

From: [Paulo Lopez](#)
To: [Lucy Temple](#)
Cc: [Sebastian Lew](#); [Matthew Grugan](#)
Subject: Vertical Bridge US-WA-5105 Cle Elum - Zoning Pre-App/Checklist (T-Mobile Project SE09034J)
Date: Thursday, February 21, 2019 4:54:47 PM
Attachments: [SE09034J Permitting_Zoning Permit_NSD-Vertical Bridge US-WA-5105 Pre-App-Cle Elum DT-VB_2-21-19.pdf](#)
[SE09034J Permitting_Zoning Permit_NSD-Pre-App Checklist-Cle Elum DT-VB_2-21-19.xlsx](#)

Hi Lucy,

I've attached the Zoning Pre-App with Description and the Check List of satisfied requirements. I've sent you a DropBox Link to the Pre-App documents.

We are working to submit the zoning app with applicable zoning fees.

Let me know when is a good time to call to follow up on the pre-app. Thanks!

Best,

Paulo Lopez

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Stamp & initial

APPLICATION FOR PRE-APPLICATION REVIEW

*A pre-application review is an opportunity for a potential applicant to meet with city staff to provide an understanding of the city's development requirements for a specific application or land use. Pursuant to CEMC 17.100.050 Applications subject to a Type II, III or IV process are **required** to conduct a pre-application meeting with staff prior to submitting an application, unless waived in writing by the city planner. See [CEMC 17.100.050](#) for more information.*

OFFICIAL USE ONLY

Permit #:	PRE-AP-2018 -
Staff Person:	
Fee Total:	
Associated Permits:	

We understand that you may not have all of the following information, but please include as many of the requested criteria as possible

Applicant

Name: SAC Wireless on Behalf of Vertical Bridge/T-Mobile

Address: 1037 Thomas Avenue SW, Renton, WA 98057

Phone Number: (916) 306-7082

Email: paulo.lopez@sacw.com

Project Description:

An unmanned 153-foot wireless communications facility is proposed on City of Cle Elum property, within a proposed approximately 0.09-acre (4000 square foot) overall lease area for associated T-Mobile and future carriers ground equipment. The proposed tower and compound are to be located at 302 E 4th St. in Cle Elum, Kittitas County, Washington on a sparsely wooded hillside with multiple rock outcroppings. Site soils exhibit relatively low infiltration potential. The ground topography is lightly sloping with existing grades across the project site ranging from approximately 0 to 30 percent. The project site consists primarily of forested area and is currently undeveloped, with the exception of an existing gravel road which provides access from E 5th St. to the west of the site and N Montgomery Ave to the east. Vertical Bridge is the tower company; T-Mobile is the anchor tenant. The proposed tower coordinates are 47°11'51.88" N, 120°55'59.77" W.

Construction of the 153' cellular tower and associated equipment shelter, fuel tank, power utilities, and accesses are proposed within a 0.06-acre (2,418 square foot) portion of the lease area on the east side of the property. The project will disturb approximately 0.09 acres and proposes approximately 0.06 acres of new impervious surfaces near the northeast portion of parcels 20-15-26050-2401 and 20-15-26050-2403. Planned retaining wall with drainage system and a maximum height of 11 feet installed around the 1600 square foot T-Mobile lease area and the 800 square foot proposed other carrier equipment lease area. Import materials will be used for backfilling behind the retaining wall. Vertical Bridge will install separate gates for each carrier along the northside of the lease area for access during construction and for maintenance operations. The T-Mobile lease area accessed via an 8-foot tall chain link fence with 10-foot wide gate. Utilities will run underground along access road with power and transport along the same trench.

Access to the project site will be provided activities include clearing and grading and the construction of crushed rock site pad, retaining walls, and 153' tower with associated equipment shelter, fuel tank, and power utilities. Construction activities will disturb approximately 0.09 acres. Vehicular traffic mostly during construction of site lasting approximately 45-60 days. Light duty truck for maintenance operations each 3-4 weeks after site goes On-Air.

Pre-application conferences are billed on an hourly basis, dependent on the staff necessary to attend. By signing this application and requesting a pre-application conference you agree to pay the hourly rates as established in the Cle Elum fee schedule for each employee. A typical 1-hour pre-application conference usually costs around \$300, but can vary depending on project complexity. **NO FEE IS DUE UP FRONT, YOU WILL RECEIVE A DETAILED INVOICE WITHIN 10-DAYS OF THE PRE APPLICATION CONFERENCE BEING HELD. ALL PAYMENTS ARE DUE WITHIN 30-DAYS OF INVOICING.**

Application Criteria ¹	
1.	Written narrative description of-uses, types of structures proposed, hours of operation, abutting properties, proposed access, frequency of deliveries, and construction schedule, including any proposed phasing of development.
2.	Two hard copies and one electronic copy (PDF) of an existing conditions plan drawn to a minimum scale of one inch equals two hundred feet on a sheet no larger than twenty-four inches by thirty-six inches and including one reduced size copy no larger than legal size. The existing conditions plan shall contain the following features;
a.	The subject property boundaries;
b.	Dimensions and size;
c.	Current structural or landscape setbacks;
d.	Location of existing on-site driveways and access points within one hundred feet of the subject site;
e.	Location and dimension of any on-site structures;
f.	Location of utilities;
g.	Location of the nearest fire hydrant;
h.	Location of existing structures within one hundred feet of the site;
i.	Locations and dimensions of adjacent public or private roads and right-of-way or easements;
j.	Approximate location of significant natural features including slopes over twenty-five percent, waterbodies, rock outcrops, wetland areas, areas of significant vegetation, the location of trees or groups of trees over six inches in diameter, and the location of any critical areas.
3.	Two hard copies and one electronic copy (PDF) of a site plan drawn to a minimum scale of one inch equals two hundred feet on a sheet no larger than twenty-four inches by thirty-six inches and including one reduced size copy no larger than legal size. The site plan shall contain the following information:
a.	The subject property boundaries;
b.	Dimensions and size;
c.	Location;

	d.	Dimensions and height of all proposed structures;
	e.	Location of building accesses;
	f.	Proposed setbacks;
	g.	Proposed phasing;
	h.	Proposed landscaping;
	i.	Location and dimensions of vehicle and pedestrian access points and circulation routes;
	j.	The location of all proposed on-site parking including provisions for handicap parking;
	k.	Any easements;
	l.	The location of any proposed lights, and any other proposed site improvements.
4.	Two hard copies and one electronic copy (PDF) of proposed architectural elevations.	
5.	Preliminary grading, erosion control and stormwater plan.	
6.	Preliminary utility plan.	
7.	Any other items that are necessary to review the proposed development.	
8.	If the applicant is not the legal owner a signed authorization from the legal owner is required. ²	
9.	Payment of a fee that is consistent with the City of Cle Elum's fee schedule.	
Decision Criteria		
1.	A completed application form signed by the owner(s) of the property subject to the application. If the applicant is not the property owner, a signed instrument authorizing the application is required. ²	
2.	A current assessor's map identifying the properties within three hundred feet of the subject site along with the names and addresses of the property owners.	
3.	Payment of a fee that is consistent with the City of Cle Elum's fee schedule.	
4.	All information required by the Planner is addressed.	

1. The application will not be processed and deemed incomplete if not all required criteria is not attached to application on the day of submission. The Planner may chooses to wave some of the requirements. If any of the required criteria is provided in another permit please cite that permit.
2. The owner can sign in allotted space provided under the authorization section of the application or send the City Planner a letter.

Authorization	
<p><i>The undersigned hereby certifies that this application has been made with the consent of the lawful property owner(s) and that all information submitted with this application is complete and correct. False statements, errors, and/or omissions may be sufficient for denial of the request. This application gives consent to the City to enter the properties listed above for the purposes of inspecting and verifying information presented in this application. The applicant further agrees to pay all fees specified in the City's fee schedule for the permit and expenses associated with the review of the application. The applicant gives consent to the City to enter the property(s) listed above for the purpose of inspecting and verifying information presented in this application.</i></p>	
Applicant Signature: <i>Paulo Lopez</i> on behalf of Vertical Bridge/T-Mobile	Date: 2/21/19
Owner Signature:	Date:

	Application Criteria	Completed
1	Written narrative description of-uses, types of structures proposed, hours of operation, abutting properties, proposed access, frequency of deliveries, and construction schedule, including any proposed phasing of development.	Description
2	One electronic copy (PDF) of an existing conditions plan drawn to a minimum scale of one inch equals two hundred feet	Survey/Geotech Report/Drainage Report
3	One electronic copy (PDF) of a site plan drawn to a minimum scale of one inch equals two hundred feet	ZDs
4	One electronic copy (PDF) of proposed architectural elevations.	ZDs
5	Preliminary grading, erosion control and stormwater plan.	SWPP
6	Preliminary utility plan.	ZDs
7	Any other items that are necessary to review the proposed development.	Drainage Site Plans
8	If the applicant is not the legal owner a signed authorization from the legal owner is required.	City of Cle Elum Jurisdiction Provided

Date: **May 8, 2018**

Matt Grugan
Vertical Bridge Holdings, LLC.
750 Park of Commerce Drive, Suite 200
Boca Raton, FL 33487
Office: (561) 948-6367



Tower Engineering Professionals, Inc.
326 Tryon Road
Raleigh, NC 27603
(919) 661-6351
Geotech@tepgroup.net

Subject: Subsurface Exploration Report

Vertical Bridge Designation:	Site Number:	US-WA-5105
	Site Name:	Peoh Point
Engineering Firm Designation:	TEP Project Number:	132753.164385
Site Data:	302 E 4th St., Cle Elum, WA 98922 (Kittitas County) Latitude N47° 11' 51.88", Longitude W120° 55' 59.77" 153 Foot - Proposed Monopole Tower	

Dear Mr. Grugan,

Tower Engineering Professionals, Inc. (TEP) is pleased to submit this "**Subsurface Exploration Report**" to evaluate subsurface conditions in the tower area as they pertain to providing support for the tower foundation.

This report has been prepared in accordance with generally accepted geotechnical engineering practice for specific application to this project. The conclusions in this report are based on the applicable standards of TEP's practice in this geographic area at the time this report was prepared. No other warranty, express or implied, is made.

TEP assumes the current ground surface elevation; tower location and subsequent centerline provided are correct and are consistent with the elevation and centerline to be used for construction of the structure. Should the ground surface elevation be altered and/or the tower location be moved or shifted TEP should be contacted to determine if additional borings are necessary.

The analyses and recommendations submitted herein are based, in part, upon the data obtained from the subsurface exploration. The soil conditions may vary from what is represented in the boring log. While some transitions may be gradual, subsurface conditions in other areas may be quite different. Should actual site conditions vary from those presented in this report, TEP should be provided the opportunity to amend its recommendations as necessary.

We at *Tower Engineering Professionals, Inc.* appreciate the opportunity of providing our continuing professional services to you and Vertical Bridge Holdings, LLC. If you have any questions or need further assistance on this or any other projects please give us a call.

Report Prepared/Reviewed by: Jason E. Lafollette, E.I. / John D. Longest, P.E.

Respectfully submitted by:

William H. Martin, P.E.



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1) PROJECT DESCRIPTION

Based on the preliminary drawings, it is understood a monopole communications tower will be constructed at the referenced site. The structure loads will be provided by the tower manufacturer. A planned retaining wall with a maximum height of 11 feet, a total length of approximately 180 feet is to be constructed at the site. It is our understanding that import materials will be used for backfill behind the retaining wall.

2) SITE EXPLORATION

The field exploration included the performance of five soil test boring (B-1, B-2, B-3, B-4, and B-5) to the depths of 10 to 32.5 feet (bgs). Boring B-1 was performed adjacent to the location of the proposed tower location. Borings B-2 to B-5 were performed along the proposed location of the retaining wall. The boring was performed by a track mounted drill rig using continuous flight hollow stem augers to advance the hole. Split-spoon samples and Standard Penetration Resistance Values (N-values) were obtained in accordance with ASTM D 1586 at a frequency of four samples in the top 10 feet and two samples every 10 feet thereafter to refusal.

The Split-spoon samples were transported to the TEP laboratory where they were classified by a Geotechnical Engineer in general accordance with the Unified Soil Classification System (USCS), using visual-manual identification procedures (ASTM D 2488).

A Boring Location Plan showing the approximate boring location, a Boring Log presenting the subsurface information obtained and a brief guide to interpreting the boring log are included in the Appendix.

3) SITE CONDITIONS

The site is located at 302 E 4th St. in Cle Elum, Kittitas County, Washington. The proposed tower and compound are to be located on a sparsely wooded hillside with multiple rock outcroppings. The ground topography is lightly sloping.

4) SUBSURFACE CONDITIONS

The following description of subsurface conditions is brief and general. For more detailed information, the individual Boring Logs contained in Appendix B - Boring Logs may be consulted.

4.1) Soil

The USCS classification of the materials encountered in the boring include SC, SM, CL, and Weathered Siltstone. The Standard Penetration Resistance ("N" Values) recorded in the materials ranged from 5 blows per foot to 50 blows per 2 inches of penetration.

4.2) Rock

Weathered Siltstone was encountered at a depth of 20 feet (bgs) in the boring B-1. Refusal of auger advancement was encountered at a depth of 32.5 feet (bgs) in the boring B-1. Drillers noted weathered rock at depths ranging from 1 foot to 8.5 feet (bgs). Rock outcrops were noted all along the access and the hillside, rock depths are anticipated to be highly variable at this site.

4.3) Subsurface Water

Subsurface water was not encountered in the boring at the time of drilling. It should be noted the subsurface water level will fluctuate during the year, due to seasonal variations and construction activity in the area.

4.4) Frost

The TIA frost depth for Kittitas County Washington is 10 inches.

5) TOWER FOUNDATION DESIGN

Based on the boring data, it is the opinion of TEP that a pier extending to a single large mat foundation or a single drilled shaft can be used to support the new tower. If the drilled shaft foundation option is utilized, design of the foundation should be adjusted to terminate in a known material. The following presents TEP's conclusions and recommendations regarding the foundation types.

5.1) Shallow Foundation

The foundation should bear a minimum of 10 inches below the ground surface to penetrate the frost depth and with sufficient depth to withstand the overturning of the tower. To resist the overturning moment, the weight of the concrete and any soil directly above the foundation can be used. TEP recommends that the foundation designer specify a minimum unit weight for compacted backfill over the new foundation based on what is required to resist overturning of shallow foundations. The values are based on the current ground surface elevation and soils bearing in undisturbed native soils.

Based on preliminary site information the site is located on lightly sloping ground, with approximately 16 feet of elevation change across the planned lease area. It is recommended that foundation designs account for site grades being raised with excavation spoils or that foundation drawings specify minimum embedment depths based on existing site elevations and factor in ground slopes.

Table 1 - Shallow Foundation Analysis Parameters – Boring B-1

Depth		Soil	Gross Ultimate Bearing ^{1,2,3} (psf)	Cohesion ¹ (psf)	Friction Angle ¹ (degrees)	Effective Unit Weight (pcf)	Friction Factor
Top	Bottom						
0	3.5	SC	2950	-	30	105	0.36
3.5	6	SM	21400	-	39	113	0.49
6	8.5	SM	36075	-	43	113	0.50
8.5	13.5	SM	38875	-	45	113	0.50

Notes:

- 1) These values should be considered ultimate soil parameters.
- 2) A minimum factor of safety of 2 is recommended for allowable bearing.
- 3) The soil values are based on a maximum foundation size of 30 foot squared. If the foundation design size exceeds this dimension TEP should be contacted to re-evaluate soil parameters based on the actual foundation size.

It is our understanding at the time that the planned tower will have a retaining wall constructed to the northwest, southwest, and southeast of the planned tower location. At the time of this report, it is understood that the retaining wall will be cast in place and have a maximum height of approximately 11 feet. It is recommended that the foundation designer collaborate with the wall designer, providing design surcharge loads for the planned wall.

Weathered rock was encountered at variable depths across the site, and weathered rock was noted as shallow as 3.5 feet (bgs) by the drillers for the tower location. It may be necessary to adjust foundation designs to minimize shallow foundation embedment depth in order to prevent excessive rock excavation at this site.

5.2) Drilled Shaft Foundation

The following values may be used for design of a drilled shaft foundation. TEP recommends the side frictional and lateral resistance values developed in the top section of the caisson for a depth equal to the half the diameter of the caisson or the frost depth, whichever is greater, be neglected in the calculations. The values are based on the current ground surface elevation.

Table 2 – Drilled Shaft Foundation Analysis Parameters

Depth		Soil	Gross Ultimate Bearing ^{1,2} (psf)	Ultimate Side Frictional Resistance ^{1,3} (psf)	Cohesion ¹ (psf)	Friction Angle ¹ (degrees)	Effective Unit Weight (pcf)
Top	Bottom						
0	3.5	SC	1250	70	-	30	105
3.5	6	SM	21650	280	-	39	113
6	8.5	SM	55200	490	-	43	113
8.5	13.5	SM	94225	810	-	45	113
13.5	15	SM	136025	1050	-	45	118
15	20	SM	160500	1310	-	45	118
20	25	Weathered Siltstone ⁴	157850	1570	-	42	125
25	30	Weathered Siltstone ⁴	190900	1960	-	42	125
30	32.5	Weathered Siltstone ⁴	224000	2240	-	42	125

Notes:

- 1) These values should be considered ultimate soil parameters.
- 2) A minimum factor of safety of 2 is recommended for allowable bearing. If the bearing depth of the foundation is less than 5 diameters below the ground surface the bearing values listed in Table 1 – Shallow Foundation Analysis Parameters should be utilized.
- 3) A minimum factor of safety of 2 is recommended for allowable side frictional resistance.
- 4) Due to the weathered nature of the rock cohesion of the rock cannot be relied upon for strength parameters. Indicated layers have been evaluated as a granular material

It is our understanding at the time that the planned tower will have a retaining wall constructed to the northwest, southwest, and southeast of the planned tower location. The centerline of the tower is to be located approximately 21 feet behind the southwest face of the wall. At the time of this report, it is understood that the retaining wall will be cast in place and have a maximum height of approximately 11 feet. Unless side friction resistance and lateral resistance values are to be neglected for the total wall height, it is recommended that the foundation designer collaborate with the wall designer, providing design surcharge loads for the planned wall.

6) RETAINING WALL DESIGN

At the time of this report it is our understanding that an approximately 180 foot long cast-in-place concrete retaining wall with a maximum height of approximately 11 feet will be constructed at the site. The centerline of the tower is to be located approximately 21 feet behind the southwest face of the wall.

The design of retaining walls should be governed by the type, grain-size distribution, and soil classification of the material to be backfilled behind the walls. It is recommended that retaining wall be backfilled with granular fill to within 18 inches of the ground surface and with a low permeability cap, consisting of clay above this level to reduce infiltration of surface water.

An internal friction angle of 30 degrees and a moist unit weight of 110 pcf may be used for retaining wall design. These values are based on using coarse Aggregate No. 67 or 57 for retaining wall backfill. If an alternative material is selected, the internal friction angle and the unit weight may be determined through laboratory analysis of the selected material. At the base of these open-graded aggregate or alternative material layers, it is useful to have a network of slotted/perforated pipe to collect moisture accumulation to drain towards weep hole outlets which should be installed at least every 20 feet. A drainage system shall be installed in accordance with Sections 1805.4.2 and 1805.4.3 of the International Building Code, otherwise the full hydraulic pressure should be considered.

The retaining wall design should include the effects of surcharge loading during construction. The surcharge loading will affect the external stability conditions of sliding and overturning and should be included within the design. The resultant forces from the foundations onsite should also be included in the surcharge loading. TEP has not been provided with foundation information for either the tower or other ancillary structures. It's recommended that the wall designer collaborate with tower foundation designer to obtain specific loading information. It is recommended that retaining walls include seismic design load combinations.

The base of the retaining wall may be designed utilizing a continuous foundation bearing at least 12 inches below grade.

Table 3 – Retaining Wall Foundation Analysis Parameters – Boring B-1

Depth		Soil	Gross Ultimate Bearing ^{1,2,3} (psf)	Cohesion ¹ (psf)	Friction Angle ¹ (degrees)	Effective Unit Weight (pcf)	Friction Factor
Top	Bottom						
0	1	SC	950	-	31	105	0.38
1	2	SC	1825	-	31	105	0.38
2	3	SC	2700	-	31	105	0.38
3	4	SC	3575	-	31	105	0.38
4	6	SC	4450	-	31	105	0.38

Notes:

- 1) These values should be considered ultimate soil parameters.
- 2) A minimum factor of safety of 2 is recommended for allowable bearing.
- 3) The soil values are based on a foundation width of 2.5 feet, and do take into consideration steep ground slope slopes. TEP may revise if a different sized footing is considered.

7) SOIL RESISTIVITY

Soil resistivity was performed at the TEP laboratory in accordance with ASTM G187-05 (Standard Test Method for Measurement of Soil Resistivity Using the Two Electrode Soil Box Method). Test results indicated a result of 2,800 ohms-cm.

8) SEISMIC PARAMETERS

The following seismic design parameters were obtained from the US Seismic Hazard Design Maps available through the USGS. A risk category of I – III was assumed.

PGA:	0.270g
PGA _M :	0.34g
S _S :	0.669g
S ₁ :	0.265g
F _a :	1.265
F _v :	1.869
S _{DS} :	0.564g
S _{D1} :	0.331g

Ground motion values provided above are in accordance with the 2010 ASCE-7 Standard.

A site-specific liquefaction potential analysis not performed at this project location, as shallow groundwater was not encountered. The ground surrounding the tower site can be described as being moderately to steeply sloping. Considering the site topography and the medium to very materials encountered, it is not likely that the site should be considered susceptible to landslides or flows, however an earthquake induced seismic hazard analysis was not conducted to rule out the potential. The site is not located within 10 miles of a fault.

9) CONSTRUCTION CONSIDERATIONS - SHALLOW FOUNDATION

9.1) Excavation

The boring data indicates excavation to the expected subgrade level for the shallow foundation will extend through sand and weathered rock. A large tracked excavator should be able to remove the materials with minimal to severe difficulty. A large tracked excavator with rock teeth and/or a pneumatic hammer will be necessary to remove the materials with difficulty. TEP anticipates the depth to the surface of the rock will vary outside of the boring location. Boulders and bedrock outcroppings are common to this geographic region and may also be encountered in the excavation area.

Excavations should be sloped or shored in accordance with local, state and federal regulations, including OSHA (29 CFR Part 1926) excavation trench safety standards. It is the responsibility of the contractor for site safety. This information is provided as a service and under no circumstance should TEP be assumed responsible for construction site safety.

9.2) Foundation Evaluation/Subgrade Preparation

After excavation to the design elevation for the footing, the materials should be evaluated by a Geotechnical Engineer or a representative of the Geotechnical Engineer prior to reinforcement and concrete placement. This evaluation should include probing, shallow hand auger borings and dynamic cone penetrometer testing (ASTM STP-399) to help verify that suitable residual material lies directly under the foundation and to determine the need for any undercut and replacement of unsuitable materials. Loose surficial material should be compacted in the excavation prior to reinforcement and concrete placement to stabilize surface soil that may have become loose during the excavation process. TEP recommends a 6-inch layer of compacted crushed stone be placed just after excavation to aid in surface stability.

Rock was encountered in the boring. If the foundation excavation shows that only a portion of the foundation will bear on rock, with a portion bearing on soil, then the entire footprint should be over-excavated by a minimum of 6 inches and the bearing elevation should be re-established with a coarse graded aggregate.

9.3) Fill Placement and Compaction

Backfill materials placed above the shallow foundation to the design subgrade elevation should not contain more than 5 percent by weight of organic matter, waste, debris or any otherwise deleterious materials. To be considered for use, backfill materials should have a maximum dry density of at least 100 pounds per cubic foot as determined by standard Proctor (ASTM D 698), a Liquid Limit no greater than 40, a Plasticity Index no greater than 20, a maximum particle size of 4 inches, and 20 percent or less of the material having a particle size between 2 and 4 inches. Because small handheld or walk-behind compaction equipment will most likely be used, backfill should be placed in thin horizontal lifts not exceeding 6 inches (loose).

Fill placement should be monitored by a qualified Materials Technician working under the direction of a Geotechnical Engineer. In addition to the visual evaluation, a sufficient amount of in-place field density tests should be conducted to confirm the required compaction is being attained.

9.4) Reuse of Excavated Soil

The sand that meets the above referenced criteria can be utilized as backfill based on dry soil and site conditions at the time of construction. Weathered rock materials may not meet the above criteria without additional crushing effort. A suitable borrow source should be identified prior to beginning construction.

10) CONSTRUCTION CONSIDERATIONS - DRILLED SHAFTS

Based on TEP's experience a conventional drilled shaft rig (Hughes Tool LDH or equivalent) can be used to excavate to the auger refusal depth of TEP's boring. An earth auger can typically penetrate the materials encountered to the auger refusal depth of the boring with moderate to severe difficulty. Materials below the auger refusal depth may require a coring bit or roller-bit to remove the material. Boulders and bedrock outcroppings are sometimes encountered in this geographic region and may be encountered outside of the boring location. Special excavation equipment may be necessary for a shaft greater than 60-inches in diameter. If hole collapse is encountered during construction, the design and geotechnical engineers should be contacted immediately to make any necessary adjustments.

The following are general procedure recommendations in drilled shaft construction using the "dry" method:

- 1) Drilling equipment should have cutting teeth to result in a hole with little or no soil smeared or caked on the sides; a spiral like corrugated side should be produced. The shaft diameter should be at least equal to the design diameter for the full depth.
- 2) The drilled shaft should be drilled to satisfy a plumbness tolerance of 1.5 to 2 percent of the length and an eccentricity tolerance of 2 to 3 inches from plan location.
- 3) Refer to Section 4.3 for subsurface water information. Water will fluctuate during the year and during rain events. Any subsurface water should be removed by pumping, leaving no more than 3 inches in the bottom of the shaft excavation.
- 4) A removable steel casing may be installed in the shaft to prevent caving of the excavation sides due to soil relaxation. Loose soils in the bottom of the shaft should be removed.
- 5) The drilled shaft should be evaluated by the Geotechnical Engineer or their representative to confirm suitable end bearing conditions and to verify the proper diameter and bottom cleanliness. The shaft should be evaluated immediately prior to and during concrete operations.
- 6) The drilled shaft should be concreted as soon as practical after excavation to reduce the deterioration of the supporting soils due to caving and subsurface water intrusion.
- 7) The slump of the concrete is critical for the development of side shear resistance. TEP recommends a concrete mix having a slump of 6 to 8 inches be used with the minimum compressive strength specified by the structural engineer. A mix design incorporating super plasticizer will likely be required to obtain this slump.
- 8) The concrete may be allowed to fall freely through the open area in the reinforcing steel cage provided it is not allowed to strike the reinforcing steel or the casing prior to reaching the bottom of the shaft excavation.
- 9) The protective steel casing should be extracted as concrete is placed. A head of concrete should be maintained above the bottom of the casing to prevent soil and water intrusion into the concrete below the casing.

Due to the sandy soil, the contractor may elect to utilize the "slurry" method for shaft construction. The following are general procedure recommendations in drilled shaft construction using the "slurry" method:

- 1) Slurry drilled shafts are constructed by conventional caisson drill rigs excavating beneath a drilling mud slurry. Typically, the slurry is introduced into the excavation after the groundwater table has been penetrated and/or the soils on the sides of the excavation are observed to be caving-in. When the design shaft depth is reached, fluid concrete is placed through a tremie pipe at the bottom of the excavation.
- 2) The slurry level should be maintained at a minimum of 5 feet or one shaft diameter, whichever is greater, above the subsurface water level.
- 3) Inspection during excavation should include verification of plumbness, maintenance of sufficient slurry head, monitoring the specific gravity, pH and sand content of the drilling slurry, and monitoring any changes in the depth of the excavation between initial approval and prior to concreting.
- 4) A removable steel casing may be installed in the shaft to prevent caving of the excavation sides due to soil relaxation. Loose soils in the bottom of the shaft should be removed.
- 5) The specific gravity or relative density of the drilling mud slurry should be monitored from the initial mixing to the completion of the excavation. An increase in the specific gravity or density of the drilling slurry by as much as 10 percent is indicative of soil particles settling out of the slurry onto the bottom of the excavation. This settling will result in a reduction of the allowable bearing capacity of the bottom of the drilled shaft.
- 6) After approval, the drilled shaft should be concreted as soon as practical using a tremie pipe.
- 7) For slurry drilled shafts, the concrete should have a 6 to 8 inch slump prior to discharge into the tremie. The bottom of the tremie should be set at about one tremie pipe diameter above the excavation. A closure flap at the bottom of the tremie should be used, or a sliding plug introduced into the tremie before the concrete, to reduce the potential for the concrete being contaminated by the slurry. The bottom of the tremie must be maintained in concrete during placement, which should be continuous.
- 8) The protective steel casing should be extracted as concrete is placed. A head of concrete should be maintained above the bottom of the casing to prevent soil and water intrusion into the concrete below the casing.
- 9) Additional concrete should be placed via the tremie causing the slurry to overflow from the excavation in order to reduce the likelihood of slurry pockets remaining in the drilled shaft.

If variability in the subsurface materials is encountered, a representative of the Geotechnical Engineer should verify that the design parameters are valid during construction. Modification to the design values presented above may be required in the field.

11) CONSTRUCTION CONSIDERATIONS – RETAINING WALL

11.1) Excavation

The boring data indicates excavation to the expected subgrade level for the shallow foundation will extend through either silty sand, clay or weathered rock. A large tracked excavator should be able to remove the materials with minimal to severe difficulty. A large tracked excavator with rock teeth and/or a pneumatic hammer will be necessary to remove the materials with difficulty. TEP anticipates the depth to the surface of the rock will vary outside of the boring location. Boulders and bedrock outcroppings are common to this geographic region and may also be encountered in the excavation area. Care should be exercised to minimize disturbance to materials in front of the toe of the wall. Excessive disturbance of these areas may reduce the stability of the overall slope.

Excavations should be sloped or shored in accordance with local, state and federal regulations, including OSHA (29 CFR Part 1926) excavation trench safety standards. It is the responsibility of the contractor for site safety. This information is provided as a service and under no circumstance should TEP be assumed responsible for construction site safety.

11.2) Foundation Base Evaluation/Subgrade Preparation

After excavation to the design elevation for the wall base and areas to receive fill, the materials should be evaluated by a Geotechnical Engineer or a representative of the Geotechnical Engineer prior to reinforcement and concrete placement. This evaluation should include probing, shallow hand auger borings and dynamic cone penetrometer testing (ASTM STP-399) to help verify that suitable residual material lies directly under the foundation and to determine the need for any undercut and replacement of unsuitable materials. Loose surficial material should be compacted in the excavation prior to reinforcement and concrete placement to stabilize surface soil that may have become loose during the excavation process.

Rock was encountered in the boring. If the foundation excavation shows that only a portion of the foundation will bear on rock, with a portion bearing on soil, then the entire width should be over-excavated by a minimum of 6 inches and the bearing elevation should be re-established with a coarse graded aggregate. The over-excavation should at least 1 foot in each direction beyond the encountered rock. This should alleviate the potential for differential settlements between material types.

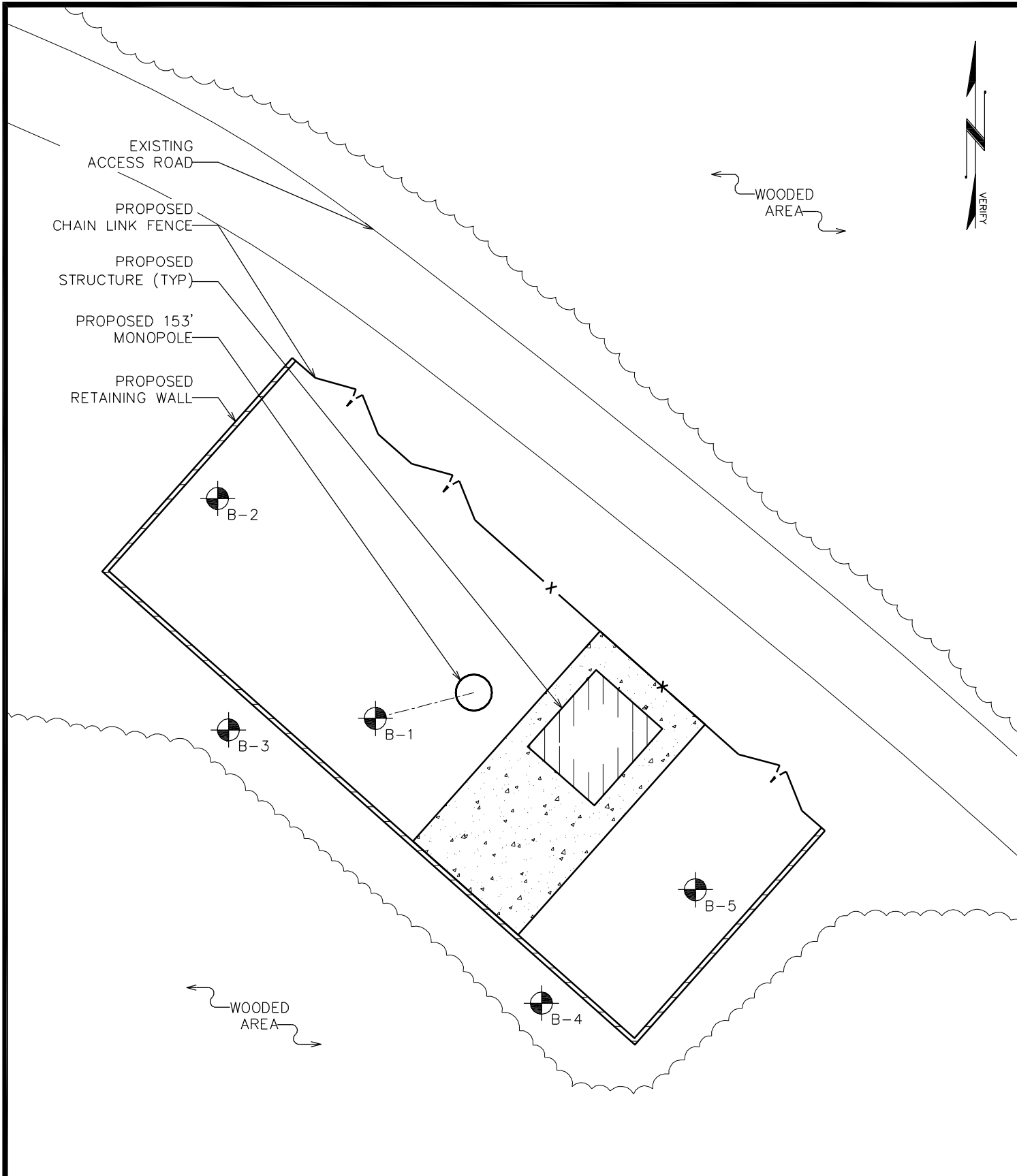
11.3) Fill Placement and Compaction – Retaining Wall

Backfill materials placed behind the retaining wall shall consist of coarse granular soils having less than 20 percent by weight passing a No. 200 sieve. Backfill materials should be free of organics, debris, and other deleterious materials. Backfill materials should be evaluated prior to being selected to determine their suitability, prior to their use. Retaining wall backfill materials should be compacted to a minimum of 95 percent of the maximum dry density as determined by the standard Proctor (ASTM D 698) or 92 percent of the modified Proctor (ASTM D 1557). In order to achieve the desired level of compaction, backfill materials should be moisture conditioned to within 20 percent of the optimum moisture content (ie. if the OMC=12 percent, then between 9.6 and 14.4 percent moisture). Because compaction will be performed behind a retaining wall, small handheld or walk-behind compaction equipment should be used. Backfill should be placed in thin horizontal lifts not exceeding 6 inches, loose. If difficulty is experienced obtaining the necessary level of compaction with 6 inch loose lifts, then the thickness of the lifts may need to be reduced. Should any of the recommendations provided above conflict with specifications from the design engineer, specifications from project drawings should supersede.

APPENDIX A

BORING LAYOUT

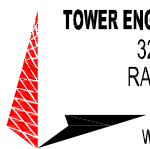




BORING LAYOUT

SCALE: N.T.S.

PREPARED BY:



TOWER ENGINEERING PROFESSIONALS
326 TRYON ROAD
RALEIGH, NC 27603
(919) 661-6351
www.tepgroup.net

PREPARED FOR:



750 PARK OF COMMERCE DRIVE
SUITE 200
BOCA RATON, FL 33487
(561) 948-6367

PROJECT INFORMATION:

PEOH POINT
SITE #: US-WA-5105

302 E 4TH ST.
CLE ELUM, WA 98922
(KITITAS COUNTY)

REVISION: 0

TEP JOB #: 132753.164385

SHEET NUMBER:

C-1

APPENDIX B

BORING LOG



Tower Engineering Professionals
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LOG OF BORING B-1

1 OF 1

PROJECT

Peoh Point

SITE ID:

US-WA-5105

TEP NO.:

132753

DATE STARTED 4/30/2018	DRILLING METHOD Hollow Stem Auger	HOLE SIZE 4in	CITY, STATE Cle Elum
DATE COMPLETE 4/30/2018	HAMMER WEIGHT/FALL 140lbs / 30in	HAMMER TYPE Automatic	TOTAL DEPTH 32.5 FT
GROUND EL.	LOGGED BY GTM	CHECKED BY JEL	BACKFILL Cuttings
BORING LOCATION Adjacent to the proposed tower location	DEPTH/EL. GROUNDWATER Not Encountered		

SAMPLE NUMBER	SAMPLE LENGTH (INCHES)	BLOW COUNTS (N) REC% / RQD%	ELEVATION (FEET)	DEPTH (FEET)	SAMPLE GRAPHIC	USCS GRAPHIC	DESCRIPTION AND CLASSIFICATION	REMARKS	POCKET PEN TSF	UNCONFINED STRENGTH, PSF	UNIT WEIGHT PCF
S1	18	1-2-3 (5)					0.0-3.5: Loose, brown, fine to coarse, clayey SAND (SC), trace roots, moist	Driller Note: Weathered rock encountered at 3.5 feet to end of boring			
S2	18	6-11-13 (24)		5			3.5-6.0: Medium dense, brown, fine to coarse, silty SAND (SM), partially cemented, moist				
S3	18	8-15-21 (36)					6.0-10.0: to dense				
S4	18	13-19-24 (43)		10			10.0-15.0: to very dense, light brown, fine to medium, not cemented				
S5	5.9	50/6"									
S6	11	45-50/5"		15			15.0-20.0: brown	Cave-in at 26 feet			
S7	10	39-50/4"		20			20.0-25.0: Very dense, light brown, weathered SILTSTONE, moist				
S8	5.9	50/6"		25			25.0-32.5: gray				
S9	5	50/5"		30							
				32.5			32.5: Boring Terminated - Auger Refusal				
				35							



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LOG OF BORING B-2

1 OF 1

PROJECT

Peoh Point

SITE ID:

US-WA-5105

TEP NO.:

132753

DATE STARTED 4/30/2018	DRILLING METHOD Hollow Stem Auger	HOLE SIZE 4in	CITY, STATE Cle Elum
DATE COMPLETE 4/30/2018	HAMMER WEIGHT/FALL 140lbs / 30in	HAMMER TYPE Automatic	TOTAL DEPTH 10.0 FT
GROUND EL.	LOGGED BY GTM	CHECKED BY JEL	BACKFILL Cuttings
BORING LOCATION Adjacent to the proposed northwest retaining wall	DEPTH/EL. GROUNDWATER Not Encountered		

SAMPLE NUMBER	SAMPLE LENGTH (INCHES)	BLOW COUNTS (N) REC% / RQD%	ELEVATION (FEET)	DEPTH (FEET)	SAMPLE GRAPHIC	USCS GRAPHIC	DESCRIPTION AND CLASSIFICATION	REMARKS	POCKET PEN TSF	UNCONFINED STRENGTH, PSF	UNIT WEIGHT PCF
							0.0-6.0: Medium stiff, brown, sandy CLAY (CL), trace roots, trace particulate organics, moist				
S1	18	2-3-4 (7)									
S2	18	2-3-5 (8)		5							
S3	18	8-16-24 (40)					6.0-8.5: Dense, brown, fine to medium, silty SAND (SM), partially cemented, moist	Driller Note: Weathered rock encountered at 6 feet to end of boring			
S4	18	11-13-10 (23)					8.5-10.0: to medium dense	Cave-in at 9 feet			
				10			10.0: Boring Terminated				



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LOG OF BORING B-3

1 OF 1

PROJECT

Peoh Point

SITE ID:

US-WA-5105

TEP NO.:

132753

DATE STARTED 5/1/2018	DRILLING METHOD Hollow Stem Auger	HOLE SIZE 4in	CITY, STATE Cle Elum
DATE COMPLETE 5/1/2018	HAMMER WEIGHT/FALL 140lbs / 30in	HAMMER TYPE Automatic	TOTAL DEPTH 10.0 FT
GROUND EL.	LOGGED BY GTM	CHECKED BY JEL	BACKFILL Cuttings
BORING LOCATION Adjacent to the proposed southwest retaining wall	DEPTH/EL. GROUNDWATER Not Encountered		

SAMPLE NUMBER	SAMPLE LENGTH (INCHES)	BLOW COUNTS (N) REC% / RQD%	ELEVATION (FEET)	DEPTH (FEET)	SAMPLE GRAPHIC	USCS GRAPHIC	DESCRIPTION AND CLASSIFICATION	REMARKS	POCKET PEN TSF	UNCONFINED STRENGTH, PSF	UNIT WEIGHT PCF
							0.0-3.5: Medium dense, brown, fine to medium, clayey SAND (SC), moist				
S1	18	3-6-7 (13)									
S2	18	6-9-13 (22)					3.5-8.5: Medium dense, light brown, fine to medium, silty SAND (SM), moist				
				5							
S3	18	9-9-10 (19)									
S4	18	10-25-35 (60)					8.5-10.0: to very dense	Driller Note: Weathered rock encountered at 8.5 feet to end of boring Cave-in at 9 feet			
				10			10.0: Boring Terminated				



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LOG OF BORING B-4

1 OF 1

PROJECT

Peoh Point

SITE ID:

US-WA-5105

TEP NO.:

132753

DATE STARTED 5/1/2018	DRILLING METHOD Hollow Stem Auger	HOLE SIZE 4in	CITY, STATE Cle Elum
DATE COMPLETE 5/1/2018	HAMMER WEIGHT/FALL 140lbs / 30in	HAMMER TYPE Automatic	TOTAL DEPTH 10.0 FT
GROUND EL.	LOGGED BY GTM	CHECKED BY JEL	BACKFILL Cuttings
BORING LOCATION Adjacent to the proposed southwest retaining wall	DEPTH/EL. GROUNDWATER Not Encountered		

SAMPLE NUMBER	SAMPLE LENGTH (INCHES)	BLOW COUNTS (N) REC% / RQD%	ELEVATION (FEET)	DEPTH (FEET)	SAMPLE GRAPHIC	USCS GRAPHIC	DESCRIPTION AND CLASSIFICATION	REMARKS	POCKET PEN TSF	UNCONFINED STRENGTH, PSF	UNIT WEIGHT PCF
							0.0-3.5: Dense, brown, fine to coarse, clayey SAND (SC), moist				
S1	18	6-10-28 (38)									
S2	17	12-24-50/5"					3.5-6.0: Very dense, brown, fine to coarse, silty SAND (SM), partially cemented, moist	Driller Note: Weathered rock encountered at 3.5 feet to end of boring			
				5							
S3	9	43-50/3"					6.0-10.0: light brown	Cave-in at 6 feet			
S4	5	50/5"									
				10			10.0: Boring Terminated				



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LOG OF BORING B-5

1 OF 1

PROJECT

Peoh Point

SITE ID:

US-WA-5105

TEP NO.:

132753

DATE STARTED 5/1/2018	DRILLING METHOD Hollow Stem Auger	HOLE SIZE 4in	CITY, STATE Cle Elum
DATE COMPLETE 5/1/2018	HAMMER WEIGHT/FALL 140lbs / 30in	HAMMER TYPE Automatic	TOTAL DEPTH 10.0 FT
GROUND EL.	LOGGED BY GTM	CHECKED BY JEL	BACKFILL Cuttings
BORING LOCATION Adjacent to the proposed southeast retaining wall	DEPTH/EL. GROUNDWATER Not Encountered		

SAMPLE NUMBER	SAMPLE LENGTH (INCHES)	BLOW COUNTS (N) REC% / RQD%	ELEVATION (FEET)	DEPTH (FEET)	SAMPLE GRAPHIC	USCS GRAPHIC	DESCRIPTION AND CLASSIFICATION	REMARKS	POCKET PEN TSF	UNCONFINED STRENGTH, PSF	UNIT WEIGHT PCF
							0.0-3.5: No Sample				
S1	17	8-34-50/5"						Driller Note: Weathered rock encountered at 1 feet to end of boring			
S2	10	34-50/4"					3.5-6.0: Very dense, light brown, fine to coarse, silty SAND (SM), moist				
				5							
S3	8	47-50/2"					6.0-10.0: trace clay				
S4	5.9	50/6"									
				10			10.0: Boring Terminated	Cave-in at 8 feet			



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Email: Geotech@tepgroup.net

Key to Soil Symbols and Terms

TERMS DESCRIBING CONSISTENCY OR CONDITION

COARSE-GRAINED SOILS (major portions retained on No. 200 sieve): includes (1) clean gravel and sands and (2) silty or clayey gravels and sands. Condition is rated according to relative density as determined by laboratory tests or standard penetration resistance tests.

Descriptive Terms

SPT Blow Count

Very Loose	< 4
Loose	4 to 10
Medium Dense	11 to 30
Dense	31 to 50
Very Dense	> 50

FINE-GRAINED SOILS (major portions passing on No. 200 sieve): includes (1) inorganic and organic silts and clays (2) gravelly, sandy, or silty clays, and (3) clayey silts. Consistency is rated according to shearing strength, as indicated by penetrometer readings, SPT blow count, or unconfined compression tests.

Descriptive Terms

SPT Blow Count

Very Soft	< 2
Soft	2 to 4
Medium Stiff	5 to 8
Stiff	9 to 15
Very Stiff	16 to 30
Hard	> 30

GENERAL NOTES

1. Classifications are based on the Unified Soil Classification System and include consistency, moisture, and color. Field descriptions have been modified to reflect results of laboratory tests where deemed appropriate.

2. Surface elevations are based on topographic maps and estimated locations and should be considered approximate.

3. Descriptions on these boring logs apply only at the specific boring locations and at the time the borings were made. They are not guaranteed to be representative of subsurface condition at other locations or times.

	Group Symbols	Typical Names	Sampler Symbols
	GW	Well-graded gravels, gravel-sand mixtures, little or no fines	Split Spoon
	GP	Poorly-graded gravels, little or no fines/sands	Standard Penetration Test (SPT)
	GM	Silty gravels, gravel-sand-silt mixtures	Pushed Shelby Tube
	GC	Clayey gravels, gravel-sand-silt mixtures	Auger Cuttings
	SW	Well-graded sands, gravelly sands, little or no fines	Grab Sample
	SP	Poorly-graded sands, little or no fines/sands/gravels	Dynamic Cone Penetrometer
	SM	Silty sands, sand-silt mixtures	Hand Auger
	SC	Clayey sands, sand-clay mixtures	Rock Core
	ML	Inorganic silts and very fine sands, rock floor, silty or clayey fine sands or clayey silts with slight plasticity	Log Abbreviations ATD - At Time of Drilling AD - After Drilling EOD - End of Drilling RMR - Rock Mass Rating WOH - Weight of Hammer WOR - Weight of Rod REC - Rock Core Recovery RQD - Rock Quality Designation
	CL	Inorganic clays of low to medium plasticity, gravelly clays, sandy clays, silty clays, lean clays	
	OL	Organic silts and organic silty clays of low plasticity	
	MH	Inorganic silts, micaceous or distomaceous fine sandy or silty soils, elastic silts	
	CH	Inorganic clays of high plasticity, fat clays	
	OH	Organic clays of medium to high plasticity, organic silts	
	PT	Peat and other highly organic soils	

Information Regarding This Subsurface Exploration Report

The information contained in this report has been specifically tailored to the needs of the client at the time the report was provided, for the specific purpose of the project named in this report. The attached report may not address the needs of contractors, civil engineers, or structural engineers. Anyone other than the named client should consult with the geotechnical engineer prior to utilizing the information contained in the report.

It is always recommended that the full report be read. While certain aspects of the report may seem unnecessary or irrelevant; just as each project and site are unique, so are the subsurface investigation reports and the information contained in them. Several factors can influence the contents of these reports, and the geotechnical engineer has taken into consideration the specific project, the project location, the client's objectives, potential future improvements, etc. If there is any question about whether the attached report pertains to your specific project or if you would like to verify that certain factors were considered in the preparation of this report, it is recommended that you contact the geotechnical engineer.

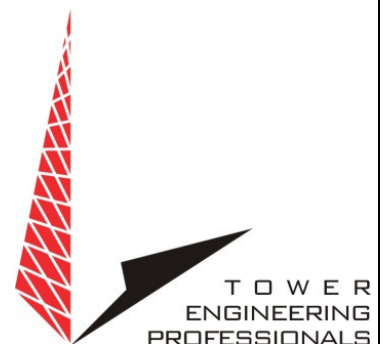
Geotechnical subsurface investigations often are prepared during the preliminary stages of a project and aspects of the project may change later on. Some changes may require a report revision or additional exploration. Some changes that often need to be brought to the attention of the geotechnical engineer include changes in location, size and/or type of structure, modifications to existing structures, grading around the project site, etc. Some naturally occurring changes can also develop that impact the information contained in this geotechnical report such as earthquakes, landslides, floods, subsurface water levels changing, etc. It is always recommended that the geotechnical be informed of known changes at the project site.

