



CONSTRUCTION STORMWATER POLLUTION PREVENTION PLAN

RAVENSDALE RECLAMATION TRENCH FILLING AND RESTORATION PROJECT KING COUNTY, WASHINGTON



MAY 2018

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Project # 09-040

*I hereby state that this Construction Stormwater Pollution Prevention Plan for the **Ravensdale Reclamation Trench Filling and Restoration Project** has been prepared by me or under my supervision and meets the standard of care and expertise that is usual and customary in this community of professional engineers. I understand that King County does not and will not assume liability for the sufficiency, suitability or performance of drainage facilities prepared by Contour Engineering LLC. This analysis is based on data and records either supplied to, or obtained by, Contour Engineering, LLC. These documents are referenced within the text of the analysis. The analysis has been prepared utilizing procedures and practices within the standard accepted practices of the industry.*

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PROJECT DESCRIPTION

This Construction Stormwater Pollution Prevention Plan (CSWPPP) accompanies the Site Development permit application associated with the reclamation of ten trenches. The site is located at 26900 Block of SE Ravensdale Way, Ravensdale, WA King County in portions of Section 1, Township 21 North, Range 6 East; Section 36, Township 22 North, Range 6 East; and Section 31, Township 22 North, Range 7 East, W.M.

The 2016 King County, Washington Surface Water Design Manual (KCSWDM), the 2016, Washington Surface Water Design Manual, the King County Stormwater Pollution Prevention Manual, and the latest edition of the LID Technical Guidance Manual for Puget Sound establish the design methodology and design criteria used for this project.

The following is a description of pertinent site information associated with the proposed project:

Location – 26900 Block SE Ravensdale Way, Ravensdale, WA

Tax Parcel Numbers – 3122079040, 3122079080, 3122079035, 3622069009, 3622069064, 0121069001, 0121069004, 0121069005, 0121069006, 0121069007

Site Area – 698 Acres

EXISTING CONDITIONS SUMMARY

Topography

The following topographic information was compiled from King County IMAP, limited topographic survey of the project site, and available LIDAR data. Generally, the northern portion of the project site, consisting of tax parcels 0121069001, 3622069009, 3122079080, 3122079040, 3122079035, and 3622069064 slopes downward from south to northwest, with a total vertical relief of 270 feet from high point to low point. These parcels generally also slope into Trench G on Parcel 3622069009, and into a small creek. The southern portion of the project site, consisting of tax parcels 0121069001, 0121069005, 0121069006, 0121069004, and 0121069007, generally slopes downward from north to southwest, with a total vertical relief of 100 feet from high to low point. The slopes range from 0% to 80%+.

Soils

The Natural Resources Conservation Service (NRCS) soil survey identifies four primary types of soil group within the project area: Alderwood gravelly sandy loam, Beausite gravelly sandy loam, Everett very gravelly sandy loam, and Chuckanut gravelly ashy sandy loam. See Appendix A for the NRCS soil map and soil descriptions.

Groundcover

The site currently is covered in multiple different uses; presently, there are multiple previously excavated mining trenches that will be filled and replanted. The site also has gravel access

roads which will be maintained throughout reclamation. The site also has scattered clear areas around the trenches. The majority of the site, however, is forested with dense underbrush.

Adjacent Land Uses

The site is bounded as follows:

- North: Town of Ravensdale (Zoned RA-5)
- West: Mining Facilities (Zoned M)
- East: Forested Parcels (Zoned F)
- South: Single-family Residences, Zoned UR-P, and mining facilities, zoned M

Drainage Patterns

The Project is located within two drainage basins. The northern parcels are mostly within the Covington Creek drainage basin, a sub-basin of the Duwamish – Green River (WRIA 9) Watershed. The southern parcels are mostly within the Lower Cedar River drainage basin, a sub-basin of the Cedar River / Lake Washington (WRIA 8) Watershed.

Stormwater runoff from the northern parcels, north of tax parcel 0121069001, sheet flows into a small creek which begins in the center of tax parcel 3622069009, and flows to the northwest. Runoff from parcels south of tax parcel 0121069001 either sheet flow east into unnamed tributaries to Rock Creek River, or sheet flow southwest onto adjacent properties. The dividing line between watersheds, which generally follows the high point in topography, runs through the centers of tax parcels 0121069005, 0121069006, and 0121069007. Maps illustrating these drainage patterns can be found in Appendix A.

Critical and Sensitive Areas

SLOPES

The project area features slopes in excess of 30%. There are landslide and erosion hazard areas located across the subject parcels per King County IMAP, in the area of the existing trenches that will be filled. There are no landslide hazard areas on site.

STREAMS

There is a stream to the southeast of the project site. Located onsite is Buck Lake, as well as several streams. These were identified in a report titled *Technical Memorandum* dated 05.30.2018, by Soundview Consultants.

WETLANDS

There are six wetlands located on site. These were identified in a report titled *Technical Memorandum* dated 05.30.2018, by Soundview Consultants.

AQUIFER RECHARGE

There is a critical aquifer recharge area just north of the project site. See Appendix A for an exhibit from King County IMAP.

FLOODPLAIN

The proposed development is not located within 300-ft of any identified floodplains.

Other Existing Site Information

No wells were identified in the immediate vicinity of the project site. There are no known underground tanks or septic systems on or adjacent to the project site.

Storm Drainage and Utilities

The site currently has no known existing storm drainage system or any known utilities extended onto the site.

Developed Site Description & Proposed Work

The developed site will consist of ten reclaimed and reforested historical mining trenches. No new permanent impervious surfaces are being proposed as part of this development; all proposed impervious surfaces are temporary gravel access points for use during reclamation and will be removed except for the existing main site access roads. After each trench is filled, one foot of native top soil will be spread over the disturbed areas, and then replanted and brought back to the original forested condition. Some trenches are already partially filled, and some are still untouched. The following table details the current status of each trench, and how much fill each trench will receive. The civil plans are included in Appendix B.

Trench Name	Permitted 2011 Import Quantity (CY)	As-built Import Quantity 2017 (CY)	Proposed Additional Import Quantity (CY)	Total Import Quantity (Bank Yards) (CY)
Trench A	96,300	Not As-built	190,683	190,683
Trench K	0	0	621	621
Trench C	213,207	Not As-built	329,571	329,571
Trench D	11,125	20,723	0	20,723
Trench E	33,200	95,854	210,931	306,785
Trench F	46,700	110,226	99,224	209,450
Trench G	0	0	107,914	107,914
Trench H	0	0	21,196	21,196
Trench I	0	0	29,042	29,042
Trench J	0	0	7,882	7,882
Totals	400,532	226,803	997,064	1,223,867

Construction Stormwater Pollution Prevention Elements

The Elements have been addressed and the appropriate BMPs have been incorporated into the Civil Plans. See Appendix B for the plan exhibits. Appendix C contains the BMPs used in the sites TESC Plan along with some others that may be needed if site conditions change as construction progresses. The list of BMPs was taken from the *2016 King County Surface Water Design Manual* and *Volume II Chapter 4* of the *2012 Department of Ecology Stormwater Management Manual for Western Washington* and are as follows:

- BMP D.2.1: ESC Measures
- BMP D.2.1.1: Clearing Limits
- BMP D.2.1.1.1: Plastic or Metal Fence
- BMP D.2.1.2.2: Mulching
- BMP D.2.1.2.3: Nets and Blankets
- BMP D.2.1.2.4: Plastic Covering
- BMP D.2.1.2.5: Straw Wattles
- BMP D.2.1.2.6: Temporary and Permanent Seeding
- BMP D.2.1.3.1: Silt Fence
- BMP D.2.1.4.1: Stabilized Construction Entrance
- BMP D.2.1.4.3: Wheel Wash
- BMP D.2.1.8: Dust Control

If necessary, contractor shall employ any additional BMPs per Appendix D of the *KCSWDM* or Appendix E of the DOE Manual to provide proper erosion, sediment, and pollutant control onsite.

Element #1: Clearing Limits

Prior to beginning land disturbing activities, including clearing and grading, clearly delineate all clearing limits, sensitive areas and their buffers, and trees (if any) that are to be preserved within the construction area. The clearing limits are typically marked with the Silt Fencing, construction fence or other appropriate BMP; however, a continuous length of brightly colored survey tape should be sufficient for the areas where silt fence is not required. The tape should be supported by vegetation or stakes at a height of 3-6 ft. The ESC Plan shows the clearing limits for the project.

Element #2: Cover Measures

Exposed and un-worked soils, such as soil stockpiles, shall be stabilized by application of effective erosion control measures that protect the soil from the erosive forces of raindrops, flowing water, and wind. Such measures include Plastic Covering and Temporary and Permanent Seeding.

Selected soil stabilization measures shall be appropriate for the time of year, site conditions, estimated duration of use, and the water quality impacts that stabilization agents may have on downstream waters or ground water.

The "Wet Season" is from October 1 to April 30. Within this period, no soils shall remain exposed and un-worked for more than 2 days. The "Dry Season" is from May 1 to September 30. Within this period, no soils shall remain exposed and un-worked for more than 7 days. This stabilization requirement applies to all soils on-site, whether at final grade or not. Soils shall be stabilized at the end of each shift before a holiday or weekend (if needed) based on the weather forecast.

Element #3: Perimeter Protection

Perimeter protection to filter sediment from sheetwash shall be located downslope of all disturbed areas and shall be installed prior to upslope grading. Perimeter protection includes constructed measures, such as silt fences, fiber rolls, sand/gravel barriers, brush or rock filters, triangular silt dikes and other methods. During the wet season, 50 linear feet of silt fence (and the necessary stakes) per acre of disturbed area must be stockpiled on site.

Silt Fence is specified in some areas due to topography and length of native vegetation area to halt any sediment laden stormwater from leaving the site perimeter. Additional silt fence shall be added as needed. Straw Wattles can be used in place of silt fence if installed per BMP and properly maintained.

Element #4: Traffic Area Stabilization

Unsurfaced entrances, roads, and parking areas used by construction traffic shall be stabilized to minimize erosion and tracking of sediment off site. Stabilized construction entrances shall be installed as the first step in clearing and grading. At the County's discretion, road and parking area stabilization is not required during the dry season (unless dust is a concern) or if the site is underlain by coarse-grained soils. Roads and parking areas shall be stabilized immediately after initial grading.

Construction vehicle ingress and egress shall be limited to the Stabilized Construction Entrances (BMP D2.1.4) shown on the TESC Plan (Figure C.3.1.A). The entrance shall be stabilized with quarry spalls or crushed rock to minimize the tracking of sediment onto public roads per the approved plan and ESC Measure D2.1.4. It shall be maintained and repaired as needed.

Sediment shall be removed from roads and transported to a controlled sediment disposal area. No street washing of sediments to the storm drain system will be allowed. If deemed necessary, a Wheel Wash (BMP D.3.4.3) may be needed or an approved mobile wheel wash system may be utilized.

Element #5: Sediment Retention

It is anticipated that the site can be treated solely with perimeter protection which includes silt fencing and vegetated strips. If sedimentation becomes an issue, it is recommended that the

project install further perimeter protection BMPs and stabilize disturbed areas prior to constructing a sediment pond or trap.

Element #6: Surface Water Collection

It is anticipated that the site can be treated solely with perimeter protection which includes silt fencing and vegetated strips. It is anticipated that much of the runoff from the site will be unconcentrated sheet flow.

Element #7: Dewatering Control

Any runoff generated by dewatering shall be treated through construction of a sediment trap (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.

It is anticipated that dewatering will not be needed. If dewatering is needed the following guidance is provided.

Discharge foundation, vault, and trench dewatering water that has similar characteristics to site stormwater runoff into a controlled conveyance system prior to discharge to a stabilized outfall location.

Clean, non-turbid dewatering water, such as well-point groundwater, can be discharged to systems tributary to state surface waters, provided the dewatering flow does not cause erosion or flooding of receiving waters. These clean waters should not be routed through stormwater sediment ponds/tanks.

Element #8: Dust Control

Preventative measures to minimize the wind transport of soil shall be taken when a traffic hazard may be created or when sediment transported by wind is likely to be deposited in water resources or adjacent properties.

Water is the most common dust control (or palliative) used in the area. When using water for dust control, the exposed soils shall be sprayed until wet, but runoff shall not be generated by spraying. Calcium chloride, Magnesium chloride, Lignin derivatives, Tree Resin Emulsions, and Synthetic Polymer Emulsions may also be used for dust control. Exposed areas shall be re-sprayed as needed. Oil shall not be used for dust control.

Element #9: Flow Control

It is anticipated that the site can be treated solely with perimeter protection which includes silt fencing and vegetated strips. If a flow control facility is required the contractor or owner should contact the project engineer.

Element #10: Control Pollutants

Stormwater pollution prevention (SWPPS) measures are required to prevent, reduce, or eliminate the discharge of pollutants to onsite or adjacent stormwater systems or watercourses from construction-related activities such as materials delivery and storage, onsite equipment fueling and maintenance, demolition of existing buildings and disposition of demolition materials and other waste, and concrete handling, washout and disposal.

Secondary containment is required for hazardous material storage, dispensing, refueling, use and handling areas.

Spill kits containing adequate response materials must be maintained to ensure the immediate containment and cleanup of any release of hazardous substances used at the construction site.

Leaking construction vehicles and equipment shall be removed immediately or repaired on-site immediately, provided the leakage is completely contained and cleaned up.

Releases shall immediately be contained, cleaned up and reported to (425) 649-7000.

Designate a person who will be on-site and responsible for spill prevention, handling of hazardous materials and cleanup of spills.

Maintenance and repair of heavy equipment and vehicles involving oil changes, hydraulic system drain down, solvent and de-greasing cleaning operations, fuel tank drain down and removal, and other activities which may result in discharge or spillage of pollutants to the ground or into surface water 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.

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 surface water runoff. Manufacturers' recommendations for application rates and procedures shall be followed.

All applicable BMPs shall be used to prevent or treat contamination of surface water runoff by pH modifying sources. These sources include 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. Some applicable BMPs from the *DOE Manual* include Concrete Handling (BMP C151), Sawcutting and Surfacing Pollution Prevention (BMP C152), and other *Volume IV – Source Control BMPs*.

It is important for any development to preserve the environmental elements within the County, so the conservation of and protection of critical areas shall be adhered too. There shall be no contamination of the groundwater as the project is in a well head protection Zone II. All necessary steps must be taken to prevent contamination such as following the requirements of this SWPPP document, due diligence and awareness by the contractor and sub-contractors, and the utilization of any and all BMPs (construction and source control) applicable to ensure protection of the County's groundwater.

Any chemical treatment must be approved by the County

Element #11: Protect Existing and Proposed Flow Control BMPs

Protection measures shall be applied/installed and maintained so as to prevent adverse impacts to existing flow control BMPs and areas of proposed flow control BMPs for the project. Adverse impacts can prompt the requirement to restore or replace affected BMPs. There are no proposed flow control BMP's.

Element #12: Maintain BMPs

Protection measures shall be maintained to assure continued performance of their intended function, to prevent adverse impacts to existing flow control BMPs and areas of proposed flow control BMPs, and protect other disturbed areas of the project.

Sediment control BMPs shall be inspected weekly or after a runoff-producing storm event during the "Dry Season" and daily during the "Wet Season". The inspection frequency for stabilized, inactive sites shall be determined by the County based on the level of soil stability and potential for adverse environmental impacts.

Temporary erosion and sediment control BMPs shall be removed on the approval of the County inspector after final site stabilization is achieved or after the temporary BMPs are no longer needed. Trapped sediment shall be removed or stabilized on site via approved measures. Disturbed soil resulting from removal of BMPs or vegetation shall be permanently stabilized.

Element #13: Manage the Project

Development projects shall be phased in order to prevent the transport of sediment from the development site during construction, unless the project engineer can demonstrate that construction phasing is infeasible. Re-vegetation of exposed areas and maintenance of that vegetation shall be an integral part of the clearing activities for any phase.

Clearing and grading activities for developments shall be permitted only if conducted pursuant to an approved site development plan (e.g., subdivision approval) that establishes permitted areas of clearing, grading, cutting, and filling. When establishing these permitted clearing and grading areas, consideration should be given to minimizing removal of existing trees and minimizing disturbance and compaction of native soils except as needed for building purposes. These permitted clearing and grading areas and any other areas required to preserve critical or

sensitive areas, buffers, native growth protection easements, or tree retention areas as may be required by the County, shall be delineated on the site plans and the development site.

Seasonal Work Limitations are from October 1 to April 30 where clearing, grading, and other soil disturbing activities shall only be permitted if shown to the satisfaction of the County that the transport of sediment from the construction site will be prevented. Based on the information provided and local weather conditions, the County may expand or restrict the seasonal limitation on site disturbance. The County may take enforcement action (such as a notice of violation, administrative order, penalty, or stop-work order) if violations are noticed, required BMPs are not be maintained or the approved plans are not be followed. The following activities are exempt from the seasonal clearing and grading limitations:

1. Routine maintenance and necessary repair of erosion and sediment control BMPs;
2. Routine maintenance of public facilities or existing utility structures that do not expose the soil or result in the removal of the vegetative cover to soil; and
3. Activities where there is one hundred percent infiltration of surface water runoff within the site in approved and installed erosion and sediment control facilities.

All BMPs shall be inspected, maintained, and repaired as needed to assure continued performance of their intended function. Additional BMPs and erosion control measures shall be installed as deemed necessary to protect adjacent properties and County right-of-ways.

Whenever inspection and/or monitoring reveals that the BMPs identified in the Construction SWPPP are inadequate, due to the actual discharge of or potential to discharge a significant amount of any pollutant, the SWPPP shall be modified, as appropriate, in a timely manner.

Spillage and/or discharge of pollutants shall be reported within 24-hours.

Maintenance and repair of heavy equipment and vehicles involving oil changes, hydraulic system drain down, solvent and de-greasing cleaning operations, fuel tank drain down and removal, and other activities which may result in discharge or spillage of pollutants to the ground or into surface water 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.

The Construction SWPPP shall be retained on-site or within reasonable access to the site. The Construction SWPPP shall be modified whenever there is a significant change in the design, construction, operation, or maintenance of any BMP. The County Inspector shall be notified of any changes to the Construction SWPPP. The inspector may require a plan modification to go through the County review process.

CONSTRUCTION SEQUENCE

1. Obtain required permits and hold a pre-construction meeting with the County.

2. Pothole any existing utilities for verification of depth and location.
3. Establish clearing and grading limits.
4. Install silt fence and other erosion control measures as needed.
5. Schedule an erosion control inspection with the County
6. Construct improvements per plan.
7. Stabilize all exposed soils
8. Arrange final inspection with the County.
9. Silt fence and other applicable TESC measures to remain until the site is stabilized to the approval of the County Inspector
10. Remove TESC measures when allowed by County Inspector

CONSTRUCTION SCHEDULE

Construction is anticipated to begin when all necessary permits have been issued. Construction will be done in a single phase.

FINANCIAL/OWNERSHIP RESPONSIBILITIES

Ravensdale LLC
4425 S. Orchard Street
Tacoma, WA 98466

EROSION CONTROL SPECIALIST

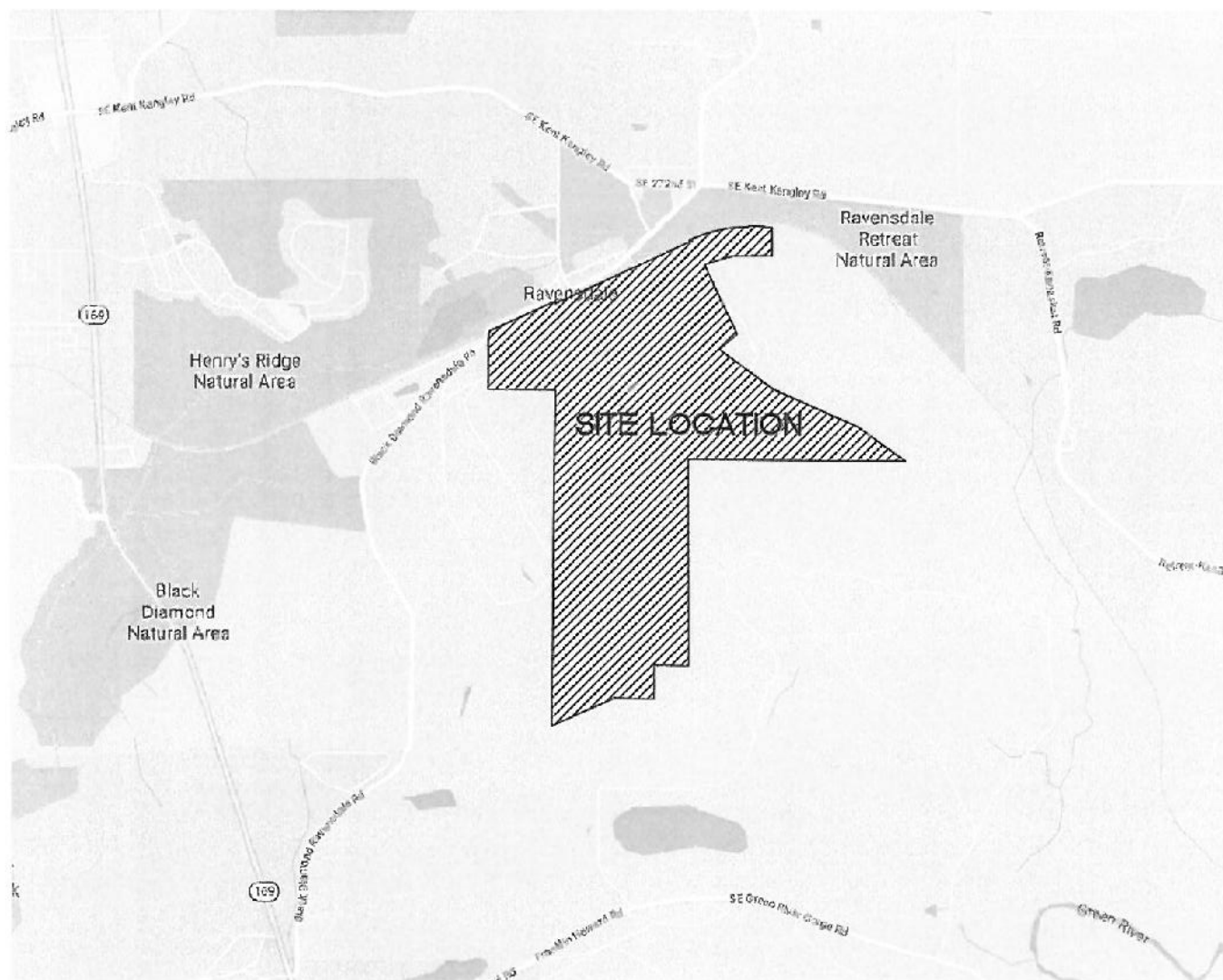
A Certified Professional in Erosion and Sediment Control shall be identified in the Construction SWPPP and shall be on-site or on-call at all times. Certification may be through the WSDOT/AGC of Washington Education Foundation Construction Site Erosion and Sediment Control Certification Program or any equivalent local or national certification and/or training program.

Name: _____

Phone: _____

APPENDIX A

General Exhibits



Vicinity Map

APPENDIX B

Plan Exhibits

RAVENSDALE RECLAMATION TRENCH FILLING AND RESTORATION PROJECT
PORTIONS OF SECTION 1, TOWNSHIP 21 NORTH, RANGE 6 EAST,
SECTION 36, TOWNSHIP 22 NORTH, RANGE 6 EAST, AND SECTION 31, TOWNSHIP 22 NORTH, RANGE 7 EAST, W.M.
KING COUNTY, WASHINGTON
COVER SHEET

LEGAL DESCRIPTION:
THE EAST 1/2 OF SEC. 1, TWP 21 N, RGE 6 E W.M.

VERTICAL DATUM:
NAVD 88

KING COUNTY POINT NUMBER 6201 NORTHEAST
SECTION CORNER OF SECTION 36, TOWNSHIP 22N,
RANGE 6 E, ELEVATION BEING 623.74

BASIS OF BEARING:
BEARING IS BASED OFF RECORD OF SURVEY
AFN NO. 9303159008

SITE DATA:

LOCATED IN THE 26900 BLOCK OF SE RAVENSDALE
WAY, RAVENSDALE WA., KING COUNTY.

N.P.D.E.S. NOTE:

NO CONSTRUCTION OR SITE DISTURBANCE FOR THIS
PROJECT MAY BEGIN BEFORE THE APPLICANT FIRST
OBTAINS A GENERAL PERMIT TO DISCHARGE
STORMWATER ASSOCIATED WITH CONSTRUCTION
ACTIVITY PERMIT FROM THE WASHINGTON STATE
DEPARTMENT OF ECOLOGY (DOE).

PLAN NOTES:

- FILLING SHALL OCCUR ON ONE TRENCH AT A TIME
TO MINIMIZE POTENTIAL EROSION ISSUES.
- EXISTING PROPERTY LINES AND EASEMENTS WERE
OBTAINED FROM KING COUNTY ASSESSOR'S MAPS.

NOTES:

SOILS MAP PER "RAVENSDALE MINE TRENCH" BY
GENESIS RESOURCE CONSULTING DATED NOV, 28
2007.

PARCEL NUMBER:

3122079040
3122079080
3122079035
3622069009
3622069064
0121069001
0121069004
0121069005
0121069006
0121069007

EARTHWORK:

TOTALS:
CUT = 15,723 CY±
FILL = 1,017,987 CY±

THIS CALCULATION IS FOR REVIEW AND PERMIT PURPOSES ONLY,
CONTRACTOR SHALL DO THEIR OWN CALCULATION BASED ON THE
INFORMATION PROVIDED WITHIN THESE PLANS.

THE QUANTITIES MAY VARY BASED ON THE FOLLOWING FACTORS:

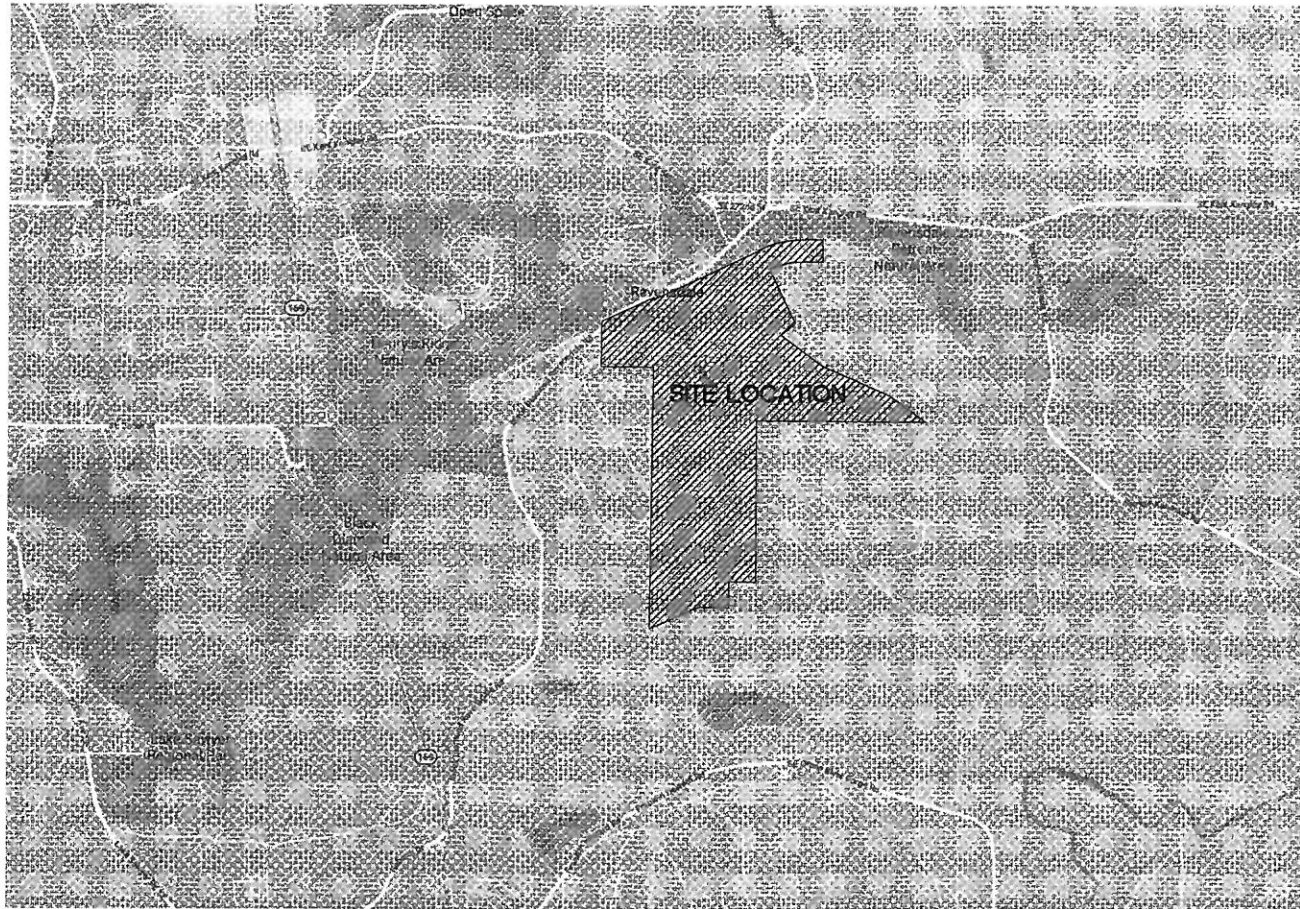
- SHRINK/SWELL OF SOILS.
- SURFACE STRIPPING.
- VARIANCE OF STRUCTURAL MATERIAL REQUIRED FOR ACCESS
ROADS.

UTILITIES:

TELEPHONE: NONE
CABLE: NONE
SCHOOL: TAHOMA #409
FIRE PROTECTION: K.C. FIRE PROTECTION DISTRICT #43
GAS: NONE

TOPOGRAPHIC NOTE:

THE EXISTING CULTURAL AND TOPOGRAPHIC DATA SHOWN ON
THESE DRAWINGS HAS BEEN PREPARED, IN PART, BASED UPON
INFORMATION FURNISHED BY DAN PRICE LAND SURVEYING AND
APEX ENGINEERING PLLC. WHILE THIS INFORMATION IS
BELIEVED RELIABLE, CONTOUR ENGINEERING CANNOT ENSURE
ITS ACCURACY AND THIS IS NOT RESPONSIBLE FOR THE
ACCURACY OF THAT INFORMATION OR FOR ANY ERRORS OR
OMISSIONS WHICH MAY HAVE BEEN INCORPORATED INTO THESE
DRAWINGS AS A RESULT.



VICINITY MAP
SCALE: 1" = 2000'

SHEET INDEX:

TRENCH	CY±
A	190,863
C	329,571
D	20,723
E	210,931
F	99,244
G	107,914
H	21,196
I	29,042
J	7,882
K	621
TOTAL	1,017,987

SHEET 1	COVER SHEET
SHEET 2	TRENCH AND PARCEL LOCATIONS MAP
SHEET 3	NOTES AND DETAILS
SHEET 4	T.E.S. C. NOTES AND
SHEET 5	TRENCH - A GRADING AND T.E.S.C. PLAN
SHEET 6	TRENCH - A GRADING PROFILE SECTIONS
SHEET 7	TRENCH - A GRADING PROFILE SECTIONS
SHEET 8	TRENCH - A GRADING PROFILE SECTIONS
SHEET 9	TRENCH - K GRADING AND T.E.S.C. PLAN / GRADING PROFILE SECTIONS
SHEET 10	TRENCH - C GRADING AND T.E.S.C. PLAN / GRADING PROFILE SECTIONS
SHEET 11	TRENCH - C GRADING PROFILE SECTIONS
SHEET 12	TRENCH - C GRADING PROFILE SECTIONS
SHEET 13	TRENCH - C GRADING PROFILE SECTIONS
SHEET 14	TRENCH - C GRADING PROFILE SECTIONS
SHEET 15	TRENCH - D GRADING AND T.E.S.C. PLAN / GRADING PROFILE SECTIONS
SHEET 16	TRENCH - E GRADING AND T.E.S.C. PLAN / GRADING PROFILE SECTIONS
SHEET 17	TRENCH - E 2011 GRADING PROFILE SECTIONS
SHEET 18	TRENCH - E GRADING PROFILE SECTIONS
SHEET 19	TRENCH - E GRADING PROFILE SECTIONS
SHEET 20	TRENCH - F GRADING AND T.E.S.C. PLAN
SHEET 21	TRENCH - F 2011 GRADING PROFILE SECTIONS
SHEET 22	TRENCH - F GRADING PROFILE SECTIONS
SHEET 23	TRENCH - F GRADING PROFILE SECTIONS
SHEET 24	TRENCH - G GRADING AND T.E.S.C. PLAN / GRADING PROFILE SECTIONS
SHEET 25	TRENCH - G GRADING PROFILE SECTIONS
SHEET 26	TRENCH - G GRADING PROFILE SECTIONS
SHEET 27	TRENCH - H GRADING AND T.E.S.C. PLAN / GRADING PROFILE SECTIONS
SHEET 28	TRENCH - H GRADING PROFILE SECTIONS
SHEET 29	TRENCH - H GRADING PROFILE SECTIONS
SHEET 30	TRENCH - I GRADING AND T.E.S.C. PLAN / GRADING PROFILE SECTIONS
SHEET 31	TRENCH - I GRADING PROFILE SECTIONS
SHEET 32	TRENCH - J GRADING AND T.E.S.C. PLAN / GRADING PROFILE SECTIONS
SHEET 33	TRENCH - J GRADING PROFILE SECTIONS

TRENCH NOTES:

IF WORKERS ENTER ANY TRENCH OR OTHER EXCAVATION FOUR OR MORE FEET IN DEPTH
THAT DOES NOT MEET THE OPEN PIT REQUIREMENTS OF WSDOT SECTION 2-09.3(3)9, IT
SHALL BE SHORED AND CRIBBED. THE CONTRACTOR IS ALONE RESPONSIBLE FOR WORKER
SAFETY. ALL TRENCH SAFETY SYSTEMS SHALL MEET THE REQUIREMENTS OF THE
WASHINGTON INDUSTRIAL SAFETY AND HEALTH ACT, CHAPTER 49.17 RCW.

UTILITY NOTES:

EXISTING UTILITY INFORMATION DEPICTED ON THESE PLANS WAS OBTAINED FROM
BEST AVAILABLE SOURCES AT THE TIME OF DESIGN. CONTRACTOR SHALL BE SOLELY
RESPONSIBLE FOR THE RELOCATION OF EXISTING UNDERGROUND CONFLICTING
UTILITIES DEPICTED OR NOT DEPICTED ON THESE PLANS.

FILL SPECIFICATION:

FILL MATERIAL SHALL NOT CONTAIN PETROLEUM PRODUCTS, OR SUBSTANCES
WHICH ARE HAZARDOUS, DANGEROUS, TOXIC, OR WHICH OTHERWISE VIOLATE
ANY STATE, FEDERAL, OR LOCAL LAW ORDINANCE, CODE, REGULATION, RULE,
ORDER, OR STANDARD. ONLY EARTH MATERIAL SHALL BE PLACED IN FILLS.

ONE CALL AT 1-800-424-5555

UNDERGROUND UTILITIES ARE SHOWN IN THE APPROXIMATE LOCATION
THERE IS NO GUARANTEE THAT ALL UTILITY LINES ARE SHOWN, OR
THAT THE LOCATION, SIZE, AND MATERIAL IS ACCURATE. THE
CONTRACTOR SHALL UNCOVER ALL INDICATED PIPING WHERE CROSSING,
INTERFERENCES, OR CONNECTIONS OCCUR PRIOR TO TRENCHING OR
EXCAVATION FOR ANY PIPE OR STRUCTURE. TO DETERMINE ACTUAL
LOCATIONS, SIZE, AND MATERIAL. THE CONTRACTOR SHALL MAKE THE
APPROPRIATE PROVISION FOR PROTECTION OF SAID FACILITIES. THE
CONTRACTOR SHALL NOTIFY ONE CALL AT 1-800-424-5555 AND
ARRANGE FOR FIELD LOCATION OF EXISTING FACILITIES BEFORE
CONSTRUCTION.

(Note to Engineer: This approval signature
block not required for cover page.)

KING COUNTY DDES APPROVAL	
Review Engineer	Date
Senior Engineer	Date
Wally Archuleta, P.E. DEVELOPMENT ENGINEER	Date

LEGEND:



PROPOSED GRAVEL
ACCESS ROAD



EXISTING WETLAND



PROPOSED EASEMENT



LOT BOUNDARY LINES



SHEET NUMBER
SECTION IS CUT FROM

SHEET NUMBER
SECTION IS SHOWN ON

Vicinity Map

Scale 1"=

Site Plan Approval

Approval of these plans is for construction of road and drainage
improvements, site drainage & temporary erosion control in unincorporated King County only. These plans do not
authorize any other utility approval or improvements proposed in
any State right of way.

Site plan approval is void if the commercial building permit has
not been obtained or renewed within two years of approval.

Subdivision plan approval is void if the final plat is not recorded
prior to the preliminary plat approval expiration.

PRO RATA SHARE ASSESSMENT ANALYSIS
(County Use Only)

Section Township Range Tax Parcel Number

Site Location is within the _____ drainage shed(s)

Pro Rata Share Assessment(s) are: ☐ Required ☐ Not Required

From the site due to development for increased storm water runoff.

Peak Runoff Assessment Rate(\$) per c.f.s. increases(10 year, 2 hour storm)

Peak Volume Assessment Rate(\$) per Ac. Ft. increases(2 year, 2 hour storm)

AGREEMENTS, PLAN REFERENCES, PERMITS ETC.
(To be completed by Consultant)

Preliminary Plat Approval/Permit Issued Date: _____

Expiration Date: _____

Other Related Permit Numbers Received: _____

Right-of-Way Use Permit _____

Grading _____

Building/Structural _____

Other _____

Board feet of tree removal on site: _____

Cubic yards of material hauled on/off the site: _____

Is this a highly sensitive area site? (Yes/No): _____

Note: If "yes", per SWDM Appendix D44 a Highly Sensitive
Site Erosion Control Supervisor is required. See ESC plan.

**Emergency
911**

Police-Fire-Rescue

RECOMMENDED FOR APPROVAL
(To be completed by King County)

Date _____

Review Engineer _____

Senior Engineer _____

Traffic & Planning Engineer _____

Sensitive Areas _____

Structural Review Engineer _____

Other _____



APPROVED FOR CONSTRUCTION
DEPARTMENT OF DEVELOPMENT & ENVIRONMENTAL SERVICES

Date _____ Molly A. Johnson, P.E.
Development Engineer

PROJECT CONTACT INFORMATION
(To be completed by Consultant)

Applicant Contract Owner Lease Name Phone

☐ ☐ Address and Zip Code

☐ ☐ Address and Zip Code

☐ ☐ Address and Zip Code

☐ ☐ Address and Zip Code

☐ ☐ Address and Zip Code

☐ ☐ Address and Zip Code

☐ ☐ Address and Zip Code

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☐ ☐ Address and Zip Code

☐ ☐ Address and Zip Code

☐ ☐ Address and Zip Code

☐ ☐ Address and Zip Code

☐ ☐ Address and Zip Code

Notice Required

Contractors shall notify operators who maintain underground utility lines in
the area of proposed excavation or blasting at least two business days, but
not more than ten working days prior to commencement of excavation or
demolition in accordance with RCW Title 19. Names and telephone numbers
of the operators of underground utility lines in this project appear below.
These numbers shall also be used to serve in an emergency conditions as
required.

Sanitary Sewer _____ Phone _____

Water District _____

Gas Company _____

Power Company _____

Call Before You Dig DIAL-A-DIG 1-800-424-5555

Notes

- The Developer is required to notify the Land Use Services Division,
Land Use Inspection Section (205) 298-6642, three days prior to the beginning
of construction for a preconstruction conference and specifically request
inspection before beginning:
A. Installing siltation and erosion control measures
B. Clearing and grubbing
C. Earthwork
D. Installation of any underground utility
E. Before placing subbase, base or paving surfaces
F. Installation of any forms or placing any concrete
- A permit must be obtained from the office of the Resident Engineer,
Washington State Department of Transportation, before any construction
is started on any existing state route.
- A Hydraulic Project Approval (HPA) Permit must be obtained from the
Washington State Department of Fisheries prior to any work when required.

