAIN PRIOR APPROVAL FROM PORT OF TACOMA FOR ANY OFF-SITE DISPOSAL OF WATER, SEDIMENT, OR DEBRIS.

EXCAVATION NOTES

1. EXCAVATE TO ELEVATIONS, LINES AND GRADES INDICATED TO NOT MORE THAN 1/2-INCH ABOVE OR BELOW THAT REQUIRED.

2. SLOPE SIDES OF EXCAVATION AS INDICATED OR COMPLY WITH LOCAL CODES AND ORDINANCES HAVING JURISDICTION, WHICHEVER IS MORE STRINGENT. SHORE AND BRACE WHERE SLOPING IS NOT POSSIBLE BECAUSE OF SPACE RESTRICTIONS OR STABILITY OF MATERIAL EXCAVATED.

3. STOCKPILE SATISFACTORY EXCAVATED MATERIALS WHERE DIRECTED UNTIL REQUIRED FOR BACKFILL OR FILL. PLACE, GRADE AND SHAPE STOCKPILES FOR PROPER DRAINAGE. LOCATE AND RETAIN SOIL MATERIALS AWAY FROM EDGE OF EXCAVATIONS.

4. DISPOSE OF EXCESS SOIL AND UNSUITABLE SOIL MATERIAL LEGALLY OFF-SITE.

COMPACTION NOTES

1. CONTROL SOIL COMPACTION DURING CONSTRUCTION PROVIDING MINIMUM PERCENTAGE OF DENSITY SPECIFIED FOR EACH AREA CLASSIFICATION. PERCENTAGES ARE RELATED TO MAXIMUM DRY DENSITY AS MEASURED IN CONFORMANCE WITH ASTM D 1557.

2. COMPACT TOP 12-INCHES OF SUBGRADE (24-INCHES UNDER PROPOSED DRIVING SURFACES) TO 95-PERCENT OF MAXIMUM DRY DENSITY UNDER PAVEMENTS AND GRAVEL SURFACING.

3. WHERE SUBGRADE OR LAYER OF SOIL MATERIAL MUST BE MOISTURE CONDITIONED BEFORE COMPACTION, UNIFORMLY APPLY WATER TO SURFACE OF SUBGRADE OR LAYER OF SOIL MATERIAL TO PREVENT FREE WATER APPEARING ON SURFACE DURING OR SUBSEQUENT TO COMPACTION OPERATIONS. REMOVE AND REPLACE, OR SCARIFY AND AIR DRY, SOIL MATERIAL THAT IS TOO WET TO PERMIT COMPACTION TO SPECIFIED DENSITY. SOIL MATERIAL THAT HAS BEEN REMOVED BECAUSE IT IS TOO WET TO PERMIT COMPACTION MAY BE STOCKPILED OR SPREAD AND ALLOWED TO DRY. ASSIST DRYING BY DISKING, HARROWING OR PULVERIZING UNTIL MOISTURE CONTENT IS REDUCED TO SATISFACTORY VALUE.

GEOTEXTILE FABRIC NOTES

1. STABILIZATION GEOTEXTILE: WOVEN GEOTEXTILE FABRIC, MANUFACTURED FOR SEPARATION APPLICATIONS MADE FROM POLYOLEFINS OR POLYESTERS WITH ELONGATION LESS THAN 50 PERCENT COMPLYING WITH WSDOT 9-33.2 TABLE 3 REQUIREMENTS:

    GRAB TENSILE STRENGTH: 315 LBF; ASTM D 4632.

    SEWN SEAM STRENGTH: 270 LBF; ASTM D 4632.

    TEAR STRENGTH: 112 LBF; ASTM D 4533.

    PUNCTURE STRENGTH: 112 LBF; ASTM D 4833.

    APPARENT OPENING SIZE: NUMBER 40 SIEVE, MAXIMUM; ASTM D 4751.

    PERMITTIVITY: 0.10 PER SECOND, MINIMUM; ASTM D 4491.

    UV STABILITY: 50 PERCENT AFTER 500 HOURS EXPOSURE; ASTM D 4355.

CATCH BASIN NOTES

1. TYPE 1 CATCH BASINS SHALL COMPLY WITH WSDOT STANDARD PLAN B-5.20-01.

2. TYPE 1 CATCH BASINS SHALL BE EQUIPPED WITH RECTANGULAR FRAMES PER WSDOT STANDARD PLAN B-30.10-01. TYPE 1 CATCH BASINS SHALL BE COVERED WITH BOLT-DOWN CAST IRON GRATES PER WSDOT STANDARD PLANS OR OTHER NOTED ON PLANS.

    A. RECTANGULAR VANED GRATE PER WSDOT B 30.30-01.
    B. RECTANGULAR BI-DIRECTIONAL VANED GRATE PER B 30.40-01.

3. STORM STRUCTURES SHALL BE INSTALLED PER WSDOT STANDARD SPECIFICATION 7-05.

4. ALL CATCH BASINS SHALL BE MARKED AS FOLLOWS: "DUMP NO WASTE. DRAINS TO SOUND." THE CONTRACTOR SHALL INSTALL STICKER PROVIDED BY THE CITY ON EACH REPLACED CATCH BASINS (TYP.).

GRAVEL NOTES

1. TOP COURSE OR CRUSHED SURFACING TOP COURSE SHALL CONFORM TO WSDOT 9-03.9(3) REQUIREMENTS.

2. BASE COURSE OR CRUSHED SURFACING BASE COURSE SHALL CONFORM TO WSDOT 9-03.9(3) REQUIREMENTS.

RIGHT-OF-WAY ASPHALT NOTES

1. CONTRACTOR TO MATCH EXISTING ASPAHLT PAVEMENT SECTION, OR REFER TO CITY OF TACOMA STANDARD PLAN PD-01/C4.01.

2. AGGREGATE SHALL COMPLY WITH CLASS 1/2" GRADATION PER WSDOT STANDARD SPECIFICATION SECTION 9-03.8

3. BINDER SHALL COMPLY WITH PERFORMANCE GRADE ASPHALT BINDER PG 58-22 PER WSDOT STANDARD SPECIFICATION SECTION 9-02.1(4)

4. HMA PAVEMENT SHALL BE COMPACTED TO 92% RICE VALUE.

30% DESIGN REVIEW

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PREPARED FOR

Port of Tacoma
P.O. BOX 1837 TACOMA, WA 98401 (253)383-5841

Tacoma

NO	REVISION	DATE	APPD

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BY
DATE
FIELD BOOKS

DATE 11/18/25 | SCALE AS NOTED
DESIGNED DCD | CHECKED DCD
DRAWN KNL | FILE NAME G1.03

DONALD C. DAVIS, STATE OF WASHINGTON, 48440, REGISTERED PROFESSIONAL ENGINEER
PRELIMINARY

CITY OF TACOMA
DEPARTMENT OF PUBLIC WORKS
ENVIRONMENTAL SERVICES SCIENCE & ENGINEERING

PORT OF TACOMA
PARCEL 117 SNAIL ERADICATION
CIVIL GENERAL NOTES

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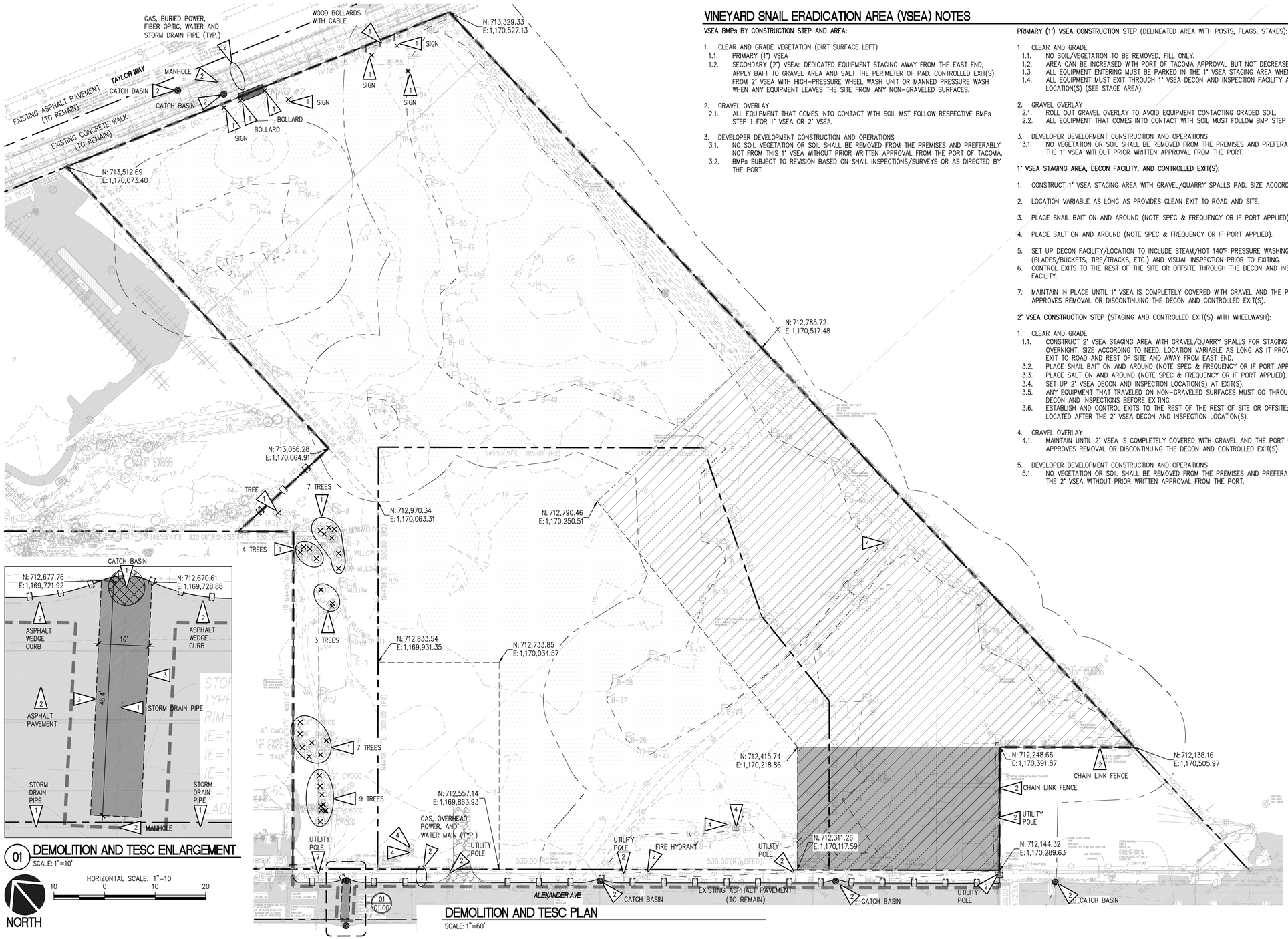
20618
SHEET NO. G1.03
SHEET 04 OF 24



