

4207 West Mercer Way: Drainage Memorandum

Vaney-Shinde Residence

Owner:

Rahul Shinde and Pashmi Vaney
4207 West Mercer Way
Mercer Island, WA 98040

Prepared by:

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May 26, 2020
Project No. 20016

A) PROJECT DESCRIPTION

The proposed improvements consist of the construction of a new rectory (house) on the southeast corner of the Episcopal Church property. See aerial photo (Figure 1) below:



Figure 1 - Project Location

Project Address:

4207 West Mercer Way
Mercer Island, WA 98040

Area of New Impervious Surfacing

The following table summarizes the area of the new impervious surfacing for the project. The areas are shown on the construction drawings (Appendix B).

<u>Proposed Impervious Area:</u>			
Roof		2,493	sf
Entry Driveway		826	sf
Entry Walkway		166	sf
	Total New Impervious:	3,485	sf

B) EXISTING DRAINAGE AND SOILS

The site drains southwest to an existing swale in the ravine below the house which ultimately drains to Lake Washington. Based on the USGS Soils map, the site is predominantly underlain by Kitsap silt loam (KpD) soils (see map below) which is a Type D soil. A small portion at the north end of the site is mapped as KpB which is the same material as KpD, but it is characterized by flatter slopes. The flatter areas at the north end of the site appear to have been created by grading for the roadway and building pad, so the current condition does not reflect the underlying or original soil classification. The Type D classification has been used for sizing the proposed detention facility.

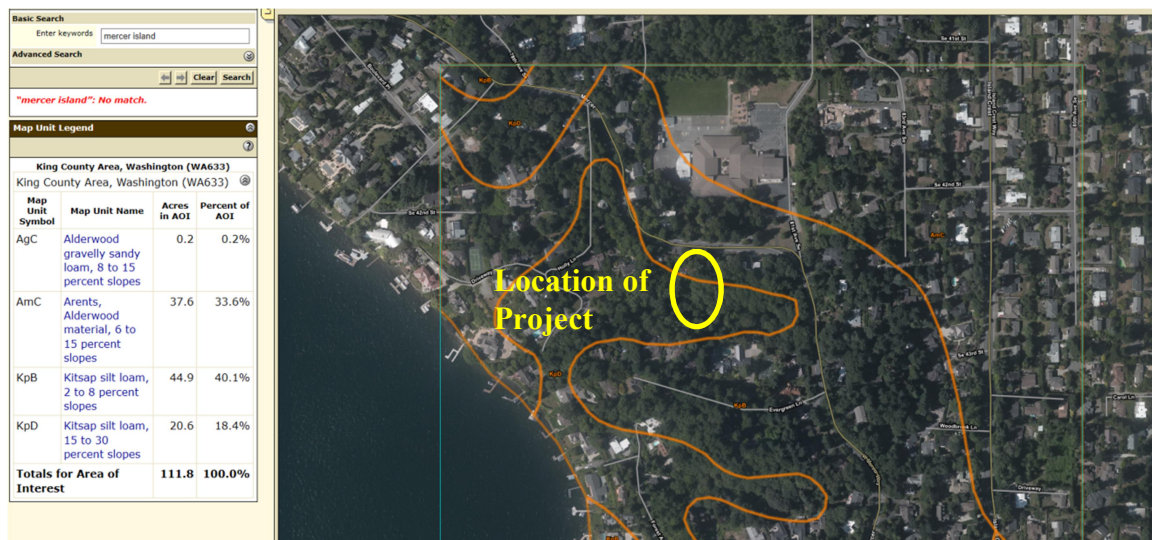


Figure 2 – Soils Map

C) DETENTION VOLUME

The detention volume is based on the City of Mercer Island Development Services Group On-site Detention Design requirements as outlined in the Detention Requirements updated January 26, 2018. In accordance with the requirements, On-site Detention is required as follows:

to be infeasible for roofs and/or other hard surfaces.

Is On-site Detention Required For My Project?

YES, if my project:

- 1) Results in 2,000 square feet, or greater, of new plus replaced hard surface area, or
- 2) Has a land disturbing activity or 7,000 square feet or greater, or
- 3) Results in a **net increase** of impervious surface of 500 square feet or greater.

AND

- 1) All of the on-site stormwater BMPs included on List #1 and List #2 are determined to be infeasible for roofs and/or other hard surfaces, and
- 2) Drainage from the site will be discharged to a storm and surface water system that includes a watercourse or there is a capacity constraint in the system.

The project results in more than 2,000 sf of new and replaced impervious and due to the steep slopes, on-site storm water BMPs are not feasible. The site also drains to a water course so On-site Detention is required for the project.

The On-site Detention was sized using Table 1 in the Requirements Handout as shown below. Type C soils were selected as noted in Section B, above with the detention tank size and orifices circled in cyan.

Table 1

ON-SITE DETENTION DESIGN FOR PROJECTS BETWEEN 500 SF AND 9,500 SF NEW PLUS REPLACED IMPERVIOUS SURFACE AREA

New and Replaced Impervious Surface Area (sf)	Detention Pipe Diameter (in)	Detention Pipe Length (ft)		Lowest Orifice Diameter (in) ^(B)		Distance from Outlet Invert to Second Orifice (ft)		Second Orifice Diameter (in)	
		B soils	C soils	B soils	C soils	B soils	C soils	B soils	C soils
500 to 1,000 sf	36"	30	22	0.5	0.5	2.2	2.0	0.5	0.8
	48"	18	11	0.5	0.5	3.3	3.2	0.9	0.8
	60"	11	7	0.5	0.5	4.2	3.4	0.5	0.6
1,001 to 2,000 sf	36"	66	43	0.5	0.5	2.2	2.3	0.9	1.4
	48"	34	23	0.5	0.5	3.2	3.3	0.9	1.2
	60"	22	14	0.5	0.5	4.3	3.6	0.9	0.9
2,001 to 3,000 sf	36"	90	66	0.5	0.5	2.2	2.4	0.9	1.9
	48"	48	36	0.5	0.5	3.1	2.8	0.9	1.5
	60"	30	20	0.5	0.5	4.2	3.7	0.9	1.1
3,001 to 4,000 sf	36"	120	78	0.5	0.5	2.4	2.2	1.4	1.6
	48"	62	42	0.5	0.5	2.8	2.9	0.8	1.3
	60"	42	26	0.5	0.5	3.8	3.9	0.9	1.3
4,001 to 5,000 sf	36"	134	91	0.5	0.5	2.8	2.2	1.7	1.5
	48"	73	49	0.5	0.5	3.6	2.9	1.6	1.5
	60"	46	31	0.5	0.5	4.6	3.5	1.6	1.3
5,001 to 6,000 sf	36"	162	109	0.5	0.5	2.7	2.2	1.8	1.6
	48"	90	59	0.5	0.5	3.5	2.9	1.7	1.5
	60"	54	37	0.5	0.5	4.6	3.6	1.6	1.4

The following table shows the elevations of the orifices and riser based on the Table 1 criteria. The plans in Appendix B include Attachment 1 (City of Mercer Island detention tank template) which includes the elevation and orifice data. The drawing has also been edited to include additional pipe requirement for a “watertight” material due to the location relative to the slope below.

Orifice Size and Height/Elevation:			
	<u>Diameter</u>	Distance above Outlet (ft)	Elevation of Orifice
Second Orifice:	1.3 inches	2.9	204.90
Lowest Orifice	0.50 inches	0.0	202.00
Top of Riser			206.00

D) **OUTFALL PIPING**

The proposed Detention Tank outfall is HDPE solid wall pipe that will be installed on the surface to convey stormwater to the base of the ravine and discharge into the existing drainage course. Although the release rate of the Detention Tank is very low, the outfall piping was sized for a 100 year flow rate using the Rational Method. The runoff calculations are shown in Appendix A.

The outfall pipe strength (DR 9) was selected based on the criteria of supporting the pipe by gravity anchor at the top of the slope. The three main aspects of sizing the outfall are 1) size of the gravity anchor block, selecting the wall thickness to withstand the maximum water pressure in the pipe and selecting the wall thickness to support the weight of the pipe and contents. For all three aspects, the pipe is assumed to be full of water and any other restraining forces such as friction along the soil or soil on the slope supporting a portion of the weight are neglected. There are no pipe anchors other than the gravity anchor at the top of the slope on the north side of the house.

The calculations show the weight of the pipe full of water is on the order of 1,700 lb and the concrete block (3' x 2' x 2') is approximately 1,900 lb which provides a factor of safety of over 1.1. This is accepted because of all of the other factors such as skin friction, distribution of the weight along the pipe, weight of the CB, etc. which provide additional factors of safety toward restraining the pipe. The maximum internal pressure is calculated at 50 psi based on the hydrostatic pressure of the pipe full of water which is much less than the 250 psi rating on the pipe.

The maximum tensile force on the pipe from the weight of the pipe full of water is calculated at 226 psi which is less than the rating of the pipe (250 psi) with a sidewall thickness of DR 9. Pipe anchors are not intended because if there is any ground moving or sloughing in the area, the pipe is expected to remain in place and the soil to move below it. Anchors would add the force of the soil to the pipe which could create significant and potentially destructive stress on the pipe.

A copy of these calculations are included in Appendix A.