Bonding Information

Restoration Bond Amount \$ _____

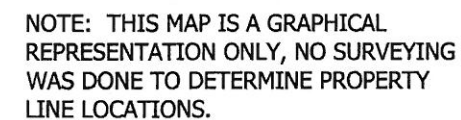
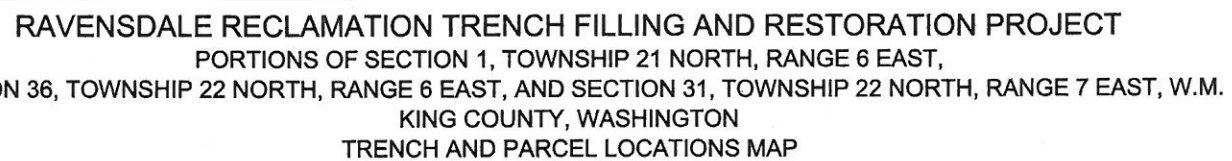
Performance Bond Amount \$ _____

CONTOUR
ENGINEERING, PLLC
CIVIL ENGINEERS-SURVEYORS-LAND PLANNERS
3309 56th Street NW, Suite 106 Gig Harbor, WA 98335
Phone: 253-837-5454 ~ Fax: 253-509-0044 ~ info@contourpllc.com

**RAVENSDALE TRENCH FILLING
COVER SHEET**

DDES FILE NUMBERS:
Activity Number: _____
Project Number: _____
Development No: _____





SHEET TITLE: TRENCH AND PARCEL LOCATION MAP		RAVENSDALE RECLAMATION TRENCH FILLING AND RESTORATION		DESIGNER: J. JACOBY ENGINEER: B. ALLEN DRAWN: J. JACOBY S 1 T 21 N 1 R 6E WM DATE: 2018-05-08 REVISED:		PROJECT: 09-040 DWG NAME: 09-040 SEC		SHEET		BY	
CLIENT: RAVENSDALE LLC 41306 90TH AVENUE E EATONVILLE, WA 98328		CONTACT: KURT ERIGUSON		PHONE: (253) 606-6660				REV.		DATE	
C2		2 OF 33		△							

RAVENSDALE RECLAMATION TRENCH FILLING AND RESTORATION PROJECT
PORTIONS OF SECTION 1, TOWNSHIP 21 NORTH, RANGE 6 EAST,
SECTION 36, TOWNSHIP 22 NORTH, RANGE 6 EAST, AND SECTION 31, TOWNSHIP 22 NORTH, RANGE 7 EAST, W.M.
KING COUNTY, WASHINGTON

GENERAL NOTES:

- (1) All design and construction shall be in accordance with permit conditions, the King County Code (KCC), Road Standards (KCRS), Washington State DOT (WSDOT) Standard Specifications and the conditions of preliminary approval. It shall be the sole responsibility of the applicant and the professional civil engineer to correct any error, omission, or variation from the above requirements found in these plans. All corrections shall be at no additional cost or liability to King County.
- (2) The design elements within these plans have been reviewed according to the King County Department of Development and Environmental Services (DDSES) Engineering Review checklist. Some elements may have been overlooked or missed by the DDSES plan reviewer. Any variance from adopted standards is not allowed unless specifically approved by King County prior to construction.
- (3) Approval of this road, grading, parking and drainage plan does not constitute an approval of any other construction (e.g. domestic water conveyance, sewer conveyance, gas, electrical, etc.).
- (4) Before any construction or development activity, a preconstruction meeting must be held between the DDSES's Land Use Inspection Section, the Applicant, and the Applicant's Construction Representative.
- (5) A copy of these approved plans must be on the job site whenever construction is in progress.
- (6) Grading activities (side alteration) are limited to the hours of 7 a.m. to 7 p.m. Monday through Saturday and 10 a.m. to 5 p.m. on Sunday, unless otherwise approved with a written decision by the Reviewing Agency.
- (7) It shall be the applicant's/contractor's responsibility to obtain all construction easements necessary before initiating off-site work. Easements require review and approval prior to construction.
- (8) Franchised utilities or other installations that are not shown on these approved plans shall not be constructed unless an approved set of plans that meet all requirements of KCRS Chapter 8 are submitted to the DDSES's Land Use Inspection Section three days prior to construction.
- (9) Datum shall be KCAS unless otherwise approved by DDSES.
- (10) Dewatering system (underdrain) construction shall be within a right-of-way or appropriate drainage easement, but not underneath the roadway section. All underdrain systems must be constructed in accordance with WSDOT Standard Specifications.
- (11) All utility trenches and roadway subgrade shall be backfilled and compacted to 95 percent density, standard proctor.
- (12) Open cutting of existing roadways for non-franchised utility or storm work is not allowed unless specifically approved by DDSES and noted on these approved plans. Any open cut shall be restored in accordance with KCRS.
- (13) The Contractor shall be responsible for providing adequate safeguards, safety devices, protective equipment, flaggers, and any other needed actions to protect the life, health, and safety of the public, and to protect property in connection with the performance of work covered by the contractor. Any work within the traveled right-of-way that may interrupt normal traffic flow shall require at least one flagger for each lane of traffic affected. Manual or Uniform Traffic Control Devices (MUTCD) shall apply. Work in right-of-way is not authorized until a traffic control plan is approved by King County.

DRAINAGE NOTES:

- (1) Proof of liability insurance shall be submitted to DDSES prior to the construction of the drainage facilities, preferably at the preconstruction meeting.
- (2) All pipe and appurtenances shall be laid on a properly prepared foundation in accordance with WSDOT specifications. This shall include leveling and compacting the trench bottom, the top of the foundation material, and any required pipe bedding, to a uniform grade so that the entire pipe is supported by a uniformly dense underlying base.
- (3) Steel pipe shall be aluminized, or galvanized with asphalt treatment #1 or better inside and outside.
- (4) All drainage structures, such as catch basins and manholes, not located within a traveled roadway or sidewalk, shall have solid locking lids. All drainage structures associated with a permanent retention/detention facility shall have solid locking lids.
- (5) All catch basin grates shall conform to KCRS, which includes the stamping "OUTFALL TO STREAM, DUMP NO POLLUTANTS" and "Property of King County", except that private drainage systems shall not have the words "Property of King County".
- (6) All driveway culverts located within King County right-of-way shall be of sufficient length to provide a minimum 3:1 slope from the edge of the driveway to the bottom of the ditch. Culverts shall have beveled end sections to match the side slope KCRS.
- (7) Rock for erosion protection of roadway ditches, where required, must be of sound quarry rock, placed to a depth of 1 foot, and must meet the following specifications: 4"-6"/40%-70% passing; 2"-4" rock/30%-40% passing; and -2" rock/10%-20% passing. Installation shall be in accordance with KCRS.
- (8) Drainage outlets (stub-outs) shall be provided for each individual lot, except for those lots approved for infiltration by King County. Stub-outs shall conform to the following:
 - a) Each outlet shall be suitably located at the lowest elevation on the lot, so as to service all future roof downspouts and footing drains, driveways, yard drains, and any other surface or subsurface drains necessary to render the lots suitable for their intended use. Each outlet shall have free-flowing, positive drainage to an approved stormwater conveyance system or to an approved outfall location.
 - b) Outlets on each lot shall be located with a five-foot-high, 2" x 4" stake marked "storm" or "drain". The stub-out shall extend above surface level, be visible, and be secured to the stake.
 - c) Pipe material shall conform to underdrain specifications described in KCRS and, if non-metallic, the pipe shall contain wire or other acceptable detection.
 - d) Drainage easements are required for drainage systems designed to convey flows through individual lots.
 - e) The applicant/contractor is responsible for coordinating the locations of all stub-out conveyance lines with respect to the utilities (e.g. power, gas, telephone, television).
 - f) All individual stub-outs shall be privately owned and maintained by the lot home owner.
- (9) All disturbed previous areas (compacted, graded, landscaped, etc.) of the development site must demonstrate one of the following: The existing duff layer shall be staged and redistributed to maintain the moisture capacity of the soil, OR; Amended soil shall be added to maintain the moisture capacity.
- (10) Seasonal clearing is limited between October 1 and March 30 inclusive, unless otherwise approved with a written decision by the Reviewing Agency.
- (11) Improvements and/or buildings shall not be installed until drainage facilities are "in operation", (KCC 9.04).

EROSION AND SEDIMENTATION CONTROL

NOTES:

- (1) Approval of this erosion and sedimentation control (ESC) plan does not constitute an approval of permanent road or drainage design (e.g. size and location of roads, pipes, restrictors, channels, retention facilities, utilities, etc.).
- (2) The implementation of these ESC plans and the construction, maintenance, replacement, and upgrading of these ESC facilities is the responsibility of the applicant/ESC supervisor until all construction is approved.
- (3) The boundaries of the clearing limits shown on this plan shall be clearly flagged by survey tape or fencing, if required, prior to construction (SWDM Appendix D). During the construction period, no disturbance beyond the clearing limits shall be permitted. The clearing limits shall be maintained by the applicant/ESC supervisor for the duration of construction.
- (4) Stabilized construction entrances shall be installed at the beginning of construction and maintained for the duration of the project. Additional measures, such as constructed wheel wash systems or wash pads, may be required to ensure that all paved areas are kept clean and track out to road right of way does not occur for the duration of the project.
- (5) The ESC facilities shown on this plan must be constructed prior to or in conjunction with all clearing and grading so as to ensure that the transport of sediment to surface waters, drainage systems, and adjacent properties is minimized.
- (6) The ESC facilities shown on this plan are the minimum requirements for anticipated site conditions. During the construction period, these ESC facilities shall be upgraded as needed for unexpected storm events and modified to account for changing site conditions (e.g. additional cover measures, additional sump pumps, relocation of ditches and silt fences, perimeter protection etc.).
- (7) The ESC facilities shall be inspected daily by the applicant/ESC supervisor and maintained to ensure continued proper functioning. Written records shall be kept of weekly reviews of the ESC facilities.
- (8) Any areas of exposed soils, including roadway embankments, that will not be disturbed for two days during the wet season or seven days during the dry season shall be immediately stabilized with the approved ESC cover methods (e.g., seeding, mulching, plastic covering, etc.).
- (9) Any area needing ESC measures, not requiring immediate attention, shall be addressed within seven (7) days.
- (10) The ESC facilities on inactive sites shall be inspected and maintained a minimum of once a month or within 24 hours following a storm event.
- (11) At no time shall more than one (1) foot of sediment be allowed to accumulate within a catch basin. All catch basins and conveyance lines shall be cleaned prior to paving. The cleaning operation shall not flush sediment-laden water into the downstream system.
- (12) Any permanent retention/detention facility used as a temporary settling basin shall be modified with the necessary erosion control measures and shall provide adequate storage capacity. If the permanent facility is to function ultimately as an infiltration system, the temporary facility must be rough graded so that the bottom and sides are at least three feet above the final grade of the permanent facility.
- (13) Cover measures will be applied in conformance with Appendix D of the Surface Water Design Manual.
- (14) Prior to the beginning of the wet season (Oct. 1), all disturbed areas shall be reviewed to identify which ones can be seeded in preparation for the winter rains. Disturbed areas shall be seeded within one week of the beginning of the wet season. A sketch map of those areas to be seeded and those areas to remain uncovered shall be submitted to the DDSES inspector for review.

CONSTRUCTION SEQUENCE:

- (1) Pre-construction meeting.
- (2) Post sign with name and phone number of ESC supervisor (may be consolidated with the required notice of construction sign).
- (3) Flag or fence clearing limits.
- (4) Install catch basin protection if required.
- (5) Grade and install construction entrance(s).
- (6) Install perimeter protection (silt fence, brush barrier, etc.).
- (7) Construct sediment ponds and traps.
- (8) Grade and stabilize construction roads.
- (9) Construct surface water controls (interceptor dikes, pipe slope drains, etc.) simultaneously with clearing and grading for project development.
- (10) Maintain erosion control measures in accordance with King County standards and manufacturer's recommendations.
- (11) Relocate erosion control measures or install new measures so that as site conditions change the erosion and sediment control is always in accordance with the King County Erosion and Sediment Control Standards.
- (12) Cover all areas that will be unworked for more than seven days during the dry season or two days during the wet season with straw, wood fiber mulch, compost, plastic sheeting or equivalent.
- (13) Stabilize all areas that reach final grade within seven days.
- (14) Seed or sod any areas to remain unworked for more than 30 days.
- (15) Upon completion of the project, all disturbed areas must be stabilized and BMPs removed if appropriate.

BPA EASEMENT NOTES:

1. COORDINATE WITH BPA PRIOR TO ANY CONSTRUCTION. ALL WORK SHALL CONFORM TO BPA REQUIREMENTS AND CONDITIONS.
2. VERIFY ACTUAL TOWER LOCATIONS AND CLEARANCES PRIOR TO ANY CONSTRUCTION / WORK.
3. APPROXIMATE LOCATIONS OF POWER LINE TOWERS WERE OBTAINED FROM EXHIBIT A OF THE NON-TRANSFERABLE LAND USE AGREEMENT.
4. MAINTAIN 50' MINIMUM CLEARANCE AROUND TOWERS
5. MAINTAIN 20' MINIMUM CLEARANCE BETWEEN ALL CONSTRUCTION EQUIPMENT AND TRANSMISSION LINE CONDUCTORS (WIRES).

GEOTECHNICAL NOTES:

1. A GEOTECHNICAL ENGINEER IS TO MONITOR AND DOCUMENT ALL CUTS, FILLS, BENCHING AND COMPACTION ON SITES INCLUDING COAL MINE HAZARDS. A COPY OF THE DOCUMENTATION SHALL BE GIVEN TO THE L.U.I.S. INSPECTOR UPON HIS/HER REQUEST. PROVIDE COPIES TO ENGINEER.

FILL MATERIALS ARE TO BE ACCEPTED AND APPROVED FOR USE BY A GEO TECHNICAL ENGINEER PRIOR TO INSTALLATION/CONSTRUCTION. COMPACTION SHALL BE PER GEOTECHNICAL ENGINEER REQUIREMENTS.
2. PROPOSED CUT AND FILL SLOPES SHALL NOT EXCEED 2:1 WITHOUT GEO TECHNICAL ENGINEER'S APPROVAL.
3. FILL MATERIAL IS TO BE IMPORTED FROM OFFSITE, LOCAL AREA PROJECTS. SOILS ARE TO BE CLEAN, FREE OF DELETERIOUS MATERIALS. DELETERIOUS MATERIALS INCLUDE BUT NOT LIMITED TO CONCRETE, ASPHALT PAVEMENT, WOOD, ORGANIC WASTE/DEBRIS, COAL, CHARCOAL OR ANY OTHER EXTRANEIOUS OR OBJECTIONABLE MATERIAL.

GENERALLY, FILL MATERIAL IS TO CONFORM TO W.S.D.O.T. SECTION 9-03.14(3) COMMON BORROW
4. ALL WORK WITHIN COAL MINE HAZARD AREAS ARE TO CONFORM TO KING COUNTY ZONING CODE/REQUIREMENTS AND GEOTECHNICAL ENGINEERS RECOMMENDATIONS.

SLOPE COVER / PROTECTION NOTES:

1. ALL PERMANENT SLOPES 3:1 OR STEEPER SHALL BE PROTECTED AS FOLLOWS:
 - a) ROUGHEN SURFACE LEAVING CLEAT IMPRINTS PARALLEL TO SLOPE CONTOURS.
 - b) HYDROSEED ENTIRE AREA WITH THE APPROVED FORESTRY SEED MIX ..
 - c) INSTALL MULCH ..
 - d) SECURE ENTIRE AREA WITH EROSION CONTROL BLANKET.

T.E.S.C. PLAN NOTES:

1. EROSION AND SEDIMENT CONTROL BMP'S SHALL CONFORM TO APPENDIX D, KING COUNTY SURFACE WATER DESIGN MANUAL. A COPY SHALL BE ON-SITE AT ALL TIMES DURING CONSTRUCTION.
2. WHERE CONSTRUCTION VEHICLES CROSS PROPOSED. TEMPORARY INTERCEPTOR DITCHES PROVIDE TEMPORARY (12" CMP OR APPROVED EQUAL) CULVERTS.

MULCHING:

1. MULCH MATERIALS USED SHALL BE HAY OR STRAW, AND SHALL BE APPLIED AT THE RATE OF 2-3 TONS PER ACRE.
2. MULCHES SHALL BE APPLIED ON ALL EXPOSED AREAS.
3. MULCHING SHALL BE USED IMMEDIATELY AFTER SEEDING OR IN AREAS WHICH CANNOT BE SEEDED BECAUSE OF THE SEASON.
4. ALL AREAS NEEDING MULCH SHALL BE COVERED BY NOVEMBER 1.

PLANTING NOTES:

1. THE PROJECT AREAS WILL HAVE A CAP OF TOPSOIL WITH AN APPROPRIATE MIXTURE OF FUNGI PERFECTI AND GLOMALIN TO SUPPORT SOIL DEVELOPMENT AND VEGETATION SURVIVAL.
2. THE PRIMARY CONIFER SPECIES WILL CONSIST OF DOUGLAS-FIR 2+0 SEEDLINGS AND THE PLANTING RATE WILL BE APPROXIMATELY 680 TREES PER ACRE. THE SPACING ON THE PLANTED SEEDLINGS WILL BE 8 FEET BY 8 FEET. ADDITIONALLY, RED ALDER IS A PIONEER SPECIES FOR THIS REGION AND WILL NATURALLY REGENERATE ON EXPOSED SOILS.
3. AN APPROVED FORESTRY SEED MIX WILL BE APPLIED EVENLY ACROSS THE COMPLETED SITE.

SEEDING NOTES:

1. SEEDING SHOULD BE DONE IMMEDIATELY AFTER FINAL SHAPING IF COMPLETED DURING THE PERIODS OF APRIL 1 THROUGH JUNE 30 AND SEPTEMBER 1 THROUGH OCTOBER 31 (IF PLANTED BETWEEN JULY 1 AND AUGUST 31, IRRIGATION MAY BE REQUIRED). SITES WHICH CANNOT BE SEEDED DURING THIS TIME PERIOD SHOULD BE PROTECTED UNTIL THE NEXT SEEDING PERIOD WITH MULCHING.
2. PERMANENT VEGETATION MAY BE IN THE FORM OF GRASS SEED MIXTURES, SOD, OR WETLAND SEED / TUBER MIXTURES. SEED ESTABLISHMENT SHALL INCLUDE THE USE OF SUPPLEMENTAL MATERIALS, SUCH AS MULCH.
3. SITE PREPARATION - INSTALL SURFACE RUNOFF CONTROL MEASURES.
4. SEEDBED PREPARATION MAY INCLUDE THE FOLLOWING:
 - a. IF INFERTILE OR COARSE TEXTURED SUBSOIL WILL BE EXPOSED DURING GRADING, STOCKPILE TOPSOIL AND RE-SPREAD IT OVER THE FINISHED SLOPE AND ROLL IT TO PROVIDE A FIRM SEEDBED.
 - b. IF CONSTRUCTION FILLS HAVE LEFT SOIL EXPOSED WITH A LOOSE, ROUGH, OR IRREGULAR SURFACE, TRACK WALK UP SLOPE.
 - c. IF CUTS OR CONSTRUCTION EQUIPMENT HAVE LEFT A TIGHTLY COMPACTED SURFACE, BREAK WITH CHISEL PLOW OR OTHER SUITABLE IMPLEMENT.
5. PERFORM ALL CULTURAL OPERATIONS ACROSS OR AT RIGHT ANGLES TO THE SLOPES (CONTOURED). THE SEEDBED SHOULD BE FIRM WITH A FAIRLY FINE SURFACE AFTER ROUGHENING.
6. FERTILIZATION - AS PER SUPPLIER'S RECOMMENDATIONS. DEVELOPMENTS ADJACENT TO WATER BODIES MUST USE NON-PHOSPHOROUS FERTILIZER.
7. "HYDROSEEDING" APPLICATIONS WITH APPROVED SEED-MULCH-FERTILIZER MIXTURES MAY ALSO BE USED.
8. SEEDING - APPLY APPROPRIATE MIXTURE TO THE PREPARED SEEDBED AT A RATE OF 120 LBS/ACRE COVER THE SEED WITH TOPSOIL OR MULCH NO DEEPER THAN 1/2 INCH.
9. INSPECT SEEDED AREAS FOR FAILURE AND MAKE NECESSARY REPAIRS AND RE-SEEDINGS IMMEDIATELY.
 - a. IF VEGETATION COVER IS INADEQUATE TO PREVENT RILL EROSION, OVERSEED AND FERTILIZE IN ACCORDANCE WITH SOIL TEST RESULTS.
 - b. IF A STAND HAS LESS THAN 40% COVER, REEVALUATE CHOICE OF PLANT MATERIALS AND QUANTITIES OF LIME AND FERTILIZER. REESTABLISH THE STAND FOLLOWING SEEDBED PREPARATION AND SEEDING RECOMMENDATIONS, OMITTING LIME AND FERTILIZER IN THE ABSENCE OF SOIL TEST RESULTS.
10. TEMPORARY EROSION CONTROL SEED MIXTURES

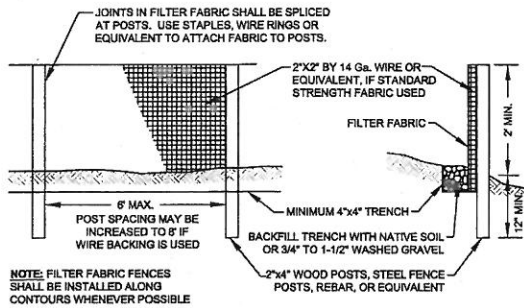
SEED MIX TYPE	PROPORTIONS BY WEIGHT	PERCENT PURITY	PERCENT GERMINATION
CHEWINGS OR RED FESCUE	40%	98%	90
ANNUAL OR PERENNIAL RYE	40%	98%	90
REDDTOP OR COLONIAL BENTGRASS	10%	92%	85
WHITE DUTCH CLOVER	10%	98%	90

*APPLY THIS MIXTURE AT A RATE OF 120 LBS/ACRE. THIS RATE CAN BE REDUCED IF SOIL AMENDMENTS OR SLOW RELEASE FERTILIZERS ARE USED.

BY					
DATE					
DESCRIPTION					
REVISION					
CONTOUR ENGINEERING • L.L.C. CIVIL ENGINEERS • SURVEYORS • LAND PLANNERS 3309 56th Street NW, Suite 106 Gig Harbor, WA 98335 Phone: 253-857-5454 ~ Fax: 253-509-0044 ~ info@contourllc.com					
					
SHEET TITLE: CONSTRUCTION NOTES					
RAVENSDALE TRENCH FILLING CLIENT: RAVENSDALE LLC 41306 90TH AVENUE E EATONVILLE, WA 98328 CONTACT: KURT ERICKSON PHONE: (253) 606-6060					
DESIGNER: J. JACOBY ENGINEER: B. ALLEN DRAWN: J. JACOBY S 1 T 21 N R 6E WM DATE: 2018-05-08 REVISED:					
PROJECT: 09-040 DWG NAME: 09-040-C					
SHEET REV.					
C3					
3 OF 33					

RAVENSDALE RECLAMATION TRENCH FILLING AND RESTORATION PROJECT

PORTIONS OF SECTION 1, TOWNSHIP 21 NORTH, RANGE 6 EAST,
SECTION 36, TOWNSHIP 22 NORTH, RANGE 6 EAST, AND SECTION 31, TOWNSHIP 22 NORTH, RANGE 7 EAST, W.M.
KING COUNTY, WASHINGTON



MAINTENANCE STANDARDS

- Any damage shall be repaired immediately.
- If concentrated flows are evident uphill of the fence, they must be intercepted and conveyed to a sediment trap or pond.
- It is important to 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.
- Sediment must be removed when the sediment is 8 inches high.
- If the filter fabric (geotextile) has deteriorated due to ultraviolet breakdown, it shall be replaced.

FILTER FABRIC FENCE NOTES:

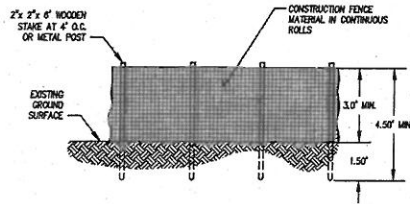
- SEE FIGURE C.3.6.A AND FIGURE C.3.6.B FOR DETAILS.
- THE GEOTEXTILE USED MUST MEET THE STANDARDS LISTED BELOW. A COPY OF THE MANUFACTURER'S FABRIC SPECIFICATIONS MUST BE AVAILABLE ON-SITE.

30-100 sieve size (0.60-0.15 mm) for all firm	0.02 sec ¹ minimum
50-100 sieve size (0.30-0.15 mm) for other fabrics	180 lbs. min. for extra strength fabric
	100 lbs. min. for standard strength fabric
	30% max. (woven)
	70% min.

- STANDARD STRENGTH FABRIC REQUIRES WIRE BACKING TO INCREASE THE STRENGTH OF THE FENCE. WIRE BACKING OR CLOSER POST SPACING MAY BE REQUIRED FOR EXTRA STRENGTH FABRIC IF FIELD PERFORMANCE WARRANTS A STRONGER FENCE.
- WHERE THE FENCE IS INSTALLED, THE SLOPE SHALL BE NO STEEPER THAN 2H:1V.
- IF A TYPICAL SILT FENCE (PER FIGURE C.3.6.A) IS USED, THE STANDARD 4 X 4 TRENCH MAY NOT BE REDUCED AS LONG AS THE BOTTOM 8 INCHES OF THE SILT FENCE IS WELL BURIED AND SECURED IN A TRENCH THAT STABILIZES THE FENCE AND DOES NOT ALLOW WATER TO BYPASS OR UNDERMINE THE SILT FENCE.
- SILT FENCES SHALL BE LOCATED SO AS TO AVOID INTERFERING WITH THE MOVEMENT OF JUVENILE SALMONIDS ATTEMPTING TO ENTER OFF-CHANNEL AREAS OR DRAINAGES.

FILTER FABRIC FENCE DETAIL

NOT TO SCALE



MAINTENANCE STANDARDS:

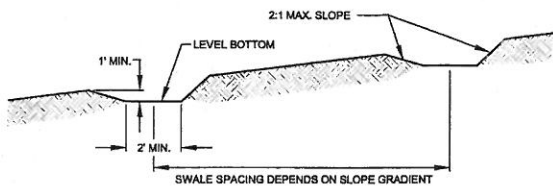
- IF THE FENCE HAS BEEN DAMAGED OR VISIBLY REDUCED, IT SHALL BE REPAIRED OR REPLACED IMMEDIATELY AND VISIBILITY RESTORED.
- DISTURBANCE OF A CRITICAL AREA, CRITICAL BUFFER, NATIVE GROWTH RETENTION AREA, OR ANY OTHER AREA REQUIRED TO BE LEFT UNDISTURBED SHALL BE REPORTED TO THE COUNTY FOR RESOLUTION.

PROTECTION FENCE NOTES:

- THE FENCE SHALL BE DESIGNED AND INSTALLED ACCORDING TO THE MANUFACTURER'S SPECIFICATIONS.
- THE FENCE SHALL BE AT LEAST 3 FEET HIGH AND MUST BE HIGHLY VISIBLE.
- THE FENCE SHALL NOT BE WIRED OR STAPLED TO TREES.
- THE FENCE SHALL BE REMOVED UPON THE COMPLETION OF THE WORK AND THE SITE IS STABILIZED.

PROTECTION FENCE DETAIL

NOT TO SCALE



DESIGN AND INSTALLATION SPECIFICATIONS

- SEE FIGURE D.2.1.6.B FOR DETAILS OF AN INTERCEPTOR DIKE AND FIGURE D.2.1.6.C FOR AN INTERCEPTOR SWALE.
 - INTERCEPTOR DICES AND SWALES SHALL BE SPACED HORIZONTALLY AS FOLLOWS:
- | 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 |
- FOR SLOPES STEEPER THAN 2H:1V WITH MORE THAN 10 FEET OF VERTICAL RELIEF, BENCHES MAY BE CONSTRUCTED OR CLOSER SPACED INTERCEPTOR DICES OR SWALES MAY BE USED, WHICHEVER MEASURE IS CHOSEN, THE SPACING AND CAPACITY OF THE MEASURES MUST BE DESIGNED BY THE ENGINEER AND THE DESIGN MUST INCLUDE PROVISIONS FOR EFFECTIVELY INTERCEPTING THE HIGH VELOCITY RUNOFF ASSOCIATED WITH STEEP SLOPES.
 - IF THE DIKE OR SWALE INTERCEPTS RUNOFF FROM DISTURBED AREAS, IT SHALL DISCHARGE TO A STABLE CONVEYANCE SYSTEM THAT ROUTES THE RUNOFF TO A SEDIMENT POND OR TRAP (SEE SECTION D.2.1.5). IF THE DIKE OR SWALE INTERCEPTS RUNOFF THAT ORIGINATES FROM UNDISTURBED AREAS, IT SHALL DISCHARGE TO A STABLE CONVEYANCE SYSTEM THAT ROUTES THE RUNOFF DOWNSLOPE OF ANY DISTURBED AREAS AND RELEASES THE WATER AT A STABILIZED OUTLET.
 - CONSTRUCTION TRAFFIC OVER TEMPORARY DICES AND SWALES SHALL BE MINIMIZED.

MAINTENANCE STANDARDS

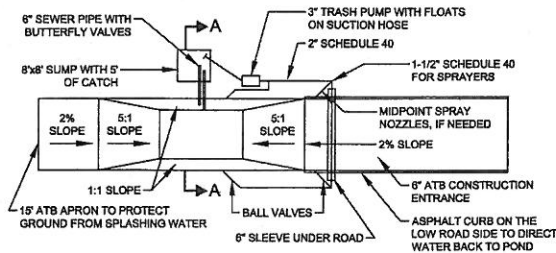
- DAMAGE RESULTING FROM RUNOFF OR CONSTRUCTION ACTIVITY SHALL BE REPAIRED IMMEDIATELY.
- IF THE FACILITIES DO NOT REGULARLY RETAIN STORM RUNOFF, THE CAPACITY AND/OR FREQUENCY OF THE DICES/SWALES SHALL BE INCREASED.

INTERCEPTOR SWALES NOTES:

- SEED AND MULCH SHALL BE APPLIED WITHIN 5 DAYS OF CONSTRUCTION (SEE VEGETATION).
- NO EROSION SHALL OCCUR AT THE OUTLET. PROVIDE ENERGY DISSIPATION MEASURES AS NECESSARY.
- SEDIMENT LADEN RUNOFF MUST BE RELEASED THROUGH A SEDIMENT TRAPPING FACILITY SUCH AS A POND, TRAP, OR SILT FENCE AS APPROPRIATE TO DRAINAGE AREA SIZE.

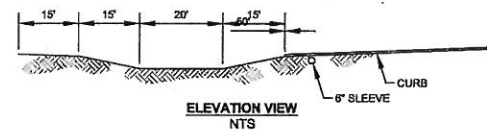
INTERCEPTOR DITCH DETAIL

NOT TO SCALE



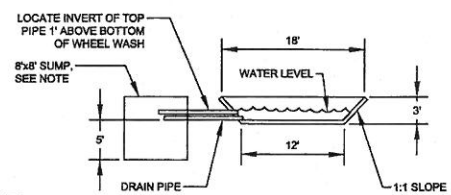
PLAN VIEW

NTS



ELEVATION VIEW

NTS



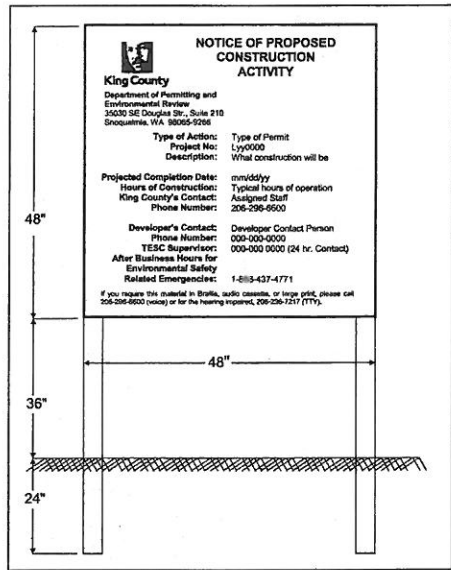
NOTE: BUILD 8"x8" SUMP TO ACCOMMODATE CLEANING BY TRACKHOE.

SECTION A-A

NTS

WHEEL WASH DETAIL

NOT TO SCALE



NOTICE BOARD CONSTRUCTION SPECIFICATIONS

THE NOTICE BOARD SHALL BE CONSTRUCTED WITH 4" X 4" X 1/2" PLYWOOD, EXTERIOR GRADE, GOOD SURFACE ONE SIDE, PROFESSIONALLY PREPARED PLASTIC BOARD OVERLAYS, PERMANENTLY AFFIXED TO THE BOARD ARE PERMISSIBLE. THE NOTICE BOARD SHALL DISPLAY THE INFORMATION AS SHOWN IN THE FIGURE ON PAGE TWO AND AS SPECIFIED AT THE PRE-CONSTRUCTION MEETING. NOTICE BOARDS MAY BE REUSED, BUT THEY MUST BE CLEAN AND SHOW NO EVIDENCE OF FORMER WORDING.

- LETTERING STYLE
- LETTERING SIZE

HELVETICA OR SIMILAR TYPEFACE
TITLE SHOULD BE 3" CAPITAL LETTERS (NOTICE OF PROPOSED CONSTRUCTION ACTIVITY), OTHER LETTERS SHOULD BE 2" LETTERS AND THE EMERGENCY TEXT AND PHONE MAY BE 1-1/2" LETTERS. SEE ILLUSTRATION ON PAGE TWO FOR USE OF CAPITAL AND LOWERCASE LETTERS. THE SIZE OF THE COUNTY LOGO WITH THE DEPARTMENT OF PERMITTING AND ENVIRONMENTAL REVIEWS (PERMITTING) ADDRESS (LETTERING HEIGHT 1") SHALL FIT THE AVAILABLE SPACE AS SHOWN. BORDER AREA AND LINES OF TEXT SHALL BE EVENLY SPACED TO APPROXIMATE THE SAMPLE SHOWN.
BLACK (PERMANENT INK OR SILK-SCREEN)
WHITE
KING COUNTY EMBLEM, IN BLACK

- LETTERING
- BACKGROUND COLOR
- LOGO

THE APPLICANT/DEVELOPER SHALL ERECT THE NOTICE BOARD BY SOLIDLY SETTING TWO 4" X 4" POSTS TO 12 TO 24 INCHES INTO THE GROUND, OR STRUCTURALLY ATTACHING IT TO AN EXISTING BUILDING. POST LENGTH SHALL BE AT LEAST 7 FEET ABOVE THE GROUND. TWO 2" X 4" DIAGONAL BRACES SHOULD BE NAILED TO THE INSIDE BACK OF THE POSTS AND STAKED AT THE GROUND TO PROVIDE STABILITY AGAINST WIND OR SOFT SOIL CONDITIONS IF POSTS ARE LESS THAN 24 INCHES INTO THE GROUND. THE NOTICE BOARD SHALL BE ATTACHED TO THE POSTS WITH FOUR LAG BOLTS AND WASHERS (3/8-INCH DIAMETER AND 3" LONG).

NOTICE BOARD LOCATION

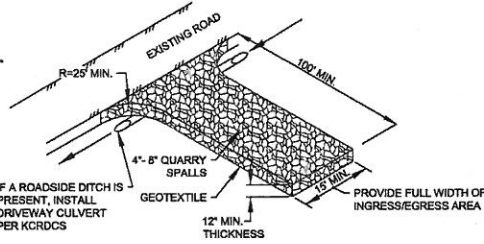
- AT THE MIDPOINT ON THE SITE STREET FRONTAGE OR AS OTHERWISE DIRECTED BY PERMITTING STAFF TO MAXIMIZE VISIBILITY.
- AT A LOCATION 5 FEET INSIDE THE STREET PROPERTY LINE; A NOTICE BOARD STRUCTURALLY ATTACHED TO AN EXISTING BUILDING SHALL BE EXEMPT FROM THE SETBACK PROVISIONS, PROVIDED THAT THE NOTICE BOARD IS LOCATED NOT MORE THAN 5 FEET FROM THE PROPERTY LINE WITHOUT APPROVAL FROM PERMITTING STAFF.
- SO THAT THE TOP OF THE NOTICE BOARD IS BETWEEN 7 TO 9 FEET ABOVE GRADE.
- SO THAT IT IS TOTALLY VISIBLE TO PEDESTRIANS.

MAINTENANCE AND REMOVAL OF NOTICE BOARD

THE APPLICANT/DEVELOPER SHALL MAINTAIN THE NOTICE BOARD IN GOOD CONDITION THROUGHOUT THE SITE IMPROVEMENT CONSTRUCTION PERIOD, WHICH SHALL EXTEND THROUGH THE TIME OF FINAL CONSTRUCTION APPROVAL BY KING COUNTY PERMITTING OR ITS SUCCESSOR AGENCY OR JURISDICTION. THE NOTICE BOARD SHALL BE REMOVED WITHIN 14 DAYS AFTER FINAL CONSTRUCTION APPROVAL. EARLY REMOVAL OF THE NOTICE BOARD MAY RESULT IN ENFORCEMENT ACTIONS AUTHORIZED UNDER KCC, TITLE 23 AND MAY DELAY FINAL CONSTRUCTION APPROVAL.

NOTICE OF CONSTRUCTION ACTIVITY SIGN

NOT TO SCALE



- NOTES:
- PER KING COUNTY ROAD DESIGN AND CONSTRUCTION STANDARDS (KCRDCS), DRIVEWAYS SHALL BE PAVED TO EDGE OF R.O.W PRIOR TO INSTALLATION OF THE CONSTRUCTION ENTRANCE TO AVOID DAMAGING OF THE ROADWAY.
 - IT IS RECOMMENDED THAT THE ENTRANCE BE CROWNED SO THAT RUNOFF DRAINS OFF THE PAD.

DESIGN AND INSTALLATION SPECIFICATIONS

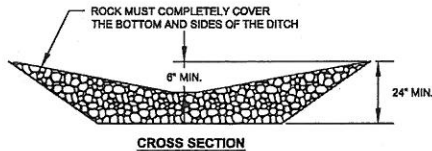
- SEE FIGURE D.2.1.1-A FOR DETAILS.
 - A SEPARATION GEOTEXTILE SHALL BE PLACED UNDER THE SPALLS TO PREVENT FINE SEDIMENT FROM PUMPING UP INTO THE ROCK PAD. THE GEOTEXTILE SHALL MEET THE FOLLOWING STANDARDS:
- | GRAB TENSILE STRENGTH (ASTM D4632) | 200 LBS MIN. |
|--------------------------------------|----------------------------------|
| GRAB TENSILE ELONGATION (ASTM D4632) | 30% MAX (WOVEN) |
| PUNCTURE STRENGTH (ASTM D6241) | 495 LBS MIN. |
| AOCS (ASTM D4751) | 20-45 (U.S. STANDARD SIEVE SIZE) |
- 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.
 - HOG FUEL (WOOD BASED MULCH) MAY BE SUBSTITUTED FOR OR COMBINED WITH QUARRY SPALLS IN AREAS THAT WILL NOT BE USED FOR PERMANENT ROADS. THE EFFECTIVENESS OF HOG FUEL IS HIGHLY VARIABLE, BUT IT HAS BEEN USED SUCCESSFULLY ON MANY SITES. IT GENERALLY REQUIRES MORE MAINTENANCE THAN QUARRY SPALLS. HOG FUEL IS NOT RECOMMENDED FOR ENTRANCE STABILIZATION IN URBAN AREAS. THE INSPECTOR MAY AT ANY TIME REQUIRE THE USE OF QUARRY SPALLS IF THE HOG FUEL IS NOT PREVENTING SEDIMENT FROM BEING TRACKED ONTO PAVEMENT OR IF THE HOG FUEL IS BEING CARRIED ONTO PAVEMENT. HOG FUEL IS PROHIBITED IN PERMANENT ROADBEDS BECAUSE ORGANICS IN THE SUBGRADE SOILS CAUSE DIFFICULTIES WITH COMPACTION.
 - FENCING (SEE SECTION D.2.1.1) 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.

MAINTENANCE STANDARDS

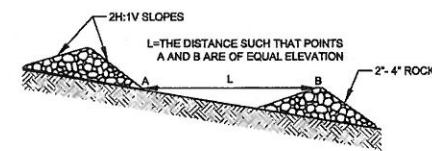
- QUARRY SPALLS (OR HOG FUEL) SHALL BE ADDED IF THE PAD IS NO LONGER IN ACCORDANCE WITH THE SPECIFICATIONS.
- IF THE ENTRANCE IS NOT PREVENTING SEDIMENT FROM BEING TRACKED ONTO PAVEMENT, THEN ALTERNATIVE MEASURES TO KEEP THE STREETS FREE OF SEDIMENT SHALL BE USED. THIS MAY INCLUDE STREET SWEEPING, AN INCREASE IN THE DIMENSIONS OF THE ENTRANCE, OR THE INSTALLATION OF A WHEEL WASH. IF WASHING IS USED, IT SHALL BE DONE ON AN AREA COVERED WITH CRUSHED ROCK, AND WASH WATER SHALL DRAIN TO A SEDIMENT TRAP OR POND.
- ANY SEDIMENT THAT IS TRACKED ONTO PAVEMENT SHALL BE REMOVED IMMEDIATELY BY 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 SWEEPING IS INEFFECTIVE AND THERE IS A THREAT TO PUBLIC SAFETY. IF IT IS NECESSARY TO WASH THE STREETS, A SMALL SUMP MUST BE CONSTRUCTED. THE SEDIMENT WOULD THEN BE WASHED INTO THE SUMP WHERE IT CAN BE CONTROLLED. WASH WATER MUST BE PUMPED BACK ONTO THE SITE AND CANNOT DISCHARGE TO SYSTEMS TRIBUTARY TO SURFACE WATERS.
- ANY QUARRY SPALLS THAT ARE LOOSENED FROM THE PAD AND 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 SECTION D.2.1.1) SHALL BE INSTALLED TO CONTROL TRAFFIC.