DEMOLITION AND TESC PLAN

SCALE: 1"=60'

01 DEMOLITION AND TESC ENLARGEMENT

SCALE: 1"=10'

HORIZONTAL SCALE: 1"=10'

10 0 10 20

NORTH

VINEYARD SNAIL ERADICATION AREA (VSEA) NOTES

VSEA BMPs BY CONSTRUCTION STEP AND AREA:

1. CLEAR AND GRADE VEGETATION (DIRT SURFACE LEFT)
   - 1.1. PRIMARY (1') VSEA
   - 1.2. SECONDARY (2') VSEA: DEDICATED EQUIPMENT STAGING AWAY FROM THE EAST END, APPLY BAIT TO GRAVEL AREA AND SALT THE PERIMETER OF PAD. CONTROLLED EXIT(S) FROM 2' VSEA WITH HIGH-PRESSURE WHEEL WASH UNIT OR MANNED PRESSURE WASH WHEN ANY EQUIPMENT LEAVES THE SITE FROM ANY NON-GRAVELED SURFACES.
2. GRAVEL OVERLAY
   - 2.1. ALL EQUIPMENT THAT COMES INTO CONTACT WITH SOIL MST FOLLOW RESPECTIVE BMPs STEP 1 FOR 1' VSEA OR 2' VSEA.
3. DEVELOPER DEVELOPMENT CONSTRUCTION AND OPERATIONS
   - 3.1. NO SOIL VEGETATION OR SOIL SHALL BE REMOVED FROM THE PREMISES AND PREFERABLY NOT FROM THIS 1' VSEA WITHOUT PRIOR WRITTEN APPROVAL FROM THE PORT OF TACOMA.
   - 3.2. BMPs SUBJECT TO REVISION BASED ON SNAIL INSPECTIONS/SURVEYS OR AS DIRECTED BY THE PORT.

PRIMARY (1') VSEA CONSTRUCTION STEP (DELINEATED AREA WITH POSTS, FLAGS, STAKES):

1. CLEAR AND GRADE
   - 1.1. NO SOIL/VEGETATION TO BE REMOVED, FILL ONLY.
   - 1.2. AREA CAN BE INCREASED WITH PORT OF TACOMA APPROVAL BUT NOT DECREASED.
   - 1.3. ALL EQUIPMENT ENTERING MUST BE PARKED IN THE 1' VSEA STAGING AREA WHEN NOT IN USE.
   - 1.4. ALL EQUIPMENT MUST EXIT THROUGH 1' VSEA DECON AND INSPECTION FACILITY AND EXIT LOCATION(S) (SEE STAGE AREA).
2. GRAVEL OVERLAY
   - 2.1. ROLL OUT GRAVEL OVERLAY TO AVOID EQUIPMENT CONTACTING GRADED SOIL.
   - 2.2. ALL EQUIPMENT THAT COMES INTO CONTACT WITH SOIL MUST FOLLOW BMP STEP 1 ABOVE.
3. DEVELOPER DEVELOPMENT CONSTRUCTION AND OPERATIONS
   - 3.1. NO VEGETATION OR SOIL SHALL BE REMOVED FROM THE PREMISES AND PREFERABLY NOT FROM THE 1' VSEA WITHOUT PRIOR WRITTEN APPROVAL FROM THE PORT.

1' VSEA STAGING AREA, DECON FACILITY, AND CONTROLLED EXIT(S):

1. CONSTRUCT 1' VSEA STAGING AREA WITH GRAVEL/QUARRY SPALLS PAD. SIZE ACCORDING TO NEED.
2. LOCATION VARIABLE AS LONG AS PROVIDES CLEAN EXIT TO ROAD AND SITE.
3. PLACE SNAIL BAIT ON AND AROUND (NOTE SPEC & FREQUENCY OR IF PORT APPLIED).
4. PLACE SALT ON AND AROUND (NOTE SPEC & FREQUENCY OR IF PORT APPLIED).
5. SET UP DECON FACILITY/LOCATION TO INCLUDE STEAM/HOT 140°F PRESSURE WASHING (BLADES/BUCKETS, TIRE/TRACKS, ETC.) AND VISUAL INSPECTION PRIOR TO EXITING.
6. CONTROL EXITS TO THE REST OF THE SITE OR OFFSITE THROUGH THE DECON AND INSPECTION FACILITY.
7. MAINTAIN IN PLACE UNTIL 1' VSEA IS COMPLETELY COVERED WITH GRAVEL AND THE PORT OF TACOMA APPROVES REMOVAL OR DISCONTINUING THE DECON AND CONTROLLED EXIT(S).

2' VSEA CONSTRUCTION STEP (STAGING AND CONTROLLED EXIT(S) WITH WHEELWASH):

1. CLEAR AND GRADE
   - 1.1. CONSTRUCT 2' VSEA STAGING AREA WITH GRAVEL/QUARRY SPALLS FOR STAGING EQUIPMENT OVERNIGHT. SIZE ACCORDING TO NEED. LOCATION VARIABLE AS LONG AS IT PROVIDES CLEAN EXIT TO ROAD AND REST OF SITE AND AWAY FROM EAST END.
   - 3.2. PLACE SNAIL BAIT ON AND AROUND (NOTE SPEC & FREQUENCY OR IF PORT APPLIED).
   - 3.3. PLACE SALT ON AND AROUND (NOTE SPEC & FREQUENCY OR IF PORT APPLIED).
   - 3.4. SET UP 2' VSEA DECON AND INSPECTION LOCATION(S) AT EXIT(S).
   - 3.5. ANY EQUIPMENT THAT TRAVELED ON NON-GRAVELED SURFACES MUST GO THROUGH 2' VSEA DECON AND INSPECTIONS BEFORE EXITING.
   - 3.6. ESTABLISH AND CONTROL EXITS TO THE REST OF THE REST OF SITE OR OFFSITE; EXISTS LOCATED AFTER THE 2' VSEA DECON AND INSPECTION LOCATION(S).
4. GRAVEL OVERLAY
   - 4.1. MAINTAIN UNTIL 2' VSEA IS COMPLETELY COVERED WITH GRAVEL AND THE PORT OF TACOMA APPROVES REMOVAL OR DISCONTINUING THE DECON AND CONTROLLED EXIT(S).
5. DEVELOPER DEVELOPMENT CONSTRUCTION AND OPERATIONS
   - 5.1. NO VEGETATION OR SOIL SHALL BE REMOVED FROM THE PREMISES AND PREFERABLY NOT FROM THE 2' VSEA WITHOUT PRIOR WRITTEN APPROVAL FROM THE PORT.

LEGEND

- PRIMARY (1') VSEA SEE VSEA NOTES.
- 1' VSEA SEE VSEA NOTES.
- 2' VSEA SEE VSEA NOTES.
- ASPHALT DEMO/REMOVAL
- TEMPORARY CONSTRUCTION ENTRANCE (03 C4.00)
- PROPERTY LINE
- WETLAND
- WETLAND BUFFER
- DEMOLITION
- SAWCUT LINE
- SILT FENCE (01 C4.00)
- CLEARING LIMITS
- CATCH BASIN PROTECTION (02 C4.00)
- TREE REMOVAL

GENERAL NOTES

1. SEE APPLICABLE PROJECT NOTES ON SHEETS G1.01, G1.02, AND G1.03.
2. CONTRACTOR IS COORDINATE AND CONFIRM FINAL VSEA BOUNDARY LOCATIONS WITH PORT OF TACOMA.

KEY NOTES

1. REMOVE EXISTING FEATURE AS NOTED.
2. PROTECT EXISTING FEATURE AS NOTED.
3. SAWCUT ASPHALT PAVEMENT TO FULL DEPTH, UNYIELDING EDGE.
4. PROTECT EXISTING MONITORING WELL AND RAISE RIM TO FINISH GRADE. REF. SHEET C3.01.