Appendix A

Pipe and Anchor Sizing Calculations

Vaney Shinde Residence

4207 West Mercer Way

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Runoff Calculations: Check 100-yr Flow w/ Rational Method

Total Drainage Area: 4,500 square feet

Rational Method: $Q=c*I*A$

	C	Area (ft ²)
Pervious Area	0.25	500

Total Impervious Area	0.90	4,000
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Total Area (square feet)	4,500 SF
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Area (A, acres):	0.10 AC
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Average C (coeff. Of runoff)	0.83
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P_R (total precipitation)	3.7 inches
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Assume T_c :	6.3 min.	(minimum time)
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$R =$	100 years
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$a_R =$	2.61	From Renton/Seattle I.D.F. Curves and King County Design Manual Table 3.2.1.B
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$b_R =$	0.63
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i_R (rainfall intensity factor)	0.82 based on $i_R = a_R \times T_c^{(-b_R)}$
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I_R (rainfall intensity)	3.03 (in/hr)
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Q =	0.26 cfs
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Pipe Sizing Calculations:

Using Hazen & Williams, roughness:	0.01
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Pipe Diameter	3.67
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Slope (percent)	20.0
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Pipe Capacity:	2.08 cfs	Okay
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Anchor Block Sizing: **Driscoplex 4000 (DIPS), DR 9**

Pipe Weight:

Length	lb/ft	Total Wt (lb)
220	3.13	688.6

Weight of Water:

Length	I.D. (in.)	Density (lb/cf)	Total Wt. (lb)
220	3.67	62.4	1008

Total Weight of Pipe and Water : 1697 lb

Size Concrete Anchor:

Length	Width	Depth	Density (lb/cf)	Total Weight
3	2	2	160	1920 lb

Additional FS due to force of soil against block, friction of pipe on soil and reduced load due to pipe on incline (not all of weight hanging from anchor).

Pipe Thickness Sizing:

Max. Pressure in Pipe:

Note: Neglect weight of pipe and water due to same assumptions noted above - load on incline and friction of pipe on soil, etc.

Assume Max. Pressure due to pipe filled with water - static pressure at base of hill.

Internal Pressure of Fluid:

Vertical Difference:	112 ft
Max. Pressure:	48.5 psi
Pipe Pressure Rating:	250 psi

Okay

Tensile Force Due to Weight of Pipe and Fluid:

Max. Suspended Length = 220 ft

Pipe Weight:

Length	lb/ft	Total Wt (lb)
220	3.13	688.6

Weight of Water:

Length	I.D. (in.)	Density (lb/cf)	Total Wt. (lb)
220	3.67	62.4	1008

Total Weight = 1697 lb

I.D. (in.) = 3.67

O.D. (in.) = 4.8

Area of HDPE (sq. in): 7.52

Max. Tensile Force at Top of Bank = 225.76 psi

Pipe Pressure Rating: 250 psi

Okay

Appendix B

Permit Drawings

GENERAL NOTES

- ALL WORK AND MATERIALS SHALL BE IN ACCORDANCE WITH THE LATEST EDITION OF THE CITY OF MERCER ISLAND STANDARD SPECIFICATIONS, AND WSDOT/APWA STANDARD SPECIFICATIONS, LATEST EDITION. THE CITY OF MERCER ISLAND RESERVES THE RIGHT TO REJECT ANY DAMAGED AND/OR NON-COMPLIANT CONSTRUCTION MATERIAL.
- PRIOR TO ANY CONSTRUCTION ACTIVITY, THE CONTRACTOR SHALL SCHEDULE AND ATTEND A PRE-CONSTRUCTION CONFERENCE WITH THE CITY OF MERCER ISLAND CONSTRUCTION INSPECTION PERSONNEL.
- AN APPROVED PLAN SET MUST BE ON THE JOB SITE WHENEVER CONSTRUCTION IS IN PROGRESS.
- ALL SITE WORK IMPROVEMENTS SHALL BE CONSTRUCTED TO OBTAIN STREET USE AND ANY OTHER RELATED PERMITS PRIOR TO ANY CONSTRUCTION ACTIVITY.
- IT SHALL BE THE SOLE RESPONSIBILITY OF THE CONTRACTOR TO OBTAIN STREET USE AND ANY OTHER RELATED PERMITS PRIOR TO ANY CONSTRUCTION ACTIVITY.
- ANY APPROVED CUTS OF EXISTING PUBLIC ROADWAYS SHALL BE BACK FILLED AND COMPACTED IN ACCORDANCE WITH CITY OF MERCER ISLAND STANDARDS. ALL CUTS INTO EXISTING ASPHALT SHALL BE ALONG NEAT, CONTINUOUS, SAWED, OR WHEEL CUT LINES. A TEMPORARY COLD MIX PATCH MUST BE PLACED IMMEDIATELY AFTER BACKFILL AND COMPACTION. THIS EXISTING ROAD CUT SHALL BE REPLACED WITH AT LEAST THREE (3) INCHES OF COMPACTED CL "B" ASPHALT CONCRETE, SIX (6) INCH CRUSHED ROCK SURFACING TOP COURSE (5/8 INCH MINUS), AS REQUIRED DEPENDENT UPON A SOILS ENGINEER'S RECOMMENDATION AND TESTS. IN NO CASE SHALL THE REPLACEMENT BE LESS THAN THE EXISTING SECTION.
- PAVED SURFACES INCLUDING ROADWAYS, SIDEWALKS, AND CURBS THAT ARE DAMAGED BY NEW CONSTRUCTION SHALL BE REPAIRED AS REQUIRED BY THE CITY OF MERCER ISLAND INSPECTOR.
- ALL LOCATIONS OF EXISTING UTILITIES SHOWN HEREON HAVE BEEN ESTABLISHED BY FIELD SURVEY OR OBTAINED FROM AVAILABLE RECORDS AND SHOULD THEREFORE BE CONSIDERED APPROXIMATE ONLY AND NOT NECESSARILY COMPLETE. IT IS THE SOLE RESPONSIBILITY OF THE CONTRACTOR TO INDEPENDENTLY VERIFY THE ACCURACY OF ALL UTILITY LOCATIONS SHOWN AND TO FURTHER DISCOVER AND AVOID ANY OTHER UTILITIES NOT SHOWN HEREON WHICH MAY BE AFFECTED BY THE IMPLEMENTATION OF THIS PLAN.
- THE CONTRACTOR SHALL LOCATE AND PROTECT ALL CASTINGS AND UTILITIES DURING CONSTRUCTION AND SHALL CONTACT THE UNDERGROUND UTILITIES LOCATOR SERVICE (1-800-424-5555) AT LEAST 48 HOURS PRIOR TO CONSTRUCTION.
- THE CONTRACTOR SHALL ADJUST ALL EXISTING MANHOLE RIMS, DRAINAGE STRUCTURE LIDS, VALVE BOXES, AND UTILITY ACCESS STRUCTURES TO FINISH GRADE WITHIN AREAS AFFECTED BY THE PROPOSED IMPROVEMENTS.
- UTILITY SERVICE CONNECTIONS SHOWN ON THIS PLAN ARE TO BE MAINTAINED PRIVATELY AND NOT BY THE CITY MERCER ISLAND.
- THE CONTRACTOR SHALL PROVIDE AND MAINTAIN TEMPORARY SEDIMENTATION COLLECTION FACILITIES TO ENSURE THAT SEDIMENT-LADEN WATER DOES NOT ENTER THE NATURAL OR PUBLIC DRAINAGE SYSTEM. AS CONSTRUCTION PROGRESSES AND UNEXPECTED (SEASONAL) CONDITIONS DICTATE, MORE SILTATION CONTROL FACILITIES MAY BE REQUIRED TO INSURE COMPLETE SILTATION CONTROL OF THE PROJECT. THEREFORE, DURING THE COURSE OF CONSTRUCTION IT SHALL BE THE OBLIGATION AND RESPONSIBILITY OF THE CONTRACTOR TO ADDRESS ANY NEW CONDITIONS THAT MAY BE CREATED BY HIS ACTIVITIES AND TO PROVIDE ADDITIONAL FACILITIES THAT MAY BE NEEDED TO PROTECT ADJACENT PROPERTIES.
- THE CONTRACTOR SHALL KEEP OFF-SITE STREETS CLEAN AT ALL TIMES BY SWEEPING. WASHING OF THESE STREETS WILL NOT BE ALLOWED WITHOUT PRIOR CITY OF MERCER ISLAND APPROVAL.
- ALL TRAFFIC CONTROL SHALL BE IN ACCORDANCE WITH THE TRAFFIC CONTROL MANUAL.
- CARE SHALL BE EXERCISED WHEN EXCAVATING NEAR EXISTING CHARGED WATER MAINS.