Subsurface exploration reports are generated based on the analysis and professional opinions of a geotechnical engineer based on the results of field and laboratory data. Often subsurface conditions can vary – sometimes significantly – across a site and over short distances. It often is helpful to retain the geotechnical engineer's services during the construction process. Otherwise, the geotechnical cannot assume responsibility or liability for report recommendations which may have needed to change based on changing site conditions or misinterpretation of recommendations.

Geotechnical engineers assemble testing and/or boring logs based on their interpretation of field and laboratory data. Testing and/or boring logs should always be coupled with the subsurface exploration report. The geotechnical engineer and Tower Engineering Professionals cannot be held reliable for interpretations, analyses, or recommendations based solely on the testing and/or boring log if it is independent of the prepared report.

The scope of the subsurface exploration report does not include an assessment or analysis of environmental conditions, determination of the presence or absence of wetlands or hazardous or toxic materials on or below the ground surface. Any notes regarding odors, fill, debris, or anything of that nature are offered as general information for the client, often to help identify or delineate natural soil boundaries.

For additional information, please contact the geotechnical engineer named in the attached report.



SE09034J Cle Elum DT

Drainage Report

Prepared for

Vertical Bridge

Prepared by

LDC, Inc.

20210 142nd Ave NE
Woodinville, WA 98072
(425) 806-1869



February 2019

Job No: T19-704

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1.0 PROJECT OVERVIEW

The SE09034J Cle Elum DT project proposes the construction of a new 153' cellular tower and associated equipment shelter, fuel tank, power utilities, and accesses on a 0.06-acre (2,418 sf) lease area within the City of Cle Elum in Kittitas County, Washington. The project will disturb approximately 0.09 acres and proposes approximately 0.06 acres of new impervious surfaces near the northeast portion of parcels 20-15-26050-2401 and 20-15-26050-2403. The proposed tower coordinates are 47° 11' 51.88" N, 120° 55' 59.77" W.

Access to the project site will be provided via an existing gravel road which extends eastward between E 5th St and N Montgomery Ave and borders the northern edge of the site. Construction activities include clearing and grading and the construction of crushed rock site pad, retaining walls, and 153' tower with associated equipment shelter, fuel tank, and power utilities. Construction activities will disturb approximately 0.09 acres.

The project site consists primarily of forested area and is currently undeveloped, with the exception of an existing gravel road which provides access from E 5th St, to the west of the site and N Montgomery Ave to the east. According to USDA Soil Mapping, site soils are most consistent with the Ampad Ashy Sandy Loam, a hydrologic group B soil which exhibits relatively low infiltration potential. Existing grades across the project site range from approximately 0 to 30 percent.

Existing site runoff flows generally southward as sheet flow over moderate slopes. Onsite flows are discharged from the southern site boundary and are conveyed overland to the south through the central/southern portions of parcels 20-15-26050-2401 and 20-15-26050-2403 for approximately 100 feet. Flow continues southward as sheet flow for an additional 200 feet through parcels 20-15-26050-2701 and 20-15-26050-2703 before reaching the E 3rd St ROW. Any flow discharged to E 3rd St enters the existing City of Cle Elum

collection and conveyance system, which carries flows beyond the 0.25-mile boundary of analysis and eventually discharges to the Yakima River. Due to the extent of forested area/native vegetation immediately downstream of the site, however, it is likely that any flows emanating from the site are fully dispersed before entering the E 3rd St ROW.

This Report was produced in accordance with the 2004 DOE Manual for Eastern Washington (2004 SWMMEW). Per Chapter 2.1.1 of the 2004 DOE Manual, the project is required to conform to Core Elements 1 through 8 due to its classification of a new development. A summary of how each of the minimum requirements is met is as follows.

Core Element #1: Preparation of Stormwater Site Plans: This report, along with the provided Construction Plans, satisfies this requirement.

Core Element #2: Construction Stormwater Pollution Prevention (SWPPP): See Section 2 of this Report for a discussion of SWPPP BMP elements, and the SWPPP (submitted as a separate document) for a complete discussion of erosion control BMPs and their use specific to the site.

Core Element #3: Source Control of Pollution: Permanent source control BMPs are not applicable for the subject site, as the associated activities for the proposed facility do not fall within the types of facilities requiring source control BMPs per the DOE Manual. BMPs for temporary erosion and sedimentation control are specified in the Construction Plans and SWPPP.

Core Element #4: Preservation of Natural drainage Systems and Outfalls: Existing site runoff flows generally southward as overland flow over moderate slopes. Onsite flows are discharged from the southern site boundary and are conveyed overland to the south through the central/southern portions of parcels 20-15-26050-2401 and 20-15-26050-2403. Flow continues southward as

sheet flow through parcels 20-15-26050-2701 and 20-15-26050-2703 before reaching the E 3rd St ROW. Any flow discharged to E 3rd St enters the existing City of Cle Elum collection and conveyance system, which carries flows beyond the 0.25-mile boundary of analysis and eventually discharges to the Yakima River. Developed condition flows will continue to discharge overland from the southern site boundary, effectively matching the predeveloped flowpath.

Core Element #5: Runoff Treatment: Per section 2.2.5 of the 2004 DOE Manual, the project is exempt from runoff treatment requirements, as proposed impervious areas fall below the 5,000 sf threshold for treatment. However, all runoff associated with proposed PGIS will be dispersed through native vegetation in accordance with BMP F6.42 as a means of flow control and water quality treatment.

Core Element #6: Flow Control: Per section 2.2.6 of the 2004 DOE Manual, this project is exempt from flow control requirements, as proposed impervious surfaces associated with the project fall below the 10,000 sf threshold for flow control.

Preliminary investigation of site soils and underlying geology indicates soils that are characterized as ashy sandy loam. Despite relatively high infiltration rates, site soils typically exhibit shallow depth to weathered bedrock. Due to the low storage capacity of site soils, it was determined that infiltration is infeasible for this project. Instead, all runoff associated with proposed impervious surfaces will be collected via a selection of proposed area drains and conveyed to a proposed dispersion trench located at the southern margin of the project site. All onsite flows will be fully dispersed in this manner through a minimum 100' of native vegetation per BMP F6.42.

Core Element #7: Operation and Maintenance: Operations and Maintenance requirements for proposed facilities are provided in Section 5 of this report.

Core Element #8: Local Requirements: All new development located within the City of Cle Elum is subject to the requirements of the 2004 DOE Manual (2004 SWMMEW). No additional local requirements have been identified.



VERTICAL BRIDGE

SE09034J CLE ELUM DT
EXISTING CONDITIONS MAP

PROJECTION: WASHINGTON STATE PLANE, NORTH ZONE, NAD 83 HARN, FEET	
REVISION:	
JOB NUMBER:	T18-212
DRAWING NAME:	T18-212F01
DESIGNER:	S.WILSON
DRAWING BY:	S.WILSON
DATE:	02-08-2019
SCALE:	AS SHOWN
JURISDICTION:	CLE ELUM

FIGURE:

1.0

15th ANNIVERSARY
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Planning
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Woodinville, WA 98072
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Ex. 425.482.2893
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SOURCE INFORMATION	
SOURCE AGENCY	DESCRIPTION
KITTITAS COUNTY GIS	PARCEL BOUNDARY
GOOGLE EARTH	AERIAL IMAGERY (2017)

2.0 SWPPP ANALYSIS AND DESIGN

Temporary Erosion and Sediment Control

A Stormwater Pollution Prevention Plan (SWPPP) will be provided prior to construction. The SWPPP report is modeled under the guidelines of Chapter 7.0 of the 2004 DOE Manual. Construction SWPPP Elements #1 through #12 are addressed below.

Element #1 - Mark Clearing Limits: All clearing limits will be delineated with high visibility plastic fence or silt fence. See sheets ER-1.0 of the construction plans for locations and details.

Element #2 - Establish Construction Access: Site access will be provided via an existing gravel road which extends eastward to the site from E 5th St. See sheets ER-1.0 and ER-2.0 of the construction plans for locations and details.

Element #3 - Control Flow Rates: Flow control is not required for this project. Silt fence installed at designated locations along clearing limits will serve to control sediment and provide a means of flow control for construction period flows, which are expected to be minimal. See sheets ER-1.0 and ER-2.0 of the plans for location and details of flow and sediment control BMP's.

Element #4 - Install Sediment Controls: Silt fence, as well as inlet protection, will be utilized to contain sediments within the project's clearing limits and prevent sediment-laden runoff from exiting the project site. See sheets ER-1.0 and ER-2.0 of the plans for locations and details.

Element #5 - Stabilize Soils: Exposed soils will be stabilized as specified in the Grading and Erosion Control Notes. See sheet ER-2.0 of the plans for notes.

Element #6 - Protect Slopes: Slopes are moderate across the subject property and shall be protected as specified under Element #5.

Element #7 - Protect Drain Inlets: Storm drain inlet protection will be provided for all area drains proposed onsite. See sheets ER-1.0 and ER-2.0 of the plans for locations and details.

Element #8 - Stabilize Channels and Outlets: Channel and outlet stabilization will not be utilized, as no interceptor swales are proposed for this project. In the event that these elements prove necessary, channels will be stabilized via mulching or seeding. See sheets ER-1.0 and ER-2.0 of the plans for locations and details.

Element #9 - Control Pollutants: Pollutants shall be controlled as specified in the Pollutant Control Notes. See sheet ER-2.0 of the plans for notes.

Element #10 - Control De-Watering: Disposal options for de-watering water are as specified in the De-Watering Control Notes. See sheet ER-2.0 of the plans for notes.

Element #11 - Maintain BMPs: Maintenance of the BMPs is specified within the Construction Sequence and Grading and Erosion Control Notes. See sheets ER-1.0 and ER-2.0 of the plans for the Construction Sequence and notes.

Element #12: Manage the Project: The Grading and Erosion Control Notes specify seasonal work limitations. Maintenance of the BMPs is specified within the Construction Sequence and Grading and Erosion Control Notes. See sheets ER-1.0 and ER-2.0 of the plans for the Construction Sequence and notes.

3.0 OFF-SITE ANALYSIS REPORT

Task 1. Study Area Definition and Maps

Survey and 2017 aerial photography were the best topographical references available for the area containing the site. The limits of the downstream analysis extend roughly 0.25 miles beyond the subject property (See Figure 2.0, Downstream Analysis Map). The project site is ultimately tributary to the Yakima River.

Task 2. Resource Review

All of the resources below have been reviewed for existing and potential issues near the project site:

- **Adopted Basin Plans**

No Adopted Basin Plans were located that include the project site.

- **Drainage Basin**

This site is tributary to the Yakima River.

- **Floodplain / Floodway (FEMA) maps**

FEMA flood insurance mapping indicates that there are no floodplains within ¼ mile of the subject property.

- **Critical Areas Map**

No critical areas exist on or in the immediate vicinity of the site.

- **Drainage Complaints**

No drainage complaints are known downstream of the subject property.

- **Road Drainage Problems**

No issues were identified near the proposed site.

- **USDA Soil Survey**

According to USDA soil mapping, the project site contains soils consistent with the Ampad ashy sandy loam, a hydrologic group B soil with a relatively low infiltration potential due to its shallow storage depth. Existing grades across the project site range from approximately 0 to 30 percent, generally sloping to the south. See Appendix 3-C for the referenced USDA Soil Map and associated unit classifications.

- **Migrating River Studies**

Migrating River Studies are considered to be not applicable to the proposed site development.

- **Section 303d List of Polluted Waters**

Washington State Department of Ecology's Water Quality Assessment for Washington 303d is not applicable to this project, as there are no receiving waters located within the 0.25-mile boundary of analysis.

- **Water Quality Problems**

No known water quality problems are present on-site or downstream of the site.

- **Stormwater Compliance Plans**

Not applicable to the proposed project.

Task 3. Field Inspection/Downstream Analysis

On July 16th, 2018, Upstream and Downstream Analyses were performed. The following conditions were observed.

Upstream Basin:

Upstream areas are defined as any areas that flow onto the proposed developed portions of the site. Despite the site's location mid-slope on an existing hillside, no significant upstream basins were observed. One upslope area was identified which flows southward towards the project site. This area consists of a small (approximately 0.005-acre) area of the existing gravel road which flows southward towards the proposed lease area. Runoff associated with this tributary basin is expected to be minimal.

Downstream Assessment:

The project site is currently undeveloped in the existing condition. Existing ground cover consists of forested area and dense shrubs. The site exhibits southward trending slopes ranging from approximately 0% to 30%.

In the existing condition, surface flows are discharged from the southern site boundary and are conveyed overland to the south for approximately 100' through the central/southern portions of parcels 20-15-26050-2401 and 20-15-26050-240. Flow continues southward as sheet flow for an additional 200 feet through parcels 20-15-26050-2701 and 20-15-26050-2703 before reaching the E 3rd St ROW. Any flow discharged to E 3rd St enters the existing City of Cle Elum collection and conveyance system, which carries flows beyond the 0.25-mile boundary of analysis and eventually discharges to the Yakima River. Due to the extent of forested area/native vegetation immediately downstream of the site, however, it is likely that any flows emanating from the site are fully dispersed before entering the E 3rd St ROW.

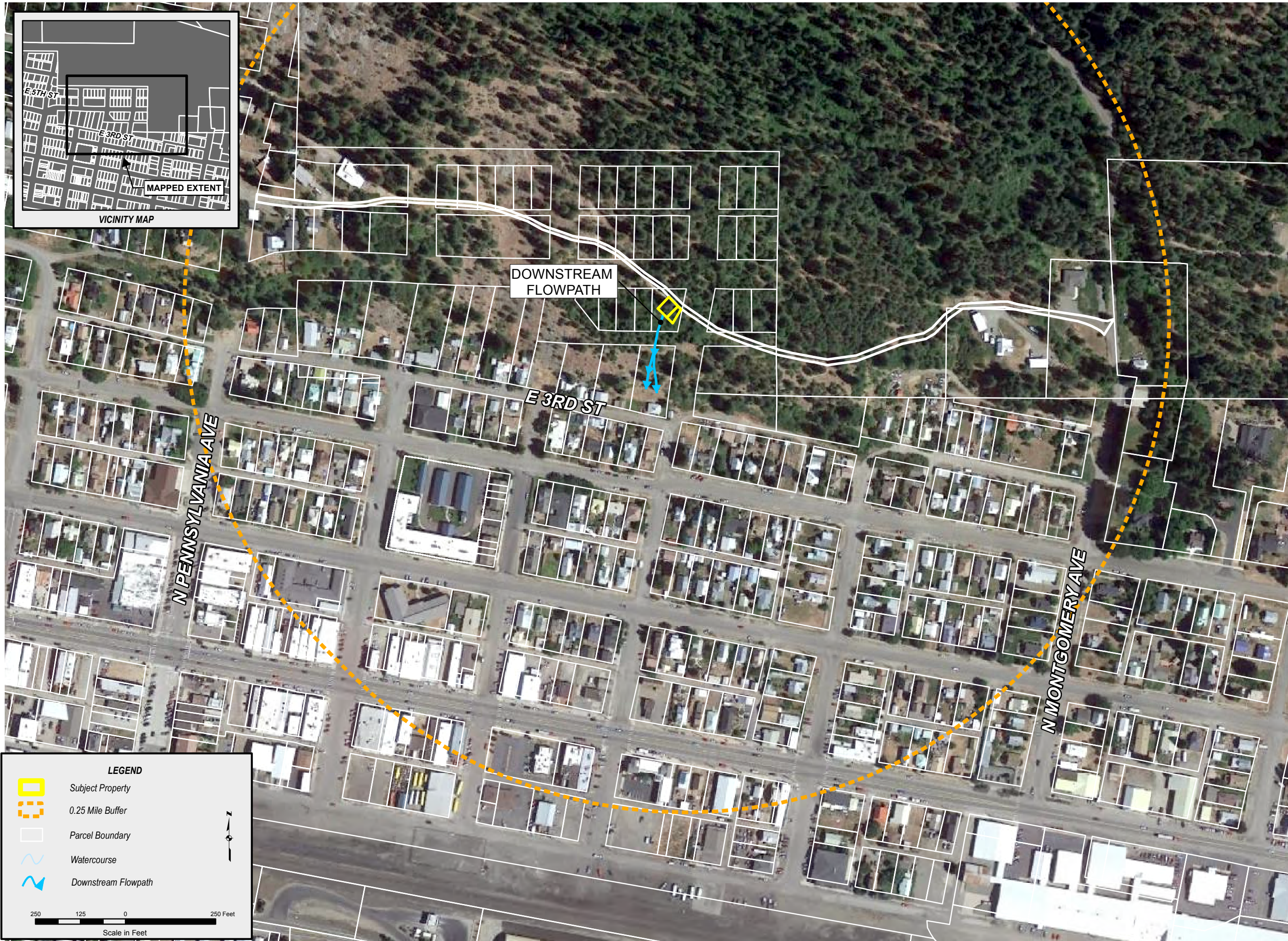
Flows emanating from the developed site are expected to be minimal and are not anticipated to exacerbate or otherwise adversely impact downstream areas. As such, onsite flows will be dispersed across the southern site boundary and the developed flowpath will effectively maintain the predeveloped condition.

Task 4. Drainage System Description and Problem Descriptions

Based on the offsite analysis and all the resources available, there is not any evidence of existing or anticipated downstream drainage problems.

Task 5. Mitigation of Existing or Potential Drainage Problems (not applicable for Level 1 Analysis)

No drainage problems identified in level 1 analysis. Therefore no additional mitigation is anticipated.



SOURCE INFORMATION	
SOURCE AGENCY	DESCRIPTION
KITTITAS COUNTY GIS	PARCEL BOUNDARY
GOOGLE EARTH	AERIAL IMAGERY (2017)

15th ANNIVERSARY

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Surveying
Engineering
Planning

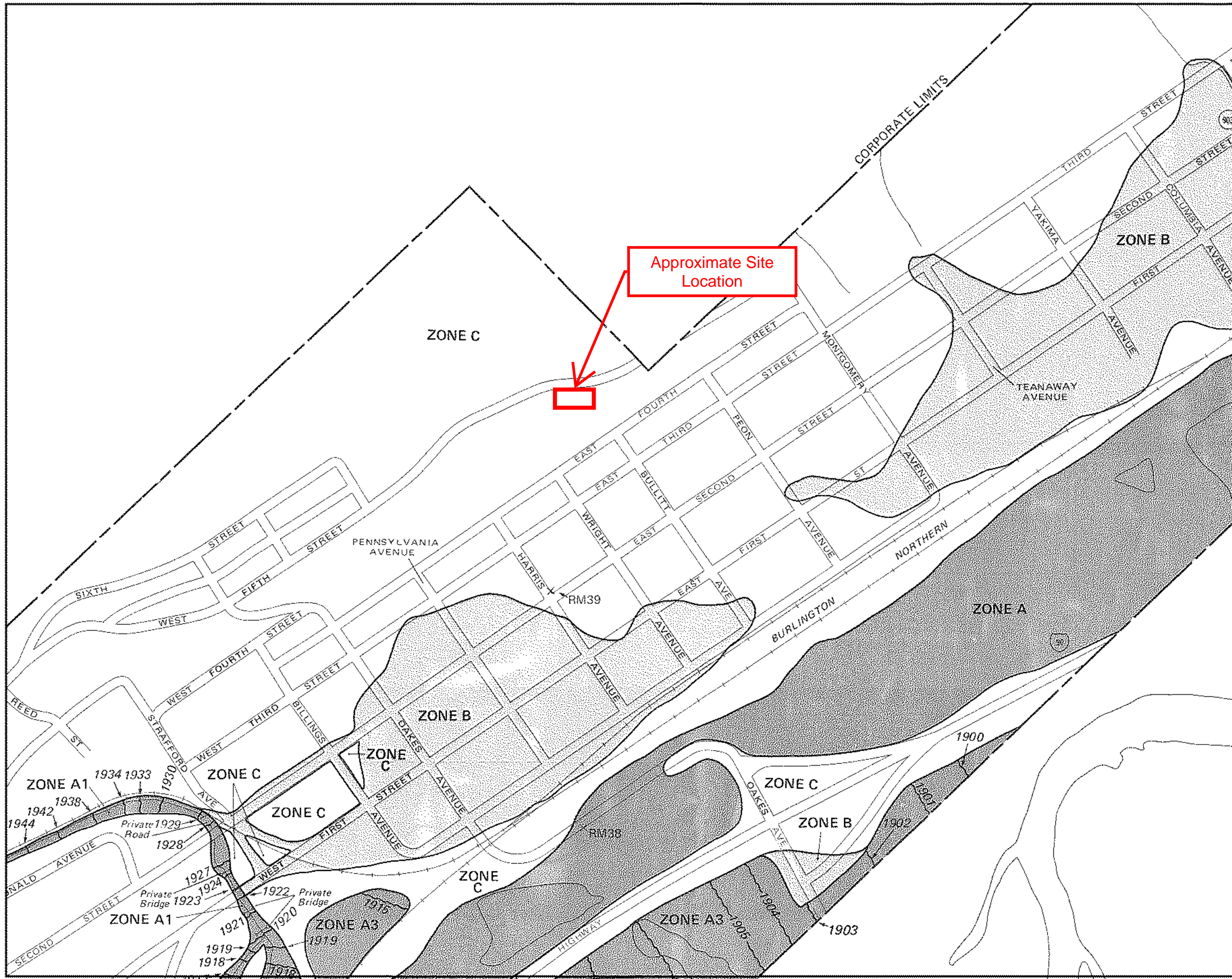
20218 142nd Avenue NE
Woodinville, WA 98072
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Ex. 425.482.2893
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VERTICAL BRIDGE

SE09034J CLE ELUM DT

DOWNSTREAM ANALYSIS MAP

PROJECTION: WASHINGTON STATE PLANE, NORTH ZONE, NAD 83 HARN, FEET
REVISION:
JOB NUMBER: T18-212
DRAWING NAME: T18-212F02
DESIGNER: S.WILSON
DRAWING BY: S.WILSON
DATE: 07-19-18
SCALE: AS SHOWN
JURISDICTION: CLE ELUM



APPROXIMATE SCALE

500 0 500 FEET

NATIONAL FLOOD INSURANCE PROGRAM

FIRM FLOOD INSURANCE RATE MAP

CITY OF
CLE ELUM,
WASHINGTON
KITITAS COUNTY

ONLY PANEL PRINTED

COMMUNITY-PANEL NUMBER
530096 0001 B

EFFECTIVE DATE:
MAY 5, 1981



federal emergency management agency
federal insurance administration

This is an official copy of a portion of the above referenced flood map. It was extracted using F-MIT On-Line. This map does not reflect changes or amendments which may have been made subsequent to the date on the title block. For the latest product information about National Flood Insurance Program flood maps check the FEMA Flood Map Store at www.msc.fema.gov

Custom Soil Resource Report Soil Map






Custom Soil Resource Report

MAP LEGEND


















Area of Interest (AOI)

Area of Interest (AOI)

Soils


-  Soil Map Unit Polygons
-  Soil Map Unit Lines
-  Soil Map Unit Points

Special Point Features






-  Blowout
-  Borrow Pit
-  Clay Spot
-  Closed Depression
-  Gravel Pit
-  Gravelly Spot
-  Landfill
-  Lava Flow
-  Marsh or swamp
-  Mine or Quarry
-  Miscellaneous Water
-  Perennial Water
-  Rock Outcrop
-  Saline Spot
-  Sandy Spot
-  Severely Eroded Spot
-  Sinkhole
-  Slide or Slip
-  Sodic Spot

-  Spoil Area
-  Stony Spot
-  Very Stony Spot
-  Wet Spot
-  Other
-  Special Line Features


Water Features

-  Streams and Canals

Transportation

-  Rails
-  Interstate Highways
-  US Routes
-  Major Roads
-  Local Roads

Background

-  Aerial Photography

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:24,000.

Warning: Soil Map may not be valid at this scale.

Enlargement of maps beyond the scale of mapping can cause misunderstanding of the detail of mapping and accuracy of soil line placement. The maps do not show the small areas of contrasting soils that could have been shown at a more detailed scale.

Please rely on the bar scale on each map sheet for map measurements.

Source of Map: Natural Resources Conservation Service
Web Soil Survey URL:
Coordinate System: Web Mercator (EPSG:3857)

Maps from the Web Soil Survey are based on the Web Mercator projection, which preserves direction and shape but distorts distance and area. A projection that preserves area, such as the Albers equal-area conic projection, should be used if more accurate calculations of distance or area are required.

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: Kittitas County Area, Washington
Survey Area Data: Version 10, Sep 7, 2017

Soil map units are labeled (as space allows) for map scales 1:50,000 or larger.

Date(s) aerial images were photographed: Aug 24, 2012—Sep 21, 2016

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

Map Unit Legend

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
166	Ampad ashy sandy loam, warm, 5 to 30 percent slopes	0.2	100.0%
Totals for Area of Interest		0.2	100.0%

Map Unit Descriptions

The map units delineated on the detailed soil maps in a soil survey represent the soils or miscellaneous areas in the survey area. The map unit descriptions, along with the maps, can be used to determine the composition and properties of a unit.

A map unit delineation on a soil map represents an area dominated by one or more major kinds of soil or miscellaneous areas. A map unit is identified and named according to the taxonomic classification of the dominant soils. Within a taxonomic class there are precisely defined limits for the properties of the soils. On the landscape, however, the soils are natural phenomena, and they have the characteristic variability of all natural phenomena. Thus, the range of some observed properties may extend beyond the limits defined for a taxonomic class. Areas of soils of a single taxonomic class rarely, if ever, can be mapped without including areas of other taxonomic classes. Consequently, every map unit is made up of the soils or miscellaneous areas for which it is named and some minor components that belong to taxonomic classes other than those of the major soils.

Most minor soils have properties similar to those of the dominant soil or soils in the map unit, and thus they do not affect use and management. These are called noncontrasting, or similar, components. They may or may not be mentioned in a particular map unit description. Other minor components, however, have properties and behavioral characteristics divergent enough to affect use or to require different management. These are called contrasting, or dissimilar, components. They generally are in small areas and could not be mapped separately because of the scale used. Some small areas of strongly contrasting soils or miscellaneous areas are identified by a special symbol on the maps. If included in the database for a given area, the contrasting minor components are identified in the map unit descriptions along with some characteristics of each. A few areas of minor components may not have been observed, and consequently they are not mentioned in the descriptions, especially where the pattern was so complex that it was impractical to make enough observations to identify all the soils and miscellaneous areas on the landscape.

The presence of minor components in a map unit in no way diminishes the usefulness or accuracy of the data. The objective of mapping is not to delineate pure taxonomic classes but rather to separate the landscape into landforms or landform segments that have similar use and management requirements. The delineation of such segments on the map provides sufficient information for the development of resource plans. If intensive use of small areas is planned, however, onsite investigation is needed to define and locate the soils and miscellaneous areas.

Custom Soil Resource Report

An identifying symbol precedes the map unit name in the map unit descriptions. Each description includes general facts about the unit and gives important soil properties and qualities.

Soils that have profiles that are almost alike make up a *soil series*. Except for differences in texture of the surface layer, all the soils of a series have major horizons that are similar in composition, thickness, and arrangement.

Soils of one series can differ in texture of the surface layer, slope, stoniness, salinity, degree of erosion, and other characteristics that affect their use. On the basis of such differences, a soil series is divided into *soil phases*. Most of the areas shown on the detailed soil maps are phases of soil series. The name of a soil phase commonly indicates a feature that affects use or management. For example, Alpha silt loam, 0 to 2 percent slopes, is a phase of the Alpha series.

Some map units are made up of two or more major soils or miscellaneous areas. These map units are complexes, associations, or undifferentiated groups.

A *complex* consists of two or more soils or miscellaneous areas in such an intricate pattern or in such small areas that they cannot be shown separately on the maps. The pattern and proportion of the soils or miscellaneous areas are somewhat similar in all areas. Alpha-Beta complex, 0 to 6 percent slopes, is an example.

An *association* is made up of two or more geographically associated soils or miscellaneous areas that are shown as one unit on the maps. Because of present or anticipated uses of the map units in the survey area, it was not considered practical or necessary to map the soils or miscellaneous areas separately. The pattern and relative proportion of the soils or miscellaneous areas are somewhat similar. Alpha-Beta association, 0 to 2 percent slopes, is an example.

An *undifferentiated group* is made up of two or more soils or miscellaneous areas that could be mapped individually but are mapped as one unit because similar interpretations can be made for use and management. The pattern and proportion of the soils or miscellaneous areas in a mapped area are not uniform. An area can be made up of only one of the major soils or miscellaneous areas, or it can be made up of all of them. Alpha and Beta soils, 0 to 2 percent slopes, is an example.

Some surveys include *miscellaneous areas*. Such areas have little or no soil material and support little or no vegetation. Rock outcrop is an example.

Kittitas County Area, Washington

166—Ampad ashy sandy loam, warm, 5 to 30 percent slopes

Map Unit Setting

National map unit symbol: 2ksy
Elevation: 2,100 to 3,600 feet
Mean annual precipitation: 25 to 40 inches
Mean annual air temperature: 43 to 45 degrees F
Frost-free period: 80 to 110 days
Farmland classification: Not prime farmland

Map Unit Composition

Ampad, warm, and similar soils: 85 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Ampad, Warm

Setting

Landform: Cuestas, mountain slopes
Landform position (two-dimensional): Backslope
Down-slope shape: Linear
Across-slope shape: Convex
Parent material: Colluvium and residuum from sandstone with an influence of volcanic ash

Typical profile

Oi - 0 to 1 inches: slightly decomposed plant material
H1 - 1 to 5 inches: ashy sandy loam
H2 - 5 to 10 inches: ashy sandy loam
H3 - 10 to 29 inches: sandy loam
H4 - 29 to 33 inches: sandy loam
H5 - 33 to 43 inches: weathered bedrock

Properties and qualities

Slope: 5 to 30 percent
Depth to restrictive feature: 20 to 40 inches to paralithic bedrock
Natural drainage class: Well drained
Capacity of the most limiting layer to transmit water (Ksat): High (1.98 to 5.95 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Available water storage in profile: Low (about 4.3 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 4e
Hydrologic Soil Group: B
Other vegetative classification: Douglas-fir/pinegrass (CDG131)
Hydric soil rating: No

Minor Components

Nard

Percent of map unit: 10 percent

Hydric soil rating: No

Rock outcrop

Percent of map unit: 5 percent

Hydric soil rating: No

4.0 ONSITE STORMWATER MANAGMENT

The flow control and water quality requirements discussed in this report are consistent with the 2004 DOE Manual (2004 SWMMEW). The project is exempt from flow control and water quality treatment requirements, as proposed disturbed and impervious areas do not surpass the thresholds set forth in Sections 2.2.5 and 2.2.6 of the 2004 DOE Manual.

In an effort to manage onsite flows and potential water quality impacts, all runoff associated with proposed impervious surfaces will be collected by area drains and conveyed to a proposed dispersion trench located at the southern margin of the project site. All onsite flows will be fully dispersed in this manner through a minimum 100' of native vegetation per BMP F6.42. Flows emanating from the developed site are expected to be minimal and are not anticipated to exacerbate or otherwise adversely impact downstream areas.

4.1 PREDEVELOPED BASIN

The Predeveloped Basin contains all area to be developed within the project site (0.06 acres), as well as approximately 0.005 acres of the existing gravel roadway which is tributary to the site. For a visual depiction of the site in the pre-developed condition, please see Figure 3.0, "Predeveloped Conditions Map" located in Appendix 4-A. The pre-developed state of the Basin's is comprised of the following coverage:

PREDEVELOPED BASIN

Coverage	Area
Forested	0.055 acres
Impervious	0.005 acres
Total	0.06 acres

4.2 DEVELOPED BASIN

The Developed Basin contains all developed area associated with the project. For a visual depiction of the site in its developed condition, please see Figure 4.0, “Developed Conditions Map” located in Appendix 4-A. In the developed state, Basin A reflects the following coverage:

DEVELOPED BASIN

Coverage	Area
Impervious	0.06 acres
Pervious (Lawn, etc.)	0.00 acres
Total	0.06 acres

4.3 Dispersion

Preliminary investigation of site soils and underlying geology indicates soils that are characterized as ashy sandy loam. Despite relatively high infiltration rates, site soils typically exhibit shallow depth to weathered bedrock. Due to the low storage capacity of site soils, it was determined that infiltration is infeasible for this project. Instead, all runoff associated with proposed impervious surfaces will be collected by area drains and conveyed to a proposed dispersion trench located at the southern margin of the project site. All onsite flows will be fully dispersed in this manner through a minimum 100’ of native vegetation per BMP F6.42.

Onsite Water Quality

Per Section 2.2.5 of the 2004 DOE Manual, the project is exempt from runoff treatment requirements, as proposed PGIS (2,418 sf) falls below the 5,000 sf threshold for water quality treatment. All runoff associated with proposed impervious surfaces will be collected and subsequently dispersed through native vegetation in accordance with BMP F6.42, which will nevertheless provide basic water quality treatment for proposed PGIS.

Figure 3. Predeveloped Hydrology.mxd | MOD: 2/8/2019 | swilson



PREDEVELOPED BASIN AREAS	
PREDEVELOPED BASIN	
FORESTED	0.06 AC
TOTAL =	0.06 AC

SOURCE INFORMATION	
SOURCE AGENCY	DESCRIPTION
KITTITAS COUNTY GIS	PARCEL BOUNDARY
GOOGLE EARTH	AERIAL IMAGERY (2017)

15th ANNIVERSARY

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Ex. 425.482.2893
www.LDCcorp.com

VERTICAL BRIDGE

SE09034J CLE ELUM DT

PREDEVELOPED HYDROLOGY MAP

PROJECTION: WASHINGTON STATE PLANE, NORTH ZONE, NAD 83 HARN, FEET	
REVISION:	
JOB NUMBER: T18-212	
DRAWING NAME: T18-212F03	
DESIGNER: S.WILSON	
DRAWING BY: S.WILSON	
DATE: 02-08-2019	
SCALE: AS SHOWN	
JURISDICTION: CLE ELUM	

FIGURE:
3.0



VERTICAL BRIDGE

SE09034J CLE ELUM DT
DEVELOPED HYDROLOGY MAP

PROJECTION: WASHINGTON STATE PLANE, NORTH ZONE, NAD 83 HARN, FEET	
REVISION:	
JOB NUMBER:	T18-212
DRAWING NAME:	T18-212F04
DESIGNER:	S.WILSON
DRAWING BY:	S.WILSON
DATE:	02-08-2019
SCALE:	AS SHOWN
JURISDICTION:	CLE ELUM

FIGURE:

4.0

15th ANNIVERSARY

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Woodinville, WA 98072

Ph. 425.806.1659
Ex. 425.482.2893

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SOURCE INFORMATION	
SOURCE AGENCY	DESCRIPTION
KITTITAS COUNTY GIS	PARCEL BOUNDARY
GOOGLE EARTH	AERIAL IMAGERY (2017)

5.0 CONVEYANCE SYSTEM ANALYSIS AND DESIGN

Conveyance analysis is not required, as no stormwater conveyance pipe is proposed onsite. All onsite runoff will be dispersed as sheet flow across the southern boundary of the project site.

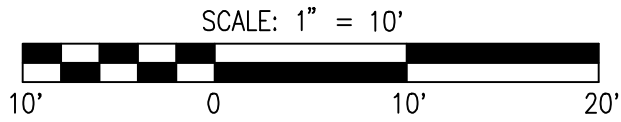
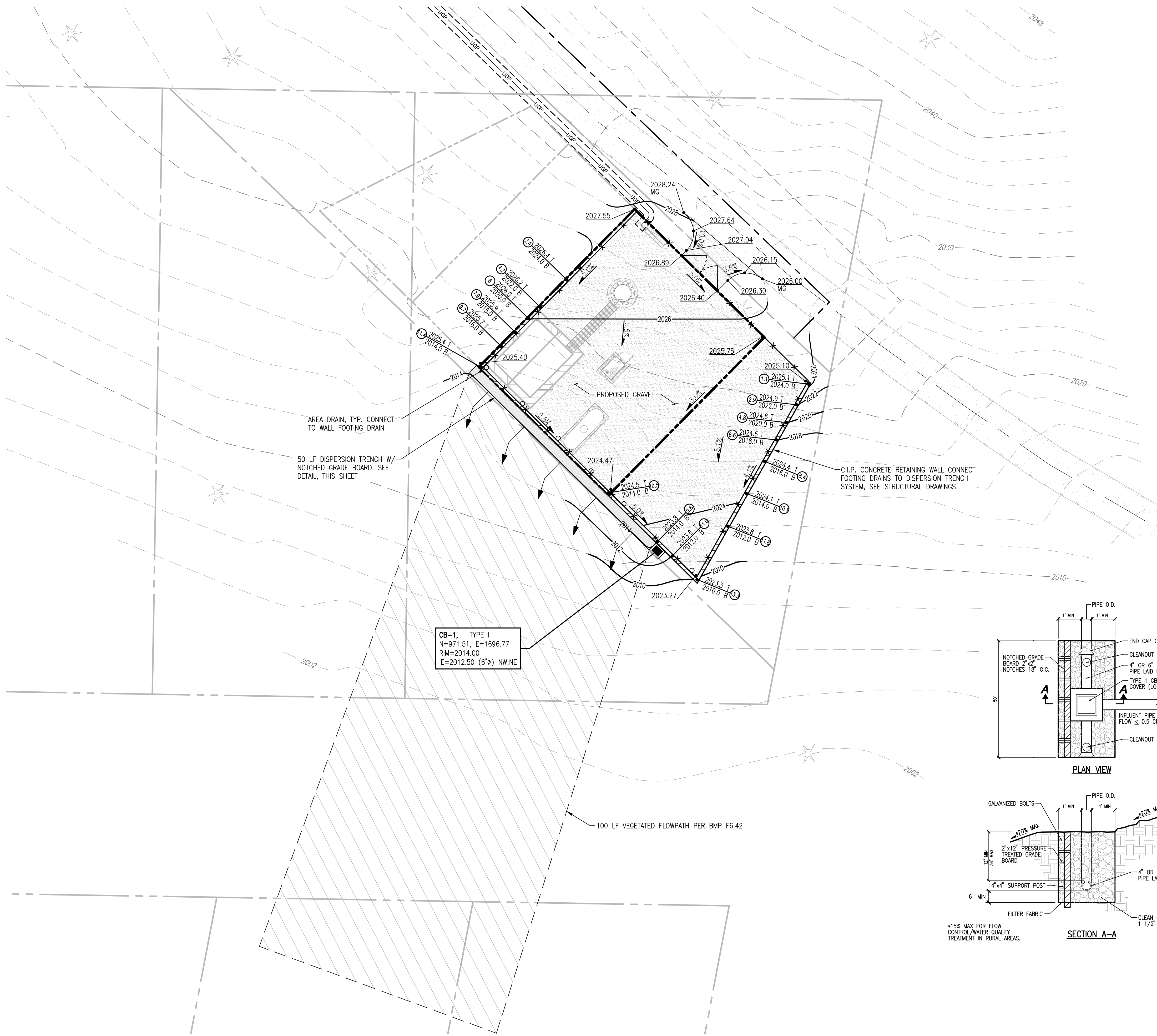
6.0 OPERATIONS AND MAINTENANCE

The proposed storm system consists of a flow spreader located at the borders of the project site. Operations and Maintenance procedures for the proposed spreader are provided below.

No. 7 – Energy Dissipators

Maintenance Components	Defect	Conditions When Maintenance is Needed	Results Expected When Maintenance is Performed
External:			
Rock Pad	Missing or Moved Rock	Only one layer of rock exists above native soil in area five square feet or larger, or any exposure of native soil.	Rock pad replaced to design standards.
	Erosion	Soil erosion in or adjacent to rock pad.	Rock pad replaced to design standards.
Dispersion Trench	Pipe Plugged with Sediment	Accumulated sediment that exceeds 20% of the design depth.	Pipe cleaned/flushed so that it matches design.
	Not Discharging Water Properly	Visual evidence of water discharging at concentrated points along trench (normal condition is a "sheet flow" of water along trench). Intent is to prevent erosion damage.	Trench redesigned or rebuilt to standards.
	Perforations Plugged	Over 1/2 of perforations in pipe are plugged with debris and sediment.	Perforated pipe cleaned or replaced.
	Water Flows Out Top of "Distributor" Catch Basin	Maintenance person observes or receives credible report of water flowing out during any storm less than the design storm or is causing or appears likely to cause damage.	Facility rebuilt or redesigned to standards.
	Receiving Area Over-Saturated	Water in receiving area is causing or has potential of causing landslide problems.	No danger of landslides.
Internal:			
Manhole/Chamber	Worn or Damaged Post, Baffles, Side of Chamber	Structure dissipating flow deteriorates to 1/2 of original size or any concentrated worn spot exceeding one square foot which would make structure unsound.	Structure replaced to design standards.
	Other Defects	See "Catch Basins" (No. 5).	See "Catch Basins" (No. 5).

7.0 SPECIAL REPORTS AND STUDIES

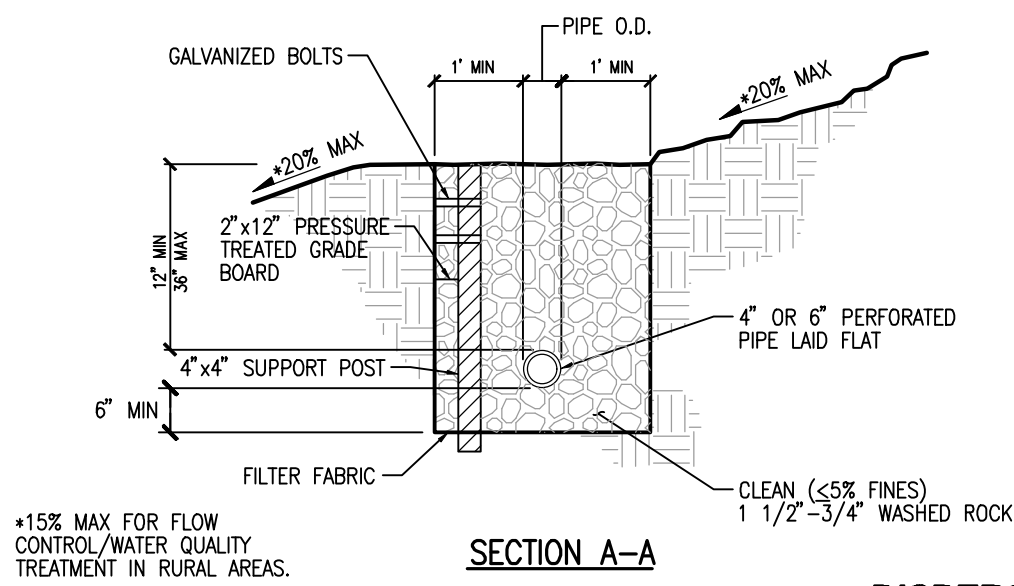
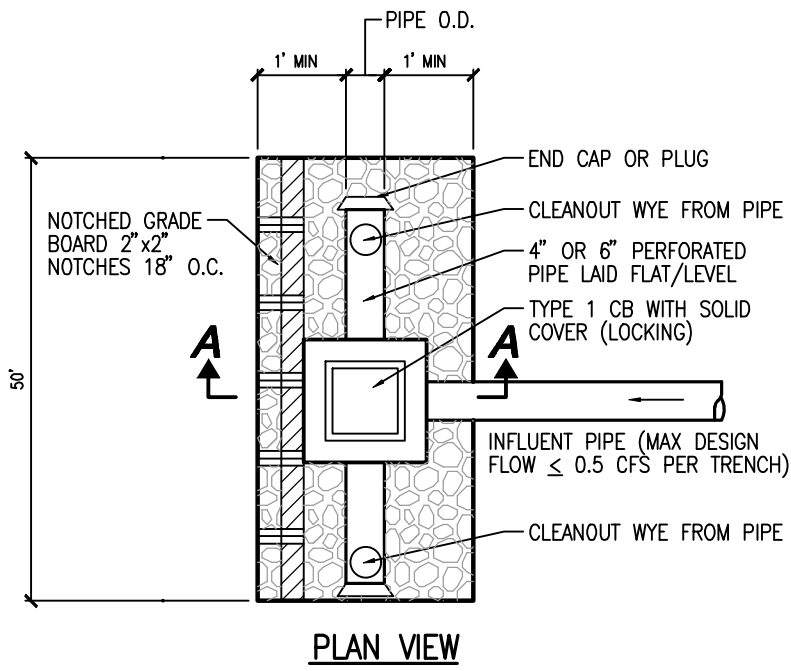


LEGEND

- AREA DRAIN
- ▬ DISPERSION TRENCH
- ▬ CONCRETE RETAINING WALL
- ✕ FENCE

NOTE

1. CONNECT WALL FOOTING DRAINS TO PROPOSED DISPERSION TRENCH
- MG - MATCH EXISTING GRADE



DISPERSION TRENCH

NOT TO SCALE

DISCLAIMER

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REVISIONS		BY
NO.	DATE	DESCRIPTION

15th ANNIVERSARY
LDC
Surveying
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2020 143rd Avenue NE
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Ph: 425.806.1869
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VERTICAL BRIDGE
SE09034J CLE ELUM DT
GRADING AND STORM DRAINAGE PLAN



JOB NUMBER:	119-704
DRAWING NAME:	18212CD-GR-01
DESIGNER:	DCS
DRAFTING BY:	RMD
DATE:	7-20-18
SCALE:	1"=10'
JURISDICTION:	CLE ELUM

GR-01

SITE GRADING AND SWPPP NOTES

- NONCOMPLIANCE WITH THE EROSION CONTROL REQUIREMENTS, WATER QUALITY REQUIREMENTS, AND CLEARING LIMITS VIOLATIONS MAY RESULT IN REVOCATION OF PROJECT PERMITS AND PLAN APPROVAL AND BOND FORECLOSURES.
- PRIOR TO ANY SITE CONSTRUCTION, INCLUDING CLEARING, LOGGING OR GRADING, THE SITE CLEARING LIMITS SHALL BE LOCATED AND FIELD IDENTIFIED BY THE PROJECT SURVEYOR (OR PROJECT ENGINEER) AS REQUIRED BY THESE PLANS.
- DEVELOPER IS RESPONSIBLE FOR WATER QUALITY AS DETERMINED BY THE MONITORING PROGRAM ESTABLISHED BY THE PROJECT ENGINEER.
- THE CONSTRUCTION STORMWATER POLLUTION PREVENTION FACILITIES SHALL BE CONSTRUCTED IN ACCORDANCE WITH THE APPROVED SWPPP PRIOR TO ANY GRADING OR EXTENSIVE LAND CLEARING. AN INSPECTION OF THESE FACILITIES SHALL BE ARRANGED FOR BY THE CONTRACTOR PRIOR TO ANY GRADING. THESE FACILITIES MUST BE SATISFACTORILY MAINTAINED UNTIL CONSTRUCTION AND LANDSCAPING IS COMPLETED AND THE POTENTIAL FOR ON-SITE EROSION HAS PASSED.
- ALL SITE WORK MUST BE PERFORMED IN ACCORDANCE WITH THE CURRENT MUNICIPALITY ADOPTED INTERNATIONAL BUILDING CODE.
- ALL EARTH WORK SHALL BE PERFORMED IN ACCORDANCE WITH MUNICIPALITY STANDARDS. PRECONSTRUCTION SOILS INVESTIGATION MAY BE REQUIRED TO EVALUATE SOILS STABILITY.
- IF CUT AND FILL SLOPES EXCEED A MAXIMUM OF TWO FEET HORIZONTAL TO ONE FOOT VERTICAL, A ROCK OR CONCRETE RETAINING WALL MAY BE REQUIRED. ALL ROCK RETAINING WALLS GREATER THAN FOUR (4) FEET IN HEIGHT ARE TO BE DESIGNED AND CERTIFIED BY A PROFESSIONAL ENGINEER EXPERIENCED IN SOIL MECHANICS.
- STOCKPILES ARE TO BE LOCATED IN SAFE AREAS AND ADEQUATELY PROTECTED BY TEMPORARY SEEDING AND MULCHING. HYDROSEEDING IS PREFERRED.
- ALL STRUCTURAL FILLS SHALL BE COMPACTED TO A MINIMUM OF 95% MAXIMUM DENSITY IN THE UPPER 4 FEET & 90% MAXIMUM DENSITY BELOW 4 FEET AS DETERMINED BY MODIFIED PROCTOR.
- PRIOR TO ANY SITE WORK PERTAINING TO DRAINAGE, THE CONTRACTOR SHALL CONTACT THE MUNICIPALITY TO SCHEDULE A PRECONSTRUCTION CONFERENCE.
- CONSTRUCTION STORMWATER POLLUTION PREVENTION MEASURES SHALL BE INSTALLED PRIOR TO ANY SITE WORK. (SEE ATTACHED DETAILED DRAINAGE PLAN).
- THE SURFACE OF ALL SLOPES SHALL BE COMPACTED. THIS MAY BE ACCOMPLISHED BY OVER-BUILDING THE SLOPES, THEN CUTTING BACK TO FINAL GRADES; OR BY COMPACTING EACH LIFT AS THE SLOPE IS BEING CONSTRUCTED. ALL SLOPES SHALL BE COMPACTED BY THE END OF EACH WORKING DAY.
- UPON COMPLETION OF WORK, FINAL REPORTS MUST BE SUBMITTED TO THE MUNICIPALITY IN CONFORMANCE WITH THE CURRENT MUNICIPALITY ADOPTED INTERNATIONAL BUILDING CODE.