NORTH

HORIZONTAL SCALE: 1"=40'

40 0 40 80

30% DESIGN REVIEW

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PREPARED FOR
Port of Tacoma
P.O. BOX 1837 TACOMA, WA 98401 (253)383-5841

NO	REVISION	DATE	APPD

FINAL CONSTRUCTION CHECKED BY / DATE / FIELD BOOKS

DATE	SCALE
11/18/25	AS NOTED
DESIGNED	CHECKED
DCD	DCD
DRAWN	FILE NAME
KNL	C1.00

DONALD C. DAVIS — STATE OF WASHINGTON — 19830 — REGISTERED PROFESSIONAL ENGINEER — PRELIMINARY NOT FOR CONSTRUCTION

CITY OF TACOMA
DEPARTMENT OF PUBLIC WORKS
ENVIRONMENTAL SERVICES SCIENCE & ENGINEERING

PORT OF TACOMA
PARCEL 117 SNAIL ERADICATION
DEMOLITION AND TESC PLAN

-- | 20618 | SHEET NO. C1.00 | SHEET 18 OF 24

LEGEND

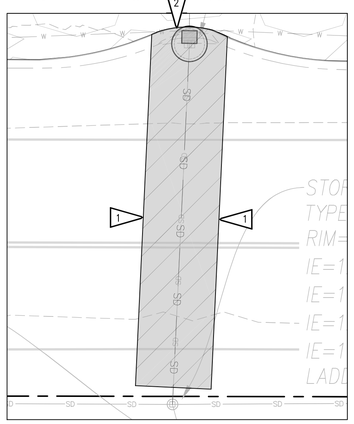
- PROPERTY LINE
- CRUSHED SURFACING BASE COURSE (05/C4.00)
- ONSITE ASPHALT PAVEMENT (05/C4.00)
- R.O.W. ASPHALT PAVEMENT
- AUTOFLUFF CONTAMINATION
- ECOLOGY BLOCK (08/C4.00)

GENERAL NOTES

1. SEE APPLICABLE PROJECT NOTES ON SHEETS G1.01, G1.02, AND G1.03.

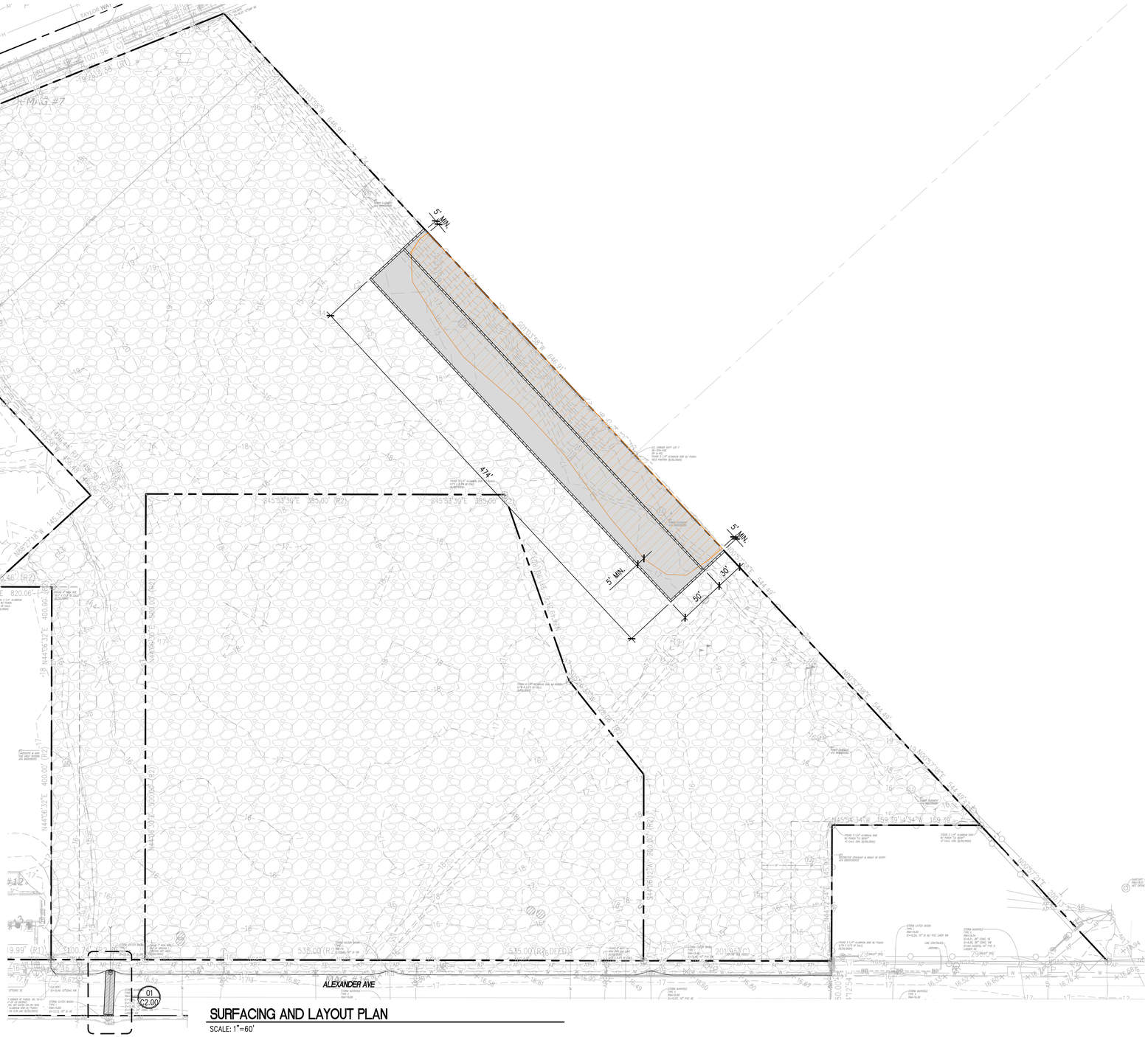
KEY NOTES

1. ASPHALT PAVEMENT RESTORATION PER DETAIL
2. INSTALL NEW ASPHALT WEDGE CURB IN KIND, MATCHING EXISTING CURB ALIGNMENT, WIDTH, AND HEIGHT. REF. 'HMA WEDGE CURB STANDARD' ON COT DETAIL SU-03A/C4.00.



01 SURFACING AND LAYOUT ENLARGEMENT
SCALE: 1"=10'

HORIZONTAL SCALE: 1"=10'
10 0 10 20



SURFACING AND LAYOUT PLAN
SCALE: 1"=60'

NORTH
HORIZONTAL SCALE: 1"=60'
60 0 60 120

30% DESIGN REVIEW

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Tacoma

NO	REVISION	DATE	APPD

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DATE
FIELD BOOKS

DATE 11/18/25	SCALE AS NOTED
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DRAWN KNL	FILE NAME C2.00

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PORT OF TACOMA
PARCEL 117 SNAIL ERADICATION
SURFACING AND LAYOUT PLAN

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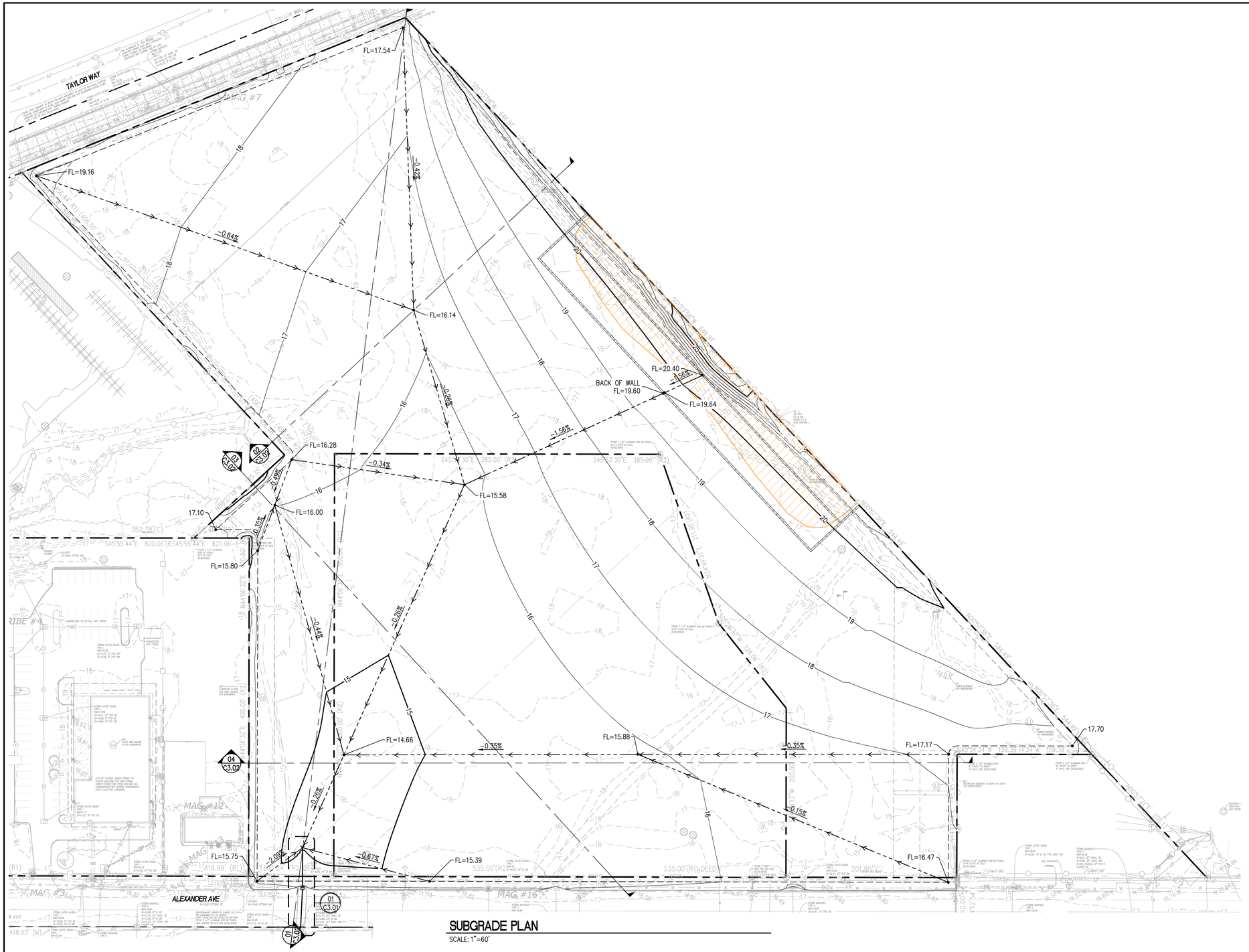
20618
SHEET NO. C2.00
SHEET 19 OF 24