SURVEY NOTE:

UNDERGROUND UTILITIES AND EXISTING IMPROVEMENTS SHOWN ARE BASED UPON THE SURVEY "TOPOGRAPHIC AND BOUNDARY SURVEY, 4207 W. MERCER WAY, BY GOEDIMENSIONS, DATED JANUARY 26, 2007 AND RECORD DRAWINGS. NO WARRANTY OR GUARANTEE OF ACCURACY OR COMPLETENESS IS EITHER IMPLIED OR EXPRESSED. EXISTING UNDERGROUND UTILITIES AND IMPROVEMENTS HAVE BEEN SHOWN ON THIS DRAWING FOR THE PURPOSE OF ASSISTING THE CONTRACTOR IN LOCATING SAID UTILITIES AND IMPROVEMENTS IN THE FIELD. THE CONTRACTOR SHALL BE RESPONSIBLE FOR CHECKING WITH APPROPRIATE AGENCIES THAT MAY HAVE UNDERGROUND UTILITIES AND IMPROVEMENTS WITHIN THE PROJECT LIMITS AND FOR CHECKING LOCATIONS IN THE FIELD. THE CONTRACTOR SHALL BE SOLELY RESPONSIBLE FOR ANY AND ALL DAMAGE TO UNDERGROUND UTILITIES AND IMPROVEMENTS RESULTING FROM HIS OPERATION.

VERTICAL DATUM

PER SURVEY, CITY OF MERCER ISLAND BENCH MARK (NAVD 88) FOUND 1" BRASS NAIL IN CONC.(DN 0.95) LOCATED 30 FT EAST DRIVEWAY #8005, EVERGREEN LANE.

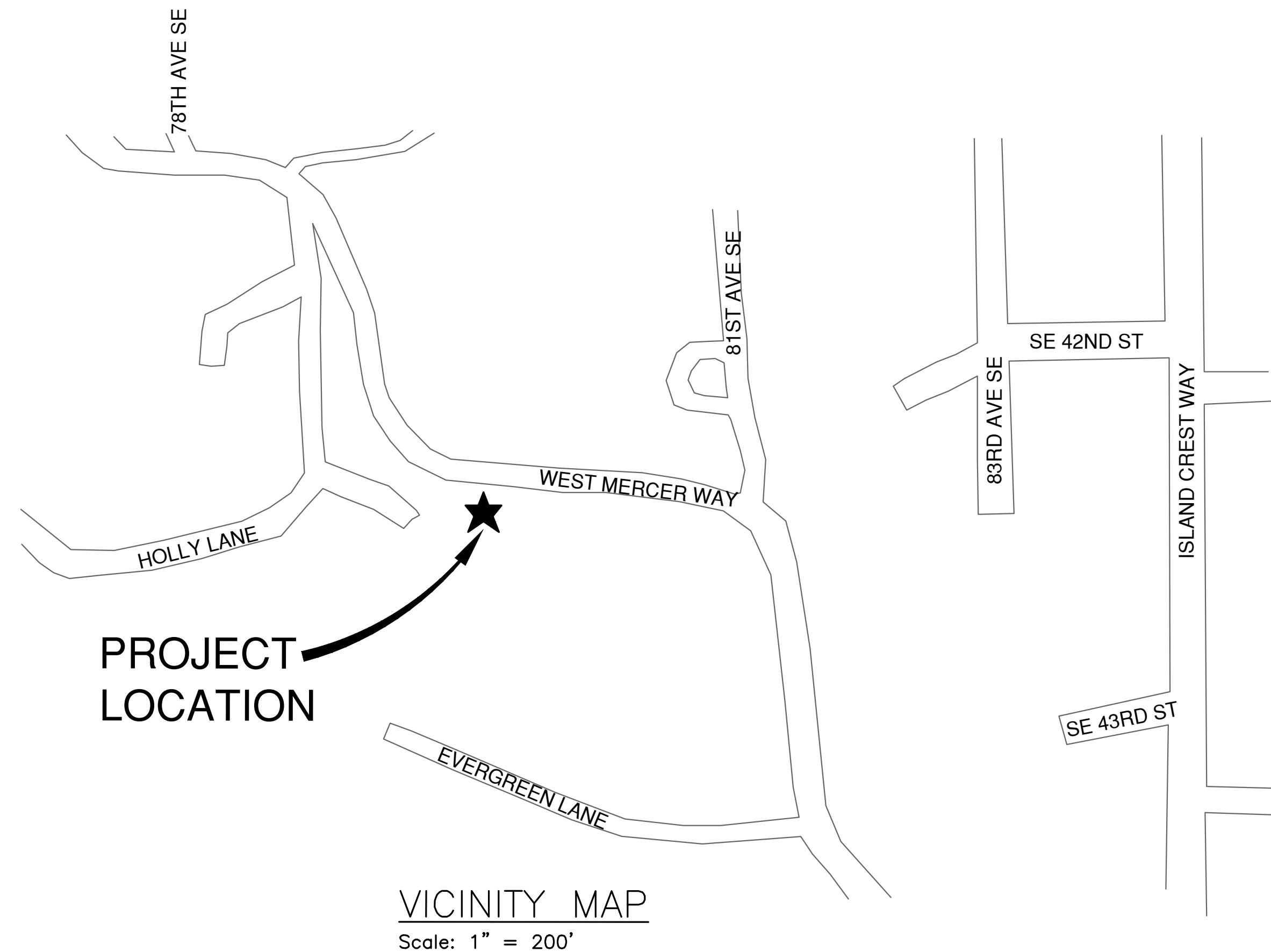
ELEVATION ON NAIL = 141.19'

GENERAL DRAINAGE NOTES

- ALL WORK AND MATERIALS SHALL BE IN ACCORDANCE WITH THE LATEST EDITION OF THE CITY OF MERCER ISLAND STANDARD SPECIFICATIONS AND WSDOT/APWA STANDARD SPECIFICATIONS, LATEST EDITION AND THE REQUIREMENTS OF THE DEPARTMENT OF ECOLOGY STORMWATER MANAGEMENT MANUAL FOR WESTERN WASHINGTON.
- PRIOR TO ANY CONSTRUCTION ACTIVITY, THE CONTRACTOR SHALL SCHEDULE AND ATTEND A PRE-CONSTRUCTION CONFERENCE WITH CITY OF MERCER ISLAND CONSTRUCTION INSPECTION PERSONNEL.
- ALL STORM DRAINAGE IMPROVEMENTS SHALL BE CONSTRUCTED IN ACCORDANCE WITH THESE APPROVED PLANS. ANY DEVIATION FROM THESE PLANS WILL REQUIRE APPROVAL FROM THE OWNER, ENGINEER AND APPROPRIATE PUBLIC AGENCIES.
- IT SHALL BE THE SOLE RESPONSIBILITY OF THE CONTRACTOR TO OBTAIN STREET USE AND ANY OTHER RELATED PERMITS PRIOR TO ANY CONSTRUCTION ACTIVITY.
- ALL STORM DRAIN PIPE MAY BE CONSTRUCTED OF ONE OF THE FOLLOWING MATERIALS UNLESS OTHERWISE SPECIFIED IN THE PLANS. ALL PIPE JOINTS MUST BE GASKETED WATERTIGHT AND MUST BE OF THE SAME MATERIAL AS THE PIPE. ALL PIPE SHALL HAVE A MINIMUM COVER AS SPECIFIED AND SHALL BE ADEQUATELY PROTECTED DURING CONSTRUCTION (REFER TO THE MANUFACTURE'S RECOMMENDATIONS FOR MINIMUM COVER FOR HEAVY EQUIPMENT LOADINGS). THE CITY OF MERCER ISLAND PUBLIC WORKS DEPARTMENT SHALL EXERCISE THE OPTION TO ACCEPT OR REJECT ALL DAMAGED OR NON-COMPLIANT CONSTRUCTION MATERIAL. THE CONTRACTOR/DEVELOPER SHALL BE RESPONSIBLE FOR ALL COSTS ASSOCIATED WITH REJECTED OR SUBSTITUTED CONSTRUCTION MATERIAL.
- PIPE SHALL BE AS FOLLOWS: PVC - FOUR (4) INCH THROUGH EIGHTEEN (18) INCH DIAMETER PIPE, WITH TWENTY FOUR (24) INCH TO THIRTY SIX (36) INCH OF COVER SHALL BE IN ACCORDANCE WITH ASTM D3034 SDR 21. FOUR (4) INCH THROUGH EIGHTEEN (18) INCH DIAMETER PIPE, WITH ASTM D3034 SDR 35 SHALL HAVE THIRTY SIX (36) INCHES MINIMUM COVER. ALL JOINTS SHALL BE PUSH-ON WITH RUBBER GASKETS. PVC STORM PIPE REQUIRES SAND COLLARS MEETING ASTM D-3034-78 SDR 35 SPECIFICATIONS (I.E. CATCH BASIN CONNECTION) OR KOR-N-SEAL BOOTS.
- ALL PIPE BEDDING SHALL BE APWA TYPE "F" FOR FLEXIBLE PIPE (I.E. PVC, SMP OR ADS). BEDDING MATERIAL SHALL BE 5/8 INCH MINUS CRUSHED ROCK ONLY.
- ALL TRENCH BACKFILL IN AREAS OF FUTURE PAVEMENT OR STRUCTURAL LOADING SHALL BE COMPACTED TO AT LEAST 95 PERCENT OF THE MAXIMUM DRY DENSITY PER ASTM D 1557-70 (MODIFIED PROCTOR). ALL OTHER AREAS SHALL BE COMPACTED TO 90 PERCENT MINIMUM).
- CONSTRUCTION OF DEWATERING (GROUNDWATER INTERCEPTION) SYSTEMS SHALL BE IN ACCORDANCE WITH THE APWA STANDARD SPECIFICATIONS, SECTION 61-3.02.
- THE CONTRACTOR SHALL KEEP OFF-SITE STREETS CLEAN AT ALL TIMES BY SWEEPING. WASHING THESE STREETS WILL NOT BE ALLOWED WITHOUT PRIOR CITY OF MERCER ISLAND APPROVAL.
- ALL STORMWATER FACILITIES WILL BE INSTALLED AND IN OPERATION PRIOR TO OR IN CONJUNCTION WITH ALL CONSTRUCTION ACTIVITY UNLESS THAT ACTIVITY EXCEEDS THE CAPACITY AND INTENT OF THE EROSION/SEDIMENTATION CONTROL FACILITY OR UNLESS OTHERWISE APPROVED BY THE CITY.
- RELAY EXISTING SERVICE DRAINS AND SIDE SEWERS TO CLEAR OVER OR UNDER THE NEW UTILITY AS APPROVED BY THE INSPECTOR.