TEMPORARY GRAVEL CONSTRUCTION ENTRANCE NOTES

- THE TEMPORARY CONSTRUCTION ENTRANCE SHOULD BE CLEARED OF ALL VEGETATION, ROOTS, AND OTHER OBJECTIONABLE MATERIAL. ANY DRAINAGE FACILITIES REQUIRED BECAUSE OF WASHING SHOULD BE CONSTRUCTED ACCORDING TO SPECIFICATIONS IN THE PLAN. IF WASH RACKS ARE USED, THEY SHOULD BE INSTALLED ACCORDING TO MANUFACTURES SPECIFICATIONS.
- GRAVEL SHALL BE CRUSHED BALLAST ROCK, 8" TO 12" IN DEPTH AND INSTALLED TO THE SPECIFIED DIMENSIONS AT THE ENTRANCE.
- THE GRAVEL BALLAST ROCK SHALL BE 4" TO 8" IN DIAMETER AND PLACED ACROSS THE FULL WIDTH OF THE VEHICULAR INGRESS AND EGRESS AREA. THE LENGTH OF ENTRANCE SHALL BE A MINIMUM OF 100 FEET OR AS SPECIFIED BY THE MUNICIPALITY INSPECTOR OR DESIGNEE.
- IF CONDITIONS ON THE SITE ARE SUCH THAT MOST OF THE MUD IS NOT REMOVED FROM VEHICLE TIRES BY CONTACT WITH THE GRAVEL, THEN THE TIRES MUST BE WASHED BEFORE VEHICLES ENTER ONTO A PUBLIC ROAD. WASH WATER MUST BE CARRIED AWAY FROM ENTRANCE TO A SETTLING AREA TO REMOVE SEDIMENT. A WASH RACK MAY ALSO BE USED TO MAKE WASHING MORE CONVENIENT AND EFFECTIVE.
- THE ENTRANCE SHALL BE MAINTAINED IN A CONDITION WHICH WILL PREVENT TRACKING OR FLOW OF MUD ONTO PUBLIC RIGHTS-OF-WAY. THIS MAY REQUIRE PERIODIC TOP DRESSING WITH 2" STONE, AS CONDITIONS DEMAND, AND REPAIR AND/OR CLEAN OUT ANY STRUCTURES USED TO TRAP SEDIMENT. ALL MATERIALS SPILLED, DROPPED, WASHED OR TRACKED FROM VEHICLES ONTO ROADWAY OR INTO STORM DRAINS MUST BE REMOVED IMMEDIATELY.

HYDROSEEDING GENERAL NOTES

- CONSTRUCTION ACCEPTANCE WILL BE SUBJECT TO A WELL ESTABLISHED GROUND COVER THAT FULFILLS THE REQUIREMENTS OF THE APPROVED CONSTRUCTION PLANS AND MUNICIPAL STANDARDS.
- ALL DISTURBED AREAS SUCH AS RETENTION FACILITIES, ROADWAY BACKSLOPES, ETC., SHALL BE SEEDDED WITH A PERENNIAL GROUND COVER GRASS TO MINIMIZE EROSION. GRASS SEEDING WILL BE DONE USING AN APPROVED HYDROSEEDER OR AS OTHERWISE APPROVED BY THE MUNICIPALITY.
- PREPARATION OF SURFACE: ALL AREAS TO BE SEEDDED SHALL BE CULTIVATED TO THE SATISFACTION OF THE MUNICIPALITY INSPECTOR. THIS MAY BE ACCOMPLISHED BY DISKING, RAKING, HARROWING, OR OTHER ACCEPTABLE MEANS.
- IMMEDIATELY FOLLOWING FINISH GRADING PERMANENT VEGETATION SHALL BE APPLIED CONSISTENT WITH THE DESIGN AND MAINTENANCE STANDARDS FOR TEMPORARY AND PERMANENT SEEDING IN THE MUNICIPALITY ADOPTED DEPARTMENT OF ECOLOGY STORMWATER MANAGEMENT MANUAL FOR WESTERN WASHINGTON.
- ALL HYDROSEEDING FIRMS SHALL HAVE A PRINTOUT OF THE APPLICATION RATE FOR EACH JOB READILY AVAILABLE FOR INSPECTION BY THE MUNICIPALITY.
- THE MUNICIPALITY SHALL BE NOTIFIED OF TEMPORAL HYDROSEEDING PRIOR TO THE COMMENCEMENT OF SAME TO ENSURE COMPLIANCE OF THESE SPECIFICATIONS.

MAINTENANCE OF SILTATION BARRIERS NOTE

- SILTATION BARRIERS SHALL BE INSPECTED IMMEDIATELY AFTER EACH RAINFALL AND AT LEAST DAILY DURING PROLONGED RAINFALL. CLOSE ATTENTION SHALL BE PAID TO THE REPAIR OF DAMAGED BALES, END RUNS AND UNDERCUTTING BENEATH BALES. NECESSARY REPAIRS TO BARRIERS OR REPLACEMENT OF BALES SHALL BE ACCOMPLISHED PROMPTLY. SEDIMENT DEPOSITS SHOULD BE REMOVED AFTER EACH RAINFALL. SEDIMENT DEPOSITS MUST BE REMOVED WHEN SEDIMENT LEVEL REACHES APPROXIMATELY ONE-HALF THE SILTATION BARRIER HEIGHT. ANY SEDIMENT DEPOSITS REMAINING IN PLACE AFTER THE STRAW BALE BARRIER IS NO LONGER REQUIRED SHALL BE DRESSED TO CONFORM TO THE EXISTING GRADE, PREPARED AND SEEDDED.

POLLUTANT CONTROL NOTES

- ALL POLLUTANTS, INCLUDING WASTE MATERIALS AND DEMOLITION DEBRIS, THAT OCCUR ON-SITE SHALL BE HANDLED AND DISPOSED OF IN A MANNER THAT DOES NOT CAUSE CONTAMINATION OF STORMWATER. WOODY DEBRIS MAY BE CHOPPED AND SPREAD ON SITE.
- COVER, CONTAINMENT AND PROTECTION FROM VANDALISM SHALL BE PROVIDED FOR ALL CHEMICALS, LIQUID PRODUCTS, PETROLEUM PRODUCTS, AND NON-INERT WASTES PRESENT ON THE SITE (SEE CHAPTER 173-304 WAC FOR THE DEFINITION OF INERT WASTE). ON-SITE FUELING TANKS SHALL INCLUDE SECONDARY CONTAINMENT.
- ALL MAINTENANCE OF HEAVY EQUIPMENT AND VEHICLES SHALL BE DONE OFFSITE.
- ACTIVITIES WHICH MAY RESULT IN DISCHARGE OR SPILLAGE OF POLLUTANTS TO THE GROUND OR INTO STORMWATER RUNOFF MUST BE CONDUCTED USING SPILL PREVENTION MEASURES, SUCH AS DRIP PANS. CONTAMINATED SURFACES SHALL BE CLEANED IMMEDIATELY FOLLOWING ANY DISCHARGE OR SPILL INCIDENT. EMERGENCY REPAIRS MAY BE PERFORMED ON-SITE USING TEMPORARY PLASTIC PLACED BENEATH AND, IF RAINING, OVER THE VEHICLE.
- WHEEL WASH OR TIRE BATH WASTEWATER SHALL BE DISCHARGED TO A SEPARATE ON-SITE TREATMENT SYSTEM OR TO THE SANITARY SEWER.
- APPLICATION OF AGRICULTURAL CHEMICALS, INCLUDING FERTILIZERS AND PESTICIDES, SHALL BE CONDUCTED IN A MANNER AND AT APPLICATION RATES THAT WILL NOT RESULT IN LOSS OF CHEMICAL TO STORMWATER RUNOFF. MANUFACTURERS' RECOMMENDATIONS FOR APPLICATION RATES AND PROCEDURES SHALL BE FOLLOWED.
- BMPs SHALL BE USED TO PREVENT OR TREAT CONTAMINATION OF STORMWATER RUNOFF BY PH MODIFYING SOURCES. THESE SOURCES INCLUDE, BUT ARE NOT LIMITED TO, BULK CEMENT, CEMENT KILN DUST, FLY ASH, NEW CONCRETE WASHING AND CURING WATERS, WASTE STREAMS GENERATED FROM CONCRETE GRINDING AND SAWING, EXPOSED AGGREGATE PROCESSES, AND CONCRETE PUMPING AND MIXER WASHOUT WATERS. STORMWATER DISCHARGES SHALL NOT CAUSE OR CONTRIBUTE TO A VIOLATION OF THE WATER QUALITY STANDARD FOR PH IN THE RECEIVING WATER.

EROSION, SEDIMENTATION AND WATER QUALITY SITE INSPECTIONS:

PRIOR TO ANY SITE DEVELOPMENT WORK TAKING PLACE, A PRE-CONSTRUCTION MEETING WITH THE CONTRACTOR, OWNER, CESCL, AND MUNICIPALITY INSPECTOR SHALL BE HELD.

THE DEPARTMENT OF ECOLOGY REQUIRES THAT CONSTRUCTION PROJECTS ONE ACRE OR LARGER RETAIN A CESCL TO ENSURE THAT THE PROJECT IS IN COMPLIANCE WITH THE CURRENT EROSION, SEDIMENTATION AND WATER QUALITY STANDARDS.

THE CESCL IS RESPONSIBLE FOR:

- INSPECTING THE CONSTRUCTION SITE TO ENSURE THAT ALL CONSTRUCTION SWPPP MEASURES ARE FUNCTIONING AS INTENDED.
- ALLOCATING RESOURCES TO REPAIR ALL EROSION CONTROL STRUCTURES THAT ARE IN NEED OF MAINTENANCE.
- MONITORING WATER QUALITY FOR ANY STORM DRAINAGE THAT LEAVES THE SITE.
- STOPPING AND/OR REDIRECTING CONSTRUCTION ACTIVITIES DEEMED NECESSARY TO PROTECT THE ENVIRONMENT.

SHOULD BMP PERFORMANCE GOALS NOT BE ACHIEVED, THE ONLY CONSTRUCTION ACTIVITIES THAT SHALL BE ALLOWED ARE THE REPAIR OF EXISTING EROSION CONTROL STRUCTURES, INSTALLATION OF ADDITIONAL BMP'S TO MINIMIZE THE TRANSPORT OF SEDIMENT OFFSITE, OR THOSE ACTIVITIES THAT DO NOT DISTURB EXPOSED EARTH AND DO NOT HAVE THE POTENTIAL TO GENERATE ADDITIONAL SEDIMENT.

THE TWELVE ELEMENTS OF A CONSTRUCTION SWPPP:

THE BMPs REFERENCED BELOW SHALL BE ADHERED TO:

- MARK CLEARING LIMITS: THE CLEARING LIMITS ARE INDICATED ON THE PLAN SHEET. CLEARING AND GRADING WILL BE LIMITED TO ONLY AREAS THAT NEED TO BE DISTURBED FOR GRADING, PLACING OR STOCK PILING FILL, AND TO PRESERVE AS MUCH NATURAL VEGETATION AND THE DUFF LAYER AS POSSIBLE. FIELD MARKING THE CLEARING LIMITS SHALL BE COMPLETED PRIOR TO ANY CLEARING OR DISTURBING THE SITE.
BMPs:
C103 PLASTIC OR METAL FENCE
C233 SILT FENCE
- ESTABLISH CONSTRUCTION ACCESS: ACCESS TO THE CONSTRUCTION SITE SHALL BE LIMITED TO THE ROCK CONSTRUCTION ENTRANCES.
BMPs:
C105 STABILIZED CONSTRUCTION ENTRANCE
- CONTROL FLOW RATES: SILT FENCE WILL BE INSTALLED AT CLEARING LIMITS TO REDUCE VELOCITY OF OVERLAND FLOW EXITING THE SITE.
BMPs:
C233 SILT FENCE
- INSTALL SEDIMENT CONTROLS: SEDIMENT CONTROL WILL BE PROVIDED THROUGH THE USE OF SILT FENCE AND INLET PROTECTION.
BMPs:
C233 SILT FENCE
C220 STORM DRAIN INLET PROTECTION
- STABILIZE SOILS: TEMPORARY AND PERMANENT SOIL STABILIZATION WILL BE PROVIDED. TEMPORARY STABILIZATION WILL BE PROVIDED TO EXPOSED WORKED EARTH FROM OCTOBER 1 UNTIL APRIL 30, NO EXPOSED SOIL MAY REMAIN EXPOSED AND UNWORKED FOR MORE THAN 20 DAYS; FROM MAY 1 UNTIL SEPTEMBER 30, NO EXPOSED SOIL MAY REMAIN EXPOSED AND UNWORKED FOR MORE THAN SEVEN DAYS.
BMPs:
C120 TEMPORARY AND PERMANENT SEEDING
C121 MULCHING
C123 PLASTIC COVERING
- PROTECT SLOPES: SLOPES SHALL BE PROTECTED FROM EROSION THROUGH COVER AND SOIL STABILIZATION.
BMPs:
C120 TEMPORARY AND PERMANENT SEEDING
C121 MULCHING
C123 PLASTIC COVERING
- PROTECT DRAIN INLETS: INLET PROTECTION SHALL BE INSTALLED IN ALL AREA DRAINS AND REMAIN UNTIL CONSTRUCTION ACTIVITIES HAVE BEEN COMPLETED. INLET PROTECTION SHALL BE INSPECTED REGULARLY AND THE FILTER FABRIC CLEANED/REPLACED AS NECESSARY.
C220 STORM DRAIN INLET PROTECTION
- STABILIZE CHANNELS AND OUTLETS: NO CHANNELS ARE PROPOSED FOR THIS PROJECT.
- CONTROL POLLUTANTS: POLLUTANTS SHALL BE CONTROLLED PER POLLUTANT CONTROL NOTES. SEE THIS SHEET FOR NOTES.
- CONTROL DE-WATERING: DISPOSAL OPTIONS FOR DE-WATERING WATER ARE AS SPECIFIED IN THE DE-WATERING CONTROL NOTES. SEE THIS SHEET FOR NOTES. IN ADDITION, THE FOLLOWING BMP TO BE USED FOR SEDIMENT TRAPPING AND TURBIDITY REDUCTION INCLUDE:
C151 CONCRETE HANDLING
- MAINTAIN BMPs: MAINTENANCE OF THE BMPs IS SPECIFIED IN THE CONSTRUCTION SEQUENCE AND GRADING AND EROSION CONTROL NOTES, SEE SHEET ER-01 AND THIS SHEET.
- PROJECT MANAGEMENT: THE GRADING AND EROSION CONTROL NOTES SPECIFY SEASONAL WORK LIMITATIONS. BMPs SHALL BE MAINTAINED PER ELEMENT #11.

DE-WATERING CONTROL NOTES

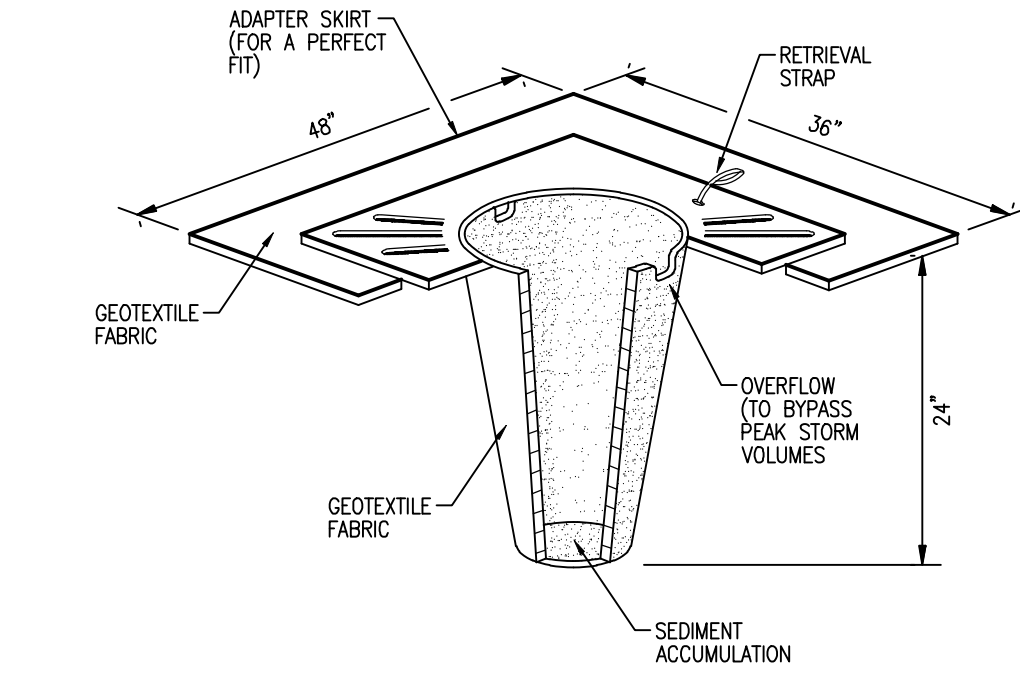
ANY RUNOFF GENERATED BY DEWATERING SHALL BE TREATED THROUGH CONSTRUCTION OF A SEDIMENT TRAP (SECTION D.2.1.5.1) WHEN THERE IS SUFFICIENT SPACE OR BY RELEASING THE WATER TO A WELL VEGETATED, GENTLY SLOPING AREA. SINCE PUMPS ARE USED FOR DEWATERING, IT MAY BE POSSIBLE TO PUMP THE SEDIMENT-LADEN WATER WELL AWAY FROM THE SURFACE WATER SO THAT VEGETATION CAN BE MORE EFFECTIVELY UTILIZED FOR TREATMENT. DISCHARGE OF SEDIMENT-LADEN WATER FROM DEWATERING ACTIVITIES TO SURFACE AND STORM WATERS IS PROHIBITED. IF DEWATERING OCCURS FROM AREAS WHERE THE WATER HAS COME IN CONTACT WITH NEW CONCRETE, SUCH AS TANKS, VAULTS, OR FOUNDATIONS, THE PH OF THE WATER MUST BE MONITORED AND MUST BE NEUTRALIZED PRIOR TO DISCHARGE. CLEAN NON-TURBID DEWATERING WATER, SUCH AS WELL POINT GROUND WATER CAN BE DISCHARGED TO SYSTEMS TRIBUTARY TO, OR DIRECTLY TO SURFACE WATERS PROVIDED THE FLOWS ARE CONTROLLED SO NO EROSION OR FLOODING OCCURS. CLEAN WATER MUST NOT BE ROUTED THROUGH A STORMWATER SEDIMENT POND. HIGHLY TURBID OR CONTAMINATED DEWATERING WATER MUST BE HANDLED SEPARATELY FROM STORMWATER.

PURPOSE: TO PREVENT THE UNTREATED DISCHARGE OF SEDIMENT-LADEN WATER FROM DEWATERING OF UTILITIES, EXCAVATED AREAS, FOUNDATIONS, ETC

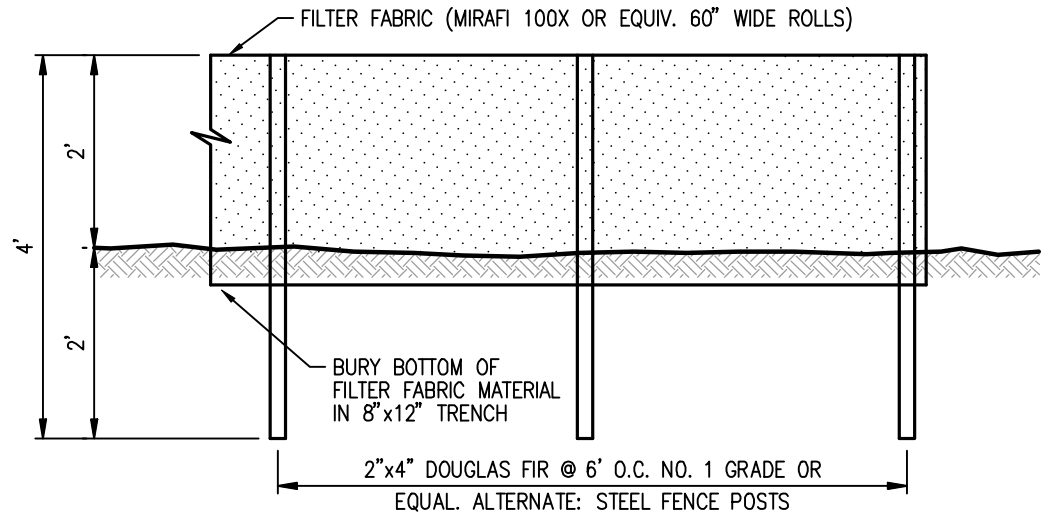
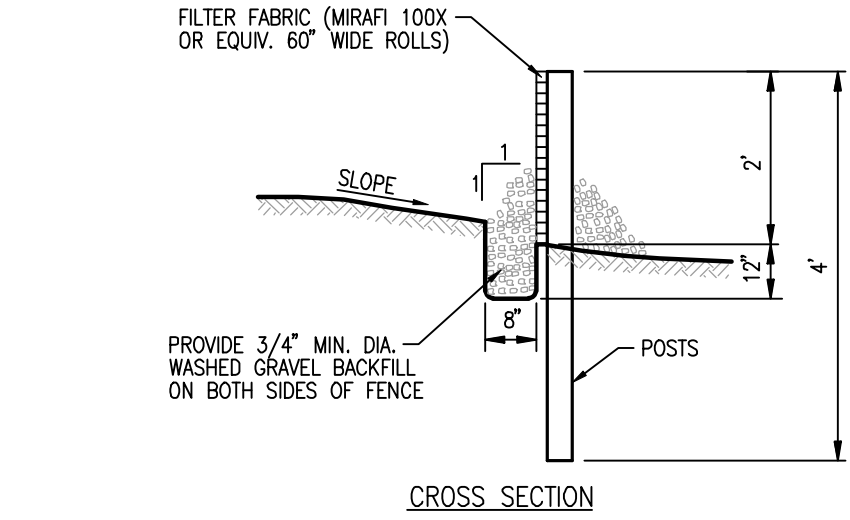
WHEN TO INSTALL: DEWATERING CONTROL MEASURES SHALL BE USED WHENEVER THERE IS A POTENTIAL FOR RUNOFF FROM DEWATERING OF UTILITIES, EXCAVATIONS, FOUNDATIONS, ETC.

MEASURES TO INSTALL:

- FOUNDATION, EXCAVATION, AND TRENCH DEWATERING WATER THAT HAS SIMILAR CHARACTERISTICS TO STORMWATER RUNOFF AT THE SITE SHALL BE DISCHARGED INTO A CONTROLLED CONVEYANCE SYSTEM PRIOR TO DISCHARGE TO A SEDIMENT TRAP OR SEDIMENT POND. FOUNDATION AND TRENCH DEWATERING WATER THAT HAS SIMILAR CHARACTERISTICS TO STORMWATER RUNOFF AT THE SITE MUST BE DISPOSED OF THROUGH ONE OF THE FOLLOWING OPTIONS DEPENDING ON SITE CONSTRAINTS:
 - INFILTRATION,
 - TRANSPORT OFFSITE IN A VEHICLE, SUCH AS A VACUUM FLUSH TRUCK, FOR LEGAL DISPOSAL IN A MANNER THAT DOES NOT POLLUTE SURFACE WATERS,
 - DISCHARGE TO THE SANITARY SEWER DISCHARGE WITH LOCAL SEWER DISTRICT APPROVAL IF THERE IS NO OTHER OPTION, OR
 - USE OF A SEDIMENTATION BAG WITH OUTFALL TO A DITCH OR SWALE FOR SMALL VOLUMES OF LOCALIZED DEWATERING.
- CLEAN, NON-TURBID DEWATERING WATER, SUCH AS WELL-POINT GROUND WATER, MAY BE DISCHARGED VIA STABLE CONVEYANCE TO SYSTEMS TRIBUTARY TO SURFACE WATERS, PROVIDED THE DEWATERING FLOW DOES NOT CAUSE EROSION OR FLOODING OF RECEIVING WATERS.
- HIGHLY TURBID OR CONTAMINATED DEWATERING WATER (HIGH PH OR OTHER) SHALL BE HANDLED SEPARATELY FROM STORMWATER. SEE SECTION D.2.2 (P. D-74), SWPPS MEASURES.



STORM DRAIN INLET PROTECTION
NOT TO SCALE



SILT FENCE DETAIL
NOT TO SCALE

REVISIONS		NO.	DATE	DESCRIPTION	BY

15th ANNIVERSARY

LDC

Surveying
Engineering
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VERTICAL BRIDGE

SE09034J CLE ELUM DT

TEEC NOTES AND DETAILS



JOB NUMBER:	T19-704
DRAWING NAME:	18212CD-ER-01
DESIGNER:	DCS
DRAFTING BY:	RMD
DATE:	7-20-18
SCALE:	NOT TO SCALE
JURISDICTION:	CLE ELUM

ER-02

Construction Stormwater General Permit (CSWGP)

Stormwater Pollution Prevention Plan (SWPPP)

for

SE09034J Cle Elum DT

Prepared for:

**Department of Ecology
Northwest Regional Office**

Permittee / Owner	Developer	Operator / Contractor
Vertical Bridge Development, LLC 750 Park of Commerce Dr, STE 200 Boca Raton, FL 33487	Vertical Bridge Development, LLC 750 Park of Commerce Dr, STE 200 Boca Raton, FL 33487	TBD

Certified Erosion and Sediment Control Lead (CESCL)

Name	Organization	Contact Phone Number
TBD	TBD	TBD

SWPPP Prepared By

Name	Organization	Contact Phone Number
Sam Wilson	LDC, Inc. 20210 142 nd Ave NE Woodinville, WA 98072	(425) 806-1869

SWPPP Preparation Date

02/08/2019

Project Construction Dates

Activity / Phase	Start Date
Mark Clearing Limits	May 2019
Install TESC Measures	May 2019
Install Stabilized Construction Entrance	June 2019
Begin Clearing and Grubbing	June 2019
Stabilize Soils	July 2019
Protect Slopes	August 2019
Stabilized Site	September 2019

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List of Acronyms and Abbreviations

Acronym / Abbreviation	Explanation
303(d)	Section of the Clean Water Act pertaining to Impaired Waterbodies
BFO	Bellingham Field Office of the Department of Ecology
BMP(s)	Best Management Practice(s)
CESCL	Certified Erosion and Sediment Control Lead
CO₂	Carbon Dioxide
CRO	Central Regional Office of the Department of Ecology
CSWGP	Construction Stormwater General Permit
CWA	Clean Water Act
DMR	Discharge Monitoring Report
DO	Dissolved Oxygen
Ecology	Washington State Department of Ecology
EPA	United States Environmental Protection Agency
ERO	Eastern Regional Office of the Department of Ecology
ERTS	Environmental Report Tracking System
ESC	Erosion and Sediment Control
GULD	General Use Level Designation
NPDES	National Pollutant Discharge Elimination System
NTU	Nephelometric Turbidity Units
NWRO	Northwest Regional Office of the Department of Ecology
pH	Power of Hydrogen
RCW	Revised Code of Washington
SPCC	Spill Prevention, Control, and Countermeasure
su	Standard Units
SWMMEW	Stormwater Management Manual for Eastern Washington
SWMMWW	Stormwater Management Manual for Western Washington
SWPPP	Stormwater Pollution Prevention Plan
TESC	Temporary Erosion and Sediment Control
SWRO	Southwest Regional Office of the Department of Ecology
TMDL	Total Maximum Daily Load
VFO	Vancouver Field Office of the Department of Ecology
WAC	Washington Administrative Code
WSDOT	Washington Department of Transportation
WWHM	Western Washington Hydrology Model

Project Information (1.0)

Project/Site Name: SE09034J Cle Elum DT

Street/Location: 302 E 4th St

City: Cle Elum State: Washington Zip code: 98922

Subdivision: Telecom Cell Tower

Receiving waterbody: Yakima River

Existing Conditions (1.1)

Total acreage (including support activities such as off-site equipment staging yards, material storage areas, borrow areas).

Total acreage: 0.06

Disturbed acreage: 0.09

Existing structures: The site is undeveloped in the existing condition. An existing gravel road extending east/southeastward from E 5th St provides access to the site.

Landscape topography: Site slopes vary from gentle to moderate/steep, ranging from approximately 0 to 30 percent across the site.

Drainage patterns: Site runoff generally flows southward as sheet flow over moderate slopes. Flows convey overland through approximately 300' of natural vegetation before discharging into the existing City of Cle Elum drainage system.

Existing Vegetation: The lease area is currently undeveloped, and ground cover is primarily forested.

Critical Areas: No critical areas have been identified on or immediately adjacent to the lease area.

List of known impairments for 303(d) listed or Total Maximum Daily Load (TMDL) for the receiving waterbody: No impaired receiving waters identified within 0.25-miles of the project site.

Table 1 includes a list of suspected and/or known contaminants associated with the construction activity.

Table 1 – Summary of Site Pollutant Constituents

Constituent (Pollutant)	Location	Depth	Concentration

Proposed Construction Activities (1.2)

Description of site development (example: subdivision):

The SE09034J Cle Elum DT project proposes the construction of a new 153' cellular tower and associated equipment shelter, fuel tank, power utilities, and accesses to serve AT&T mobility on a 0.055-acre (2,418 sf) lease area.

Description of construction activities (example: site preparation, demolition, excavation):

Construction activities will include clearing and grading, construction of fill retaining structures, and the import/compaction of material to establish the site pad. Following clearing/grading activities, the project proposes the construction of a crushed rock site pad, gravel access, and 153' tower with associated equipment shelter, fuel tank, and power utilities.

Description of site drainage including flow from and onto adjacent properties. Must be consistent with Site Map in Appendix A:

In general, site runoff generally flows southward from the site as sheet flow over moderate slopes. Flows convey overland through approximately 300' of natural vegetation, crossing through parcels 20-15-26050-2401, 20-15-26050-2701, and 20-15-26050-2703 before discharging into the existing City of Cle Elum drainage system.

The project proposes full dispersion (BMP F6.42) as the primary means of stormwater management in the developed condition. Area drains located along the southern margin of the lease area will collect flow and convey it to a 50LF dispersion trench which will disperse flows southward in a manner consistent with the predeveloped flowpath.

Description of final stabilization (example: extent of revegetation, paving, landscaping):

Approximately 0.06 acres of new impervious cover will be constructed as part of site development. Final stabilization of the project site will be conducted using BMPs listed in Section 2.0 of this report. Any disturbed landscaped areas will be underlain with BMP T5.13 soil mixtures in the developed condition.

Contaminated Site Information:

Proposed activities regarding contaminated soils or groundwater (example: on-site treatment system, authorized sanitary sewer discharge):

No contaminated soils and/or sources of contaminated groundwater are known to the project. A combination of silt fence and inlet protection will be utilized to contain sediment-laden runoff associated with development activities.

Construction Stormwater Best Management Practices (BMPs) (2.0)

The SWPPP is a living document reflecting current conditions and changes throughout the life of the project. These changes may be informal (i.e. hand-written notes and deletions). Update the SWPPP when the CESCL has noted a deficiency in BMPs or deviation from original design.

The 13 Elements (2.1)

Element 1: Preserve Vegetation / Mark Clearing Limits (2.1.1)

To protect adjacent properties and to reduce the area of soil exposed to construction, the limits of construction will be clearly marked before land-disturbing activities begin. Trees that are to be preserved, as well as all sensitive areas and their buffers, shall be clearly delineated, both in the field and on the plans. In general, natural vegetation and native topsoil shall be retained in an undisturbed state to the maximum extent possible. The BMPs relevant to marking the clearing limits that will be applied for this project include:

- High Visibility Plastic or Metal Fence (BMP C103)
- Silt Fence (BMP C233)

Clearing limits shall be marked in the initial stages of construction in order to establish the correct boundary for clearing and grubbing. Alternate BMPs for marking clearing limits are included in Appendix B as a quick reference tool for the onsite inspector in the event the BMP(s) listed above are deemed ineffective or inappropriate during construction to satisfy the requirements set forth in the General NPDES Permit (Appendix D). To avoid potential erosion and sediment control issues that may cause a violation(s) of the NPDES Construction Stormwater permit (as provided in Appendix D), the Certified Erosion and Sediment Control Lead will promptly initiate the implementation of one or more of the alternative BMPs listed in Appendix B after the first sign that existing BMPs are ineffective or failing.

Element 2: Establish Construction Access (2.1.2)

Construction access or activities occurring on unpaved areas shall be minimized, yet where necessary, access points shall be stabilized to minimize the tracking of sediment onto public roads, and wheel washing, street sweeping, and street cleaning shall be employed to prevent sediment from entering state waters. All wash wastewater shall be controlled on site. The specific BMPs related to establishing construction access that will be used on this project include:

- Stabilized Construction Entrance (BMP C105)

The construction access road shall be established in the initial stages of construction concurrent with the clearing limits in order to minimize vehicles tracking sediment off-site. Street sweeping, cleaning, or wheel wash/tire baths may be necessary if the stabilized construction access is not effective. All wheel wash wastewater shall be controlled on-site and cannot be discharged into waters of the State. Alternate construction access BMPs are included in Appendix B as a quick reference tool for the onsite inspector in the event the BMP(s) listed above are deemed ineffective or inappropriate during construction to satisfy the requirements set forth in the General NPDES Permit (Appendix D). To avoid potential erosion and sediment control issues that may cause a violation(s) of the NPDES Construction Stormwater permit (as provided in Appendix D), the Certified Erosion and Sediment Control Lead will promptly initiate the implementation of one or more of the alternative BMPs listed in Appendix B after the first sign that existing BMPs are ineffective or failing.

Element 3: Control Flow Rates (2.1.3)

Will you construct stormwater retention and/or detention facilities?

No

Will you use permanent infiltration ponds or other low impact development (example: rain gardens, bio-retention, porous pavement) to control flow during construction?

No

In order to protect the properties and waterways downstream of the project site, stormwater discharges from the site will be controlled by the following:

- Silt Fence (BMP C233)

TESC measures shall be implemented in the initial stages of construction once clearing limits are established and construction entrances are installed.. In general, discharge rates of stormwater from the site will be controlled where increases in impervious area or soil compaction during construction could lead to downstream erosion, or where necessary to meet local agency stormwater discharge requirements (e.g. discharge to combined sewer systems).

Element 4: Install Sediment Controls (2.1.4)

All stormwater runoff from disturbed areas shall pass through an appropriate sediment removal BMP before leaving the construction site or prior to being discharged to an infiltration facility. The specific BMPs to be used for controlling sediment on this project include:

- Silt Fence (BMP C233)
- Inlet Protection (BMP C220)

Alternate sediment control BMPs are included in Appendix B as a quick reference tool for the onsite inspector in the event the BMP(s) listed above are deemed ineffective or inappropriate during construction to satisfy the requirements set forth in the General NPDES Permit (Appendix D). To avoid potential erosion and sediment control issues that may cause a violation(s) of the NPDES Construction Stormwater permit (as provided in Appendix D), the Certified Erosion and Sediment Control Lead will promptly initiate the implementation of one or more of the alternative BMPs listed in Appendix B after the first sign that existing BMPs are ineffective or failing.

In addition, sediment will be removed from paved areas in and adjacent to construction work areas manually or using mechanical sweepers, as needed, to minimize tracking of sediments on vehicle tires away from the site and to minimize washoff of sediments from adjacent streets in runoff.

In some cases, sediment discharge in concentrated runoff can be controlled using permanent stormwater BMPs (e.g., infiltration swales, ponds, trenches). Sediment loads can limit the effectiveness of some permanent stormwater BMPs, such as those used for infiltration or biofiltration; however, those BMPs designed to remove solids by settling (wet ponds or detention ponds) can be used during the construction phase. When permanent stormwater BMPs will be used to control sediment discharge during construction, the structure will be protected from excessive sedimentation with adequate erosion and sediment control BMPs. Any accumulated sediment shall be removed after construction is complete and the permanent stormwater BMP will be restabilized with vegetation per applicable design requirements once the remainder of the site has been stabilized.

Element 5: Stabilize Soils (2.1.5)

West of the Cascade Mountains Crest

Season	Dates	Number of Days Soils Can be Left Exposed
During the Dry Season	May 1 – September 30	7 days
During the Wet Season	October 1 – April 30	2 days

Soils must be stabilized at the end of the shift before a holiday or weekend if needed based on the weather forecast.

Anticipated project dates:

Start date: May 2019

End date: September 2019

Will you construct during the wet season?

No

Exposed and unworked soils shall be stabilized with the application of effective BMPs to prevent erosion throughout the life of the project. The specific BMPs for soil stabilization that shall be used on this project include:

- Temporary and Permanent Seeding (BMP C120)
- Mulching (BMP C121)
- Plastic Covering (BMP C123)

The project site is located west of the Cascade Mountain Crest. As such, no soils shall remain exposed and unworked for more than 7 days during the dry season (May 1 to September 30) and 2 days during the wet season (October 1 to April 30). Regardless of the time of year, all soils shall be stabilized at the end of the shift before a holiday or weekend if needed based on weather forecasts.

In general, cut and fill slopes will be stabilized as soon as possible and soil stockpiles will be temporarily covered with plastic sheeting. All stockpiled soils shall be stabilized from erosion, protected with sediment trapping measures, and where possible, be located away from storm drain inlets, waterways, and drainage channels.

Element 6: Protect Slopes (2.1.6)

Will steep slopes be present at the site during construction?

Yes

All cut and fill slopes will be designed, constructed, and protected in a manner that minimizes erosion. The following specific BMPs will be used to protect slopes for this project:

- Temporary and Permanent Seeding (BMP C120)
- Mulching (BMP C121)
- Plastic Covering (BMP C123)

Erosion will be minimized by designing and constructing cut-and-fill slopes in a manner where continuous length of slope will be reduced with diversions and roughening slope surfaces. Stormwater runoff will be diverted away from slopes and disturbed areas with interceptor dikes, pipes, and swales. Check dams will be installed every 100' or 2' of elevation change along constructed channels in order to reduce flow velocity and erosion. Excavated material shall be placed on the uphill side of trenches, consistent with safety and space considerations.

Element 7: Protect Drain Inlets (2.1.7)

Area drains are proposed to collect flows from the project site and convey them to the dispersion trench along the southern boundary of the lease area. The following BMPs will be implemented in order to protect proposed inlets:

- Inlet Protection (BMP C220)

Element 8: Stabilize Channels and Outlets (2.1.8)

Provide stabilization, including armoring material, adequate to prevent erosion of outlets, adjacent stream banks, slopes, and downstream reaches, will be installed at the outlets of all conveyance systems.

Where site runoff is to be conveyed in channels, or discharged to a stream or some other natural drainage point, efforts will be taken to prevent downstream erosion. The specific BMPs for channel and outlet stabilization that shall be used on this project include:

- Temporary and Permanent Seeding (BMP C120)
- Mulching (BMP C121)
- Check Dams (BMP C207)

Stormwater runoff will be diverted away from slopes and disturbed areas with interceptor dikes, pipes, and swales. Check dams will be installed every 100' or 2' of elevation change along constructed channels in order to recude flow velocity and erosion. Excavated material shall be palced on the uphill side of trenches, consistent with safety and space considerations. Riprap pads shall be installed at the outlets of all conveyance systems in order to provide stabilization and adequate prevention of erosion to outlets, adjacent stream banks, slopes and downstream reaches.

Element 9: Control Pollutants (2.1.9)

The following pollutants are anticipated to be present on-site:

Table 2 – Pollutants

Pollutant (and source, if applicable)
Waste Material
Fuel leak from vehicles, equipment and petroleum product storage

All pollutants, including waste materials and demolition debris, that occur onsite shall be handled and disposed of in a manner that does not cause contamination of stormwater. Good housekeeping and preventative measures will be taken to ensure that the site will be kept clean, well-organized, and free of debris. If required, BMPs to be implemented to control specific sources of pollutants are discussed below.

Vehicles, construction equipment, and/or petroleum product storage/dispensing:

- All vehicles, equipment, and petroleum product storage/dispensing areas will be inspected regularly to detect any leaks or spills, and to identify maintenance needs to prevent leaks or spills.
- On-site fueling tanks and petroleum product storage containers shall include secondary containment.
- Spill prevention measures, such as drip pans, will be used when conducting maintenance and repair of vehicles or equipment.
- In order to perform emergency repairs on site, temporary plastic will be placed beneath and, if raining, over the vehicle.
- Contaminated surfaces shall be cleaned immediately following any discharge or spill incident.

Concrete and grout:

- Process water and slurry resulting from concrete work will be prevented from entering the waters of the State by implementing Concrete Handling measures (BMP C151). Concrete wash out areas shall not be allowed on bare dirt or allowed to drain to bare dirt or the storm system.
- Saw cutting and Surfacing Pollution Prevention (BMP C152)

The facility does require a Spill Prevention, Control, and Countermeasure (SPCC) Plan under the Federal regulations of the Clean Water Act (CWA) and will be provided under separate cover.

Will maintenance, fueling, and/or repair of heavy equipment and vehicles occur on-site?

No

Emergency repairs are very unlikely but possible. In order to perform emergency repairs on site, temporary plastic will be placed beneath and, if raining, over the vehicle.

Will wheel wash or tire bath system BMPs be used during construction?

No

All sediment will be removed from paved areas in and adjacent to construction work areas manually or using mechanical sweepers, as needed, to minimize tracking of sediments on vehicle tires away from the site and to minimize washoff of sediments from adjacent streets in runoff.

Will pH-modifying sources be present on-site?

No

Table 3 – pH-Modifying Sources

	None
	Bulk cement
	Cement kiln dust
	Fly ash
	Other cementitious materials
	New concrete washing or curing waters
	Waste streams generated from concrete grinding and sawing
	Exposed aggregate processes
	Dewatering concrete vaults
	Concrete pumping and mixer washout waters
	Recycled concrete
	Other (i.e. calcium lignosulfate) [please describe]

Concrete trucks must not be washed out onto the ground, or into storm drains, open ditches, streets, or streams. Excess concrete must not be dumped on-site, except in designated concrete washout areas with appropriate BMPs installed.

Element 10: Control Dewatering (2.1.10)

There will be no dewatering as part of this construction project. All dewatering water from open cut excavation, tunneling, foundation work, trench, or underground vaults shall be discharged into a controlled conveyance system prior to discharge to a sediment trap or sediment pond, or will be treated with dispersion across vegetated areas or by other modular methods before being discharged to or draining to an uncontrolled collection and conveyance system. Channels will be stabilized, per Element #8. Clean, non-turbid dewatering water will not be routed through stormwater sediment ponds, and will be discharged to systems tributary to the receiving waters of the State in a manner that does not cause erosion, flooding, or a violation of State water quality standards in the receiving water. Highly turbid dewatering water from soils known or suspected to be contaminated, or from use of construction equipment, will require additional monitoring and treatment as required for the specific pollutants based on the receiving waters into which the discharge is occurring. Such monitoring is the responsibility of the contractor.

However, the dewatering of soils known to be free of contamination will trigger BMPs to trap sediment and reduce turbidity. At a minimum, geotextile fabric socks/bags/cells will be used to filter this material. Other BMPs to be used for sediment trapping and turbidity reduction include the following:

- Use of a sedimentation bag, with outfall to a ditch or swale for small volumes of localized dewatering.

Alternative BMP not included in the above bulleted list are included in Appendix B as a quick reference tool for the onsite inspector in the event the BMP(s) listed above are deemed ineffective or inappropriate during construction to satisfy the requirements set forth in the General NPDES Permit (Appendix D). To avoid potential erosion and sediment control issues that may cause a violation(s) of the NPDES Construction Stormwater permit (as provided in Appendix D), the Certified Erosion and Sediment Control Lead will promptly initiate the implementation of one or more of the alternative BMPs listed in Appendix B after the first sign that existing BMPs are ineffective or failing.

Table 4 – Dewatering BMPs

	Infiltration
	Transport off-site in a vehicle (vacuum truck for legal disposal)
	Ecology-approved on-site chemical treatment or other suitable treatment technologies
	Sanitary or combined sewer discharge with local sewer district approval (last resort)
x	Use of sedimentation bag with discharge to ditch or swale (small volumes of localized dewatering)

Element 11: Maintain BMPs (2.1.11)

All temporary and permanent Erosion and Sediment Control (ESC) BMPs shall be maintained and repaired as needed to ensure continued performance of their intended function.

Maintenance and repair shall be conducted in accordance with each particular BMP specification (see *Volume II of the SWMMWW* or *Chapter 7 of the SWMMEW*).

Visual monitoring of all BMPs installed at the site will be conducted at least once every calendar week and within 24 hours of any stormwater or non-stormwater discharge from the site. If the site becomes inactive and is temporarily stabilized, the inspection frequency may be reduced to once every calendar month.

All temporary ESC BMPs shall be removed within 30 days after final site stabilization is achieved or after the temporary BMPs are no longer needed.

Trapped sediment shall be stabilized on-site or removed. Disturbed soil resulting from removal of either BMPs or vegetation shall be permanently stabilized.

Additionally, protection must be provided for all BMPs installed for the permanent control of stormwater from sediment and compaction. BMPs that are to remain in place following completion of construction shall be examined and restored to full operating condition. If sediment enters these BMPs during construction, the sediment shall be removed and the facility shall be returned to conditions specified in the construction documents.

Element 12: Manage the Project (2.1.12)

The project will be managed based on the following principles:

- Projects will be phased to the maximum extent practicable and seasonal work limitations will be taken into account.
- Inspection and monitoring:
 - Inspection, maintenance and repair of all BMPs will occur as needed to ensure performance of their intended function.
 - Site inspections and monitoring will be conducted in accordance with Special Condition S4 of the CSWGP. Sampling locations are indicated on the [Site Map](#). Sampling station(s) are located in accordance with applicable requirements of the CSWGP.
- Maintain an updated SWPPP.
 - The SWPPP will be updated, maintained, and implemented in accordance with Special Conditions S3, S4, and S9 of the CSWGP.

As site work progresses the SWPPP will be modified routinely to reflect changing site conditions. The SWPPP will be reviewed monthly to ensure the content is current.

Table 5 – Management

x	Design the project to fit the existing topography, soils, and drainage patterns
x	Emphasize erosion control rather than sediment control
x	Minimize the extent and duration of the area exposed
x	Keep runoff velocities low
x	Retain sediment on-site
x	Thoroughly monitor site and maintain all ESC measures
x	Schedule major earthwork during the dry season
	Other (please describe)

Reference Elements 1-11 above for BMP implementation.

Table 6 – BMP Implementation Schedule

[illegible]

Element 13: Protect Low Impact Development (LID) BMPs (2.1.13)

Low impact development (LID) BMPs are not proposed for use on this project.

Pollution Prevention Team (3.0)

Table 7 – Team Information

Title	Name(s)	Phone Number
Certified Erosion and Sediment Control Lead (CESCL)	TBD	TBD
Resident Engineer	Darrell Smith, P.E.	(425) 806-1869
Emergency Ecology Contact	Joyce Smith	(360) 407-6858
Emergency Permittee/ Owner Contact	Matt Grugan	(561) 948-6367
Non-Emergency Owner Contact	Matt Grugan	(561) 948-6367
Monitoring Personnel*	N/A	N/A

**Water quality monitoring not required as the disturbed construction area is less than one acre and site stormwaters do not discharge to an impaired water body.*

Monitoring and Sampling Requirements (4.0)

Monitoring includes visual inspection, sampling for water quality parameters of concern, and documentation of the inspection and sampling findings in a site log book. A site log book will be maintained for all on-site construction activities and will include:

- A record of the implementation of the SWPPP and other permit requirements
- Site inspections
- Stormwater sampling data

The site log book must be maintained on-site within reasonable access to the site and be made available upon request to Ecology or the local jurisdiction.

Numeric effluent limits may be required for certain discharges to 303(d) listed waterbodies. See CSWGP Special Condition S8 and Section 5 of this template.

Complete the following paragraph for sites that discharge to impaired waterbodies for fine sediment, turbidity, phosphorus, or pH:

The receiving waterbody, Klickitat Creek, is impaired for: Temperature. All stormwater and dewatering discharges from the site are subject to an **effluent limit** of 8.5 su for pH or 25 NTU for turbidity.

Site Inspection (4.1)

Site inspections will be conducted at least once every calendar week and within 24 hours following any discharge from the site. For sites that are temporarily stabilized and inactive, the required frequency is reduced to once per calendar month.

The discharge point(s) are indicated on the Site Map (see Appendix A) and in accordance with the applicable requirements of the CSWGP.

Reference Appendix D for a Site Inspection Form.

Stormwater Quality Sampling (4.2)

Turbidity Sampling (4.2.1)

Requirements include calibrated turbidity meter or transparency tube to sample site discharges for compliance with the CSWGP. Sampling will be conducted at all discharge points at least once per calendar week.

Method for sampling turbidity:

Table 8 – Turbidity Sampling Method

x	Turbidity Meter/Turbidimeter (required for disturbances 5 acres or greater in size)
	Transparency Tube (option for disturbances less than 1 acre and up to 5 acres in size)

The benchmark for turbidity value is 25 nephelometric turbidity units (NTU) and a transparency less than 33 centimeters.

If the discharge's turbidity is 26 to 249 NTU or the transparency is less than 33 cm but equal to or greater than 6 cm, the following steps will be conducted:

1. Review the SWPPP for compliance with Special Condition S9. Make appropriate revisions within 7 days of the date the discharge exceeded the benchmark.
2. Immediately begin the process to fully implement and maintain appropriate source control and/or treatment BMPs as soon as possible. Address the problems within 10 days of the date the discharge exceeded the benchmark. If installation of necessary treatment BMPs is not feasible within 10 days, Ecology may approve additional time when the Permittee requests an extension within the initial 10-day response period.
3. Document BMP implementation and maintenance in the site log book.