SUBGRADE PLAN

SCALE: 1"=60'

LEGEND

- PROPERTY LINE
- SD — STORM DRAIN PIPE
- 15 — SUBGRADE MAJOR CONTOUR
- 14 — SUBGRADE MINOR CONTOUR
- SUBGRADE TOP OF SLOPE
- SUBGRADE TOE OF SLOPE
- FLOW LINE
- GRADE BREAK
- MANHOLE, TYPE 1
- 18.18 — PROPOSED ELEVATION
- -0.49% — SLOPE
- FL — FLOW LINE
- AUTOFLUFF CONTAMINATION

GENERAL NOTES

1. SEE APPLICABLE PROJECT NOTES ON SHEETS G1.01, G1.02, AND G1.03.
2. PERMANENT BACKFILL SLOPES SHALL NOT EXCEED 2H:1V.

NORTH

HORIZONTAL SCALE: 1"=60'

60 0 60 120

30% DESIGN REVIEW

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BY

DATE

FIELD BOOKS

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CITY OF TACOMA

DEPARTMENT OF PUBLIC WORKS

ENVIRONMENTAL SERVICES SCIENCE & ENGINEERING

PORT OF TACOMA

PARCEL 117 SNAIL ERADICATION

SUBGRADE PLAN

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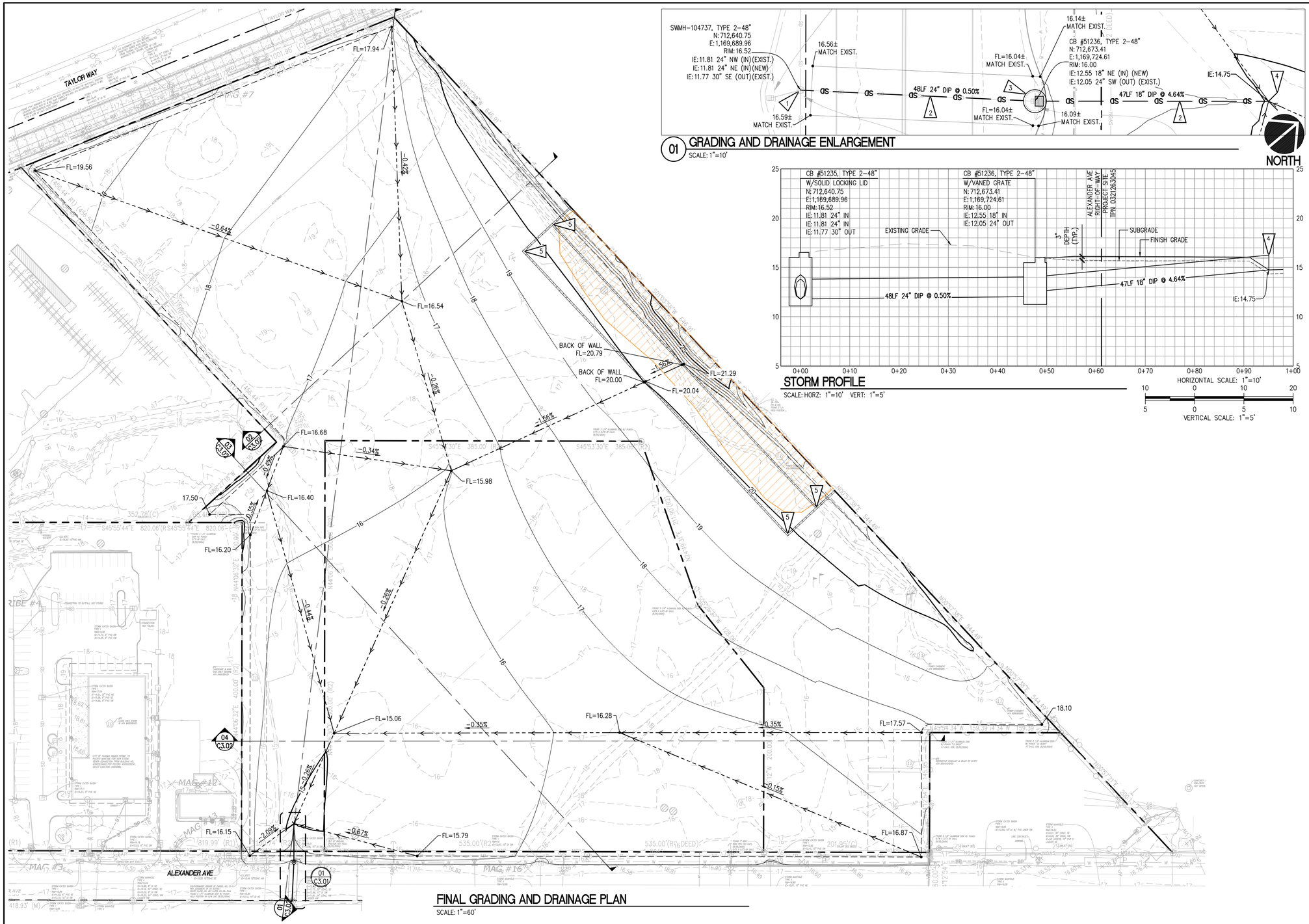
20618

SHEET NO. C3.00

SHEET 20 OF 24



FINAL GRADING AND DRAINAGE PLAN

SCALE: 1"=60'

01 GRADING AND DRAINAGE ENLARGEMENT

SCALE: 1"=10'

STORM PROFILE

SCALE: HORZ: 1"=10' VERT: 1"=5'

LEGEND

- PROPERTY LINE
- SD — STORM DRAIN PIPE
- 15 — PROPOSED MAJOR CONTOUR
- 14 — PROPOSED MINOR CONTOUR
- PROPOSED TOP OF SLOPE
- PROPOSED TOE OF SLOPE
- FLOW LINE
- GRADE BREAK
- MANHOLE, TYPE 1
- 18.18 — PROPOSED ELEVATION
- -0.49% — SLOPE
- FL — FLOW LINE
- IE — INVERT ELEVATION
- AUTOFLUFF CONTAMINATION

GENERAL NOTES

1. SEE APPLICABLE PROJECT NOTES ON SHEETS G1.01, G1.02, AND G1.03.
2. PERMANENT BACKFILL SLOPES SHALL NOT EXCEED 2H:1V.
3. VANED GRATE SHALL BE PER DETAIL 06/C4.00.
4. STORMWATER SHALL NOT BE PONDED BEHIND THE ECOLOGY BLOCK WALL. CONTRACTOR SHALL PROVIDE POSITIVE DRAINAGE BEHIND THE WALL AND ENSURE ANY ACCUMULATED STORMWATER IS DISCHARGED.

KEY NOTES

1. CONNECT PROPOSED 24" DI PIPE TO EXIST. MANHOLE. IE PER PLAN.
2. INSTALL STORM DRAIN PIPE PER COT DETAIL SU-16/C4.01.
3. INSTALL MANHOLE PER COT DETAIL SU-17/C4.01.
4. DEBRIS BARRIER AT CULVERT PER DETAIL 07/C4.00.
5. INSTALL 6" WEEPHOLE IN ECOLOGY BLOCK WALL, AS NECESSARY. SEE GENERAL NOTE 4. INVERT ELEVATION SHALL MATCH THE FINISH GRADE OF ASPHALT.