CONSTRUCTION ENTRANCE DETAIL

NOT TO SCALE



CROSS SECTION



CHECK DAM SPACING

ROCK CHECK DAMS

NOT TO SCALE

BY DATE DESCRIPTION REVISION

DESIGNER: J. JACOBY
ENGINEER: B. ALLEN
DRAWN: J. JACOBY
S 1 T 21 N R 6E WM
DATE: 2018-05-08
REVISED:

PROJECT: 09-040
DWG NAME: 09-040-C

SHEET C4 4 OF 33

RAVENSDALE TRENCH FILLING
CLIENT: RAVENSDALE LLC
41306 90TH AVENUE E
EATONVILLE, WA 98328
CONTACT: KURT ERICKSON
PHONE: (253) 606-6060

ENGINEERING & LAND PLANNING
CIVIL ENGINEERS-SURVEYORS
3309 56th Street NW, Suite 106 Gig Harbor, WA 98335
Phone: 253-857-5454 ~ Fax: 253-509-0044 ~ info@contourplc.com

PROFESSIONAL ENGINEER
BRETT J. ALLEN
STATE OF WASHINGTON
No. 57276
EXPIRATION DATE 12/31/2020















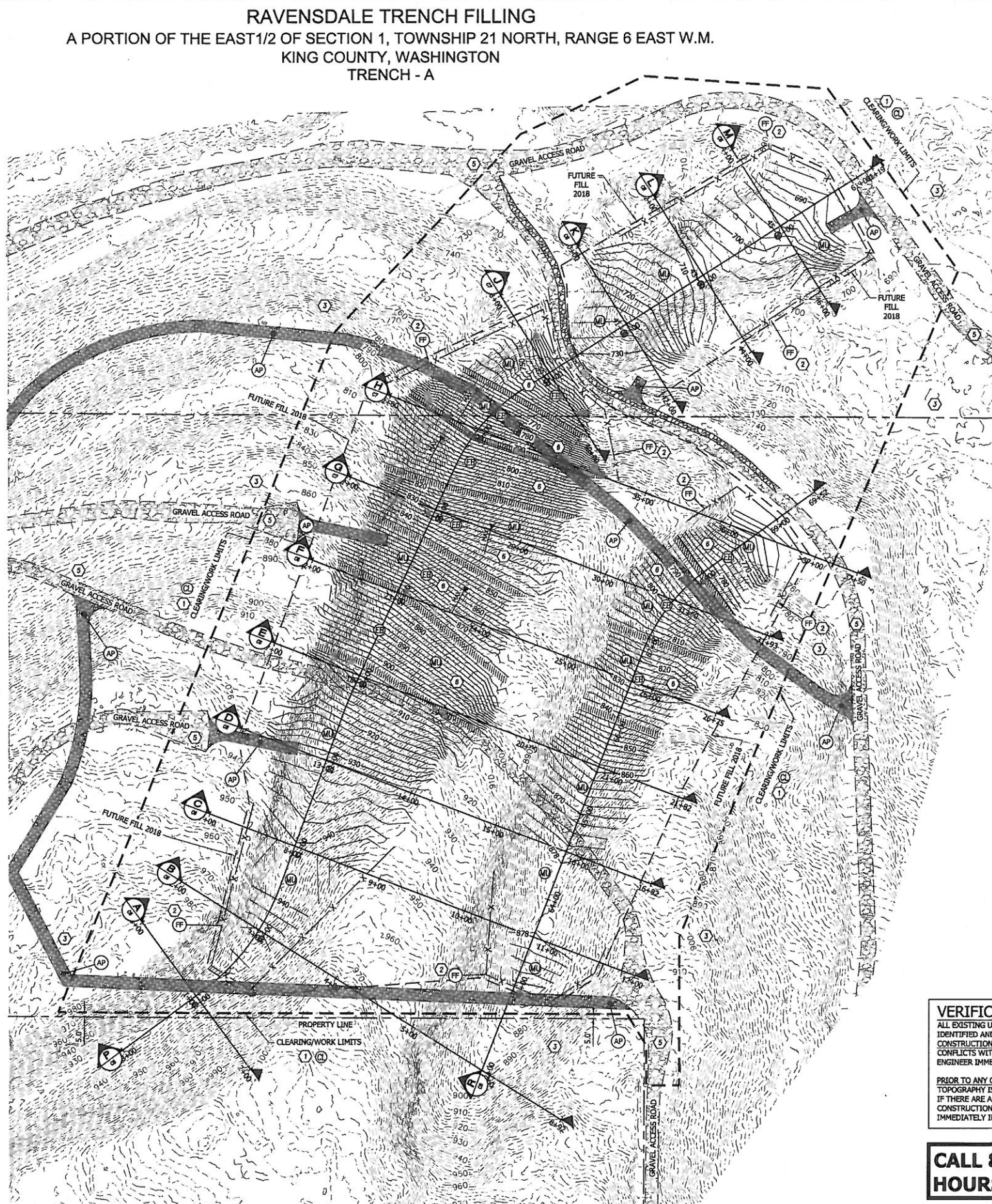
SCALE: 1" = 60' HORIZONTAL
1" = 20' VERTICAL

CONSTRUCTION NOTES:

- PLAN NOTES:

1. SEE PLANTING NOTES SHEET 10.
2. 5' WIDE BENCH VERTICAL SEPARATION PER GEOTECHNICAL ENGINEER REQUIREMENTS.
3. ACTUAL LOCATION OF TOE OF SLOPE VARIES TO ALLOW WORKING AREA/CLEARANCE. TOE OF SLOPE SHALL NOT ENCROACH INTO WETLAND BUFFER.
4. ACCESS ROADS SHOW ARE FOR REFERENCE ONLY. LOCATIONS SUBJECT TO BE MODIFIED AS NEEDED FOR FILLING OPERATIONS.

- | | | |
|---|---|--|
|  |  | TEMPORARY ACCESS POINT
- AFTER COMPLETION OF PROJECT,
ROADSIDE IS TO BE REMOVED - AREA TO
BE HYDROSEED & REFORESTED PER
FOREST PRACTICE REQUIREMENTS |
|  |  | FILTER FABRIC FENCE
SEE NOTES AND DETAIL SHEET 4 |
|  |  | INTERCEPTOR DITCHES |
|  |  | HYDROSEED, FERTILIZER, AND
MULCH SEE NOTES SHEET 3 |
|  |  | CLEARING/CONSTRUCTION LIMITS |
|  |  | EROSION CONTROL BLANKET |

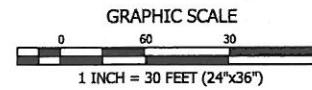


ALL EXISTING UTILITIES IN THE CONSTRUCTION AREA SHALL BE IDENTIFIED AND VERIFIED FOR DEPTH AND LOCATION PRIOR TO ANY CONSTRUCTION ACTIVITIES SO TO IDENTIFY ANY POTENTIAL CONFLICTS WITH PROPOSED CONSTRUCTION. CONTACT PROJECT ENGINEER IMMEDIATELY IF ANY CONFLICTS ARE IDENTIFIED.

PRIOR TO ANY CONSTRUCTION ACTIVITIES, VERIFY EXISTING TOPOGRAPHY IS CONSISTENT WITH WHAT IS SHOWN ON PLANS AND IF THERE ARE ANY POTENTIAL CONFLICTS WITH PROPOSED CONSTRUCTION ACTIVITIES. CONTACT PROJECT ENGINEER IMMEDIATELY IF ANY CONFLICTS ARE IDENTIFIED.

CALL 811 AT LEAST 48 HOURS BEFORE YOU DIG

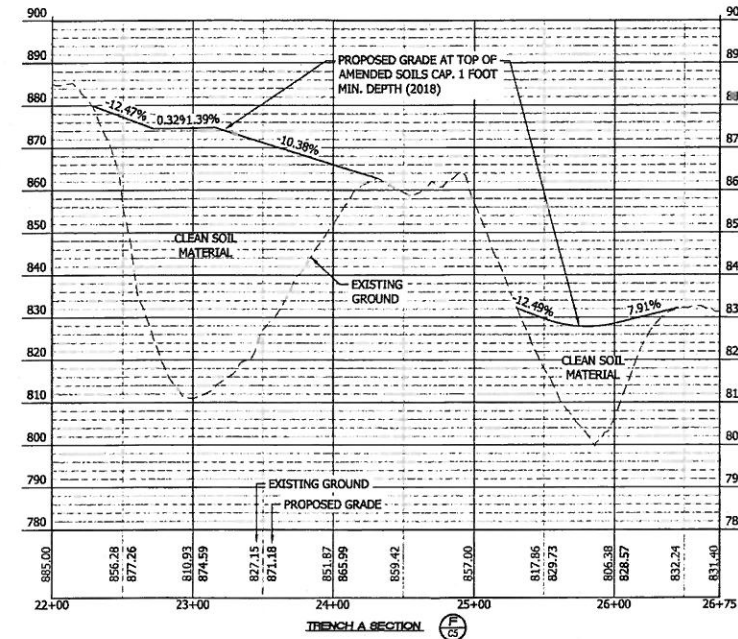
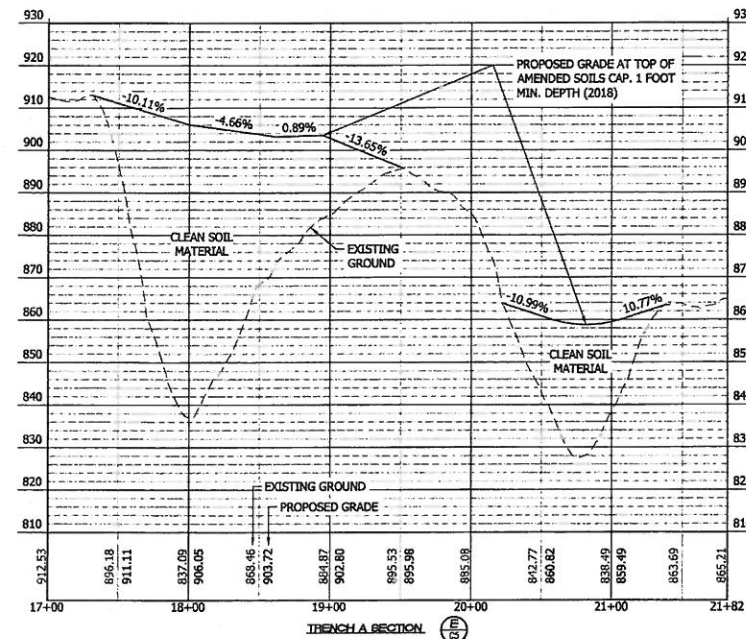
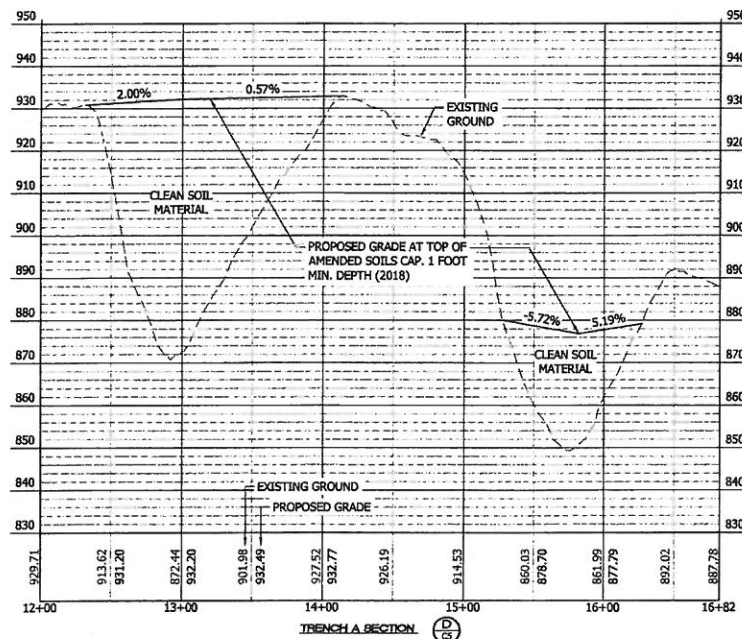
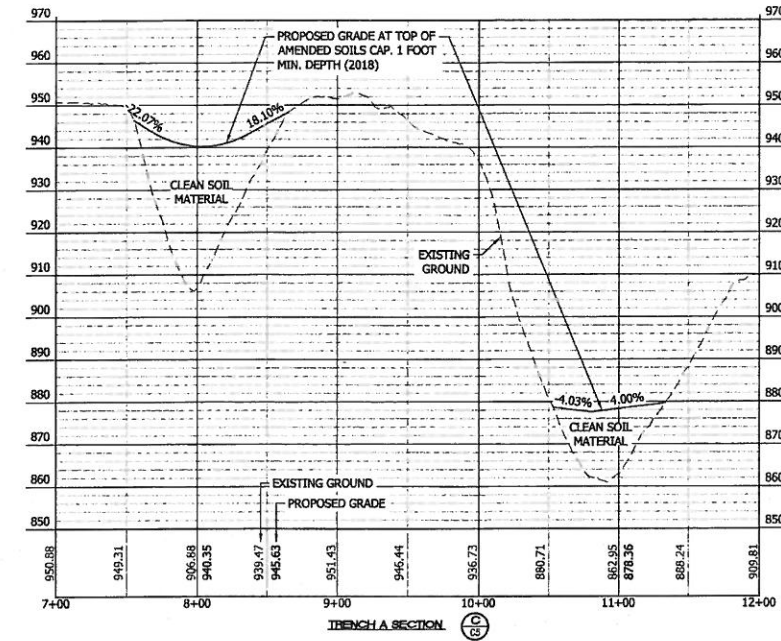
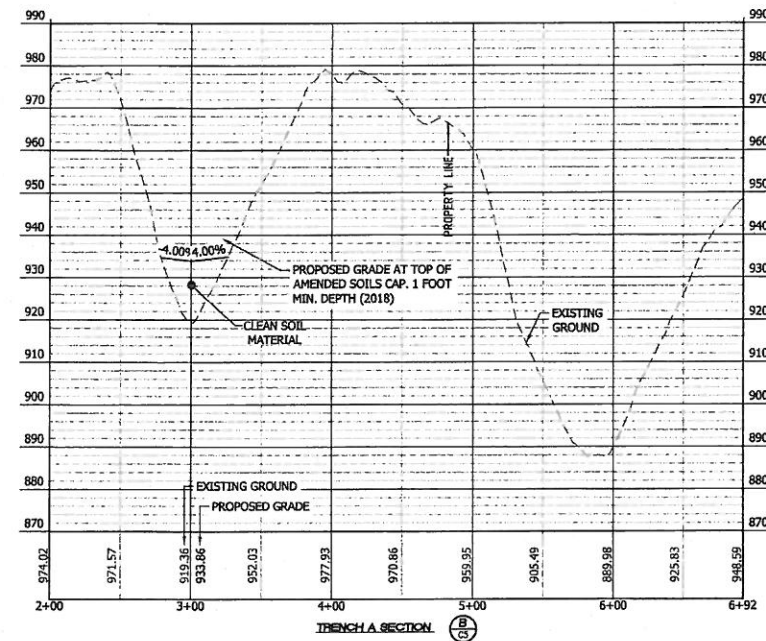
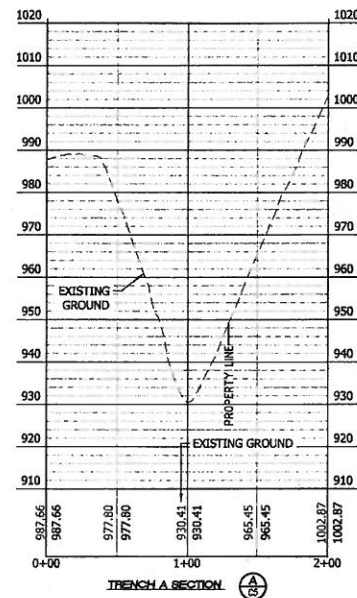
SHEET TITLE: TRENCH - A			
DESIGNER: J. JACOBY ENGINEER: B. ALLEN DRAWN: J. JACOBY S 1 T 21 N R 6E WM DATE: 2018-05-08 REVISED:		RAVENSDALE TRENCH FILLING CLIENT: RAVENSDALE LLC 41306 90TH AVENUE E EATONVILLE, WA 98328 CONTACT: KURT ERIKSSON PHONE: (253) 606-6060	
PROJECT: 09-040		DWG NAME: 09-040-TRENCH	
SHEET		REV.	
C5			
5 OF 33			



TRENCH A:

SCALE: 1" = 60' HORIZONTAL
1" = 20' VERTICAL

PROPOSED IMPORT QUANTITY: 190,863 CY±
(BANK YARDS)

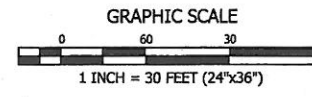


CONTOUR
ENGINEERING • L.L.C.
CIVIL ENGINEERS • SURVEYORS • LAND PLANNERS
3309 56th Street NW, Suite 106 Gig Harbor, WA 98335
Phone: 253-857-5454 ~ Fax: 253-509-0444 ~ info@contourllc.com



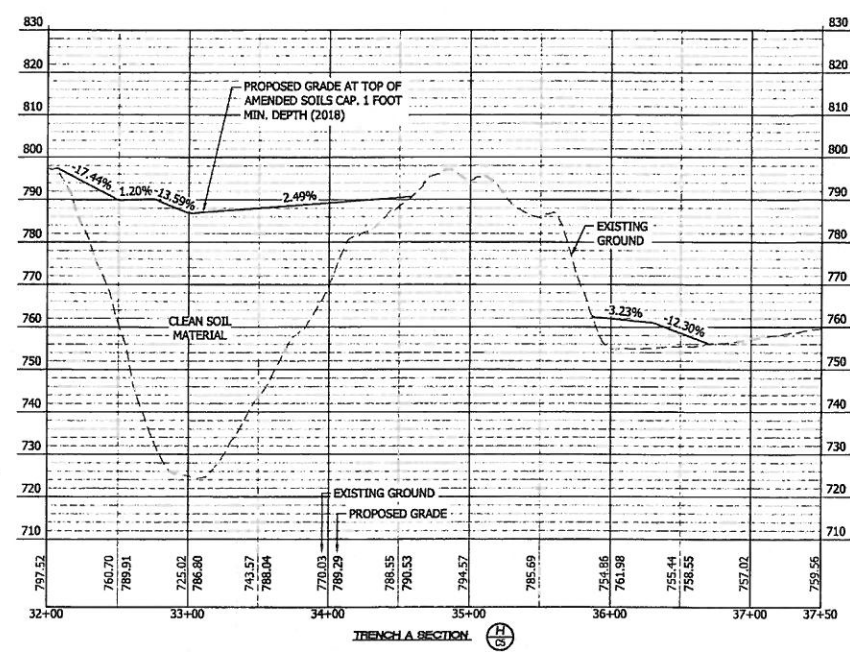
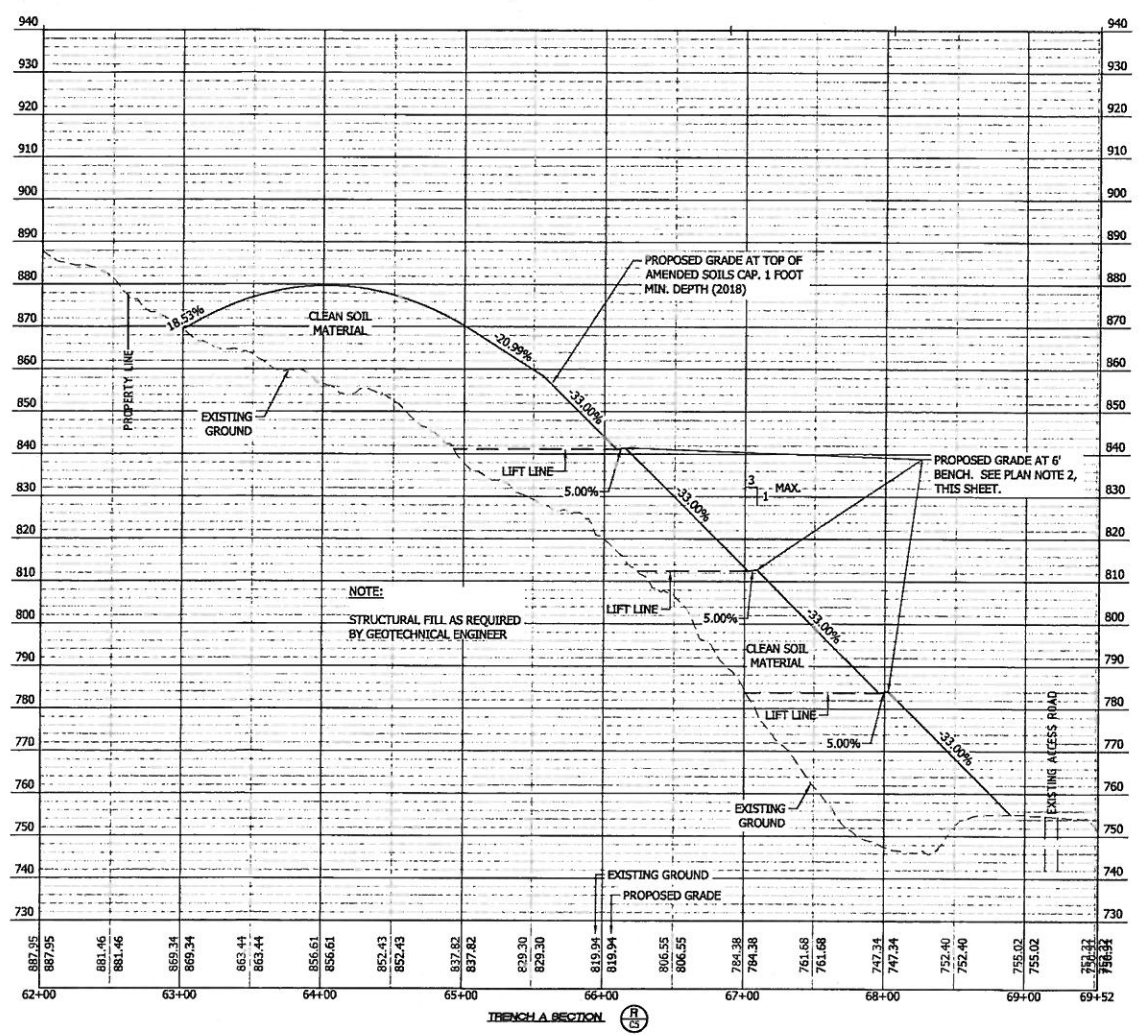
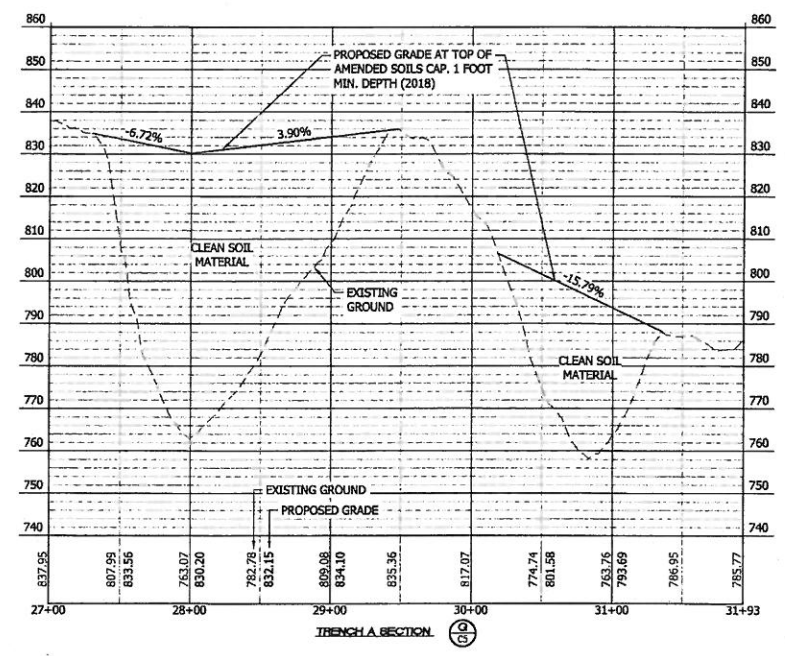
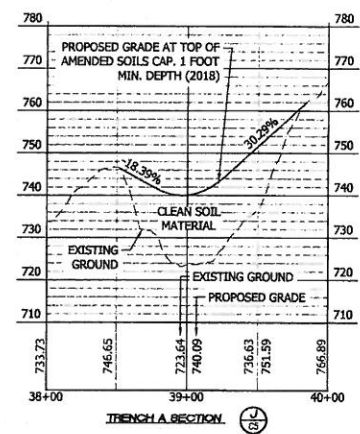
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DESIGNER: J. JACOBY
ENGINEER: B. ALLEN
DRAWN: J. JACOBY
DATE: 2018-05-08
REVISED:
PROJECT: 09-040
DWG NAME: 09-040-TRENCH-A

REVISION		DESCRIPTION	DATE	BY
C6				
6 OF 33				



TRENCH A:
SCALE: 1" = 60' HORIZONTAL
1" = 20' VERTICAL
PROPOSED IMPORT QUANTITY: 190,863 CY±
(BANK YARDS)

RAVENSDALE TRENCH FILLING
A PORTION OF THE EAST 1/2 OF SECTION 1, TOWNSHIP 21 NORTH, RANGE 6 EAST W.M.
KING COUNTY, WASHINGTON
TRENCH - A



REVISION	DATE	BY	DESCRIPTION

CONTOUR
ENGINEERING, L.L.C.
CIVIL ENGINEERS/SURVEYORS/LAND PLANNERS
3309 56th Street NW, Suite 106 Gig Harbor, WA 98335
Phone: 253-857-5454 ~ Fax: 253-509-0044 ~ info@contourplc.com

BETTY M. ALLEN
STATE OF WASHINGTON
REGISTERED PROFESSIONAL ENGINEER
No. 12140

SHEET TITLE: TRENCH - A

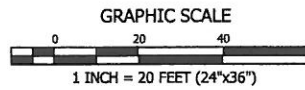
DESIGNER: J. JACOBY
ENGINEER: B. ALLEN
DRAWN: J. JACOBY
S 1 T 21 N R 6 E WM
DATE: 2018-05-08
REVISED:

PROJECT: 09-040
DWG NAME: 09-040-TRENCH-A

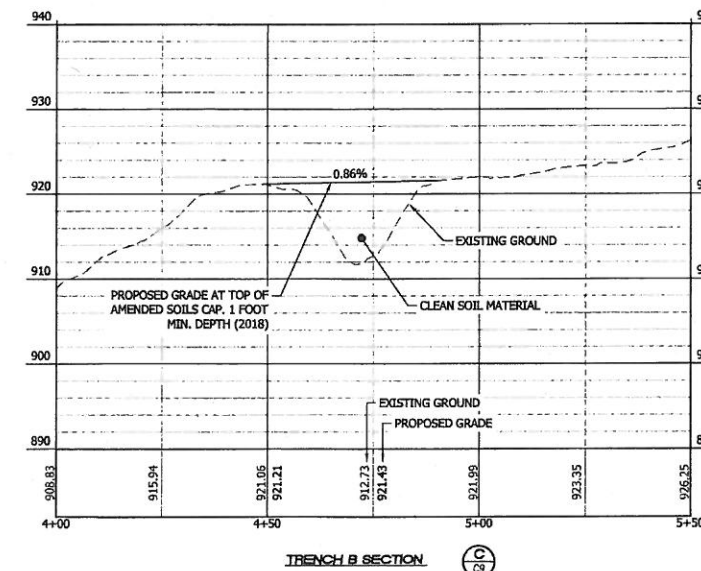
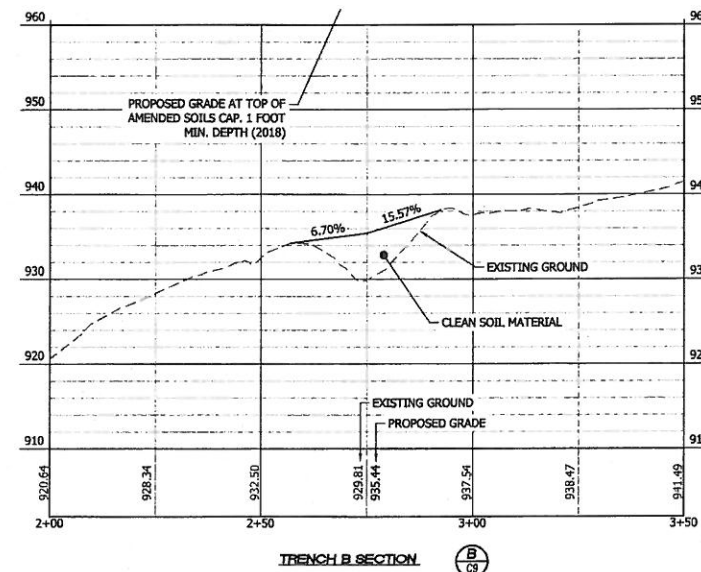
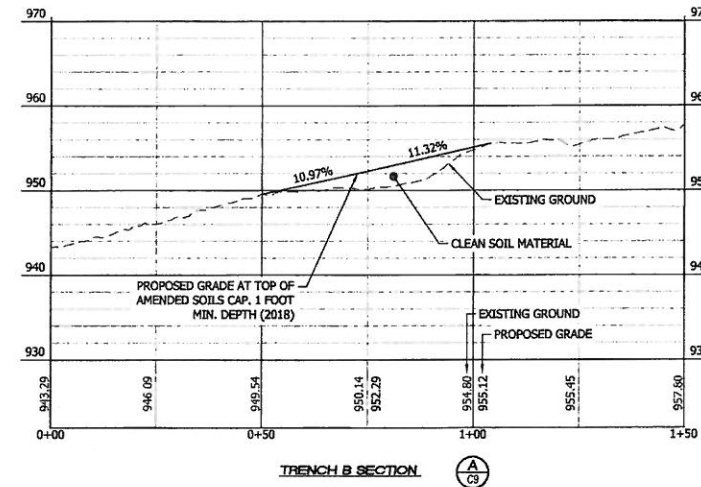
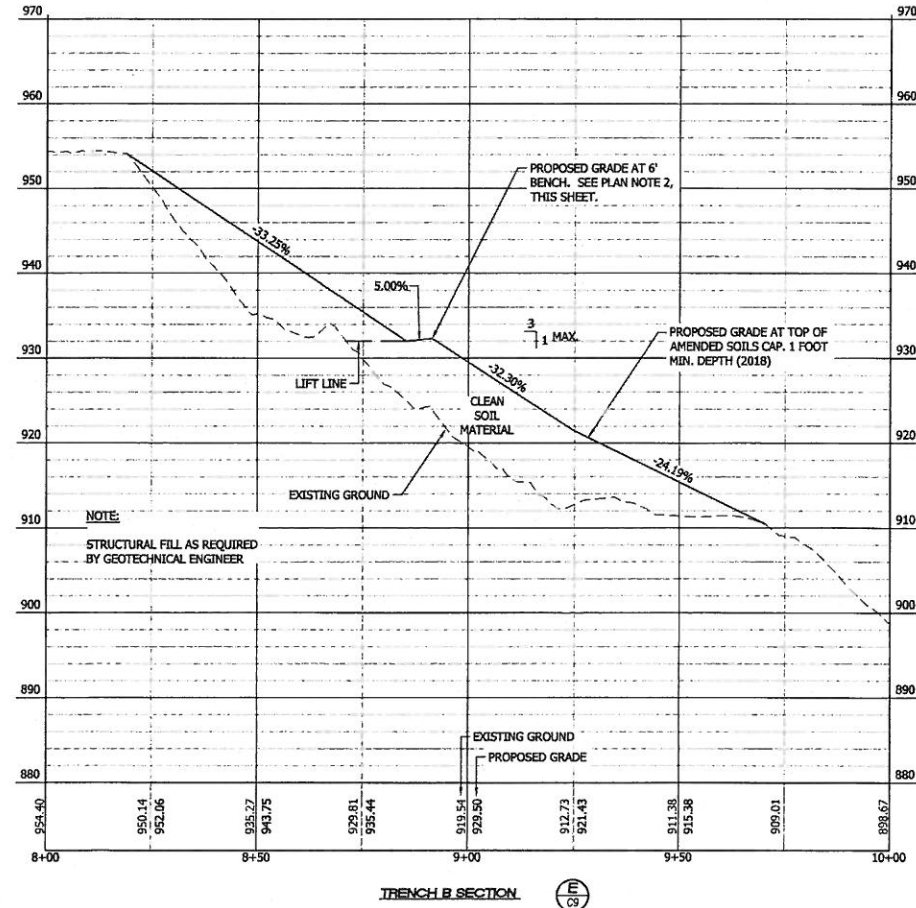
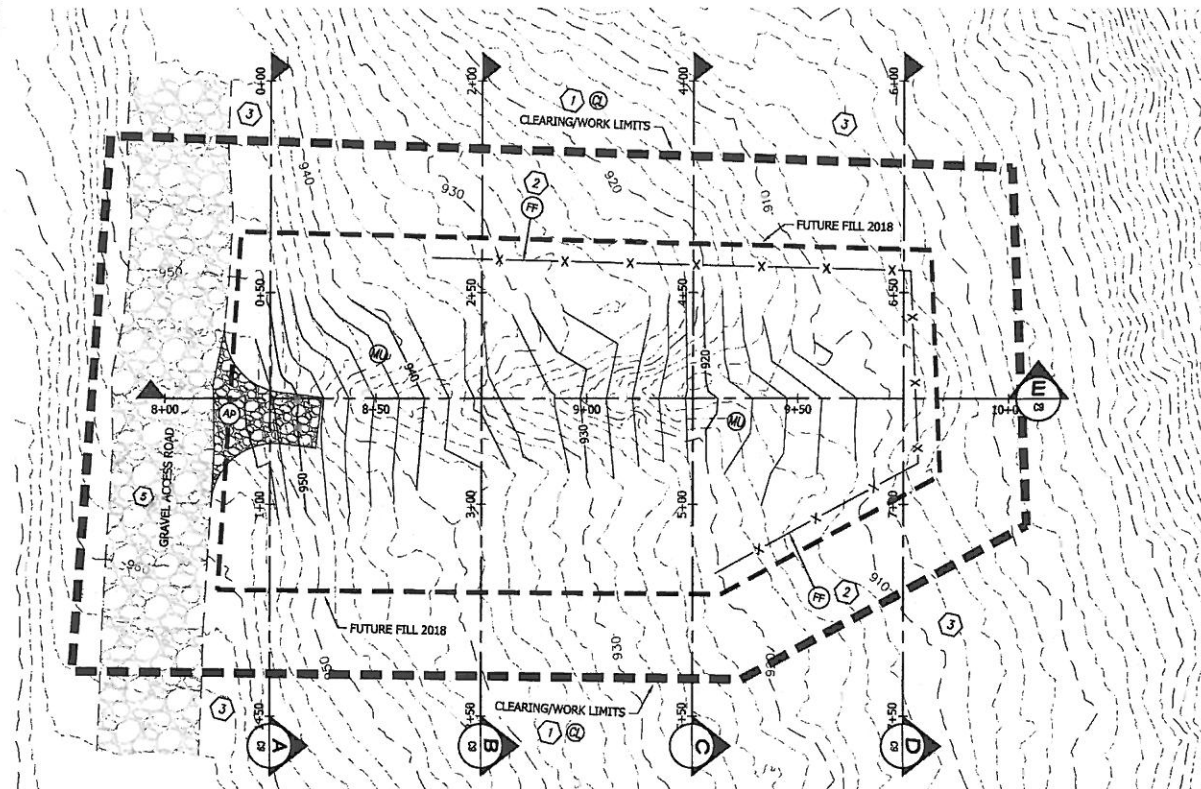
SHEET	REV.
C7	
7 OF 33	



SHEET TITLE: TRENCH - A DESIGNER: J. JACOBY ENGINEER: B. ALLEN DRAWN: J. JACOBY S 1 T 21 N R 6E WM DATE: 2018-05-08 REVISED: PROJECT: 09-040 DWG NAME: 09-040-TRENCH-A	RAVENSDALE TRENCH FILLING CLIENT: RAVENSDALE LLC 41306 90TH AVENUE E EATONVILLE, WA 98328 CONTACT: KURT ERLICSON PHONE: (253) 606-6060				CIVIL ENGINEERS~SURVEYORS~LAND PLANNERS 3309 56th Street NW, Suite 106 Gig Harbor, WA 98335 Phone: 253-857-5654 • Fax: 253-509-0044 • info@contourllc.com	REVISION	DESCRIPTION	DATE	BY



RAVENSDALE TRENCH FILLING
A PORTION OF THE EAST 1/2 OF SECTION 1, TOWNSHIP 21 NORTH, RANGE 6 EAST W.M.
KING COUNTY, WASHINGTON
TRENCH - K



CONSTRUCTION NOTES:

1. LIMIT OF WORK, CLEARING/GRADING LIMITS AS SHOWN
2. LOCATE FILTER FABRIC FENCE AS CLOSE TO CLEARING LIMITS AS PRACTICAL
3. UNDISTURBED AREAS.
4. WETLAND BUFFER DO NOT DISTURB.
5. MAINTAIN EXISTING GRAVEL ACCESS ROAD.
6. ARMOR PER GEOTECHNICAL ENGINEER REQUIREMENTS.
7. FIELD LOCATE ACTUAL WETLAND AND BUFFER PRIOR TO ANY FILLING. ADJUST EDGE OF FILL/TOE SLOPE TO KEEP ALL WORK OUTSIDE OF BUFFER.

PLAN NOTES:

1. SEE PLANTING NOTES SHEET 10.
2. 5' WIDE BENCH VERTICAL SEPARATION PER GEOTECHNICAL ENGINEER REQUIREMENTS.
3. ACTUAL LOCATION OF TOE OF SLOPE VARIES TO ALLOW WORKING AREA/CLEARANCE. TOE OF SLOPE SHALL NOT ENCRONCH INTO WETLAND BUFFER.
4. ACCESS ROADS SHOW ARE FOR REFERENCE ONLY. LOCATIONS SUBJECT TO BE MODIFIED AS NEEDED FOR FILLING OPERATIONS.

TESC LEGEND:

- AP TEMPORARY ACCESS POINT - AFTER COMPLETION OF PROJECT, ROADWAY IS TO BE REMOVED - AREA TO BE HYDROSEED & REFORESTED PER FOREST PRACTICE REQUIREMENTS
- FF FILTER FABRIC FENCE SEE NOTES AND DETAIL SHEET 4
- DI INTERCEPTOR DITCHES
- ML HYDROSEED, FERTILIZER, AND MULCH SEE NOTES SHEET 3
- CL CLEARING/CONSTRUCTION LIMITS
- EB EROSION CONTROL BLANKET

TRENCH K:

SCALE: 1" = 20' HORIZONTAL
1" = 10' VERTICAL

PROPOSED IMPORT QUANTITY: 621 CY±
(BANK YARDS)

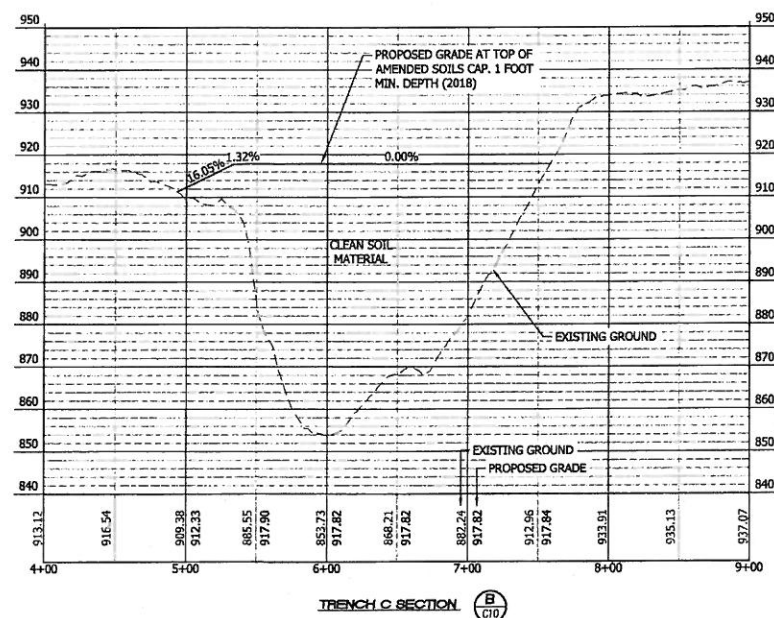
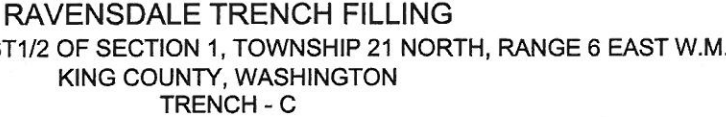
VERIFICATION NOTE

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PRIOR TO ANY CONSTRUCTION ACTIVITIES, VERIFY EXISTING TOPOGRAPHY IS CONSISTENT WITH WHAT IS SHOWN ON PLANS AND IF THERE ARE ANY POTENTIAL CONFLICTS WITH PROPOSED CONSTRUCTION ACTIVITIES, CONTACT PROJECT ENGINEER IMMEDIATELY IF ANY CONFLICTS ARE IDENTIFIED.

CALL 811 AT LEAST 48
HOURS BEFORE YOU DIG

BY	
DATE	
DESCRIPTION	
REVISION	
CONTOUR ENGINEERING, L.L.C. CIVIL ENGINEERS/SURVEYORS/LAND PLANNERS 3309 56th Street NW, Suite 106, Gig Harbor, WA 98335 Phone: 253-857-5454 ~ Fax: 253-509-0044 ~ info@contourllc.com	
SHEET TITLE: TRENCH - K	PHONE: (253) 606-6060
DESIGNER: J. JACOBY	CLIENT: RAVENSDALE TRENCH FILLING
ENGINEER: B. ALLEN	CLIENT: RAVENSDALE LLC
DRAWN: J. JACOBY	41306 90TH AVENUE E
S 1 T 21 N R 6E WM	EDMONTVILLE, WA 98328
DATE: 2018-05-08	CONTACT: KURT ERICKSON
REVISED:	
PROJECT: 08-040	
DWG NAME: 08-040-TRENCH-K	
SHEET	REV.
C9	
9 OF 33	



TRENCH C:
SCALE: 1" = 60' HORIZONTAL
1" = 20' VERTICAL







PROPOSED IMPORT QUANTITY: 329,571 CY±
(BANK YARDS)

- ## CONSTRUCTION NOTES:
1. LIMIT OF WORK, CLEARING/GRADING LIMITS AS SHOWN
 2. LOCATE FILTER FABRIC FENCE AS CLOSE TO CLEARING LIMITS AS PRACTICAL.
 3. UNDISTURBED AREAS.
 4. WETLAND BUFFER DO NOT DISTURB.
 5. MAINTAIN EXISTING GRAVEL ACCESS ROAD.
 6. ARMOR PER GEOTECHNICAL ENGINEER REQUIREMENTS.
 7. FIELD LOCATE ACTUAL WETLAND AND BUFFER

PLAN NOTES:

1. SEE PLANTING NOTES SHEET 10.
2. 5' WIDE BENCH VERTICAL SEPARATION PER GEOTECHNICAL ENGINEER REQUIREMENTS.
3. ACTUAL LOCATION OF TOE OF SLOPE VARIES TO ALLOW WORKING AREA/CLEARANCE. TOE OF SLOPE SHALL NOT ENCRACH INTO WETLAND BUFFER.
4. ACCESS ROADS SHOW ARE FOR REFERENCE ONLY. LOCATIONS SUBJECT TO BE MODIFIED AS NEEDED FOR FILLING OPERATIONS.