If the turbidity exceeds 250 NTU or the transparency is 6 cm or less at any time, the following steps will be conducted:

1. Telephone or submit an electronic report to the applicable Ecology Region's Environmental Report Tracking System (ERTS) within 24 hours.
<https://www.ecology.wa.gov/About-us/Get-involved/Report-an-environmental-issue>
 - Central Region (Benton, Chelan, Douglas, Kittitas, Klickitat, Okanogan, Yakima): (509) 575-2490
 - Eastern Region (Adams, Asotin, Columbia, Ferry, Franklin, Garfield, Grant, Lincoln, Pend Oreille, Spokane, Stevens, Walla Walla, Whitman): (509) 329-3400
 - Northwest Region (King, Kitsap, Island, San Juan, Skagit, Snohomish, Whatcom): (425) 649-7000
 - Southwest Region (Clallam, Clark, Cowlitz, Grays Harbor, Jefferson, Lewis, Mason, Pacific, Pierce, Skamania, Thurston, Wahkiakum,): (360) 407-6300
2. Immediately begin the process to fully implement and maintain appropriate source control and/or treatment BMPs as soon as possible. Address the problems within 10 days of the date the discharge exceeded the benchmark. If installation of necessary treatment BMPs is not feasible within 10 days, Ecology may approve additional time when the Permittee requests an extension within the initial 10-day response period
3. Document BMP implementation and maintenance in the site log book.
4. Continue to sample discharges daily until one of the following is true:
 - Turbidity is 25 NTU (or lower).
 - Transparency is 33 cm (or greater).
 - Compliance with the water quality limit for turbidity is achieved.
 - 1 - 5 NTU over background turbidity, if background is less than 50 NTU
 - 1% - 10% over background turbidity, if background is 50 NTU or greater
 - The discharge stops or is eliminated.

pH Sampling (4.2.2)

pH monitoring is required for “Significant concrete work” (i.e. greater than 1000 cubic yards poured concrete or recycled concrete over the life of the project). The use of engineered soils (soil amendments including but not limited to Portland cement-treated base [CTB], cement kiln dust [CKD] or fly ash) also requires pH monitoring.

For significant concrete work, pH sampling will start the first day concrete is poured and continue until it is cured, typically three (3) weeks after the last pour.

For engineered soils and recycled concrete, pH sampling begins when engineered soils or recycled concrete are first exposed to precipitation and continues until the area is fully stabilized.

Stormwater samples will be collected daily from all points of discharge from the site and measure for pH using a calibrated pH meter, pH test kit, or wide range pH indicator paper.

If the measured pH is 8.5 or greater, the following measures will be taken:

1. Prevent high pH water from entering storm sewer systems or surface water.
2. Adjust or neutralize the high pH water to the range of 6.5 to 8.5 su using appropriate technology such as carbon dioxide (CO₂) sparging (liquid or dry ice).
3. Written approval will be obtained from Ecology prior to the use of chemical treatment other than CO₂ sparging or dry ice.

Method for sampling pH:

Table 8 – pH Sampling Method

x	pH meter
x	pH test kit
x	Wide range pH indicator paper

Discharges to 303(d) or Total Maximum Daily Load (TMDL) Waterbodies (5.0)

303(d) Listed Waterbodies (5.1)

Is the receiving water 303(d) (Category 5) listed for turbidity, fine sediment, phosphorus, or pH?

No

List the impairment(s):

N/A

TMDL Waterbodies (5.2)

The 303(d) list is used to determine what water quality improvements are most needed. The TMDL process is only used where it is determined it will be the most effective tool.

Discharges to TMDL receiving waterbodies will meet in-stream water quality criteria at the point of discharge.

The Construction Stormwater General Permit Proposed New Discharge to an Impaired Water Body form is included in Appendix F.

Reporting and Record Keeping (6.0)

Record Keeping (6.1)

Site Log Book (6.1.1)

A site log book will be maintained for all on-site construction activities and will include:

- A record of the implementation of the SWPPP and other permit requirements
- Site inspections
- Sample logs

Records Retention (6.1.2)

Records will be retained during the life of the project and for a minimum of three (3) years following the termination of permit coverage in accordance with Special Condition S5.C of the CSWGP.

Permit documentation to be retained on-site:

- CSWGP
- Permit Coverage Letter
- SWPPP
- Site Log Book

Permit documentation will be provided within 14 days of receipt of a written request from Ecology. A copy of the SWPPP or access to the SWPPP will be provided to the public when requested in writing in accordance with Special Condition S5.G.2.b of the CSWGP.

Updating the SWPPP (6.1.3)

The SWPPP will be modified if:

- Found ineffective in eliminating or significantly minimizing pollutants in stormwater discharges from the site.
- There is a change in design, construction, operation, or maintenance at the construction site that has, or could have, a significant effect on the discharge of pollutants to waters of the State.

The SWPPP will be modified within seven (7) days if inspection(s) or investigation(s) determine additional or modified BMPs are necessary for compliance. An updated timeline for BMP implementation will be prepared.

Reporting (6.2)

Discharge Monitoring Reports (6.2.1)

Cumulative soil disturbance is one (1) acre or larger; therefore, Discharge Monitoring Reports (DMRs) will be submitted to Ecology monthly. If there was no discharge during a given monitoring period the DMR will be submitted as required, reporting “No Discharge”. The DMR due date is fifteen (15) days following the end of each calendar month.

DMRs will be reported online through Ecology’s WQWebDMR System.

To sign up for WSWebDMR, visit:

<https://www.ecology.wa.gov/Regulations-Permits/Guidance-technical-assistance/Water-quality-permits-guidance/WQWebPortal-guidance>

Notification of Noncompliance (6.2.2)

If any of the terms and conditions of the permit is not met, and the resulting noncompliance may cause a threat to human health or the environment, the following actions will be taken:

1. Ecology will be notified within 24-hours of the failure to comply by calling the applicable Regional office ERTS phone number (Regional office numbers listed below).
2. Immediate action will be taken to prevent the discharge/pollution or otherwise stop or correct the noncompliance. If applicable, sampling and analysis of any noncompliance will be repeated immediately and the results submitted to Ecology within five (5) days of becoming aware of the violation.
3. A detailed written report describing the noncompliance will be submitted to Ecology within five (5) days, unless requested earlier by Ecology.

Anytime turbidity sampling indicates turbidity is 250 NTUs or greater, or water transparency is 6 cm or less, the Ecology Regional office will be notified by phone within 24 hours of analysis as required by Special Condition S5.A of the CSWGP.

- Central Region at (509) 575-2490 for Benton, Chelan, Douglas, Kittitas, Klickitat, Okanogan, or Yakima County
- Eastern Region at (509) 329-3400 for Adams, Asotin, Columbia, Ferry, Franklin, Garfield, Grant, Lincoln, Pend Oreille, Spokane, Stevens, Walla Walla, or Whitman County
- Northwest Region at (425) 649-7000 for Island, King, Kitsap, San Juan, Skagit, Snohomish, or Whatcom County
- Southwest Region at (360) 407-6300 for Clallam, Clark, Cowlitz, Grays Harbor, Jefferson, Lewis, Mason, Pacific, Pierce, Skamania, Thurston, or Wahkiakum

Include the following information:

1. Your name and / Phone number
2. Permit number
3. City / County of project

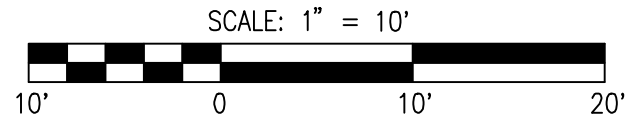
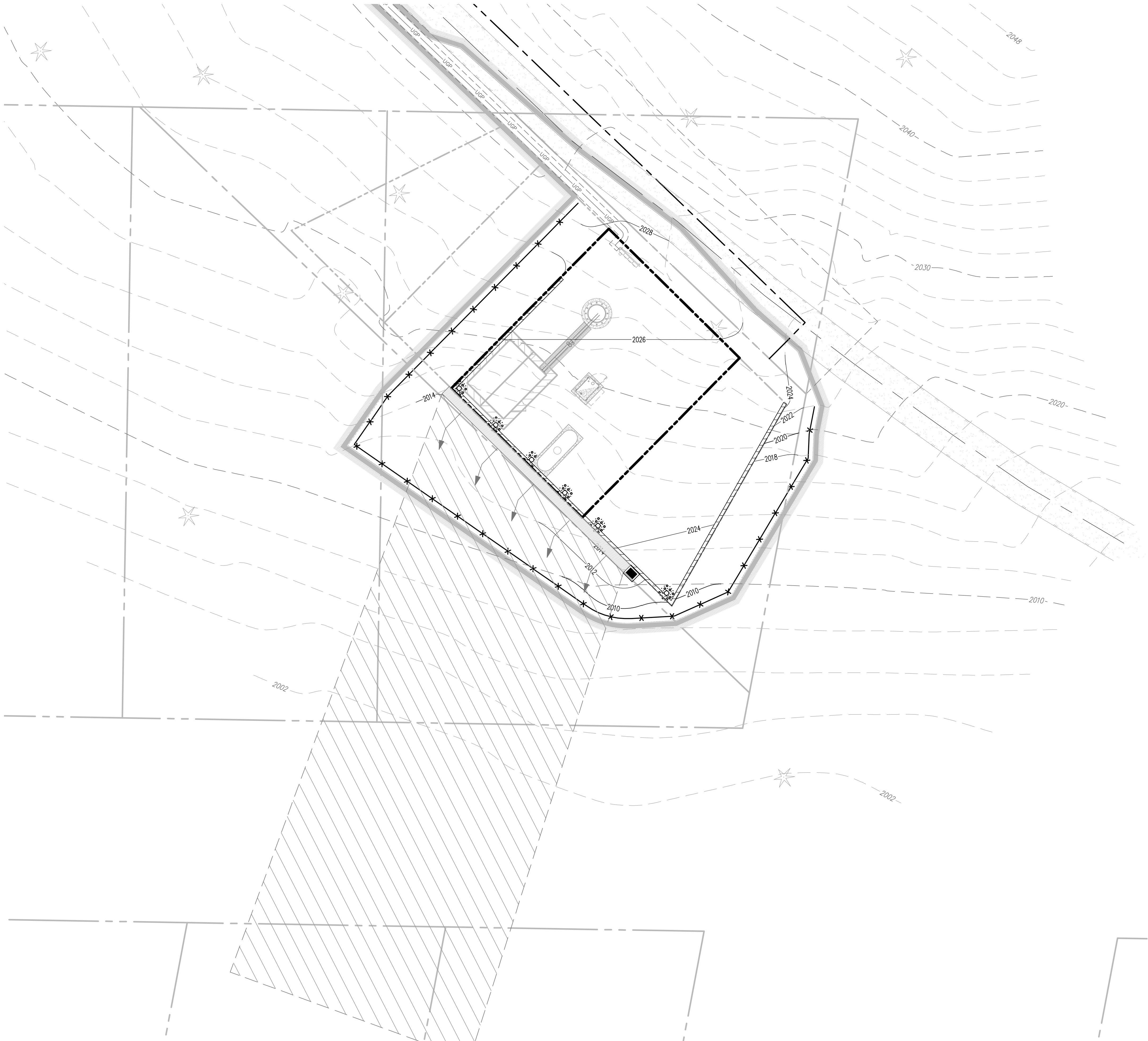
4. Sample results
5. Date / Time of call
6. Date / Time of sample
7. Project name

In accordance with Special Condition S4.D.5.b of the CSWGP, the Ecology Regional office will be notified if chemical treatment other than CO₂ sparging is planned for adjustment of high pH water.

Appendix/Glossary

Site Map

Drawing: P:\Telecom\2018\116-212 Vertical Bridge - SE09034J Cle Elum DT\Drawings\Engineering\18212CD-ER-PL.dwg Plotted: Feb 08, 2019 - 12:38pm



LEGEND

- CLEARING AREA
- PROTECTED AREA
- CLEARING LIMITS
- SILT FENCE
- INLET BASIN PROTECTION

CONSTRUCTION SEQUENCE

1. PRIOR TO ANY CONSTRUCTION ACTIVITY, THE CONTRACTOR SHALL SCHEDULE AND ATTEND A PRE-CONSTRUCTION CONFERENCE WITH THE MUNICIPAL STAFF. CESL SHALL ATTEND CONFERENCE.
2. FLAG CLEARING LIMITS.
3. INSTALL SILT FENCE AS SHOWN.
4. GRADE AND STABILIZE CONSTRUCTION ROADS.
5. MAINTAIN EROSION CONTROL MEASURES IN ACCORDANCE WITH MUNICIPALITY STANDARDS AND MANUFACTURER'S RECOMMENDATIONS.
6. RELOCATE EROSION CONTROL MEASURES OR INSTALL NEW MEASURES SO THAT AS SITE CONDITIONS CHANGE, THE EROSION AND SEDIMENT CONTROL IS ALWAYS IN ACCORDANCE WITH MUNICIPALITY ESC MINIMUM REQUIREMENTS.
7. COVER ALL AREAS WITHIN THE SPECIFIED TIME FRAME WITH STRAW, WOOD FIBER MULCH, COMPOST, PLASTIC SHEETING, CRUSHED ROCK OR EQUIVALENT.
8. STABILIZE ALL AREAS THAT REACH FINAL GRADE WITHIN 7 DAYS.
9. SEED OR SOD ANY AREAS TO REMAIN UNWORKED FOR MORE THAN 30 DAYS.
10. UPON COMPLETION OF THE PROJECT, ALL DISTURBED AREAS MUST BE STABILIZED AND BEST MANAGEMENT PRACTICES REMOVED IF APPROPRIATE.

VERTICAL BRIDGE

SE09034J CLE ELUM DT

TESC PLAN



JOB NUMBER: 119-704
DRAWING NAME: 18212CD-ER-PL
DESIGNER: DCS
DRAFTING BY: RMD
DATE: 7-20-18
SCALE: 1"=10'
JURISDICTION: CLE ELUM

ER-01

SHEET 2 OF 3

15th ANNIVERSARY
LDC
Surveying
Engineering
Planning
2020 143rd Avenue NE
Woodinville, WA 98072
Ph: 425.806.1869
Fx: 425.482.2893
www.LDCorp.com

REVISIONS

DESCRIPTION

NO.

DATE

BY

SITE GRADING AND SWPPP NOTES

- NONCOMPLIANCE WITH THE EROSION CONTROL REQUIREMENTS, WATER QUALITY REQUIREMENTS, AND CLEARING LIMITS VIOLATIONS MAY RESULT IN REVOCATION OF PROJECT PERMITS AND PLAN APPROVAL AND BOND FORECLOSURES.
- PRIOR TO ANY SITE CONSTRUCTION, INCLUDING CLEARING, LOGGING OR GRADING, THE SITE CLEARING LIMITS SHALL BE LOCATED AND FIELD IDENTIFIED BY THE PROJECT SURVEYOR (OR PROJECT ENGINEER) AS REQUIRED BY THESE PLANS.
- DEVELOPER IS RESPONSIBLE FOR WATER QUALITY AS DETERMINED BY THE MONITORING PROGRAM ESTABLISHED BY THE PROJECT ENGINEER.
- THE CONSTRUCTION STORMWATER POLLUTION PREVENTION FACILITIES SHALL BE CONSTRUCTED IN ACCORDANCE WITH THE APPROVED SWPPP PRIOR TO ANY GRADING OR EXTENSIVE LAND CLEARING. AN INSPECTION OF THESE FACILITIES SHALL BE ARRANGED FOR BY THE CONTRACTOR PRIOR TO ANY GRADING. THESE FACILITIES MUST BE SATISFACTORILY MAINTAINED UNTIL CONSTRUCTION AND LANDSCAPING IS COMPLETED AND THE POTENTIAL FOR ON-SITE EROSION HAS PASSED.
- ALL SITE WORK MUST BE PERFORMED IN ACCORDANCE WITH THE CURRENT MUNICIPALITY ADOPTED INTERNATIONAL BUILDING CODE.
- ALL EARTH WORK SHALL BE PERFORMED IN ACCORDANCE WITH MUNICIPALITY STANDARDS. PRECONSTRUCTION SOILS INVESTIGATION MAY BE REQUIRED TO EVALUATE SOILS STABILITY.
- IF CUT AND FILL SLOPES EXCEED A MAXIMUM OF TWO FEET HORIZONTAL TO ONE FOOT VERTICAL, A ROCK OR CONCRETE RETAINING WALL MAY BE REQUIRED. ALL ROCK RETAINING WALLS GREATER THAN FOUR (4) FEET IN HEIGHT ARE TO BE DESIGNED AND CERTIFIED BY A PROFESSIONAL ENGINEER EXPERIENCED IN SOIL MECHANICS.
- STOCKPILES ARE TO BE LOCATED IN SAFE AREAS AND ADEQUATELY PROTECTED BY TEMPORARY SEEDING AND MULCHING. HYDROSEEDING IS PREFERRED.
- ALL STRUCTURAL FILLS SHALL BE COMPACTED TO A MINIMUM OF 95% MAXIMUM DENSITY IN THE UPPER 4 FEET & 90% MAXIMUM DENSITY BELOW 4 FEET AS DETERMINED BY MODIFIED PROCTOR.
- PRIOR TO ANY SITE WORK PERTAINING TO DRAINAGE, THE CONTRACTOR SHALL CONTACT THE MUNICIPALITY TO SCHEDULE A PRECONSTRUCTION CONFERENCE.
- CONSTRUCTION STORMWATER POLLUTION PREVENTION MEASURES SHALL BE INSTALLED PRIOR TO ANY SITE WORK. (SEE ATTACHED DETAILED DRAINAGE PLAN).
- THE SURFACE OF ALL SLOPES SHALL BE COMPACTED. THIS MAY BE ACCOMPLISHED BY OVER-BUILDING THE SLOPES, THEN CUTTING BACK TO FINAL GRADES; OR BY COMPACTING EACH LIFT AS THE SLOPE IS BEING CONSTRUCTED. ALL SLOPES SHALL BE COMPACTED BY THE END OF EACH WORKING DAY.
- UPON COMPLETION OF WORK, FINAL REPORTS MUST BE SUBMITTED TO THE MUNICIPALITY IN CONFORMANCE WITH THE CURRENT MUNICIPALITY ADOPTED INTERNATIONAL BUILDING CODE.

TEMPORARY GRAVEL CONSTRUCTION ENTRANCE NOTES

- THE TEMPORARY CONSTRUCTION ENTRANCE SHOULD BE CLEARED OF ALL VEGETATION, ROOTS, AND OTHER OBJECTIONABLE MATERIAL. ANY DRAINAGE FACILITIES REQUIRED BECAUSE OF WASHING SHOULD BE CONSTRUCTED ACCORDING TO SPECIFICATIONS IN THE PLAN. IF WASH RACKS ARE USED, THEY SHOULD BE INSTALLED ACCORDING TO MANUFACTURES SPECIFICATIONS.
- GRAVEL SHALL BE CRUSHED BALLAST ROCK, 8" TO 12" IN DEPTH AND INSTALLED TO THE SPECIFIED DIMENSIONS AT THE ENTRANCE.
- THE GRAVEL BALLAST ROCK SHALL BE 4" TO 8" IN DIAMETER AND PLACED ACROSS THE FULL WIDTH OF THE VEHICULAR INGRESS AND EGRESS AREA. THE LENGTH OF ENTRANCE SHALL BE A MINIMUM OF 100 FEET OR AS SPECIFIED BY THE MUNICIPALITY INSPECTOR OR DESIGNEE.
- IF CONDITIONS ON THE SITE ARE SUCH THAT MOST OF THE MUD IS NOT REMOVED FROM VEHICLE TIRES BY CONTACT WITH THE GRAVEL, THEN THE TIRES MUST BE WASHED BEFORE VEHICLES ENTER ONTO A PUBLIC ROAD. WASH WATER MUST BE CARRIED AWAY FROM ENTRANCE TO A SETTLING AREA TO REMOVE SEDIMENT. A WASH RACK MAY ALSO BE USED TO MAKE WASHING MORE CONVENIENT AND EFFECTIVE.
- THE ENTRANCE SHALL BE MAINTAINED IN A CONDITION WHICH WILL PREVENT TRACKING OR FLOW OF MUD ONTO PUBLIC RIGHTS-OF-WAY. THIS MAY REQUIRE PERIODIC TOP DRESSING WITH 2" STONE, AS CONDITIONS DEMAND, AND REPAIR AND/OR CLEAN OUT ANY STRUCTURES USED TO TRAP SEDIMENT. ALL MATERIALS SPILLED, DROPPED, WASHED OR TRACKED FROM VEHICLES ONTO ROADWAY OR INTO STORM DRAINS MUST BE REMOVED IMMEDIATELY.

HYDROSEEDING GENERAL NOTES

- CONSTRUCTION ACCEPTANCE WILL BE SUBJECT TO A WELL ESTABLISHED GROUND COVER THAT FULFILLS THE REQUIREMENTS OF THE APPROVED CONSTRUCTION PLANS AND MUNICIPAL STANDARDS.
- ALL DISTURBED AREAS SUCH AS RETENTION FACILITIES, ROADWAY BACKSLOPES, ETC., SHALL BE SEEDDED WITH A PERENNIAL GROUND COVER GRASS TO MINIMIZE EROSION. GRASS SEEDING WILL BE DONE USING AN APPROVED HYDROSEEDER OR AS OTHERWISE APPROVED BY THE MUNICIPALITY.
- PREPARATION OF SURFACE: ALL AREAS TO BE SEEDDED SHALL BE CULTIVATED TO THE SATISFACTION OF THE MUNICIPALITY INSPECTOR. THIS MAY BE ACCOMPLISHED BY DISKING, RAKING, HARROWING, OR OTHER ACCEPTABLE MEANS.
- IMMEDIATELY FOLLOWING FINISH GRADING PERMANENT VEGETATION SHALL BE APPLIED CONSISTENT WITH THE DESIGN AND MAINTENANCE STANDARDS FOR TEMPORARY AND PERMANENT SEEDING IN THE MUNICIPALITY ADOPTED DEPARTMENT OF ECOLOGY STORMWATER MANAGEMENT MANUAL FOR WESTERN WASHINGTON.
- ALL HYDROSEEDING FIRMS SHALL HAVE A PRINTOUT OF THE APPLICATION RATE FOR EACH JOB READILY AVAILABLE FOR INSPECTION BY THE MUNICIPALITY.
- THE MUNICIPALITY SHALL BE NOTIFIED OF PERMANENT HYDROSEEDING PRIOR TO THE COMMENCEMENT OF SAME TO ENSURE COMPLIANCE OF THESE SPECIFICATIONS.

MAINTENANCE OF SILTATION BARRIERS NOTE

- SILTATION BARRIERS SHALL BE INSPECTED IMMEDIATELY AFTER EACH RAINFALL AND AT LEAST DAILY DURING PROLONGED RAINFALL. CLOSE ATTENTION SHALL BE PAID TO THE REPAIR OF DAMAGED BALES, END RUNS AND UNDERCUTTING BENEATH BALES. NECESSARY REPAIRS TO BARRIERS OR REPLACEMENT OF BALES SHALL BE ACCOMPLISHED PROMPTLY. SEDIMENT DEPOSITS SHOULD BE REMOVED AFTER EACH RAINFALL. SEDIMENT DEPOSITS MUST BE REMOVED WHEN SEDIMENT LEVEL REACHES APPROXIMATELY ONE-HALF THE SILTATION BARRIER HEIGHT. ANY SEDIMENT DEPOSITS REMAINING IN PLACE AFTER THE STRAW BALE BARRIER IS NO LONGER REQUIRED SHALL BE DRESSED TO CONFORM TO THE EXISTING GRADE, PREPARED AND SEEDDED.

POLLUTANT CONTROL NOTES

- ALL POLLUTANTS, INCLUDING WASTE MATERIALS AND DEMOLITION DEBRIS, THAT OCCUR ON-SITE SHALL BE HANDLED AND DISPOSED OF IN A MANNER THAT DOES NOT CAUSE CONTAMINATION OF STORMWATER. WOODY DEBRIS MAY BE CHOPPED AND SPREAD ON SITE.
- COVER, CONTAINMENT AND PROTECTION FROM VANDALISM SHALL BE PROVIDED FOR ALL CHEMICALS, LIQUID PRODUCTS, PETROLEUM PRODUCTS, AND NON-INERT WASTES PRESENT ON THE SITE (SEE CHAPTER 173-304 WAC FOR THE DEFINITION OF INERT WASTE). ON-SITE FUELING TANKS SHALL INCLUDE SECONDARY CONTAINMENT.
- ALL MAINTENANCE OF HEAVY EQUIPMENT AND VEHICLES SHALL BE DONE OFFSITE.
- ACTIVITIES WHICH MAY RESULT IN DISCHARGE OR SPILLAGE OF POLLUTANTS TO THE GROUND OR INTO STORMWATER RUNOFF MUST BE CONDUCTED USING SPILL PREVENTION MEASURES, SUCH AS DRIP PANS. CONTAMINATED SURFACES SHALL BE CLEANED IMMEDIATELY FOLLOWING ANY DISCHARGE OR SPILL INCIDENT. EMERGENCY REPAIRS MAY BE PERFORMED ON-SITE USING TEMPORARY PLASTIC PLACED BENEATH AND, IF RAINING, OVER THE VEHICLE.
- WHEEL WASH OR TIRE BATH WASTEWATER SHALL BE DISCHARGED TO A SEPARATE ON-SITE TREATMENT SYSTEM OR TO THE SANITARY SEWER.
- APPLICATION OF AGRICULTURAL CHEMICALS, INCLUDING FERTILIZERS AND PESTICIDES, SHALL BE CONDUCTED IN A MANNER AND AT APPLICATION RATES THAT WILL NOT RESULT IN LOSS OF CHEMICAL TO STORMWATER RUNOFF. MANUFACTURERS' RECOMMENDATIONS FOR APPLICATION RATES AND PROCEDURES SHALL BE FOLLOWED.
- BMPs SHALL BE USED TO PREVENT OR TREAT CONTAMINATION OF STORMWATER RUNOFF BY PH MODIFYING SOURCES. THESE SOURCES INCLUDE, BUT ARE NOT LIMITED TO, BULK CEMENT, CEMENT KILN DUST, FLY ASH, NEW CONCRETE WASHING AND CURING WATERS, WASTE STREAMS GENERATED FROM CONCRETE GRINDING AND SAWING, EXPOSED AGGREGATE PROCESSES, AND CONCRETE PUMPING AND MIXER WASHOUT WATERS. STORMWATER DISCHARGES SHALL NOT CAUSE OR CONTRIBUTE TO A VIOLATION OF THE WATER QUALITY STANDARD FOR PH IN THE RECEIVING WATER.

EROSION, SEDIMENTATION AND WATER QUALITY SITE INSPECTIONS:

PRIOR TO ANY SITE DEVELOPMENT WORK TAKING PLACE, A PRE-CONSTRUCTION MEETING WITH THE CONTRACTOR, OWNER, CESCL, AND MUNICIPALITY INSPECTOR SHALL BE HELD.

THE DEPARTMENT OF ECOLOGY REQUIRES THAT CONSTRUCTION PROJECTS ONE ACRE OR LARGER RETAIN A CESCL TO ENSURE THAT THE PROJECT IS IN COMPLIANCE WITH THE CURRENT EROSION, SEDIMENTATION AND WATER QUALITY STANDARDS.

THE CESCL IS RESPONSIBLE FOR:

- INSPECTING THE CONSTRUCTION SITE TO ENSURE THAT ALL CONSTRUCTION SWPPP MEASURES ARE FUNCTIONING AS INTENDED.
- ALLOCATING RESOURCES TO REPAIR ALL EROSION CONTROL STRUCTURES THAT ARE IN NEED OF MAINTENANCE.
- MONITORING WATER QUALITY FOR ANY STORM DRAINAGE THAT LEAVES THE SITE.
- STOPPING AND/OR REDIRECTING CONSTRUCTION ACTIVITIES DEEMED NECESSARY TO PROTECT THE ENVIRONMENT.

SHOULD BMP PERFORMANCE GOALS NOT BE ACHIEVED, THE ONLY CONSTRUCTION ACTIVITIES THAT SHALL BE ALLOWED ARE THE REPAIR OF EXISTING EROSION CONTROL STRUCTURES, INSTALLATION OF ADDITIONAL BMP'S TO MINIMIZE THE TRANSPORT OF SEDIMENT OFFSITE, OR THOSE ACTIVITIES THAT DO NOT DISTURB EXPOSED EARTH AND DO NOT HAVE THE POTENTIAL TO GENERATE ADDITIONAL SEDIMENT.

THE TWELVE ELEMENTS OF A CONSTRUCTION SWPPP:

THE BMPs REFERENCED BELOW SHALL BE ADHERED TO:

- MARK CLEARING LIMITS: THE CLEARING LIMITS ARE INDICATED ON THE PLAN SHEET. CLEARING AND GRADING WILL BE LIMITED TO ONLY AREAS THAT NEED TO BE DISTURBED FOR GRADING, PLACING OR STOCK PILING FILL, AND TO PRESERVE AS MUCH NATURAL VEGETATION AND THE DUFF LAYER AS POSSIBLE. FIELD MARKING THE CLEARING LIMITS SHALL BE COMPLETED PRIOR TO ANY CLEARING OR DISTURBING THE SITE.
BMPs:
C103 PLASTIC OR METAL FENCE
C233 SILT FENCE
- ESTABLISH CONSTRUCTION ACCESS: ACCESS TO THE CONSTRUCTION SITE SHALL BE LIMITED TO THE ROCK CONSTRUCTION ENTRANCES.
BMPs:
C105 STABILIZED CONSTRUCTION ENTRANCE
- CONTROL FLOW RATES: SILT FENCE WILL BE INSTALLED AT CLEARING LIMITS TO REDUCE VELOCITY OF OVERLAND FLOW EXITING THE SITE.
BMPs:
C233 SILT FENCE
- INSTALL SEDIMENT CONTROLS: SEDIMENT CONTROL WILL BE PROVIDED THROUGH THE USE OF SILT FENCE AND INLET PROTECTION.
BMPs:
C233 SILT FENCE
C220 STORM DRAIN INLET PROTECTION
- STABILIZE SOILS: TEMPORARY AND PERMANENT SOIL STABILIZATION WILL BE PROVIDED. TEMPORARY STABILIZATION WILL BE PROVIDED TO EXPOSED WORKED EARTH FROM OCTOBER 1 UNTIL APRIL 30, NO EXPOSED SOIL MAY REMAIN EXPOSED AND UNWORKED FOR MORE THAN 20 DAYS; FROM MAY 1 UNTIL SEPTEMBER 30, NO EXPOSED SOIL MAY REMAIN EXPOSED AND UNWORKED FOR MORE THAN SEVEN DAYS.
BMPs:
C120 TEMPORARY AND PERMANENT SEEDING
C121 MULCHING
C123 PLASTIC COVERING
- PROTECT SLOPES: SLOPES SHALL BE PROTECTED FROM EROSION THROUGH COVER AND SOIL STABILIZATION.
BMPs:
C120 TEMPORARY AND PERMANENT SEEDING
C121 MULCHING
C123 PLASTIC COVERING
- PROTECT DRAIN INLETS: INLET PROTECTION SHALL BE INSTALLED IN ALL AREA DRAINS AND REMAIN UNTIL CONSTRUCTION ACTIVITIES HAVE BEEN COMPLETED. INLET PROTECTION SHALL BE INSPECTED REGULARLY AND THE FILTER FABRIC CLEANED/REPLACED AS NECESSARY.
C220 STORM DRAIN INLET PROTECTION
- STABILIZE CHANNELS AND OUTLETS: NO CHANNELS ARE PROPOSED FOR THIS PROJECT.
- CONTROL POLLUTANTS: POLLUTANTS SHALL BE CONTROLLED PER POLLUTANT CONTROL NOTES. SEE THIS SHEET FOR NOTES.
- CONTROL DE-WATERING: DISPOSAL OPTIONS FOR DE-WATERING WATER ARE AS SPECIFIED IN THE DE-WATERING CONTROL NOTES. SEE THIS SHEET FOR NOTES. IN ADDITION, THE FOLLOWING BMP TO BE USED FOR SEDIMENT TRAPPING AND TURBIDITY REDUCTION INCLUDE:
C151 CONCRETE HANDLING
- MAINTAIN BMPs: MAINTENANCE OF THE BMPs IS SPECIFIED IN THE CONSTRUCTION SEQUENCE AND GRADING AND EROSION CONTROL NOTES, SEE SHEET ER-01 AND THIS SHEET.
- PROJECT MANAGEMENT: THE GRADING AND EROSION CONTROL NOTES SPECIFY SEASONAL WORK LIMITATIONS. BMPs SHALL BE MAINTAINED PER ELEMENT #11.

DE-WATERING CONTROL NOTES

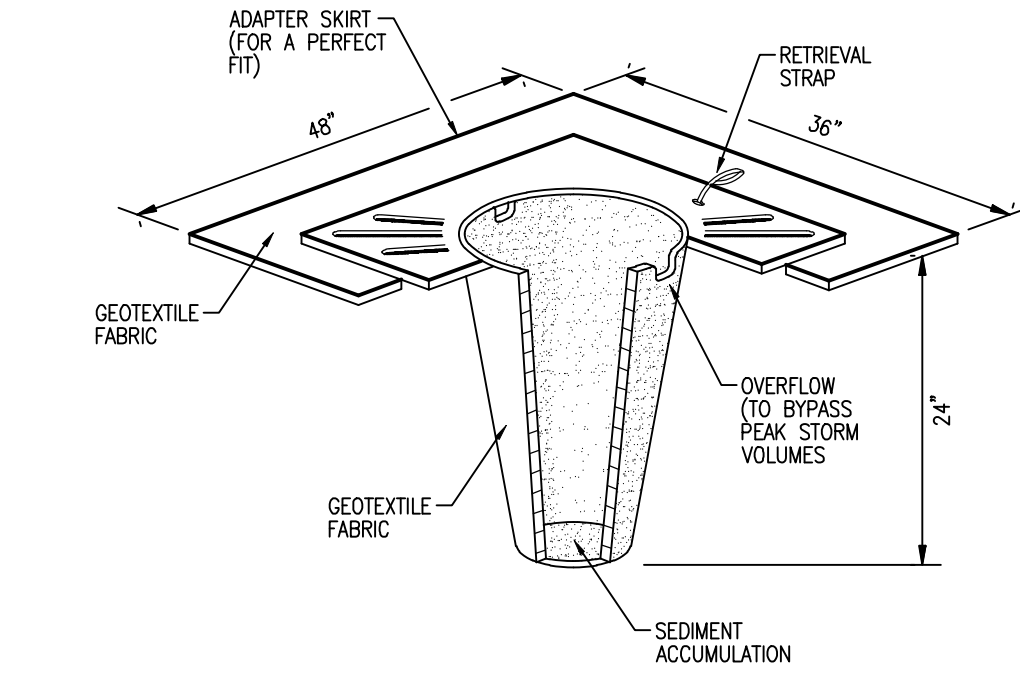
ANY RUNOFF GENERATED BY DEWATERING SHALL BE TREATED THROUGH CONSTRUCTION OF A SEDIMENT TRAP (SECTION D.2.1.5.1) WHEN THERE IS SUFFICIENT SPACE OR BY RELEASING THE WATER TO A WELL VEGETATED, GENTLY SLOPING AREA. SINCE PUMPS ARE USED FOR DEWATERING, IT MAY BE POSSIBLE TO PUMP THE SEDIMENT-LADEN WATER WELL AWAY FROM THE SURFACE WATER SO THAT VEGETATION CAN BE MORE EFFECTIVELY UTILIZED FOR TREATMENT. DISCHARGE OF SEDIMENT-LADEN WATER FROM DEWATERING ACTIVITIES TO SURFACE AND STORM WATERS IS PROHIBITED. IF DEWATERING OCCURS FROM AREAS WHERE THE WATER HAS COME IN CONTACT WITH NEW CONCRETE, SUCH AS TANKS, VAULTS, OR FOUNDATIONS, THE PH OF THE WATER MUST BE MONITORED AND MUST BE NEUTRALIZED PRIOR TO DISCHARGE. CLEAN NON-TURBID DEWATERING WATER, SUCH AS WELL POINT GROUND WATER CAN BE DISCHARGED TO SYSTEMS TRIBUTARY TO, OR DIRECTLY TO SURFACE WATERS PROVIDED THE FLOWS ARE CONTROLLED SO NO EROSION OR FLOODING OCCURS. CLEAN WATER MUST NOT BE ROUTED THROUGH A STORMWATER SEDIMENT POND. HIGHLY TURBID OR CONTAMINATED DEWATERING WATER MUST BE HANDLED SEPARATELY FROM STORMWATER.

PURPOSE: TO PREVENT THE UNTREATED DISCHARGE OF SEDIMENT-LADEN WATER FROM DEWATERING OF UTILITIES, EXCAVATED AREAS, FOUNDATIONS, ETC

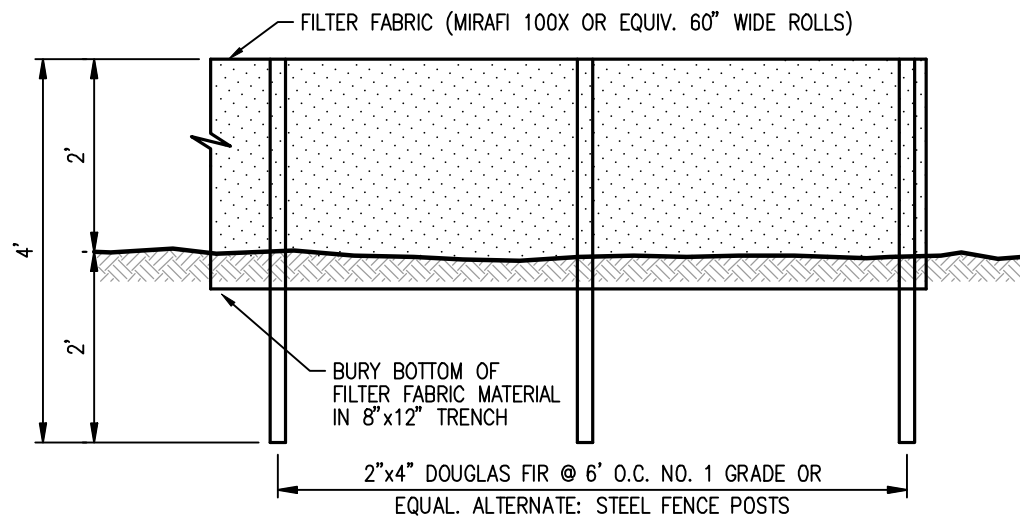
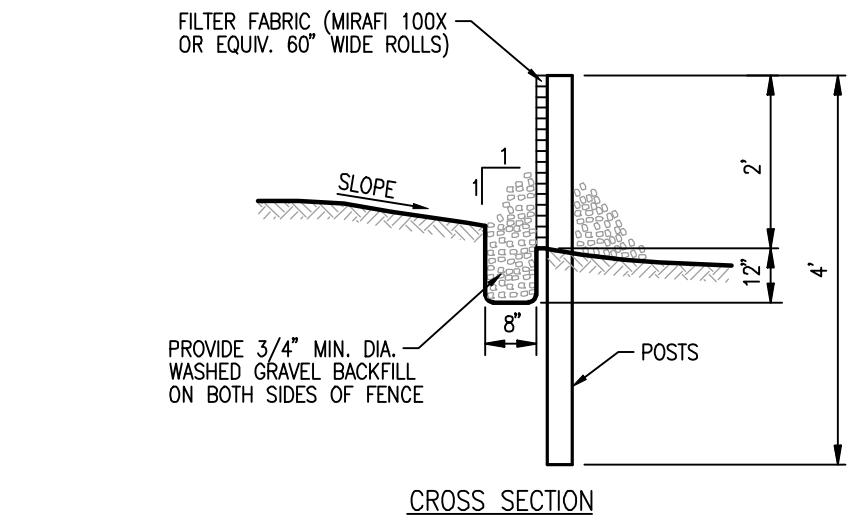
WHEN TO INSTALL: DEWATERING CONTROL MEASURES SHALL BE USED WHENEVER THERE IS A POTENTIAL FOR RUNOFF FROM DEWATERING OF UTILITIES, EXCAVATIONS, FOUNDATIONS, ETC.

MEASURES TO INSTALL:

- FOUNDATION, EXCAVATION, AND TRENCH DEWATERING WATER THAT HAS SIMILAR CHARACTERISTICS TO STORMWATER RUNOFF AT THE SITE SHALL BE DISCHARGED INTO A CONTROLLED CONVEYANCE SYSTEM PRIOR TO DISCHARGE TO A SEDIMENT TRAP OR SEDIMENT POND. FOUNDATION AND TRENCH DEWATERING WATER THAT HAS SIMILAR CHARACTERISTICS TO STORMWATER RUNOFF AT THE SITE MUST BE DISPOSED OF THROUGH ONE OF THE FOLLOWING OPTIONS DEPENDING ON SITE CONSTRAINTS:
 - INFILTRATION,
 - TRANSPORT OFFSITE IN A VEHICLE, SUCH AS A VACUUM FLUSH TRUCK, FOR LEGAL DISPOSAL IN A MANNER THAT DOES NOT POLLUTE SURFACE WATERS,
 - DISCHARGE TO THE SANITARY SEWER DISCHARGE WITH LOCAL SEWER DISTRICT APPROVAL IF THERE IS NO OTHER OPTION, OR
 - USE OF A SEDIMENTATION BAG WITH OUTFALL TO A DITCH OR SWALE FOR SMALL VOLUMES OF LOCALIZED DEWATERING.
- CLEAN, NON-TURBID DEWATERING WATER, SUCH AS WELL-POINT GROUND WATER, MAY BE DISCHARGED VIA STABLE CONVEYANCE TO SYSTEMS TRIBUTARY TO SURFACE WATERS, PROVIDED THE DEWATERING FLOW DOES NOT CAUSE EROSION OR FLOODING OF RECEIVING WATERS.
- HIGHLY TURBID OR CONTAMINATED DEWATERING WATER (HIGH PH OR OTHER) SHALL BE HANDLED SEPARATELY FROM STORMWATER. SEE SECTION D.2.2 (P. D-74), SWPPS MEASURES.



STORM DRAIN INLET PROTECTION
NOT TO SCALE



SILT FENCE DETAIL
NOT TO SCALE

REVISIONS		BY
NO.	DATE	DESCRIPTION

15th ANNIVERSARY

LDC


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VERTICAL BRIDGE

SE09034J CLE ELUM DT

TEEC NOTES AND DETAILS



JOB NUMBER: T19-704
DRAWING NAME: 18212CD-ER-01
DESIGNER: DCS
DRAFTING BY: RMD
DATE: 7-20-18
SCALE: NOT TO SCALE
JURISDICTION: CLE ELUM

ER-02

SHEET 3 OF 3

BMP Detail

Construction BMPs

High Visibility Plastic or Metal Fence (BMP C103)

Stabilized Construction Entrance (BMP C105)

Temporary and Permanent Seeding (BMP C120)

Mulching (BMP C121)

Plastic Covering (BMP C123)

Concrete Handling (BMP C151)

Inlet Protection (BMP C220)

Silt Fence (BMP C233)

damage from burying and smothering.

- Vegetative buffer zones for streams, lakes or other waterways shall be established by the local permitting authority or other state or federal permits or approvals.

Maintenance Standards

Inspect the area frequently to make sure flagging remains in place and the area remains undisturbed. Replace all damaged flagging immediately.

BMP C103: High Visibility Fence

Purpose

Fencing is intended to:

1. Restrict clearing to approved limits.
2. Prevent disturbance of sensitive areas, their buffers, and other areas required to be left undisturbed.
3. Limit construction traffic to designated construction entrances, exits, or internal roads.
4. Protect areas where marking with survey tape may not provide adequate protection.

Conditions of Use

To establish clearing limits plastic, fabric, or metal fence may be used:

- At the boundary of sensitive areas, their buffers, and other areas required to be left uncleared.
- As necessary to control vehicle access to and on the site.

Design and Installation Specifications

High visibility plastic fence shall be composed of a high-density polyethylene material and shall be at least four feet in height. Posts for the fencing shall be steel or wood and placed every 6 feet on center (maximum) or as needed to ensure rigidity. The fencing shall be fastened to the post every six inches with a polyethylene tie. On long continuous lengths of fencing, a tension wire or rope shall be used as a top stringer to prevent sagging between posts. The fence color shall be high visibility orange. The fence tensile strength shall be 360 lbs./ft. using the ASTM D4595 testing method.

If appropriate install fabric silt fence in accordance with [BMP C233: Silt Fence \(p.367\)](#) to act as high visibility fence. Silt fence shall be at least 3 feet high and must be highly visible to meet the requirements of this BMP.

Metal fences shall be designed and installed according to the manufacturer's specifications.

Metal fences shall be at least 3 feet high and must be highly visible.

Fences shall not be wired or stapled to trees.

Maintenance Standards

If the fence has been damaged or visibility reduced, it shall be repaired or replaced immediately and visibility restored.

BMP C105: Stabilized Construction Entrance / Exit

Purpose

Stabilized Construction entrances are established to reduce the amount of sediment transported onto paved roads by vehicles or equipment. This is done by constructing a stabilized pad of quarry spalls at entrances and exits for construction sites.

Conditions of Use

Construction entrances shall be stabilized wherever traffic will be entering or leaving a construction site if paved roads or other paved areas are within 1,000 feet of the site.

For residential construction provide stabilized construction entrances for each residence, rather than only at the main subdivision entrance. Stabilized surfaces shall be of sufficient length/width to provide vehicle access/parking, based on lot size/configuration.

On large commercial, highway, and road projects, the designer should include enough extra materials in the contract to allow for additional stabilized entrances not shown in the initial Construction SWPPP. It is difficult to determine exactly where access to these projects will take place; additional materials will enable the contractor to install them where needed.

Design and Installation Specifications

See [Figure II-4.1.1 Stabilized Construction Entrance \(p.273\)](#) for details. Note: the 100' minimum length of the entrance shall be reduced to the maximum practicable size when the size or configuration of the site does not allow the full length (100').

Construct stabilized construction entrances with a 12-inch thick pad of 4-inch to 8-inch quarry spalls, a 4-inch course of asphalt treated base (ATB), or use existing pavement. Do not use crushed concrete, cement, or calcium chloride for construction entrance stabilization because these products raise pH levels in stormwater and concrete discharge to surface waters of the State is prohibited.

A separation geotextile shall be placed under the spalls to prevent fine sediment from pumping up into the rock pad. The geotextile shall meet the following standards:

Grab Tensile Strength (ASTM D4751)	200 psi min.
Grab Tensile Elongation (ASTM D4632)	30% max.
Mullen Burst Strength (ASTM D3786-80a)	400 psi min.
AOS (ASTM D4751)	20-45 (U.S. standard sieve size)

- Consider early installation of the first lift of asphalt in areas that will be paved; this can be used as a stabilized entrance. Also consider the installation of excess concrete as a stabilized entrance. During large concrete pours, excess concrete is often available for this purpose.
- Fencing (see [BMP C103: High Visibility Fence \(p.269\)](#)) shall be installed as necessary to restrict traffic to the construction entrance.
- Whenever possible, the entrance shall be constructed on a firm, compacted subgrade. This can substantially increase the effectiveness of the pad and reduce the need for maintenance.
- Construction entrances should avoid crossing existing sidewalks and back of walk drains if at all possible. If a construction entrance must cross a sidewalk or back of walk drain, the full length of the sidewalk and back of walk drain must be covered and protected from sediment leaving the site.

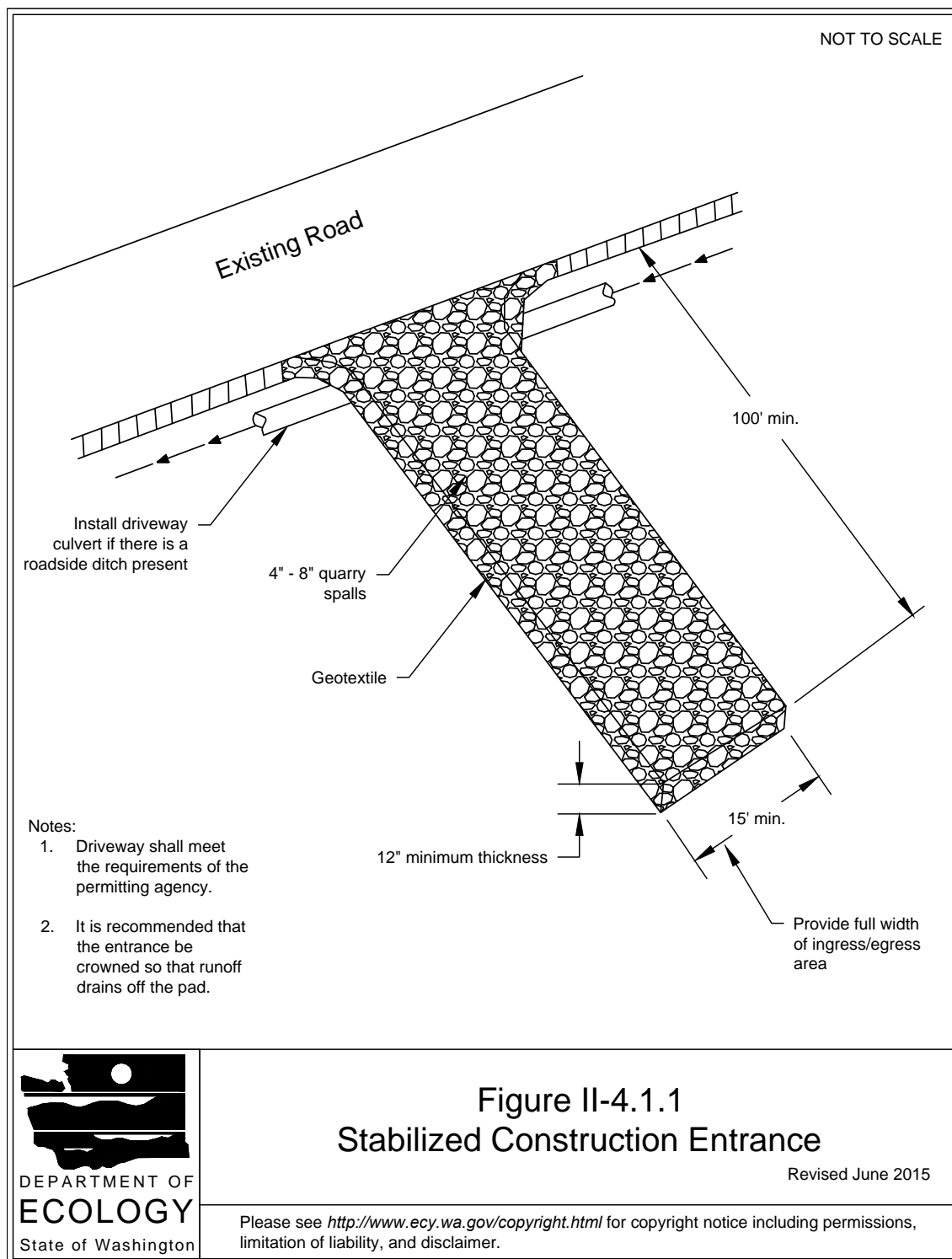
Maintenance Standards

Quarry spalls shall be added if the pad is no longer in accordance with the specifications.