EROSION CONTROL/CONSTRUCTION SEQUENCE

- ARRANGE AND ATTEND PRE-CONSTRUCTION MEETING WITH BETWEEN OWNER OR OWNER'S REPRESENTATIVE AND CITY OF MERCER ISLAND SITE INSPECTOR.
- CONTRACTOR'S SURVEYOR TO ESTABLISH AND STAKE OUT CONTROL POINTS FOR WORK.
- INSTALL STRAW WATTLE BARRIERS AND GRATE INLET PROTECTION.
- CONSTRUCT STABILIZED CONSTRUCTION ENTRANCE (IF REQUIRED).
- CLEAR AND GRUB AREA.
- REMOVE EXISTING PAVEMENT, SURFACE FEATURES AND MISCELLANEOUS ITEMS AS NOTED.
- COORDINATE REMOVAL AND CAPPING OF EXISTING UTILITY LINES WITH APPROPRIATE PURVEYOR.
- GRADE SITE PER PLAN. STABILIZE GRADED AREAS WITH TEMPORARY EROSION CONTROL MEASURES AS REQUIRED.
- CONSTRUCT SITE IMPROVEMENTS.
- HYDROSEED REMAINING DISTURBED AREAS.
- RETURN SILTATION CONTROL AREAS TO ORIGINAL GROUND CONDITIONS.
- REMOVE REMAINING TEMPORARY EROSION/SEDIMENTATION CONTROL ONLY AFTER SITE HAS BEEN STABILIZED AND CITY OF MERCER ISLAND SITE INSPECTOR HAS APPROVED THE REMOVAL.



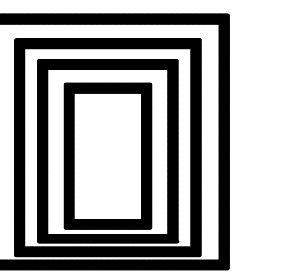
TEMPORARY EROSION/SEDIMENTATION CONTROL (ESC) NOTES

- APPROVAL OF THIS TEMPORARY EROSION/SEDIMENTATION CONTROL PLAN (TESC) DOES NOT CONSTITUTE AN APPROVAL OF PERMANENT ROAD OR DRAINAGE DESIGN (E.G. SIZE AND LOCATION OF ROADS, PIPES, RESTRICTORS, CHANNELS, RETENTION FACILITIES, UTILITIES, ETC.)
- THE IMPLEMENTATION OF THESE TESC AND THE CONSTRUCTION, MAINTENANCE, REPLACEMENT AND UPGRADING OF THESE TESC FACILITIES IS THE RESPONSIBILITY OF THE APPLICANT/CONTRACTOR UNTIL ALL CONSTRUCTION IS APPROVED.
- THE TESC FACILITIES SHOWN ON THIS PLAN MUST BE CONSTRUCTED PRIOR TO ALL CLEARING AND GRADING ACTIVITIES, AND IN SUCH A MANNER TO ENSURE THAT SEDIMENT LADEN WATER DOES NOT ENTER THE DRAINAGE SYSTEM OR VIOLATE APPLICABLE WATER STANDARDS.
- THE TESC FACILITIES SHOWN ON THIS PLAN ARE THE MINIMUM REQUIREMENTS FOR ANTICIPATED SITE CONDITIONS. DURING THE CONSTRUCTION PERIOD, THESE TESC FACILITIES SHALL BE UPGRADED (E.G. ADDITIONAL SUMPS, RELOCATION OF DITCHES AND SILT FENCES, ETC.) AS NEEDED FOR UNEXPECTED STORM EVENTS AND AS THE CITY REQUIRES.
- THE TESC FACILITIES SHALL BE INSPECTED DAILY BY THE APPLICANT/CONTRACTOR AND MAINTAINED AS NECESSARY TO ENSURE THEIR CONTINUED FUNCTIONING AND OPERATION.
- ANY AREA STRIPPED OF VEGETATION, INCLUDING ROADWAY EMBANKMENTS, WHERE NO FURTHER WORK IS ANTICIPATED FOR A PERIOD OF TWO (2) DAYS, SHALL BE IMMEDIATELY STABILIZED WITH THE APPROVED TESC METHODS (E.G. SEEDING, MULCHING, NETTING, EROSION BLANKETS, ETC.) GRASS SEEDING ALONE WILL BE ACCEPTABLE ONLY DURING THE MONTHS OF APRIL THROUGH OCTOBER INCLUSIVE.
- ANY AREA NEEDING TESC MEASURE, NOT REQUIRING IMMEDIATE ATTENTION, SHALL BE ADDRESSED WITHIN FIFTEEN (15) DAYS.
- THE TESC FACILITIES ON INACTIVE SITES SHALL BE INSPECTED AND MAINTAINED A MINIMUM OF ONCE A MONTH OR WITHIN 48 HOURS FOLLOWING A STORM EVENT AND AS THE CITY DEEMS NECESSARY.
- AT NO TIME SHALL MORE THAN ONE (1) FOOT OF SEDIMENT BE ALLOWED TO ACCUMULATE WITHIN A CATCH BASIN. 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.
- STABILIZED CONSTRUCTION ENTRANCES AND WASH PADS PER CITY STANDARDS, 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.
- DURING THE TIME PERIOD OF NOVEMBER 1ST THROUGH MARCH 31ST, ALL PROJECT DISTURBED AREAS THAT ARE TO BE LEFT UNWORKED FOR MORE THAN TWO (2) DAYS SHALL BE COVERED BY ONE OF THE FOLLOWING COVER MEASURES: MULCH, SODDING OR PLASTIC COVERING.
- WHERE SEEDING FOR TEMPORARY EROSION CONTROL IS REQUIRED, FAST GERMINATING GRASSES SHALL BE APPLIED AT AN APPROPRIATE (E.G. ANNUAL OR PERENNIAL RYE APPLIED AT APPROXIMATELY 80 POUNDS PER ACRE).
- WHERE STRAW MULCH FOR TEMPORARY EROSION CONTROL IS REQUIRED, IT SHALL BE APPLIED AT A MINIMUM THICKNESS OF THREE (3) INCHES OR 3,000 LBS/ACRE.
- AS CONSTRUCTION PROGRESSES AND UNEXPECTED SEASONAL CONDITIONS DICTATE, AND AS THE CITY REQUIRES, THE PERMITTEE SHOULD ANTICIPATE THAT MORE TESC MEASURES WILL BE NECESSARY TO PROTECT ADJACENT PROPERTIES AND ENSURE MINIMUM WATER QUALITY FOR SITE RUNOFF. IT SHALL BE THE RESPONSIBILITY OF THE PERMITTEE TO ADDRESS DEFICIENT TESC CONDITIONS AND PROVIDE ADDITIONAL FACILITIES, OVER AND ABOVE MINIMUM REQUIREMENTS OUTLINED ON THE APPROVED PLANS.
- FILTER FABRIC FENCE SHALL BE USED WHERE NOTED ON THE PLANS OR AS DIRECTED BY THE CITY.

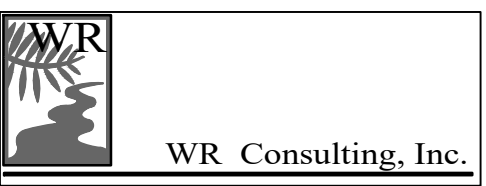
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ARCHITECTURE

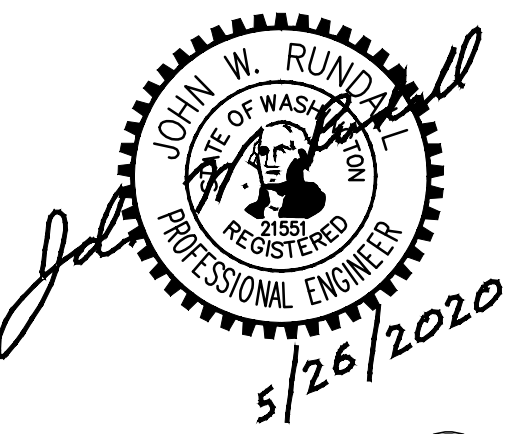


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Civil Engineer:

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3611 45th Ave W.
Seattle, WA 98199
P: 206.285.1593



VANEY / SHINDE

New Residence

4207 West Mercer Way

Mercer Island, WA 98040

PROJECT ADDRESS

4207 WEST MERCER WAY
MERCER ISLAND, WA 98040

LEGAL DESCRIPTION

THE WEST 82 FEET OF THAT PORTION OF TRACT 13 IN HARRY WHITE'S PLAT OF EAST SEATTLE ACRE TRACTS, AS PER PLAT RECORDED IN VOLUME 3 OF PLATS, PAGE 36, RECORDS OF KING COUNTY, LYING SOUTHERLY OF WEST MERCER WAY RIGHT OF WAY; TOGETHER WITH THAT PORTION OF THE EAST 1/2 OF VACATED SECOND STREET ADJOINING ON THE WEST; SITUATE IN THE CITY OF MERCER ISLAND, COUNTY OF KING, STATE OF WASHINGTON.