NORTH

HORIZONTAL SCALE: 1"=60'

60 0 60 120

30% DESIGN REVIEW

PREPARED BY

sitts&hill

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Tacoma

NO	REVISION	DATE	APPD

FINAL CONSTRUCTION CHECKED

BY

DATE

FIELD BOOKS

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11/18/25	AS NOTED
DESIGNED DCD	CHECKED DCD
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PORT OF TACOMA

PARCEL 117 SNAIL ERADICATION

FINAL GRADING AND DRAINAGE PLAN

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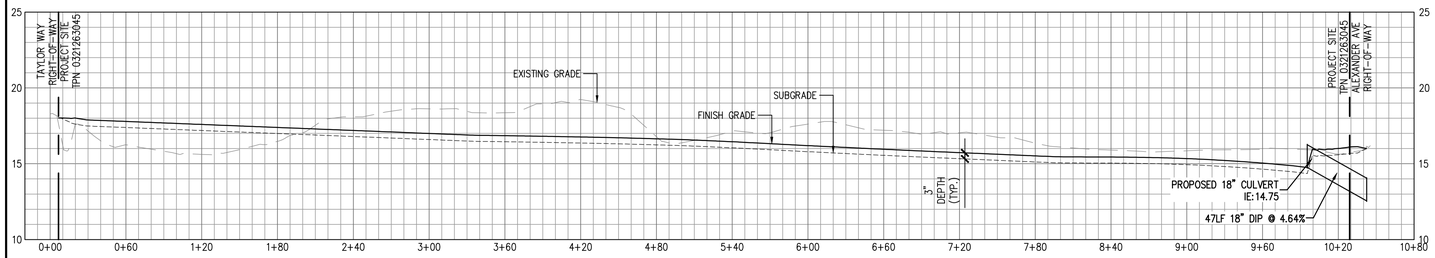
20618

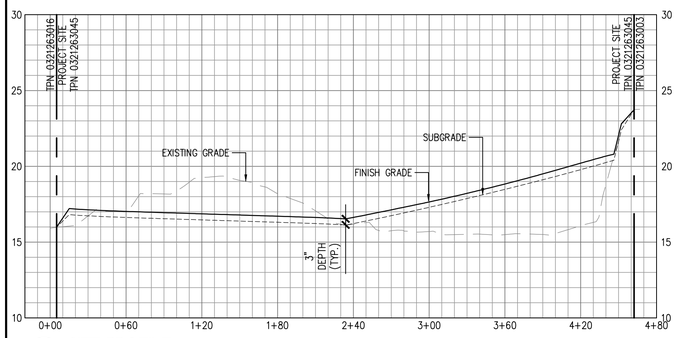
SHEET NO. C3.01

SHEET 21 OF 24



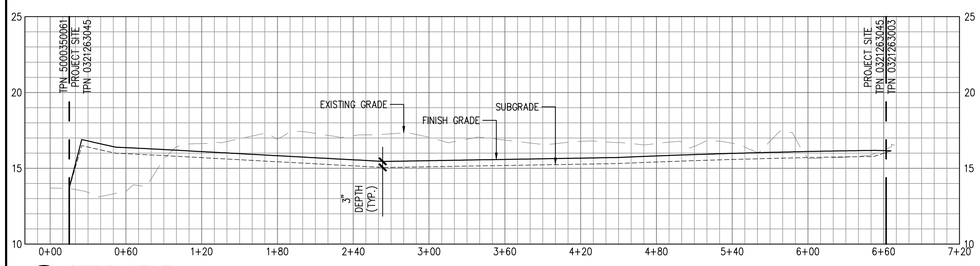
01 SITE PROFILE

SCALE: HORZ: 1"=60' VERT: 1"=5'



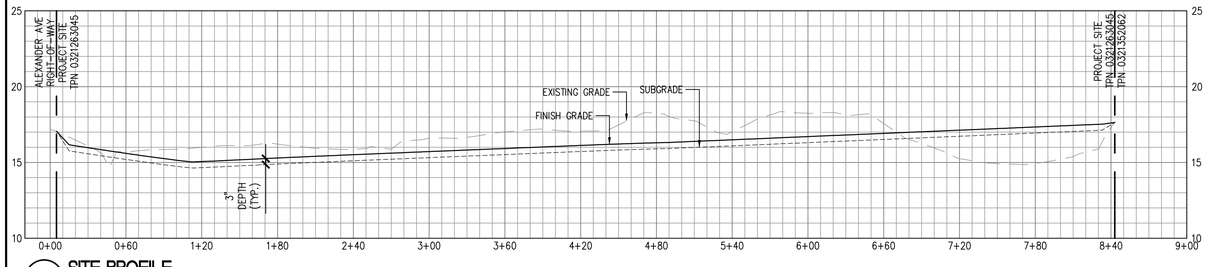
02 SITE PROFILE

SCALE: HORZ: 1"=60' VERT: 1"=5'



03 SITE PROFILE

SCALE: HORZ: 1"=60' VERT: 1"=5'



04 SITE PROFILE

SCALE: HORZ: 1"=60' VERT: 1"=5'

HORIZONTAL SCALE: 1"=60'

60 0 60 120

VERTICAL SCALE: 1"=5'

5 0 5 10

30% DESIGN REVIEW

PREPARED BY

sitts&hill

CIVIL | STRUCTURAL | SURVEY

4815 CENTER STREET | TACOMA, WA. 98409

PHONE: (253) 474-9449 | FAX: (253) 474-0153

http://www.sittshill.com/

PREPARED FOR

Port of Tacoma

P.O. BOX 1837 TACOMA, WA 98401 (253)383-5841

Tacoma

NO	REVISION	DATE	APPD

FINAL CONSTRUCTION CHECKED

BY

DATE

FIELD BOOKS

DATE	SCALE
11/18/25	AS NOTED
DESIGNED DCD	CHECKED DCD
DRAWN KNL	FILE NAME C3.02

DONALD C. DAVIS — STATE OF WASHINGTON — 46440 — REGISTERED PROFESSIONAL ENGINEER — PRELIMINARY

CITY OF TACOMA

DEPARTMENT OF PUBLIC WORKS

ENVIRONMENTAL SERVICES SCIENCE & ENGINEERING

PORT OF TACOMA

PARCEL 117 SNAIL ERADICATION

SITE PROFILES

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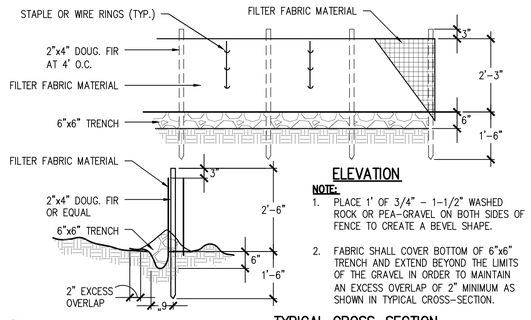
20618

SHEET NO. C3.02

SHEET 22 OF 24



ELEVATION

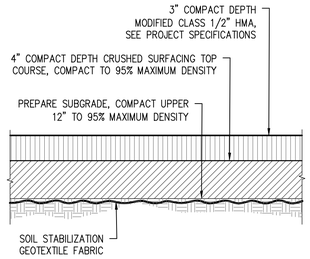
TYPICAL CROSS-SECTION

NOTE:

1. PLACE 1' OF 3/4" – 1-1/2" WASHED ROCK OR PEA-GRAVEL ON BOTH SIDES OF FENCE TO CREATE A BEVEL SHAPE.
2. FABRIC SHALL COVER BOTTOM OF 6"x6" TRENCH AND EXTEND BEYOND THE LIMITS OF THE GRAVEL IN ORDER TO MAINTAIN AN EXCESS OVERLAP OF 2" MINIMUM AS SHOWN IN TYPICAL CROSS-SECTION.

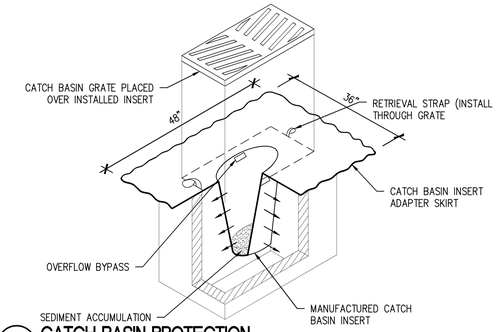
01 SILT FENCE

SCALE: N.T.S.



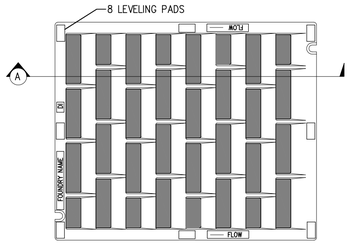
05 LIGHT DUTY ASPHALT PAVEMENT

SCALE: N.T.S.

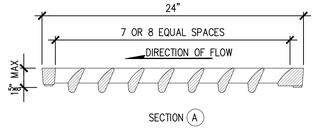


02 CATCH BASIN PROTECTION

SCALE: N.T.S.

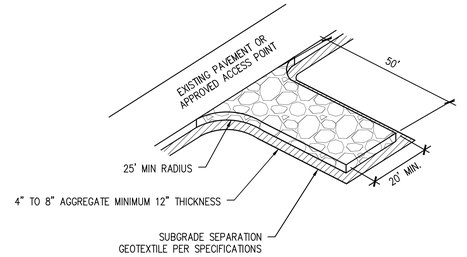


PLAN VIEW



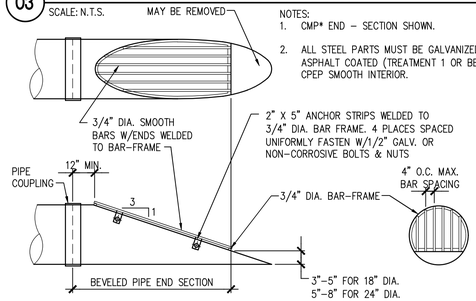
06 VANED GRATE

SCALE: N.T.S.



03 TEMPORARY CONSTRUCTION ENTRANCE

SCALE: N.T.S.

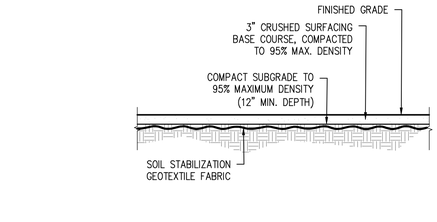


NOTES:

1. CMP* END – SECTION SHOWN.
2. ALL STEEL PARTS MUST BE GALVANIZED AND ASPHALT COATED (TREATMENT 1 OR BETTER). *OR CPEP SMOOTH INTERIOR.

07 DEBRIS BARRIER

SCALE: N.T.S.

