

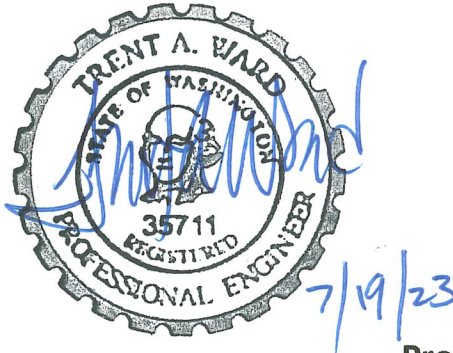
STORM WATER MANAGEMENT MEMORANDUM

KELSO SOUTHWEST REGIONAL AIRPORT NEW FUEL SITE

PREPARED FOR:

SOUTHWEST WASHINGTON REGIONAL AIRPORT

KELSO, WA



Prepared by:

Property Owner:



E N G I N E E R I N G

208 W. 9th Avenue
Suite #3
Ellensburg, WA 98926
(509) 795-5870

Southwest Washington Regional Airport
City of Kelso
2222 South Pacific Ave
Kelso, WA 98626
Representative: Chris Paolini, Airport Manager

JUNE 2023

CWEC PROJECT NO. 35005.010.03

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1 PROJECT OVERVIEW

The Southwest Washington Regional Airport (Airport), owned by the City of Kelso, proposes to demo the existing fuel building, decommission the three existing underground fuel tanks in place and construct a new fuel station with two new 12,000 gallon above-ground fuel tanks located southeasterly of the FBO building adjacent to Parrott Way (see Appendix A for Site plan).

This memorandum is being provided to address this project’s stormwater requirements.

This memorandum has been prepared in accordance with the provisions outlined in the 2019 Washington Department of Ecology Stormwater Management Manual for Western Washington (SWMMWW) and the City of Kelso Engineering Design Standards.

Permits anticipated for this project are listed in Table 1-1 below. Permit applications will be prepared and submitted during the design phase.

Table 1-1: Expected permits required for the project.

Permit	Reviewing Agency
State Environmental Policy Act Checklist (SEPA)	City of Kelso
Site Plan Review Application	City of Kelso
Building Permit (Demo Permit) for demo of existing fuel building;	City of Kelso
Building Permit for new Fuel Station foundation	
Fire Permit for existing underground fuel tank decommissioning;	Cowlitz 2 Fire & Rescue
Fire Permit for new above-ground Fuel Station tanks	



2 STORM WATER REDEVELOPMENT REQUIREMENTS

The total storm water tributary sub-basin area that is being redeveloped is approximately 8,394 SF in size. The existing Pervious area is 2,966 SF and the existing Impervious area is 5,428 SF.

The proposed Pervious area is 1,108 SF and the proposed Impervious area is 7,286 SF.

The new Impervious area being created with this project is 1,859 SF.

- A. Pursuant to the City of Kelso Engineering Design Standards and SWMMWW Figure I-3.2: Flow Chart for Determining Requirements for Redevelopment, this project results in less than 2,000 SF of new plus replaced hard surface area, and does not disturb 7,000 SF or greater of land area, therefore, this project is required to comply with Minimum Requirement #2 of the SWMMWW (see Appendix B for Redevelopment Projects Flow-chart and Appendix C for Developed Storm Water Sub-basin Plan

Minimum Requirement #2: Construction Stormwater Pollution Prevention (SWPPP)

This project is exempt from preparing a SWPPP Plan to address pollution and erosion prevention and control. However, all construction SWPPP elements and development controls for all Construction SWPPP elements pertaining to the proposed activities at this project site will be incorporated during construction.

Temporary erosion and sediment control (TESC) plans are completed as part of the construction plans.

This project is exempt from requiring a Department of Ecology Construction Stormwater permit.

3. STORM WATER QUALITY FACILITY ANALYSIS & DESIGN

The new fuel system will be comprised of two 12,000-gallon tanks, installed above ground on a concrete foundation. The tanks will be double wall, fire protected, steel construction, conforming to UL-2085 standards for horizontal atmospheric aviation fuel storage tanks.

Spill kits & accompanying signing and instructions are to be provided at the fueling station site at all times.

The fuel tanks, delivery equipment and fueling area are all sloped/graded to drain to a central catch basin and is conveyed through a Coalescing Plate Oil/Water Separator (CPS) vault facility prior to discharging to the City's storm system.

The total tributary drainage area is 8,394 SF. The storm water quality treatment flow rate is calculated to be 0.0336 CFS (15 GPM) and the 100-yr stormwater flow is calculated to be 0.2807 CFS (126 GPM), using the WWHM program (see Appendix D for Storm Water Quality Facility Sizing Calculations).