PARCEL NUMBER

936570-0163

Date: 5/21/20 Permit Set

Scale: As Noted

Sheet: 1 of 5

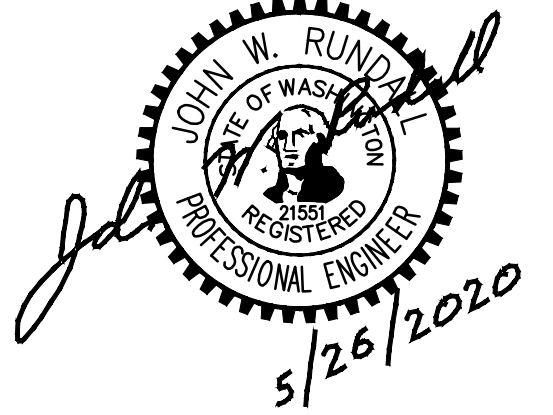
GENERAL NOTES

C1

CALL 48 HOURS BEFORE YOU DIG
1-800-424-5555
OR CALL 8-1-1

Studio Ectypos
ARCHITECTURE
4212 W. Mercer Way
Mercer Island, WA 98040
t. (206)232-9147
www.studioectypos.com

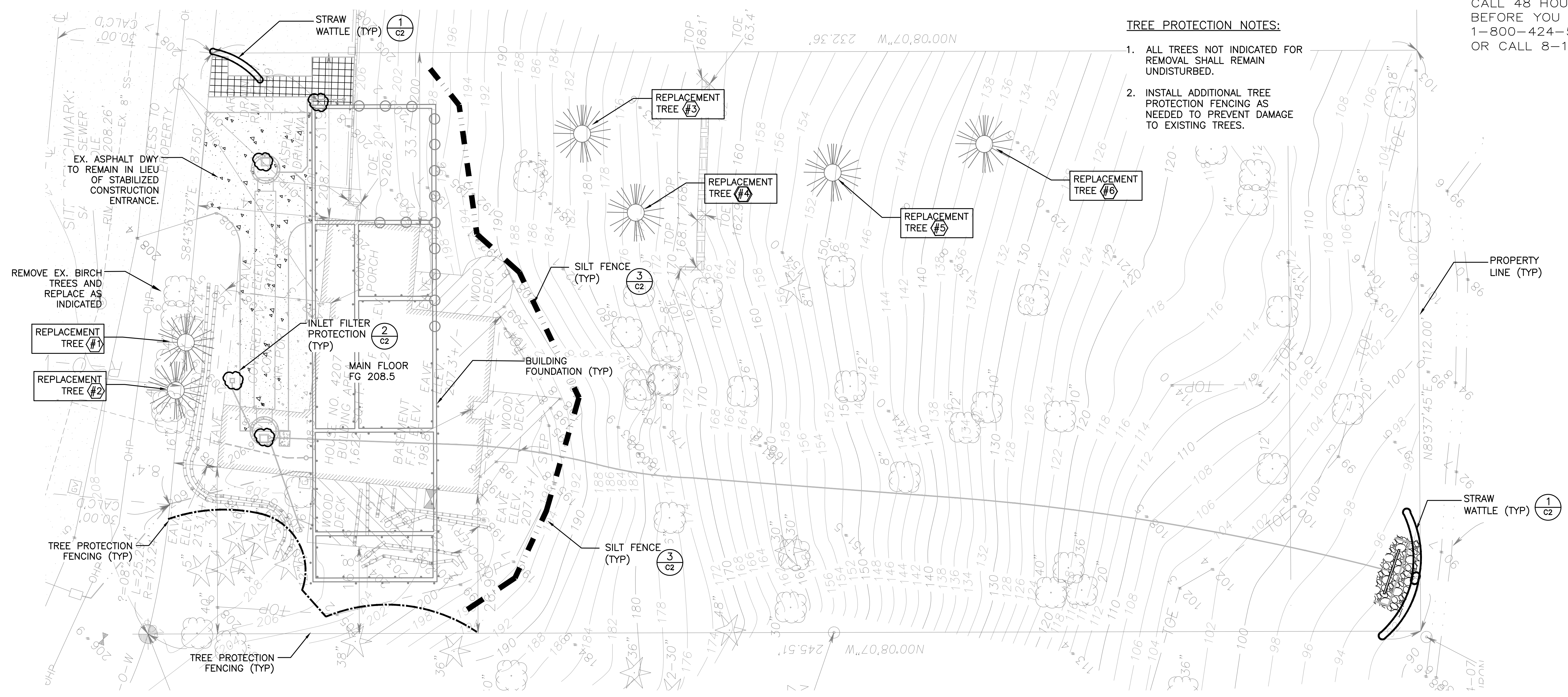
WR Consulting, Inc.
Civil Engineer:
WR Consulting, Inc.
3611 45th Ave W.
Seattle, WA 98199
P: 206.285.1593



VANEY / SHINDE
New Residence
4207 West Mercer Way
Mercer Island, WA 98040

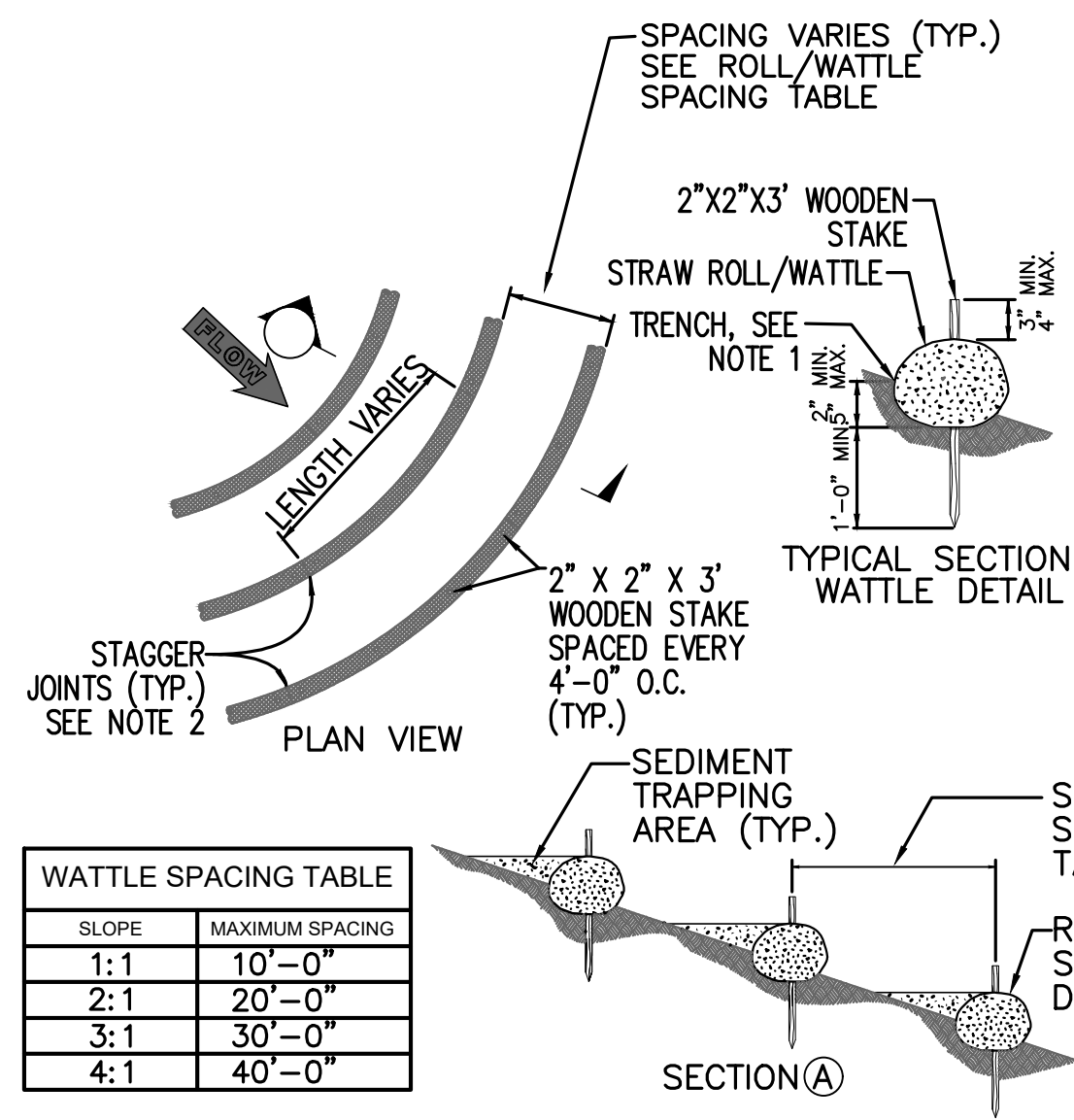
TREE PROTECTION NOTES:

- ALL TREES NOT INDICATED FOR REMOVAL SHALL REMAIN UNDISTURBED.
- INSTALL ADDITIONAL TREE PROTECTION FENCING AS NEEDED TO PREVENT DAMAGE TO EXISTING TREES.