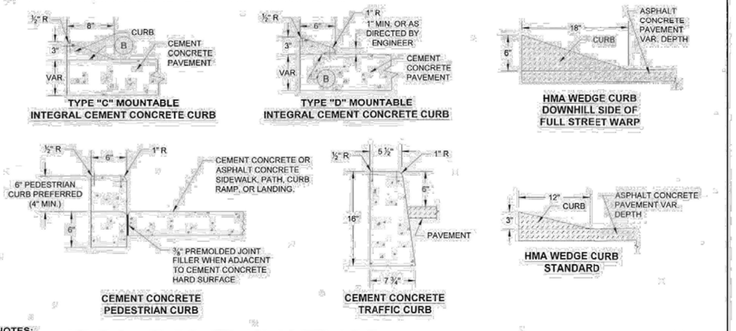


04 CRUSHED SURFACING BASE COURSE

SCALE: N.T.S.

NOTE:

B Flush with gutter pan at curb ramp entrance or ¾" vertical lip at driveway entrance.

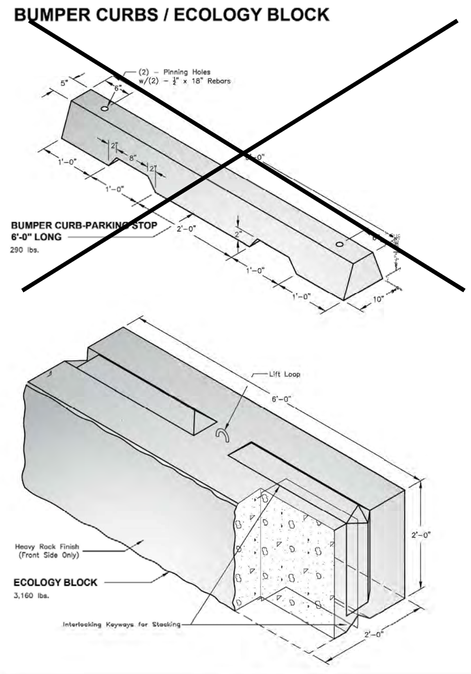


NOTES:

1. For trench crossings, curb and gutter shall be removed to a minimum 2' cut back over undisturbed soil.
2. In all projects, any remaining sections of curb and gutter less than 5' in length between the project area and the nearest control joint shall also be removed and replaced.
3. All joints shall be saw cut full depth prior to restoration and ¾" expansion joint installed.
4. Concrete finish shall match existing.
5. Cutting wheel run-out beyond the limits of the opening shall be filled in accordance with WSDOT Standard Specification 5-05.3(8)B for cement concrete surfaces and 5-04.3(5)C for asphalt concrete surfaces.
6. Foundations shall be fully compacted prior to form placement.
7. Unsuitable foundation shall be replaced with ⅝" crushed surfacing top course.

REVIEWED BY		APPROVED FOR PUBLICATION	CITY OF TACOMA CEMENT CONCRETE CURB AND GUTTER AND ASPHALT WEDGE CURB
DCS PUBLIC WORKS	GMS ENVIRONMENTAL SERVICES		
NA TACOMA POWER	NA TACOMA WATER	CITY ENGINEER — DATE 8/16/16	STANDARD PLAN NO. SU-03A

BUMPER CURBS / ECOLOGY BLOCK



Oldcastle Precast®
PO Box 323, Wilsonville, Oregon 97070-0323
Tel: (503) 682-2844 Fax: (503) 682-2657

B. CURB / E. BLOCK	BUMPER CURBS ECOLOGY BLOCK
File Name: 020-CRBBLK	
Issue Date: 2018	
oldcastleprecast.com/wilsonville	

6.0

08 OLDCASTLE PRECAST ECOLOGY BLOCK

SCALE: N.T.S.

30% DESIGN REVIEW

PREPARED BY
sitts&hill
CIVIL | STRUCTURAL | SURVEY
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PREPARED FOR
Port of Tacoma
P.O. BOX 1837 TACOMA, WA 98401 (253)383-5841

NO	REVISION	DATE	APPD

FINAL CONSTRUCTION CHECKED BY / DATE / FIELD BOOKS

DATE	SCALE
11/18/25	AS NOTED
DESIGNED DCD	CHECKED DCD
DRAWN KNL	FILE NAME C4.00

DONALD C. DAVIS — STATE OF WASHINGTON — 46449 — REGISTERED PROFESSIONAL ENGINEER — PRELIMINARY

CITY OF TACOMA
DEPARTMENT OF PUBLIC WORKS
ENVIRONMENTAL SERVICES SCIENCE & ENGINEERING

PORT OF TACOMA
PARCEL 117 SNAIL ERADICATION
PROJECT DETAILS

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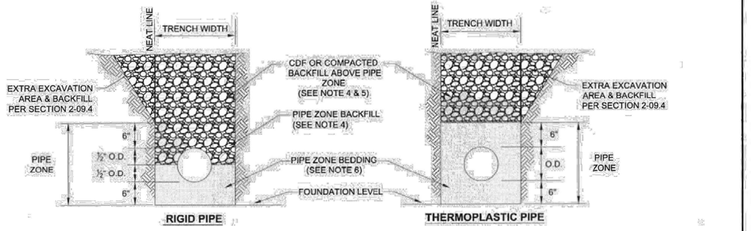
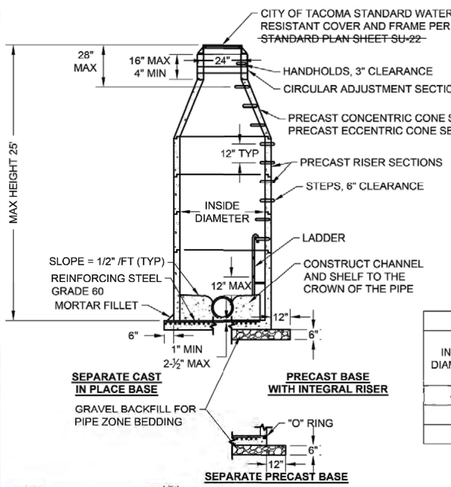
20618
SHEET NO. C4.00
SHEET 23 OF 24



NOTES:

1. Provide uniform support under barrel and provide pockets in bedding for pipe bells.
2. Hand tamp under haunches.
3. Trench width shall be as specified in Section 2-09.4 of the WSDOT Standard Specifications.
4. Pipe zone backfill and backfill above pipe zone shall meet the material requirements of WSDOT Standard Specification Section 9-03.12(2) for gravel backfill for walls.
5. All trenches shall be compacted in accordance with SU-28.
6. Pipe zone bedding shall meet the material requirements of WSDOT Standard Specification Section 9-03.9(3) for crushed surfacing top course.

REVIEWED BY			APPROVED FOR PUBLICATION	CITY OF TACOMA
DCS PUBLIC WORKS	GMS ENVIRONMENTAL SERVICES			PIPE ZONE BEDDING AND BACKFILL FOR SANITARY AND STORM SEWERS
NA TACOMA POWER	NA TACOMA WATER		8/16/16 CITY ENGINEER DATE	STANDARD PLAN NO. SU-16



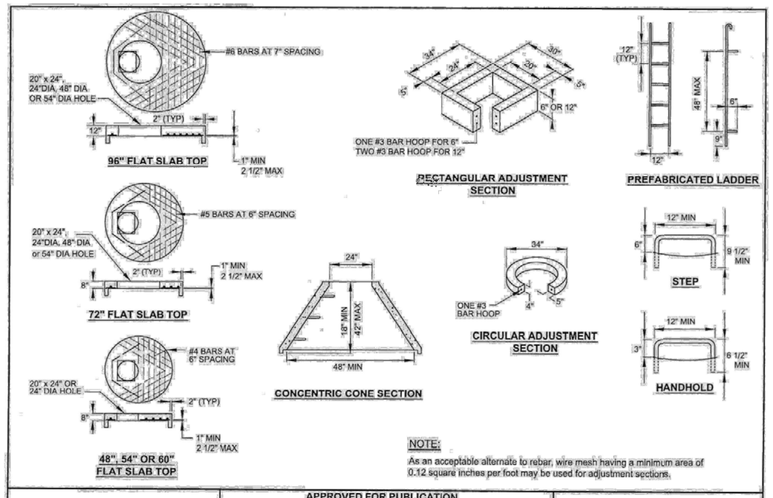
NOTES

1. For details showing grade ring, ladder, steps, handholds and top slabs, see Standard Plan No. SU-21.
2. Non-reinforced concrete in channel and shelf shall be Class 3000. All precast concrete shall be Class 4000.
3. Rubber gaskets shall be used in tongue and groove joints of pre-cast sections.
4. A flexible pipe-to-manhole connector shall be employed in all connections of rigid and flexible pipes to new precast concrete manholes. The connector shall be "Kor-N-Seal" with "Wedge Korband" manufactured by NPC, Inc., or approved equal.
5. Base reinforcing steel shall be per manufacturer's recommendation.

MANHOLE DIMENSION TABLE

INSIDE DIAMETER	MINIMUM WALL THICKNESS	MINIMUM BASE THICKNESS	MAXIMUM HOLE SIZE	MINIMUM DISTANCE BETWEEN HOLES
48"	4"	6"	36"	8"
54"	4 ½"	8"	42"	8"
60"	5"	8"	48"	8"

REVIEWED BY			APPROVED FOR PUBLICATION	CITY OF TACOMA
EWI PUBLIC WORKS	EWI ENVIRONMENTAL SERVICES			MANHOLE - TYPE 1 48", 54", AND 60"
NR TACOMA POWER	TACOMA WATER		Signed by: Ramiro Chavez, P.E. Pgm. 09/15/2025 CITY ENGINEER DATE	STANDARD PLAN NO. SU-17



NOTE:
As an acceptable alternate to rebar, wire mesh having a minimum area of 0.12 square inches per foot may be used for adjustment sections.