NOTE: Though it is typical practice to install the CPS facility offline from the storm system and bypass flow rates exceeding the water quality treatment flow rate, due to the fact the tributary area to be



treated for this project is relatively small, and the available CPS vault has capacity to treat a much higher flow rate = 105 GPM, with a Maximum Process Flow Rate = 565 GPM (significantly higher than the calculated 100-yr stormwater flow rate), it is proposed that the CPS facility be on-line for treatment of all stormwater runoff events for this application.

4. STORM WATER FACILITY OPERATION AND MAINTENANCE REQUIREMENTS

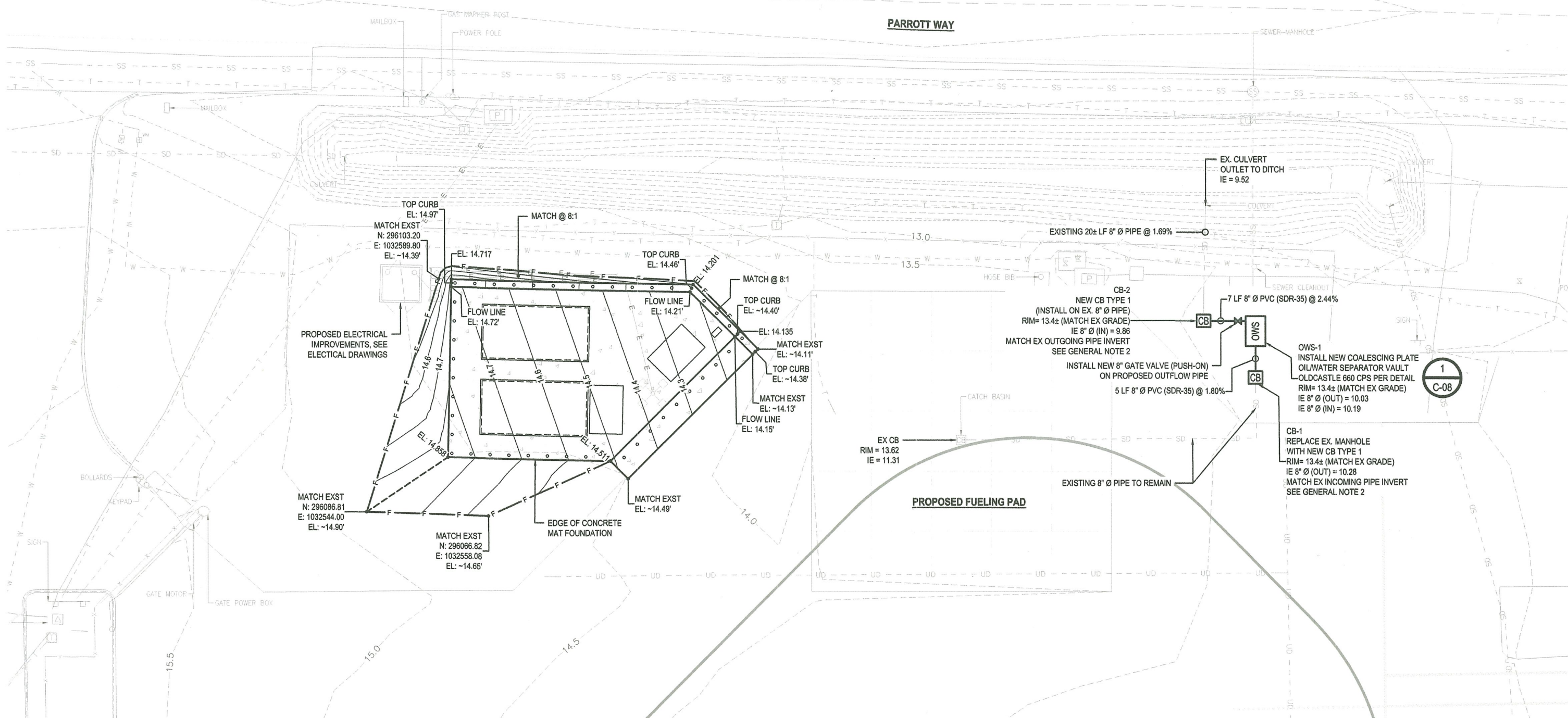
Operation and Maintenance (O&M) of this Fuel Site will be the responsibility of the Airport.