WATTLE DETAIL NOTES

- Install Wattles along contours. Installation shall be in accordance with Standard Specification 8-01.3(10).
- Securely knot each end of Wattle. Abut adjacent Wattles tightly, end to end, without overlapping the ends.
- Pilot holes may be driven through the Wattles and into the soil when soil conditions require.
- Live stakes may be used for Permanent installation and shall be in accordance with Standard Specification 9-14.6.
- Wattles shall be inspected regularly, and immediately after a rainfall produces runoff, to ensure they remain thoroughly entrenched and in contact with the soil.



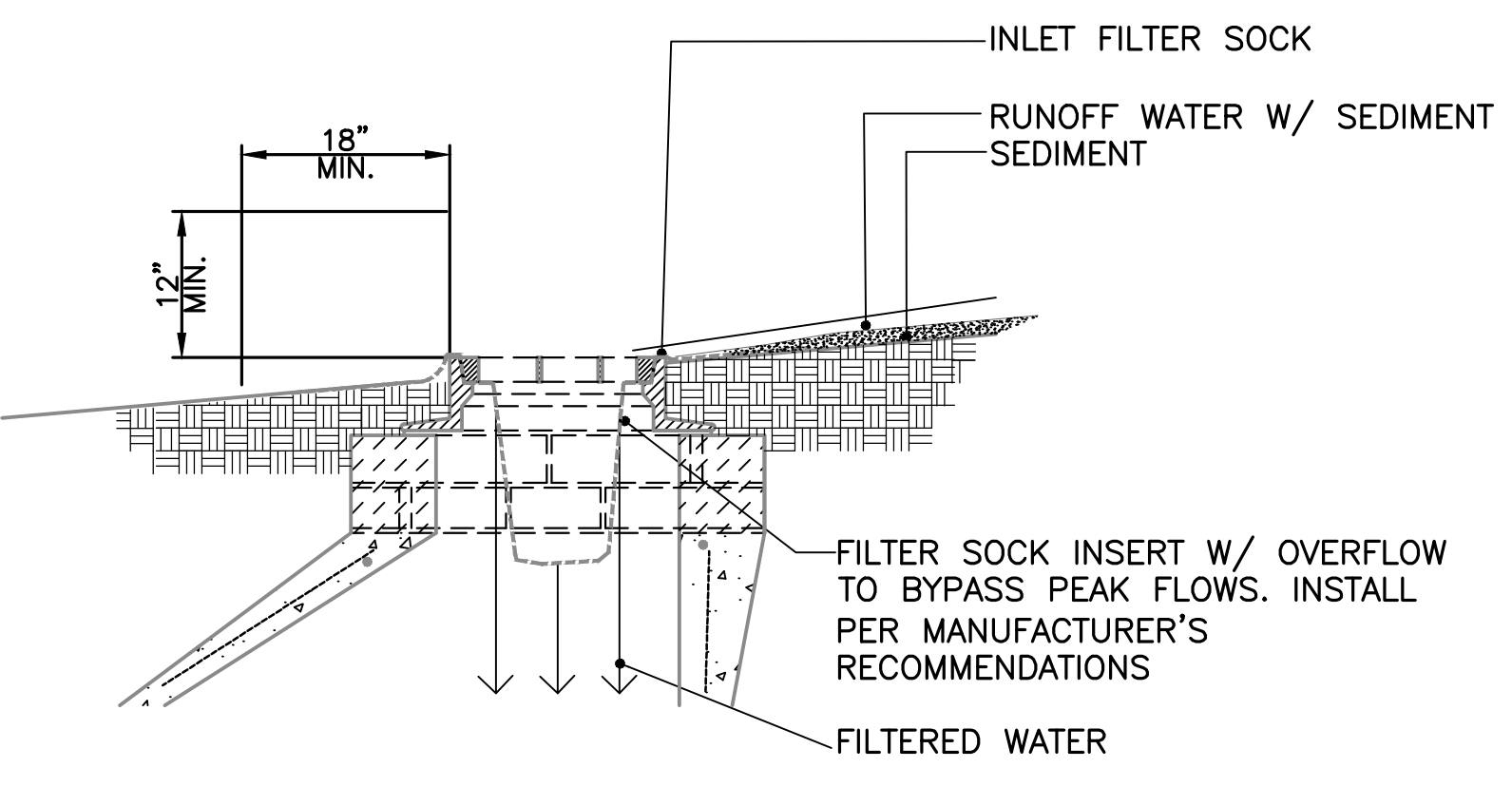
WATTLE SPACING TABLE

SLOPE	MAXIMUM SPACING
1:1	10'-0"
2:1	20'-0"
3:1	30'-0"
4:1	40'-0"

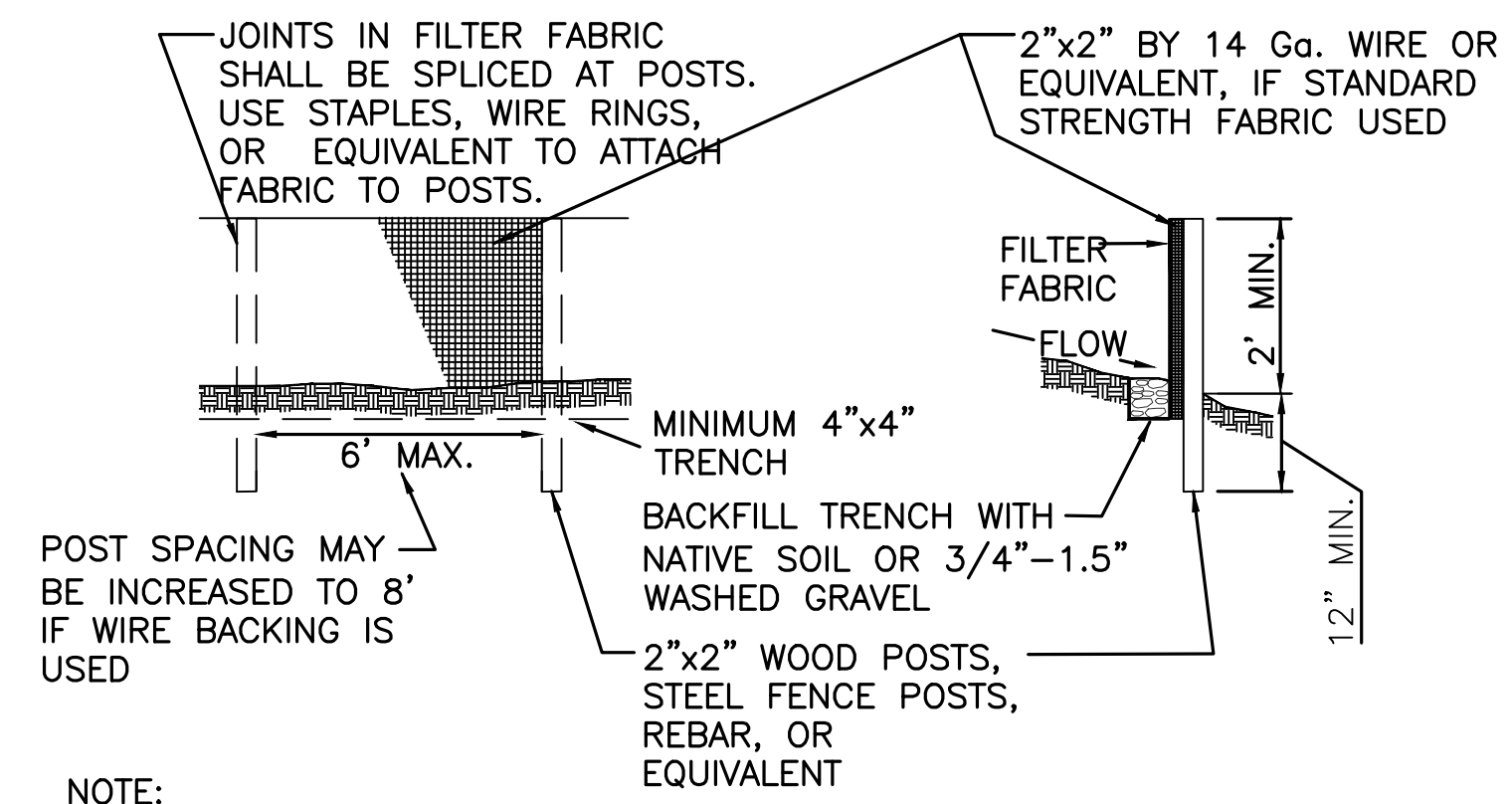


TREE REPLACEMENT SCHEDULE

NUMBER	NAME/TYPE	HEIGHT
①	PACIFIC YEW (TAXIS BREVIFOLIA)	6 FT
②	PACIFIC YEW (TAXIS BREVIFOLIA)	6 FT
③	DOUGLAS FIR (PSEUDOTSUGA MENZIESII)	8-10 FT
④	SITKA SPRUCE (PICEA SITCHENSIS)	6 FT
⑤	DOUGLAS FIR (PSEUDOTSUGA MENZIESII)	8-10 FT
⑥	SITKA SPRUCE (PICEA SITCHENSIS)	6 FT



② INLET PROTECTION DETAIL
SCALE: N.T.S.