- If the entrance is not preventing sediment from being tracked onto pavement, then alternative measures to keep the streets free of sediment shall be used. This may include replacement/cleaning of the existing quarry spalls, street sweeping, an increase in the dimensions of the entrance, or the installation of a wheel wash.
- Any sediment that is tracked onto pavement shall be removed by shoveling or street sweeping. The sediment collected by sweeping shall be removed or stabilized on site. The pavement shall not be cleaned by washing down the street, except when high efficiency sweeping is ineffective and there is a threat to public safety. If it is necessary to wash the streets, the construction of a small sump to contain the wash water shall be considered. The sediment would then be washed into the sump where it can be controlled.
- Perform street sweeping by hand or with a high efficiency sweeper. Do not use a non-high efficiency mechanical sweeper because this creates dust and throws soils into storm systems or conveyance ditches.

- Any quarry spalls that are loosened from the pad, which end up on the roadway shall be removed immediately.
- If vehicles are entering or exiting the site at points other than the construction entrance(s), fencing (see BMP C103) shall be installed to control traffic.
- Upon project completion and site stabilization, all construction accesses intended as permanent access for maintenance shall be permanently stabilized.

Figure II-4.1.1 Stabilized Construction Entrance



- Storm drain inlets shall be protected to prevent sediment-laden water entering the storm drain system (see [BMP C220: Storm Drain Inlet Protection \(p.357\)](#)).

Maintenance Standards

Inspect stabilized areas regularly, especially after large storm events.

Crushed rock, gravel base, etc., shall be added as required to maintain a stable driving surface and to stabilize any areas that have eroded.

Following construction, these areas shall be restored to pre-construction condition or better to prevent future erosion.

Perform street cleaning at the end of each day or more often if necessary.

BMP C120: Temporary and Permanent Seeding

Purpose

Seeding reduces erosion by stabilizing exposed soils. A well-established vegetative cover is one of the most effective methods of reducing erosion.

Conditions of Use

Use seeding throughout the project on disturbed areas that have reached final grade or that will remain unworked for more than 30 days.

The optimum seeding windows for western Washington are April 1 through June 30 and September 1 through October 1.

Between July 1 and August 30 seeding requires irrigation until 75 percent grass cover is established.

Between October 1 and March 30 seeding requires a cover of mulch with straw or an erosion control blanket until 75 percent grass cover is established.

Review all disturbed areas in late August to early September and complete all seeding by the end of September. Otherwise, vegetation will not establish itself enough to provide more than average protection.

- Mulch is required at all times for seeding because it protects seeds from heat, moisture loss, and transport due to runoff. Mulch can be applied on top of the seed or simultaneously by hydroseeding. See [BMP C121: Mulching \(p.284\)](#) for specifications.
- Seed and mulch, all disturbed areas not otherwise vegetated at final site stabilization. Final stabilization means the completion of all soil disturbing activities at the site and the establishment of a permanent vegetative cover, or equivalent per-

manent stabilization measures (such as pavement, riprap, gabions, or geotextiles) which will prevent erosion.

Design and Installation Specifications

Seed retention/detention ponds as required.

Install channels intended for vegetation before starting major earthwork and hydroseed with a Bonded Fiber Matrix. For vegetated channels that will have high flows, install erosion control blankets over hydroseed. Before allowing water to flow in vegetated channels, establish 75 percent vegetation cover. If vegetated channels cannot be established by seed before water flow; install sod in the channel bottom—over hydromulch and erosion control blankets.

- Confirm the installation of all required surface water control measures to prevent seed from washing away.
- Hydroseed applications shall include a minimum of 1,500 pounds per acre of mulch with 3 percent tackifier. See [BMP C121: Mulching \(p.284\)](#) for specifications.
- Areas that will have seeding only and not landscaping may need compost or meal-based mulch included in the hydroseed in order to establish vegetation. Re-install native topsoil on the disturbed soil surface before application.
- When installing seed via hydroseeding operations, only about 1/3 of the seed actually ends up in contact with the soil surface. This reduces the ability to establish a good stand of grass quickly. To overcome this, consider increasing seed quantities by up to 50 percent.
- Enhance vegetation establishment by dividing the hydromulch operation into two phases:
 1. Phase 1- Install all seed and fertilizer with 25-30 percent mulch and tackifier onto soil in the first lift.
 2. Phase 2- Install the rest of the mulch and tackifier over the first lift.

Or, enhance vegetation by:

1. Installing the mulch, seed, fertilizer, and tackifier in one lift.
2. Spread or blow straw over the top of the hydromulch at a rate of 800-1000 pounds per acre.
3. Hold straw in place with a standard tackifier.

Both of these approaches will increase cost moderately but will greatly improve and enhance vegetative establishment. The increased cost may be offset by the reduced need for:

- Irrigation.
- Reapplication of mulch.
- Repair of failed slope surfaces.

This technique works with standard hydromulch (1,500 pounds per acre minimum) and BFM/MBFMs (3,000 pounds per acre minimum).

- Seed may be installed by hand if:
 - Temporary and covered by straw, mulch, or topsoil.
 - Permanent in small areas (usually less than 1 acre) and covered with mulch, topsoil, or erosion blankets.
 - The seed mixes listed in the tables below include recommended mixes for both temporary and permanent seeding.
 - Apply these mixes, with the exception of the wetland mix, at a rate of 120 pounds per acre. This rate can be reduced if soil amendments or slow-release fertilizers are used.
 - Consult the local suppliers or the local conservation district for their recommendations because the appropriate mix depends on a variety of factors, including location, exposure, soil type, slope, and expected foot traffic. Alternative seed mixes approved by the local authority may be used.
 - Other mixes may be appropriate, depending on the soil type and hydrology of the area.
- [Table II-4.1.2 Temporary Erosion Control Seed Mix \(p.280\)](#) lists the standard mix for areas requiring a temporary vegetative cover.

Table II-4.1.2 Temporary Erosion Control Seed Mix

	% Weight	% Purity	% Germination
Chewings or annual blue grass <i>Festuca rubra var. commutata</i> or <i>Poa annua</i>	40	98	90
Perennial rye <i>Lolium perenne</i>	50	98	90
Redtop or colonial bentgrass <i>Agrostis alba</i> or <i>Agrostis tenuis</i>	5	92	85
White dutch clover <i>Trifolium repens</i>	5	98	90

- [Table II-4.1.3 Landscaping Seed Mix \(p.281\)](#) lists a recommended mix for landscaping seed.

Table II-4.1.3 Landscaping Seed Mix

	% Weight	% Purity	% Germination
Perennial rye blend <i>Lolium perenne</i>	70	98	90
Chewings and red fescue blend <i>Festuca rubra</i> var. <i>commutata</i> or <i>Festuca rubra</i>	30	98	90

- [Table II-4.1.4 Low-Growing Turf Seed Mix \(p.281\)](#) lists a turf seed mix for dry situations where there is no need for watering. This mix requires very little maintenance.

Table II-4.1.4 Low-Growing Turf Seed Mix

	% Weight	% Purity	% Germination
Dwarf tall fescue (several varieties) <i>Festuca arundinacea</i> var.	45	98	90
Dwarf perennial rye (Barclay) <i>Lolium perenne</i> var. <i>barclay</i>	30	98	90
Red fescue <i>Festuca rubra</i>	20	98	90
Colonial bentgrass <i>Agrostis tenuis</i>	5	98	90

- [Table II-4.1.5 Bioswale Seed Mix* \(p.281\)](#) lists a mix for bioswales and other intermittently wet areas.

Table II-4.1.5 Bioswale Seed Mix*

	% Weight	% Purity	% Germination
Tall or meadow fescue <i>Festuca arundinacea</i> or <i>Festuca elatior</i>	75-80	98	90
Seaside/Creeping bentgrass <i>Agrostis palustris</i>	10-15	92	85
Redtop bentgrass <i>Agrostis alba</i> or <i>Agrostis gigantea</i>	5-10	90	80
* Modified Briargreen, Inc. Hydroseeding Guide Wetlands Seed Mix			

- [Table II-4.1.6 Wet Area Seed Mix* \(p.282\)](#) lists a low-growing, relatively non-invasive seed mix appropriate for very wet areas that are not regulated wetlands. Apply

this mixture at a rate of 60 pounds per acre. Consult Hydraulic Permit Authority (HPA) for seed mixes if applicable.

Table II-4.1.6 Wet Area Seed Mix*

	% Weight	% Purity	% Germination
Tall or meadow fescue <i>Festuca arundinacea</i> or <i>Festuca elatior</i>	60-70	98	90
Seaside/Creeping bentgrass <i>Agrostis palustris</i>	10-15	98	85
Meadow foxtail <i>Alepocurus pratensis</i>	10-15	90	80
Alsike clover <i>Trifolium hybridum</i>	1-6	98	90
Redtop bentgrass <i>Agrostis alba</i>	1-6	92	85
* Modified Briargreen, Inc. Hydroseeding Guide Wetlands Seed Mix			

- [Table II-4.1.7 Meadow Seed Mix \(p.282\)](#) lists a recommended meadow seed mix for infrequently maintained areas or non-maintained areas where colonization by native plants is desirable. Likely applications include rural road and utility right-of-way. Seeding should take place in September or very early October in order to obtain adequate establishment prior to the winter months. Consider the appropriateness of clover, a fairly invasive species, in the mix. Amending the soil can reduce the need for clover.

Table II-4.1.7 Meadow Seed Mix

	% Weight	% Purity	% Germination
Redtop or Oregon bentgrass <i>Agrostis alba</i> or <i>Agrostis oregonensis</i>	20	92	85
Red fescue <i>Festuca rubra</i>	70	98	90
White dutch clover <i>Trifolium repens</i>	10	98	90

- **Roughening and Rototilling:**
 - The seedbed should be firm and rough. Roughen all soil no matter what the slope. Track walk slopes before seeding if engineering purposes require

compaction. Backblading or smoothing of slopes greater than 4H:1V is not allowed if they are to be seeded.

- Restoration-based landscape practices require deeper incorporation than that provided by a simple single-pass rototilling treatment. Wherever practical, initially rip the subgrade to improve long-term permeability, infiltration, and water inflow qualities. At a minimum, permanent areas shall use soil amendments to achieve organic matter and permeability performance defined in engineered soil/landscape systems. For systems that are deeper than 8 inches complete the rototilling process in multiple lifts, or prepare the engineered soil system per specifications and place to achieve the specified depth.
- **Fertilizers:**
 - Conducting soil tests to determine the exact type and quantity of fertilizer is recommended. This will prevent the over-application of fertilizer.
 - Organic matter is the most appropriate form of fertilizer because it provides nutrients (including nitrogen, phosphorus, and potassium) in the least water-soluble form.
 - In general, use 10-4-6 N-P-K (nitrogen-phosphorus-potassium) fertilizer at a rate of 90 pounds per acre. Always use slow-release fertilizers because they are more efficient and have fewer environmental impacts. Do not add fertilizer to the hydromulch machine, or agitate, more than 20 minutes before use. Too much agitation destroys the slow-release coating.
 - There are numerous products available that take the place of chemical fertilizers. These include several with seaweed extracts that are beneficial to soil microbes and organisms. If 100 percent cottonseed meal is used as the mulch in hydroseed, chemical fertilizer may not be necessary. Cottonseed meal provides a good source of long-term, slow-release, available nitrogen.
- **Bonded Fiber Matrix and Mechanically Bonded Fiber Matrix:**
 - On steep slopes use Bonded Fiber Matrix (BFM) or Mechanically Bonded Fiber Matrix (MBFM) products. Apply BFM/MBFM products at a minimum rate of 3,000 pounds per acre of mulch with approximately 10 percent tackifier. Achieve a minimum of 95 percent soil coverage during application. Numerous products are available commercially. Installed products per manufacturer's instructions. Most products require 24-36 hours to cure before rainfall and cannot be installed on wet or saturated soils. Generally, products come in 40-50 pound bags and include all necessary ingredients except for seed and fertilizer.

- BFM and MBFMs provide good alternatives to blankets in most areas requiring vegetation establishment. Advantages over blankets include:
 - BFM and MBFMs do not require surface preparation.
 - Helicopters can assist in installing BFM and MBFMs in remote areas.
 - On slopes steeper than 2.5H:1V, blanket installers may require ropes and harnesses for safety.
 - Installing BFM and MBFMs can save at least \$1,000 per acre compared to blankets.

Maintenance Standards

Reseed any seeded areas that fail to establish at least 80 percent cover (100 percent cover for areas that receive sheet or concentrated flows). If reseeding is ineffective, use an alternate method such as sodding, mulching, or nets/blankets. If winter weather prevents adequate grass growth, this time limit may be relaxed at the discretion of the local authority when sensitive areas would otherwise be protected.

- Reseed and protect by mulch any areas that experience erosion after achieving adequate cover. Reseed and protect by mulch any eroded area.
- Supply seeded areas with adequate moisture, but do not water to the extent that it causes runoff.

Approved as Equivalent

Ecology has approved products as able to meet the requirements of [BMP C120: Temporary and Permanent Seeding](#). The products did not pass through the Technology Assessment Protocol – Ecology (TAPE) process. Local jurisdictions may choose not to accept this product approved as equivalent, or may require additional testing prior to consideration for local use. The products are available for review on Ecology’s website at <http://www.ecy.wa.gov/programs/wq/stormwater/newtech/equivalent.html>.

BMP C121: Mulching

Purpose

Mulching soils provides immediate temporary protection from erosion. Mulch also enhances plant establishment by conserving moisture, holding fertilizer, seed, and topsoil in place, and moderating soil temperatures. There is an enormous variety of mulches that can be used. This section discusses only the most common types of mulch.

Conditions of Use

As a temporary cover measure, mulch should be used:

- For less than 30 days on disturbed areas that require cover.
- At all times for seeded areas, especially during the wet season and during the hot summer months.
- During the wet season on slopes steeper than 3H:1V with more than 10 feet of vertical relief.

Mulch may be applied at any time of the year and must be refreshed periodically.

- For seeded areas mulch may be made up of 100 percent: cottonseed meal; fibers made of wood, recycled cellulose, hemp, kenaf; compost; or blends of these. Tackifier shall be plant-based, such as guar or alpha plantago, or chemical-based such as polyacrylamide or polymers. Any mulch or tackifier product used shall be installed per manufacturer's instructions. Generally, mulches come in 40-50 pound bags. Seed and fertilizer are added at time of application.

Design and Installation Specifications

For mulch materials, application rates, and specifications, see [Table II-4.1.8 Mulch Standards and Guidelines \(p.286\)](#). Always use a 2-inch minimum mulch thickness; increase the thickness until the ground is 95% covered (i.e. not visible under the mulch layer). Note: Thickness may be increased for disturbed areas in or near sensitive areas or other areas highly susceptible to erosion.

Where the option of "Compost" is selected, it should be a coarse compost that meets the following size gradations when tested in accordance with the U.S. Composting Council "Test Methods for the Examination of Compost and Composting" (TMECC) Test Method 02.02-B.

Coarse Compost

Minimum Percent passing 3" sieve openings 100%

Minimum Percent passing 1" sieve openings 90%

Minimum Percent passing ¾" sieve openings 70%

Minimum Percent passing ¼" sieve openings 40%

Mulch used within the ordinary high-water mark of surface waters should be selected to minimize potential flotation of organic matter. Composted organic materials have higher specific gravities (densities) than straw, wood, or chipped material. Consult Hydraulic Permit Authority (HPA) for mulch mixes if applicable.

Maintenance Standards

- The thickness of the cover must be maintained.
- Any areas that experience erosion shall be remulched and/or protected with a net

or blanket. If the erosion problem is drainage related, then the problem shall be fixed and the eroded area remulched.

Table II-4.1.8 Mulch Standards and Guidelines

Mulch Material	Quality Standards	Application Rates	Remarks
Straw	Air-dried; free from undesirable seed and coarse material.	2"-3" thick; 5 bales per 1,000 sf or 2-3 tons per acre	Cost-effective protection when applied with adequate thickness. Hand-application generally requires greater thickness than blown straw. The thickness of straw may be reduced by half when used in conjunction with seeding. In windy areas straw must be held in place by crimping, using a tackifier, or covering with netting. Blown straw always has to be held in place with a tackifier as even light winds will blow it away. Straw, however, has several deficiencies that should be considered when selecting mulch materials. It often introduces and/or encourages the propagation of weed species and it has no significant long-term benefits. It should also not be used within the ordinary high-water elevation of surface waters (due to flotation).
Hydromulch	No growth inhibiting factors.	Approx. 25-30 lbs per 1,000 sf or 1,500 - 2,000 lbs per acre	Shall be applied with hydromulcher. Shall not be used without seed and tackifier unless the application rate is at least doubled. Fibers longer than about 3/4 - 1 inch clog hydromulch equipment. Fibers should be kept to less than 3/4 inch.
Compost	No visible water or dust during handling. Must be produced per WAC 173-350, Solid Waste Handling Standards, but may have up to 35%	2" thick min.; approx. 100 tons per acre (approx. 800 lbs per yard)	More effective control can be obtained by increasing thickness to 3". Excellent mulch for protecting final grades until landscaping because it can be directly seeded or tilled into soil as an amendment. Compost used for mulch has a coarser size gradation than compost used for BMP C125: Topsoiling / Composting (p.297) or BMP T5.13: Post-Construction Soil Quality and Depth (p.911) . It is more stable and practical to use in wet areas and during rainy weather conditions. Do not use near wetlands or near phosphorous impaired water bodies.

Table II-4.1.8 Mulch Standards and Guidelines (continued)

Mulch Material	Quality Standards	Application Rates	Remarks
	biosolids.		
Chipped Site Vegetation	Average size shall be several inches. Gradations from fines to 6 inches in length for texture, variation, and interlocking properties.	2" thick min.;	This is a cost-effective way to dispose of debris from clearing and grubbing, and it eliminates the problems associated with burning. Generally, it should not be used on slopes above approx. 10% because of its tendency to be transported by run-off. It is not recommended within 200 feet of surface waters. If seeding is expected shortly after mulch, the decomposition of the chipped vegetation may tie up nutrients important to grass establishment.
Wood-based Mulch or Wood Straw	No visible water or dust during handling. Must be purchased from a supplier with a Solid Waste Handling Permit or one exempt from solid waste regulations.	2" thick min.; approx. 100 tons per acre (approx. 800 lbs. per cubic yard)	This material is often called "hog or hogged fuel". The use of mulch ultimately improves the organic matter in the soil. Special caution is advised regarding the source and composition of wood-based mulches. Its preparation typically does not provide any weed seed control, so evidence of residual vegetation in its composition or known inclusion of weed plants or seeds should be monitored and prevented (or minimized).
Wood Strand Mulch	A blend of loose, long, thin wood pieces derived from native conifer or deciduous trees with	2" thick min.	Cost-effective protection when applied with adequate thickness. A minimum of 95-percent of the wood strand shall have lengths between 2 and 10-inches, with a width and thickness between 1/16 and 3/8-inches. The mulch shall not contain resin, tannin, or other compounds in quantities that would be detrimental to plant life. Sawdust or wood shavings shall not be used as mulch. (WSDOT specification (9-14.4(4)))

BMP C123: Plastic Covering

Purpose

Plastic covering provides immediate, short-term erosion protection to slopes and disturbed areas.

Conditions of Use

Plastic covering may be used on disturbed areas that require cover measures for less than 30 days, except as stated below.

- Plastic is particularly useful for protecting cut and fill slopes and stockpiles. Note: The relatively rapid breakdown of most polyethylene sheeting makes it unsuitable for long-term (greater than six months) applications.
- Due to rapid runoff caused by plastic covering, do not use this method upslope of areas that might be adversely impacted by concentrated runoff. Such areas include steep and/or unstable slopes.
- Plastic sheeting may result in increased runoff volumes and velocities, requiring additional on-site measures to counteract the increases. Creating a trough with wattles or other material can convey clean water away from these areas.
- To prevent undercutting, trench and backfill rolled plastic covering products.
- While plastic is inexpensive to purchase, the added cost of installation, maintenance, removal, and disposal make this an expensive material, up to \$1.50-2.00 per square yard.
- Whenever plastic is used to protect slopes install water collection measures at the base of the slope. These measures include plastic-covered berms, channels, and pipes used to convey clean rainwater away from bare soil and disturbed areas. Do not mix clean runoff from a plastic covered slope with dirty runoff from a project.
- Other uses for plastic include:
 1. Temporary ditch liner.
 2. Pond liner in temporary sediment pond.
 3. Liner for bermed temporary fuel storage area if plastic is not reactive to the type of fuel being stored.
 4. Emergency slope protection during heavy rains.
 5. Temporary drainpipe ("elephant trunk") used to direct water.

Design and Installation Specifications

- Plastic slope cover must be installed as follows:
 1. Run plastic up and down slope, not across slope.
 2. Plastic may be installed perpendicular to a slope if the slope length is less than 10 feet.
 3. Minimum of 8-inch overlap at seams.
 4. On long or wide slopes, or slopes subject to wind, tape all seams.
 5. Place plastic into a small (12-inch wide by 6-inch deep) slot trench at the top of the slope and backfill with soil to keep water from flowing underneath.
 6. Place sand filled burlap or geotextile bags every 3 to 6 feet along seams and tie them together with twine to hold them in place.
 7. Inspect plastic for rips, tears, and open seams regularly and repair immediately. This prevents high velocity runoff from contacting bare soil which causes extreme erosion.
 8. Sandbags may be lowered into place tied to ropes. However, all sandbags must be staked in place.
- Plastic sheeting shall have a minimum thickness of 0.06 millimeters.
- If erosion at the toe of a slope is likely, a gravel berm, riprap, or other suitable protection shall be installed at the toe of the slope in order to reduce the velocity of runoff.

Maintenance Standards

- Torn sheets must be replaced and open seams repaired.
- Completely remove and replace the plastic if it begins to deteriorate due to ultra-violet radiation.
- Completely remove plastic when no longer needed.
- Dispose of old tires used to weight down plastic sheeting appropriately.

Approved as Equivalent

Ecology has approved products as able to meet the requirements of [BMP C123: Plastic Covering](#). The products did not pass through the Technology Assessment Protocol – Ecology (TAPE) process. Local jurisdictions may choose not to accept this product approved as equivalent, or may require additional testing prior to consideration for local use. The products are available for review on Ecology’s website at <http://www.ecy.wa.gov/programs/wq/stormwater/newtech/equivalent.html>

BMP C151: Concrete Handling

Purpose

Concrete work can generate process water and slurry that contain fine particles and high pH, both of which can violate water quality standards in the receiving water. Concrete spillage or concrete discharge to surface waters of the State is prohibited. Use this BMP to minimize and eliminate concrete, concrete process water, and concrete slurry from entering waters of the state.

Conditions of Use

Any time concrete is used, utilize these management practices. Concrete construction projects include, but are not limited to, the following:

- Curbs
- Sidewalks
- Roads
- Bridges
- Foundations
- Floors
- Runways

Design and Installation Specifications

- Assure that washout of concrete trucks, chutes, pumps, and internals is performed at an approved off-site location or in designated concrete washout areas. Do not wash out concrete trucks onto the ground, or into storm drains, open ditches, streets, or streams. Refer to [BMP C154: Concrete Washout Area \(p.317\)](#) for information on concrete washout areas.
- Return unused concrete remaining in the truck and pump to the originating batch plant for recycling. Do not dump excess concrete on site, except in designated concrete washout areas.
- Wash off hand tools including, but not limited to, screeds, shovels, rakes, floats, and trowels into formed areas only.
- Wash equipment difficult to move, such as concrete pavers in areas that do not directly drain to natural or constructed stormwater conveyances.
- Do not allow washdown from areas, such as concrete aggregate driveways, to drain directly to natural or constructed stormwater conveyances.
- Contain washwater and leftover product in a lined container when no formed areas

are available. Dispose of contained concrete in a manner that does not violate ground water or surface water quality standards.

- Always use forms or solid barriers for concrete pours, such as pilings, within 15-feet of surface waters.
- Refer to [BMP C252: High pH Neutralization Using CO2 \(p.409\)](#) and [BMP C253: pH Control for High pH Water \(p.412\)](#) for pH adjustment requirements.
- Refer to the Construction Stormwater General Permit for pH monitoring requirements if the project involves one of the following activities:
 - Significant concrete work (greater than 1,000 cubic yards poured concrete or recycled concrete used over the life of a project).
 - The use of engineered soils amended with (but not limited to) Portland cement-treated base, cement kiln dust or fly ash.
 - Discharging stormwater to segments of water bodies on the 303(d) list (Category 5) for high pH.

Maintenance Standards

Check containers for holes in the liner daily during concrete pours and repair the same day.

BMP C152: Sawcutting and Surfacing Pollution Prevention

Purpose

Sawcutting and surfacing operations generate slurry and process water that contains fine particles and high pH (concrete cutting), both of which can violate the water quality standards in the receiving water. Concrete spillage or concrete discharge to surface waters of the State is prohibited. Use this BMP to minimize and eliminate process water and slurry created through sawcutting or surfacing from entering waters of the State.

Conditions of Use

Utilize these management practices anytime sawcutting or surfacing operations take place. Sawcutting and surfacing operations include, but are not limited to, the following:

- Sawing
- Coring
- Grinding
- Roughening

BMP C160: Certified Erosion and Sediment Control Lead

Purpose

The project proponent designates at least one person as the responsible representative in charge of erosion and sediment control (ESC), and water quality protection. The designated person shall be the Certified Erosion and Sediment Control Lead (CESCL) who is responsible for ensuring compliance with all local, state, and federal erosion and sediment control and water quality requirements.

Conditions of Use

A CESCL shall be made available on projects one acre or larger that discharge stormwater to surface waters of the state. Sites less than one acre may have a person without CESCL certification conduct inspections; sampling is not required on sites that disturb less than an acre.

- The CESCL shall:
 - Have a current certificate proving attendance in an erosion and sediment control training course that meets the minimum ESC training and certification requirements established by Ecology (see details below).

Ecology will maintain a list of ESC training and certification providers at:

<http://www.ecy.wa.gov/programs/wq/stormwater/cescl.html>

OR

- Be a Certified Professional in Erosion and Sediment Control (CPESC); for additional information go to: <http://www.envirocertintl.org/cpesc/>

Specifications

- Certification shall remain valid for three years.
- The CESCL shall have authority to act on behalf of the contractor or developer and shall be available, or on-call, 24 hours per day throughout the period of construction.
- The Construction SWPPP shall include the name, telephone number, fax number, and address of the designated CESCL.
- A CESCL may provide inspection and compliance services for multiple construction projects in the same geographic region.

Duties and responsibilities of the CESCL shall include, but are not limited to the following:

- Maintaining permit file on site at all times which includes the Construction SWPPP and any associated permits and plans.
- Directing BMP installation, inspection, maintenance, modification, and removal.
- Updating all project drawings and the Construction SWPPP with changes made.
- Completing any sampling requirements including reporting results using WebDMR.
- Keeping daily logs, and inspection reports. Inspection reports should include:
 - Inspection date/time.
 - Weather information; general conditions during inspection and approximate amount of precipitation since the last inspection.
 - A summary or list of all BMPs implemented, including observations of all erosion/sediment control structures or practices. The following shall be noted:
 1. Locations of BMPs inspected.
 2. Locations of BMPs that need maintenance.
 3. Locations of BMPs that failed to operate as designed or intended.
 4. Locations of where additional or different BMPs are required.
 - Visual monitoring results, including a description of discharged stormwater. The presence of suspended sediment, turbid water, discoloration, and oil sheen shall be noted, as applicable.
 - Any water quality monitoring performed during inspection.
 - General comments and notes, including a brief description of any BMP repairs, maintenance or installations made as a result of the inspection.
- Facilitate, participate in, and take corrective actions resulting from inspections performed by outside agencies or the owner.

BMP C162: Scheduling

Purpose

Sequencing a construction project reduces the amount and duration of soil exposed to erosion by wind, rain, runoff, and vehicle tracking.

Conditions of Use

The construction sequence schedule is an orderly listing of all major land-disturbing activities together with the necessary erosion and sedimentation control measures

**Table II-4.2.1 Runoff Conveyance and Treatment BMPs by SWPPP
Element (continued)**

BMP or Element Name	Element #3 Control Flow Rates	Element #4 Install Sediment Controls	Element #6 Protect Slopes	Element #7 Protect Drain Inlets	Element #8 Stabilize Channels and Outlets	Element #9 Control Pollutants	Element #10 Control De-Watering	Element #13 Protect Low Impact Development
for High pH Water (p.412)								

BMP C200: Interceptor Dike and Swale

Purpose

Provide a ridge of compacted soil, or a ridge with an upslope swale, at the top or base of a disturbed slope or along the perimeter of a disturbed construction area to convey stormwater. Use the dike and/or swale to intercept the runoff from unprotected areas and direct it to areas where erosion can be controlled. This can prevent storm runoff from entering the work area or sediment-laden runoff from leaving the construction site.

Conditions of Use

Where the runoff from an exposed site or disturbed slope must be conveyed to an erosion control facility which can safely convey the stormwater.

- Locate upslope of a construction site to prevent runoff from entering disturbed area.
- When placed horizontally across a disturbed slope, it reduces the amount and velocity of runoff flowing down the slope.
- Locate downslope to collect runoff from a disturbed area and direct water to a sediment basin.

Design and Installation Specifications

- Dike and/or swale and channel must be stabilized with temporary or permanent vegetation or other channel protection during construction.
- Channel requires a positive grade for drainage; steeper grades require channel protection and check dams.
- Review construction for areas where overtopping may occur.
- Can be used at top of new fill before vegetation is established.

- May be used as a permanent diversion channel to carry the runoff.
- Sub-basin tributary area should be one acre or less.
- Design capacity for the peak volumetric flow rate calculated using a 10-minute time step from a 10-year, 24-hour storm, assuming a Type 1A rainfall distribution, for temporary facilities. Alternatively, use 1.6 times the 10-year, 1-hour flow indicated by an approved continuous runoff model. For facilities that will also serve on a permanent basis, consult the local government's drainage requirements.

Interceptor dikes shall meet the following criteria:

- Top Width: 2 feet minimum.
- Height: 1.5 feet minimum on berm.
- Side Slope: 2H:1V or flatter.
- Grade: Depends on topography, however, dike system minimum is 0.5%, and maximum is 1%.
- Compaction: Minimum of 90 percent ASTM D698 standard proctor.
- Horizontal Spacing of Interceptor Dikes:

Average Slope	Slope Percent	Flowpath Length
20H:1V or less	3-5%	300 feet
(10 to 20)H:1V	5-10%	200 feet
(4 to 10)H:1V	10-25%	100 feet
(2 to 4)H:1V	25-50%	50 feet

- Stabilization: depends on velocity and reach
- Slopes <5%: Seed and mulch applied within 5 days of dike construction (see [BMP C121: Mulching \(p.284\)](#)).
- Slopes 5 - 40%: Dependent on runoff velocities and dike materials. Stabilization should be done immediately using either sod or riprap or other measures to avoid erosion.
- The upslope side of the dike shall provide positive drainage to the dike outlet. No erosion shall occur at the outlet. Provide energy dissipation measures as necessary. Sediment-laden runoff must be released through a sediment trapping facility.
- Minimize construction traffic over temporary dikes. Use temporary cross culverts for channel crossing.

Interceptor swales shall meet the following criteria:

- Bottom Width: 2 feet minimum; the cross-section bottom shall be level.
- Depth: 1-foot minimum.

- Side Slope: 2H:1V or flatter.
- Grade: Maximum 5 percent, with positive drainage to a suitable outlet (such as a sediment pond).
- Stabilization: Seed as per [BMP C120: Temporary and Permanent Seeding \(p.278\)](#), or [BMP C202: Channel Lining \(p.338\)](#), 12 inches thick riprap pressed into the bank and extending at least 8 inches vertical from the bottom.

Inspect diversion dikes and interceptor swales once a week and after every rainfall. Immediately remove sediment from the flow area.

Damage caused by construction traffic or other activity must be repaired before the end of each working day.

Check outlets and make timely repairs as needed to avoid gully formation. When the area below the temporary diversion dike is permanently stabilized, remove the dike and fill and stabilize the channel to blend with the natural surface.

BMP C201: Grass-Lined Channels

Purpose

To provide a channel with a vegetative lining for conveyance of runoff. See [Figure II-4.2.1 Typical Grass-Lined Channels \(p.336\)](#) for typical grass-lined channels.

Conditions of Use

This practice applies to construction sites where concentrated runoff needs to be contained to prevent erosion or flooding.

- When a vegetative lining can provide sufficient stability for the channel cross section and at lower velocities of water (normally dependent on grade). This means that the channel slopes are generally less than 5 percent and space is available for a relatively large cross section.
- Typical uses include roadside ditches, channels at property boundaries, outlets for diversions, and other channels and drainage ditches in low areas.
- Channels that will be vegetated should be installed before major earthwork and hydroseeded with a bonded fiber matrix (BFM). The vegetation should be well established (i.e., 75 percent cover) before water is allowed to flow in the ditch. With channels that will have high flows, erosion control blankets should be installed over the hydroseed. If vegetation cannot be established from seed before water is allowed in the ditch, sod should be installed in the bottom of the ditch in lieu of hydromulch and blankets.

Design and Installation Specifications

Locate the channel where it can conform to the topography and other features such as roads.

- Locate them to use natural drainage systems to the greatest extent possible.
- Avoid sharp changes in alignment or bends and changes in grade.
- Do not reshape the landscape to fit the drainage channel.
- The maximum design velocity shall be based on soil conditions, type of vegetation, and method of revegetation, but at no times shall velocity exceed 5 feet/second. The channel shall not be overtopped by the peak volumetric flow rate calculated using a 10-minute time step from a 10-year, 24-hour storm, assuming a Type 1A rainfall distribution. Alternatively, use 1.6 times the 10-year, 1-hour flow indicated by an approved continuous runoff model to determine a flow rate which the channel must contain.
- Where the grass-lined channel will also function as a permanent stormwater conveyance facility, consult the drainage conveyance requirements of the local government with jurisdiction.
- An established grass or vegetated lining is required before the channel can be used to convey stormwater, unless stabilized with nets or blankets.
- If design velocity of a channel to be vegetated by seeding exceeds 2 ft/sec, a temporary channel liner is required. Geotextile or special mulch protection such as fiberglass roving or straw and netting provides stability until the vegetation is fully established. See [Figure II-4.2.2 Temporary Channel Liners \(p.337\)](#).
- Check dams shall be removed when the grass has matured sufficiently to protect the ditch or swale unless the slope of the swale is greater than 4 percent. The area beneath the check dams shall be seeded and mulched immediately after dam removal.
- If vegetation is established by sodding, the permissible velocity for established vegetation may be used and no temporary liner is needed.
- Do not subject grass-lined channel to sedimentation from disturbed areas. Use sediment-trapping BMPs upstream of the channel.
- V-shaped grass channels generally apply where the quantity of water is small, such as in short reaches along roadsides. The V-shaped cross section is least desirable because it is difficult to stabilize the bottom where velocities may be high.
- Trapezoidal grass channels are used where runoff volumes are large and slope is low so that velocities are nonerosive to vegetated linings. (Note: it is difficult to

construct small parabolic shaped channels.)

- Subsurface drainage, or riprap channel bottoms, may be necessary on sites that are subject to prolonged wet conditions due to long duration flows or a high water table.
- Provide outlet protection at culvert ends and at channel intersections.
- Grass channels, at a minimum, should carry peak runoff for temporary construction drainage facilities from the 10-year, 24-hour storm without eroding. Where flood hazard exists, increase the capacity according to the potential damage.
- Grassed channel side slopes generally are constructed 3H:1V or flatter to aid in the establishment of vegetation and for maintenance.
- Construct channels a minimum of 0.2 foot larger around the periphery to allow for soil bulking during seedbed preparations and sod buildup.

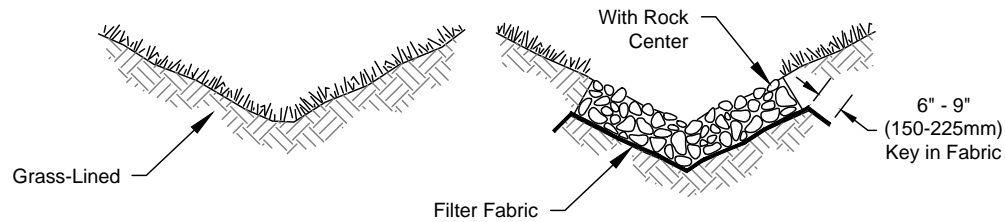
Maintenance Standards

During the establishment period, check grass-lined channels after every rainfall.

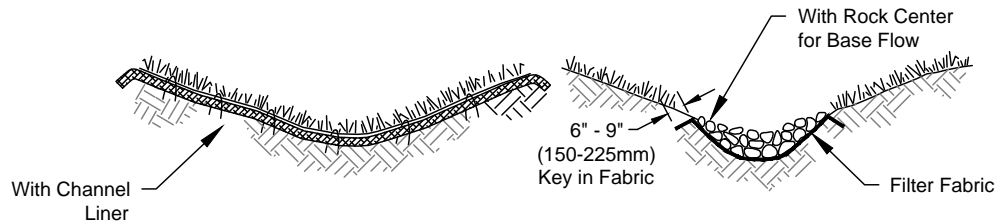
- After grass is established, periodically check the channel; check it after every heavy rainfall event. Immediately make repairs.
- It is particularly important to check the channel outlet and all road crossings for bank stability and evidence of piping or scour holes.
- Remove all significant sediment accumulations to maintain the designed carrying capacity. Keep the grass in a healthy, vigorous condition at all times, since it is the primary erosion protection for the channel.

Figure II-4.2.1 Typical Grass-Lined Channels

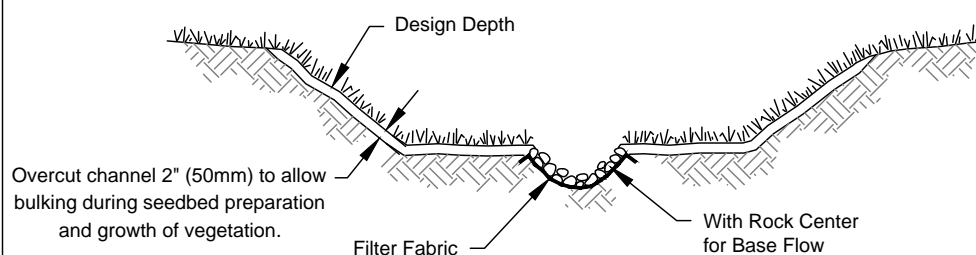
Typical V-Shaped Channel Cross-Section



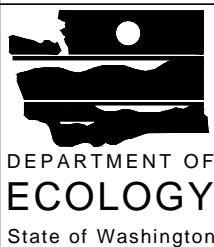
Typical Parabolic Channel Cross-Section



Typical Trapezoidal Channel Cross-Section



NOT TO SCALE

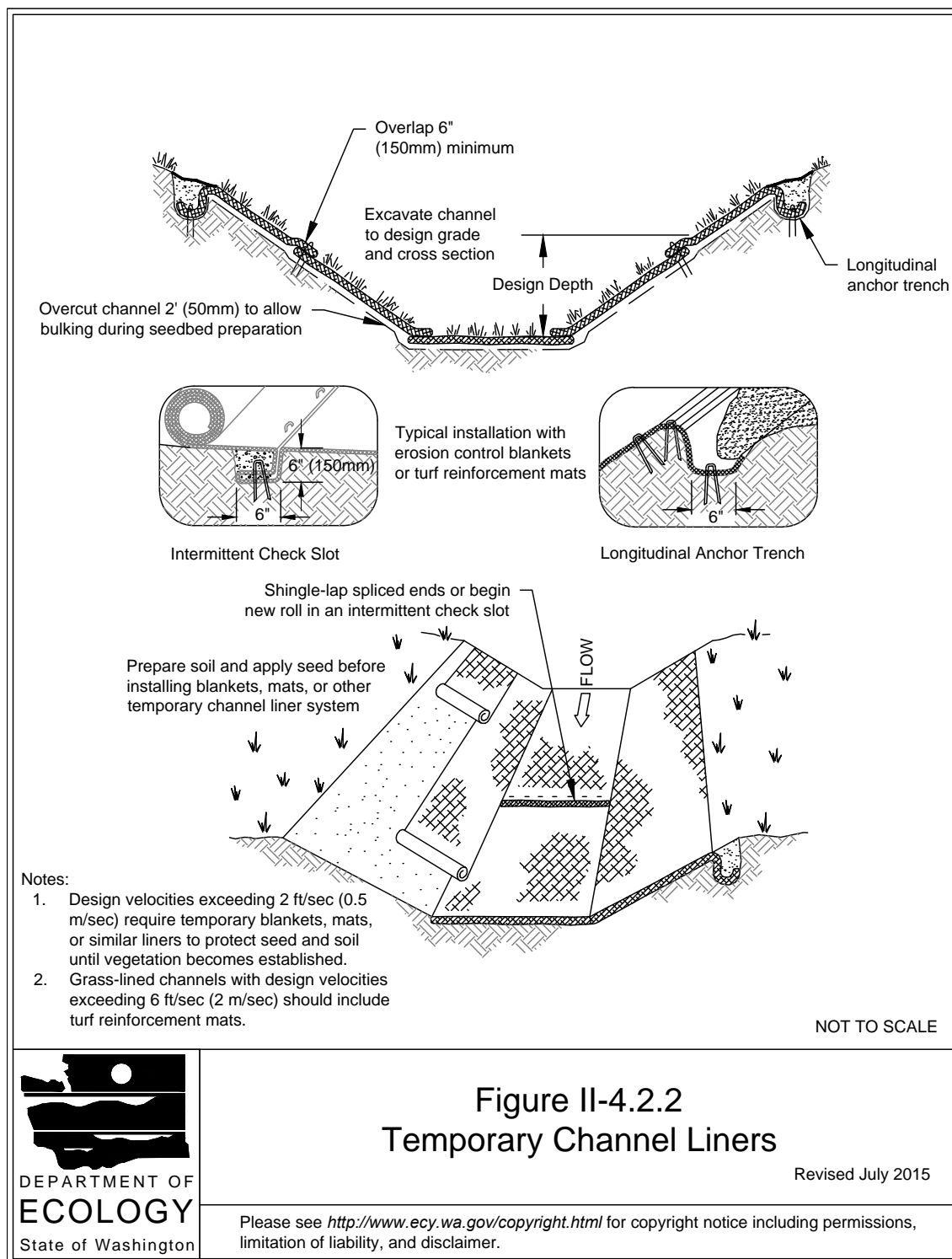


**Figure II-4.2.1
Typical Grass-Lined Channels**

Revised June 2015

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Figure II-4.2.2 Temporary Channel Liners



BMP C207: Check Dams

Purpose

Construction of small dams across a swale or ditch reduces the velocity of concentrated flow and dissipates energy at the check dam.

Conditions of Use

Where temporary channels or permanent channels are not yet vegetated, channel lining is infeasible, and/or velocity checks are required.

- Check dams may not be placed in streams unless approved by the State Department of Fish and Wildlife. Check dams may not be placed in wetlands without approval from a permitting agency.
- Do not place check dams below the expected backwater from any salmonid bearing water between October 1 and May 31 to ensure that there is no loss of high flow refuge habitat for overwintering juvenile salmonids and emergent salmonid fry.
- Construct rock check dams from appropriately sized rock. The rock used must be large enough to stay in place given the expected design flow through the channel. The rock must be placed by hand or by mechanical means (no dumping of rock to form dam) to achieve complete coverage of the ditch or swale and to ensure that the center of the dam is lower than the edges.
- Check dams may also be constructed of either rock or pea-gravel filled bags. Numerous new products are also available for this purpose. They tend to be reusable, quick and easy to install, effective, and cost efficient.
- Place check dams perpendicular to the flow of water.
- The dam should form a triangle when viewed from the side. This prevents undercutting as water flows over the face of the dam rather than falling directly onto the ditch bottom.
- Before installing check dams impound and bypass upstream water flow away from the work area. Options for bypassing include pumps, siphons, or temporary channels.
- Check dams in association with sumps work more effectively at slowing flow and retaining sediment than just a check dam alone. A deep sump should be provided immediately upstream of the check dam.
- In some cases, if carefully located and designed, check dams can remain as permanent installations with very minor regrading. They may be left as either spillways, in which case accumulated sediment would be graded and seeded, or as

check dams to prevent further sediment from leaving the site.

- The maximum spacing between the dams shall be such that the toe of the upstream dam is at the same elevation as the top of the downstream dam.
- Keep the maximum height at 2 feet at the center of the dam.
- Keep the center of the check dam at least 12 inches lower than the outer edges at natural ground elevation.
- Keep the side slopes of the check dam at 2H:1V or flatter.
- Key the stone into the ditch banks and extend it beyond the abutments a minimum of 18 inches to avoid washouts from overflow around the dam.
- Use filter fabric foundation under a rock or sand bag check dam. If a blanket ditch liner is used, filter fabric is not necessary. A piece of organic or synthetic blanket cut to fit will also work for this purpose.
- In the case of grass-lined ditches and swales, all check dams and accumulated sediment shall be removed when the grass has matured sufficiently to protect the ditch or swale - unless the slope of the swale is greater than 4 percent. The area beneath the check dams shall be seeded and mulched immediately after dam removal.
- Ensure that channel appurtenances, such as culvert entrances below check dams, are not subject to damage or blockage from displaced stones. [Figure II-4.2.7 Rock Check Dam \(p.354\)](#) depicts a typical rock check dam.

Maintenance Standards

Check dams shall be monitored for performance and sediment accumulation during and after each runoff producing rainfall. Sediment shall be removed when it reaches one half the sump depth.

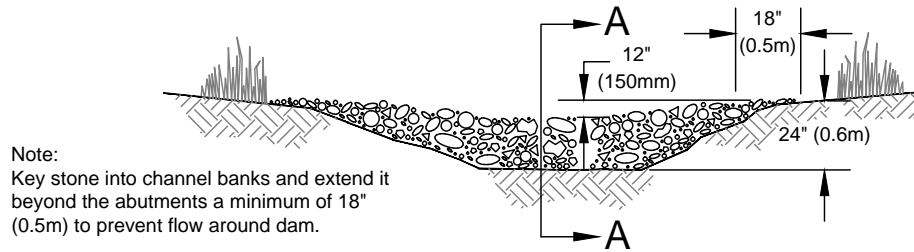
- Anticipate submergence and deposition above the check dam and erosion from high flows around the edges of the dam.
- If significant erosion occurs between dams, install a protective riprap liner in that portion of the channel.

Approved as Equivalent

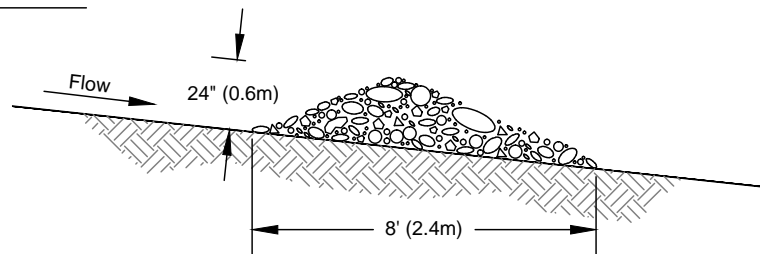
Ecology has approved products as able to meet the requirements of [BMP C207: Check Dams](#). The products did not pass through the Technology Assessment Protocol – Ecology (TAPE) process. Local jurisdictions may choose not to accept this product approved as equivalent, or may require additional testing prior to consideration for local use. The products are available for review on Ecology's website at <http://www.ecy.wa.gov/programs/wq/stormwater/newtech/equivalent.html>

Figure II-4.2.7 Rock Check Dam

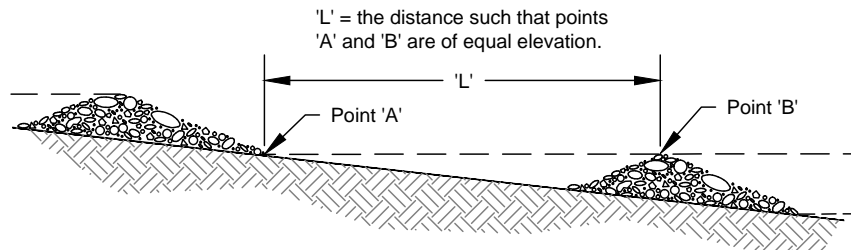
View Looking Upstream



Section A-A



Spacing Between Check Dams



NOT TO SCALE



**Figure II-4.2.7
Rock Check Dam**

Revised July 2015

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- In the case of grass-lined ditches and swales, check dams and accumulated sediment shall be removed when the grass has matured sufficiently to protect the ditch or swale unless the slope of the swale is greater than 4 percent. The area beneath the check dams shall be seeded and mulched immediately after dam removal.

Maintenance Standards

- Triangular silt dams shall be inspected for performance and sediment accumulation during and after each runoff producing rainfall. Sediment shall be removed when it reaches one half the height of the dam.
- Anticipate submergence and deposition above the triangular silt dam and erosion from high flows around the edges of the dam. Immediately repair any damage or any undercutting of the dam.

BMP C209: Outlet Protection

Purpose

Outlet protection prevents scour at conveyance outlets and minimizes the potential for downstream erosion by reducing the velocity of concentrated stormwater flows.

Conditions of Use

Outlet protection is required at the outlets of all ponds, pipes, ditches, or other conveyances, and where runoff is conveyed to a natural or manmade drainage feature such as a stream, wetland, lake, or ditch.