TESC LEGEND:

- | | | |
|---|------|---|
|  | (AP) | TEMPORARY ACCESS POINT
- AFTER COMPLETION OF PROJECT,
ROADBED IS TO BE REMOVED - AREA TO
BE HYDROSEED & REFORESTED PER
FOREST PRACTICE REQUIREMENTS |
|  | (FF) | FILTER FABRIC FENCE
SEE NOTES AND DETAIL SHEET 4 |
|  | (DI) | INTERCEPTOR DITCHES |
|  | (ML) | HYDROSEED, FERTILIZER, AND
MULCH SEE NOTES SHEET 3 |
|  | (CL) | CLEARING/CONSTRUCTION LIMITS |
|  | (EB) | EROSION CONTROL BLANKET |

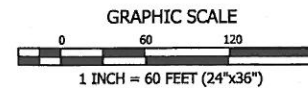
VERIFICATION NOTE

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CALL 811 AT LEAST 48 HOURS BEFORE YOU DIG

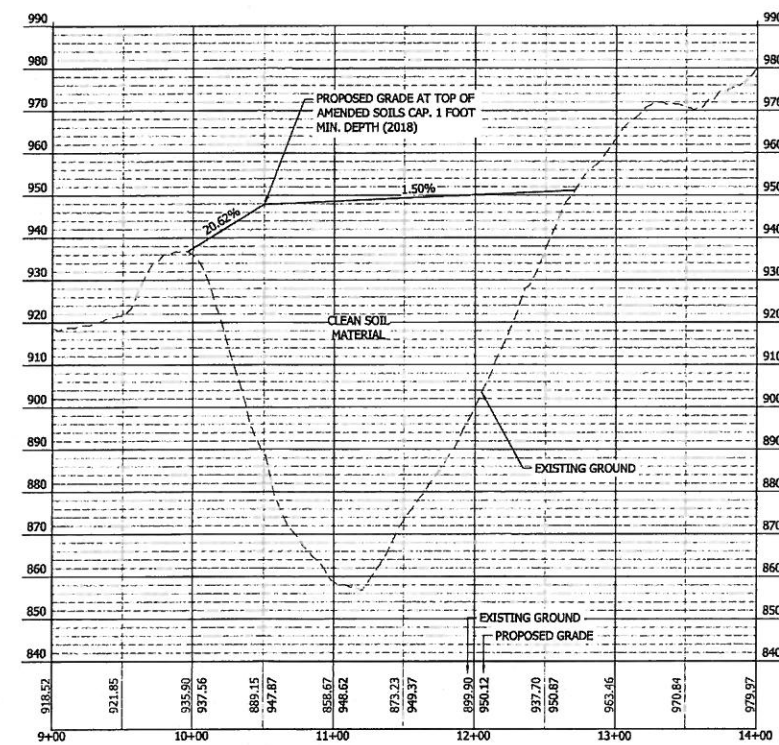
SHEET TITLE: TRENCH - C		DESIGNER: J. JACOBY ENGINEER: B. ALLEN DRAWN: J. JACOBY S 1 T 21 N R 6E WM DATE: 2018-05-08 REVISED:	
RAVENSDALE TRENCH FILLING CLIENT: RAVENSDALE LLC 41306 90TH AVENUE E EATONTVILLE, WA 98328 CONTACT: KURT ERICKSON PHONE: (253) 606-6060			
SHEET C10 10 OF 34		REV. 	



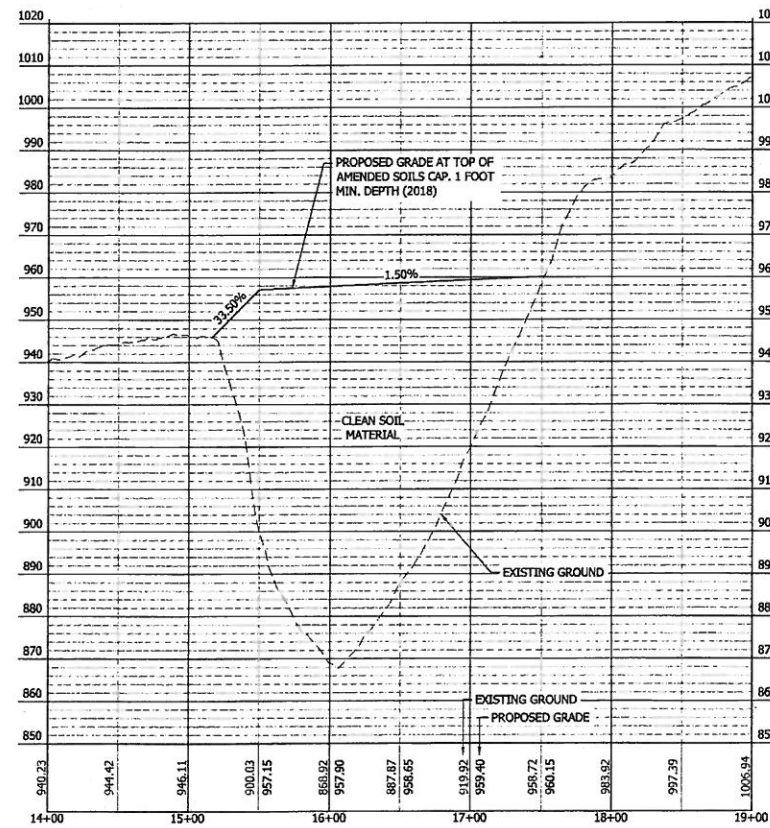
TRENCH C:

SCALE: 1" = 60' HORIZONTAL
1" = 20' VERTICAL

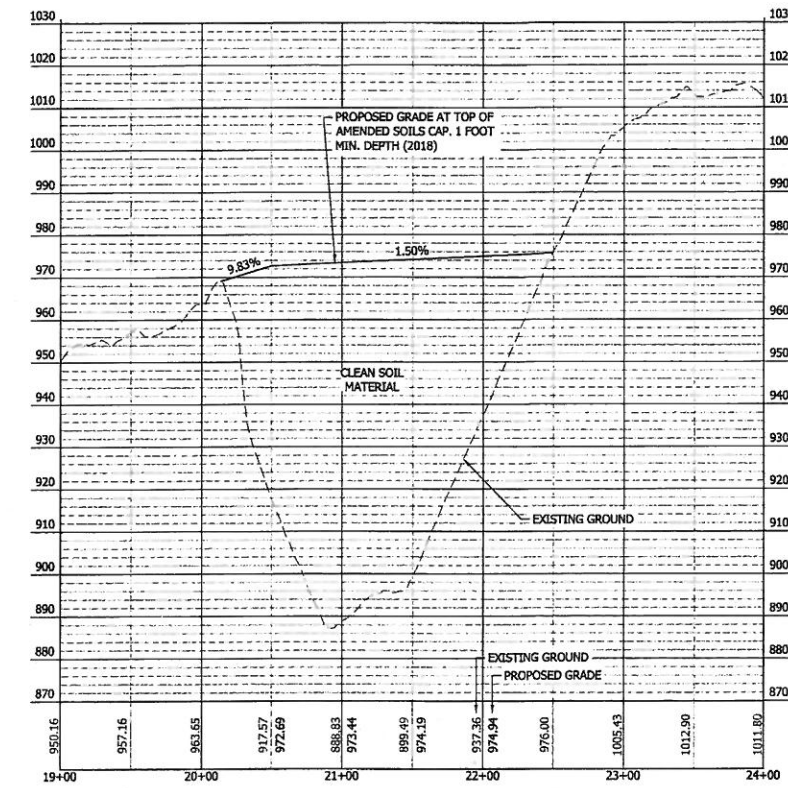
PROPOSED IMPORT QUANTITY: 329,571 CY±
(BANK YARDS)



TRENCH C SECTION C



TRENCH C SECTION D



TRENCH C SECTION E

CONTOUR
ENGINEERING, L.L.C.
CIVIL ENGINEERS-SURVEYORS-LAND PLANNERS
3309 56th Street NW, Suite 106 Gig Harbor, WA 98335
Phone: 253-857-5454 ~ Fax: 253-509-0044 ~ info@contourllc.com



SHEET TITLE: TRACT - C
DESIGNER: J. JACOBY
ENGINEER: B. ALLEN
DRAWN: J. JACOBY
S 1 T 21 N R 6 E WM
DATE: 2018-05-08
REVISED:
PROJECT: 09-040
DWG NAME: 09-040-TRENCH-C
CONTACT: KURT ERLICKSON
PHONE: (253) 606-6060

SHEET	REV.
C11	11 OF 34



SCALE: 1" = 60' HORIZONTAL
1" = 20' VERTICAL





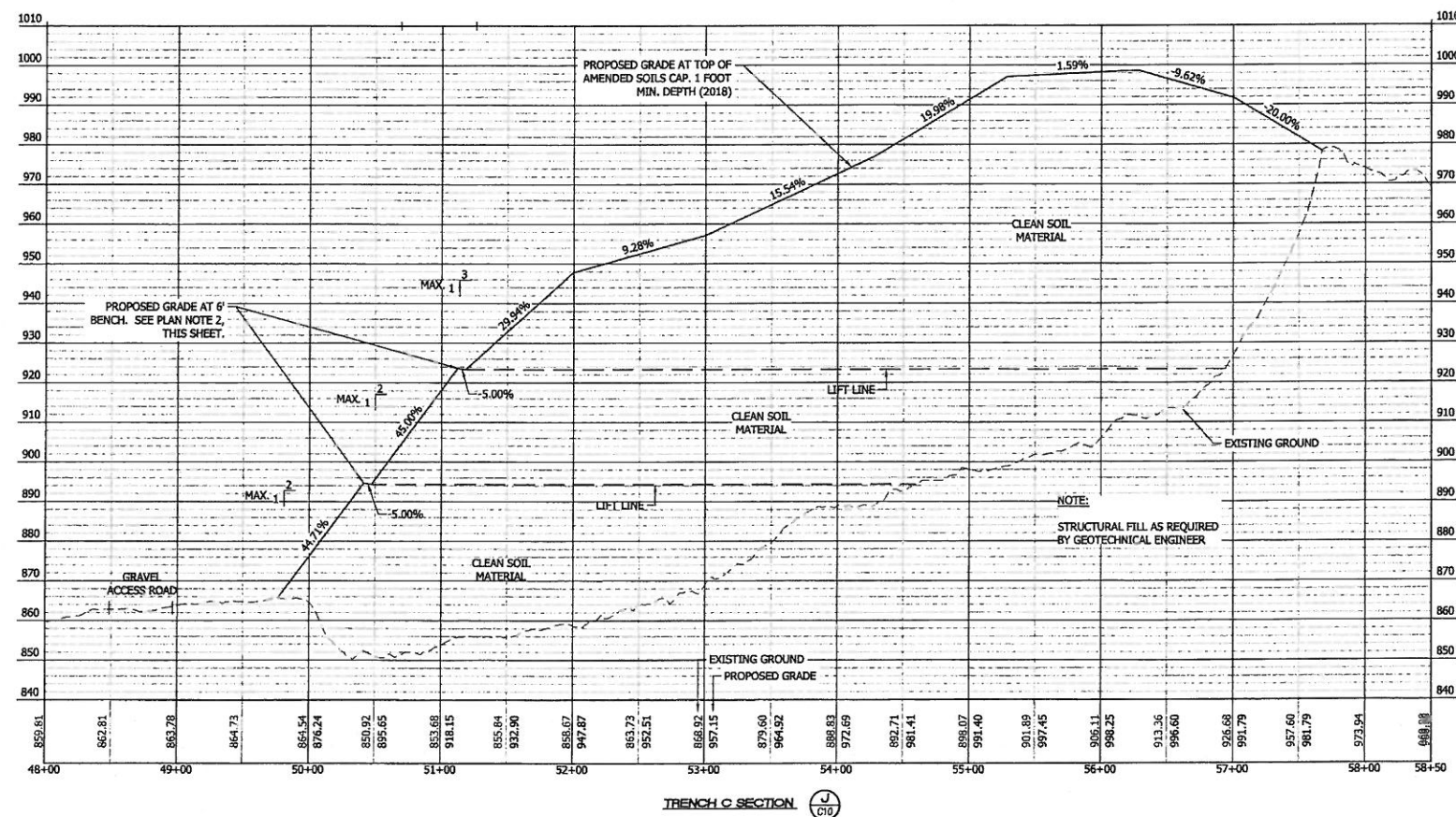
SHEET TITLE: TRACT - C	RAVENSDALE TRENCH FILLING			CONTOUR ENGINEERING • LLC CIVIL ENGINEERS~SURVEYORS~LAND PLANNERS 3309 56th Street NW, Suite 106 Gig Harbor, WA 98335 Phone: 253-457-5454 ~ Fax: 253-509-0044 ~ info@contourllc.com	REVISION	DESCRIPTION	DATE	BY
	CLIENT: RAVENSDALE LLC 41306 90TH AVENUE E EATONVILLE, WA 98328 CONTACT: KURT ERICSON PHONE: (253) 666-6060	DESIGNER: J. JACOBY ENGINEER: B. ALLEN DRAWN: J. JACOBY S 1 T 21 N R 6E WM DATE: 2018-05-08 REVISED:						
PROJECT: 09-040 DWG NAME: 09-040-TRENCH-C								
SHEET C13 13 OF 34			REV. 					



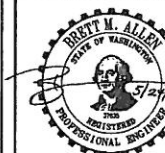
SCALE: 1" = 60' HORIZONTAL
1" = 20' VERTICAL

PROPOSED IMPORT QUANTITY: 329,571 CY±
(BANK YARDS)

A PORTION OF THE EAST 1/2 OF SECTION 1, TOWNSHIP 21 NORTH, RANGE 6 EAST W.M.
KING COUNTY, WASHINGTON
TRENCH - C



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CIVIL ENGINEERS ~ SURVEYORS ~ LAND PLANNERS
3309 56th Street NW, Suite 106 Gig Harbor, WA 98335
Phone: 253-857-5454 ~ Fax: 253-509-0044 ~ info@contourllc.com




SHEET TITLE: TRACT - C

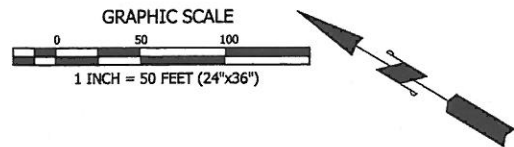
RAVENSDALE TRENCH FILLING

EATONVILLE, WA 98328
CONTACT: KURT ERICKSON
PHONE: (253) 606-6060

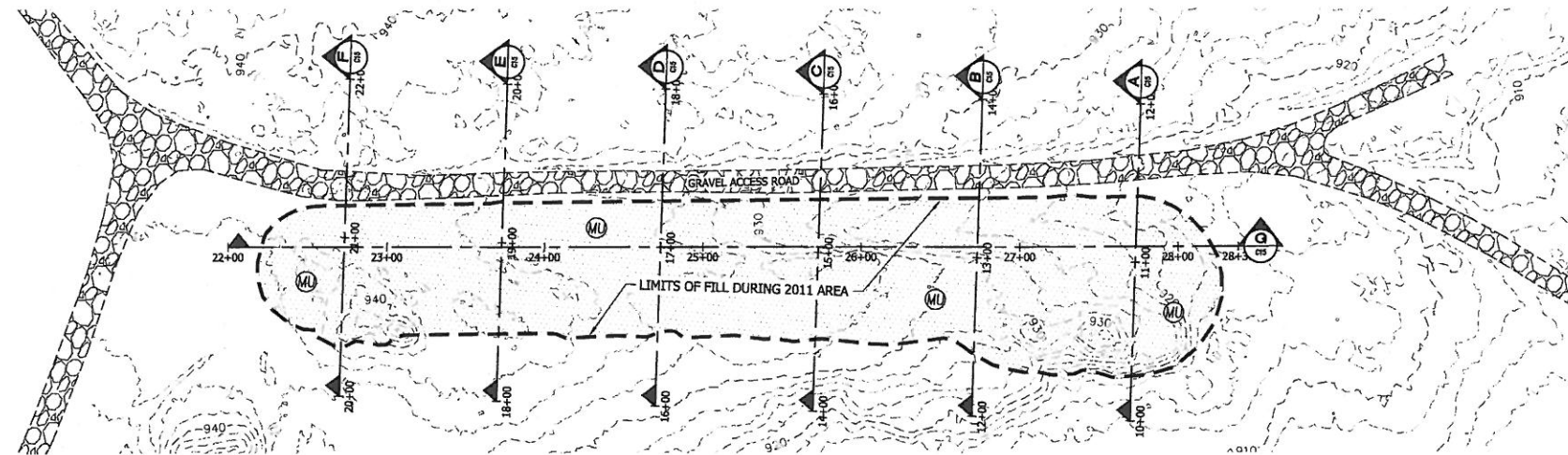
DESIGNER: J. JACOBY
ENGINEER: B. ALLEN
DRAWN: J. JACOBY
S 1 T 21 N R 6E WM
DATE: 2018-05-08
REVISED:

PROJECT: 09-040
DWG NAME: 09-040-TRENCH-C

SHEET	REV.
C14	
14 OF 34	



RAVENSDALE TRENCH FILLING
A PORTION OF THE EAST 1/2 OF SECTION 1, TOWNSHIP 21 NORTH, RANGE 6 EAST W.M.
KING COUNTY, WASHINGTON
TRENCH - D



CONSTRUCTION NOTES:

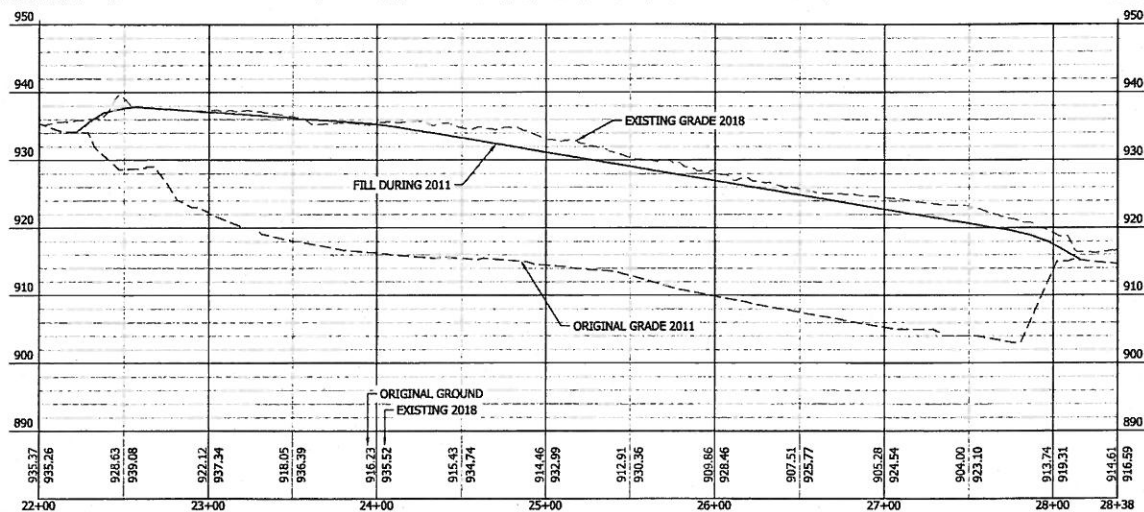
1. LIMIT OF WORK, CLEARING/GRADING LIMITS AS SHOWN
2. LOCATE FILTER FABRIC FENCE AS CLOSE TO CLEARING LIMITS AS PRACTICAL.
3. UNDISTURBED AREAS.
4. WETLAND BUFFER DO NOT DISTURB.
5. MAINTAIN EXISTING GRAVEL ACCESS ROAD.
6. ARMOR PER GEOTECHNICAL ENGINEER REQUIREMENTS.
7. FIELD LOCATE ACTUAL WETLAND AND BUFFER PRIOR TO ANY FILLING. ADJUST EDGE OF FILL/TOE SLOPE TO KEEP ALL WORK OUTSIDE OF BUFFER.

PLAN NOTES:

1. SEE PLANTING NOTES SHEET 10.
2. 5' WIDE BENCH VERTICAL SEPARATION PER GEOTECHNICAL ENGINEER REQUIREMENTS.
3. ACTUAL LOCATION OF TOE OF SLOPE VARIES TO ALLOW WORKING AREA/CLEARANCE. TOE OF SLOPE SHALL NOT ENCRoACH INTO WETLAND BUFFER.
4. ACCESS ROADS SHOW ARE FOR REFERENCE ONLY. LOCATIONS SUBJECT TO BE MODIFIED AS NEEDED FOR FILLING OPERATIONS.

TESC LEGEND:

- AP TEMPORARY ACCESS POINT
- AFTER COMPLETION OF PROJECT, ROADBED IS TO BE REMOVED - AREA TO BE HYDROSEED & REFORESTED PER FOREST PRACTICE REQUIREMENTS
- FF FILTER FABRIC FENCE
SEE NOTES AND DETAIL SHEET 4
- DI INTERCEPTOR DITCHES
- ML HYDROSEED, FERTILIZER, AND MULCH
SEE NOTES SHEET 3
- CL CLEARING/CONSTRUCTION LIMITS
- EB EROSION CONTROL BLANKET



TRENCH D:

SCALE: 1" = 50' HORIZONTAL
1" = 12.5' VERTICAL

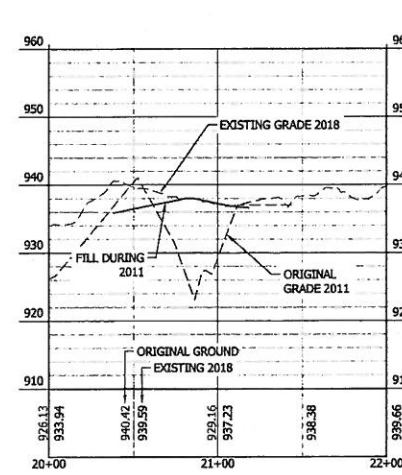
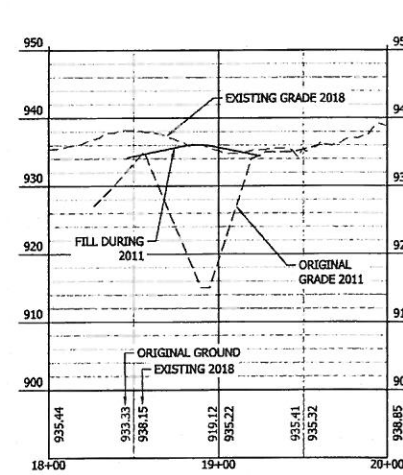
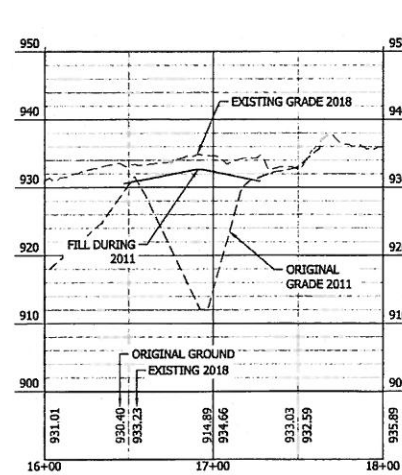
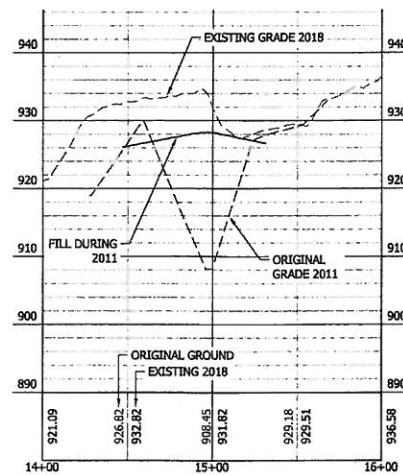
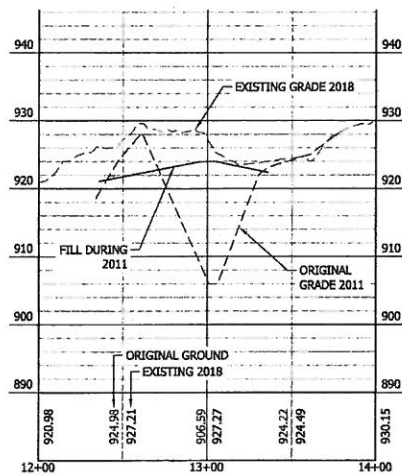
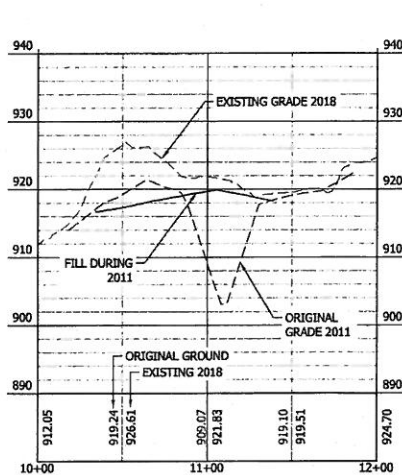
PERMITTED 2011 IMPORT QUANTITY:	11,125 CY±
AS-BUILT IMPORT QUANTITY 2017:	20,723 CY±
PROPOSED ADDITIONAL IMPORT QUANTITY:	0 CY±
TOTAL IMPORT QUANTITY: (BANK YARDS)	20,723 CY±

VERIFICATION NOTE

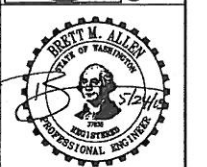
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CIVIL ENGINEERS-SURVEYORS-PLANNERS
3309 56th Street NW, Suite 106 Gig Harbor, WA 98335
Phone: 253-857-5454 ~ Fax: 253-509-0044 ~ info@contourplc.com

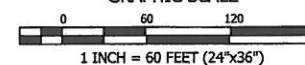


SHEET TITLE: TRENCH - D
DESIGNER: J. JACOBY
ENGINEER: B. ALLEN
CLIENT: RAVENSDALE LLC
41306 90TH AVENUE E
EATONVILLE, WA 98328
CONTACT: KURT ERIKSON
PHONE: (253) 606-6060

PROJECT: 09-040
DWG NAME: 09-040-TRENCH-D
DATE: 2018-05-08
REVISED:

SHEET	REV.
C15	1
15 OF 33	

A PORTION OF THE EAST 1/2 OF SECTION 1, TOWNSHIP 21 NORTH, RANGE 6 EAST W.M.
KING COUNTY, WASHINGTON
TRENCH - E















CONSTRUCTION NOTES:

1. LIMIT OF WORK, CLEARING/GRADING LIMITS AS SHOWN
2. LOCATE FILTER FABRIC FENCE AS CLOSE TO CLEARING LIMITS AS PRACTICAL.
3. UNDISTURBED AREAS.
4. WETLAND BUFFER DO NOT DISTURB.
5. MAINTAIN EXISTING GRAVEL ACCESS ROAD.
6. ARMOR PER GEOTECHNICAL ENGINEER REQUIREMENTS.
7. FIELD LOCATE ACTUAL WETLAND AND BUFFER PRIOR TO ANY FILLING. ADJUST EDGE OF FILL/TOE SLOPE TO KEEP ALL WORK OUTSIDE OF BUFFER.

PLAN NOTES:

- 1. SEE PLANTING NOTES SHEET 10.**
- 2. 5' WIDE BENCH VERTICAL SEPARATION PER GEOTECHNICAL ENGINEER REQUIREMENTS.**
- 3. ACTUAL LOCATION OF TOE OF SLOPE VARIES TO ALLOW WORKING AREA/CLEARANCE. TOE OF SLOPE SHALL NOT ENCRoACH INTO WETLAND BUFFER.**
- 4. ACCESS ROADS SHOW ARE FOR REFERENCE ONLY. LOCATIONS SUBJECT TO BE MODIFIED AS NEEDED FOR FILLING OPERATIONS.**

TESC LEGEND:

- | | | |
|---|---|---|
|  |  | <p>TEMPORARY ACCESS POINT</p> <p>- AFTER COMPLETION OF PROJECT, ROADBED IS TO BE REMOVED - AREA TO BE HYDROSEEDED & REFORESTED PER FOREST PRACTICE REQUIREMENTS</p> |
|  |  | <p>FILTER FABRIC FENCE</p> <p>SEE NOTES AND DETAIL SHEET 4</p> |
|  |  | <p>INTERCEPTOR DITCHES</p> |
|  |  | <p>HYDROSEED, FERTILIZER, AND MULCH SEE NOTES SHEET 3</p> |
|  |  | <p>CLEARING/CONSTRUCTION LIMITS</p> |
|  |  | <p>EROSION CONTROL BLANKET</p> |

TRENCH E:
SCALE: 1" = 60' HORIZONTAL
1" = 20' VERTICAL

PERMITTED 2011 IMPORT QUANTITY:	33,200 CY±
AS-BUILT IMPORT QUANTITY 2017:	95,854 CY±
PROPOSED ADDITIONAL IMPORT QUANTITY:	210,931 CY±
TOTAL IMPORT QUANTITY (BANK YARDS):	306,785 CY±

VERIFICATION NOTE

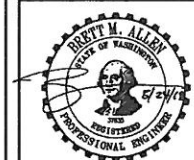
VERIFICATION NOTE
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
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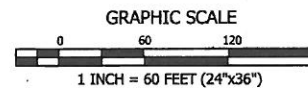
CONTOUR
ENGINEERING • LLC
CIVIL ENGINEERS~SURVEYORS~LAND PLANNERS
3309 56th Street NW, Suite 106 Gig Harbor, WA 98335
Phone: 253-857-5454 ~ Fax: 253-509-0044 ~ info@contourllc.com



SHEET TITLE: TRACT - E	RAVENSDALE TRENCH FILLING
	CLIENT: RAVENSDALE LLC 41305 90TH AVENUE E EATONVILLE, WA 98328 CONTACT: KURT ERICKSON PHONE:(253) 606-6060

DESIGNER: J. JACOBY
ENGINEER: B. ALLEN
DRAWN: J. JACOBY
S 1 T 21 N R 6E WM
DATE: 2018-05-08
REVISED:

PROJECT: 09-040	
DWG NAME: 09-040-TRENCH-E	
SHEET	REV.
C16	
16 OF 33	



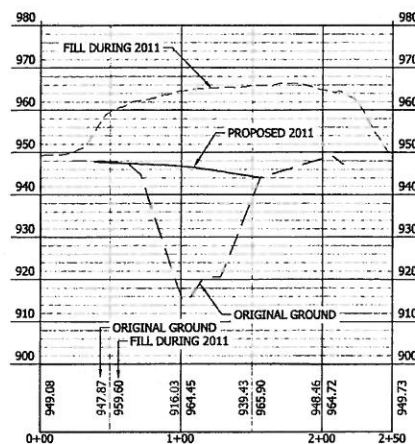
TRENCH E:

SCALE: 1" = 60' HORIZONTAL
1" = 20' VERTICAL

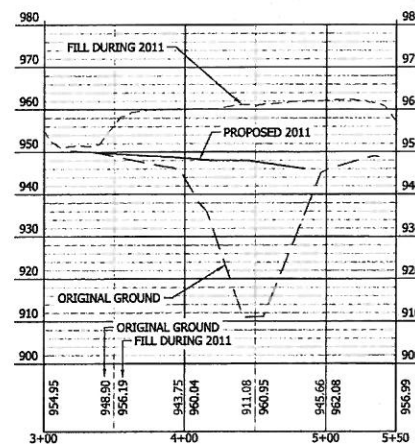
PERMITTED 2011 IMPORT QUANTITY:	33,200 CY±
AS-BUILT IMPORT QUANTITY 2017:	95,854 CY±
PROPOSED ADDITIONAL IMPORT QUANTITY:	210,931 CY±
TOTAL IMPORT QUANTITY (BANK YARDS):	306,785 CY±

RAVENSDALE TRENCH FILLING

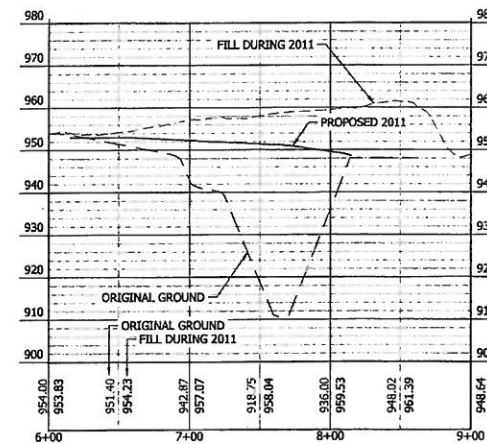
A PORTION OF THE EAST 1/2 OF SECTION 1, TOWNSHIP 21 NORTH, RANGE 6 EAST W.M.
KING COUNTY, WASHINGTON
TRENCH - E



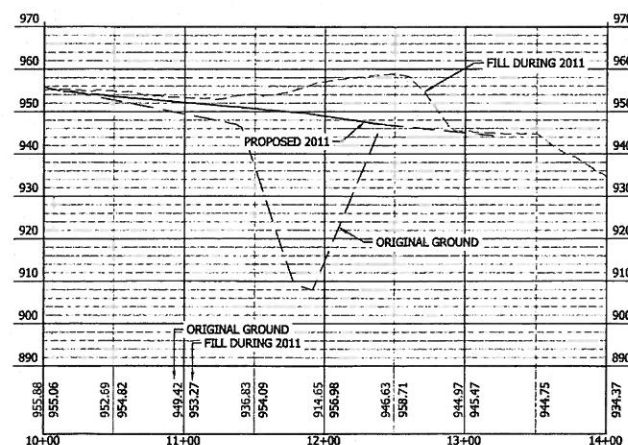
TRENCH E SECTION A
C16



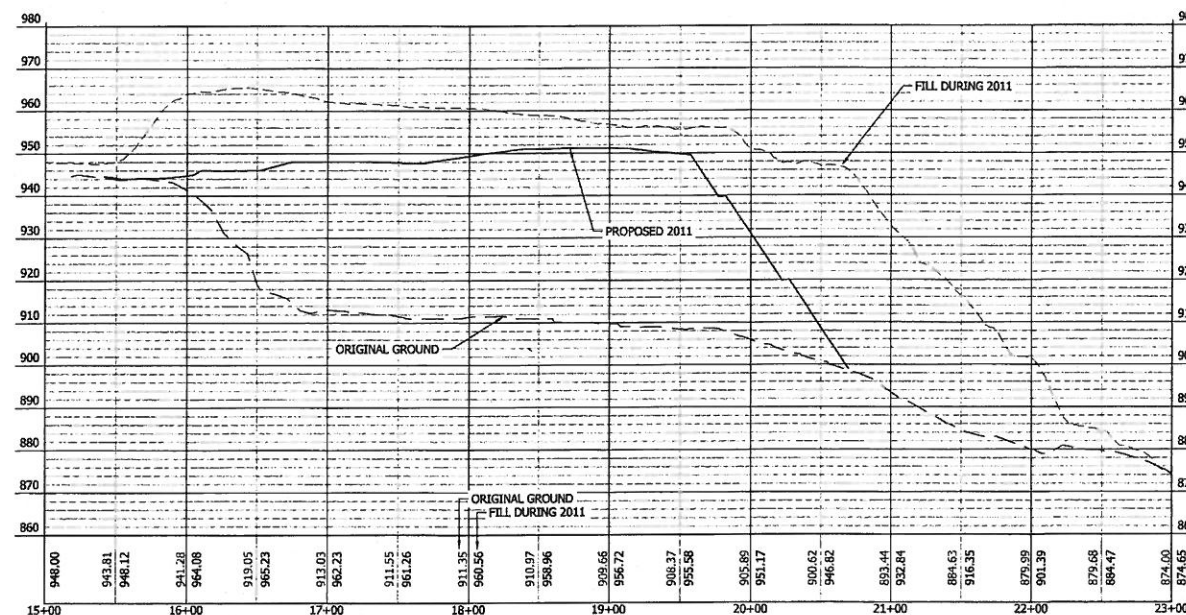
TRENCH E SECTION B
C16



TRENCH E SECTION C
C16



TRENCH E SECTION D
C16



TRENCH E SECTION E
C16

CONTOUR
ENGINEERING • LLC
CIVIL ENGINEERS • SURVEYORS • LAND PLANNERS
3309 56th Street NW, Suite 106 Gig Harbor, WA 98335
Phone: 253-857-5454 ~ Fax: 253-509-0044 ~ Info@contourplc.com



SHEET TITLE: TRACT - E

RAVENSDALE TRENCH FILLING

CLIENT: RAVENSDALE LLC
41306 90TH AVENUE E
EATONVILLE, WA 98328

CONTACT: KURT ERICKSON

PHONE: (253) 606-6060

DESIGNER: J. JACOBY
ENGINEER: B. ALLEN
DRAWN: J. JACOBY
S 1 T 21 N R 6E WM
DATE: 2018-05-08
REVISED:

PROJECT: 09-040
DWG NAME: 09-040-TRENCH-E

SHEET	REV.
C17	

17 OF 33



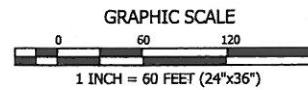


SCALE: 1" = 60' HORIZONTAL
1" = 20' VERTICAL

PERMITTED 2011 IMPORT QUANTITY:	33,200 CY±
AS-BUILT IMPORT QUANTITY 2017:	95,854 CY±
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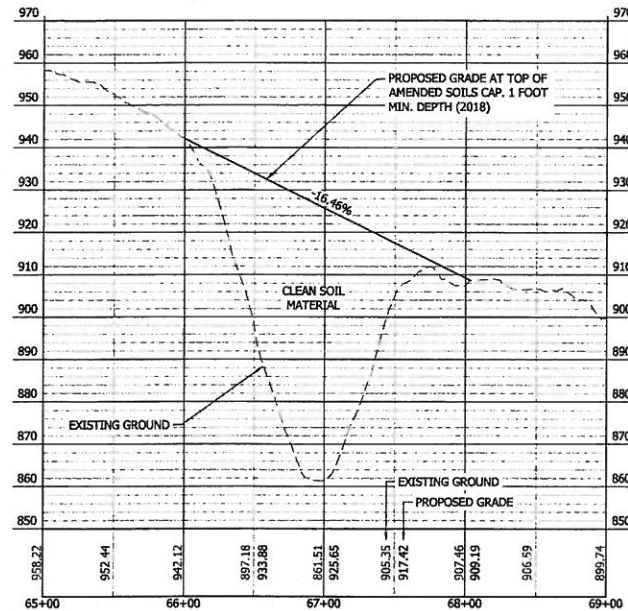
SHEET TITLE: TRACT - E				CONTOUR E N G I N E E R I N G • L L C CIVIL ENGINEERS~SURVEYORS~LAND PLANNERS 3309 56th Street NW, Suite 106 Gig Harbor, WA 98335 Phone: 253-857-5454 ~ Fax: 253-509-0044 ~ info@contourp LLC.com		REVISION	DATE	BY
RAVENSDALE TRENCH FILLING								
CLIENT: RAVENSDALE LLC 41306 90TH AVENUE E EATONVILLE, WA 98328 CONTACT: KURT ERICKSON PHONE:(253) 606-6060								
DESIGNER: J. JACOBY ENGINEER: B. ALLEN DRAWN: J. JACOBY S 1 T 21 N R 6E WM DATE: 2018-05-08 REVISED:								
PROJECT: 09-040								
DWG NAME: 09-040-TRENCH-E								
SHEET		REV.						
C18								
18 OF 33								



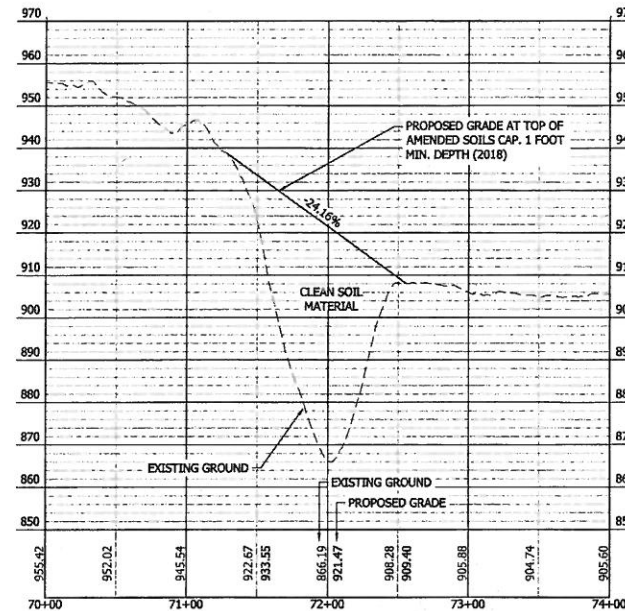
TRENCH E:

SCALE: 1" = 60' HORIZONTAL
1" = 20' VERTICAL

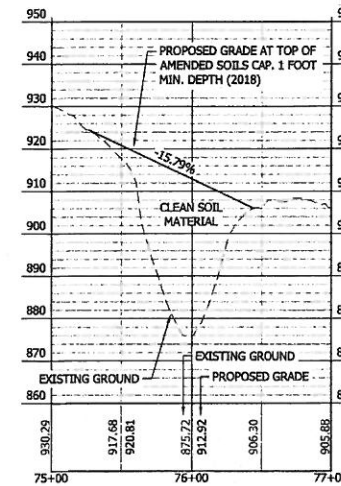
PERMITTED 2011 IMPORT QUANTITY:	33,200 CY±
AS-BUILT IMPORT QUANTITY 2017:	95,854 CY±
PROPOSED ADDITIONAL IMPORT QUANTITY:	210,931 CY±
TOTAL IMPORT QUANTITY (BANK YARDS):	306,785 CY±