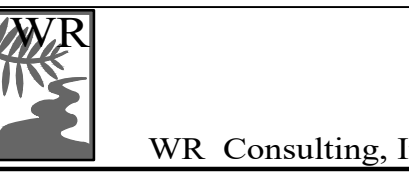
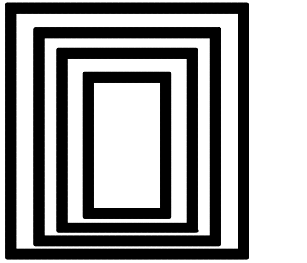


③ SILT FENCE DETAIL
SCALE: N.T.S.

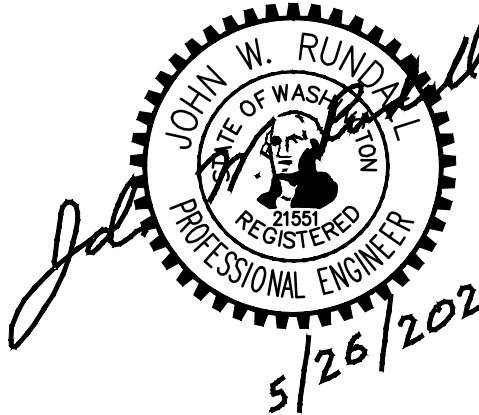
LEGEND

- INLET PROTECTION
- REMOVE TREE
- SILT FENCE
- STRAW WATTLE/COIR LOG
- TREE PROTECTION FENCE

C2



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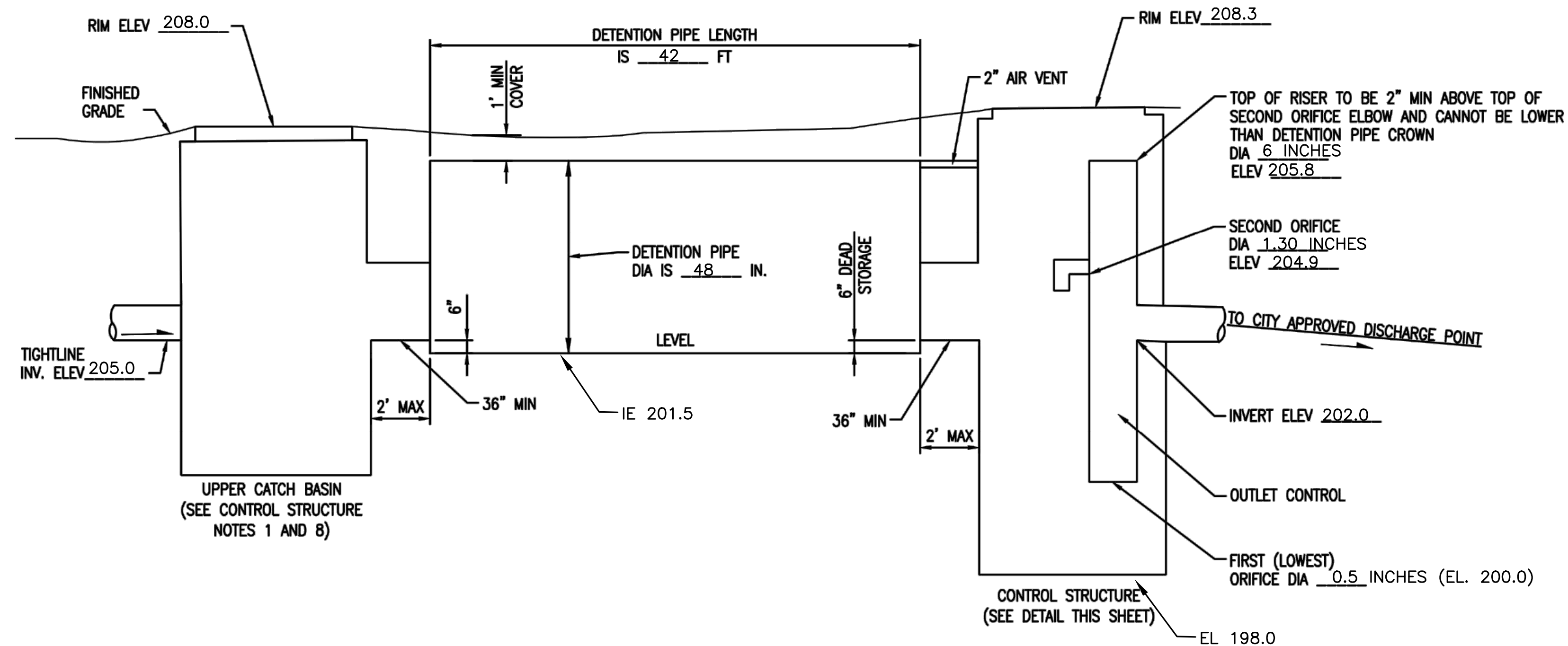
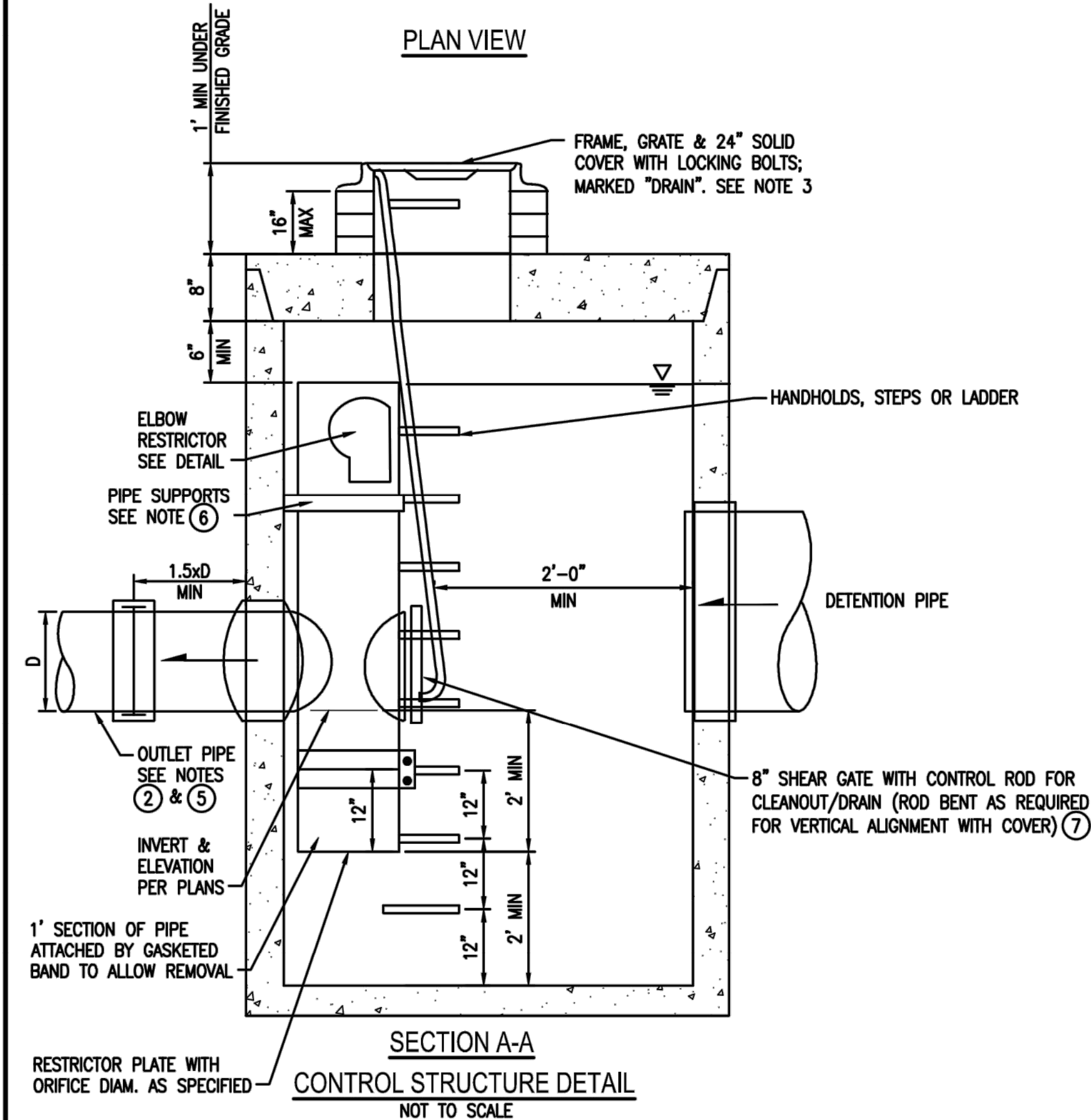
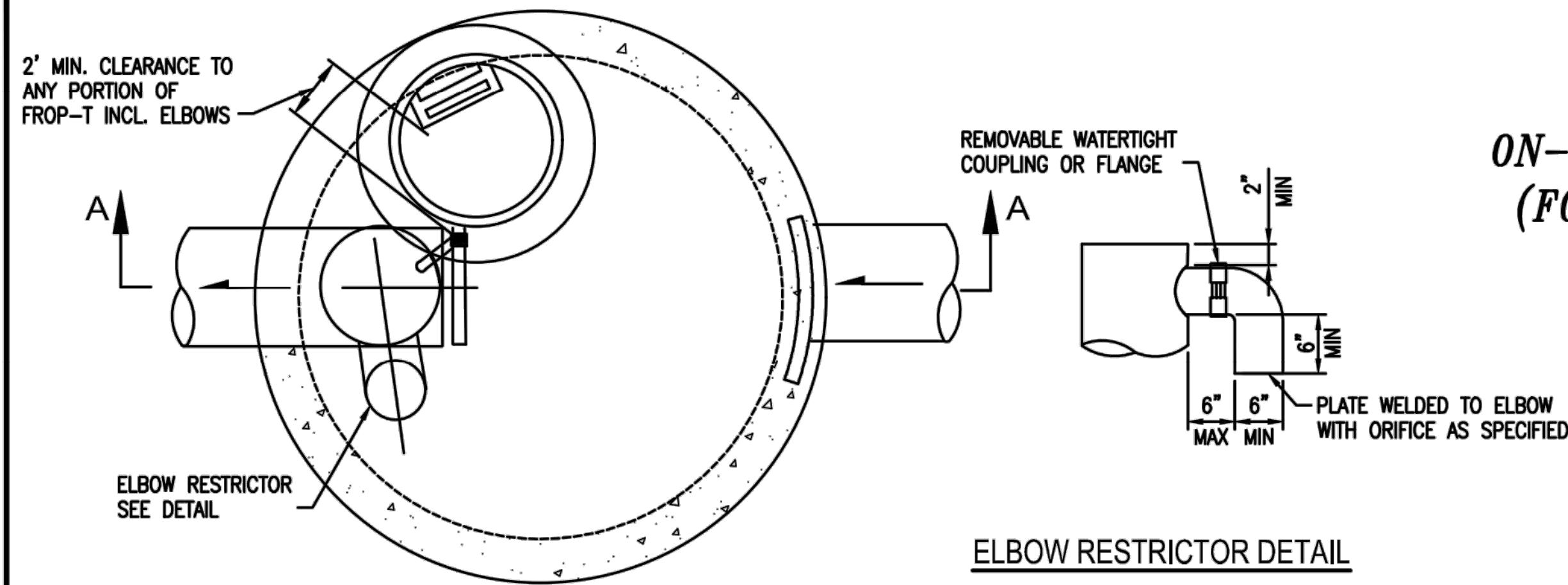
VANEY / SHINDE
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ATTACHMENT 1
CITY OF MERCER ISLAND
ON-SITE DETENTION SYSTEM WORKSHEET
(FOR NEW PLUS REPLACED IMPERVIOUS
AREA OF 9,500 SF OR LESS)