Design and Installation Specifications

The receiving channel at the outlet of a culvert shall be protected from erosion by rock lining a minimum of 6 feet downstream and extending up the channel sides a minimum of 1-foot above the maximum tailwater elevation or 1-foot above the crown, whichever is higher. For large pipes (more than 18 inches in diameter), the outlet protection lining of the channel is lengthened to four times the diameter of the culvert.

- Standard wingwalls, and tapered outlets and paved channels should also be considered when appropriate for permanent culvert outlet protection. (See WSDOT Hydraulic Manual, available through WSDOT Engineering Publications).
- Organic or synthetic erosion blankets, with or without vegetation, are usually more effective than rock, cheaper, and easier to install. Materials can be chosen using manufacturer product specifications. ASTM test results are available for most products and the designer can choose the correct material for the expected flow.
- With low flows, vegetation (including sod) can be effective.
- The following guidelines shall be used for riprap outlet protection:

1. If the discharge velocity at the outlet is less than 5 fps (pipe slope less than 1 percent), use 2-inch to 8-inch riprap. Minimum thickness is 1-foot.
 2. For 5 to 10 fps discharge velocity at the outlet (pipe slope less than 3 percent), use 24-inch to 48-inch riprap. Minimum thickness is 2 feet.
 3. For outlets at the base of steep slope pipes (pipe slope greater than 10 percent), an engineered energy dissipater shall be used.
- Filter fabric or erosion control blankets should always be used under riprap to prevent scour and channel erosion.
 - New pipe outfalls can provide an opportunity for low-cost fish habitat improvements. For example, an alcove of low-velocity water can be created by constructing the pipe outfall and associated energy dissipater back from the stream edge and digging a channel, over-widened to the upstream side, from the outfall. Overwintering juvenile and migrating adult salmonids may use the alcove as shelter during high flows. Bank stabilization, bioengineering, and habitat features may be required for disturbed areas. This work may require a HPA. See [Volume V \(p.765\)](#) for more information on outfall system design.

Maintenance Standards

- Inspect and repair as needed.
- Add rock as needed to maintain the intended function.
- Clean energy dissipater if sediment builds up.

BMP C220: Storm Drain Inlet Protection

Purpose

Storm drain inlet protection prevents coarse sediment from entering drainage systems prior to permanent stabilization of the disturbed area.

Conditions of Use

Use storm drain inlet protection at inlets that are operational before permanent stabilization of the disturbed drainage area. Provide protection for all storm drain inlets downslope and within 500 feet of a disturbed or construction area, unless conveying runoff entering catch basins to a sediment pond or trap.

Also consider inlet protection for lawn and yard drains on new home construction. These small and numerous drains coupled with lack of gutters in new home construction can add significant amounts of sediment into the roof drain system. If possible delay installing lawn and yard drains until just before landscaping or cap these drains to pre-

vent sediment from entering the system until completion of landscaping. Provide 18-inches of sod around each finished lawn and yard drain.

[Table II-4.2.2 Storm Drain Inlet Protection \(p.358\)](#) lists several options for inlet protection. All of the methods for storm drain inlet protection tend to plug and require a high frequency of maintenance. Limit drainage areas to one acre or less. Possibly provide emergency overflows with additional end-of-pipe treatment where stormwater ponding would cause a hazard.

Table II-4.2.2 Storm Drain Inlet Protection

Type of Inlet Protection	Emergency Overflow	Applicable for Paved/ Earthen Surfaces	Conditions of Use
Drop Inlet Protection			
Excavated drop inlet protection	Yes, temporary flooding will occur	Earthen	Applicable for heavy flows. Easy to maintain. Large area Requirement: 30'x30'/acre
Block and gravel drop inlet protection	Yes	Paved or Earthen	Applicable for heavy concentrated flows. Will not pond.
Gravel and wire drop inlet protection	No		Applicable for heavy concentrated flows. Will pond. Can withstand traffic.
Catch basin filters	Yes	Paved or Earthen	Frequent Maintenance required.
Curb Inlet Protection			
Curb inlet protection with wooden weir	Small capacity overflow	Paved	Used for sturdy, more compact installation.
Block and gravel curb inlet protection	Yes	Paved	Sturdy, but limited filtration.
Culvert Inlet Protection			
Culvert inlet Sediment trap			18 month expected life.

Design and Installation Specifications

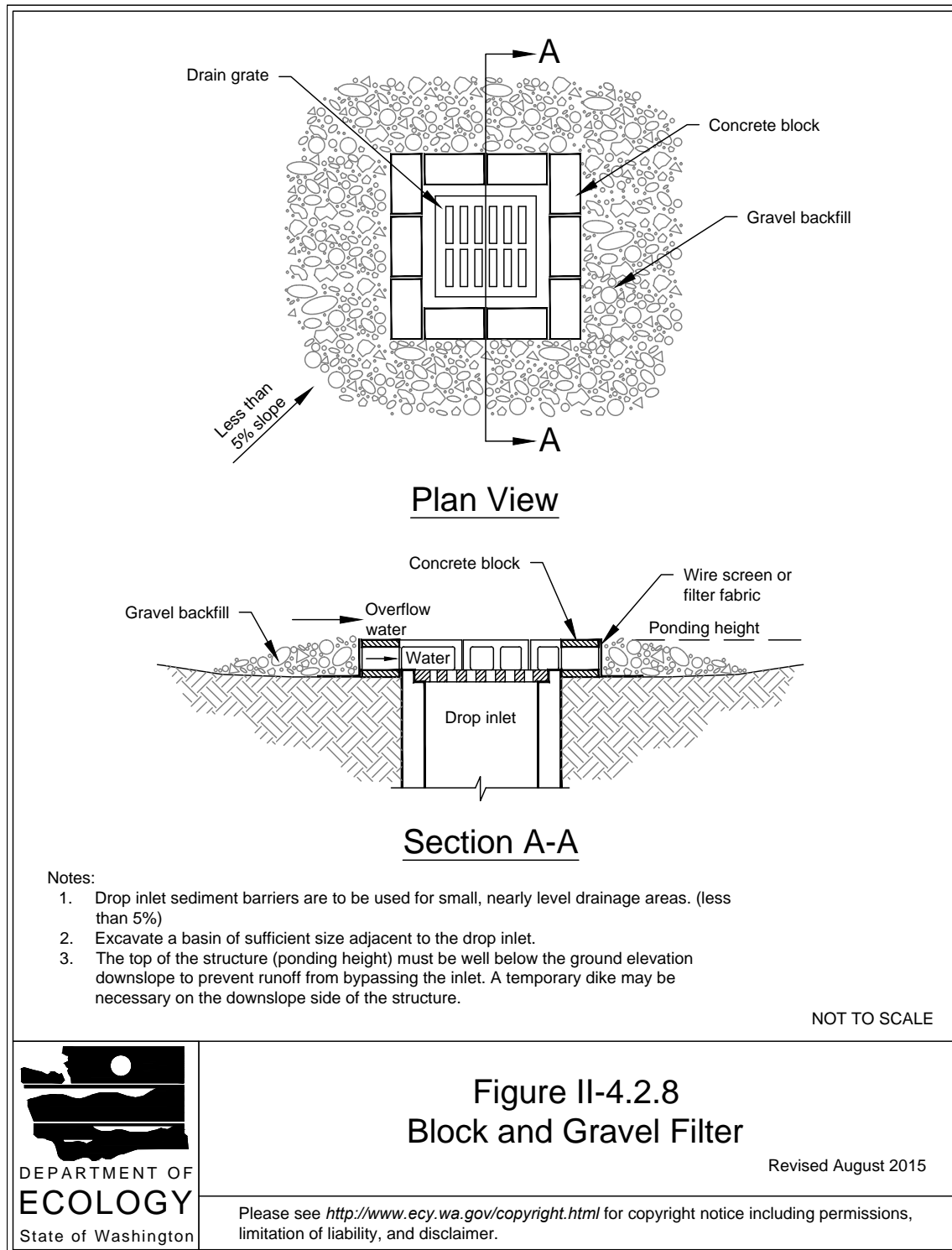
Excavated Drop Inlet Protection - An excavated impoundment around the storm drain. Sediment settles out of the stormwater prior to entering the storm drain.

- Provide a depth of 1-2 ft as measured from the crest of the inlet structure.
- Slope sides of excavation no steeper than 2H:1V.
- Minimum volume of excavation 35 cubic yards.
- Shape basin to fit site with longest dimension oriented toward the longest inflow area.
- Install provisions for draining to prevent standing water problems.
- Clear the area of all debris.
- Grade the approach to the inlet uniformly.
- Drill weep holes into the side of the inlet.
- Protect weep holes with screen wire and washed aggregate.
- Seal weep holes when removing structure and stabilizing area.
- Build a temporary dike, if necessary, to the down slope side of the structure to prevent bypass flow.

Block and Gravel Filter - A barrier formed around the storm drain inlet with standard concrete blocks and gravel. See [Figure II-4.2.8 Block and Gravel Filter \(p.360\)](#).

- Provide a height of 1 to 2 feet above inlet.
- Recess the first row 2-inches into the ground for stability.
- Support subsequent courses by placing a 2x4 through the block opening.
- Do not use mortar.
- Lay some blocks in the bottom row on their side for dewatering the pool.
- Place hardware cloth or comparable wire mesh with ½-inch openings over all block openings.
- Place gravel just below the top of blocks on slopes of 2H:1V or flatter.
- An alternative design is a gravel donut.
- Provide an inlet slope of 3H:1V.
- Provide an outlet slope of 2H:1V.
- Provide a 1-foot wide level stone area between the structure and the inlet.
- Use inlet slope stones 3 inches in diameter or larger.
- Use gravel ½- to ¾-inch at a minimum thickness of 1-foot for the outlet slope.

Figure II-4.2.8 Block and Gravel Filter



Gravel and Wire Mesh Filter - A gravel barrier placed over the top of the inlet. This structure does not provide an overflow.

- Use a hardware cloth or comparable wire mesh with ½-inch openings.
- Use coarse aggregate.
- Provide a height 1-foot or more, 18-inches wider than inlet on all sides.
- Place wire mesh over the drop inlet so that the wire extends a minimum of 1-foot beyond each side of the inlet structure.
- Overlap the strips if more than one strip of mesh is necessary.
- Place coarse aggregate over the wire mesh.
- Provide at least a 12-inch depth of gravel over the entire inlet opening and extend at least 18-inches on all sides.

Catchbasin Filters – Use inserts designed by manufacturers for construction sites. The limited sediment storage capacity increases the amount of inspection and maintenance required, which may be daily for heavy sediment loads. To reduce maintenance requirements combine a catchbasin filter with another type of inlet protection. This type of inlet protection provides flow bypass without overflow and therefore may be a better method for inlets located along active rights-of-way.

- Provides 5 cubic feet of storage.
- Requires dewatering provisions.
- Provides a high-flow bypass that will not clog under normal use at a construction site.
- Insert the catchbasin filter in the catchbasin just below the grating.

Curb Inlet Protection with Wooden Weir – Barrier formed around a curb inlet with a wooden frame and gravel.

- Use wire mesh with ½-inch openings.
- Use extra strength filter cloth.
- Construct a frame.
- Attach the wire and filter fabric to the frame.
- Pile coarse washed aggregate against wire/fabric.
- Place weight on frame anchors.

Block and Gravel Curb Inlet Protection – Barrier formed around a curb inlet with concrete blocks and gravel. See [Figure II-4.2.9 Block and Gravel Curb Inlet Protection \(p.363\)](#).

- Use wire mesh with ½-inch openings.
- Place two concrete blocks on their sides abutting the curb at either side of the inlet opening. These are spacer blocks.
- Place a 2x4 stud through the outer holes of each spacer block to align the front blocks.
- Place blocks on their sides across the front of the inlet and abutting the spacer blocks.
- Place wire mesh over the outside vertical face.
- Pile coarse aggregate against the wire to the top of the barrier.

Curb and Gutter Sediment Barrier – Sandbag or rock berm (riprap and aggregate) 3 feet high and 3 feet wide in a horseshoe shape. See [Figure II-4.2.10 Curb and Gutter Barrier \(p.364\)](#).

- Construct a horseshoe shaped berm, faced with coarse aggregate if using riprap, 3 feet high and 3 feet wide, at least 2 feet from the inlet.
- Construct a horseshoe shaped sedimentation trap on the outside of the berm sized to sediment trap standards for protecting a culvert inlet.

Maintenance Standards

- Inspect catch basin filters frequently, especially after storm events. Clean and replace clogged inserts. For systems with clogged stone filters: pull away the stones from the inlet and clean or replace. An alternative approach would be to use the clogged stone as fill and put fresh stone around the inlet.
- Do not wash sediment into storm drains while cleaning. Spread all excavated material evenly over the surrounding land area or stockpile and stabilize as appropriate.

Approved as Equivalent

Ecology has approved products as able to meet the requirements of [BMP C220: Storm Drain Inlet Protection](#). The products did not pass through the Technology Assessment Protocol – Ecology (TAPE) process. Local jurisdictions may choose not to accept this product approved as equivalent, or may require additional testing prior to consideration for local use. The products are available for review on Ecology’s website at <http://www.ecy.wa.gov/programs/wq/stormwater/newtech/equivalent.html>

Figure II-4.2.9 Block and Gravel Curb Inlet Protection

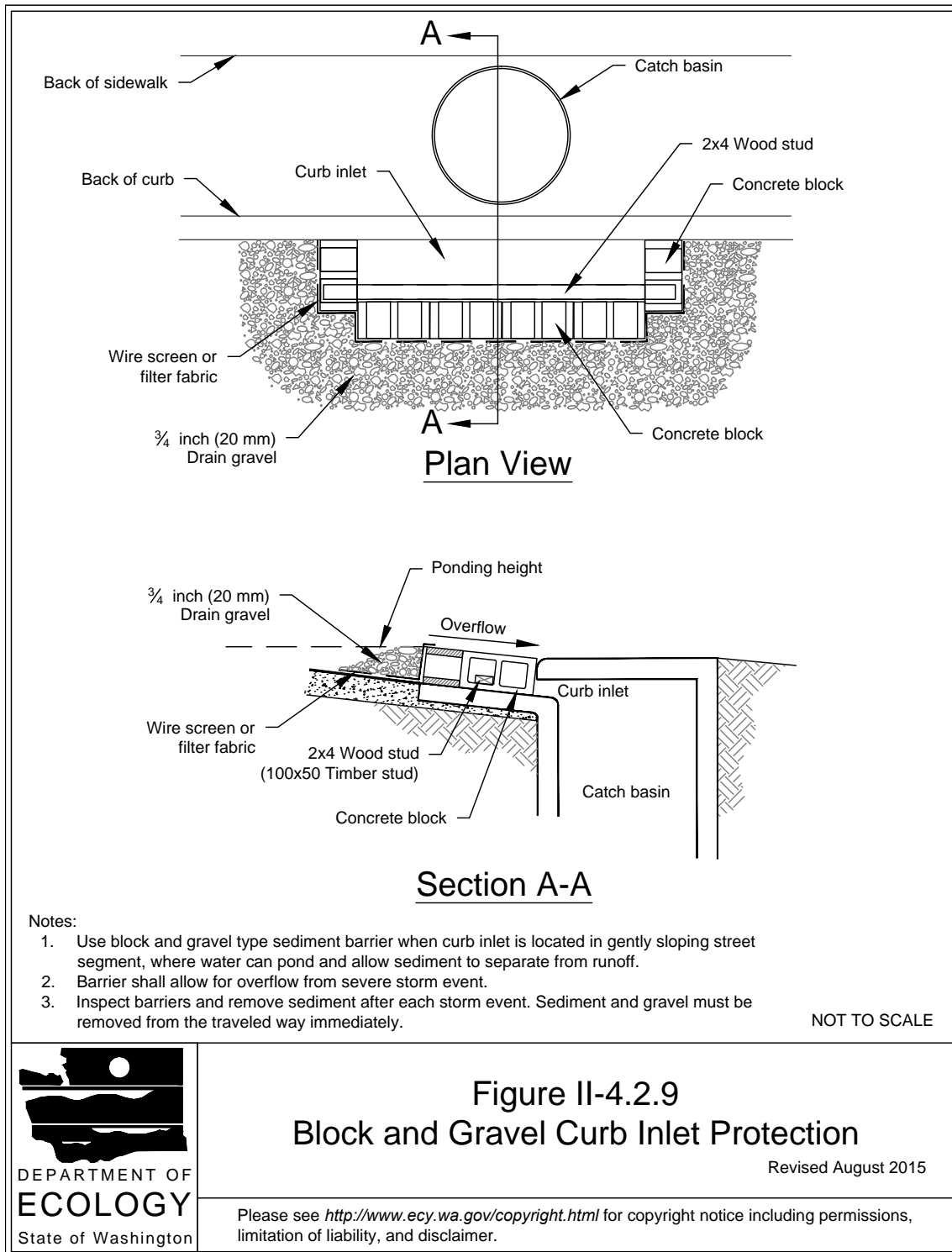
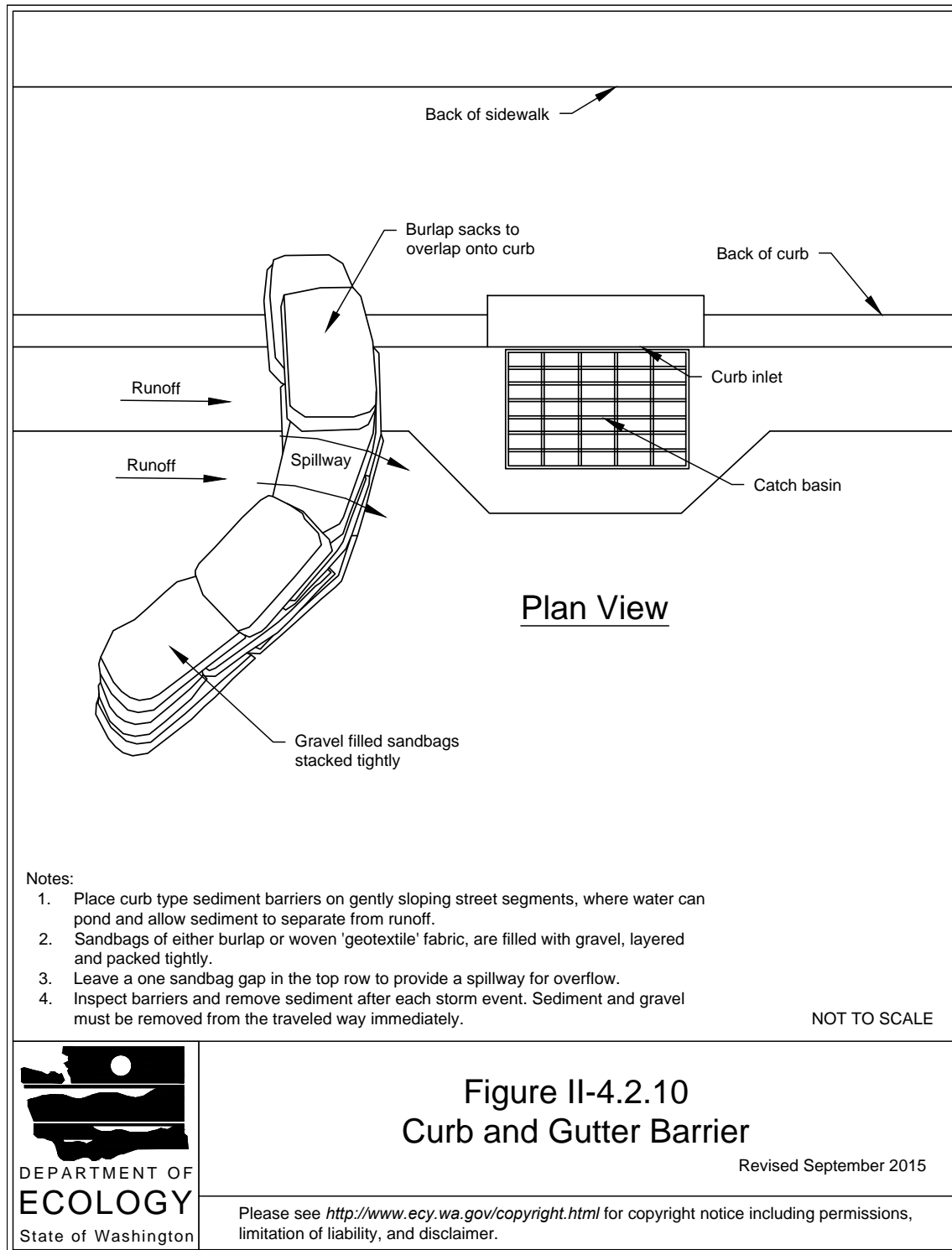


Figure II-4.2.10 Curb and Gutter Barrier



BMP C232: Gravel Filter Berm

Purpose

A gravel filter berm is constructed on rights-of-way or traffic areas within a construction site to retain sediment by using a filter berm of gravel or crushed rock.

Conditions of Use

Where a temporary measure is needed to retain sediment from rights-of-way or in traffic areas on construction sites.

Design and Installation Specifications

- Berm material shall be $\frac{3}{4}$ to 3 inches in size, washed well-graded gravel or crushed rock with less than 5 percent fines.
- Spacing of berms:
 - Every 300 feet on slopes less than 5 percent
 - Every 200 feet on slopes between 5 percent and 10 percent
 - Every 100 feet on slopes greater than 10 percent
- Berm dimensions:
 - 1 foot high with 3H:1V side slopes
 - 8 linear feet per 1 cfs runoff based on the 10-year, 24-hour design storm

Maintenance Standards

- Regular inspection is required. Sediment shall be removed and filter material replaced as needed.

BMP C233: Silt Fence

Purpose

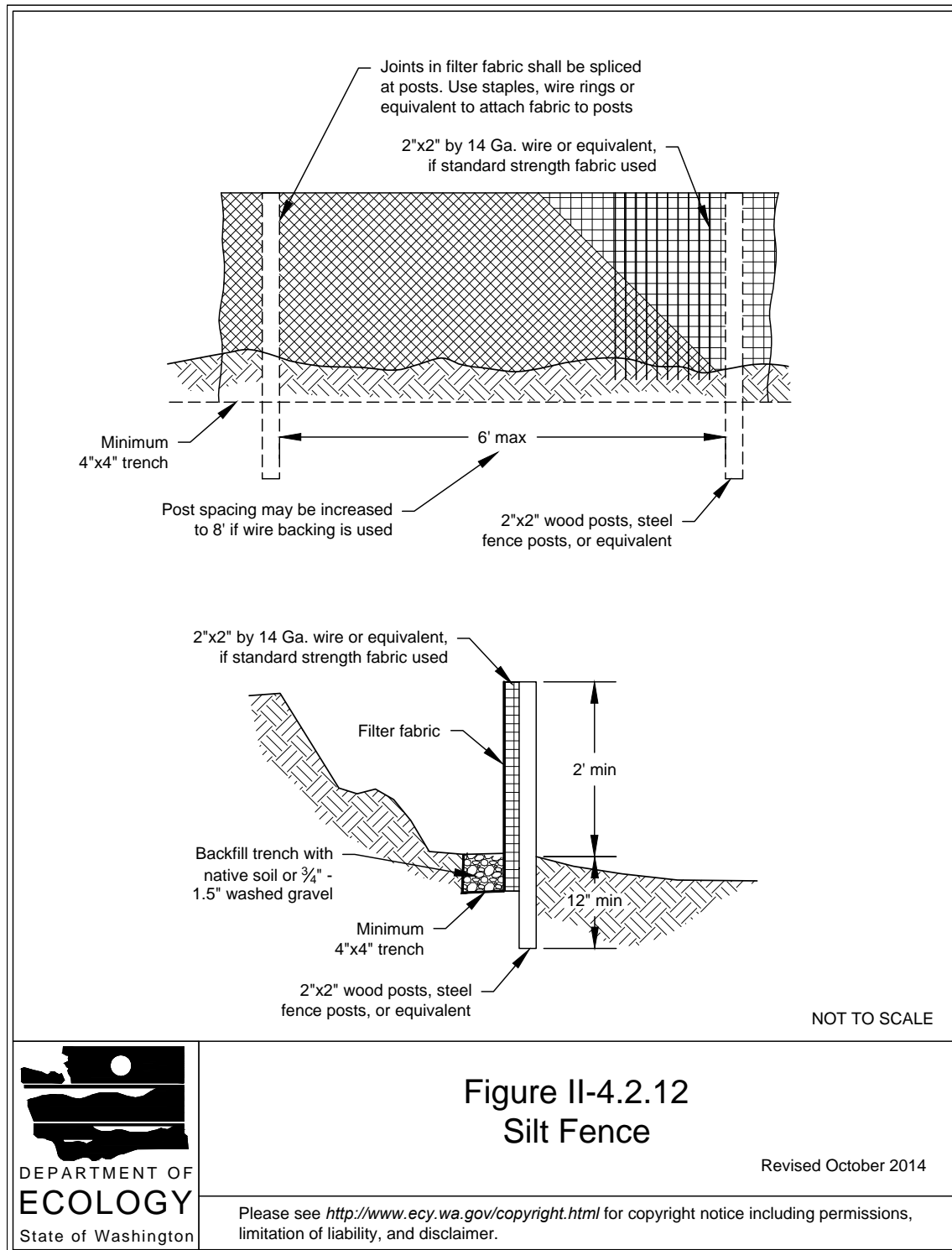
Use of a silt fence reduces the transport of coarse sediment from a construction site by providing a temporary physical barrier to sediment and reducing the runoff velocities of overland flow. See [Figure II-4.2.12 Silt Fence \(p.369\)](#) for details on silt fence construction.

Conditions of Use

Silt fence may be used downslope of all disturbed areas.

- Silt fence shall prevent soil carried by runoff water from going beneath, through, or over the top of the silt fence, but shall allow the water to pass through the fence.
- Silt fence is not intended to treat concentrated flows, nor is it intended to treat substantial amounts of overland flow. Convey any concentrated flows through the drainage system to a sediment pond.
- Do not construct silt fences in streams or use in V-shaped ditches. Silt fences do not provide an adequate method of silt control for anything deeper than sheet or overland flow.

Figure II-4.2.12 Silt Fence



Design and Installation Specifications

- Use in combination with sediment basins or other BMPs.
- Maximum slope steepness (normal (perpendicular) to fence line) 1H:1V.
- Maximum sheet or overland flow path length to the fence of 100 feet.
- Do not allow flows greater than 0.5 cfs.
- The geotextile used shall meet the following standards. All geotextile properties listed below are minimum average roll values (i.e., the test result for any sampled roll in a lot shall meet or exceed the values shown in [Table II-4.2.3 Geotextile Standards \(p.370\)](#)):

Table II-4.2.3 Geotextile Standards

Polymeric Mesh AOS (ASTM D4751)	0.60 mm maximum for slit film woven (#30 sieve). 0.30 mm maximum for all other geotextile types (#50 sieve). 0.15 mm minimum for all fabric types (#100 sieve).
Water Permittivity (ASTM D4491)	0.02 sec ⁻¹ minimum
Grab Tensile Strength (ASTM D4632)	180 lbs. Minimum for extra strength fabric. 100 lbs minimum for standard strength fabric.
Grab Tensile Strength (ASTM D4632)	30% maximum
Ultraviolet Resistance (ASTM D4355)	70% minimum

- Support standard strength fabrics with wire mesh, chicken wire, 2-inch x 2-inch wire, safety fence, or jute mesh to increase the strength of the fabric. Silt fence materials are available that have synthetic mesh backing attached.
- Filter fabric material shall contain ultraviolet ray inhibitors and stabilizers to provide a minimum of six months of expected usable construction life at a temperature range of 0°F. to 120°F.
- One-hundred percent biodegradable silt fence is available that is strong, long lasting, and can be left in place after the project is completed, if permitted by local regulations.
- Refer to [Figure II-4.2.12 Silt Fence \(p.369\)](#) for standard silt fence details. Include the following standard Notes for silt fence on construction plans and specifications:

1. The contractor shall install and maintain temporary silt fences at the locations shown in the Plans.
2. Construct silt fences in areas of clearing, grading, or drainage prior to starting those activities.
3. The silt fence shall have a 2-feet min. and a 2½-feet max. height above the original ground surface.
4. The filter fabric shall be sewn together at the point of manufacture to form filter fabric lengths as required. Locate all sewn seams at support posts. Alternatively, two sections of silt fence can be overlapped, provided the Contractor can demonstrate, to the satisfaction of the Engineer, that the overlap is long enough and that the adjacent fence sections are close enough together to prevent silt laden water from escaping through the fence at the overlap.
5. Attach the filter fabric on the up-slope side of the posts and secure with staples, wire, or in accordance with the manufacturer's recommendations. Attach the filter fabric to the posts in a manner that reduces the potential for tearing.
6. Support the filter fabric with wire or plastic mesh, dependent on the properties of the geotextile selected for use. If wire or plastic mesh is used, fasten the mesh securely to the up-slope side of the posts with the filter fabric up-slope of the mesh.
7. Mesh support, if used, shall consist of steel wire with a maximum mesh spacing of 2-inches, or a prefabricated polymeric mesh. The strength of the wire or polymeric mesh shall be equivalent to or greater than 180 lbs. grab tensile strength. The polymeric mesh must be as resistant to the same level of ultra-violet radiation as the filter fabric it supports.
8. Bury the bottom of the filter fabric 4-inches min. below the ground surface. Backfill and tamp soil in place over the buried portion of the filter fabric, so that no flow can pass beneath the fence and scouring cannot occur. When wire or polymeric back-up support mesh is used, the wire or polymeric mesh shall extend into the ground 3-inches min.
9. Drive or place the fence posts into the ground 18-inches min. A 12-inch min. depth is allowed if topsoil or other soft subgrade soil is not present and 18-inches cannot be reached. Increase fence post min. depths by 6 inches if the fence is located on slopes of 3H:1V or steeper and the slope is perpendicular to the fence. If required post depths cannot be obtained, the posts shall be adequately secured by bracing or guying to prevent overturning of the fence due to sediment loading.
10. Use wood, steel or equivalent posts. The spacing of the support posts shall

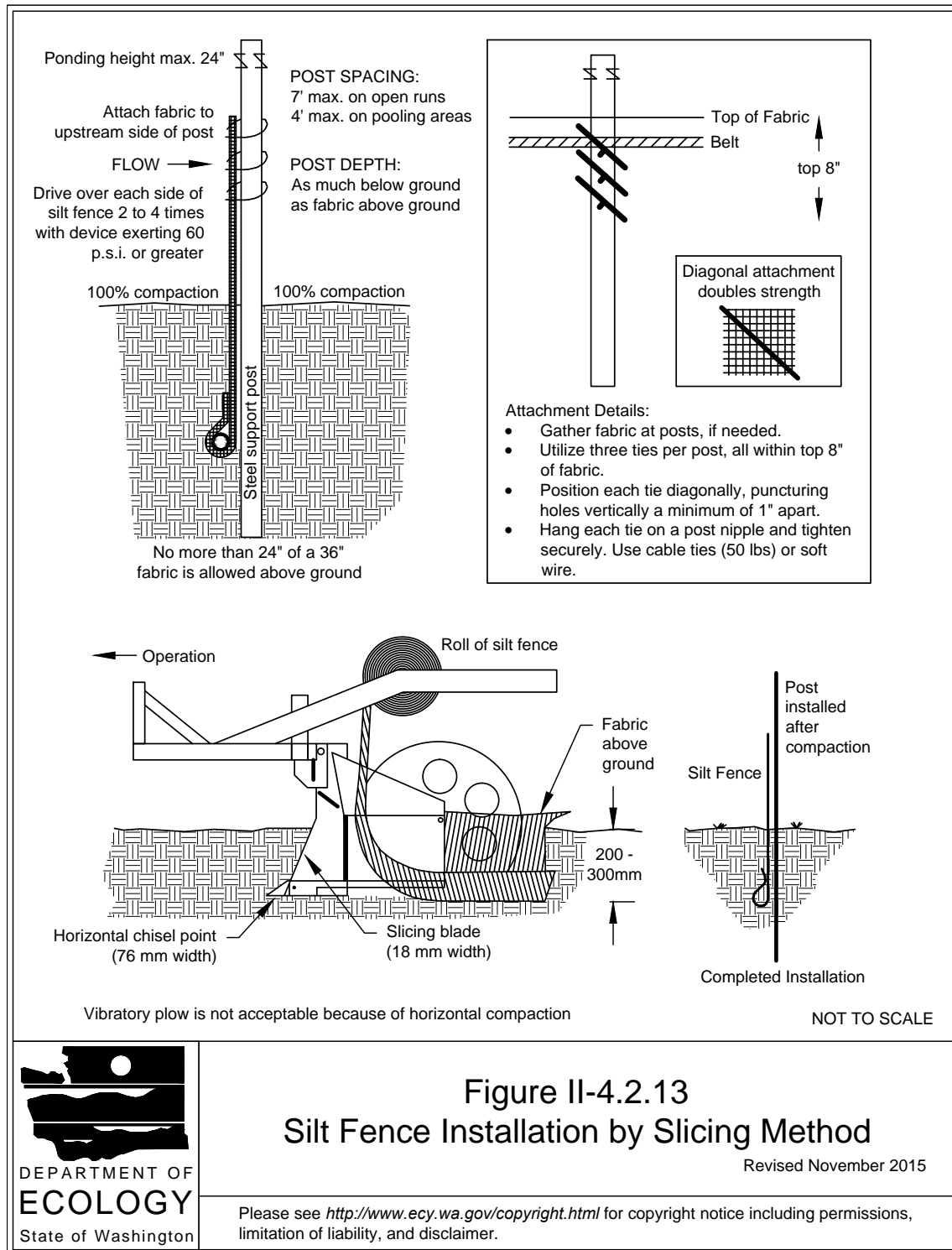
be a maximum of 6-feet. Posts shall consist of either:

- Wood with dimensions of 2-inches by 2-inches wide min. and a 3-foot min. length. Wood posts shall be free of defects such as knots, splits, or gouges.
 - No. 6 steel rebar or larger.
 - ASTM A 120 steel pipe with a minimum diameter of 1-inch.
 - U, T, L, or C shape steel posts with a minimum weight of 1.35 lbs./ft.
 - Other steel posts having equivalent strength and bending resistance to the post sizes listed above.
11. Locate silt fences on contour as much as possible, except at the ends of the fence, where the fence shall be turned uphill such that the silt fence captures the runoff water and prevents water from flowing around the end of the fence.
 12. If the fence must cross contours, with the exception of the ends of the fence, place gravel check dams perpendicular to the back of the fence to minimize concentrated flow and erosion. The slope of the fence line where contours must be crossed shall not be steeper than 3H:1V.
 - Gravel check dams shall be approximately 1-foot deep at the back of the fence. Gravel check dams shall be continued perpendicular to the fence at the same elevation until the top of the check dam intercepts the ground surface behind the fence.
 - Gravel check dams shall consist of crushed surfacing base course, gravel backfill for walls, or shoulder ballast. Gravel check dams shall be located every 10 feet along the fence where the fence must cross contours.
- Refer to [Figure II-4.2.13 Silt Fence Installation by Slicing Method \(p.374\)](#) for slicing method details. Silt fence installation using the slicing method specifications:
 1. The base of both end posts must be at least 2- to 4-inches above the top of the filter fabric on the middle posts for ditch checks to drain properly. Use a hand level or string level, if necessary, to mark base points before installation.
 2. Install posts 3- to 4-feet apart in critical retention areas and 6- to 7-feet apart in standard applications.
 3. Install posts 24-inches deep on the downstream side of the silt fence, and as close as possible to the filter fabric, enabling posts to support the filter fabric from upstream water pressure.
 4. Install posts with the nipples facing away from the filter fabric.

5. Attach the filter fabric to each post with three ties, all spaced within the top 8-inches of the filter fabric. Attach each tie diagonally 45 degrees through the filter fabric, with each puncture at least 1-inch vertically apart. Each tie should be positioned to hang on a post nipple when tightening to prevent sagging.
6. Wrap approximately 6-inches of fabric around the end posts and secure with 3 ties.
7. No more than 24-inches of a 36-inch filter fabric is allowed above ground level.

Compact the soil immediately next to the filter fabric with the front wheel of the tractor, skid steer, or roller exerting at least 60 pounds per square inch. Compact the upstream side first and then each side twice for a total of four trips. Check and correct the silt fence installation for any deviation before compaction. Use a flat-bladed shovel to tuck fabric deeper into the ground if necessary.

Figure II-4.2.13 Silt Fence Installation by Slicing Method



Maintenance Standards

- Repair any damage immediately.
- Intercept and convey all evident concentrated flows uphill of the silt fence to a sediment pond.
- Check the uphill side of the fence for signs of the fence clogging and acting as a barrier to flow and then causing channelization of flows parallel to the fence. If this occurs, replace the fence or remove the trapped sediment.
- Remove sediment deposits when the deposit reaches approximately one-third the height of the silt fence, or install a second silt fence.
- Replace filter fabric that has deteriorated due to ultraviolet breakdown.

BMP C234: Vegetated Strip

Purpose

Vegetated strips reduce the transport of coarse sediment from a construction site by providing a temporary physical barrier to sediment and reducing the runoff velocities of overland flow.

Conditions of Use

- Vegetated strips may be used downslope of all disturbed areas.
- Vegetated strips are not intended to treat concentrated flows, nor are they intended to treat substantial amounts of overland flow. Any concentrated flows must be conveyed through the drainage system to a sediment pond. The only circumstance in which overland flow can be treated solely by a strip, rather than by a sediment pond, is when the following criteria are met (see [Table II-4.2.4 Contributing Drainage Area for Vegetated Strips \(p.375\)](#)):

Table II-4.2.4 Contributing Drainage Area for Vegetated Strips

Average Contributing Area Slope	Average Contributing Area Percent Slope	Max Contributing area Flowpath Length
1.5H : 1V or flatter	67% or flatter	100 feet
2H : 1V or flatter	50% or flatter	115 feet
4H : 1V or flatter	25% or flatter	150 feet
6H : 1V or flatter	16.7% or flatter	200 feet
10H : 1V or flatter	10% or flatter	250 feet

Alternative BMPs

The following are possible alternative BMPs for each of the 12 elements not described in Appendix B. This list can be referenced in the event a BMP for a specific element is not functioning as designed and an alternative BMP needs to be implemented. There are no alternatives listed at this time. Alternative BMPs can be added as warranted during construction.

Temporary and Permanent Seeding (BMP C120)

Mulching (BMP C121)

Surface Roughening (BMP C130)

Certified Erosion and Sediment Control Lead (BMP C160)

Interceptor Dike and Swale (BMP C200)

Grass-Lined Channels (BMP C201)

Check Dams (BMP C207)

Outlet Protection (BMP C209)

Vegetative Strip (BMP C234)

Correspondence

There are no correspondence documents at this time.

Site Inspection Form

Site Inspection Form

General Information

Project Name:

Inspector Name:

Date:

Title:

CESCL # :

Time:

Inspection Type:

- ☐ After a rain event
- ☐ Weekly
- ☐ Turbidity/transparency benchmark exceedance
- ☐ Other

Weather

Precipitation

Since last inspection

In last 24 hours

Description of General Site Conditions:

Inspection of BMPs

Element 1: Mark Clearing Limits

BMP:

Location	Inspected		Functioning			Problem/Corrective Action
	Y	N	Y	N	NIP	

BMP:

Location	Inspected		Functioning			Problem/Corrective Action
	Y	N	Y	N	NIP	

Element 2: Establish Construction Access

BMP:

Location	Inspected		Functioning			Problem/Corrective Action
	Y	N	Y	N	NIP	

BMP:

Location	Inspected		Functioning			Problem/Corrective Action
	Y	N	Y	N	NIP	

Element 3: Control Flow Rates

BMP:

Location	Inspected		Functioning			Problem/Corrective Action
	Y	N	Y	N	NIP	

BMP:

Location	Inspected		Functioning			Problem/Corrective Action
	Y	N	Y	N	NIP	

Element 4: Install Sediment Controls

BMP:

Location	Inspected		Functioning			Problem/Corrective Action
	Y	N	Y	N	NIP	

BMP:

Location	Inspected		Functioning			Problem/Corrective Action
	Y	N	Y	N	NIP	

BMP:

Location	Inspected		Functioning			Problem/Corrective Action
	Y	N	Y	N	NIP	

BMP:

Location	Inspected		Functioning			Problem/Corrective Action
	Y	N	Y	N	NIP	

BMP:

Location	Inspected		Functioning			Problem/Corrective Action
	Y	N	Y	N	NIP	

Element 5: Stabilize Soils

BMP:

Location	Inspected		Functioning			Problem/Corrective Action
	Y	N	Y	N	NIP	

BMP:

Location	Inspected		Functioning			Problem/Corrective Action
	Y	N	Y	N	NIP	

BMP:

Location	Inspected		Functioning			Problem/Corrective Action
	Y	N	Y	N	NIP	

BMP:

Location	Inspected		Functioning			Problem/Corrective Action
	Y	N	Y	N	NIP	

Element 6: Protect Slopes

BMP:

Location	Inspected		Functioning			Problem/Corrective Action
	Y	N	Y	N	NIP	

BMP:

Location	Inspected		Functioning			Problem/Corrective Action
	Y	N	Y	N	NIP	

BMP:

Location	Inspected		Functioning			Problem/Corrective Action
	Y	N	Y	N	NIP	

Element 7: Protect Drain Inlets

BMP:

Location	Inspected		Functioning			Problem/Corrective Action
	Y	N	Y	N	NIP	

BMP:

Location	Inspected		Functioning			Problem/Corrective Action
	Y	N	Y	N	NIP	

BMP:

Location	Inspected		Functioning			Problem/Corrective Action
	Y	N	Y	N	NIP	

Element 8: Stabilize Channels and Outlets

BMP:

Location	Inspected		Functioning			Problem/Corrective Action
	Y	N	Y	N	NIP	

BMP:

Location	Inspected		Functioning			Problem/Corrective Action
	Y	N	Y	N	NIP	

BMP:

Location	Inspected		Functioning			Problem/Corrective Action
	Y	N	Y	N	NIP	

BMP:

Location	Inspected		Functioning			Problem/Corrective Action
	Y	N	Y	N	NIP	

Element 9: Control Pollutants

BMP:

Location	Inspected		Functioning			Problem/Corrective Action
	Y	N	Y	N	NIP	

BMP:

Location	Inspected		Functioning			Problem/Corrective Action
	Y	N	Y	N	NIP	

Element 10: Control Dewatering

BMP:

Location	Inspected		Functioning			Problem/Corrective Action
	Y	N	Y	N	NIP	

BMP:

Location	Inspected		Functioning			Problem/Corrective Action
	Y	N	Y	N	NIP	

BMP:

Location	Inspected		Functioning			Problem/Corrective Action
	Y	N	Y	N	NIP	

Stormwater Discharges From the Site

	Observed?		
	Y	N	
Location			
Turbidity			
Discoloration			
Sheen			
Location			
Turbidity			
Discoloration			
Sheen			

Water Quality Monitoring											
Was any water quality monitoring conducted?						<input type="checkbox"/> Yes			<input type="checkbox"/> No		
If water quality monitoring was conducted, record results here:											
If water quality monitoring indicated turbidity 250 NTU or greater; or transparency 6 cm or less, was Ecology notified by phone within 24 hrs?											
						<input type="checkbox"/> Yes			<input type="checkbox"/> No		
If Ecology was notified, indicate the date, time, contact name and phone number below:											
Date:											
Time:											
Contact Name:											
Phone #:											
General Comments and Notes											
Include BMP repairs, maintenance, or installations made as a result of the inspection.											
Were Photos Taken?						<input type="checkbox"/> Yes			<input type="checkbox"/> No		
If photos taken, describe photos below:											

Construction Stormwater General Permit (CSWGP)

The Construction Stormwater General Permit will be inserted once it has been granted approval by the Department of Ecology.

303(d) List Waterbodies / TMDL Waterbodies Information

No impaired waterbodies were identified within 0.25 miles downstream of the site.

THE INFORMATION CONTAINED IN THIS SET OF CONSTRUCTION DOCUMENTS IS PROPRIETARY BY NATURE. ANY USE OR DISCLOSURE OTHER THAN THAT WHICH RELATES TO CARRIER SERVICES IS STRICTLY PROHIBITED.



SITE NUMBER (VERTICAL BRIDGE): **US-WA-5105**

SITE NUMBER (T-MOBILE): **SE09034J**

SITE NAME: **CLE ELUM DT**

ADDRESS: **302 E 4TH STREET**
CLE ELUM, WA 98922

JURISDICTION: **CITY OF CLE ELUM**

PROJECT INFORMATION

SITE NAME:
SITE NUMBER
(VERTICAL BRIDGE):
SITE NUBMER (T-MOBILE):
SITE ADDRESS:

CLE ELUM DT
US-WA-5105
SE09034J
302 E 4TH STREET
CLE ELUM, WA 98922

JURISDICTION:
COUNTY:

CITY OF CLE ELUM
KITITITAS COUNTY

LATITUDE:
LONGITUDE:
CONSTRUCTION TYPE:
A.P.N. :
ZONING CLASSIFICATION:
PROPOSED USE:

47° 11' 51.07" N
120° 55' 58.43" W
V-B
2015260502401
PUBLIC RESERVE AREA
UNMANNED
TELECOMMUNICATION FACILITY

PROPERTY OWNER:

CITY OF CLE ELMUM

APPLICANT:

SAC WIRELESS ON
BEHALF OF VERTICAL BRIDGE
PAULO LOPEZ
(916) 306-7082
paulo.lopez@sacw.com

VICINITY MAP

SCOPE OF WORK

T-MOBILE PROPOSES TO INSTALL:

- NEW 4,000 SQUARE FEET LEASE AREA W/ NEW RETAINING WALL& CHAIN LINK FENCE
- (8) NEW T-MOBILE PANEL ANTENNAS
- (4) NEW T-MOBILE RADIOS (FRIJ)
- (4) NEW T-MOBILE RADIOS (FRBG)
- (4) NEW T-MOBILE RADIOS (FHFB)
- NEW NOKIE HCS TRUNK CABLES
- NEW T-MOBILE ICE BRIDGE
- NEW T-MOBILE EQUIPMENT SHELTER

- NEW T-MOBILE ELECTRICAL METER ON NEW MULTI-TENANT H-FRAME
- NEW T-MOBILE 500 GALLON PROPANE TANK ON NEW CONCRETE PAD
- NEW T-MOBILE GENERATOR ON NEW CONCRETE PAD
- NEW LOW PROFILE QUAD PLATFORM ON NEW MONOPOLE

PROJECT TEAM

ARCHITECT:
SAC WIRELESS
KEVIN ALLEN
540 W. MADISON ST. 16TH FLOOR
CHICAGO, IL 60661
CONTACT: OMAR MUNOZ
PHONE: (619) 736-3588
EMAIL: omar.munoz@sacw.com

CONSTRUCTION MANAGER:
SAC WIRELESS
ROLLA PUTNAM
1037 THOMAS AVENUE SW
RENTON, WA 98057
PHONE: (253) 241-5939
EMAIL: rolla.putnam@sacw.com

PLANNING/ZONING CONSULTANT:

SAC WIRELESS
PAULO LOPEZ
8880 CAL CENTER DRIVE
SUITE 130
SACRAMENTO, CA 95826
PHONE: (916) 306-7082
EMAIL: paulo.lopez@sacw.com

DRIVING DIRECTIONS

DIRECTIONS FROM: SEATTLE-TACOMA
INTERNATIONAL AIRPORT

1. MERGE ONTO WA-518 E

5. KEEP LEFT AT THE FORK TO STAY ON I-90 E

2. USE THE LEFT LANE TO TAKE THE
INTERSTATE 5 N EXIT TOWARD SEATTLE

6. TAKE EXIT 84 TOWARD CLE ELUM/S CLE
ELUM

3. MERGE ONTO I-5 N

7. CONTINUE ONTO W 1ST ST

4. USE THE RIGHT 2 LANES TO TAKE EXIT 164A
TO MERGE ONTO I-90 E TOWARD SPOKANE

8. TURN LEFT ONTO N PENNSYLVANIA AVE

9. TURN RIGHT ONTO E 4TH ST

TO OBTAIN LOCATION OF PARTICIPANTS
UNDERGROUND FACILITIES BEFORE YOU DIG
IN WASHINGTON, CALL 811
TOLL FREE: 1-800-424-5555 OR
www.call811.com
WASHINGTON STATUTE REQUIRES
MIN OF 2 WORKING DAYS NOTICE
BEFORE YOU EXCAVATE

LOCATION MAP

LEGAL DESCRIPTION

SEE SITE SURVEY- SHEET SV1

GENERAL NOTES

THE FACILITY IS UNMANNED AND NOT FOR HUMAN HABITATION. A TECHNICIAN WILL VISIT THE SITE AS REQUIRED FOR ROUTINE MAINTENANCE. THE PROJECT WILL NOT RESULT IN ANY SIGNIFICANT DISTURBANCE OR EFFECT ON DRAINAGE; NO SANITARY SEWER SERVICE REQUIRED AND NO COMMERCIAL SIGNAGE IS PROPOSED.

DO NOT SCALE DRAWINGS

CONTRACTOR SHALL VERIFY ALL PLANS, EXISTING DIMENSIONS & FIELD CONDITIONS ON THE JOB SITE & SHALL IMMEDIATELY NOTIFY THE ARCHITECT OR ENGINEER OF RECORD IN WRITING OF ANY DISCREPANCIES BEFORE PROCEEDING WITH THE WORK OR BE RESPONSIBLE FOR SAME.

SPECIAL NOTES

1. ALL WORK SHALL BE INSTALLED IN
CONFORMANCE WITH CURRENT T-MOBILE
CONSTRUCTION INSTALLATION GUIDE.

2. EXISTING CONDITIONS WILL BE VERIFIED
IN FIELD. IF SIGNIFICANT DEVIATIONS OR
DETERIORATION ARE ENCOUNTERED AT
THE TIME OF CONSTRUCTION, A REPAIR
PERMIT WILL BE OBTAINED &
CONTRACTOR SHALL NOTIFY ARCHITECT
OR ENGINEER OF RECORD IMMEDIATELY.