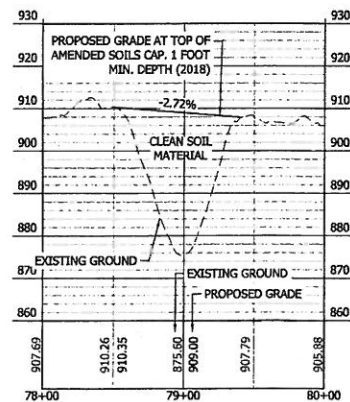
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C16



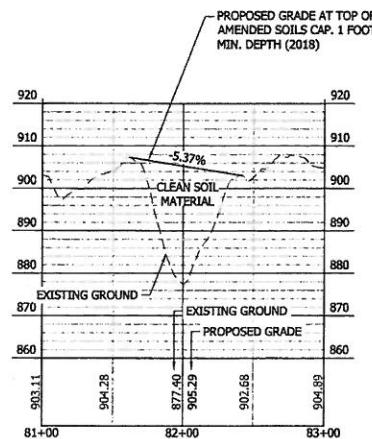
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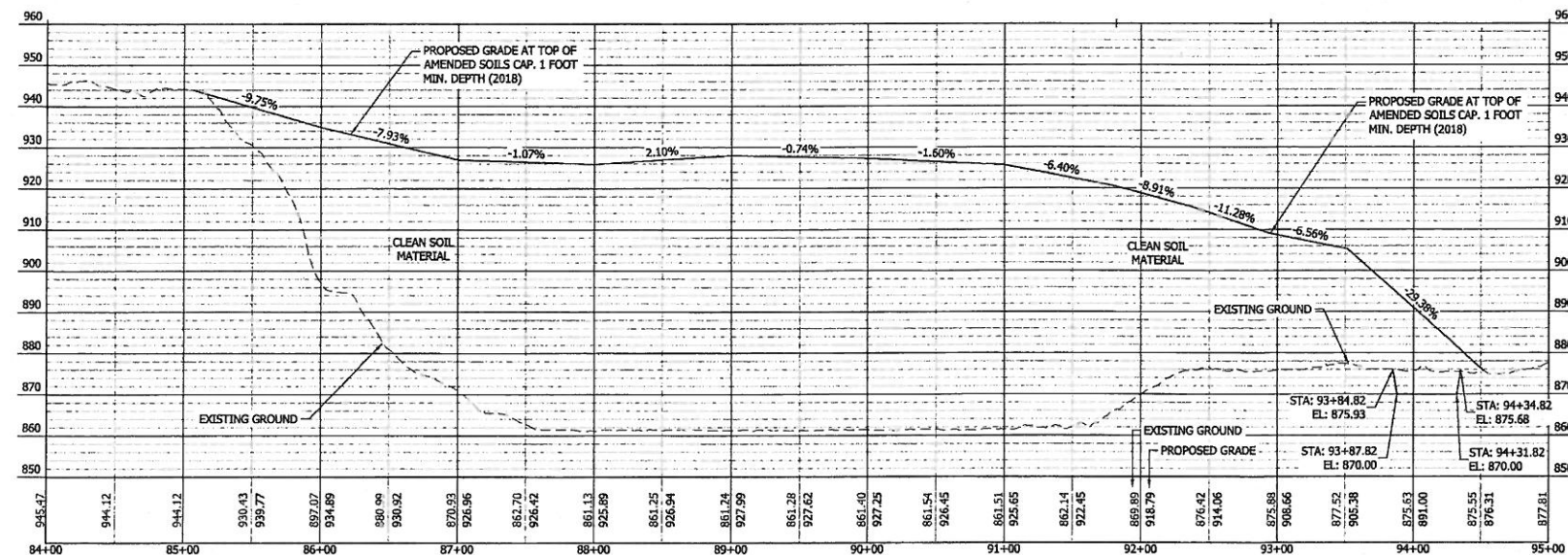
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TRENCH E SECTION S
C16



TRENCH E SECTION T
C16



TRENCH E SECTION W
C16

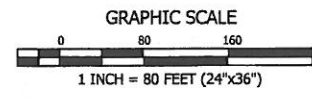
CONTOUR
ENGINEERING • L.L.C.
CIVIL ENGINEERS • SURVEYORS • LAND PLANNERS
3309 56th Street NW, Suite 105 Gig Harbor, WA 98335
Phone: 253-857-5454 • Fax: 253-509-0044 • info@contourllc.com



SHEET TITLE: TRACT - E
RAVENSDALE TRENCH FILLING
CLIENT: RAVENSDALE LLC
41306 90TH AVENUE E
EATONVILLE, WA 98328
CONTACT: KURT ERICSON
PHONE: (253) 606-6060

DESIGNER: J. JACOBY
ENGINEER: B. ALLEN
DRAWN: J. JACOBY
S 1 T 21 N R 6E WM
DATE: 2018-05-08
REVISED:

PROJECT: 09-040
DWG NAME: 09-040-TRENCH-E
SHEET C19
19 OF 33

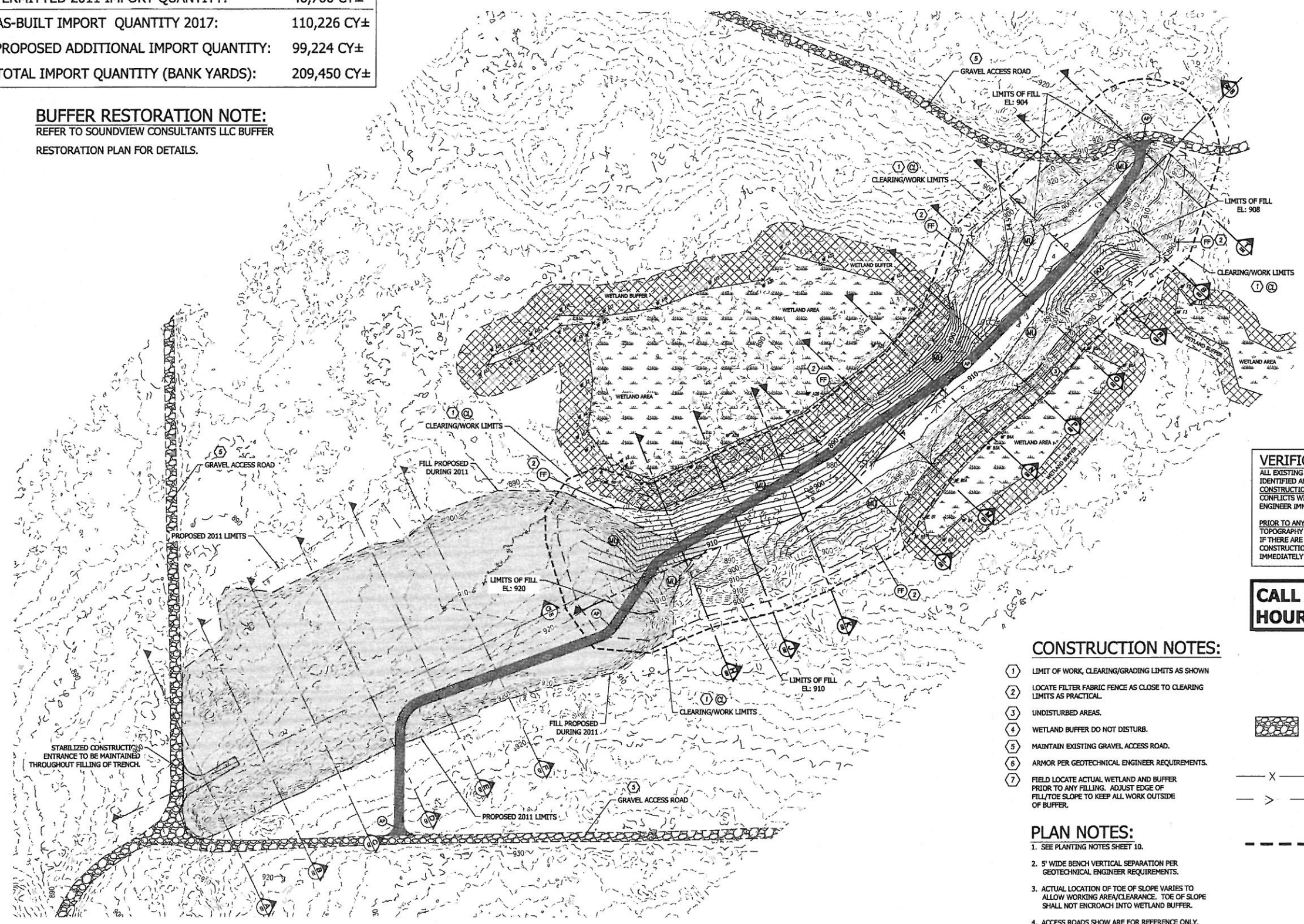


RAVENSDALE TRENCH FILLING
A PORTION OF THE EAST 1/2 OF SECTION 1, TOWNSHIP 21 NORTH, RANGE 6 EAST W.M.
KING COUNTY, WASHINGTON
TRENCH - F

TRENCH F:
SCALE: 1" = 80' HORIZONTAL
1" = 20' VERTICAL

PERMITTED 2011 IMPORT QUANTITY:	46,700 CY±
AS-BUILT IMPORT QUANTITY 2017:	110,226 CY±
PROPOSED ADDITIONAL IMPORT QUANTITY:	99,224 CY±
TOTAL IMPORT QUANTITY (BANK YARDS):	209,450 CY±

BUFFER RESTORATION NOTE:
REFER TO SOUNDVIEW CONSULTANTS LLC BUFFER
RESTORATION PLAN FOR DETAILS.



VERIFICATION NOTE
ALL EXISTING UTILITIES IN THE CONSTRUCTION AREA SHALL BE IDENTIFIED AND VERIFIED FOR DEPTH AND LOCATION PRIOR TO ANY CONSTRUCTION ACTIVITIES SO TO IDENTIFY ANY POTENTIAL CONFLICTS WITH PROPOSED CONSTRUCTION. CONTACT PROJECT ENGINEER IMMEDIATELY IF ANY CONFLICTS ARE IDENTIFIED.

PRIOR TO ANY CONSTRUCTION ACTIVITIES, VERIFY EXISTING TOPOGRAPHY IS CONSISTENT WITH WHAT IS SHOWN ON PLANS AND IF THERE ARE ANY POTENTIAL CONFLICTS WITH PROPOSED CONSTRUCTION ACTIVITIES. CONTACT PROJECT ENGINEER IMMEDIATELY IF ANY CONFLICTS ARE IDENTIFIED.

CALL 811 AT LEAST 48 HOURS BEFORE YOU DIG

CONSTRUCTION NOTES:

1. LIMIT OF WORK, CLEARING/GRADING LIMITS AS SHOWN
2. LOCATE FILTER FABRIC FENCE AS CLOSE TO CLEARING LIMITS AS PRACTICAL.
3. UNDISTURBED AREAS.
4. WETLAND BUFFER DO NOT DISTURB.
5. MAINTAIN EXISTING GRAVEL ACCESS ROAD.
6. ARMOR PER GEOTECHNICAL ENGINEER REQUIREMENTS.
7. FIELD LOCATE ACTUAL WETLAND AND BUFFER PRIOR TO ANY FILLING. ADJUST EDGE OF FILL/TOE SLOPE TO KEEP ALL WORK OUTSIDE OF BUFFER.

PLAN NOTES:

1. SEE PLANTING NOTES SHEET 10.
2. 5' WIDE BENCH VERTICAL SEPARATION PER GEOTECHNICAL ENGINEER REQUIREMENTS.
3. ACTUAL LOCATION OF TOE OF SLOPE VARIES TO ALLOW WORKING AREA/CLEARANCE. TOE OF SLOPE SHALL NOT ENCRUCH INTO WETLAND BUFFER.
4. ACCESS ROADS SHOW ARE FOR REFERENCE ONLY. LOCATIONS SUBJECT TO BE MODIFIED AS NEEDED FOR FILLING OPERATIONS.

TESC LEGEND:

- | | | |
|--|----|---|
| | AP | TEMPORARY ACCESS POINT - AFTER COMPLETION OF PROJECT, ROADBED IS TO BE REMOVED - AREA TO BE HYDROSEED & REFORESTED PER FOREST PRACTICE REQUIREMENTS |
| | FF | FILTER FABRIC FENCE SEE NOTES AND DETAIL SHEET 4 |
| | DI | INTERCEPTOR DITCHES |
| | ML | HYDROSEED, FERTILIZER, AND MULCH SEE NOTES SHEET 3 |
| | CL | CLEARING/CONSTRUCTION LIMITS |
| | EB | EROSION CONTROL BLANKET |

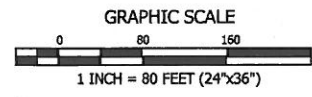
CONTOUR
ENGINEERING • L.L.C.
CIVIL ENGINEERS • SURVEYORS • LAND PLANNERS
3309 56th Street NW, Suite 106 Gig Harbor, WA 98335
Phone: 253-857-5454 • Fax: 253-509-0044 • info@contourllc.com



SHEET TITLE: TRACT - F

RAVENSDALE TRENCH FILLING
CLIENT: RAVENSDALE LLC
41306 90TH AVENUE E
EATONVILLE, WA 98328
CONTACT: KURT ERICKSON
PHONE: (253) 606-6060

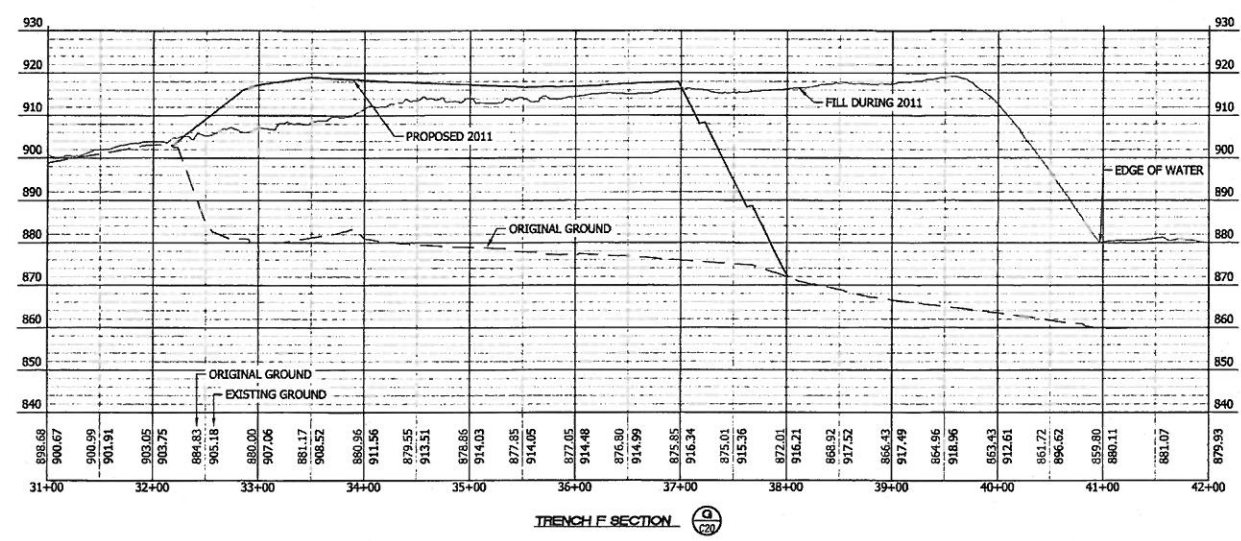
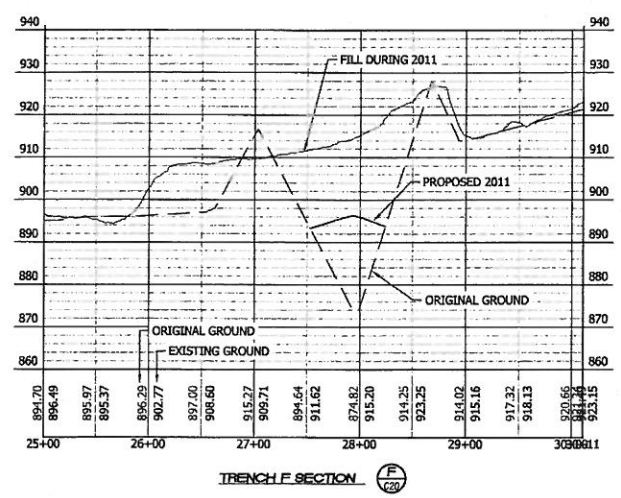
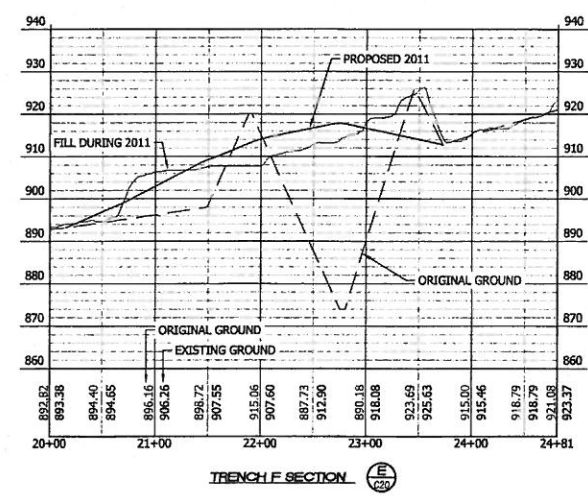
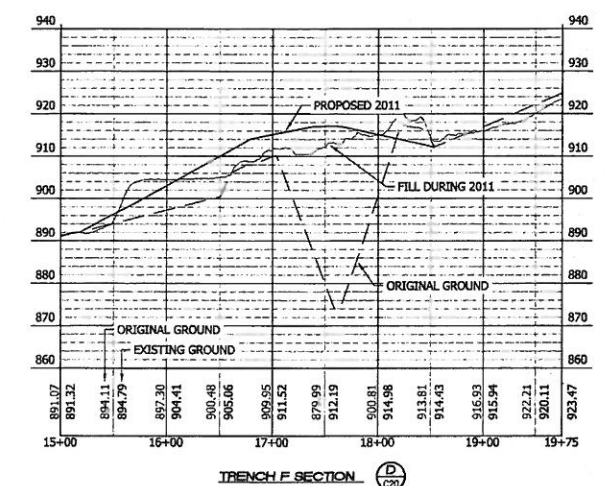
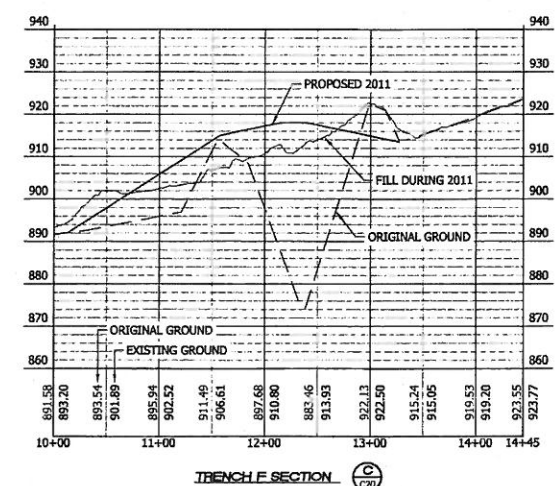
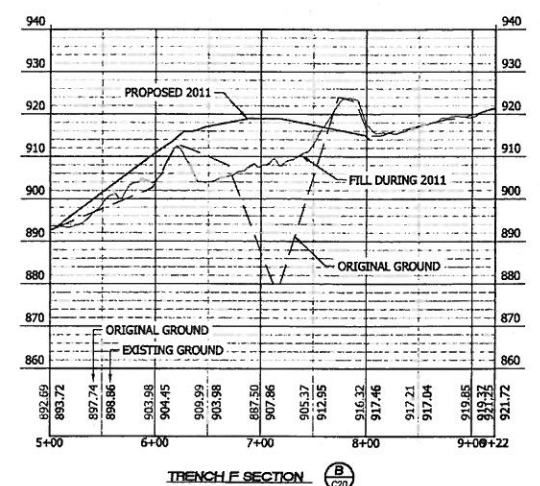
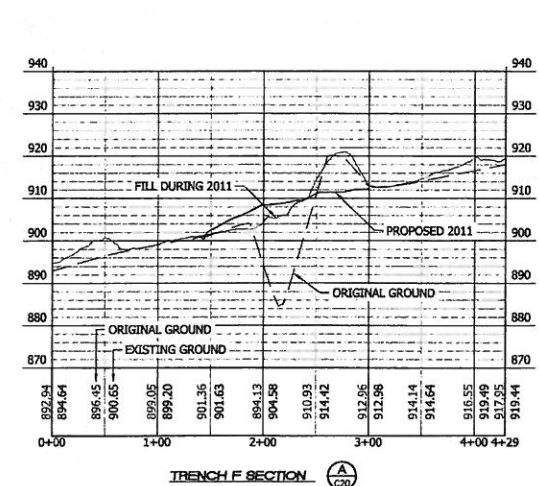
DESIGNER: J. JACOBY	ENGINEER: B. ALLEN
DRAWN: J. JACOBY	S 1 T 21 N R 6E WM
DATE: 2018-05-08	REVISED:
PROJECT: 09-040	DWG NAME: 09-040-TRENCH-F
SHEET	REV.
C20	
20 OF 33	



TRENCH F:
SCALE: 1" = 80' HORIZONTAL
1" = 20' VERTICAL

PERMITTED 2011 IMPORT QUANTITY:	46,700 CY±
AS-BUILT IMPORT QUANTITY 2017:	110,226 CY±
PROPOSED ADDITIONAL IMPORT QUANTITY:	99,224 CY±
TOTAL IMPORT QUANTITY (BANK YARDS):	209,450 CY±

RAVENSDALE TRENCH FILLING
A PORTION OF THE EAST 1/2 OF SECTION 1, TOWNSHIP 21 NORTH, RANGE 6 EAST W.M.
KING COUNTY, WASHINGTON
TRENCH - F



BY	
DATE	
DESCRIPTION	
REVISION	

CONTOUR ENGINEERING, LLC
CIVIL ENGINEERS/SURVEYORS/PLANNERS
3309 56th Street NW, Suite 106 Gig Harbor, WA 98335
Phone: 253-857-5454 ~ Fax: 253-509-0044 ~ info@contourpic.com

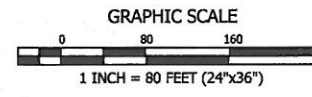
BRETT M. ALLEN
STATE OF WASHINGTON
PROFESSIONAL ENGINEER
No. 37247
Exp. 3/24/19

SHEET TITLE: **TRACT - F**

DESIGNER: J. JACOBY
ENGINEER: B. ALLEN
DRAWN: J. JACOBY
S 1 T 21 N R 6 E WM
DATE: 2018-05-08
REVISED:

PROJECT: 09-040
DWG NAME: 09-040-TRENCH-F

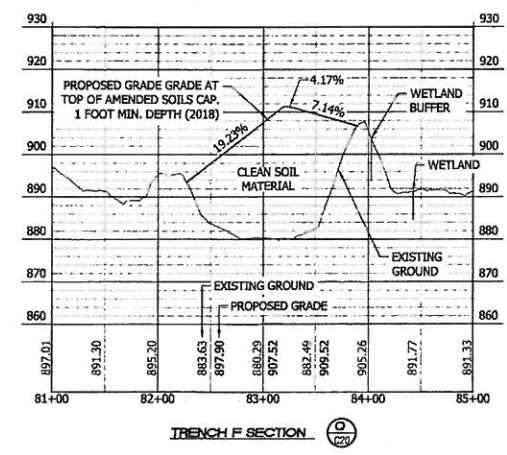
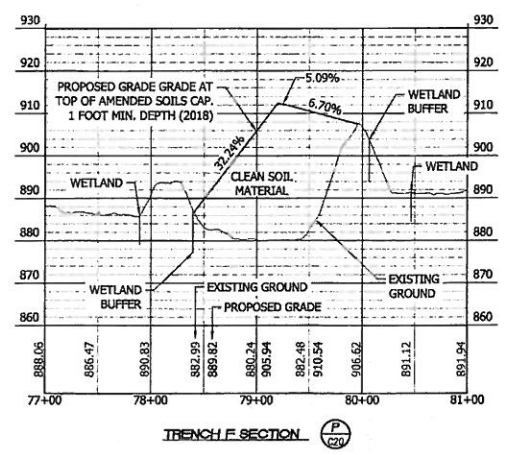
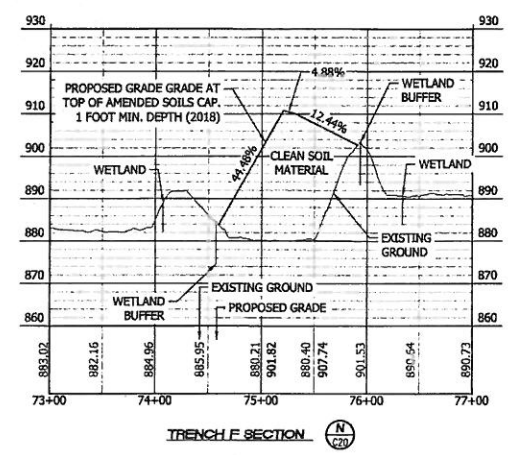
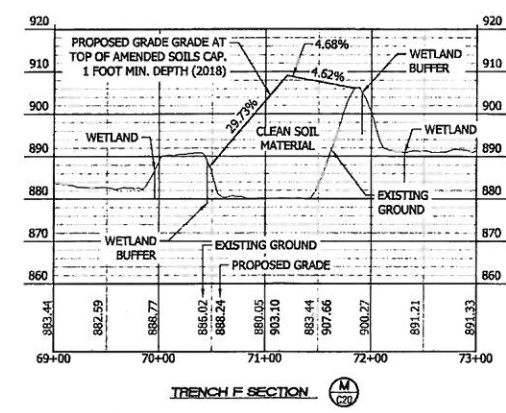
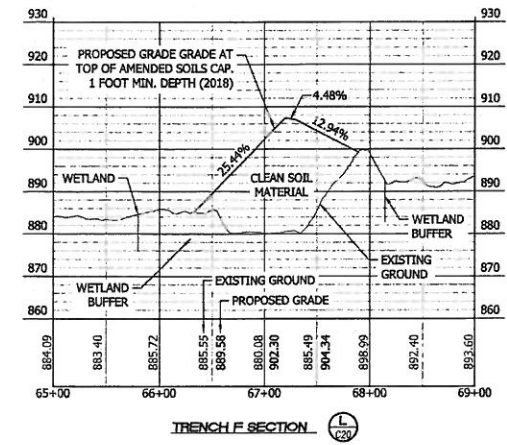
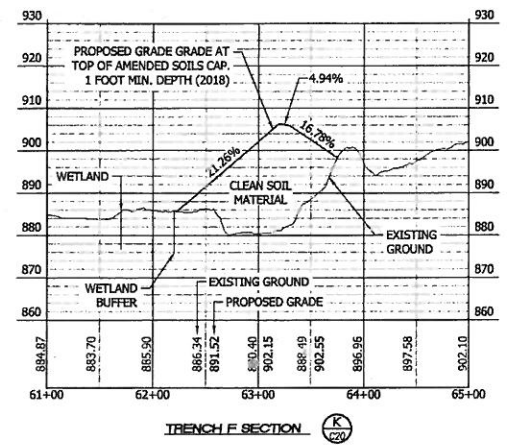
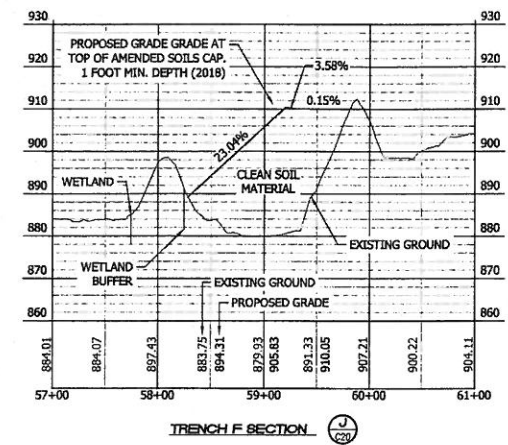
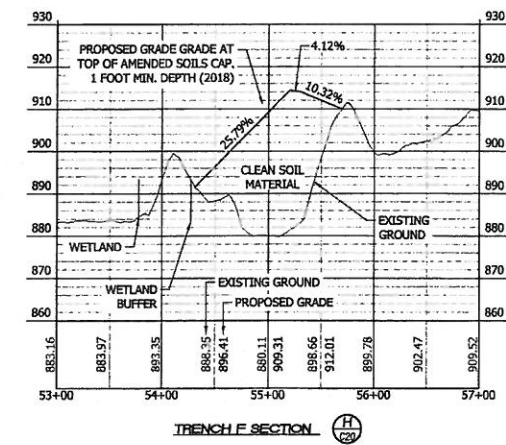
SHEET	REV.
C21	
21 OF 33	



TRENCH F:
SCALE: 1" = 80' HORIZONTAL
1" = 20' VERTICAL

PERMITTED 2011 IMPORT QUANTITY:	46,700 CY±
AS-BUILT IMPORT QUANTITY 2017:	110,226 CY±
PROPOSED ADDITIONAL IMPORT QUANTITY:	99,224 CY±
TOTAL IMPORT QUANTITY (BANK YARDS):	209,450 CY±

RAVENSDALE TRENCH FILLING
A PORTION OF THE EAST 1/2 OF SECTION 1, TOWNSHIP 21 NORTH, RANGE 6 EAST W.M.
KING COUNTY, WASHINGTON
TRENCH - F

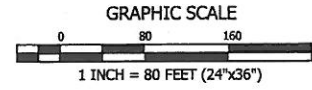


BY	
DATE	
DESCRIPTION	
REVISION	

CONTOUR ENGINEERING
CIVIL ENGINEERS-SURVEYORS-LAND PLANNERS
3309 56th Street NW, Suite 106, Gig Harbor, WA 98335
Phone: 253-857-5454 • Fax: 253-509-0044 • info@contourpic.com

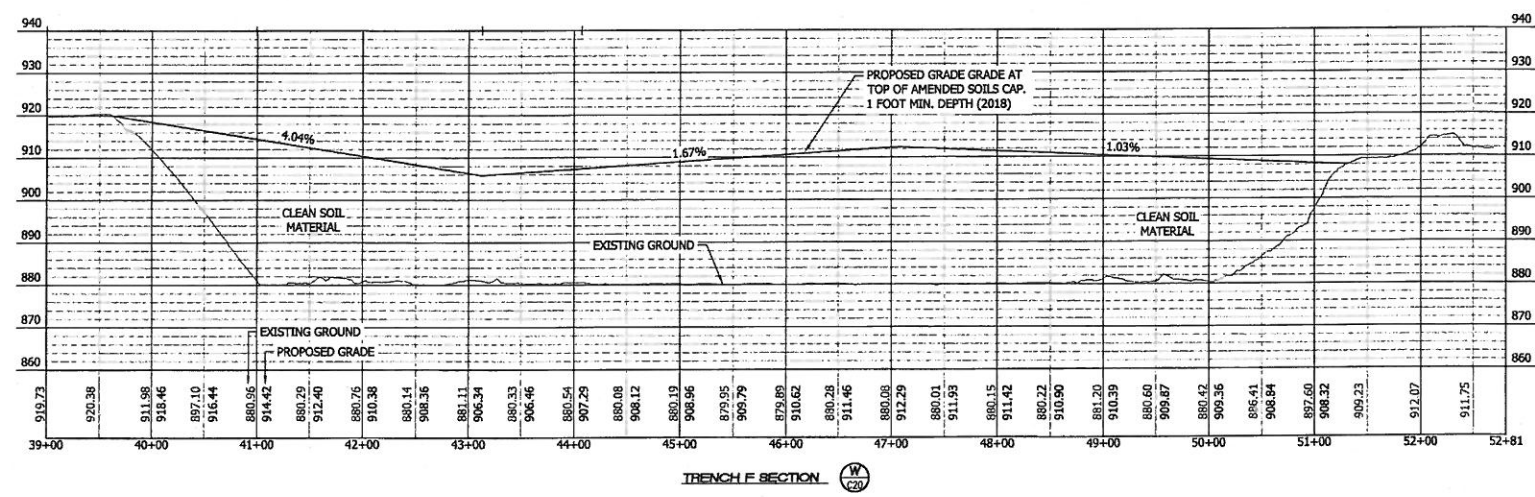
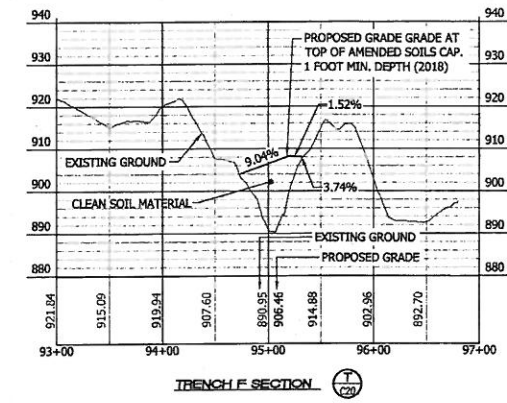
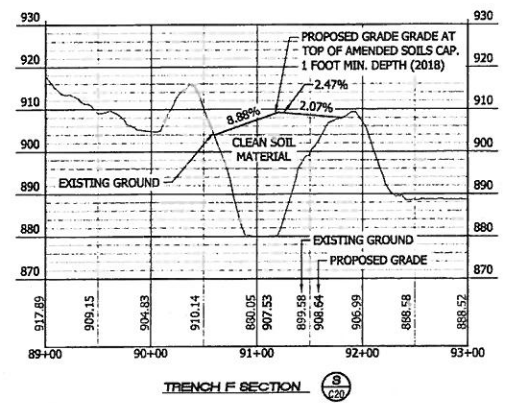
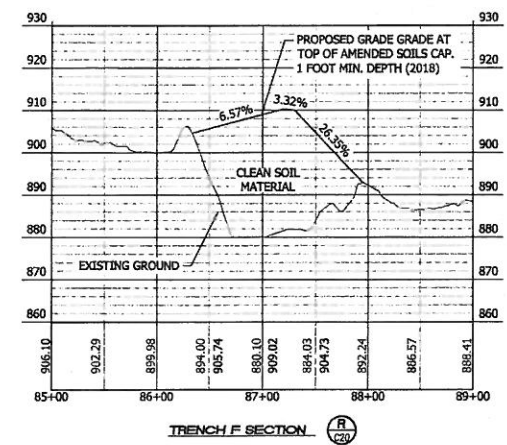
BRETT M. ALLEN
PROFESSIONAL ENGINEER
NO. 12345
STATE OF WASHINGTON

SHEET TITLE: TRACT - F	RAVENSDALE TRENCH FILLING
DESIGNER: J. JACOBY	ENGINEER: B. ALLEN
DRAWN: J. JACOBY	CLIENT: RAVENSDALE LLC
DATE: 2018-05-08	41306 90TH AVENUE E
REVISED:	EATONVILLE, WA 98328
PROJECT: 09-040	CONTACT: KURT ERIKSON
DWG NAME: 09-040-TRENCH-F	PHONE (253) 606-6060
SHEET	REV.
C22	
22 OF 33	



TRENCH F:	
SCALE: 1" = 80' HORIZONTAL 1" = 20' VERTICAL	
PERMITTED 2011 IMPORT QUANTITY:	46,700 CY±
AS-BUILT IMPORT QUANTITY 2017:	110,226 CY±
PROPOSED ADDITIONAL IMPORT QUANTITY:	99,224 CY±
TOTAL IMPORT QUANTITY (BANK YARDS):	209,450 CY±

RAVENSDALE TRENCH FILLING
A PORTION OF THE EAST 1/2 OF SECTION 1, TOWNSHIP 21 NORTH, RANGE 6 EAST W.M.
KING COUNTY, WASHINGTON
TRENCH - F



BY	
DATE	
DESCRIPTION	
REVISION	

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3309 56th Street NW, Suite 105, Gig Harbor, WA 98335
Phone: 253-857-5454 • Fax: 253-509-0044 • info@contourllc.com

BRETT M. ALLEN
STATE OF WASHINGTON
REGISTERED PROFESSIONAL ENGINEER
No. 35216

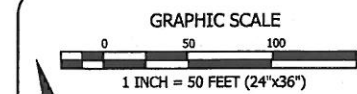
SHEET TITLE: TRACT - F

RAVENSDALE TRENCH FILLING
CLIENT: RAVENSDALE LLC
41306 90TH AVENUE E
EATONVILLE, WA 98328
CONTACT: KURT ERIKSON
PHONE: (253) 606-6060

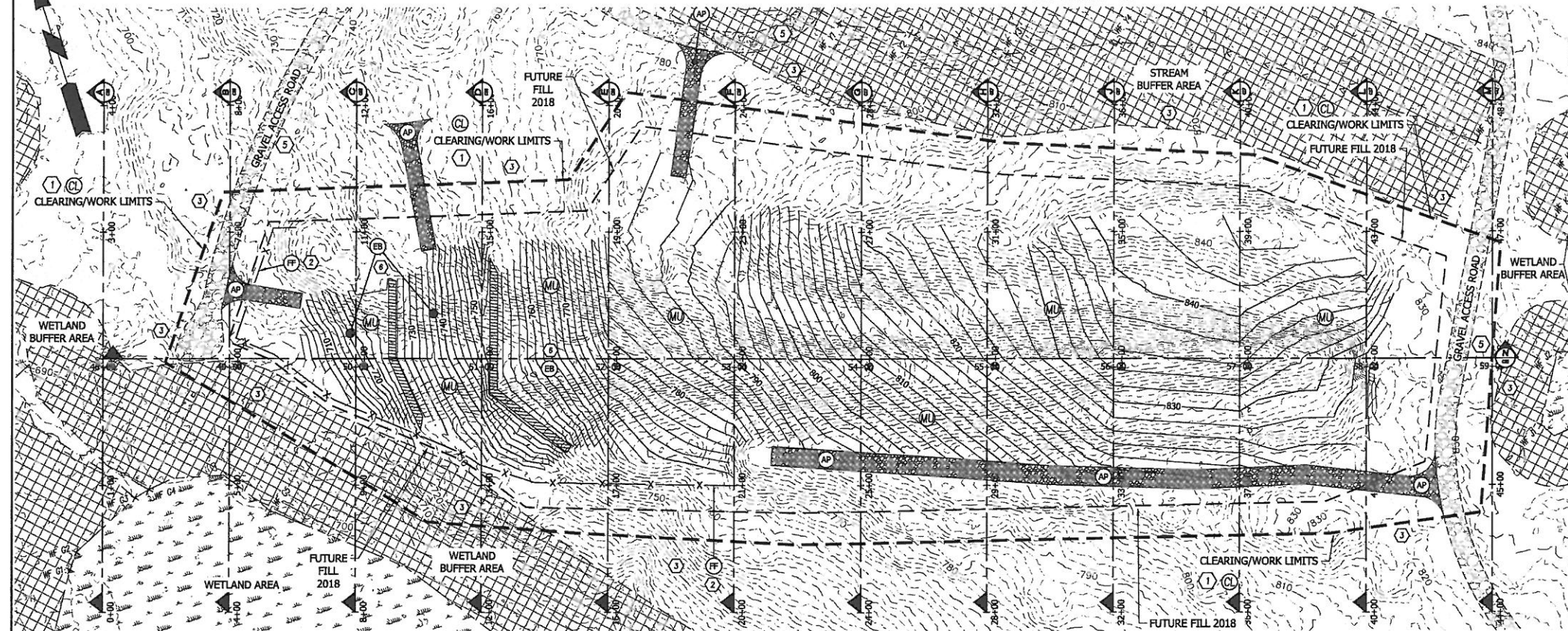
DESIGNER: J. JACOBY
ENGINEER: B. ALLEN
DRAWN: J. JACOBY
S 1 T 21 N R 6 E W M
DATE: 2018-05-08
REVISED:

PROJECT: 09-040
DWG NAME: 09-040-TRENCH-F

SHEET	REV.
C23	
23 OF 33	



RAVENSDALE TRENCH FILLING
A PORTION OF THE EAST 1/2 OF SECTION 1, TOWNSHIP 21 NORTH, RANGE 6 EAST W.M.
KING COUNTY, WASHINGTON
TRENCH - G



CONSTRUCTION NOTES:

1. LIMIT OF WORK, CLEARING/GRADING LIMITS AS SHOWN
2. LOCATE FILTER FABRIC FENCE AS CLOSE TO CLEARING LIMITS AS PRACTICAL.
3. UNDISTURBED AREAS.
4. WETLAND BUFFER DO NOT DISTURB.
5. MAINTAIN EXISTING GRAVEL ACCESS ROAD.
6. ARMOR PER GEOTECHNICAL ENGINEER REQUIREMENTS.
7. FIELD LOCATE ACTUAL WETLAND AND BUFFER PRIOR TO ANY FILLING. ADJUST EDGE OF FILL/TOE SLOPE TO KEEP ALL WORK OUTSIDE OF BUFFER.

PLAN NOTES:

1. SEE PLANTING NOTES SHEET 10.
2. 5' WIDE BENCH VERTICAL SEPARATION PER GEOTECHNICAL ENGINEER REQUIREMENTS.
3. ACTUAL LOCATION OF TOE OF SLOPE VARIES TO ALLOW WORKING AREA/CLEARANCE. TOE OF SLOPE SHALL NOT ENCRUCH INTO WETLAND BUFFER.
4. ACCESS ROADS SHOW ARE FOR REFERENCE ONLY. LOCATIONS SUBJECT TO BE MODIFIED AS NEEDED FOR FILLING OPERATIONS.