CITY OF TACOMA DEPARTMENT OF PUBLIC WORKS	APPROVED FOR PUBLICATION	MISCELLANEOUS DETAILS FOR MANHOLES AND CATCH BASINS
	James Perry 12 Jan 2009 CITY ENGINEER DATE	STANDARD PLAN NO. SU-21

COMPACTION TESTING REQUIREMENTS [A]		
DEPTH	TESTING FREQUENCY [C]	
	VERTICAL	HORIZONTAL
SURFACE (BELOW HMA)	N/A	1 TEST EVERY 150 LINEAR FEET OF TRENCH OR MINIMUM 2 PER TRENCH
		1 TEST FOR 150 SQUARE FEET FOR ISOLATED PATCHES [B]
1 TO 4 FEET (OR MIN 18 IN. ABOVE PIPE)	1 EVERY 12 INCHES	SAME AS FOR SURFACE
> 4 FEET TO BOTTOM OF TRENCH	NO SPECIFIC REQUIREMENT - MAY BE REQUIRED BY COT INSPECTOR FOR VERIFICATION OF COMPACTION	

A. TESTING SHALL BE PERFORMED BY A CERTIFIED INDEPENDENT TESTING LABORATORY OR A CERTIFIED TESTOR AS APPROVED BY THE CITY'S CONSTRUCTION DIVISION. THE COST OF TESTING IS THE RESPONSIBILITY OF THE PERMITTEE. TESTS SHALL BE COMPLETED AND REPORTS IDENTIFYING THE PROJECT NUMBER SUBMITTED TO THE CONSTRUCTION DIVISION WITHIN 48 HOURS OF TESTS.
B. ONLY ONE COMPACTION TEST WILL BE REQUIRED FOR MULTIPLE TRENCHES WITHIN A 150 SF AREA PROVIDED COMPACTION PROCEDURES ARE THE SAME.
C. EACH LIFT SHALL BE COMPACTED TO 95% MODIFIED PROCTOR DENSITY, AS VERIFIED BY COMPACTION TESTING, BEFORE PROCEEDING TO THE NEXT LIFT. COT INSPECTOR MAY REQUIRE EXCAVATION AND REMOVAL OF SOIL WHERE COMPACTION IS IN QUESTION.

NOTES:

1. Compact backfill material in max. 12 in. lifts. Compact backfill material to 95% max. modified proctor density (ASTM 1557) except directly over pipe, hand tamp only.
2. Native backfill will require laboratory testing to determine max. modified proctor density. Imported backfill will require submittal of proctor test results from supplier.
3. See WSDOT Standard Specification Section 2-09.3(1)E for material requirements on "Controlled Density Fill" (CDF). CDF may be used for trenches less than 24 in. wide or as approved by the City Engineer. CDF shall be vibrated/compacted.

CITY OF TACOMA DEPARTMENT OF PUBLIC WORKS	APPROVED FOR PUBLICATION	TRENCH BACKFILL COMPACTION REQUIREMENTS
	11/3/16 CITY ENGINEER DATE	STANDARD PLAN NO. SU-28

TYPE		Heavy Haul Industrial Corridors	Port Area Arterials	Non-classified Port-Area Roadways	Primary Transit Streets	Principal Arterials	Minor Arterials	Collector Arterials	Nonclassified Arterials and Commercial Alleys	Residential	Residential Alleys	Shared use Paths and Trails
AASHTO Flexible Pavement Design Standards	Tacoma Municipal Code Ref.	11.55.020.C	11.05.490, 13.10	13.10	11.05.492	11.05.490	11.05.490	11.05.490	11.05.490			
	Initial ADT	30,000	20,000	10,000	30,000	30,000	20,000	15,000	10,000	2,000	500	100
	% ADT, Truck	30	30	30	8	8	8	5	5	5	5	1
	% ADT, Bus	0	0	0	5	1	1	1	1	0	0	0
	GROWTH RATE (compound)	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5
	Assumed CBR	1	1	1	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
	Assumed Mr	2,555	2,555	2,555	6,690	6,690	6,690	6,690	6,690	6,690	6,690	6,690
	Lanes in Design Direction	2	1	1	2	2	1	1	1	1	1	1
	Percent Trucks, Design Direction	50	50	50	50	50	50	50	50	100	100	100
	Percent Trucks, Design Lane	80	100	100	80	80	100	100	100	100	100	100
	DESIGN EAL	26,367,108	21,972,588	10,986,294	8,430,756	5,878,017	4,898,348	2,445,675	1,364,540	994,831	49,365	4,087
	Reliability, R%	95%	95%	90%	95%	95%	90%	90%	85%	85%	80%	80%
	Deviation, S_o	0.45	0.45	0.45	0.45	0.45	0.45	0.45	0.45	0.45	0.45	0.45
	Initial Serviceability, P_i	4.20	4.20	4.20	4.20	4.20	4.20	4.20	4.20	4.20	4.20	4.20
	Terminal Serviceability, P_t	2.5	2.5	2.4	3	3	2.7	2.5	2.4	2.3	2.2	2.2
	Δ PSI	1.70	1.70	1.80	1.20	1.20	1.50	1.70	1.80	1.90	2.00	2.00
	Design SN	8.19	8.12	6.89	5.89	5.6	4.81	4.18	3.58	3.41	2.03	1.3

Refer to PD-01 Sheet 2 for pavement design sections and notes.

REVIEWED BY			APPROVED FOR PUBLICATION	CITY OF TACOMA PAVEMENT DESIGN STANDARDS
DCS PUBLIC WORKS	GMS ENVIRONMENTAL SERVICES			SHEET 1 OF 2
NA TACOMA POWER	NA TACOMA WATER		9/4/12 CITY ENGINEER DATE	STANDARD PLAN NO. PD-01

TYPE		Heavy Haul Industrial Corridors	Port Area Arterials	Non-classified Port-Area Roadways	Primary Transit Streets	Principal Arterials	Minor Arterials	Collector Arterials	Nonclassified Arterials and Commercial Alleys	Residential	Residential Alleys	Shared use Paths and Trails
Standard Asphalt Pavement Section	HMA	10	10	8	8	8	6	6	5	4	2	2
	CSTC	2	2	2	2	2	2	2	2	2	2	2
	CSBC	26	24	22	16	14	14	9	8	10	6	2
Minimum Asphalt Pavement Section with Approved Design	HMA	8	8	6	6	6	6	4	4	3	2	2
	CSTC	2	2	2	2	2	2	2	2	2	2	2
	CSBC	10	10	10	8	6	6	6	6	5	4	2
Minimum Concrete Pavement Section with Approved Design		*Concrete Streets are allowed with approved supporting design.*										
	PCC	10	10	8	10	10	10	8	8	8	8	4
	CSBC	2	2	2	2	2	2	2	2	2	2	2
Standard Porous Asphalt Pavement Section	HMA	NA	NA	Note 6	Note 6	Note 6	Note 6	Note 6	Note 6	4	2	3
	ATPB			Note 6	Note 6	Note 6	Note 6	Note 6	Note 6	4	3	0
	Permeable Base			Note 6	Note 6	Note 6	Note 6	Note 6	Note 6	6 (Note 7)	4 (Note 7)	4 (Note 7)
Minimum Porous Asphalt Pavement Section with Approved Design	HMA	NA	NA	Note 6	Note 6	Note 6	Note 6	Note 6	Note 6	2	2	3
	ATPB			Note 6	Note 6	Note 6	Note 6	Note 6	Note 6	3	3	0
	Permeable Base			Note 6	Note 6	Note 6	Note 6	Note 6	Note 6	6 (Note 7)	6 (Note 7)	4 (Note 7)
Minimum Pervious Concrete Section	PCPC	NA	NA	Note 6	Note 6	Note 6	Note 6	Note 6	Note 6	8	7	7
	Permeable Base			Note 6	Note 6	Note 6	Note 6	Note 6	Note 6	4 (Note 7)	4 (Note 7)	4 (Note 7)

NOTES:

1 Standard Pavement Section shall be used when no custom design is provided
2 Minimum Pavement Sections are the minimum acceptable pavement sections for custom designs
3 Refer to the City of Tacoma Design Manual for additional road design information.
4 Pavement sections for other facilities, such as parking lots, shall be substantiated by geotechnical analyses and design documentation.
5 Pavement design for State routes shall be determined by the Washington State Department of Transportation.
6 Contact Public Works Engineering to discuss acceptability and requirements for specific projects. Design required if acceptable.
7 Minimum Structural Values, Hydrological Properties may require a thicker base.
8 Permeable pavement shall be designed or reviewed by a geotechnical professional. All custom designs shall be stamped by a Washington State licensed professional engineer. Calculations showing the required permeable ballast thickness necessary for stormwater control is required for all permeable pavement projects. Refer to the City of Tacoma Stormwater Management Manual.