3. CONTRACTOR SHALL VERIFY ALL PLANS &
EXISTING DIMENSIONS & CONDITIONS ON
THE JOB SITE & SHALL IMMEDIATELY
NOTIFY THE ARCHITECT OR ENGINEER OF

RECORD IN WRITING OF ANY
DISCREPANCIES BEFORE PROCEEDING
WITH THE WORK OR BE RESPONSIBLE
FOR SAME.

4. THESE DRAWINGS ARE FULL SIZE &
SCALEABLE ON 22"x34" SHEET SIZE & ARE
NOT REDUCED IN SIZE.

5. STATEMENT THAT COMPLIANCE WITH THE
ENERGY CODE IS NOT REQUIRED. -SCOPE
OF WORK DOES NOT INVOLVE
MODIFICATIONS TO EXTERIOR ENVELOPE
OF BUILDING, HVAC SYSTEMS OR
ELECTRICAL LIGHTING.

DRAWING INDEX

SHEET	DESCRIPTION
T-1.0	TITLE SHEET
T-2.0	GENERAL NOTES
T-3.0	REFERENCED DOCUMENTS, ABBREVIATIONS, LEGEND & SIGNAGE
SV1	EXISTING SITE SURVEY
SV2	EXISTING SITE SURVEY
A-1.0	OVERALL SITE PLAN
A-2.0	ENLARGED SITE PLAN
A-3.0	ANTENNA PLAN AND MOUNTING DETAILS
A-4.0	EQUIPMENT LAYOUT & EQUIPMENT SHELTER PLAN
A-5.0	NORTHWEST & NORTHEAST ELEVATIONS
A-6.0	SOUTHEAST & SOUTHWEST ELEVATIONS

CODE COMPLIANCE

- 2015 INTERNATIONAL BUILDING CODE
- 2015 INTERNATIONAL RESIDENTIAL CODE
- 2015 INTERNATIONAL MECHANICAL CODE
- 2015 INTERNATIONAL FIRE CODE
- 2015 WASHINGTON STATE ENERGY CODE

APPROVALS

THE FOLLOWING PARTIES HEREBY APPROVE AND ACCEPT THESE DOCUMENTS & AUTHORIZE THE SUBCONTRACTOR TO PROCEED WITH THE CONSTRUCTION DESCRIBED HEREIN. ALL DOCUMENTS ARE SUBJECT TO REVIEW BY THE LOCAL BUILDING DEPARTMENT & MAY IMPOSE CHANGES OR MODIFICATIONS.

T-MOBILE PROJECT MANAGER: _____

DATE: _____

T-MOBILE CONSTRUCTION MANAGER: _____

DATE: _____

T-MOBILE RF ENGINEER: _____

DATE: _____

SITE ACQUISITION: _____

DATE: _____

PROPERTY OWNER: _____

DATE: _____

ZONING: _____

DATE: _____

VERTICAL BRIDGE HOLDINGS, LLC
750 PARK OF COMMERCE DRIVE,
SUITE 200
BOCA RATON, FL 33487

10509 VISTA SORRENTO PKWY #206
SAN DIEGO, CA 92121
T-MOBILE.COM

SAC AE DESIGN GROUP, INC.
5015 SHOREHAM PLACE, SUITE 150
SAN DIEGO, CA 92122
www.sacw.com

REVISIONS

REV.	DATE	DESCRIPTION	INITIALS
0	02/01/19	PZD	SR
1	02/19/19	FZD	SR

DATE: _____

I HEREBY CERTIFY THAT THESE PLANS WERE
PREPARED BY ME AND UNDER MY DIRECT
SUPERVISION AND THAT I AM DULY REGISTERED
ARCHITECT UNDER THE LAWS OF THE STATE OF
WASHINGTON"

CLE ELUM DT
US-WA-5105
302 E 4TH STREET
CLE ELUM, WA 98922

SHEET TITLE

TITLE SHEET

SHEET NUMBER

T-1.0

GENERAL NOTES:

1. THIS FACILITY IS EXEMPT FROM ACCESSIBILITY REQUIREMENTS PER 2015 IBC SECTION 1103.2.9. THIS FACILITY IS NON-OCCUPIABLE SPACE AND ENTERED ONLY BY SERVICE PERSONNEL.

2. ALL WORK SHALL CONFORM TO THE REQUIREMENTS OF THE LOCAL BUILDING CODE, THE LATEST EDITION AND ALL OTHER APPLICABLE CODES AND ORDINANCES.

3. CONTRACTOR SHALL CONSTRUCT SITE IN ACCORDANCE WITH THESE DRAWINGS AND CONSTRUCTION SPECIFICATIONS 80-T1196-1 REV H. THE SPECIFICATION IS THE RULING DOCUMENT AND ANY DISCREPANCIES BETWEEN THE SPECIFICATION AND THESE DRAWINGS SHOULD BE BROUGHT TO THE ATTENTION OF THE ARCHITECT OR ENGINEER OF RECORD PRIOR TO PROCEEDING WITH CONSTRUCTION.

4. CONTRACTOR SHALL VISIT THE JOB SITE AND SHALL FAMILIARIZE HIMSELF WITH ALL CONDITIONS AFFECTING THE PROPOSED WORK AND SHALL MAKE PREVISIONS AS TO THE COST THEREOF. CONTRACTOR SHALL BE RESPONSIBLE FOR FAMILIARIZING HIMSELF WITH ALL CONTRACT DOCUMENTS, FIELD CONDITIONS AND DIMENSIONS AND CONFORMING THAT THE WORK MAY BE ACCOMPLISH AS SHOWN PRIOR TO PROCEEDING WITH CONSTRUCTION. ANY DISCREPANCIES SHALL BE BROUGHT TO THE ATTENTION OF THE ARCHITECT OR ENGINEER OF RECORD PRIOR TO THE COMMENCEMENT OF WORK. NO COMPENSATION WILL BE AWARDED BASED ON CLAIM OF LACK OF KNOWLEDGE OF FIELD CONDITIONS.

5. PLANS ARE NOT TO BE SCALED. THESE PLANS ARE INTENDED TO BE A DIAGRAMMATIC OUTLINE ONLY UNLESS OTHERWISE NOTED. THE WORK SHALL INCLUDE FURNISHING MATERIALS, EQUIPMENT AND APPURTENANCES, AND LABOR NECESSARY TO EFFECT ALL INSTALLATIONS AS INDICATED ON THE DRAWINGS. OWNER PROVIDED MATERIALS WILL INCLUDE THE FOLLOWING, UNLESS NOTED OTHERWISE:

A. TRANSMITTER

B. RF FILTER

C. MFTS RACKS

D. AUXILIARY EQUIPMENT IN MFTS RACK

E. PUMP ASSEMBLY

F. HEAT EXCHANGE

G. HOSE AND HOSE MANIFOLD (ANY COPPER OR STEEL SECTION PROVIDED BY CONTRACTOR)

H. UHF ANTENNA AND MOUNTING BRACKET, GPS ANTENNA AND KU ANTENNAS

I. UHF COAX AND HANGERS

J. 480-208 & 208-400 ELECTRICAL TRANSFORMER (RE: E-2 FOR SPECIALIZED TRANSFORMER PROVIDED BY CONTRACTOR)

K. AUTOMATIC TRANSFER SWITCH AND GENERATOR

L. EQUIPMENT SHELTER (SHELTER FURNISH IN FACTORY W/HVAC EQUIPMENT AND ELECTRICAL DISTRIBUTION PANEL)

M. INTEGRATED LOAD CENTER

N. ANTENNAS, RADIOS & CABLES

6. DIMENSIONS SHOWN ARE TO FINISH SURFACES UNLESS OTHERWISE NOTED. SPACING BETWEEN EQUIPMENT IS REQUIRED CLEARANCE. THEREFORE, IT IS CRITICAL TO FIELD VERIFY DIMENSIONS, SHOULD THERE BE ANY QUESTIONS REGARDING THE CONTRACT DOCUMENTS, EXISTING CONDITIONS AND/OR DESIGN INTENT, THE CONTRACTOR SHALL BE RESPONSIBLE FOR OBTAINING THE WORK.

7. DETAILS ARE INTENDED TO SHOW DESIGN INTENT. MODIFICATIONS MAY BE REQUIRED TO SUIT JOB DIMENSIONS OR CONDITIONS, AND SUCH MODIFICATIONS SHALL BE INCLUDED AS PART OF THE WORK.

8. CONTRACTOR SHALL RECEIVE CLARIFICATION IN WRITING, AND SHALL RECEIVE IN WRITING AUTHORIZATION TO PROCEED BEFORE STARTING WORK ON ANY ITEMS NOT CLEARLY DEFINED OR IDENTIFIED BY THE CONTRACT DOCUMENT.

9. CONTRACTOR SHALL SUPERVISE AND DIRECT THE WORK USING THE BEST CONSTRUCTION SKILLS AND ATTENTION. CONTRACTOR SHALL BE SOLELY RESPONSIBLE FOR CONSTRUCTION MEANS, METHODS, TECHNIQUES, SEQUENCES AND PROCEDURES AND FOR COORDINATING ALL PORTIONS OF THE WORK UNDER CONTRACT, UNLESS OTHERWISE NOTED.

10. CONTRACTOR SHALL BE RESPONSIBLE FOR THE SAFETY OF THE WORK AREA, ADJACENT AREAS AND BUILDING OCCUPANTS THAT ARE LIKELY TO BE AFFECTED BY THE WORK UNDER THIS CONTRACT. WORK SHALL CONFORM TO ALL OSHA REQUIREMENTS.

11. CONTRACTOR SHALL COORDINATE HIS WORK WITH THE SUPERINTENDENT OF THE BUILDING & GROUNDS & SCHEDULE HIS ACTIVITIES AND WORKING HOURS IN ACCORDANCE WITH THE REQUIREMENTS.

12. CONTRACTOR SHALL BE RESPONSIBLE FOR COORDINATING HIS WORK WITH THE WORK OF OTHERS AS IT MAY RELATE TO RADIO EQUIPMENT, ANTENNAS AND ANY OTHER PORTIONS OF THE WORK.

13. INSTALL ALL EQUIPMENT AND MATERIAL IN ACCORDANCE WITH MANUFACTURER'S RECOMMENDATIONS UNLESS SPECIFICALLY OTHERWISE INDICATED OR WHERE LOCAL CODES OR REGULATIONS TAKE PRECEDENCE.

14. MAKE NECESSARY PROVISIONS TO PROTECT EXISTING SURFACE, EQUIPMENT, IMPROVEMENTS, PIPING, ETC. AND IMMEDIATELY REPAIR ANY DAMAGE THAT OCCURS DURING CONSTRUCTION.

15. IN DRILLING HOLES INTO CONCRETE WHETHER FOR FASTENING OR ANCHORING PURPOSES, OR PENETRATIONS THROUGH THE FLOOR FOR CONDUIT RUNS, PIPE RUNS, ETC., IT MUST BE CLEARLY UNDERSTOOD THAT REINFORCING STEEL SHALL NOT BE DRILLED INTO, CUT OR DAMAGED UNDER ANY CIRCUMSTANCES (UNLESS NOTED OTHERWISE). LOCATIONS OF REINFORCING STEEL ARE NOT DEFINITELY KNOWN AND THEREFORE MUST BE SEARCHED FOR BY APPROPRIATE METHODS AND EQUIPMENT.

16. REPAIR ALL EXISTING WALL SURFACE DAMAGED DURING CONSTRUCTION SUCH THAT THEY MATCH AND BLEND IN WITH ADJACENT SURFACE.

17. SEAL PENETRATION THROUGH FIRE RATED AREAS WITH U.L. LISTED AND FIRE CODE APPROVED MATERIALS.

18. KEEP CONTRACT AREA CLEAN, HAZARD FREE, AND DISPOSE OF ALL DIRT, DEBRIS, AND RUBBISH, EQUIPMENT NOT SPECIFIED AS REMAINING ON THE PROPERTY OF THE OWNER SHALL BE REMOVED. LEAVE PREMISES IN CLEAN CONDITIONS AND FREE FROM PAINT SPOT, DUST, OR SMUDGES OF ANY NATURE. CONTRACTOR SHALL BE RESPONSIBLE FOR MAINTAINING ALL ITEMS UNTIL COMPLETION OF CONSTRUCTION.

19. MINIMUM BEND RADIUS OF ANTENNA CABLE SHALL BE IN ACCORDANCE WITH CABLE MANUFACTURER'S RECOMMENDATIONS.

20. DAMAGE TO EXISTING STRUCTURES AND/OR UTILITIES RESULTING FROM CONTRACTORS NEGLIGENCE SHALL BE REPAIRED AND/OR REPLACED TO THE OWNERS SATISFACTION AT NO ADDITIONAL COST TO THE CONTRACT.

21. ALL CONSTRUCTION IS TO ADHERE TO T-MOBILE'S INTEGRATED CONSTRUCTION STANDARDS UNLESS 2015 IBC IS MORE STRINGENT.

22. THE INTENT OF THE PLANS AND SPECIFICATIONS IS TO PERFORM THE CONSTRUCTION IN ACCORDANCE WITH THE 2015 IBC, WAC 51-11, WAC 51-11C, WAC 51-11R. SHOULD ANY CONDITIONS DEVELOP NOT COVERED BY THE APPROVED PLANS AND SPECIFICATIONS WHEREIN THE FINISH WORK WILL NOT COMPLY WITH WAC 51-11, 2015 IBC OF REGULATIONS, A CHANGE ORDER DETAILING AND SPECIFYING THE REQUIRED WORK SHALL BE SUBMITTED TO AND APPROVED BY THE JURISDICTION BEFORE PROCEEDING WITH THE WORK.
- SITE WORK NOTES:
1. DO NOT SCALE BUILDING DIMENSIONS FROM DRAWINGS.

2. SIZE, LOCATION, AND TYPE OF ANY UNDERGROUND UTILITIES OR IMPROVEMENTS SHALL BE ACCURATELY NOTED AND PLACED ON AS-BUILT DRAWINGS BY GENERAL CONTRACTOR AND ISSUED TO ARCHITECT OR ENGINEER OF RECORD AT COMPLETION OF PROJECT.

3. ALL EXISTING UTILITIES, FACILITIES, CONDITIONS AND THEIR DIMENSIONS SHOWN ON PLANS HAVE BEEN PLOTTED FROM AVAILABLE RECORDS. THE ARCHITECT OR ENGINEER OF RECORD AND OWNER ASSUME NO
- RESPONSIBILITY WHATSOEVER AS TO THE SUFFICIENCY OR ACCURACY OF THE INFORMATION SHOWN ON THE PLANS OR THE MANNER OF THEIR REMOVAL OR ADJUSTMENT. CONTRACTOR SHALL BE RESPONSIBLE FOR DETERMINING EXACT LOCATION OF ALL EXISTING UTILITIES AND FACILITIES PRIOR TO START OF CONSTRUCTION. CONTRACTOR SHALL ALSO OBTAIN FROM EACH UTILITY COMPANY DETAILED INFORMATION RELATIVE TO WORK SCHEDULES AND METHODS OF REMOVING OR ADJUSTING EXISTING UTILITIES.

4. CONTRACTOR SHALL VERIFY ALL EXISTING UTILITIES BOTH HORIZONTAL AND VERTICALLY PRIOR TO START OF CONSTRUCTION. ANY DISCREPANCIES OR DOUBTS AS TO THE INTERPRETATION OF PLANS SHALL BE IMMEDIATELY REPORTED TO THE ARCHITECT OR ENGINEER OF RECORD FOR RESOLUTION AND INSTRUCTION, AND NO FURTHER WORK SHALL BE PERFORMED UNTIL THE DISCREPANCY IS CHECKED AND CORRECTED BY THE ARCHITECT OR ENGINEER OF RECORD. FAILURE TO SECURE SUCH INSTRUCTION MEANS CONTRACTOR WILL HAVE WORKED AT HIS/HER OWN RISK AND EXPENSE. CONTRACTOR SHALL CALL LOCAL DIGGER HOT LINE FOR UTILITY LOCATIONS 48 HOURS PRIOR TO START OF CONSTRUCTION.

5. CONTRACTOR SHALL CLEAN ENTIRE SITE AFTER CONSTRUCTION SUCH THAT NO PAPER, TRASH, WEEDS, BRUSH OR ANY OTHER DEPOSITS WILL REMAIN. ALL MATERIALS COLLECTED DURING CLEANING OPERATIONS SHALL BE DISPOSED OF OFF-SITE BY THE GENERAL CONTRACTOR.

6. ALL SITE WORK SHALL BE CAREFULLY COORDINATED BY THE GENERAL CONTRACTOR WITH LOCAL UTILITY COMPANY, TELEPHONE COMPANY, AND ANY OTHER UTILITY COMPANIES HAVING JURISDICTION OVER THIS LOCATION.
- PAINTING NOTES & SPECIFICATIONS:
- A. GENERAL

1. ALL PAINT PRODUCT LINES SHALL BE SHERWIN WILLIAMS UNLESS SPECIFICALLY NOTED OTHERWISE.

2. CONTRACTOR SHALL PREPARE ALL SURFACES AND APPLY ALL FINISHES PER LATEST EDITION OF MANUFACTURER'S SPECIFICATIONS.

3. COMPLY WITH MANUFACTURER'S WRITTEN INSTRUCTIONS REGARDING SUFFICIENT DRYING TIME BETWEEN COATS WITH PROVISIONS AS RECOMMENDED BY MANUFACTURER FOR EXISTING WEATHER CONDITIONS.

4. FINISH COLOR AND TEXTURE OF ALL PAINTED SURFACES SHALL MATCH EXISTING ADJACENT SURFACES UNLESS OTHERWISE NOTED.

5. ALL PAINT MATERIAL DATA SHEETS SHALL BE PROVIDED TO THE T-MOBILE CONSTRUCTION MANAGER.

6. PREPARE PREVIOUSLY PAINTED SURFACE BY LIGHT SANDING WITH 400 GRIT SANDPAPER AND NON-HYDROCARBON WASH. PREPARE GALVANIZED SURFACES BY ACID ETCH OR SOLVENT CLEANING IN ACCORDANCE WITH SSPC-SP1.

7. FURNISH DROP CLOTHES, SHIELDS, MASKING AND PROTECTIVE METHODS TO PREVENT SPRAY OR DROPPINGS FROM DAMAGING ADJACENT SURFACES AND FACILITIES.

8. APPLY PAINT BY AIRLESS SPRAY, SANDING LIGHTLY BETWEEN EACH SUCCEEDING ENAMEL COAT ON FLAT SURFACES. APPLY MATERIAL TO ACHIEVE A COATING NO THINNER THAN THE DRY FILM THICKNESS INDICATED.

9. APPLY BLOCK FILTER TO CONCRETE BLOCK CONSTRUCTION AT A RATE TO ENSURE COMPLETE COVERAGE WITH PORES COMPLETELY FILLED.

10. CONTRACTOR SHALL CORRECT RUNS, SAGS, MISSES AND OTHER DEFECTS INCLUDING INADEQUATE COVERAGE AS DIRECTED BY THE T-MOBILE CONSTRUCTION MANAGER. REPAINT AS NECESSARY TO ACHIEVE SURFACES WHICH ARE SMOOTH, EVENLY COATED WITH UNIFORM SHEEN AND FREE FROM BLEMISHES.

B. COATING SYSTEM SPECIFICATIONS

1. DTM ACRYLIC COATING (SERIES B66) BY SHERWIN WILLIAMS CO. 1MIL DFT PER COAT APPLIED IN TWO COATS OVER DTM BONDING PRIMER (B66A50).

2. 100% ACRYLIC, LATEX COATING EQUIVALENT TO A-100 (SERIES A-82) BY SHERWIN WILLIAMS CO. 1 DFT PER COAT APPLIED IN TWO COATS OVER SPECIFIED PRIMER.

C. PAINT & PRIMER

1. ANTENNAS

PRIMER - KEM AQUA E61-W525

TOPCOAT - COROTHANE II B65W200/B60V22
- BTS CABINET**
PRIMER - KEM AQUA E61-W525
TOPCOAT - COROTHANE II B65W200/B60V22
COAXIAL JUMPER CABLES
- PRIMER** - AS REQUIRED FOR ADHESION. APPLY ONE COAT OF KEM AQUA WATER REDUCIBLE
PRIMER E61W25 REDUCED 25%
TOPCOAT - 2 COATS COROTHANE II POLYURETHANE B65W200/B60V2
- RAW STEEL**
PRIMER - KEM BOND HS B50WZ4, DMT ACRYLIC PRIMER
TOPCOAT - 2 COATS COROTHANE II POLYURETHANE B65W200/B60V2
- GALVANIZED METAL**
ACID ETCH WITH COMMERCIAL ETCH OR VINEGAR PRIMER COAT AND FINISH COAT (GALVITE HIGH SOLIDS OR DTM PRIMER/FINISH)
- STAINLESS STEEL**
PRIMER - OTM WASH PRIMER, B71Y1
TOPCOATS - 2 COATS COROTHANE II POLYURETHANE B65W200/B60V2
- PRE-PRIMED STEEL**
TOUCH UP ANY RUST OR UN-PRIMED STEEL WITH KEM BOND HS, SS0WZ4
- ALUMINUM & COPPER**
PRIMER - DTM WASH PRIMER, B71Y1
TOPCOAT - 2 COATS COROTHANE II POLYURETHANE B65W200/B60V2
- CONCRETE MASONRY**
PRIMER - PRO MAR EXTERIOR BLOCK FILLER
TOPCOAT - 2 COATS A-100 LATEX HOUSE & TRIM, SHEEN TO MATCH
- CONCRETE STUCCO (EXISTING)**
2 COATS A-100 LATEX HOUSE & TRIM, SHEEN TO MATCH
- STUCCO**
PRIMER - PRO MAR MASONRY CONDITIONED B-46 W21000
TOPCOAT - SUPERPAINT A-80 SERIES A-89 SATIN A-84 GLOSS
- WOOD**
PRIMER - A-100 EXTERIOR ALKYD W009D PRIMER Y-24W20
TOPCOAT - 2 COATS A-100 LATEX HOUSE & TRIM SHEEN TO MATCH ADJACENT SURFACES
- FIELD CUTS/ DAMAGE (PRIOR TO PRIME & PAINT)
FIRST & SECOND COAT - CUPRINOL CLEAR WOOD PRESERVATIVE #158-0356 ALL PENETRATIONS INTO FINISHED GLU-LAMS SHALL BE CAULKED WITH "SIKAFLEX" SEALANT
STEEL TOUCH UP
STEEL THAT HAS BEEN WELDED, CUT OR SCRATCHED IN THE FIELD SHALL BE TOUCHED UP WITH COLD
- GALVANIZED PAINT.
- GROUNDING NOTES:
1. COMPRESSION CONNECTIONS (2), 2 AWG BARE TINNED SOLID COPPER CONDUCTORS TO GROUNDING BAR. ROUTE CONDUCTORS TO BURIED GROUNDING RING AND PROVIDE PARALLEL EXOTHERMIC WELD.

2. EC SHALL USE PERMANENT MARKER TO DRAW THE LINES BETWEEN EACH SECTION AND LABEL EACH SECTION ("P", "A", "N", "I") WITH 1" HIGH LETTERS.

3. ALL HARDWARE 18-8 STAINLESS STEEL, INCLUDING LOCK WASHERS, COAT ALL SURFACES WITH AN ANTI-OXIDANT COMPOUND BEFORE MATING. ALL HARDWARE SHALL BE STAINLESS STEEL 3/8 INCH DIAMETER OR LARGER.

4. FOR GROUND BOND TO STEEL ONLY: INSERT A CADMIUM FLAT WASHER BETWEEN LUG AND STEEL, COAT ALL SURFACES WITH AN ANTI-OXIDANT COMPOUND BEFORE MATING.

5. NUT & WASHER SHALL BE PLACED ON THE FRONT SIDE OF THE GROUNDING BAR AND BOLTED ON THE BACK SIDE.

6. NUMBER OF GROUNDING BARS MAY VARY DEPENDING ON THE TYPE OF TOWER, ANTENNA LOCATION, AND CONNECTION ORIENTATION. PROVIDE AS REQUIRED.

7. WHEN THE SCOPE OF WORK REQUIRES THE ADDITION OF A GROUNDING BAR TO AN EXISTING TOWER, THE SUBCONTRACTOR SHALL OBTAIN APPROVAL FROM THE TOWER OWNER PRIOR TO MOUNTING THE GROUNDING BAR TO THE TOWER.

8. ALL ELECTRICAL AND GROUNDING AT THE CELL SITE SHALL COMPLY WITH THE NATIONAL ELECTRICAL CODE (NEC), NATIONAL FIRE PROTECTION ASSOCIATION (NFPA) 780 (LATEST EDITION).
- BATTERY NOTES:
- A. ANY CHANGES OR ADDITIONS TO BACK-UP BATTERIES SHALL NOT CONTAIN ELECTROLYTE QUANTITIES IN EXCESS OF 50 GALLONS AND NEED NOT COMPLY WITH THE REQUIREMENTS OF 2015 IFC SECTION 608 AS INDICATED IN SECTION 608.1
- FIRE DEPARTMENT NOTES:
- A. FIRE DEPARTMENT FINAL INSPECTION REQUIRED. SCHEDULE INSPECTION 2 DAYS IN ADVANCE.

B. A CFC PERMIT TO OPERATE BATTERY SYSTEMS WITH STATIONARY LEAD-ACID BATTERIES IS NOT REQUIRED FOR THE QUANTITIES ON SITE.

C. A CFC PERMIT MAY BE REQUIRED FOR THE HAZARDOUS MATERIALS ON SITE.

D. A HAZARDOUS MATERIALS IDENTIFICATION SIGN IS REQUIRED FOR ALL ENTRANCES INTO BATTERY STORAGE AREAS. LETTERS MUST BE AT LEAST 1" IN HEIGHT AND IN A COLOR WHICH CONTRASTS TO THE BACKGROUND OF THE SIGN AND LIST THE FOLLOWING: "CLASS 1 WATER REACTIVE LIQUID TOXIC LIQUID CORROSIVE LIQUID OTHER HEALTH HAZARD LIQUID"

E. AN APPROVED METHOD TO NEUTRALIZE SPILLED ELECTROLYTE SHALL BE PROVIDED IN THE BATTERY ROOM.

F. BATTERIES SHALL BE PROVIDED WITH SAFETY VENTING CAPS.

G. LOCATIONS AND CLASSIFICATIONS OF EXTINGUISHERS SHALL BE IN ACCORDANCE WITH THE UNIFORM FIRE CODE STANDARD 10-1 AND PLACEMENT IS SUBJECT TO APPROVAL OF THE FIRE INSPECTOR.

H. STORAGE, DISPENSING OR USE OF ANY FLAMMABLE AND COMBUSTIBLE LIQUIDS, FLAMMABLE AND COMPRESSED GASES, AND OTHER HAZARDOUS MATERIALS SHALL COMPLY WITH UNIFORM FIRE CODE REGULATIONS.

I. EXIST DOORS SHALL BE ABLE TO OPEN FROM THE INSIDE WITHOUT THE USE OF KEY OR ANY SPECIAL KNOWLEDGE OR EFFORT.

J. ADDRESS NUMBERS SHALL BE A MINIMUM 6 INCHES HIGH AND PLAINLY VISIBLE FROM ROADWAY BUILDING IS ADDRESSED ON.

K. REQUIRED SIGNAGE SHALL INCLUDE LETTERING HEIGHT OF AT LEAST ONE INCH, IN A COLOR THAT CONTRASTS TO THE SIGN BACKGROUND, AND SHALL BE PROMINENTLY DISPLAYED.

L. REQUIRED SIGNAGE SHALL INCLUDE, BUT MAY NOT BE LIMITED TO, APPLICABLE TYPES FROM EXAMPLES SHOWN HEREIN (SEE SIGNAGE).

M. ALL PENETRATIONS THROUGH FIRE RATED ASSEMBLIES SHALL BE CONSTRUCTED SO AS TO MAINTAIN AN EQUAL OR GREATER FIRE RATING.

N. DECORATIVE MATERIALS SHALL BE MAINTAINED IN A FLAME-RETARDANT CONDITION. [IFC 807.3]

O. CONTRACTOR SHALL VERIFY IN FIELD THE EXISTENCE OR INSTALLATION OF A FIRE EXTINGUISHER WITH A MINIMUM RATING OF 2A-10BC, WITH A CHARGE STATUS ACCEPTABLE TO THE LOCAL FIRE AUTHORITY HAVING JURISDICTION.
- verticalbridge

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BOCA RATON, FL 33487
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- SAC WIRELESS

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www.sacw.com
- | REVISIONS | | | |
|-----------|----------|-------------|----------|
| REV. | DATE | DESCRIPTION | INITIALS |
| 0 | 02/01/19 | PZD | SR |
| 1 | 02/19/19 | FZD | SR |
| | | | |
| | | | |
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| | | | |
| | | | |
| | | | |
| | | | |
| | | | |
- DATE:

"I HEREBY CERTIFY THAT THESE PLANS WERE PREPARED BY ME AND UNDER MY DIRECT SUPERVISION AND THAT I AM DULY REGISTERED ARCHITECT UNDER THE LAWS OF THE STATE OF WASHINGTON"
- CLE ELUM DT
US-WA-5105
302 E 4TH STREET
CLE ELUM, WA 98922
- SHEET TITLE

GENERAL NOTES
- SHEET NUMBER

T-2.0
- THE INFORMATION CONTAINED IN THIS SET OF CONSTRUCTION DOCUMENTS IS PROPRIETARY BY NATURE. ANY USE OR DISCLOSURE OTHER THAN THAT WHICH RELATES TO CARRIER SERVICES IS STRICTLY PROHIBITED.

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NOTICE



Radio frequency fields beyond this point may exceed the FCC general public exposure limit. Obey all posted signs and site guidelines for working in radio frequency environments.

In accordance with Federal Communications Commission rules on radio frequency emissions 47 CFR 1.1307 (b)

AVISO



Los campos de frecuencias de radio a partir de este punto podrán exceder el límite del cual el FCC permite que el público en general podrá estar expuesto

Obedezca todas las señales indicadas y las guías del sitio para trabajar en los ambientes de frecuencia de radio.

De acuerdo a las reglas de la Comisión Federal de Comunicaciones (FCC) sobre las emisiones de frecuencias de radio 47 CFR 1.1307(b)

CAUTION



Beyond this point:
Radio frequency fields at this site may exceed FCC rules for human exposure.

For your safety, obey all posted signs and site guidelines for working in radio frequency environments.

In accordance with Federal Communications Commission rules on radio frequency emissions 47 CFR 1.1307 (b)

ATENCION



A partir de este lugar:
Los campos de frecuencias de radio en este sitio podrán exceder el límite del cual las reglas del FCC permiten que estén expuestos los humanos.

Por su seguridad, obedezca todas las señales indicadas y las guías del sitio para trabajar en los ambientes de frecuencia de radio.

De acuerdo a las reglas de la Comisión Federal de Comunicaciones (FCC) sobre las emisiones de frecuencias de radio 47 CFR 1.1307(b)

WARNING



Beyond this point:
Radio frequency fields at this site may exceed FCC rules for human exposure.

Failure to obey all posted signs and site guidelines for working in radio frequency environments could result in serious injury.

In accordance with Federal Communications Commission rules on radio frequency emissions 47 CFR 1.1307 (b)

ADVERTENCIA



A partir de este lugar:
Los campos de frecuencias de radio en este sitio exceden el límite del cual las reglas del FCC permiten que estén expuestos los humanos.

El no obedezca todas las señales indicadas y las guías del sitio para trabajar en los ambientes de frecuencia de radio, podría resultar en graves lesiones.

De acuerdo a las reglas de la Comisión Federal de Comunicaciones (FCC) sobre las emisiones de frecuencias de radio 47 CFR 1.1307(b)

ALERTING SIGNS

DANGER



HAZARDOUS MATERIAL STORAGE AREA

WARNING

THIS FACILITY CONTAINS CORROSIVE LIQUID TOXIC LIQUID CLASS 1 WATER REACTIVE LIQUID


IN CASE OF EMERGENCY CALL

1-888-662-4662


SITE NUMBER: SE09034J
SITE NAME: CLE ELUM DT




INFORMATION SIGN




DETAIL REFERENCE




ELEVATION REFERENCE




SECTION REFERENCE




AZIMUTH ARROW




ELEVATION BUBBLE




MECHANICAL GRND. CONN.




CADWELD



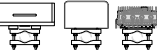
GROUND BUS BAR



EXISTING T-MOBILE PANEL ANTENNAS

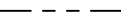


PROPOSED T-MOBILE PANEL ANTENNAS




PROPOSED T-MOBILE RADIOS

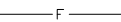
LINE TYPES



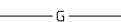
PROPERTY LINE




CENTER LINE




FIBER CABLE



GROUNDING CABLE



CHAIN LINK FENCE



WOOD FENCE

LEGEND	SCALE	3
	N.T.S.	

- CONSTRUCTION DRAWINGS: N/A
- SCOPE OF WORK: RFDS_SE09034J_0.1
- SITE SURVEY: SE09034J_A and E_Surveys_NSD-Revised Site Survey-DT Cle Elum_11-01-17
- BATTERY INFORMATION: N/A

REFERENCED DOCUMENTS	SCALE	2
	N.T.S.	

ABBREVIATION	DEFINITION		
A.B.	ANCHOR BOLT	GRND.	GROUND
ABV.	ABOVE	HDR.	HEADER
AC	AIR CONDITIONING	HGR.	HEIGHT
ACU	AIR CONDITIONING UNIT	ICGB.	ISOLATED COPPER GROUND BUS
ACCA	ANTENNA CABLE COVER ASSY.	IGR	INTERIOR GROUND RING
ADD'L	ADDITIONAL	IN. (")	INCH(ES)
A.F.F.	ABOVE FINISHED FLOOR	INT.	INTERIOR
A.F.G.	ABOVE FINISHED GRADE	LB. (#)	POUND(S)
A.G.L.	ABOVE GRADE LEVEL	L.B.	LAG BOLTS
ALUM.	ALUMINUM	L.F.	LINEAR FEET (FOOT)
ALT.	ALTERNATE	L.	LONG(ITU)DINAL
ANT.	ANTENNA	MGB	MASTER GROUND BUS
APPRX.	APPROXIMATE(LY)	MAS.	MASONRY
APX	APEX	MAX.	MAXIMUM
ARCH.	ARCHITECT(URAL)	M.B.	MACHINE BOLT
ASSY.	ASSEMBLY	MECH.	MECHANICAL
AWG.	AMERICAN WIRE GAUGE	MFR.	MANUFACTURER
BCN	BEACON	MIN.	MINIMUM
BD.	BOLLARD	MISC.	MISCELLANEOUS
BDK	BRASS DISK	MTL.	METAL
BLDG.	BUILDING	MW	MICROWAVE
BLK.	BLOCK	(N)	NEW
BLKG.	BLOCKING	NO. (#)	NUMBER
BM	BEAM / BENCH MARK	N.T.S.	NOT TO SCALE
B.N.	BOUNDARY NAILING	O.C.	ON CENTER
BTCW.	BARE TINNED COPPER WIRE	OH.	OVERHEAD
B.O.F.	BOTTOM OF FOOTING	OHP	OVERHEAD POWER LINE
BTM.	BOTTOM	OPNG.	OPENING
BRC.	BRACE	P/C	PRECAST CONCRETE
BTS	BASE TRANSCEIVER STATION	PLY.	PLYWOOD
B.W.F.	BARBED WIRE FENCE	PPC	POWER PROTECTION CABINET
B/U	BACK-UP CABINET	P.S.F.	POUNDS PER SQUARE FOOT
CAB.	CABINET	P.S.I.	POUNDS PER SQUARE INCH
CANT.	CANTILEVER(ED)	P.T.	PRESSURE TREATED
C.I.P.	CAST IN PLACE	PWR.	POWER (CABINET)
C.L.F.	CHAIN LINK FENCE	QTY.	QUANTITY
CLG.	CEILING	R.	RADIUS
CLR.	CLEAR	RAD. CTR.	RADIATION CENTER
COL.	COLUMN	RBS	RADIO BASE STATION
CONC.	CONCRETE	REF.	REFERENCE
CONN.	CONNECTION(OR)	REINF.	REINFORCEMENT(ING)
CONST.	CONSTRUCTION	REQD.	REQUIRED
CONT.	CONTINUOUS	RF	RADIO FREQUENCY
CPD	CONCRETE PAD	RGS	RIGID GALVANIZED STEEL
C.T.	CABLE TRAY	RRU	REMOTE RADIO UNIT
d	PENNY (NAILS)	RRH	REMOTE RADIO HEAD
DBL.	DOUBLE	SCH.	SCHEDULE
DEF.	DEFINITION	SHT.	SHEET
DEPT.	DEPARTMENT	SIM.	SIMILAR
D.F.	DOUGLAS FIR	SPEC.	SPECIFICATION(S)
DIA. (Ø)	DIAMETER	SP	STEEL PLATE
DIAG.	DIAGONAL	SQ.	SQUARE
DIM.	DIMENSION	S.S.	STAINLESS STEEL
DR.	DOOR	STD.	STANDARD
DWG.	DRAWING(S)	STL.	STEEL
DWL.	DOWEL(S)	STRUC.	STRUCTURAL
EA.	EACH	T.B.D.	TO BE DETERMINED
EBX	ELECTRICAL BOX	T.B.R.	TO BE RESOLVED
EG	EQUIPMENT GROUND	TEMP.	TEMPORARY
EGR	EQUIPMENT GROUND RING	THK.	THICK(NESS)
EL.	ELEVATION	TMA	TOWER MOUNTED AMPLIFIER
ELEC.	ELECTRICAL	T.N.	TOE NAIL
ELEV.	ELEVATOR	T.O.A.	TOP OF ANTENNA
EM	ELECTRICAL METER	T.O.C.	TOP OF CURB
E.M.T.	ELECTRICAL METALLIC TUBING	T.O.F.	TOP OF FOUNDATION
E.O.P.	EDGE OF PAVEMENT	T.O.P.	TOP OF PLATE (PARAPET)
EQ. (=)	EQUAL	T.O.S.	TOP OF STEEL
EVLT	ELECTRICAL VAULT	T.O.W.	TOP OF WALL
ENG.	EXPANSION	TWR.	TOWER
EXST.	EXISTING	TYP.	TYPICAL
EXT.	EXTERIOR	U.G.	UNDER GROUND
FAB.	FABRICATION(OR)	U.L.	UTILITY POLE
F.N.	FINISH FLOOR	U.N.O.	UNLESS NOTED OTHERWISE
F.O.	FINISH GRADE	V.I.N.	VERIFY IN FIELD
FIN.	FINISH(ED)	W.	WIDE(WIDTH)
FLR.	FLOOR	WD.	WOOD
FDN.	FOUNDATION	W.P.	WEATHERPROOF
F.C.	FACE OF CONCRETE	WT.	WEIGHT
F.M.	FACE OF MASONRY		
F.S.	FACE OF STUD		
F.W.	FACE OF WALL		
F.S.	FINISHED SURFACE		
FT. (')	FOOT(FEET)		
FTG.	FOOTING		
GA.	GAUGE		
GI.	GALVANIZE(D)		
G.F.I.	GROUND FAULT INTERRUPTER		
GEN	GENERATOR		
GLB.	GLOBAL POSITIONING SYSTEM		
GRC.	GROWTH RADIO CABINET		

ABBREVIATIONS	SCALE	1
	N.T.S.	

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SAN DIEGO, CA 92122
www.sacw.com

REVISIONS			
REV.	DATE	DESCRIPTION	INITIALS
0	02/01/19	PZD	SR
1	02/19/19	FZD	SR

DATE:

I HEREBY CERTIFY THAT THESE PLANS WERE PREPARED BY ME AND UNDER MY DIRECT SUPERVISION AND THAT I AM DULY REGISTERED ARCHITECT UNDER THE LAWS OF THE STATE OF WASHINGTON

CLE ELUM DT
US-WA-5105
302 E 4TH STREET
CLE ELUM, WA 98922

SHEET TITLE

REFERENCED DOCUMENTS, ABBREVIATIONS, LEGEND & SIGNAGE

SHEET NUMBER

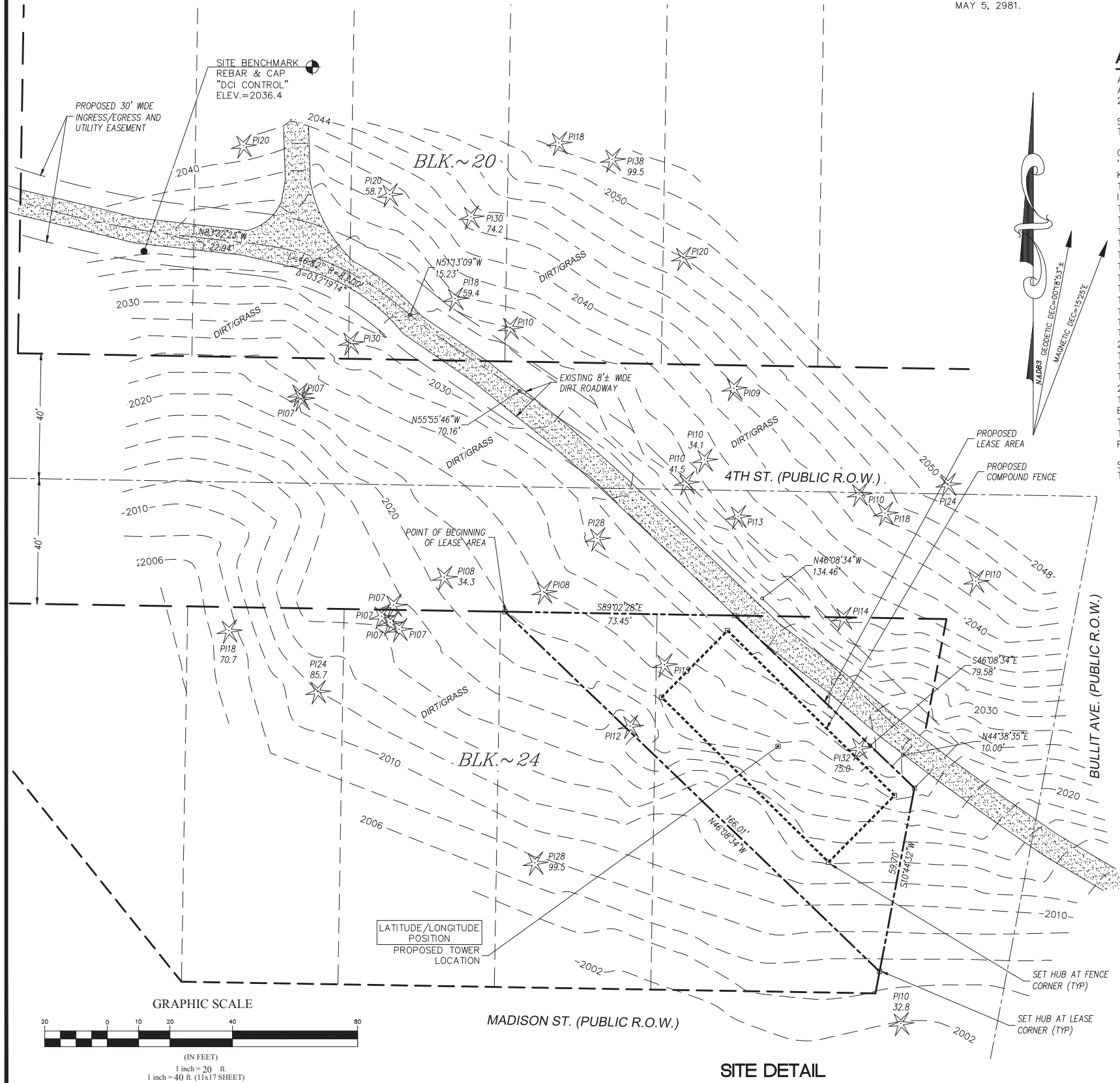
T-3.0

LEASE DESCRIPTION

THAT PORTION OF BLOCK 24, PLAT OF HILLCREST ADDITION TO CLE ELUM, RECORDS OF KITTITAS COUNTY, WASHINGTON, IN SECTION 26, TOWNSHIP 20 NORTH, RANGE 15 EAST, W.M., DESCRIBED AS FOLLOWS:

COMMENCING AT THE FOUND BAR AND CAP AT THE NORTHWEST CORNER OF LOT 'B' AS SHOWN ON SURVEY RECORDED IN VOLUME 39 PAGE 149, RECORDS OF KITTITAS COUNTY, WASHINGTON;
THENCE SOUTH 14°30'06" WEST 300.84 FEET TO A FOUND MONUMENT AT THE INTERSECTION OF PENNSYLVANIA AVENUE AND 5TH STREET;
THENCE SOUTH 77°25'53" EAST 1091.92 FEET TO THE POINT OF BEGINNING;
THENCE SOUTH 89°02'28" EAST 73.45 FEET;
THENCE SOUTH 46°08'34" EAST 79.58 FEET;
THENCE SOUTH 10°44'32" WEST 59.70 FEET;
THENCE NORTH 46°08'34" WEST 166.01 FEET TO THE POINT OF BEGINNING;

CONTAINING 6,140 SQUARE FEET, MORE OR LESS.



NOTES

- 1) NO TITLE RESEARCH PROVIDED AT THIS TIME. CALCULATED BOUNDARY MAY CHANGE UPON RECEIPT OF TITLE.
- 2) FIELD WORK CONDUCTED IN JUNE, 2017.
- 3) BASIS OF BEARING: WASHINGTON STATE PLANE COORDINATE SYSTEM, SOUTH ZONE (NAD83).
- 4) UNDERGROUND UTILITIES SHOWN HEREON, IF ANY, WERE DELINEATED FROM SURFACE EVIDENCE AND/OR UTILITY COMPANY RECORDS. CRITICAL LOCATIONS SHOULD BE VERIFIED PRIOR TO DESIGN AND CONSTRUCTION.
- 5) FEMA DESIGNATION: ZONE 'C' (AREAS OF MINIMAL FLOODING. [NO SHADING]), ONLY PANEL PRINTED FOR FIRM MAP NUMBER 5300960001B, EFFECTIVE DATE MAY 5, 2981.

LATITUDE/LONGITUDE POSITION

COORDINATE DATA AT PROPOSED TOWER LOCATION:
NAD 83
LAT - 47°11'51.07" N NAVD 88
LONG - 120°55'58.43" W ELEV.= 2023.6 FEET



BENCHMARK IS BASED ON
WSRN PUGET SOUND
REFERENCE NETWORK.

ELEVATION DERIVED USING GPS. ACCURACY
MEETS OR EXCEEDS 1A STANDARDS AS DEFINED
ON THE FAA ASAC INFORMATION SHEET 91:003.

ACCESS AND UTILITY DESCRIPTION

A TRACT OF LAND LOCATED IN THAT PORTION OF BLOCK 24, PLAT OF HILLCREST ADDITION TO CLE ELUM, RECORDS OF KITTITAS COUNTY, WASHINGTON, IN SECTION 26, TOWNSHIP 20 NORTH, RANGE 15 EAST, W.M., DESCRIBED AS FOLLOWS:

SAID TRACT BEING A 20 FOOT STRIP OF LAND LYING 10 FEET OF BOTH SIDES OF THE FOLLOWING DESCRIBED CENTERLINE:

COMMENCING AT THE FOUND BAR AND CAP AT THE NORTHWEST CORNER OF LOT 'B' AS SHOWN ON SURVEY RECORDED IN VOLUME 39 PAGE 149, RECORDS OF KITTITAS COUNTY, WASHINGTON;
THENCE SOUTH 14°30'06" WEST 300.84 FEET TO A FOUND MONUMENT AT THE INTERSECTION OF PENNSYLVANIA AVENUE AND 5TH STREET;
THENCE SOUTH 77°25'53" EAST 1091.92 FEET;
THENCE SOUTH 89°02'28" EAST 73.45 FEET;
THENCE SOUTH 46°08'34" EAST 69.58 FEET TO THE POINT OF BEGINNING;
THENCE NORTH 44°38'35" EAST 10.00 FEET;
THENCE NORTH 46°08'34" WEST 134.46 FEET;
THENCE NORTH 55°55'46" WEST 70.16 FEET;
THENCE NORTH 51°13'09" WEST 15.23 FEET TO THE BEGINNING OF A CURVE TO THE LEFT HAVING A RADIUS OF 83.00 FEET;
THENCE ALONG SAID CURVE 46.82 FEET THROUGH A CENTRAL ANGLE OF 32°19'14";
THENCE NORTH 83°32'23" WEST 22.94 FEET TO THE BEGINNING OF A CURVE TO THE RIGHT HAVING A RADIUS OF 300.00 FEET;
THENCE ALONG SAID CURVE 106.11 FEET THROUGH A CENTRAL ANGLE OF 20°15'59";
THENCE NORTH 63°16'24" WEST 48.40 FEET TO THE BEGINNING OF A CURVE TO THE LEFT HAVING A RADIUS OF 428.70 FEET;
THENCE ALONG SAID CURVE 172.47 FEET THROUGH A CENTRAL ANGLE OF 23°03'00";
THENCE NORTH 86°19'25" WEST 1.08 FEET TO THE CENTERLINE OF THE ALLEY BETWEEN BLOCKS 17 AND 21 OF SAID PLAT OF HILLCREST ADDITION TO CLE ELUM;
THENCE ALONG SAID ALLEY CENTERLINE NORTH 89°02'28" WEST 518.69 FEET;
THENCE NORTH 73°38'27" WEST 94.96 FEET TO THE EASTERLY MARGIN OF PENNSYLVANIA AVENUE AND THE TERMINUS OF THIS CENTERLINE DESCRIPTION;

SIDELINE TO BE LENGTHENED OR SHORTENED TO CONNECT WITH EACH OTHER AND THE TERMINATE AT THE EASTERLY MARGIN OF SAID PENNSYLVANIA AVENUE.