TESC LEGEND:

- AP TEMPORARY ACCESS POINT
- AFTER COMPLETION OF PROJECT, ROADBED IS TO BE REMOVED - AREA TO BE HYDROSEED & REFORESTED PER FOREST PRACTICE REQUIREMENTS
- FT FILTER FABRIC FENCE
SEE NOTES AND DETAIL SHEET 4
- DI INTERCEPTOR DITCHES
- ML HYDROSEED, FERTILIZER, AND MULCH SEE NOTES SHEET 3
- CL CLEARING/CONSTRUCTION LIMITS
- EB EROSION CONTROL BLANKET

BUFFER RESTORATION NOTE:
REFER TO SOUNDVIEW CONSULTANTS LLC BUFFER RESTORATION PLAN FOR DETAILS.

TRENCH G:

SCALE: 1" = 50' HORIZONTAL
1" = 25' VERTICAL

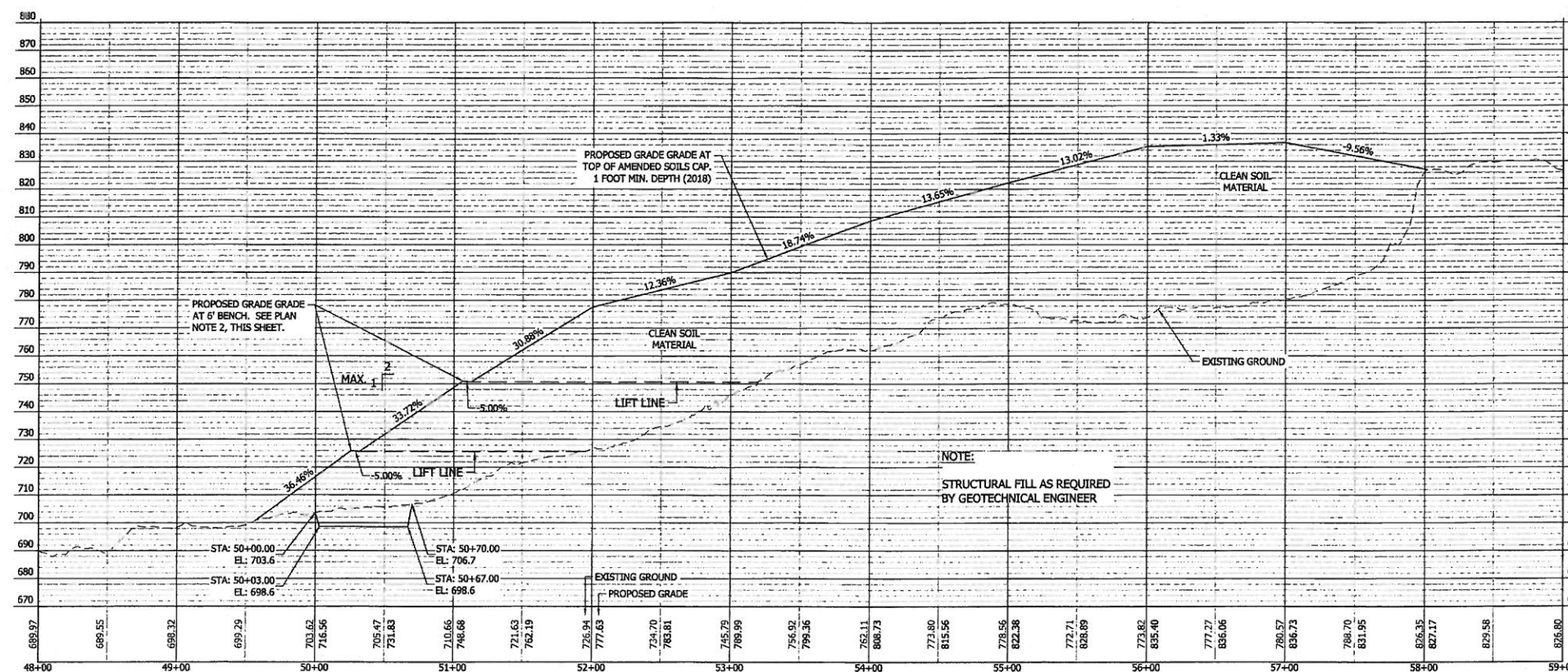
PROPOSED GRADE IMPORT QUANTITY: 107,914 CY±
(BANK YARDS)

VERIFICATION NOTE

ALL EXISTING UTILITIES IN THE CONSTRUCTION AREA SHALL BE IDENTIFIED AND VERIFIED FOR DEPTH AND LOCATION PRIOR TO ANY CONSTRUCTION ACTIVITIES. IF ANY POTENTIAL CONFLICTS WITH PROPOSED GRADE CONSTRUCTION, CONTACT PROJECT ENGINEER IMMEDIATELY IF ANY CONFLICTS ARE IDENTIFIED.

PRIOR TO ANY CONSTRUCTION ACTIVITIES, VERIFY EXISTING TOPOGRAPHY IS CONSISTENT WITH WHAT IS SHOWN ON PLANS AND IF THERE ARE ANY POTENTIAL CONFLICTS WITH PROPOSED GRADE CONSTRUCTION ACTIVITIES, CONTACT PROJECT ENGINEER IMMEDIATELY IF ANY CONFLICTS ARE IDENTIFIED.

CALL 811 AT LEAST 48 HOURS BEFORE YOU DIG



NOTE:
STRUCTURAL FILL AS REQUIRED BY GEOTECHNICAL ENGINEER

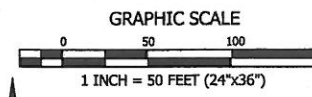
CONTOUR ENGINEERING, LLC
ENGINEERS-SURVEYORS-LAND PLANNERS
CIVIL ENGINEERS
3309 56th Street NW, Suite 106 Gig Harbor, WA 98335
Phone: 253-857-5454 ~ Fax: 253-509-0044 ~ info@contourplc.com



SHEET TITLE: TRACT - G
RAVENSDALE TRENCH FILLING
CLIENT: RAVENSDALE LLC
41305 90TH AVENUE E
EATONVILLE, WA 98328
CONTACT: KURT ERICKSON
PHONE: (253) 606-6060

DESIGNER: J. JACOBY
ENGINEER: B. ALLEN
DRAWN: J. JACOBY
S 1 T 21 N R 6E WM
DATE: 2018-05-08
REVISED:

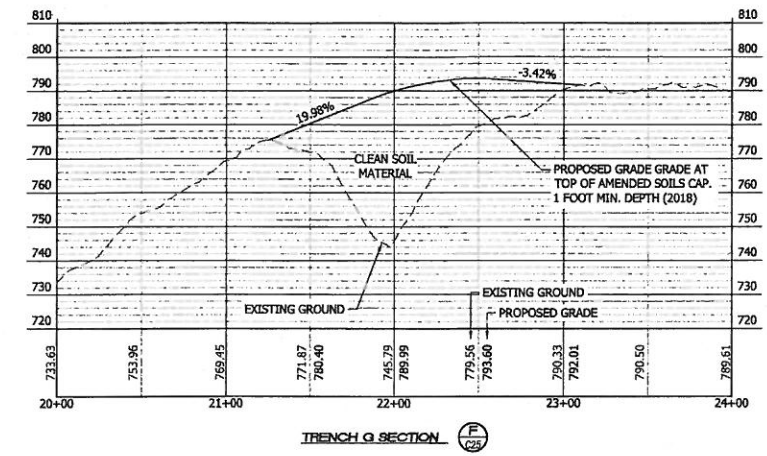
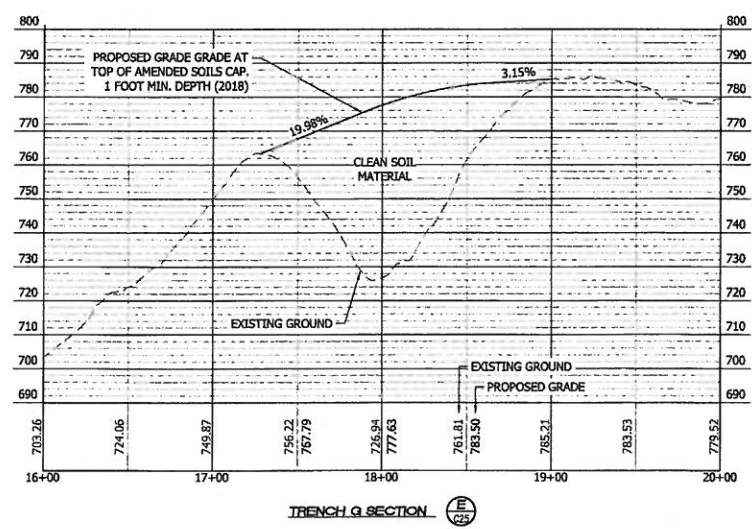
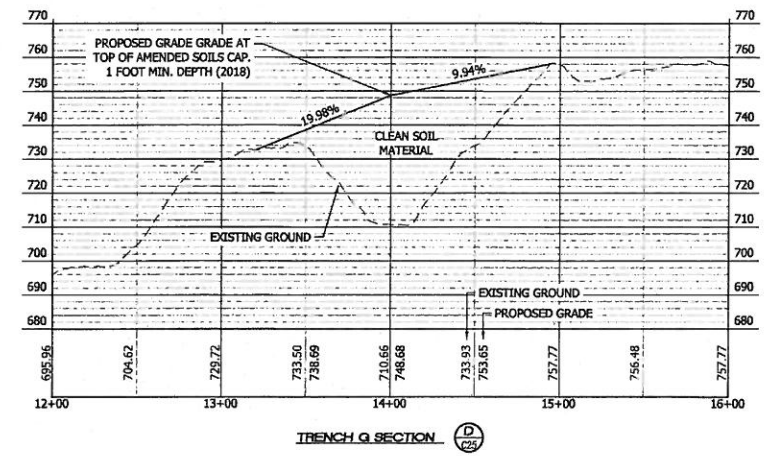
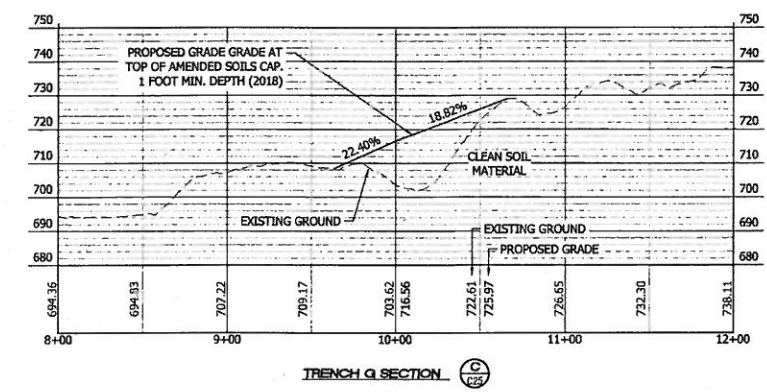
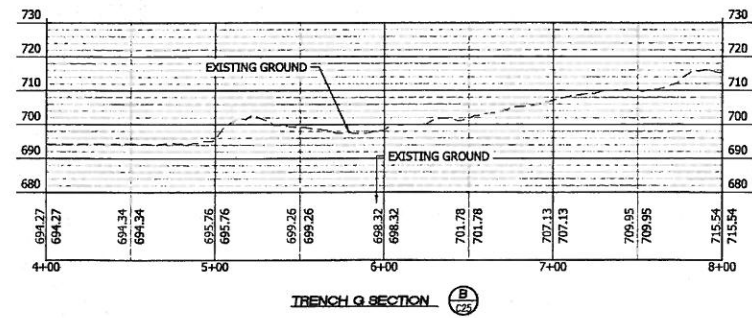
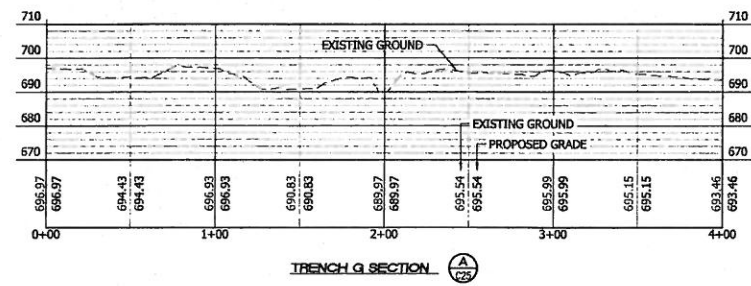
PROJECT: 09-040
DWG NAME: 09-040-TRENCH-G
SHEET
C24
24 OF 33



TRENCH G:
SCALE: 1" = 50' HORIZONTAL
1" = 25' VERTICAL

PROPOSED GRADE IMPORT QUANTITY: 107,914 CY±
(BANK YARDS)

RAVENSDALE TRENCH FILLING
A PORTION OF THE EAST 1/2 OF SECTION 1, TOWNSHIP 21 NORTH, RANGE 6 EAST W.M.
KING COUNTY, WASHINGTON
TRENCH - G



REVISION	DESCRIPTION	DATE	BY

CONTOUR ENGINEERING, L.L.C.
CIVIL ENGINEERS/SURVEYORS/LAND PLANNERS
3305 56th Street NW, Suite 105 Gig Harbor, WA 98335
Phone: 253-537-5154 ~ Fax: 253-509-0044 ~ info@contourllc.com

PROFESSIONAL ENGINEER
BRETT M. ALLEN
STATE OF WASHINGTON
No. 42476

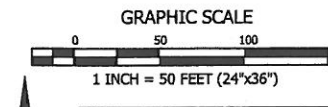
SHEET TITLE: TRACT - G

RAVENSDALE TRENCH FILLING
CLIENT: RAVENSDALE LLC
41305 90TH AVENUE E
EATONVILLE, WA 98328
CONTACT: KURT ERIKSON
PHONE: (253) 606-6060

DESIGNER: J. JACOBY
ENGINEER: B. ALLEN
DRAWN: J. JACOBY
S 1 T 21 N R 6E WM
DATE: 2018-05-08
REVISED:

PROJECT: 09-040
DWG NAME: 09-040-TRENCH-G

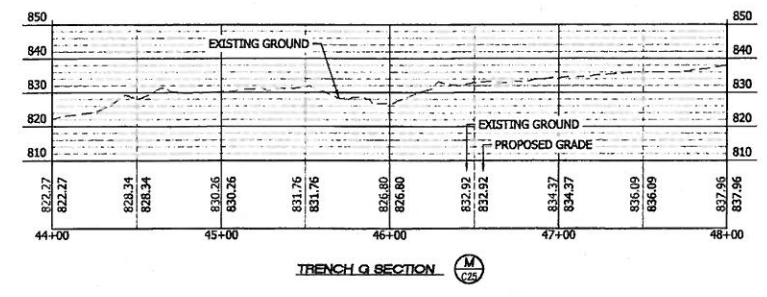
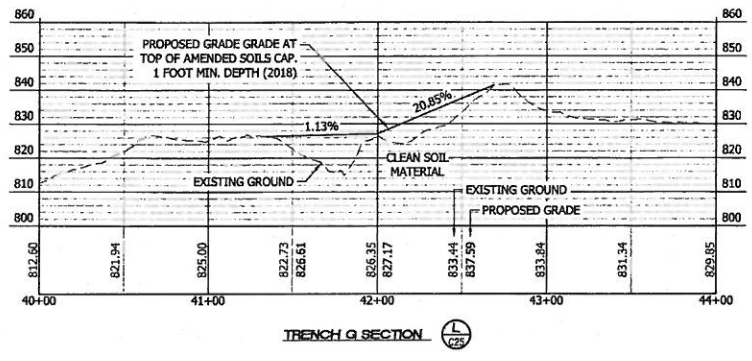
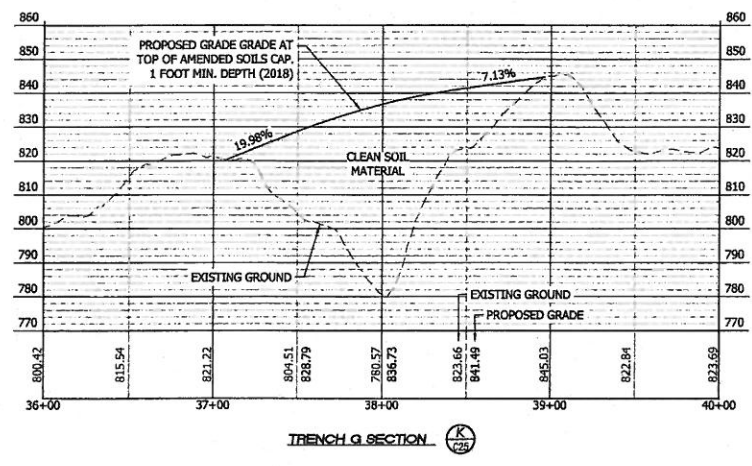
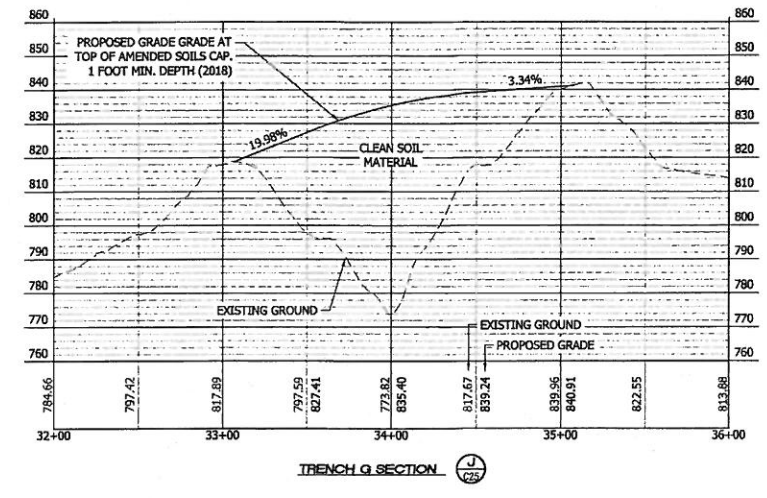
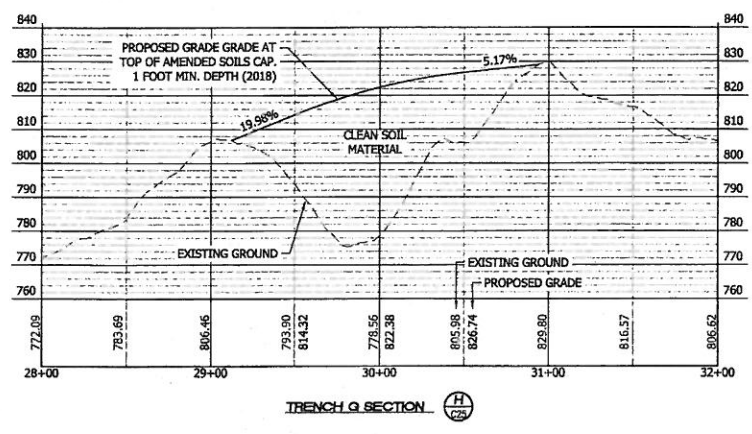
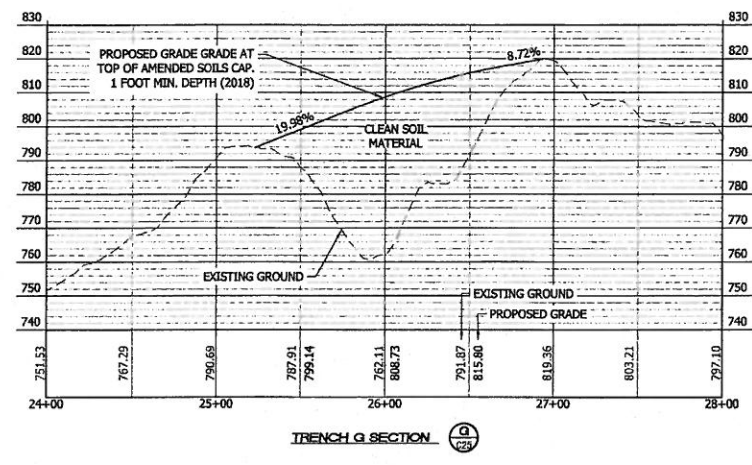
SHEET	REV.
C25	
25 OF 33	



TRENCH G:
SCALE: 1" = 50' HORIZONTAL
1" = 25' VERTICAL

PROPOSED GRADE IMPORT QUANTITY: 107,914 CY±
(BANK YARDS)

RAVENSDALE TRENCH FILLING
A PORTION OF THE EAST 1/2 OF SECTION 1, TOWNSHIP 21 NORTH, RANGE 6 EAST W.M.
KING COUNTY, WASHINGTON
TRENCH - G



REVISION	DESCRIPTION	DATE	BY

CONTOUR ENGINEERING, L.L.C.
CIVIL ENGINEERS-SURVEYORS-LAND PLANNERS
3309 56th Street NW, Suite 106 Gig Harbor, WA 98335
Phone: 253-857-5454 • Fax: 253-509-0044 • info@contourpk.com

BRETT M. ALLEN
STATE OF WASHINGTON
REGISTERED PROFESSIONAL SURVEYOR
No. 15474

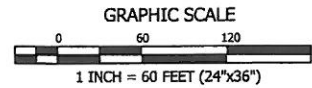
SHEET TITLE: TRACT - G

RAVENSDALE TRENCH FILLING
CLIENT: RAVENSDALE LLC
41306 90TH AVENUE E
EATONVILLE, WA 98328
CONTACT: KURT ERIKSON
PHONE: (253) 606-6060

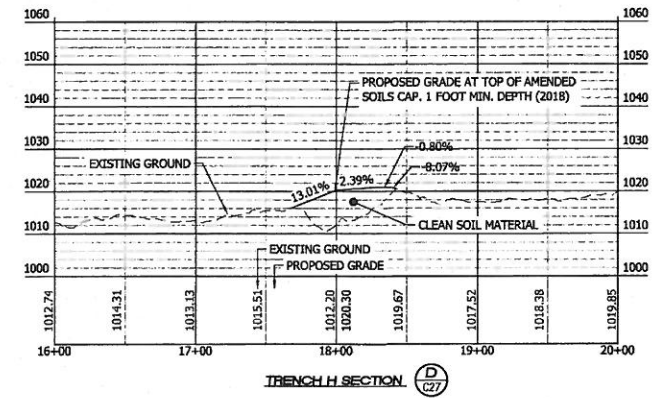
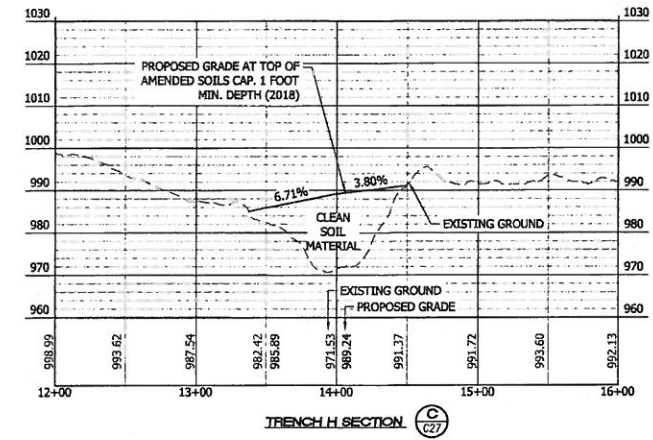
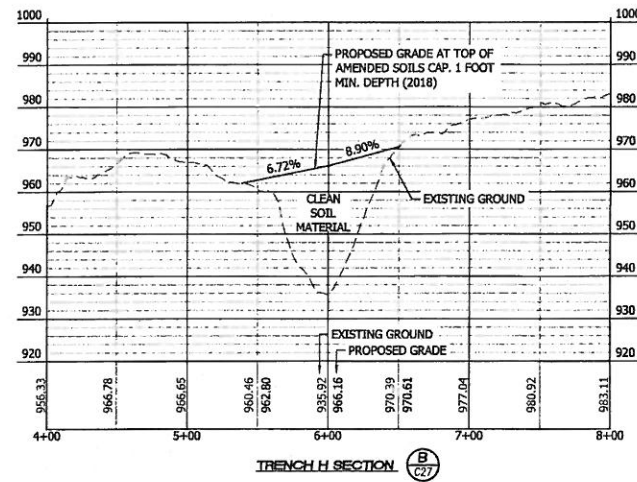
DESIGNER: J. JACOBY
ENGINEER: B. ALLEN
DRAWN: J. JACOBY
S 1 T 21 N R 6E WM
DATE: 2018-05-08
REVISED:

PROJECT: 09-040
DWG NAME: 09-040-TRENCH-G

SHEET	REV.
C26	
26 OF 33	



RAVENSDALE TRENCH FILLING
A PORTION OF THE EAST 1/2 OF SECTION 1, TOWNSHIP 21 NORTH, RANGE 6 EAST W.M.
KING COUNTY, WASHINGTON
TRENCH - H



CONSTRUCTION NOTES:

1. LIMIT OF WORK, CLEARING/GRADING LIMITS AS SHOWN
2. LOCATE FILTER FABRIC FENCE AS CLOSE TO CLEARING LIMITS AS PRACTICAL
3. UNDISTURBED AREAS.
4. WETLAND BUFFER DO NOT DISTURB.
5. MAINTAIN EXISTING GRAVEL ACCESS ROAD.
6. ARMOR PER GEOTECHNICAL ENGINEER REQUIREMENTS.
7. FIELD LOCATE ACTUAL WETLAND AND BUFFER PRIOR TO ANY FILLING. ADJUST EDGE OF FILL/TOE SLOPE TO KEEP ALL WORK OUTSIDE OF BUFFER.

PLAN NOTES:

1. SEE PLANTING NOTES SHEET 10.
2. 5' WIDE BENCH VERTICAL SEPARATION PER GEOTECHNICAL ENGINEER REQUIREMENTS.
3. ACTUAL LOCATION OF TOE OF SLOPE VARIES TO ALLOW WORKING AREA/CLEARANCE. TOE OF SLOPE SHALL NOT ENCRUCH INTO WETLAND BUFFER.
4. ACCESS ROADS SHOW ARE FOR REFERENCE ONLY. LOCATIONS SUBJECT TO BE MODIFIED AS NEEDED FOR FILLING OPERATIONS.

TESC LEGEND:

- AP TEMPORARY ACCESS POINT
- AFTER COMPLETION OF PROJECT, ROADBED IS TO BE REMOVED - AREA TO BE HYDROSEED & REFORESTED PER FOREST PRACTICE REQUIREMENTS
- FF FILTER FABRIC FENCE
SEE NOTES AND DETAIL SHEET 4
- DI INTERCEPTOR DITCHES
- ML HYDROSEED, FERTILIZER, AND MULCH
SEE NOTES SHEET 3
- CL CLEARING/CONSTRUCTION LIMITS
- EB EROSION CONTROL BLANKET

TRENCH H:

SCALE: 1" = 60' HORIZONTAL
1" = 20' VERTICAL

PROPOSED IMPORT QUANTITY: 21,196 CY±
(BANK YARDS)

VERIFICATION NOTE

ALL EXISTING UTILITIES IN THE CONSTRUCTION AREA SHALL BE IDENTIFIED AND VERIFIED FOR DEPTH AND LOCATION PRIOR TO ANY CONSTRUCTION ACTIVITIES SO TO IDENTIFY ANY POTENTIAL CONFLICTS WITH PROPOSED CONSTRUCTION. CONTACT PROJECT ENGINEER IMMEDIATELY IF ANY CONFLICTS ARE IDENTIFIED.

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Phone: 253-857-5454 • Fax: 253-509-0044 • info@contourllc.com



SHEET TITLE: TRENCH - H
DESIGNER: J. JACOBY
ENGINEER: B. ALLEN
CLIENT: RAVENSDALE LLC
41306 90TH AVENUE E
EATONVILLE, WA 98328
CONTACT: KURT ERICKSON
PHONE: (253) 606-6060

PROJECT: 09-040
DWG NAME: 09-040-TRENCH-H
DATE: 2018-05-08
REVISED:

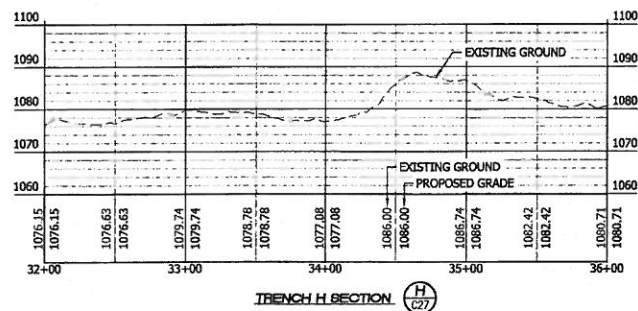
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27 OF 33	



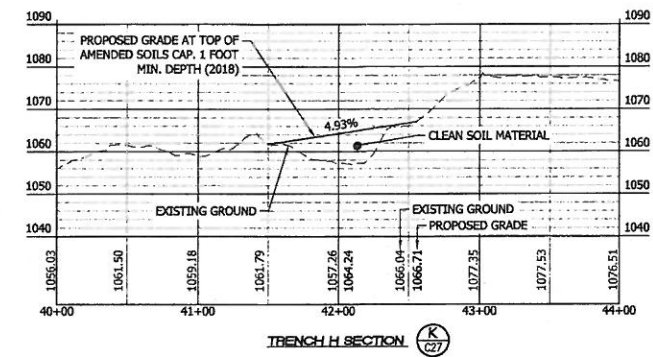
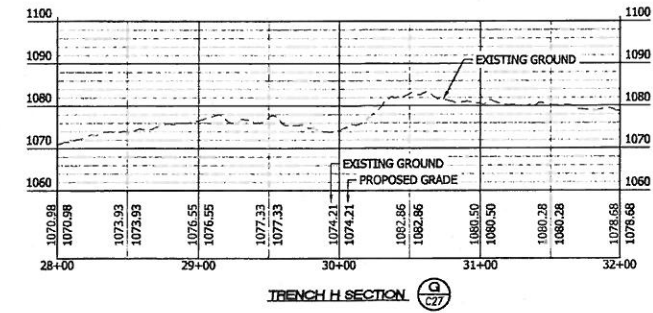
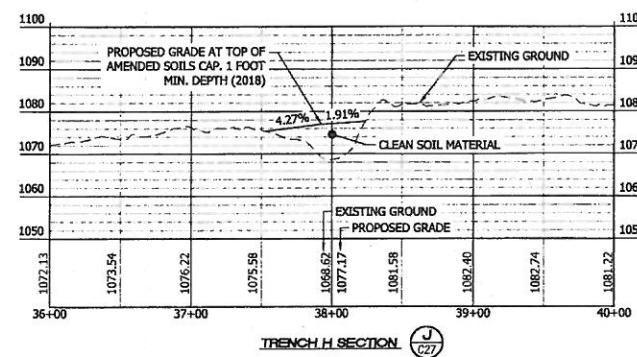
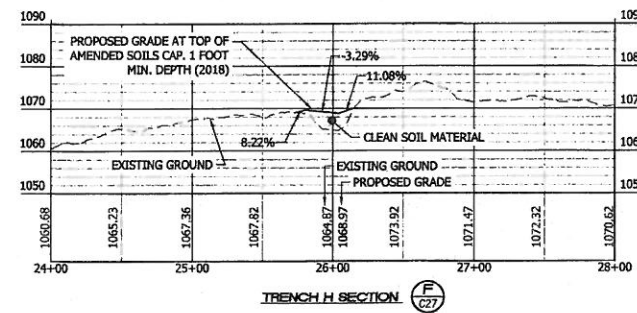
SCALE: 1" = 60' HORIZONTAL
1" = 20' VERTICAL

Profile view of Trench H Section. The vertical axis represents elevation in feet, ranging from 1010 to 1080. The horizontal axis represents stationing, ranging from 20+00 to 24+00. The profile shows the existing ground (dashed line), the proposed grade (solid line), and the amended soils cap (dotted line). A 2.84% slope is indicated between stations 21+00 and 22+00. A 19.25% slope is indicated between stations 22+00 and 23+00. The amended soils cap is shown at a minimum depth of 1 foot from the proposed grade at station 20+18. The clean soil material is shown between the amended soils cap and the existing ground.

Station	Existing Ground (ft)	Proposed Grade (ft)	Amended Soils Cap (ft)
20+00	1028.02	1028.02	1028.02
20+18	1033.93	1033.93	1033.93
21+00	1038.40	1038.40	1038.40
22+00	1043.42	1043.42	1043.42
23+00	1058.73	1058.73	1058.73
24+00	1069.68	1069.68	1069.68



A PORTION OF THE EAST 1/2 OF SECTION 1, TOWNSHIP 21 NORTH, RANGE 6 EAST W.M.
KING COUNTY, WASHINGTON
TRENCH - H

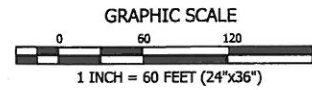


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CALL 811 AT LEAST 48 HOURS BEFORE YOU DIG

SHEET TITLE: TRACT - H		REVISION	DESCRIPTION	DATE	BY
PROJECT: 09-040 DWG NAME: 09-040-TRENCH-H					
SHEET C28 28 OF 33					
REV.					
DESIGNER: J. JACOBY ENGINEER: B. ALLEN DRAWN: J. JACOBY S 1 T 21 N R 6E WM DATE: 2018-05-08 REVISED:					
CLIENT: RAVENSDALE LLC 41306 90TH AVENUE E EATONVILLE, WA 98328 CONTACT: KURT ERICKSON					
PHONE: (253) 606-6060					
					
					
CIVIL ENGINEERS~SURVEYORS~LAND PLANNERS 3309 56th Street NW, Suite 106 Gig Harbor, WA 98335 Phone: 253-857-5454 ~ Fax: 253-509-0044 ~ info@contourpllc.com					

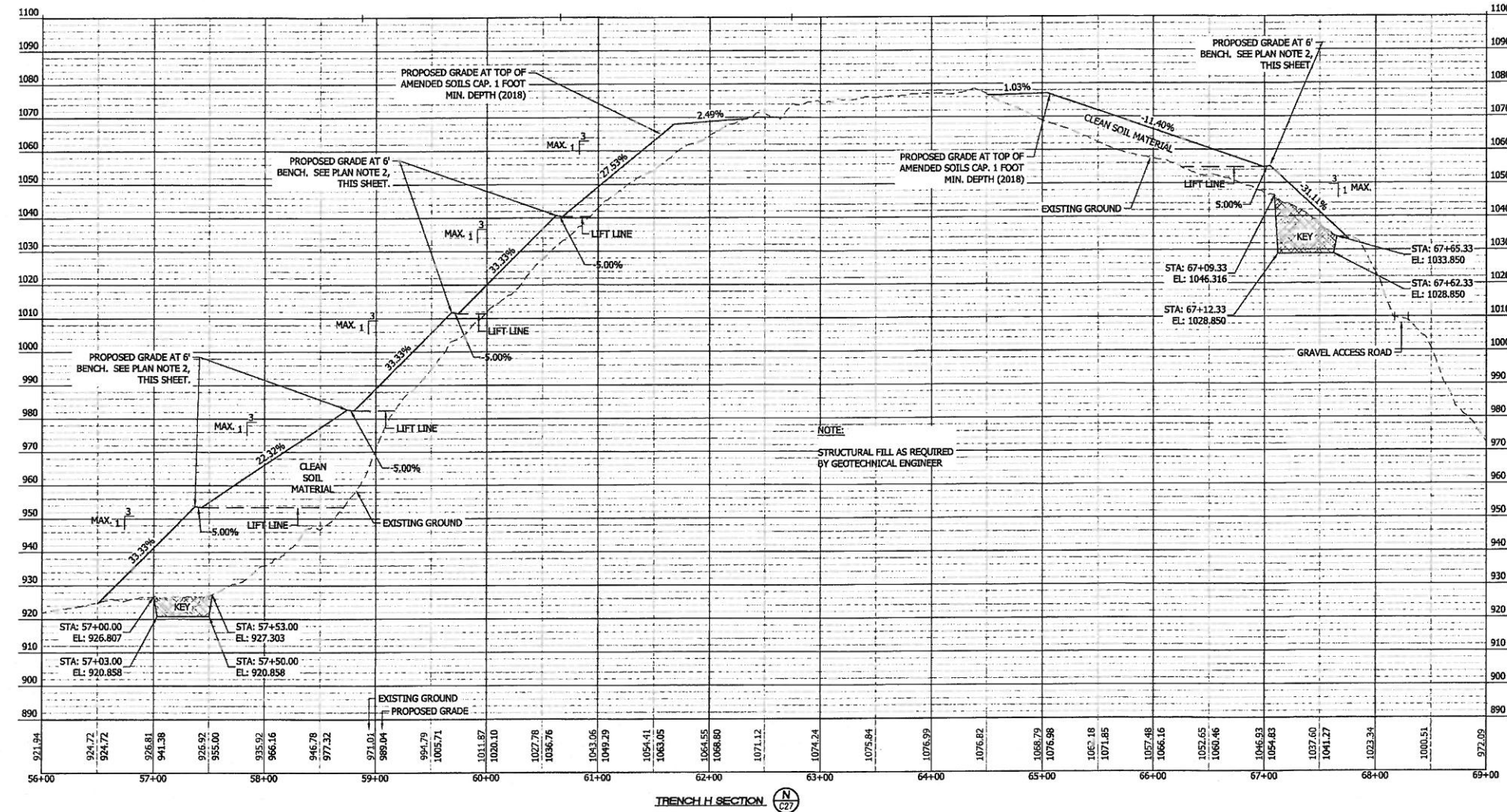
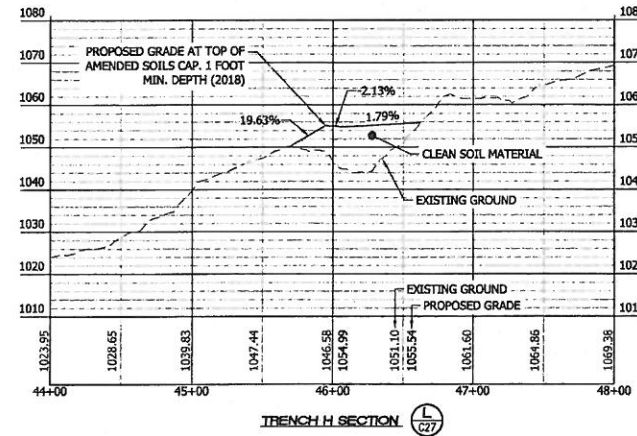


TRENCH H:

SCALE: 1" = 60' HORIZONTAL
1" = 20' VERTICAL

PROPOSED IMPORT QUANTITY: 21,196 CY±
(BANK YARDS)

RAVENSDALE TRENCH FILLING
A PORTION OF THE EAST 1/2 OF SECTION 1, TOWNSHIP 21 NORTH, RANGE 6 EAST W.M.
KING COUNTY, WASHINGTON
TRENCH - H



VERIFICATION NOTE
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REVISION	DESCRIPTION	DATE	BY

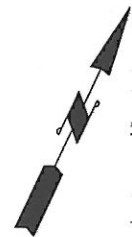
CONTOUR ENGINEERING, L.L.C.
CIVIL ENGINEERS/SURVEYORS/LAND PLANNERS
3309 56th Street NW, Suite 106 Gig Harbor, WA 98335
Phone: 253-857-5454 • Fax: 253-509-0044 • info@contourpic.com

BRETT M. ALLEN
STATE OF WASHINGTON
REGISTERED PROFESSIONAL ENGINEER

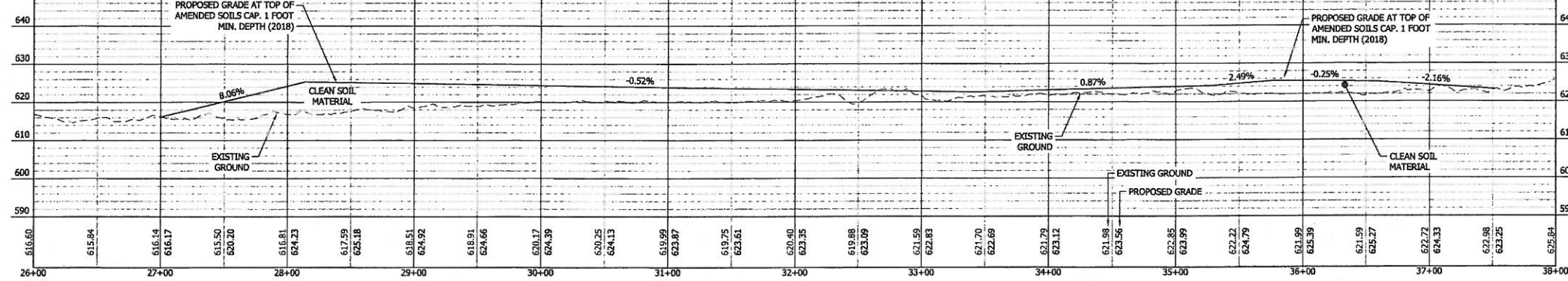
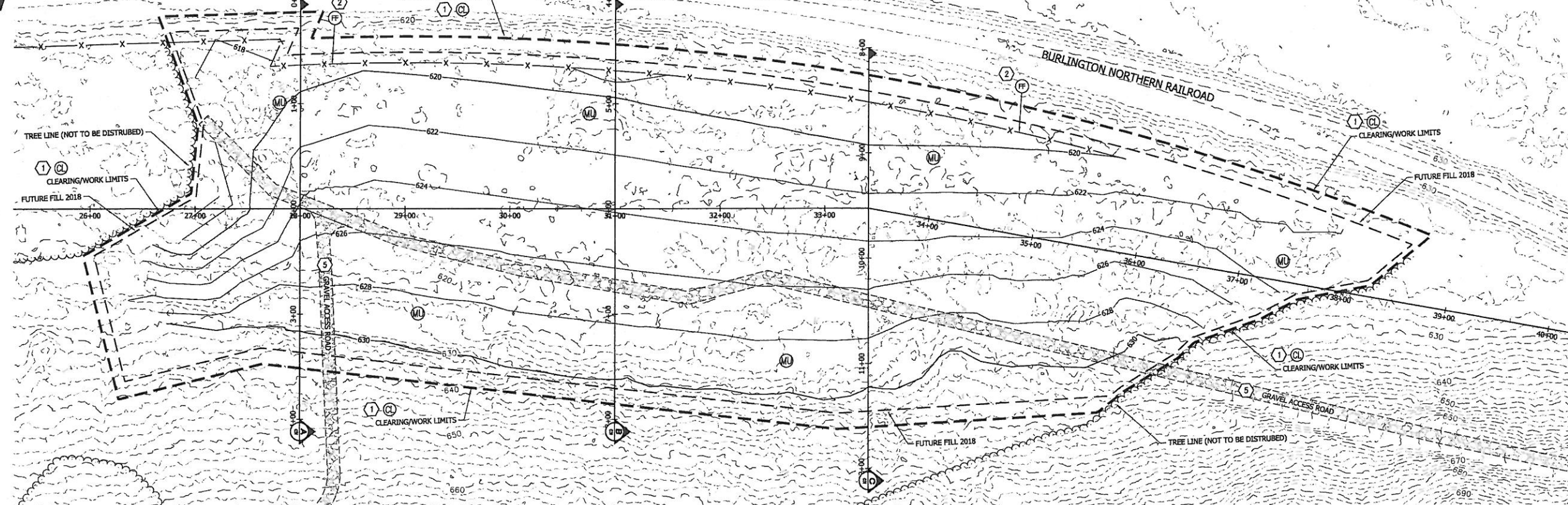
TRACT - H
RAVENSDALE TRENCH FILLING
CLIENT: RAVENSDALE LLC
41306 90TH AVENUE E
EATONVILLE, WA 98328
CONTACT: KURT ERICKSON
PHONE: (253) 606-6060

DESIGNER: J. JACOBY
ENGINEER: B. ALLEN
DRAWN: J. JACOBY
DATE: 2018-05-08
PROJECT: 09-040
DWG NAME: 09-040-TRENCH-H

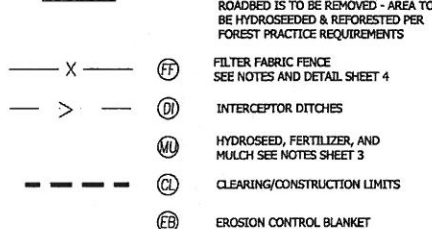
SHEET	REV.
C29	
29 OF 33	



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AD TEMPORARY ACCESS



LIMIT OF WORK, CLEARING/GRADING LIMITS AS SHOWN

2. LOCATE FILTER FABRIC FENCE AS CLOSE TO CLEARING LIMITS AS PRACTICAL.
3. UNDISTURBED AREAS.
4. WETLAND BUFFER DO NOT DISTURB.
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6. ARMOR PER GEOTECHNICAL ENGINEER REQUIREMENTS.
7. FIELD LOCATE ACTUAL WETLAND AND BUFFER PRIOR TO ANY FILLING. ADJUST EDGE OF FILL/TOE SLOPE TO KEEP ALL WORK OUTSIDE OF BUFFER.