NA = Not Allowed

REVIEWED BY			APPROVED FOR PUBLICATION	CITY OF TACOMA PAVEMENT DESIGN STANDARDS
DCS PUBLIC WORKS	GMS ENVIRONMENTAL SERVICES			SHEET 2 OF 2
NA TACOMA POWER	NA TACOMA WATER		9/4/12 CITY ENGINEER DATE	STANDARD PLAN NO. PD-01

30% DESIGN REVIEW

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http://www.sittshill.com/

PREPARED FOR
Port of Tacoma
P.O. BOX 1837 TACOMA, WA 98401 (253)383-5841

Tacoma

NO	REVISION	DATE	APPD

FINAL CONSTRUCTION CHECKED BY
DATE
FIELD BOOKS

DATE 11/18/25 | SCALE AS NOTED
DESIGNED DCD | CHECKED DCD
DRAWN KNL | FILE NAME C4.01

DONALD C. DAVIES 48449 REGISTERED PROFESSIONAL ENGINEER STATE OF WASHINGTON
PRELIMINARY

CITY OF TACOMA
DEPARTMENT OF PUBLIC WORKS
ENVIRONMENTAL SERVICES SCIENCE & ENGINEERING

PORT OF TACOMA
PARCEL 117 SNAIL ERADICATION
PROJECT DETAILS

-- | 20618
SHEET NO. C4.01
SHEET 24 OF 24

Vineyard Snail Eradication Area BMPs by Construction Step & Zone

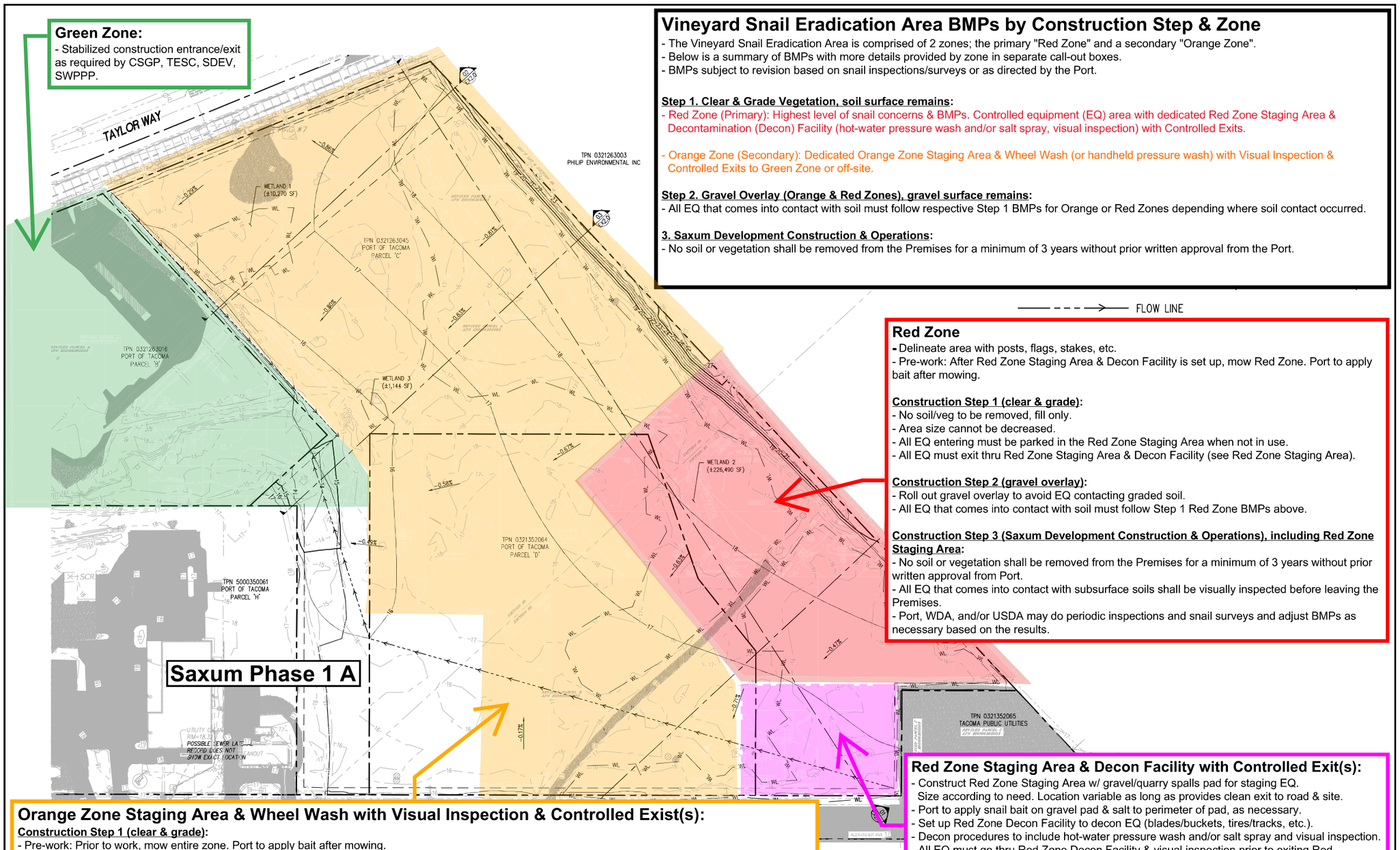
- The Vineyard Snail Eradication Area is comprised of 2 zones; the primary "Red Zone" and a secondary "Orange Zone".
- Below is a summary of BMPs with more details provided by zone in separate call-out boxes.
- BMPs subject to revision based on snail inspections/surveys or as directed by the Port.

Step 1. Clear & Grade Vegetation, soil surface remains:
- Red Zone (Primary): Highest level of snail concerns & BMPs. Controlled equipment (EQ) area with dedicated Red Zone Staging Area & Decontamination (Decon) Facility (hot-water pressure wash and/or salt spray, visual inspection) with Controlled Exits.

- Orange Zone (Secondary): Dedicated Orange Zone Staging Area & Wheel Wash (or handheld pressure wash) with Visual Inspection & Controlled Exits to Green Zone or off-site.

Step 2. Gravel Overlay (Orange & Red Zones), gravel surface remains:
- All EQ that comes into contact with soil must follow respective Step 1 BMPs for Orange or Red Zones depending where soil contact occurred.

3. Saxum Development Construction & Operations:
- No soil or vegetation shall be removed from the Premises for a minimum of 3 years without prior written approval from the Port.



Red Zone

- Delineate area with posts, flags, stakes, etc.
- Pre-work: After Red Zone Staging Area & Decon Facility is set up, mow Red Zone. Port to apply bait after mowing.

Construction Step 1 (clear & grade):
- No soil/veg to be removed, fill only.
- Area size cannot be decreased.
- All EQ entering must be parked in the Red Zone Staging Area when not in use.
- All EQ must exit thru Red Zone Staging Area & Decon Facility (see Red Zone Staging Area).

Construction Step 2 (gravel overlay):
- Roll out gravel overlay to avoid EQ contacting graded soil.
- All EQ that comes into contact with soil must follow Step 1 Red Zone BMPs above.

Construction Step 3 (Saxum Development Construction & Operations), including Red Zone Staging Area:
- No soil or vegetation shall be removed from the Premises for a minimum of 3 years without prior written approval from Port.
- All EQ that comes into contact with subsurface soils shall be visually inspected before leaving the Premises.
- Port, WDA, and/or USDA may do periodic inspections and snail surveys and adjust BMPs as necessary based on the results.

Red Zone Staging Area & Decon Facility with Controlled Exit(s):

- Construct Red Zone Staging Area w/ gravel/quarry spalls pad for staging EQ. Size according to need. Location variable as long as provides clean exit to road & site.
- Port to apply snail bait on gravel pad & salt to perimeter of pad, as necessary.
- Set up Red Zone Decon Facility to decon EQ (blades/buckets, tires/tracks, etc.).
- Decon procedures to include hot-water pressure wash and/or salt spray and visual inspection.
- All EQ must go thru Red Zone Decon Facility & visual inspection prior to exiting Red Zone to the rest of the site or offsite.
- Maintain Red Zone Staging Area, Decon Facility & Controlled Exits until Red Zone is completely covered with gravel & Port approves discontinuing them.

Orange Zone Staging Area & Wheel Wash with Visual Inspection & Controlled Exist(s):

Construction Step 1 (clear & grade):
- Pre-work: Prior to work, mow entire zone. Port to apply bait after mowing.
- Construct Orange Zone Staging Area with gravel/quarry spalls for staging EQ when not in use. Size according to need. Location variable as long as it provides decontaminated "clean" exit to road & rest of site (Green Zone) and away from east end (tree area & Red Zone).
- Port to apply snail bait on gravel pad & salt to perimeter of pad, as necessary.
- Set up Orange Zone Wheel Wash (or handheld pressure washer) with Visual Inspections & Controlled Exits to Green Zone or offsite.
- Any EQ that comes into contact with soil (non-gravel) must go through Orange Zone Wheel Wash & Inspection before exiting Orange Zone.

Construction Step 2 (gravel overlay):
- Any EQ that comes into contact with soil (non-gravel) must go through Orange Zone Wheel Wash & Inspection before leaving Orange Zone.
- EQ including dump trucks should minimize contact with soils by driving on gravel haul roads and/or gravel overlay surface.
- Maintain Orange Zone Staging Area, Wheel Wash & Controlled Exits until Orange Zone is completely covered with gravel & Port approves discontinuing them.

Construction Step 3 (Saxum Development Construction & Operations):
- No vegetation or soil shall be removed from the Premises for a minimum of 3 years without prior written approval from the Port.
- All equipment that comes into contact with subsurface soils shall be visually inspected before leaving the Premises.
- Port, WDA, and/or USDA may do periodic inspections and snail surveys and adjust BMPs as necessary based on the results.

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