LEGEND

- SUBJECT BOUNDARY LINE
- - - - - RIGHT-OF-WAY CENTERLINE
- RIGHT-OF-WAY LINE
- ADJACENT BOUNDARY LINE
- SECTIONAL BREAKDOWN LINE
- DP --- OVERHEAD POWER LINE
- UP --- BURIED POWER LINE
- G --- BURIED GAS LINE
- OT --- OVERHEAD TELEPHONE LINE
- UT --- BURIED TELEPHONE LINE
- W --- BURIED WATER LINE
- SS --- BURIED SANITARY SEWER
- SD --- BURIED STORM DRAIN
- D --- DITCH LINE/FLOW LINE

- ROCK RETAINING WALL
- VEGETATION LINE
- CHAIN LINK FENCE
- WOOD FENCE
- BARBED WIRE/WIRE FENCE

- △ TRANSFORMER
- ⌘ LIGHT STANDARD
- P POWER VAULT
- ☒ UTILITY BOX
- ☒ UTILITY POLE
- ← POLE GUY WIRE
- ⊠ GAS VALVE
- ⊠ GAS METER
- T TELEPHONE VAULT
- ⊙ TEL. MANHOLE
- TELEPHONE RISER
- ⊙ FIRE HYDRANT
- ⊠ GATE VALVE
- ⊙ WATER METER
- ⊙ FIRE STAND PIPE
- ⊠ IRRIGATION CONTROL
- ⊠ CATCH BASIN, TYPE I
- ⊠ CATCH BASIN, TYPE II
- ⊠ SIGN
- ⊠ BOLLARD
- ⊠ MAIL BOX
- ⊠ SPOT ELEVATION

- NOTE:
- 1) ALL ELEVATIONS SHOWN ARE ABOVE MEAN SEA LEVEL (AMSL) AND ARE REFERENCED TO THE NAVD88 DATUM.
 - 2) ALL TOWER, TREE AND APPURTENANCE HEIGHTS ARE ABOVE GROUND LEVEL (AGL) AND ARE ACCURATE TO ± 0.5 FEET OR ± 1% OF TOTAL HEIGHT, WHICHEVER IS GREATER.

TREE LEGEND

- DECIDUOUS TREE
- AL=ALDER
 - MP=MAPLE
 - DS=DECIDUOUS
 - MA=MADRONA
 - OK=OAK
 - CH=CHERRY
- EVERGREEN TREE
- CE=CEDAR
 - DF=DOUGLAS FIR
 - HE=HEMLOCK
 - PI=PINE
 - EVG=EVERGREEN
- NOTE: TREE DRIP LINES ARE NOT TO SCALE. TREE SYMBOLS REFERENCE TRUNK LOCATION ONLY. TRUNK DIAMETERS WERE APPROXIMATED AT 3.5' TO 4' ABOVE GROUND LEVEL. TREES SHOWN ARE FOR REFERENCE ONLY AND OTHER TREES AND VEGETATION MAY EXIST.

SITE INFORMATION

TAX LOT NUMBER 950417, 950416, 950415, 950423, 950422, 950421 AND R.O.W.

SITE ADDRESS N/A

OWNER: CLE ELUM, WA 98922

ZONING CITY OF CLE ELUM PUBLIC RESERVE AREA (CITY OF CLE ELUM) TO BE DETERMINED

TOTAL LOT AREA 6,140 S.F.

PROJECT AREA 6,140 S.F.

SURVEY REFERENCE

- 1.) RECORD OF SURVEY PER A.F. NO. 201504140014, RECORDS OF KITTITAS COUNTY.
- 2.) PLAT OF HILLCREST ADDITION TO CLE ELUM PER VOLUME 2, PAGE 45, PLAT RECORDS OF KITTITAS COUNTY.

BOUNDARY DISCLAIMER

THIS PLAN DOES NOT REPRESENT A BOUNDARY SURVEY. SUBJECT AND ADJACENT PROPERTY LINES ARE DEPICTED USING FIELD-FOUND EVIDENCE AND RECORD INFORMATION.

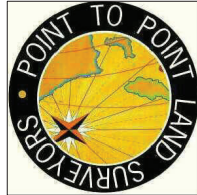
CAUTION!

UNDERGROUND UTILITIES EXIST IN THE AREA AND UTILITY INFORMATION SHOWN MAY BE INCOMPLETE. STATE LAW REQUIRES THAT CONTRACTOR CONTACT THE ONE-CALL UTILITY LOCATE SERVICE AT LEAST 48 HOURS BEFORE STARTING ANY CONSTRUCTION.

1-800-424-5555

T-Mobile

SURVEY MANAGED BY:



POINT TO POINT
LAND SURVEYORS
1010 PENNSYLVANIA AVENUE
McDONOUGH, GA 30253
(p)678-565-4440 (f)678-565-4497
(w)POINTTOPPOINTSURVEY.COM
TEXAS REGISTRATION NO. 10194197

SURVEY PREPARED FOR:



VERTICAL BRIDGE HOLDINGS, LLC
750 PARK OF COMMERCE DRIVE,
SUITE 200
BOCA RATON, FL 33487

SURVEY PREPARED BY:



DUNCANSON
Company, Inc.

145 SW 155th Street, Suite 102
Seattle, Washington 98166
Phone 206.244.4141
Fax 206.244.4455

SITE
US-WA-5105
CITY OF CLE ELUM
SE09034
CLE ELUM, WA 98922
KITTITAS COUNTY

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FLD. BOOK:	448/127
DRAWN BY:	LAC
JOB #:	01808.1282
DATE:	06/13/17

REVISIONS

DATE	DESCRIPTION	BY
11/01/17	ADDITIONAL TOPOGRAPHY SITE RE-LOCATION	JMB



SHEET TITLE
EXISTING SITE SURVEY
SEC 26, TWP 20 N, RNG 15 E, WM

SHEET NUMBER

SV1

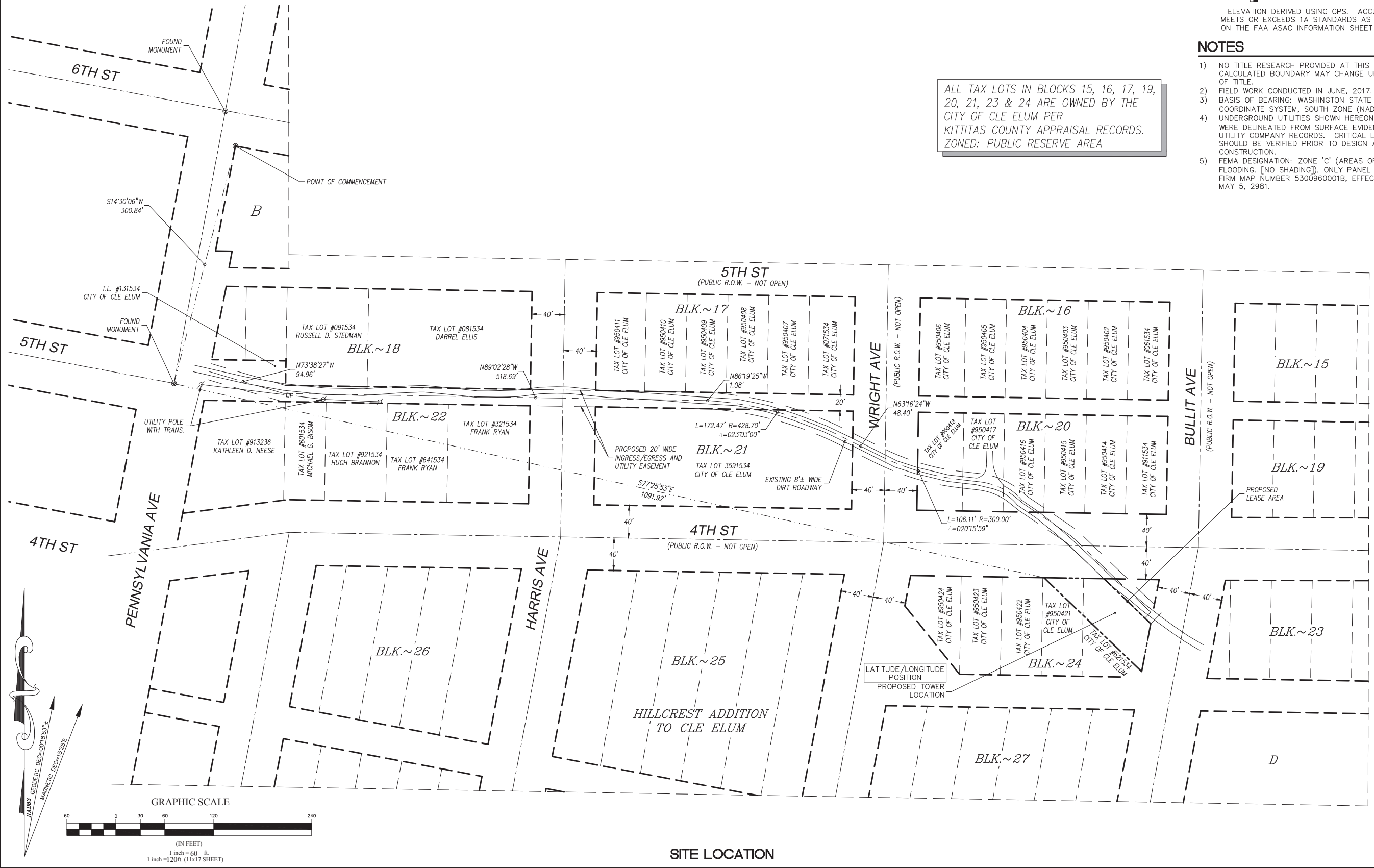
LEGAL DESCRIPTION
NO TITLE RESEARCH PROVIDED AT THIS TIME

EASEMENTS
CORRESPONDS WITH ITEM NUMBER IN 'SCHEDULE B' OF TITLE REPORT.
THE FOLLOWING EASEMENTS FROM THE REFERENCED TITLE REPORT CONTAIN SUFFICIENT INFORMATION TO BE DEPICTED ON THE PLAN. OTHER EASEMENTS OR ENCUMBRANCES, IF ANY, MAY AFFECT THE PROPERTY, BUT LACK SUFFICIENT INFORMATION TO BE SHOWN.
NO TITLE RESEARCH PROVIDED AT THIS TIME

LATITUDE/LONGITUDE POSITION
COORDINATE DATA AT PROPOSED TOWER LOCATION:
NAD 83
LAT - 47°11'51.07" N NAVD 88
LONG - 120°55'58.43" W ELEV.= 2023.6 FEET
BENCHMARK IS BASED ON WSRN PUGET SOUND REFERENCE NETWORK.
ELEVATION DERIVED USING GPS. ACCURACY MEETS OR EXCEEDS 1A STANDARDS AS DEFINED ON THE FAA ASAC INFORMATION SHEET 91:003.

- NOTES
- 1) NO TITLE RESEARCH PROVIDED AT THIS TIME. CALCULATED BOUNDARY MAY CHANGE UPON RECEIPT OF TITLE.
 - 2) FIELD WORK CONDUCTED IN JUNE, 2017.
 - 3) BASIS OF BEARING: WASHINGTON STATE PLANE COORDINATE SYSTEM, SOUTH ZONE (NAD83).
 - 4) UNDERGROUND UTILITIES SHOWN HEREON, IF ANY, WERE DELINEATED FROM SURFACE EVIDENCE AND/OR UTILITY COMPANY RECORDS. CRITICAL LOCATIONS SHOULD BE VERIFIED PRIOR TO DESIGN AND CONSTRUCTION.
 - 5) FEMA DESIGNATION: ZONE 'C' (AREAS OF MINIMAL FLOODING, [NO SHADING]). ONLY PANEL PRINTED FOR FIRM MAP NUMBER 5300960001B, EFFECTIVE DATE MAY 5, 2081.

ALL TAX LOTS IN BLOCKS 15, 16, 17, 19, 20, 21, 23 & 24 ARE OWNED BY THE CITY OF CLE ELUM PER KITTITAS COUNTY APPRAISAL RECORDS. ZONED: PUBLIC RESERVE AREA



T-Mobile

SURVEY MANAGED BY:

POINT TO POINT LAND SURVEYORS
1010 PENNSYLVANIA AVENUE
McDONOUGH, GA 30253
(p)678-565-4440 (f)678-565-4497
(w)POINTTOPPOINTSSURVEY.COM
TEXAS REGISTRATION NO. 10194197

SURVEY PREPARED FOR:

verticalbridge

VERTICAL BRIDGE HOLDINGS, LLC
750 PARK OF COMMERCE DRIVE, SUITE 200
BOCA RATON, FL 33487

SURVEY PREPARED BY:

DUNCANSON
Company, Inc.
145 SW 155th Street, Suite 102
Seattle, Washington 98166
Phone 206.244.4141
Fax 206.244.4455

SITE
US-WA-5105
CITY OF CLE ELUM
SE09034
CLE ELUM, WA 98922
KITTITAS COUNTY

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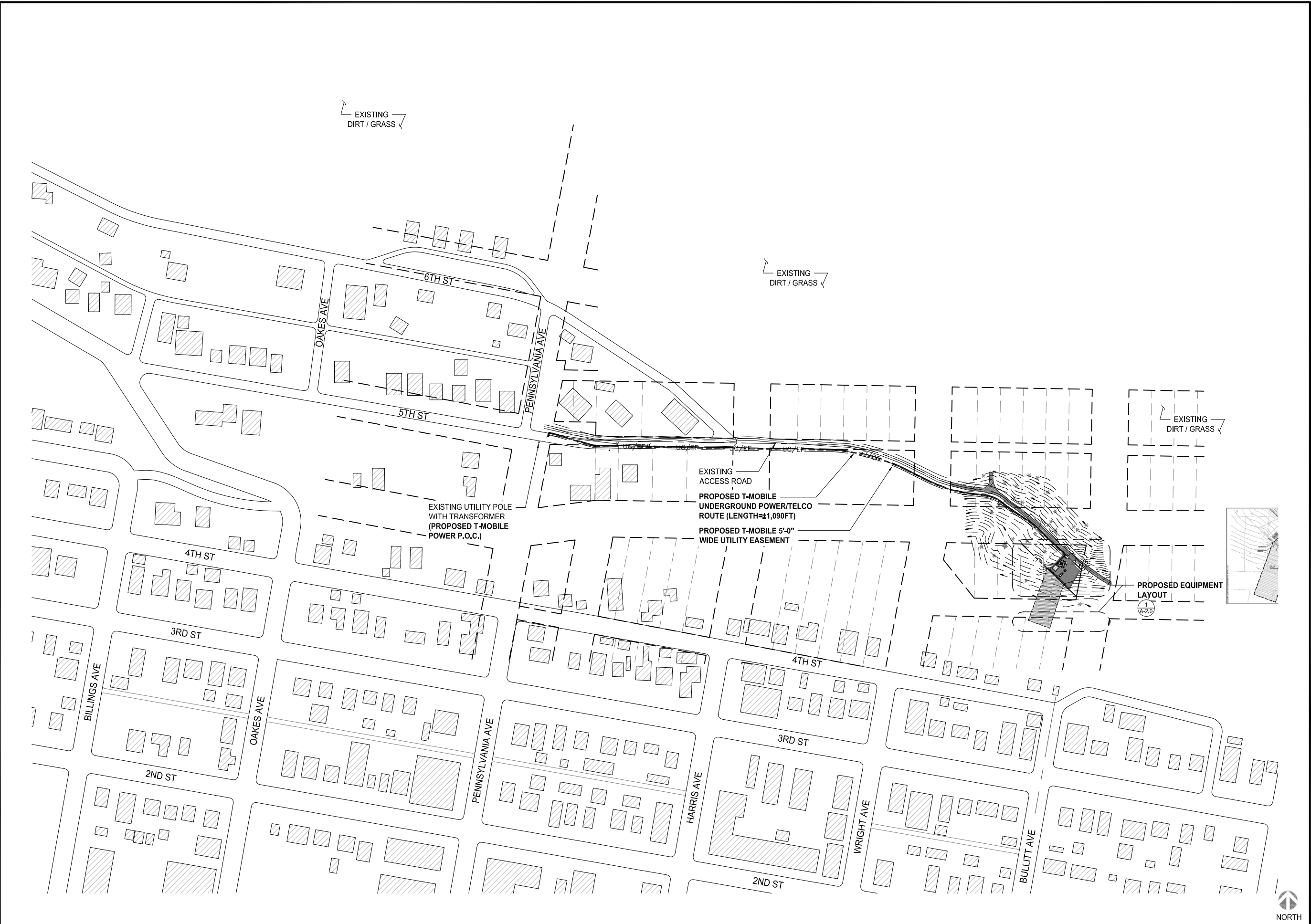
REVISIONS

DATE	DESCRIPTION	BY
11/01/17	ADDITIONAL TOPOGRAPHY SITE RE-LOCATION	JMB

SHEET TITLE
EXISTING SITE SURVEY
SEC 26, TWP 20 N, RNG 15 E, WM

SHEET NUMBER
SV2

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OVERALL SITE PLAN

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SUITE 200
BOCA RATON, FL 33487

T-Mobile

10509 VISTA SORRENTO PKWY #206
SAN DIEGO, CA 92121
T-MOBILE.COM

SAC WIRELESS
SAC AE DESIGN GROUP, INC.
5015 SHOREHAM PLACE, SUITE 150
SAN DIEGO, CA 92122
www.sacw.com

REVISIONS			
REV.	DATE	DESCRIPTION	INITIALS
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1	02/19/19	FZD	SR

DATE: _____

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CLE ELUM DT
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302 E 4TH STREET
CLE ELUM, WA 98922

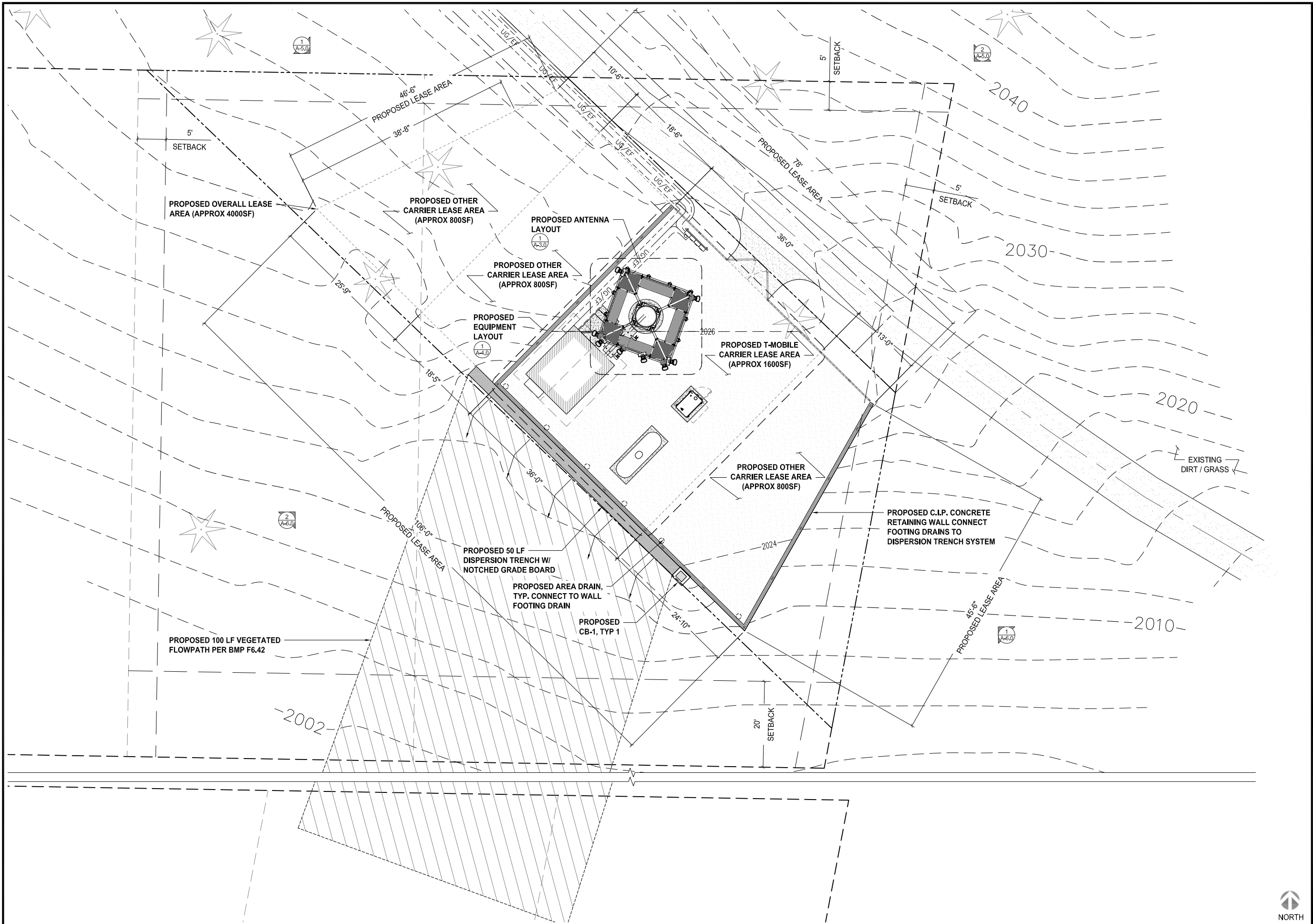
SHEET TITLE

OVERALL SITE PLAN

SHEET NUMBER

A-1.0

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www.sacw.com

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DATE: _____

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SHEET TITLE

ENLARGED SITE PLAN

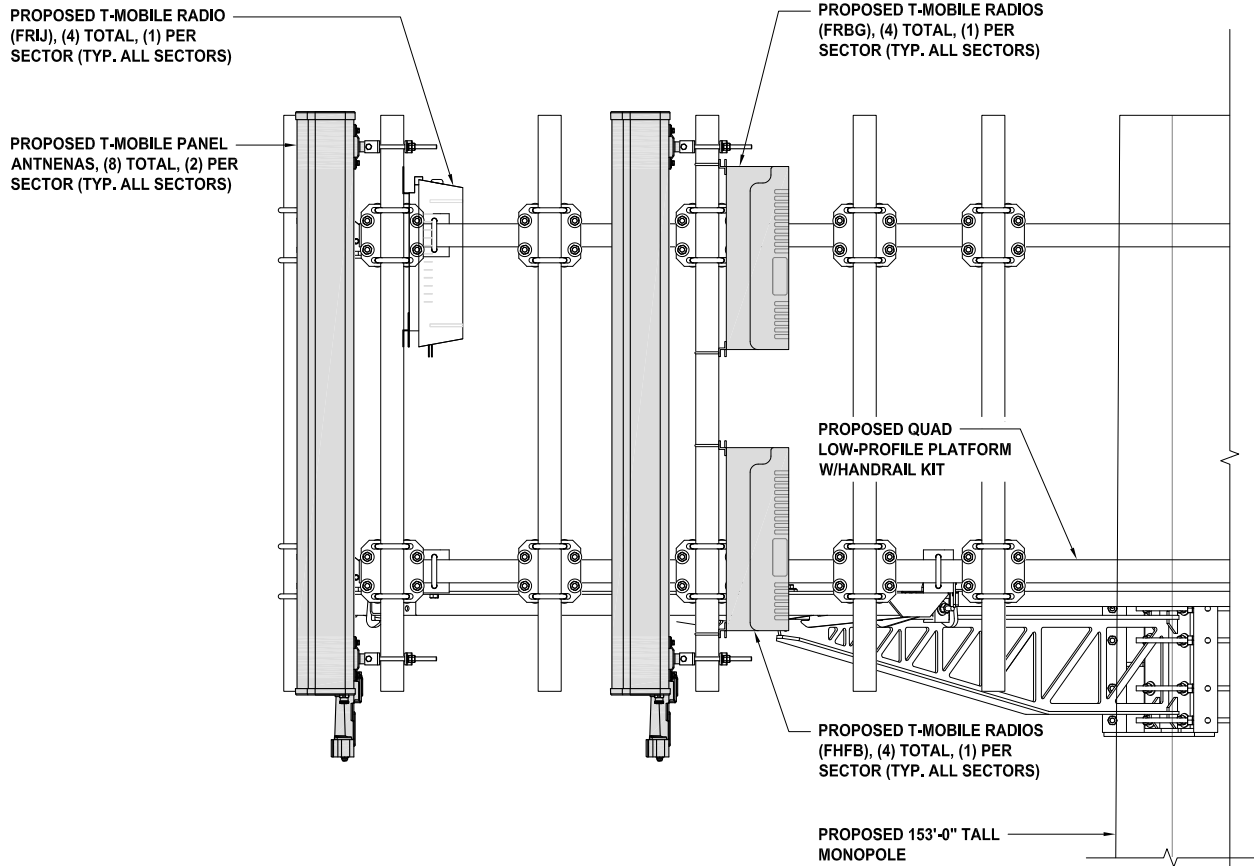
SHEET NUMBER

A-2.0

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NOT USED

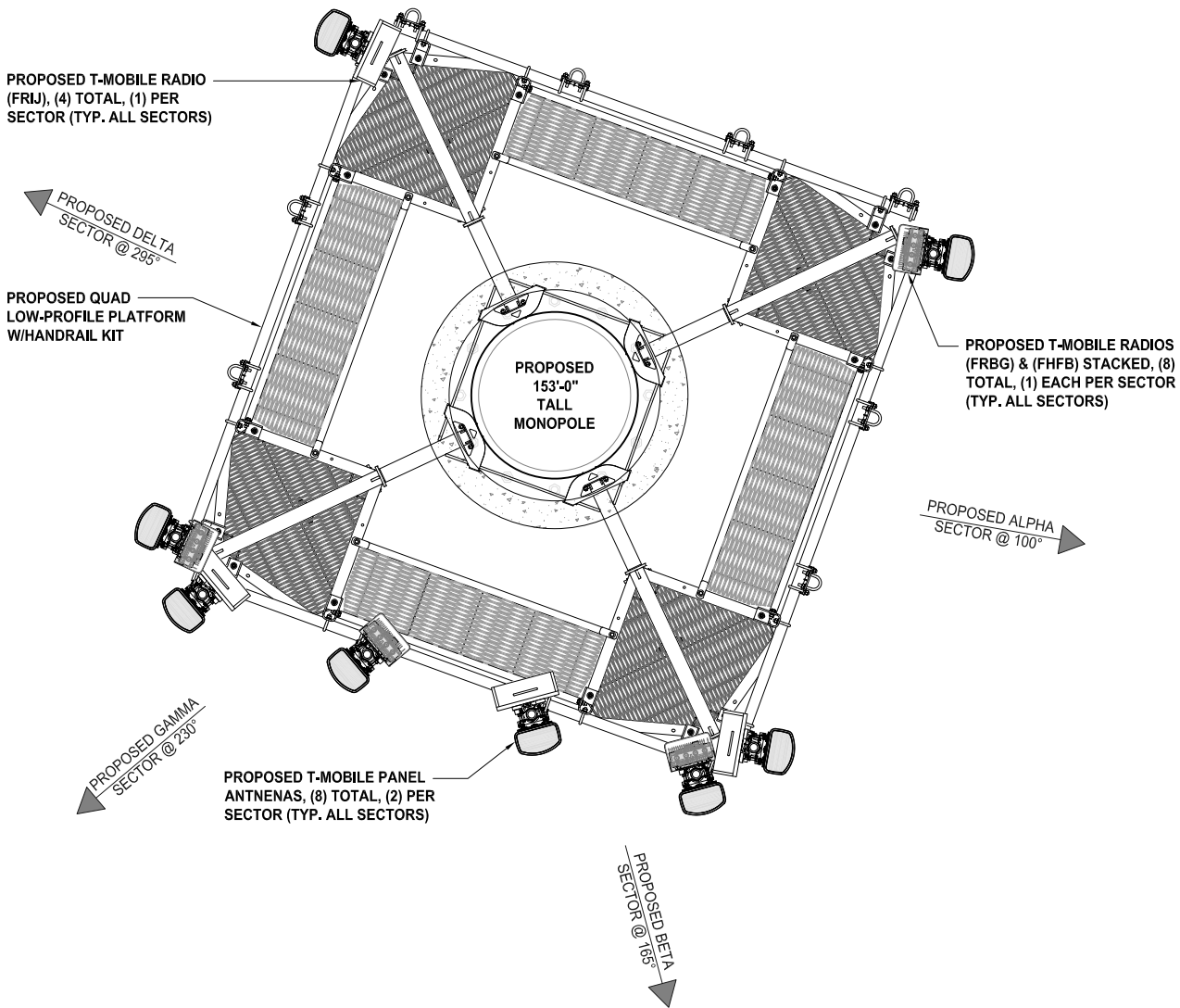
SCALE
N.T.S. 3



0 3" 6" 1'
SCALE: 1"=1'-0" (22x34)
(OR) 1/2"=1'-0" (11x17)

2

ANTENNA PLAN



0 6" 1' 2'
SCALE: 1/2"=1'-0" (22x34)
(OR) 1/4"=1'-0" (11x17)

1

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SHEET TITLE

ANTENNA PLAN AND
MOUNTING DETAILS

SHEET NUMBER

A-3.0



PROPOSED ACCESS DOOR

PROPOSED T-MOBILE CABLE ENTRY PORT

PROPOSED T-MOBILE EQUIPMENT RACKS (TYP. OF 3)

PROPOSED T-MOBILE 10' x 12' EQUIPMENT SHELTER

PROPOSED T-MOBILE OVERHEAD CABLE LADDER

PROPOSED T-MOBILE ELECTRICAL PANEL

PROPOSED T-MOBILE TVSS

3' WORKING CLEARANCE

HVAC UNIT

HVAC UNIT

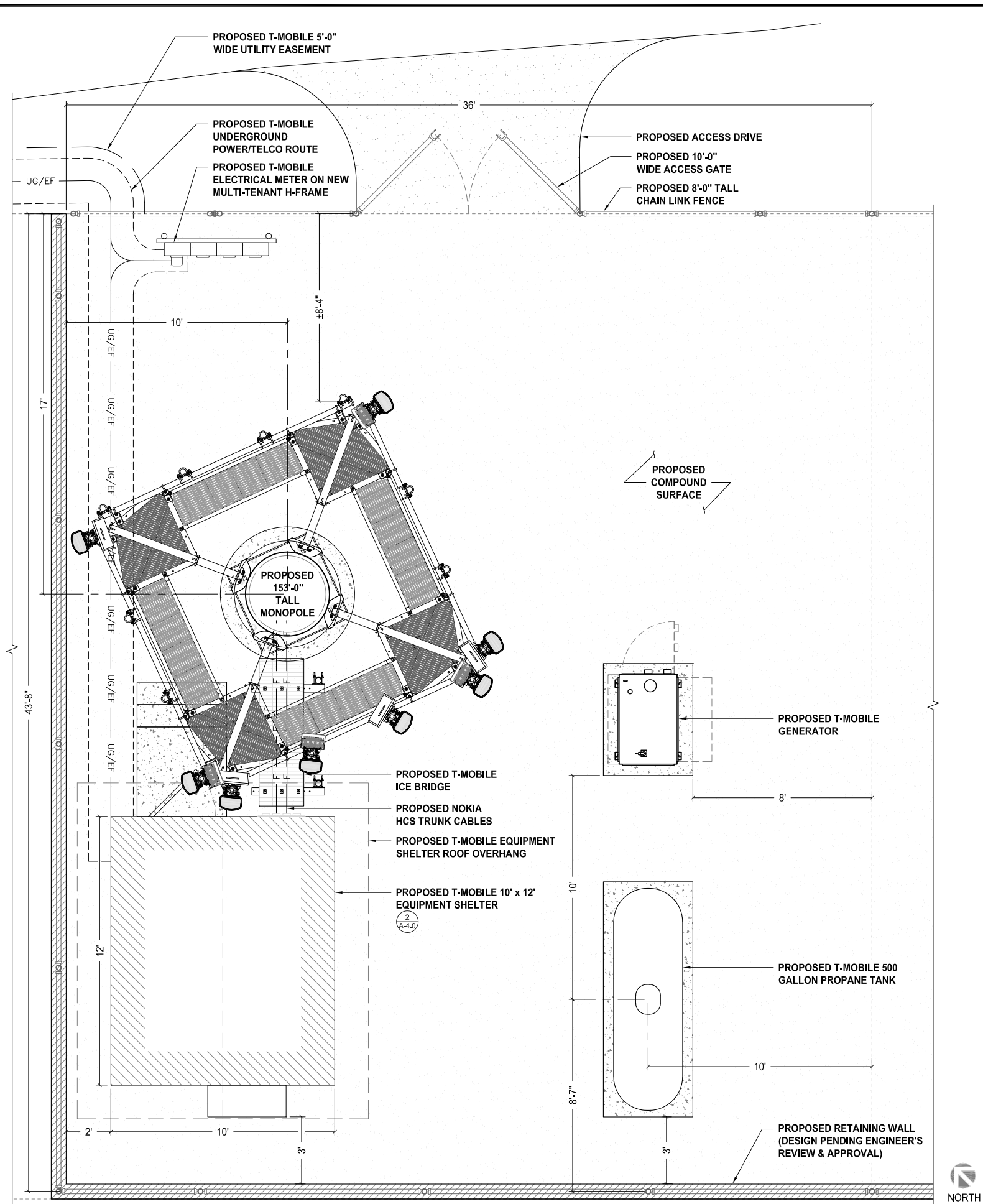
10'

PROPOSED T-MOBILE EQUIPMENT SHELTER

PROPOSED T-MOBILE EQUIPMENT SHELTER ROOF OVERHANG

12'

NORTH



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750 PARK OF COMMERCE DRIVE,
SUITE 200
BOCA RATON, FL 33487

T-Mobile
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T-MOBILE.COM

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WIRELESS
SAC AE DESIGN GROUP, INC.
5015 SHOREHAM PLACE, SUITE 150
SAN DIEGO, CA 92122
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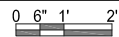
SHEET TITLE

EQUIPMENT LAYOUT &
EQUIPMENT SHELTER
PLAN

SHEET NUMBER

A-4.0

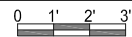
EQUIPMENT SHELTER PLAN



SCALE: 1/2"=1'-0" (22x34)
(OR) 1/4"=1'-0" (11x17)

2

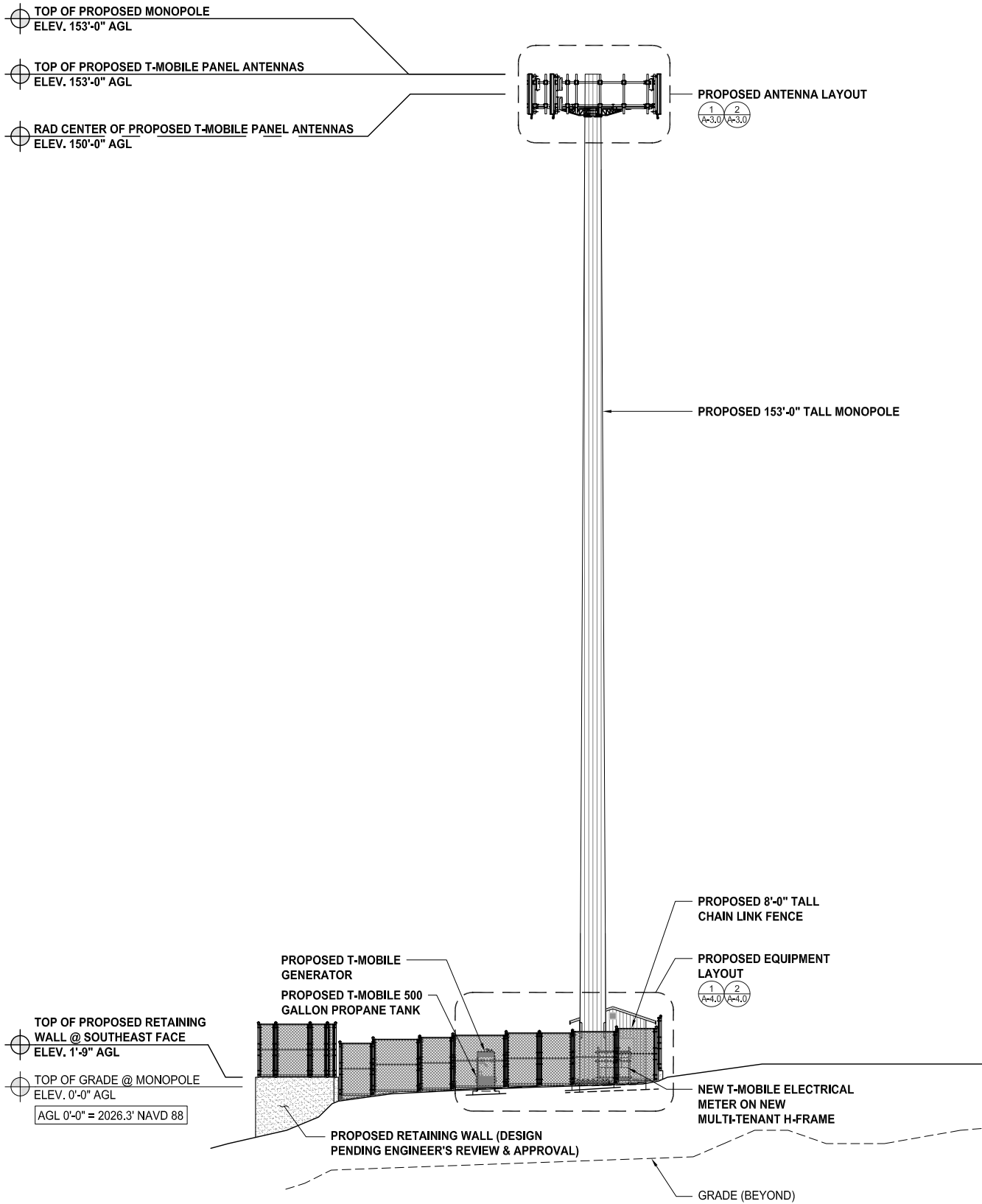
EQUIPMENT LAYOUT



SCALE: 3/8"=1'-0" (22x34)
(OR) 3/16"=1'-0" (11x17)

1

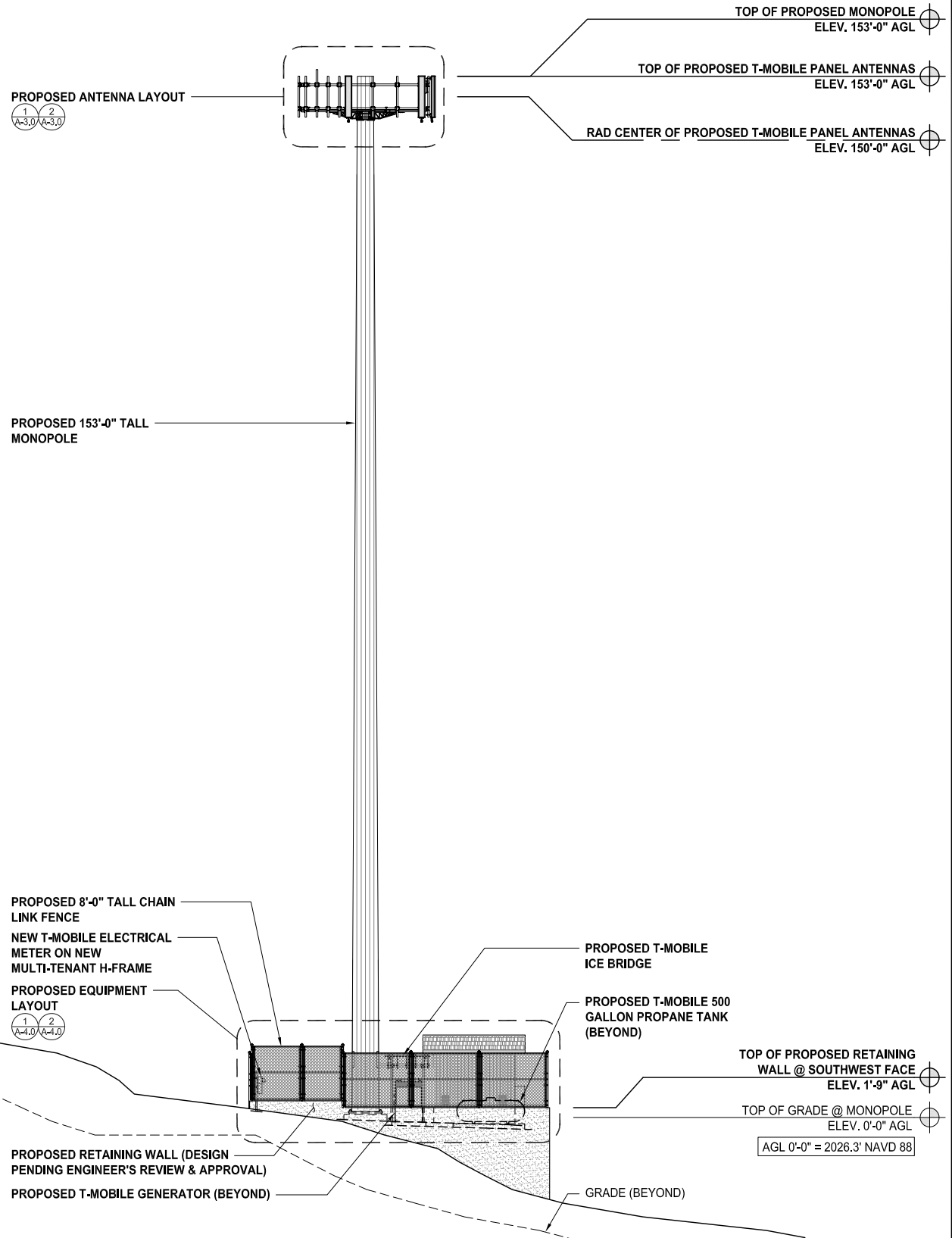
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NORTHEAST ELEVATION

0 3' 6' 12'
SCALE: 3/32"=1'-0" (22x34)
(OR) 3/64"=1'-0" (11x17)

2



NORTHWEST ELEVATION

0 3' 6' 12'
SCALE: 3/32"=1'-0" (22x34)
(OR) 3/64"=1'-0" (11x17)

1



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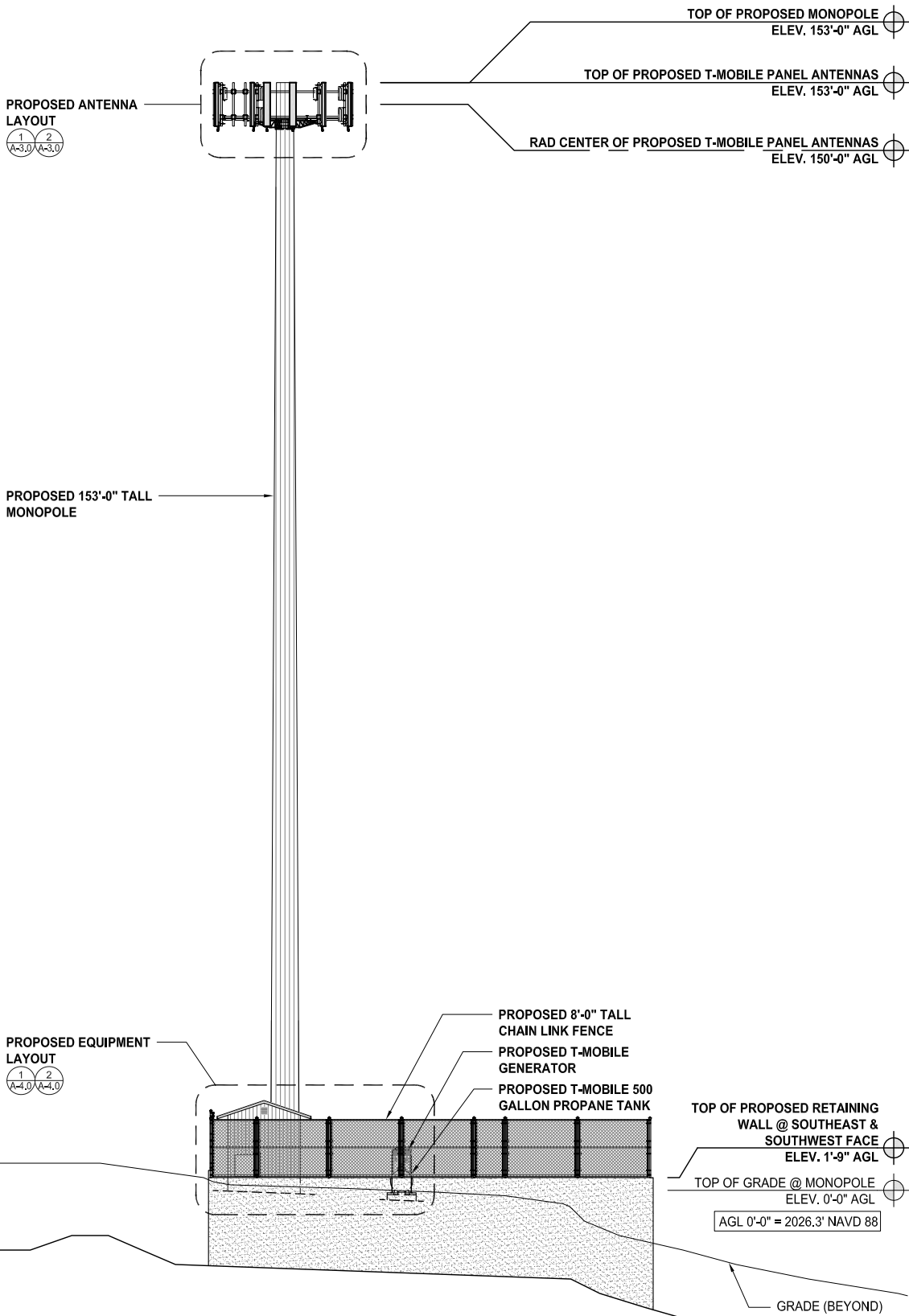
SHEET TITLE

NORTHWEST & NORTHEAST ELEVATIONS

SHEET NUMBER

A-5.0

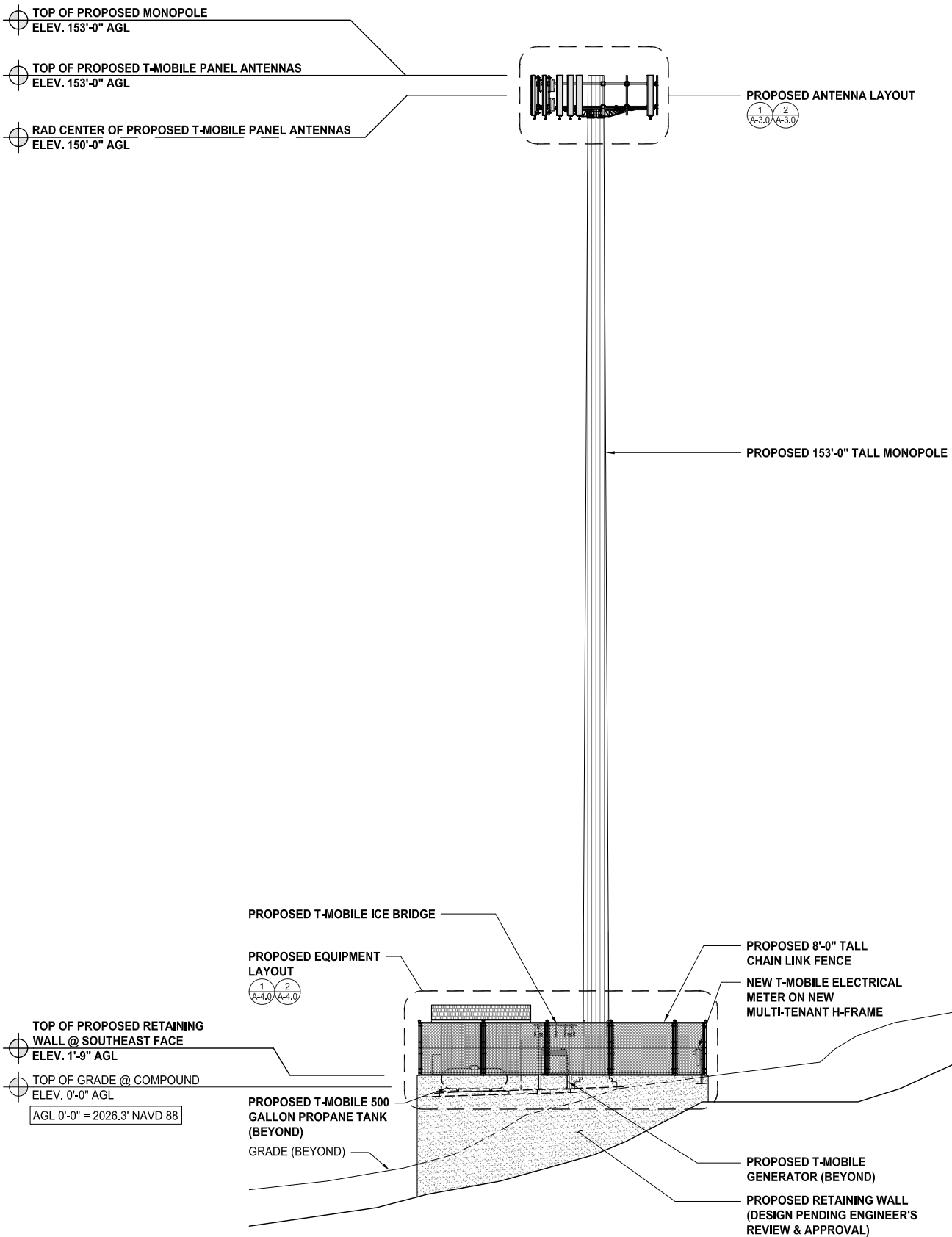
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SOUTHWEST ELEVATION

0 3' 6' 12' SCALE: 3/32"=1'-0" (22x34)
(OR) 3/64"=1'-0" (11x17)

2



SOUTHEAST ELEVATION

0 3' 6' 12' SCALE: 3/32"=1'-0" (22x34)
(OR) 3/64"=1'-0" (11x17)

1



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SHEET TITLE

SOUTHEAST & SOUTHWEST ELEVATIONS

SHEET NUMBER

A-6.0