1. SEE PLANTING NOTES SHEET :
2. 5' WIDE BENCH VERTICAL SEP

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3. ACTUAL LOCATION OF TOE OF SLOPE VARIES TO ALLOW WORKING AREA/CLEARANCE. TOE OF SLOPE SHALL NOT ENROACH INTO WETLAND BUFFER.
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SCALE: 1" = 50' HORIZONTAL
1" = 17.5' VERTICAL

PROPOSED IMPORT QUANTITY: 29,042 CY±
(BANK YARDS)

ALL EXISTING UTILITIES IN THE CONSTRUCTION AREA SHALL BE IDENTIFIED AND VERIFIED FOR DEPTH AND LOCATION PRIOR TO CONSTRUCTION ACTIVITIES SO TO IDENTIFY AND AVOID ANY UTILITIES.

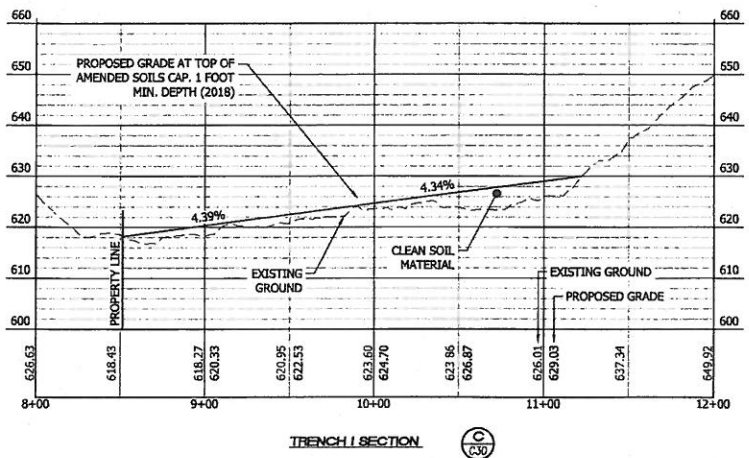
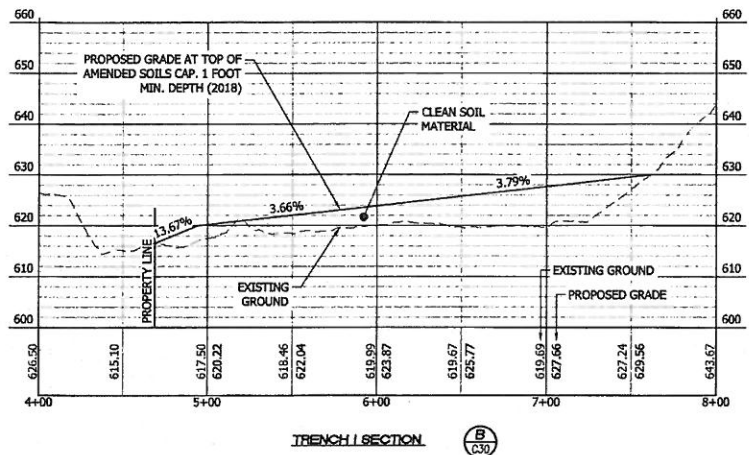
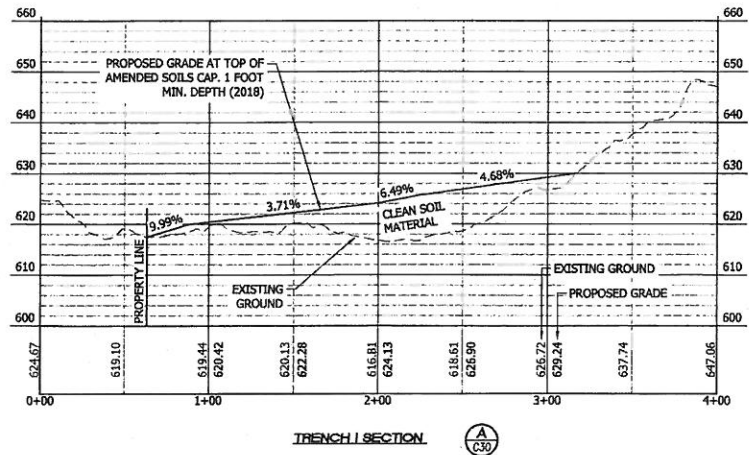
CONSTRUCTION ACTIVITIES SO TO IDENTIFY ANY POTENTIAL CONFLICTS WITH PROPOSED CONSTRUCTION. CONTACT PROJECT ENGINEER IMMEDIATELY IF ANY CONFLICTS ARE IDENTIFIED.

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CALL 811 AT LEAST 48 HOURS BEFORE YOU DIG

SHEET TITLE: TRENCH - I		RAVENSDALE TRENCH FILLING	CLIENT: RAVENSDALE LLC 41306 90TH AVENUE E EATONVILLE, WA 98328	PHONE: (253) 606-6660 CONTACT: KURT ERICSON		CONTOUR ENGINEERS~SURVEYORS~LAND PLANNERS 3309 56th Street NW, Suite 106 Gig Harbor, WA 98335 Phone: 253-857-5454 ~ Fax: 253-509-0044 ~ info@contaurplc.com	REVISION	DESCRIPTION	DATE	BY
DESIGNER: J. JACOBY ENGINEER: B. ALLEN DRAWN: J. JACOBY S 1 T 21 N R 6E WM DATE: 2018-05-08 REVISED:										
PROJECT: 09-040 DWG NAME: 09-040-TRENCH-I										
SHEET						REV.				
C30										
30 OF 33										

RAVENSDALE TRENCH FILLING
A PORTION OF THE EAST 1/2 OF SECTION 1, TOWNSHIP 21 NORTH, RANGE 6 EAST W.M.
KING COUNTY, WASHINGTON
TRENCH - I



TRENCH I:
SCALE: 1" = 50' HORIZONTAL
1" = 17.5' VERTICAL

PROPOSED IMPORT QUANTITY: 29,042 CY±
(BANK YARDS)

VERIFICATION NOTE
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REVISION	DESCRIPTION	DATE	BY

CONTOUR ENGINEERING, LLC
CIVIL ENGINEERS~SURVEYORS~LAND PLANNERS
3309 56th Street NW, Suite 106 Gig Harbor, WA 98335
Phone: 253-857-5454 ~ Fax: 253-509-0044 ~ info@contourplc.com

BETTY M. ALLEN
STATE OF WASHINGTON
REGISTERED PROFESSIONAL ENGINEER
No. 52744

SHEET TITLE: TRENCH - I

RAVENSDALE TRENCH FILLING
CLIENT: RAVENSDALE LLC
41306 90TH AVENUE E
EATONVILLE, WA 98328
CONTACT: KURT BRUCKSON
PHONE: (253) 606-6060

DESIGNER: J. JACOBY
ENGINEER: B. ALLEN
DRAWN: J. JACOBY
S 1 T 21 N R 6E WM
DATE: 2018-05-08
REVISED:

PROJECT: 09-040
DWG NAME: 09-040-TRENCH-I

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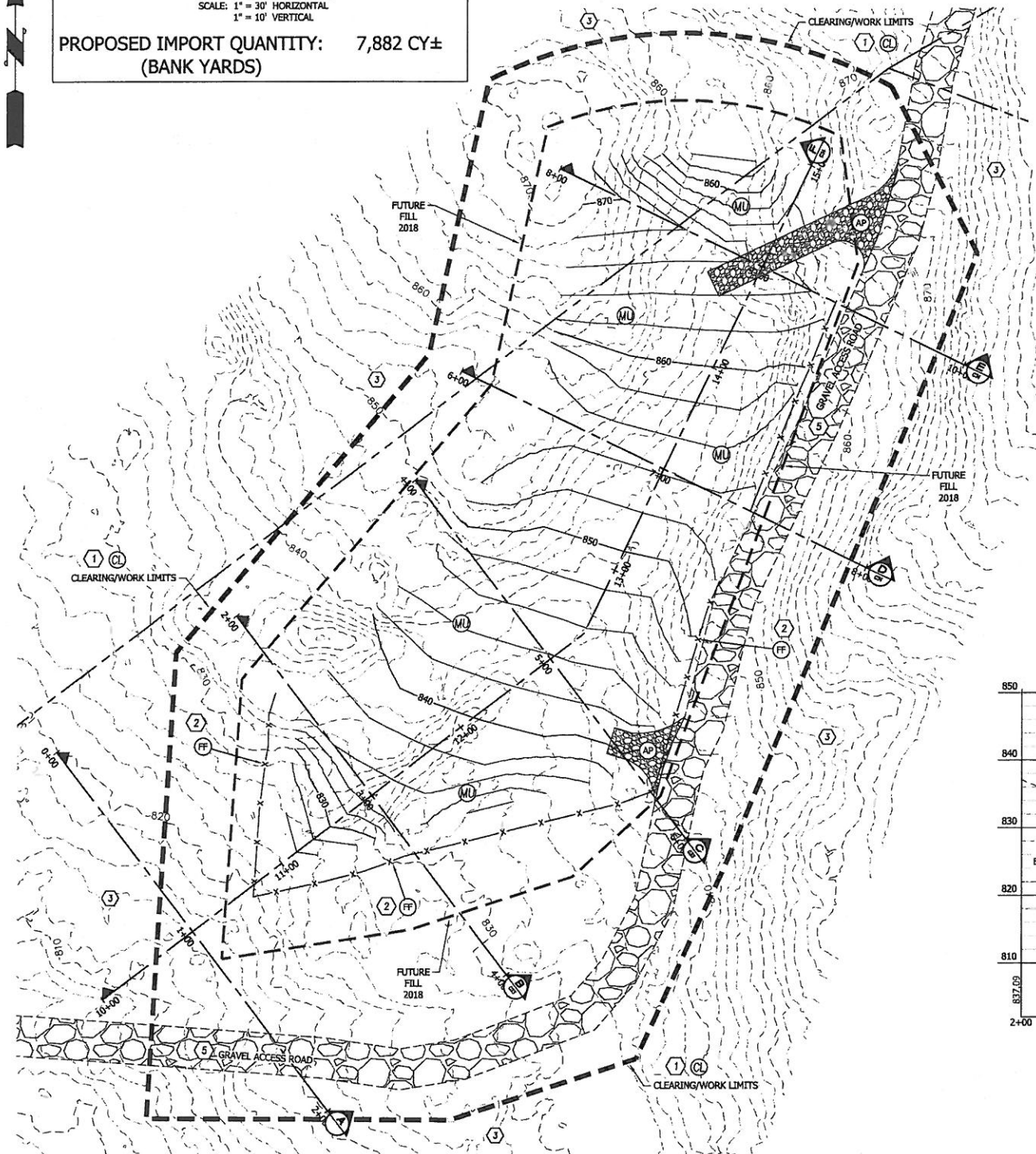
31 OF 33



SCALE: 1" = 30' HORIZONTAL
1" = 10' VERTICAL

PROPOSED IMPORT QUANTITY: 7,882 CY±
(BANK YARDS)

A PORTION OF THE EAST 1/2 OF SECTION 1, TOWNSHIP 21 NORTH, RANGE 6 EAST W.M.
KING COUNTY, WASHINGTON
TRENCH - J



1. LIMIT OF WORK, CLEARING/GRADING LIMITS AS SHOWN
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AP TEMPORARY ACCESS POINT
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ROADBED IS TO BE REMOVED - AREA TO
BE HYDROSEED & REFORESTED PER
FOREST PRACTICE REQUIREMENTS

FF FILTER FABRIC FENCE
SEE NOTES AND DETAIL SHEET 4

(DI) INTERCEPTOR DITCHES

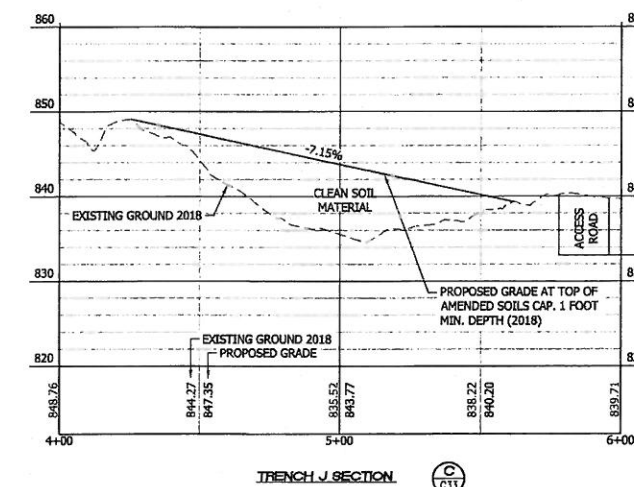
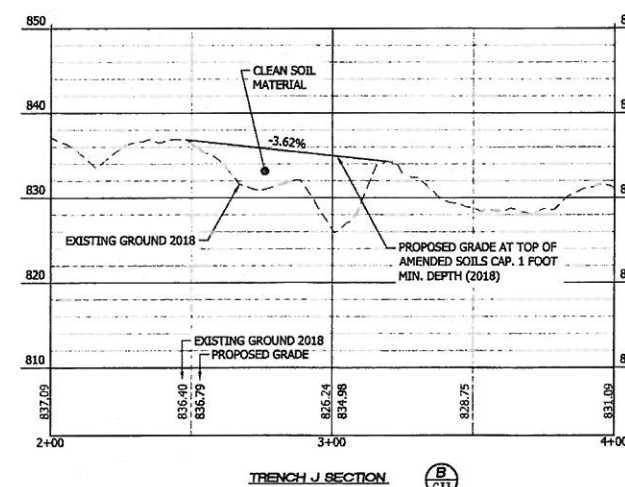
(MU) HYDROSEED, FERTILIZER, AND
MULCH SEE NOTES SHEET 3

(CL) CLEARING/CONSTRUCTION LIMITS

EB EROSION CONTROL BLANKET

1. SEE PLANTING NOTES SHEET 10.

2. 5' WIDE BENCH VERTICAL SEPARATION PER GEOTECHNICAL ENGINEER REQUIREMENTS.
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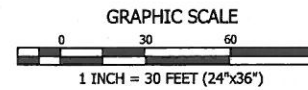


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SHEET TITLE: TRENCH - J						REVISION DATE		BY	
DESIGNER: J. JACOBY ENGINEER: B. ALLEN DRAWN: J. JACOBY S 1 T 21 N 8E WM DATE: 2018-05-08 REVISED:		CLIENT: RAVENSDALE LLC 41306 90TH AVENUE E EATONVILLE, WA 98328 CONTACT: KURT ERICKSON PHONE: (253) 606-6060		CIVIL ENGINEERS~SURVEYORS~LAND PLANNERS F N G I N E E R I N G • L L C 3309 56th Street NW, Suite 106 Gig Harbor, WA 98335 Phone: 253-457-5454 ~ Fax: 253-509-0044 ~ info@contourllc.com					
PROJECT: 09-040		DWG NAME: 09-040-TRENCH-J							
SHEET		REV.							
C32									
32 OF 33									



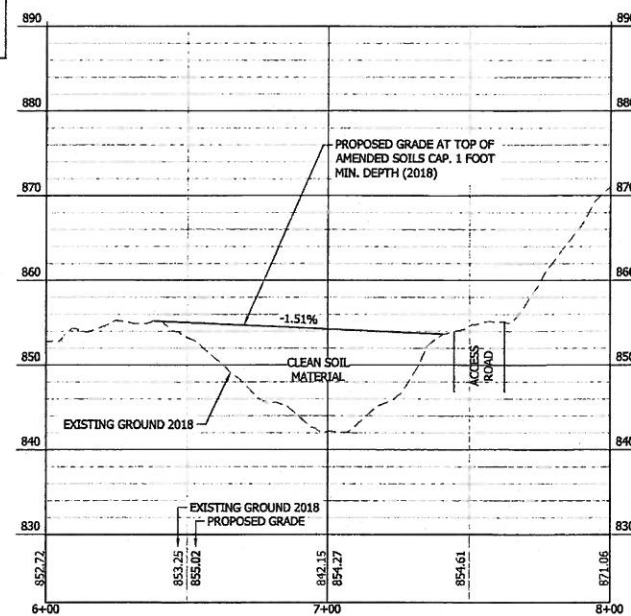
TRENCH J:

SCALE: 1" = 30' HORIZONTAL
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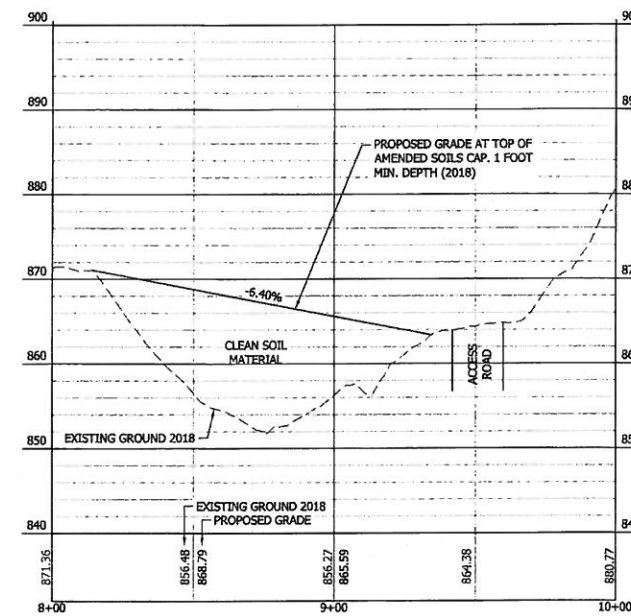
PROPOSED IMPORT QUANTITY: 7,882 CY±
(BANK YARDS)

RAVENSDALE TRENCH FILLING

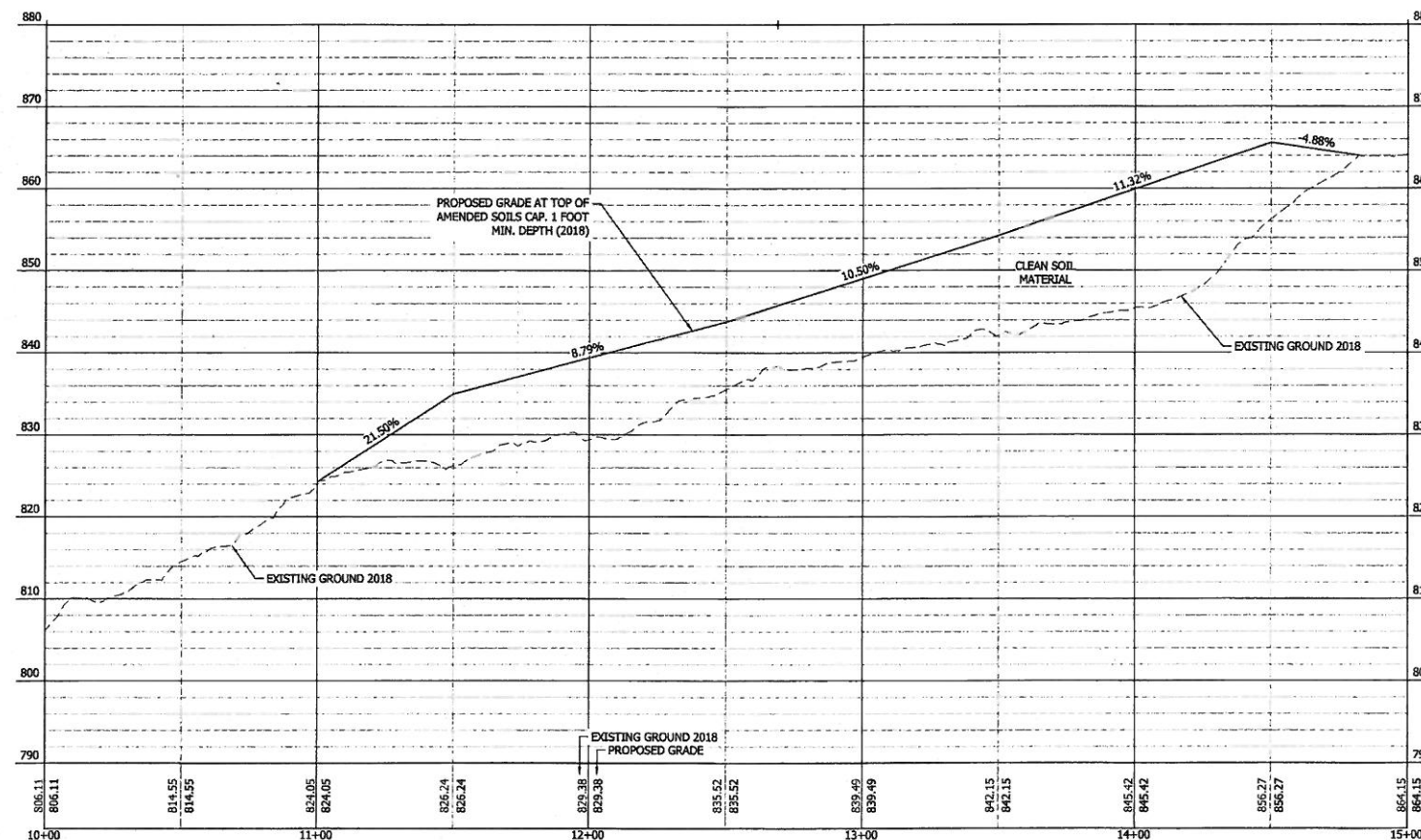
A PORTION OF THE EAST 1/2 OF SECTION 1, TOWNSHIP 21 NORTH, RANGE 6 EAST W.M.
KING COUNTY, WASHINGTON
TRENCH - J



TRENCH J SECTION D (C13)



TRENCH J SECTION E (C13)



TRENCH J SECTION F (C13)

VERIFICATION NOTE

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CONTOUR
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CIVIL ENGINEERS & SURVEYORS
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SHEET TITLE: TRENCH - J
DESIGNER: J. JACOBY
ENGINEER: B. ALLEN
DRAWN: J. JACOBY
S 1 T 21 N R 6 E WM
DATE: 2018-05-08
REVISED:
PROJECT: 09-040
DWG NAME: 09-040-TRENCH-J
SHEET C33
REV. 33 OF 33

RAVENSDALE TRENCH FILLING
CLIENT: RAVENSDALE LLC
41306 90TH AVENUE E
EATONVILLE, WA 98328
CONTACT: KURT ERICKSON
PHONE: (253) 606-6060

APPENDIX C

Construction BMP's

D.2.1 ESC MEASURES

This section details the ESC measures that are required to minimize erosion and sediment transport off a construction site and protect areas of existing and proposed flow control BMPs. These ESC measures represent Best Management Practices (BMPs)⁶ for the control of erosion and entrained sediment as well as other impacts related to construction such as increased runoff due to land disturbing activities. The measures and practices are grouped into nine sections corresponding to each of the nine categories of ESC measures in Core Requirement #5, Section 1.2.5 of the King County *Surface Water Design Manual*. The introductory paragraphs at the beginning each section present the basic requirement for that category of measures, the purpose of those measures, installation requirements relative to construction activity, guidelines for the conditions of use, and other information relevant to all measures in the section/category. Compliance with each of the nine categories of the ESC measures, to the extent applicable and necessary to meet the performance criteria in Section D.2.1, and compliance with the ESC implementation requirements in Section D.2.4, constitutes overall compliance with King County's ESC Standards.

Note: Additional measures shall be required by the County if the existing standards are insufficient to protect adjacent properties, drainage facilities, or water resources.

The standards for each individual ESC measure are divided into four sections:

1. Purpose
2. Conditions of Use
3. Design and Installation Specifications
4. Maintenance Requirements.

A code and symbol for each measure have also been included for ease of use on ESC plans. Note that the "Conditions of Use" always refers to site conditions. As site conditions change, ESC measures must be changed to remain in compliance with the requirements of this appendix.

Whenever compliance with King County ESC Standards is required, all of the following categories of ESC measures must be considered for application to the project site as detailed in the following sections:

1. **Clearing Limits:** Prior to any site clearing or grading, areas to remain undisturbed during project construction shall be delineated on the project's ESC plan and physically marked on the project site.
2. **Cover Measures:** Temporary and permanent cover measures shall be provided when necessary to protect disturbed areas. The intent of these measures is to prevent erosion by having as much area as possible covered during any period of precipitation.
3. **Perimeter Protection:** Perimeter protection to filter sediment from sheet flow shall be provided downstream of all disturbed areas prior to upslope grading.
4. **Traffic Area Stabilization:** Unsurfaced entrances, roads, and parking areas used by construction traffic shall be stabilized to minimize erosion and tracking of sediment offsite.
5. **Sediment Retention:** Surface water collected from all disturbed areas of the site shall be routed through a sediment pond or trap prior to release from the site, except those areas at the perimeter of the site small enough to be treated solely with perimeter protection. Sediment retention facilities shall be installed prior to grading any contributing area.
6. **Surface Water Collection:** Surface water collection measures (e.g., ditches, berms, etc.) shall be installed to intercept all surface water from disturbed areas, convey it to a sediment pond or trap, and discharge it downstream of any disturbed areas. Areas at the perimeter of the site, which are small enough to be treated solely with perimeter protection, do not require surface water collection.

⁶ *Best Management Practices (BMPs)* means the best available and reasonable physical, structural, managerial, or behavioral activities, that when singly or in combination, eliminate or reduce the contamination of surface and/or ground waters.

Significant sources of upstream surface water that drain onto disturbed areas shall be intercepted and conveyed to a stabilized discharge point downstream of the disturbed areas. Surface water collection measures shall be installed concurrently with or immediately following rough grading and shall be designed, constructed, and stabilized as needed to minimize erosion.

7. **Dewatering Control:** The water resulting from construction site de-watering activities must be treated prior to discharge or disposed of as specified.
8. **Dust Control:** Preventative measures to minimize wind transport of soil shall be implemented when a traffic hazard may be created or when sediment transported by wind is likely to be deposited in water resources.
9. **Flow Control:** Surface water from disturbed areas must be routed through the project's onsite flow control facility or other provisions must be made to prevent increases in the existing site conditions 2-year and 10-year runoff peaks discharging from the project site during construction (flow control BMP areas (existing or proposed) shall not be used for this purpose).
10. **Control Pollutants:** Stormwater pollution prevention (SWPPS) measures are required to prevent, reduce, or eliminate the discharge of pollutants to onsite or adjacent stormwater systems or watercourses from construction-related activities such as materials delivery and storage, onsite equipment fueling and maintenance, demolition of existing buildings and disposition of demolition materials and other waste, and concrete handling, washout and disposal. Section D.2.2 describes BMPs specific to this purpose; additionally, several of the ESC BMPs described herein are applicable.
11. **Protect Existing and Proposed Flow Control BMPs:** Sedimentation and soil compaction reduce the infiltration capacity of native and engineered soils. Protection measures shall be applied/installed and maintained so as to prevent adverse impacts to existing flow control BMPs and areas of proposed flow control BMPs for the project. Adverse impacts can prompt the requirement to restore or replace affected BMPs.
12. **Maintain BMPs:** Protection measures shall be maintained to assure continued performance of their intended function, to prevent adverse impacts to existing flow control BMPs and areas of proposed flow control BMPs, and protect other disturbed areas of the project.
13. **Manage the Project:** Coordination and timing of site development activities relative to ESC concerns, and timely inspection, maintenance and update of protective measures are necessary to effectively manage the project and assure the success of protective ESC and SWPPS design and implementation.

D.2.1.1 CLEARING LIMITS

Prior to any site clearing or grading, those areas that are to remain undisturbed during project construction shall be delineated. At a minimum, clearing limits shall be installed at the edges of all critical area buffers and any other areas required to be left uncleared such as portions of the site subject to clearing limits under KCC 16.82.150, areas around significant trees identified to be retained, flow control BMP areas to be protected, and other areas identified to be left undisturbed to protect sensitive features.

Purpose: The purpose of clearing limits is to prevent disturbance of those areas of the project site that are not designated for clearing or grading. This is important because limiting site disturbance is the single most effective method for reducing erosion. Clearing limits may also be used to control construction traffic, thus reducing the disturbance of soil and limiting the amount of sediment tracked off site.

When to Install: Clearing limits shall be installed prior to the clearing and/or grading of the site.

Measures to Use: Marking clearing limits by delineating the site with a continuous length of brightly colored survey tape is sometimes sufficient. The tape may be supported by vegetation or stakes, and it shall be 3 to 6 feet high and highly visible. Critical areas and their buffers require more substantial protection and shall be delineated with plastic or metal safety fences or stake and wire fences. Fencing may be required at the County's discretion to control construction traffic or at any location where greater

protection is warranted. Permanent fencing may also be used if desired by the applicant. Silt fence, in combination with survey flagging, is also an acceptable method of marking critical areas and their buffers.

D.2.1.1.1 PLASTIC OR METAL FENCE

Code: FE

Symbol:



Purpose

Fencing is intended to (1) restrict clearing to approved limits; (2) prevent disturbance of critical areas, their buffers, and other areas required to be left undisturbed; (3) limit construction traffic to designated construction entrances or roads; and (4) protect areas where marking with survey tape may not provide adequate protection.

Conditions of Use

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

1. At the boundary of critical areas, their buffers, and other areas required to be left uncleared.
2. As necessary to control vehicle access to and on the site (see Sections D.2.1.4.1 and D.2.1.4.2).

Design and Installation Specifications

1. The fence shall be designed and installed according to the manufacturer's specifications.
2. The fence shall be at least 3 feet high and must be highly visible.
3. The fence shall not be wired or stapled to trees.

Maintenance Requirements

1. If the fence has been damaged or visibility reduced, it shall be repaired or replaced immediately and visibility restored.
2. Disturbance of a critical area, critical area buffer, native growth retention area, or any other area required to be left undisturbed shall be reported to the County for resolution.

D.2.1.2 COVER MEASURES

Temporary and permanent cover measures shall be provided to protect all disturbed areas, including the faces of cut and fill slopes. Temporary cover shall be installed if an area is to remain unworked for more than seven days during the dry season (May 1 to September 30) or for more than two consecutive working days during the wet season (October 1 to April 30). These time limits may be relaxed if an area poses a low risk of erosion due to soil type, slope gradient, anticipated weather conditions, or other factors. Conversely, the County may reduce these time limits if site conditions warrant greater protection (e.g., adjacent to significant aquatic resources or highly erosive soils) or if significant precipitation (see Section D.2.4.2) is expected. Any area to remain unworked for more than 30 days shall be seeded or sodded, unless the County determines that winter weather makes vegetation establishment infeasible. During the wet season, slopes and stockpiles at 3H:1V or steeper and with more than ten feet of vertical relief shall be covered if they are to remain unworked for more than 12 hours. Also during the wet season, the material necessary to cover all disturbed areas must be stockpiled on site. The intent of these cover requirements is to have as much area as possible covered during any period of precipitation.

Purpose: The purpose of covering exposed soils is to prevent erosion, thus reducing reliance on less effective methods that remove sediment after it is entrained in runoff. Cover is the only practical method of reducing turbidity in runoff. Structural measures, such as silt fences and sediment ponds, are only capable of removing coarse particles and in most circumstances have little to no effect on turbidity.

D.2.1.2.2 MULCHING

Code: MU

Symbol:

**Purpose**

The purpose of mulching soils is to provide 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 may be used. Only the most common types are discussed in this section.

Conditions of Use

As a temporary cover measure, mulch should be used:

1. On disturbed areas that require cover measures for less than 30 days
2. As a cover for seed during the wet season and during the hot summer months
3. During the wet season on slopes steeper than 3H:1V with more than 10 feet of vertical relief.

Design and Installation Specifications

For mulch materials, application rates, and specifications, see Table D.2.1.2.A. *Note: Thicknesses may be increased for disturbed areas in or near critical areas or other areas highly susceptible to erosion.*

Maintenance Standards

1. The thickness of the cover must be maintained.
2. 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 drainage problem shall be assessed and alternate drainage such as interceptor swales may be needed to fix the problem and the eroded area remulched.

Straw	Air-dried; free from undesirable seed and coarse material	2"-3" thick; 5 bales per 1000 sf or 2-3 tons per acre	Cost-effective protection when applied with adequate thickness. Hand-application generally requires greater thickness than blown straw. Straw should be crimped to avoid wind blow. The thickness of straw may be reduced by half when used in conjunction with seeding.
Wood Fiber Cellulose	No growth inhibiting factors	Approx. 25-30 lbs per 1000 sf or 1500-2000 lbs per acre	Shall be applied with hydromulcher. Shall not be used without seed and tackifier unless the application rate is at least doubled. Some wood fiber with very long fibers can be effective at lower application rates and without seed or tackifier.
Compost	No visible water or dust during handling. Must be purchased from supplier with Solid Waste Handling Permit.	2" thick min.; approx. 100 tons per acre (approx. 1.5 cubic feet per square yard)	More effective control can be obtained by increasing thickness to 3" (2.25 cubic feet per square yard). Excellent mulch for protecting final grades until landscaping because it can be directly seeded or tilled into soil as an amendment. Compost may not be used in Sensitive Lake ⁷ basins unless analysis of the compost shows no phosphorous release.
Hydraulic Matrices (Bonded Fiber Matrix)	This mulch category includes hydraulic slurries composed of wood fiber, paper fiber or a combination of the two held together by a binding system. The BFM shall be a mixture of long wood fibers and various bonding agents.	Apply at rates from 3,000 lbs per acre to 4,000 lbs per acre and based on manufacturers recommendations	The BFM shall not be applied immediately before, during or immediately after rainfall so that the matrix will have an opportunity to dry for 24 hours after installation. Application rates beyond 2,500 pounds may interfere with germination and are not usually recommended for turf establishment. BFM is generally a matrix where all fiber and binders are in one bag, rather than having to mix components from various manufacturers to create a matrix. BFMs can be installed via helicopter in remote areas. They are approximately \$1,000 per acre cheaper to install.
Chipped Site Vegetation	Average size shall be several inches.	2" minimum thickness	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 runoff. 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.

⁷ Sensitive lake means a lake that has proved to be particularly prone to eutrophication; the County gives this designation when an active input plan has been adopted to limit the amount of phosphorous entering the lake.

D.2.1.2.3 NETS AND BLANKETS

Code: NE

Symbol:



Purpose

Erosion control nets and blankets are intended to prevent erosion and hold seed and mulch in place on steep slopes and in channels so that vegetation can become well established. In addition, some nets and blankets can be used to permanently reinforce turf to protect drainage ways during high flows. Nets are strands of material woven into an open, but high-tensile strength net (for example, jute matting). Blankets are strands of material that are not tightly woven, but instead form a layer of interlocking fibers, typically held together by a biodegradable or photodegradable netting (for example, excelsior or straw blankets). They generally have lower tensile strength than nets, but cover the ground more completely. Coir (coconut fiber) fabric comes as both nets and blankets.

Conditions of Use

Erosion control nets and blankets should be used:

1. For permanent stabilization of slopes 2H:1V or greater and with more than 10 feet of vertical relief.
2. In conjunction with seed for final stabilization of a slope, not for temporary cover. However, they may be used for temporary applications as long as the product is not damaged by repeated handling. In fact, this method of slope protection is superior to plastic sheeting, which generates high-velocity runoff (see Section D.2.1.2.4).
3. For drainage ditches and swales (highly recommended). The application of appropriate netting or blanket to drainage ditches and swales can protect bare soil from channelized runoff while vegetation is established. Nets and blankets also can capture a great deal of sediment due to their open, porous structure. Synthetic nets and blankets may be used to permanently stabilize channels and may provide a cost-effective, environmentally preferable alternative to riprap.

Design and Installation Specifications

1. See Figure D.2.1.2.B and Figure D.2.1.2.C for **typical orientation and installation** of nettings and blankets. *Note: Installation is critical to the effectiveness of these products. If good ground contact is not achieved, runoff can concentrate under the product, resulting in significant erosion.*
2. With the variety of products available, it is impossible to cover all the details of appropriate use and installation. Therefore, it is critical that the design engineer thoroughly consults the **manufacturer's information** and that a site visit takes place in order to insure that the product specified is appropriate.
3. Jute matting must be used in conjunction with mulch (Section D.2.1.2.2). Excelsior, woven straw blankets, and coir (coconut fiber) blankets may be installed without mulch. There are many other types of **erosion control nets and blankets** on the market that may be appropriate in certain circumstances. Other types of products will have to be evaluated individually. In general, most nets (e.g., jute matting) require mulch in order to prevent erosion because they have a fairly open structure. Blankets typically do not require mulch because they usually provide complete protection of the surface.
4. Purely synthetic blankets are allowed but shall only be used for long-term stabilization of waterways. The organic blankets authorized above are better for slope protection and short-term waterway protection because they retain moisture and provide organic matter to the soil, substantially improving the speed and success of re-vegetation.

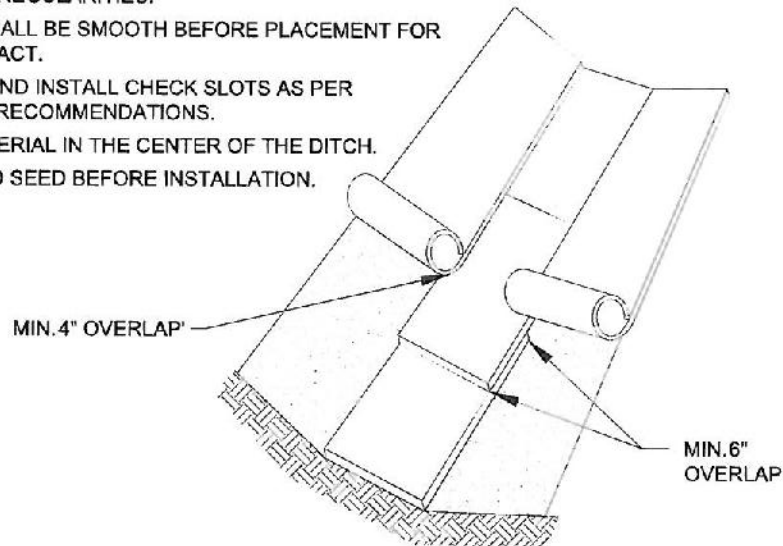
Maintenance Standards

1. Good contact with the ground must be maintained, and there must not be erosion beneath the net or

blanket.