NOTE:

1. THE DETENTION PIPE MATERIAL SHALL BE WATERTIGHT AS OPPOSED TO "SOIL TIGHT".
2. THE PIPE MATERIAL SELECTED SHALL CONFORM TO THE TESTING REQUIREMENTS IN SECTION 7-17.3(2)F OF THE 2020 WSDOT STANDARD SPECIFICATIONS EXCEPT THE DETENTION PIPE SHALL BE TESTED IN ITS ENTIRETY RATHER THAN ONE JOINT AT A TIME.

OWNER: PASHMI VANEY & RAHUL SHINDE	ADDRESS: 4207 WEST MERCER WAY	PREPARED BY: JOHN W. RUNDALL, P.E.
PERMIT #:	MERCER ISLAND, WA	PHONE: 206-850-1686
		DATE: May 19, 2020
NEW PLUS REPLACED IMPERVIOUS SURFACE AREA (SF): 3,485 SF	DETENTION PIPE DIA (INCH): 48" ø	DETENTION PIPE LENGTH (FT): 42
SOIL TYPE: TYPE C	PIPE MATERIAL: CORRUG. OR SPIRAL AL PIPE	ORIFICE #1 DIA 0.5 INCH, ELEV 200.0
		ORIFICE #2 DIA 1.30 INCH, ELEV 204.9



ON-SITE DETENTION SYSTEM
NOT TO SCALE (ENGINEER TO FILL IN BLANKS)

CONTROL STRUCTURE NOTES:

1. USE A MINIMUM OF A 54 IN. DIAM. TYPE 2 CATCH BASIN. THE ACTUAL SIZE IS DEPENDENT ON CONNECTING PIPE MATERIAL AND DIAMETER.
2. OUTLET PIPE: MIN. 6 INCH.
3. METAL PARTS: CORROSION RESISTANT. NON-GALVANIZED PARTS PREFERRED. GALVANIZED PIPE PARTS TO HAVE ASPHALT TREATMENT 1.
4. FRAME AND LADDER OR STEPS OFFSET SO:
 - A. CLEANOUT GATE IS VISIBLE FROM TOP;
 - B. CLIMB-DOWN SPACE IS CLEAR OF RISER AND CLEANOUT GATE;
 - C. FRAME IS CLEAR OF CURB.
5. IF METAL OUTLET PIPE CONNECTS TO CEMENT CONCRETE PIPE, OUTLET PIPE TO HAVE SMOOTH O.D. EQUAL TO CONCRETE PIPE I.D. LESS 1/4 IN.
6. PROVIDE AT LEAST ONE 3 X 0.090 GAUGE SUPPORT BRACKET ANCHORED TO CONCRETE WALL WITH 5/8 IN. STAINLESS STEEL EXPANSION BOLTS OR EMBEDDED SUPPORTS 2 IN. INTO CATCH BASIN WALL (MAXIMUM 3'-0" VERTICAL SPACING).
7. THE SHEAR GATE SHALL BE MADE OF ALUMINUM ALLOY IN ACCORDANCE WITH ASTM B 26M AND ASTM B 275, DESIGNATION ZG32A; OR CAST IRON IN ACCORDANCE WITH ASTM A 48, CLASS 30B. THE LIFT HANDLE SHALL BE MADE OF A SIMILAR METAL TO THE GATE (TO PREVENT GALVANIC CORROSION), IT MAY BE OF SOLID ROD OR HOLLOW TUBING, WITH ADJUSTABLE HOOK AS REQUIRED. A NEOPRENE RUBBER GASKET IS REQUIRED BETWEEN THE RISER MOUNTING FLANGE AND THE GATE FLANGE. INSTALL THE GATE SO THAT THE LEVEL-LINE MARK IS LEVEL WHEN THE GATE IS CLOSED. THE MATING SURFACES OF THE LID AND THE BODY SHALL BE MACHINED FOR PROPER FIT. ALL SHEAR GATE BOLTS SHALL BE STAINLESS STEEL.
8. THE UPPER CATCH BASIN IS REQUIRED IF THE LENGTH OF THE DETENTION PIPE IS GREATER THAN 50 FT.

ON-SITE DETENTION SYSTEM NOTES:

1. CALL DEVELOPMENT SERVICES (206-275-7605) 24 HOURS IN ADVANCE FOR A DETENTION SYSTEM INSPECTION BEFORE BACKFILLING AND FOR FINAL INSPECTIONS.
2. RESPONSIBILITY FOR OPERATION AND MAINTENANCE OF DRAINAGE SYSTEMS ON PRIVATE PROPERTY IS RESPONSIBILITY OF THE PROPERTY OWNER. MATERIAL ACCUMULATED IN THE STORAGE PIPE MUST BE REMOVED FROM CATCH BASINS TO ALLOW PROPER OPERATION. THE OUTLET CONTROL ORIFICE MUST BE KEPT OPEN AT ALL TIMES.
3. PIPE MATERIAL, JOINT, AND PROTECTIVE TREATMENT SHALL BE IN ACCORDANCE WITH SECTION 7.04 AND 9.05 OF THE WSDOT STANDARD SPECIFICATION FOR ROAD, BRIDGE, AND MUNICIPAL CONSTRUCTION, LATEST VERSION. SUCH MATERIALS INCLUDE THE FOLLOWING, LINED CORRUGATED POLYETHYLENE PIPE (LCPE), ALUMINIZED TYPE 2 CORRUGATED STEEL PIPE AND PIPE ARCH (MEETS AASHTO DESIGNATIONS M274 AND M36), CORRUGATED OR SPIRAL RIB ALUMINUM PIPE, OR REINFORCED CONCRETE PIPE. CORRUGATED STEEL PIPE IS NOT ALLOWED.
4. FOOTING DRAINS SHALL NOT BE CONNECTED TO THE DETENTION SYSTEM.

Date: 5/21/20 Permit Set

Scale: As Noted

Sheet: 4 of 5

DETENTION
TANK DETAILS

C4