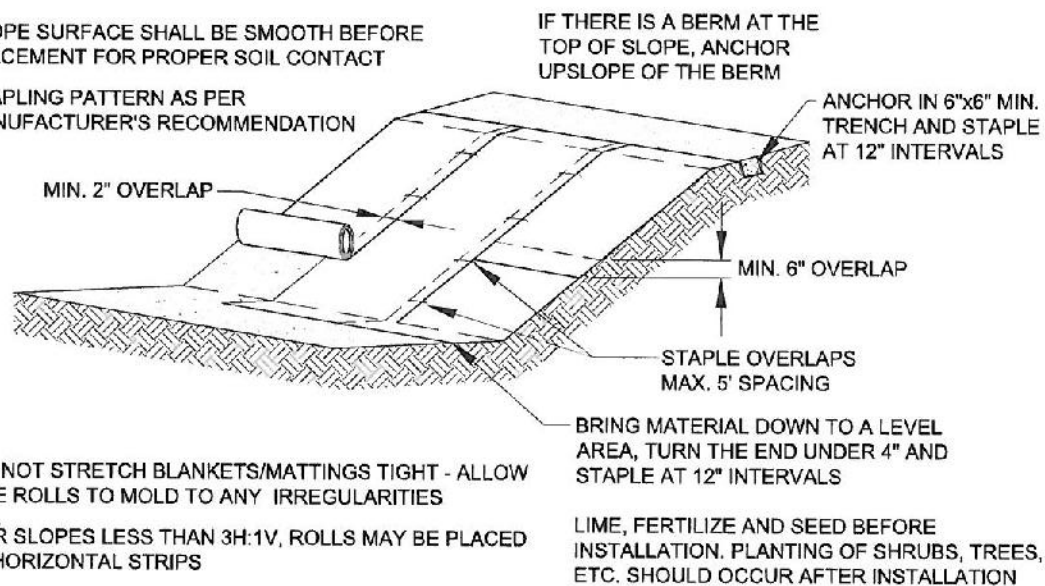
2. Any areas of the net or blanket that are damaged or not in close contact with the ground shall be repaired and stapled.
3. If erosion occurs due to poorly controlled drainage, the problem shall be fixed and the eroded area protected.

- DO NOT STRETCH BLANKETS/MATTINGS TIGHT - ALLOW THE ROLLS TO MOLD TO ANY IRREGULARITIES.
- SLOPE SURFACE SHALL BE SMOOTH BEFORE PLACEMENT FOR PROPER SOIL CONTACT.
- ANCHOR, STAPLE, AND INSTALL CHECK SLOTS AS PER MANUFACTURER'S RECOMMENDATIONS.
- AVOID JOINING MATERIAL IN THE CENTER OF THE DITCH.
- LIME, FERTILIZE AND SEED BEFORE INSTALLATION.



SLOPE SURFACE SHALL BE SMOOTH BEFORE PLACEMENT FOR PROPER SOIL CONTACT

STAPLING PATTERN AS PER MANUFACTURER'S RECOMMENDATION



D.2.1.2.4 PLASTIC COVERING

Code: PC

Symbol:

**Purpose**

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

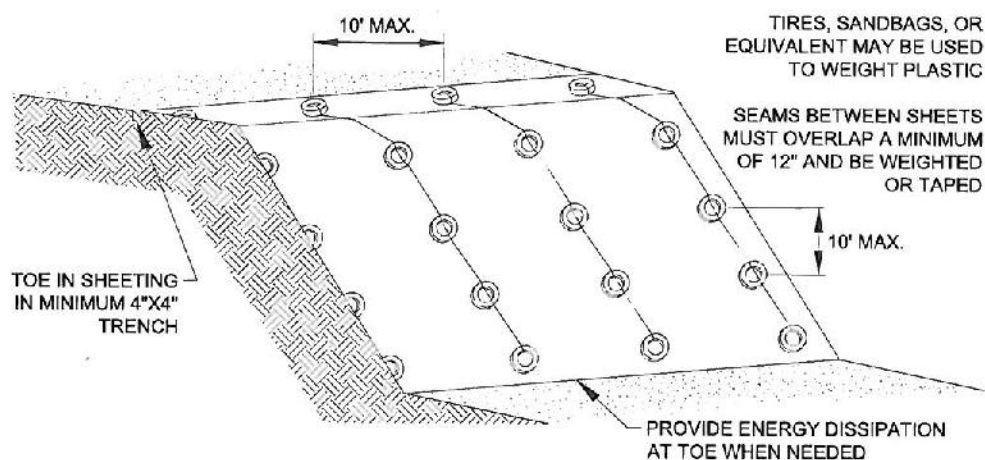
Conditions of Use

1. Plastic covering may be used on disturbed areas that require cover measures for less than 30 days.
2. 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 applications.*
3. Clear plastic sheeting may be used over newly-seeded areas to create a greenhouse effect and encourage grass growth. Clear plastic should not be used for this purpose during the summer months because the resulting high temperatures can kill the grass.
4. Due to rapid runoff caused by plastic sheeting, this method shall not be used upslope of areas that might be adversely impacted by concentrated runoff. Such areas include steep and/or unstable slopes.

Note: There have been many problems with plastic, usually attributable to poor installation and maintenance. However, the material itself can cause problems, even when correctly installed and maintained, because it generates high-velocity runoff and breaks down quickly due to ultraviolet radiation. In addition, if the plastic is not completely removed, it can clog drainage system inlets and outlets. It is highly recommended that alternatives to plastic sheeting be used whenever possible and that its use be limited.

Design and Installation Specifications

1. See Figure D.2.1.2.D for details.
2. Plastic sheeting shall have a minimum thickness of 0.06 millimeters.
3. 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 for Plastic Covering

1. Torn sheets must be replaced and open seams repaired.
2. If the plastic begins to deteriorate due to ultraviolet radiation, it must be completely removed and replaced.
3. When the plastic is no longer needed, it shall be completely removed.

D.2.1.2.5 STRAW WATTLES

Code: SW

Symbol:



Purpose

Wattles are erosion and sediment control barriers consisting of straw wrapped in biodegradable tubular plastic or similar encasing material. Wattles may reduce the velocity and can spread the flow of rill and sheet runoff, and can capture and retain sediment. Straw wattles are typically 8 to 10 inches in diameter and 25 to 30 feet in length. The wattles are placed in shallow trenches and staked along the contour of disturbed or newly constructed slopes.

Conditions of Use

1. Install on disturbed areas that require immediate erosion protection.
2. Use on slopes requiring stabilization until permanent vegetation can be established.
3. Can be used along the perimeter of a project, as a check dam in unlined ditches and around temporary stockpiles
4. Wattles can be staked to the ground using willow cuttings for added revegetation.
5. Rilling can occur beneath and between wattles if not properly entrenched, allowing water to pass below and between wattles

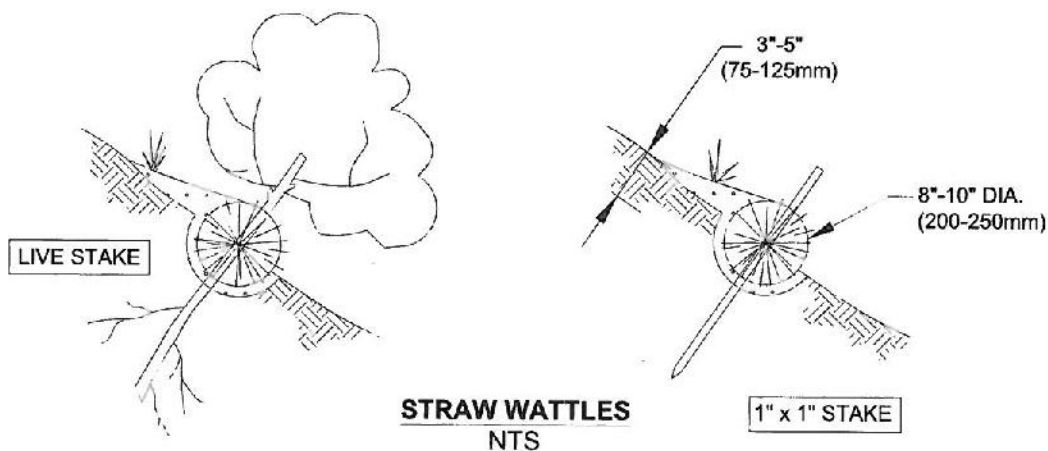
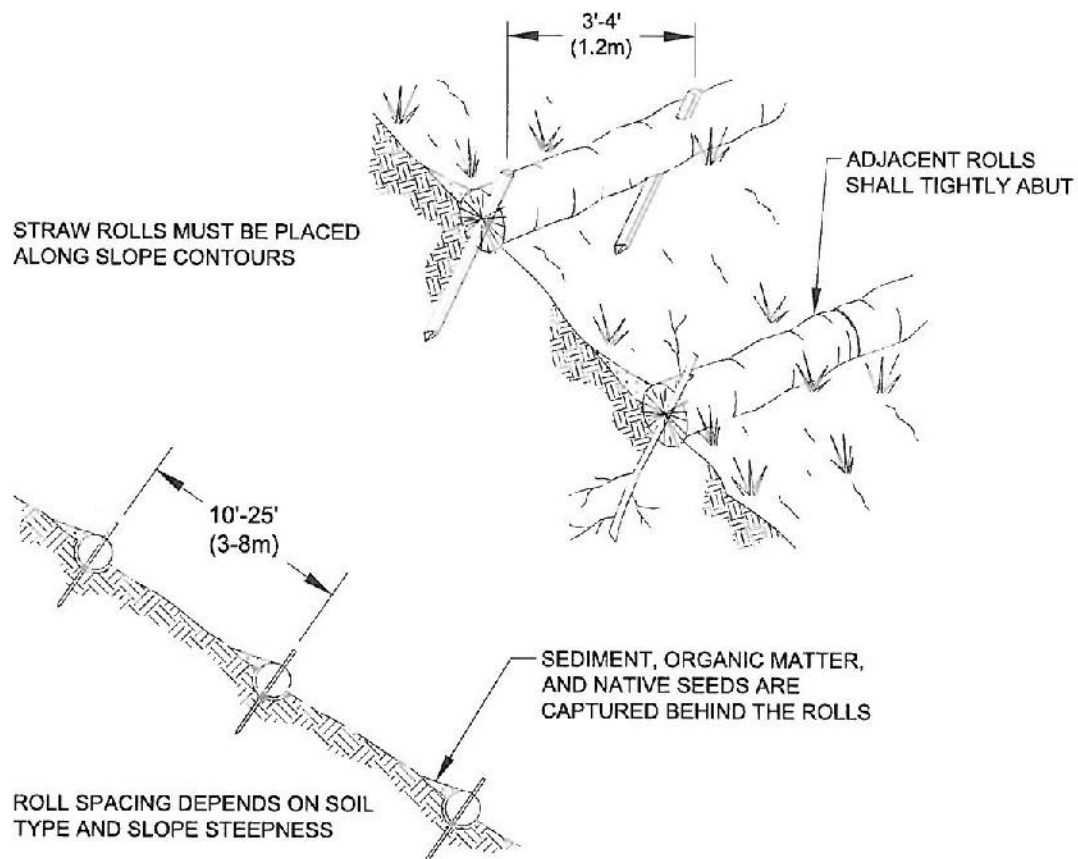
Design and Installation Specifications

1. It is critical that wattles are installed perpendicular to the flow direction and parallel to the slope contour.
2. Narrow trenches should be dug across the slope, on contour, to a depth of 3 to 5 inches on clay soils and soils with gradual slopes. On loose soils, steep slopes, and during high rainfall events, the trenches should be dug to a depth of 5 to 7 inches, or $\frac{1}{2}$ to $\frac{2}{3}$ of the thickness of the wattle.
3. Start construction of trenches and installing wattles from the base of the slope and work uphill. Excavated material should be spread evenly along the uphill slope and compacted using hand tamping or other method. Construct trenches at contour intervals of 3 to 30 feet apart depending on the steepness of the slope, soil type, and rainfall. The steeper the slope the closer together the trenches should be constructed.
4. Install the wattles snugly into the trenches and abut tightly end to end. Do not overlap the ends.
5. Install stakes at each end of the wattle, and at 4 foot centers along the entire length of the wattle.
6. If required, install pilot holes for the stakes using a straight bar to drive holes through the wattle and into the soil.
7. At a minimum, wooden stakes should be approximately $\frac{1}{4}$ x $\frac{3}{4}$ x 24 inches. Willow cuttings or $\frac{3}{8}$ inch rebar can also be used for stakes.

8. Stakes should be driven through the middle of the wattle, leaving 2 to 3 inches of the stake protruding above the wattle.

Maintenance Standards

1. Inspect wattles prior to forecasted rain, daily during extended rain events, after rain events, weekly during the wet season, and at two week intervals at all other times of the year.
2. Repair or replace split, torn, raveling, or slumping wattles
3. Remove sediment accumulations when exceeding $\frac{1}{2}$ the height between the top of the wattle and the ground surface.

**NOTES:**

1. STRAW ROLL INSTALLATION REQUIRES THE PLACEMENT AND SECURE STAKING OF THE ROLL IN A TRENCH, 3" x 5" (75-125mm) DEEP, DUG ON CONTOUR.
2. RUNOFF MUST NOT BE ALLOWED TO RUN UNDER OR AROUND ROLL.

D.2.1.2.6 TEMPORARY AND PERMANENT SEEDING

Code: SE

Symbol:

**Purpose**

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

Conditions of Use

1. Seeding shall be used throughout the project on **disturbed areas** that have reached final grade or that will remain unworked for more than 30 days.
2. **Vegetation-lined channels** shall be seeded. Channels that will be vegetated should be installed before major earthwork and hydroseeded or covered with a Bonded Fiber Matrix (BFM).
3. **Retention/detention ponds** shall be seeded as required.
4. At the County's discretion, seeding without mulch during the **dry season** is allowed even though it will take more than seven days to develop an effective cover. Mulch is, however, recommended at all times because it protects seeds from heat, moisture loss, and transport due to runoff.
5. At the beginning of the **wet season**, all disturbed areas shall be reviewed to identify which ones can be seeded in preparation for the winter rains (see Section D.2.4.2). Disturbed areas shall be seeded within one week of the beginning of the wet season. A sketch map of those areas to be seeded and those areas to remain uncovered shall be submitted to the DPER inspector. The DPER inspector may require seeding of additional areas in order to protect surface waters, adjacent properties, or drainage facilities.
6. At final site stabilization, all disturbed areas not otherwise vegetated or stabilized shall be seeded and mulched (see Section D.2.4.5).

Design and Installation Specifications

1. The best **time to seed** is April 1 through June 30, and September 1 through October 15. Areas may be seeded between July 1 and August 31, but irrigation may be required in order to grow adequate cover. Areas may also be seeded during the winter months, but it may take several months to develop a dense groundcover due to cold temperatures. The application and maintenance of mulch is critical for winter seeding.
2. To prevent seed from being washed away, confirm that **all required surface water control measures** have been installed.
3. The **seedbed** should be firm but not compacted because soils that are well compacted will not vegetate as quickly or thoroughly. Slopes steeper than 3H:1V shall be surface roughened. Roughening can be accomplished in a variety of ways, but the typical method is track walking, or driving a crawling tractor up and down the slope, leaving cleat imprints parallel to the slope contours.
4. In general, 10-20-20 N-P-K (nitrogen-phosphorus-potassium) **fertilizer** may be used at a rate of 90 pounds per acre. Slow-release fertilizers are preferred because they are more efficient and have fewer environmental impacts. It is recommended that areas being seeded for final landscaping conduct soil tests to determine the exact type and quantity of fertilizer needed. This will prevent the over-application of fertilizer. Disturbed areas within 200 feet of water bodies and wetlands must use slow-release low-phosphorus fertilizer (typical proportions 3-1-2 N-P-K).
5. The following requirements apply to **mulching**:
 - a) Mulch is always required for seeding slopes greater than 3H:1V (see Section D.2.1.2.2).

- b) If seeding during the wet season, mulch is required.
 - c) The use of mulch may be required during the dry season at the County's discretion if grass growth is expected to be slow, the soils are highly erodible due to soil type or gradient, there is a water body close to the disturbed area, or significant precipitation (see Section D.2.4.2) is anticipated before the grass will provide effective cover.
 - d) Mulch may be applied on top of the seed or simultaneously by hydroseeding.
6. **Hydroseeding** is allowed as long as tackifier is included. Hydroseeding with wood fiber mulch is adequate during the dry season. During the wet season, the application rate shall be doubled because the mulch and tackifier used in hydroseeding break down fairly rapidly. It may be necessary in some applications to include straw with the wood fiber, but this can be detrimental to germination.
 7. Areas to be permanently landscaped shall use **soil amendments**. Good quality topsoil shall be tilled into the top six inches to reduce the need for fertilizer and improve the overall soil quality. Most native soils will require the addition of four inches of well-rotted compost to be tilled into the soil to provide a good quality topsoil. Compost used should meet specifications provided in Reference 11-C of the *SWDM*.
 8. The **seed mixes** listed below include recommended mixes for both temporary and permanent seeding. These mixes, with the exception of the wetland mix, shall be applied at a rate of 120 pounds per acre. This rate may be reduced if soil amendments or slow-release fertilizers are used. Local suppliers should be consulted for their recommendations because the appropriate mix depends on a variety of factors, including exposure, soil type, slope, and expected foot traffic. Alternative seed mixes approved by the County may be used.

Table D.2.1.2.B presents the standard mix for those areas where just a temporary vegetative cover is required.

	% Weight	% Purity	% Germination
Chewings or red fescue <i>Festuca rubra</i> var. <i>commutata</i> or <i>Festuca rubra</i>	40	98	90
Annual or perennial rye <i>Lolium multiflorum</i> or <i>Lolium perenne</i>	40	98	90
Redtop or colonial bentgrass <i>Agrostis alba</i> or <i>Agrostis tenuis</i>	10	92	85
White dutch clover <i>Trifolium repens</i>	10	98	90

Table D.2.1.2.C provides just one recommended possibility for landscaping seed.

	% 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

This turf seed mix in Table D.2.1.2.D is for dry situations where there is no need for much water. The advantage is that this mix requires very little maintenance.

	% 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 D.2.1.2.E presents a mix recommended for bioswales and other intermittently wet areas. Sod shall generally not be used for bioswales because the seed mix is inappropriate for this application. Sod may be used for lining ditches to prevent erosion, but it will provide little water quality benefit during the wet season.

	% 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			

The seed mix shown in Table D.2.1.2.F is a recommended low-growing, relatively non-invasive seed mix appropriate for very wet areas that are not regulated wetlands (if planting in wetland areas, see Section 6.3.1 of the King County *Surface Water Design Manual*). Other mixes may be appropriate, depending on the soil type and hydrology of the area. Apply this mixture at a rate of 60 pounds per acre.

	% 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>Alephocurus 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			

The meadow seed mix in Table D.2.1.2.G is recommended for areas that will be maintained infrequently or not at all and 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. The appropriateness of clover in the mix may need to be considered as this can be a fairly invasive species. If the soil is amended, the addition of clover may not be necessary.

	% Weight	% Purity	% Germination
Redtop or Oregon bentgrass <i>Agrostis alba</i> or <i>Agrostis oregonensis</i>	40	92	85
Red fescue <i>Festuca rubra</i>	40	98	90
White dutch clover <i>Trifolium repens</i>	20	98	90

Maintenance Standards for Temporary and Permanent Seeding

1. Any seeded areas that fail to establish at least 80 percent cover within one month shall be reseeded. If reseeding is ineffective, an alternate method, such as sodding or nets/blankets, shall be used. If winter weather prevents adequate grass growth, this time limit may be relaxed at the discretion of the County when critical areas would otherwise be protected.

D.2.1.3 PERIMETER PROTECTION

Perimeter protection to filter sediment from sheetwash shall be located downslope of all disturbed areas and shall be installed prior to upslope grading. Perimeter protection includes the use of vegetated strips as well as, constructed measures, such as silt fences, fiber rolls, sand/gravel barriers, brush or rock filters, triangular silt dikes and other methods. During the wet season, 50 linear feet of silt fence (and the necessary stakes) per acre of disturbed area must be stockpiled on site.

Purpose: The purpose of perimeter protection is to reduce the amount of sediment transported beyond the disturbed areas of the construction site. Perimeter protection is primarily a backup means of sediment control. Most, if not all, sediment-laden water is to be treated in a sediment trap or pond. The only circumstances in which perimeter control is to be used as a primary means of sediment removal is when the catchment is very small (see below).

When to Install: Perimeter protection is to be installed prior to any upslope clearing and grading.

Measures to Use: The above measures may be used interchangeably and are not the only perimeter protection measures available. If surface water is collected by an interceptor dike or swale and routed to a sediment pond or trap, there may be no need for the perimeter protection measures specified in this section.

Criteria for Use as Primary Treatment: At the boundary of a site, perimeter protection may be used as the sole form of treatment when the flowpath meets the criteria listed below. If these criteria are not met, perimeter protection shall only be used as a backup to a sediment trap or pond.

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

D.2.1.3.1 SILT FENCE

Code: SF

Symbol: X — X — X — X — X

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.

Conditions of Use

1. Silt fence may be used downslope of all disturbed areas.
2. Silt fence is not intended to treat concentrated flows, nor is it intended to treat substantial amounts of overland flow. Any concentrated flows must be conveyed through the drainage system to a sediment trap or pond. The only circumstance in which overland flow may be treated solely by a silt fence, rather than by a sediment trap or pond, is when the area draining to the fence is small (see "Criteria for Use as Primary Treatment" in Section D.2.1.3 above).

Design and Installation Specifications

1. See Figure D.2.1.3.A and Figure D.2.1.3.B for details.

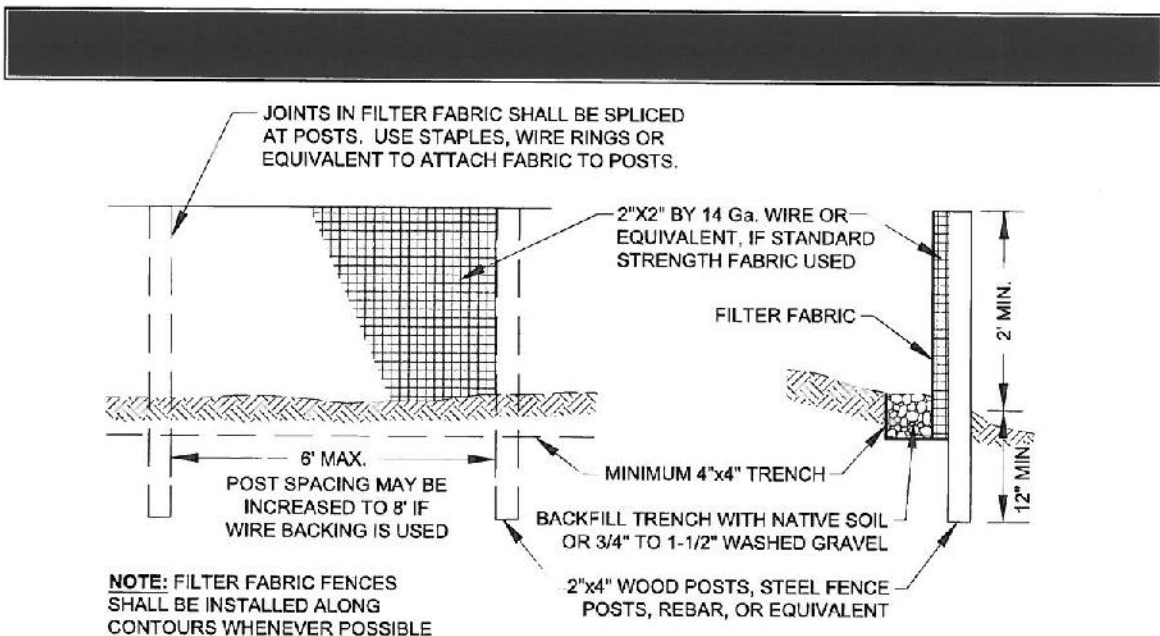
2. The geotextile used must meet the standards listed below. A copy of the manufacturer's fabric specifications must be available on site.

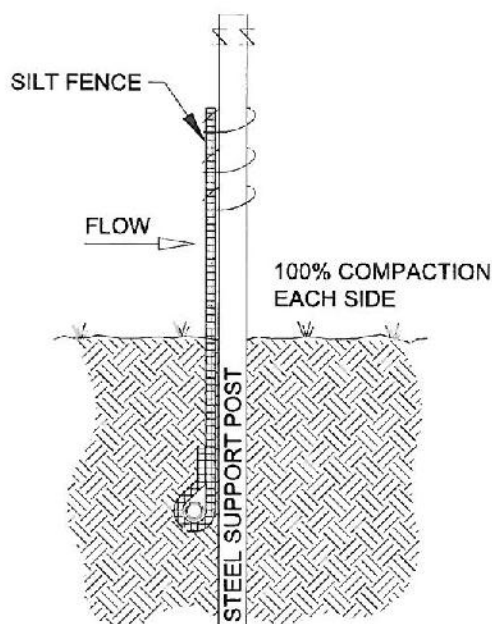
	30-100 sieve size (0.60-0.15 mm) for slit film
	50-100 sieve size (0.30-0.15 mm) for other fabrics
	0.02 sec ⁻¹ minimum
	180 lbs. min. for extra strength fabric
	100 lbs. min. for standard strength fabric
	30% max. (woven)
	70% min.

3. Standard strength fabric requires wire backing to increase the strength of the fence. Wire backing or closer post spacing may be required for extra strength fabric if field performance warrants a stronger fence.
4. Where the fence is installed, the slope shall be no steeper than 2H:1V.
5. If a typical silt fence (per Figure D.2.1.3.A) is used, the standard 4 x 4 trench may not be reduced as long as the bottom 8 inches of the silt fence is well buried and secured in a trench that stabilizes the fence and does not allow water to bypass or undermine the silt fence.

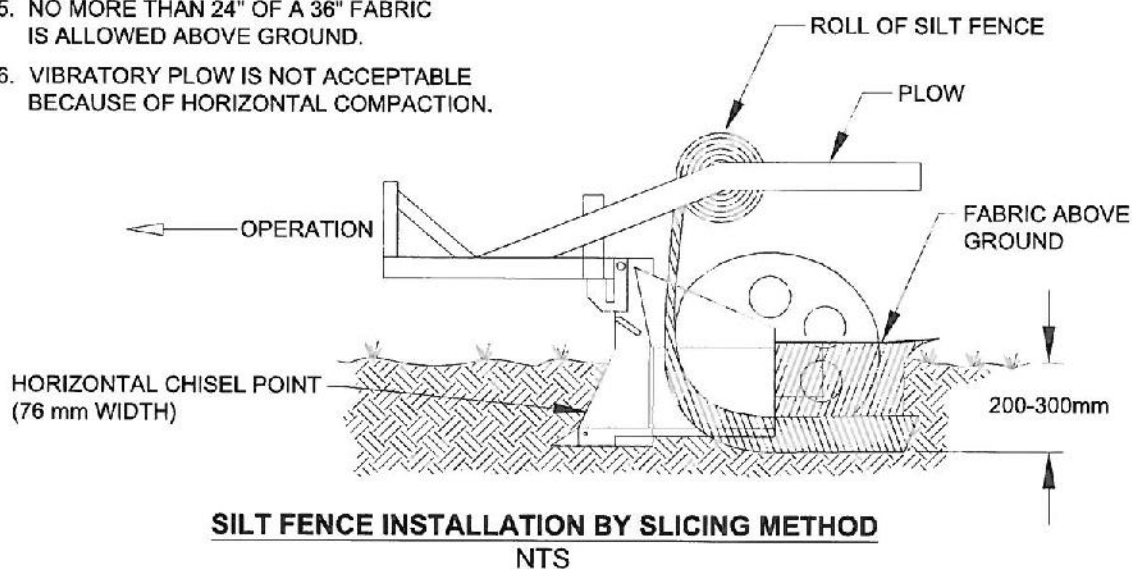
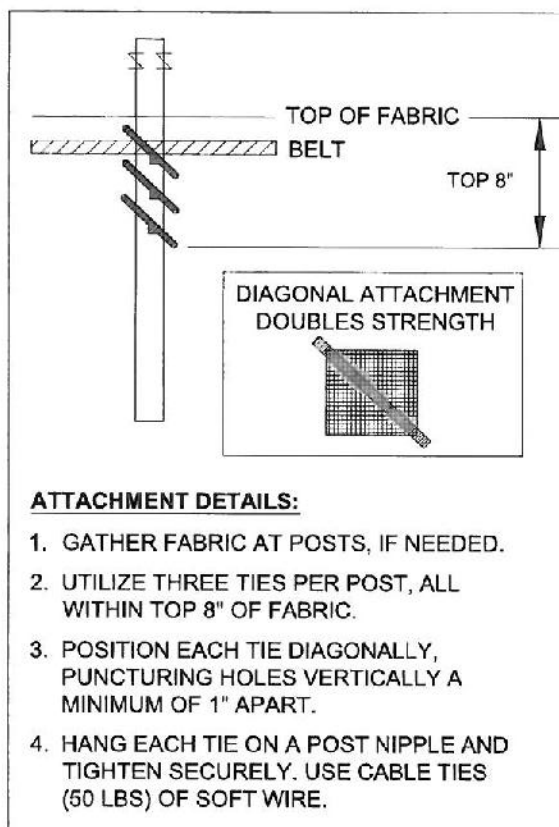
Maintenance Standards

- Any damage shall be repaired immediately.
- If concentrated flows are evident uphill of the fence, they must be intercepted and conveyed to a sediment trap or pond.
- It is important to 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.
- Sediment must be removed when the sediment is 6 inches high.
- If the filter fabric (geotextile) has deteriorated due to ultraviolet breakdown, it shall be replaced.



**NOTES:**

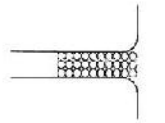
1. POST SPACING: 7' MAX. ON OPEN RUNS
4' MAX. ON POOLING AREAS.
2. POST DEPTH: AS MUCH BELOW GROUND
AS FABRIC ABOVE GROUND.
3. PONDING HEIGHT MAX. 24" ATTACH
FABRIC TO UPSTREAM SIDE OF POST.
4. DRIVE OVER EACH SIDE OF SILT FENCE
2 TO 4 TIMES WITH DEVICE EXERTING
60 P.S.I. OR GREATER.
5. NO MORE THAN 24" OF A 36" FABRIC
IS ALLOWED ABOVE GROUND.
6. VIBRATORY PLOW IS NOT ACCEPTABLE
BECAUSE OF HORIZONTAL COMPACTION.



D.2.1.4.1 STABILIZED CONSTRUCTION ENTRANCE

Code: CE

Symbol:

**Purpose**

Construction entrances are stabilized to reduce the amount of sediment transported onto paved roads by motor vehicles or runoff by constructing a stabilized pad of quarry spalls at entrances to construction sites.

Conditions of Use

Construction entrances shall be stabilized wherever traffic will be leaving a construction site and traveling on paved roads or other paved areas within 1,000 feet of the site. Access and exits shall be limited to one route if possible, or two for linear projects such as roadway where more than one access/exit is necessary for maneuvering large equipment.

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

Design and Installation Specifications

1. See Figure D.2.1.4.A for details.
2. 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:

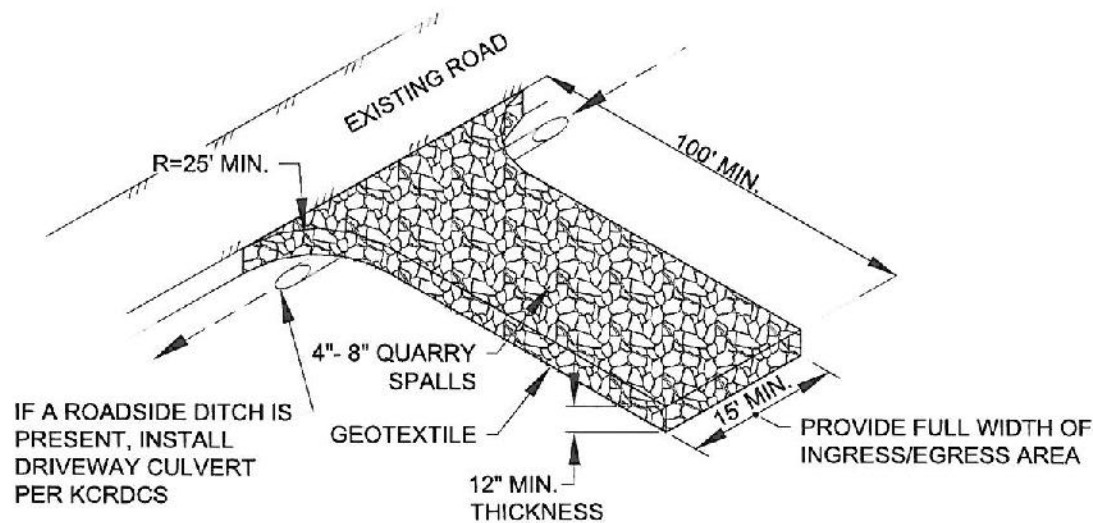
	200 lbs min.
	30% max.(woven)
	495 lbs min.
	20-45 (U.S. standard sieve size)

3. 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.
4. Hog fuel (wood based mulch) may be substituted for or combined with quarry spalls in areas that will not be used for permanent roads. The effectiveness of hog fuel is highly variable, but it has been used successfully on many sites. It generally requires more maintenance than quarry spalls. Hog fuel is not recommended for entrance stabilization in urban areas. The inspector may at any time require the use of quarry spalls if the hog fuel is not preventing sediment from being tracked onto pavement or if the hog fuel is being carried onto pavement. Hog fuel is prohibited in permanent roadbeds because organics in the subgrade soils cause difficulties with compaction.
5. Fencing (see Section D.2.1.1) shall be installed as necessary to restrict traffic to the construction entrance.
6. 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.

Maintenance Standards

1. Quarry spalls (or hog fuel) shall be added if the pad is no longer in accordance with the specifications.

2. 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 street sweeping, an increase in the dimensions of the entrance, or the installation of a wheel wash. If washing is used, it shall be done on an area covered with crushed rock, and wash water shall drain to a sediment trap or pond.
3. Any sediment that is tracked onto pavement shall be removed immediately by 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 sweeping is ineffective and there is a threat to public safety. If it is necessary to wash the streets, a small sump must be constructed. The sediment would then be washed into the sump where it can be controlled. Wash water must be pumped back onto the site and cannot discharge to systems tributary to surface waters.
4. Any quarry spalls that are loosened from the pad and end up on the roadway shall be removed immediately.
5. If vehicles are entering or exiting the site at points other than the construction entrance(s), fencing (see Section D.2.1.1) shall be installed to control traffic.

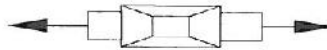
**NOTES:**

- PER KING COUNTY ROAD DESIGN AND CONSTRUCTION STANDARDS (KCRDCS), DRIVEWAYS SHALL BE PAVED TO EDGE OF R-O-W PRIOR TO INSTALLATION OF THE CONSTRUCTION ENTRANCE TO AVOID DAMAGING OF THE ROADWAY.
- IT IS RECOMMENDED THAT THE ENTRANCE BE CROWNED SO THAT RUNOFF DRAINS OFF THE PAD.

D.2.1.4.3 WHEEL WASH

Code: WW

Symbol:



Purpose

Wheel wash systems reduce the amount of sediment transported onto paved roadways and into surface water systems by construction vehicles.

Conditions of Use

When a stabilized construction entrance is not preventing sediment from being tracked onto pavement:

- Wheel washing is generally an effective erosion and sediment control method and BMP when installed with careful attention to topography. For example, a wheel wash can be detrimental if installed at the top of a slope abutting a right-of-way where the water from the dripping truck wheels and undercarriage can run unimpeded into the street.
- Pressure washing combined with an adequately sized and properly surfaced wash pad with direct drainage discharge to a large 10 foot x 10-foot sump can be very effective.

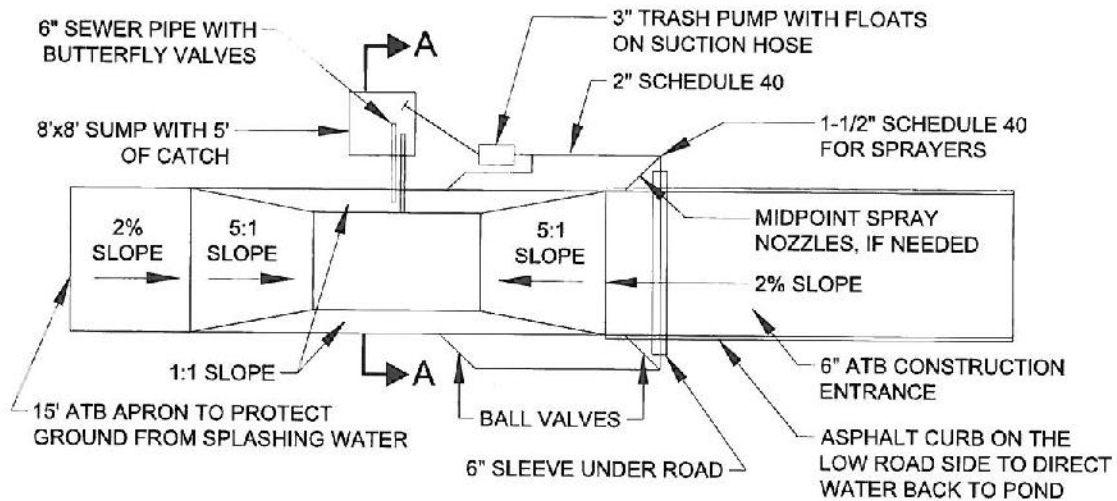
Design and Installation Specifications

A suggested detail is shown in Figure D.2.1.4.B.

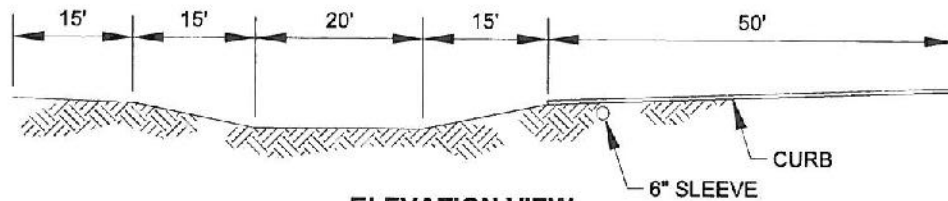
1. A minimum of 6 inches of asphalt treated base (ATB) over crushed base material or 8 inches over a good subgrade is recommended to pave the wheel wash area.
2. Use a low clearance truck to test the wheel wash before paving. Either a belly dump or lowboy will work well to test clearance.
3. Keep the water level from 12 to 14 inches deep to avoid damage to truck hubs and filling the truck tongues with water.
4. Midpoint spray nozzles are only needed in very muddy conditions.
5. Wheel wash systems should be designed with a small grade change, 6 to 12 inches for a 10-foot wide pond, to allow sediment to flow to the low side of the pond and to help prevent re-suspension of sediment.
6. A drainpipe with a 2 to 3 foot riser should be installed on the low side of the wheel wash pond to allow for easy cleaning and refilling. Polymers may be used to promote coagulation and flocculation in a closed-loop system.
7. Polyacrylamide (PAM) added to the wheel washwater at a rate of 0.25 – 0.5 pounds per 1,000 gallons of water increases effectiveness and reduces cleanup time. If PAM is already being used for dust or erosion control and is being applied by a water truck, the same truck may be used to change the washwater.

Maintenance Standards

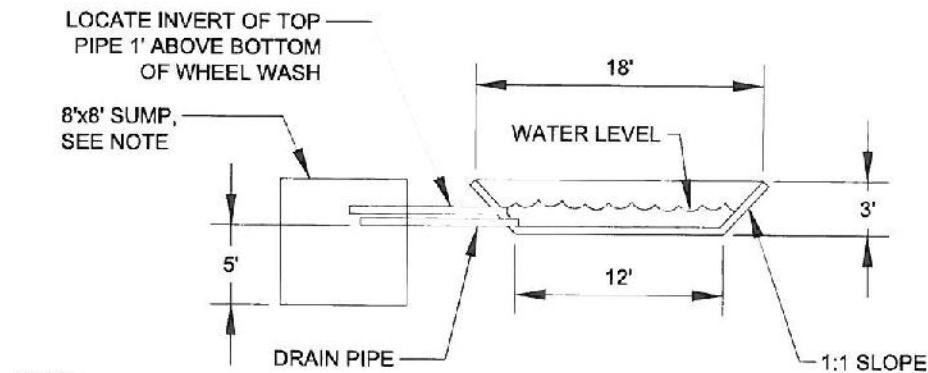
1. The wheel wash should start out each day with clean, fresh water.
2. The washwater should be changed a minimum of once per day. On large earthwork jobs where more than 10-20 trucks per hour are expected, the washwater will need to be changed more often.
3. Wheel wash or tire bath wastewater shall be discharged to a separate on-site treatment system, such as a closed-loop recirculation system or land application, or to the sanitary sewer system with proper local sewer district approval or permits.



PLAN VIEW
NTS



ELEVATION VIEW
NTS



NOTE:
BUILD 8'x8' SUMP TO ACCOMMODATE CLEANING BY TRACKHOE.

SECTION A-A
NTS

D.2.1.8 DUST CONTROL

Preventative measures to minimize the wind transport of soil shall be taken when a traffic hazard may be created or when sediment transported by wind is likely to be deposited in water resources or adjacent properties.

Purpose: To prevent wind transport of dust from exposed soil surfaces onto roadways, drainage ways, and surface waters.

When to Install: Dust control shall be implemented when exposed soils are dry to the point that wind transport is possible and roadways, drainage ways, or surface waters are likely to be impacted. Dust control measures may consist of chemical, structural, or mechanical methods.

Measures to Install: Water is the most common dust control (or palliative) used in the area. When using water for dust control, the exposed soils shall be sprayed until wet, but runoff shall not be generated by spraying. Calcium chloride, Magnesium chloride, Lignin derivatives, Tree Resin Emulsions, and Synthetic Polymer Emulsions may also be used for dust control. Exposed areas shall be re-sprayed as needed. Oil shall not be used for dust control. The following table lists many common dust control measures. Some of the measures are not recommended for use in King County and must have prior approval prior to use from the DPER inspector assigned to specific projects.