The O&M obligations specific to the Fuel Station and CPS facility are included in Appendix E and summarized as follows:

- Prepare a Spill Prevention and Emergency Cleanup Plan (SPECP) as described in Ecology S426 BMPs for Spills of Oil and Hazardous Substances
- Provide and maintain onsite, visible and accessible and stocked at all times, a spill kit containing suitable cleanup materials to allow prompt cleanup of a spill
- Post all required International Fire Code (IFC) signs and local jurisdiction signs for fueling stations
- Monitor, assess and cause maintenance to the CPS vault facility as described in Table V-A.17: Maintenance Standards - Coalescing Plate Oil/Water Separators



APPENDIX A. SITE PLAN

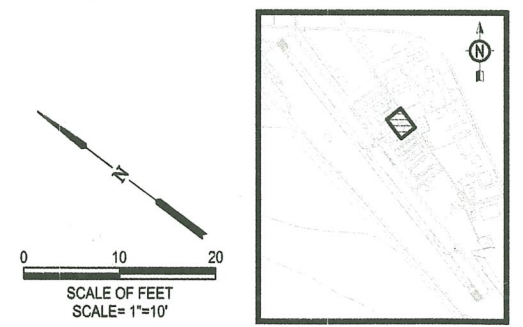


- LEGEND**
- PROPOSED CONTOUR LINE
 - - - EXISTING CONTOUR LINE
 - F - PROPOSED FILL LIMITS
 - - - GRADE BREAK LINE
 - CB PROPOSED TYPE 1 CATCH BASIN, SEE GENERAL NOTES 4, 5 AND DRAINAGE CONSTRUCTION NOTES
 - OWS PROPOSED OIL WATER SEPARATOR, SEE DRAINAGE CONSTRUCTION NOTES
 - ⊞ PROPOSED GATE VALVE

- GENERAL NOTES**
1. REFER TO SHEET C-05 FOR ADDITIONAL HORIZONTAL CONTROL.
 2. EXISTING PIPE SLOPES AND INVERTS ARE BASED ON THE BEST INFORMATION AVAILABLE. CONTRACTOR SHALL FIELD VERIFY INVERT ELEVATIONS AT ALL TIE IN POINTS PRIOR TO INSTALLATION OF PROPOSED IMPROVEMENTS. CONTRACTOR SHALL IMMEDIATELY NOTIFY THE ENGINEER OF ANY DISCREPANCIES BETWEEN WHAT IS SHOWN IN THE PLANS AND ACTUAL SITE CONDITIONS.
 3. EXISTING PIPE TYPE, SIZE AND CONDITION ARE BASED ON THE BEST INFORMATION AVAILABLE. CONTRACTOR SHALL FIELD VERIFY TYPE, SIZE AND CONDITION PRIOR TO INSTALLATION OF PROPOSED IMPROVEMENTS AND SHALL IMMEDIATELY NOTIFY THE ENGINEER OF ANY DISCREPANCIES BETWEEN WHAT IS SHOWN ON THE PLANS AND ACTUAL SITE CONDITIONS.

- GENERAL NOTES CONT.**
4. TYPE 1 CATCH BASINS SHALL MEET THE REQUIREMENTS OF WSDOT STANDARD PLAN B-5.20-03. TYPE 1 CATCH BASINS SHALL BE INSTALLED WITH A BOLTED DOWN RECTANGULAR SOLID METAL COVER PER WSDOT STANDARD PLAN B-30.20-04.
 5. PIPE EXTENSIONS, AS NECESSARY, TO CONNECT NEW TYPE 1 CATCH BASINS TO EXISTING PIPES SHALL BE SDR-35 PVC AND SHALL BE INCIDENTAL TO THE TYPE 1 CATCH BASIN.

- DRAINAGE CONSTRUCTION NOTES**
1. TRACER WIRE SHALL BE INSTALLED ALONG THE TOP OF ALL PIPE. EXTEND THE TRACER WIRE INTO THE CATCH BASINS AND ALL OTHER STRUCTURES, THEN UP THE INSIDE WALL OF STRUCTURES. PROVIDE 3 FEET OF COILED TRACER WIRE SLACK ATTACHED TO TOP INSIDE OF THE STRUCTURE.
 2. STORM SEWERS AND APPURTENANCES SHALL BE CLEANED, AIR TESTED, INFILTRATION TESTED AND DEFLECTION TESTED AFTER BACKFILLING AND PRIOR TO TOPSOILING AND SEEDING. TESTING SHALL BE COMPLETED PER THE REQUIREMENTS OF THE SPECIFICATIONS. TV INSPECTION SHALL BE PERFORMED AFTER CLEANING, TESTING AND CORRECTIONS ARE COMPLETE. AN ELECTRONIC COPY OF THE TV INSPECTION VIDEO AND THE TV INSPECTION REPORT SHALL BE PROVIDED TO THE ENGINEER. TOPSOIL AND SEEDING SHALL NOT BE PLACED UNTIL THE ENGINEER HAS APPROVED THE TV INSPECTION.
 3. ALL DRAINAGE STRUCTURES SHALL BE WATERTIGHT. FOLLOWING BACKFILL AND PRIOR TO FINAL TOPSOILING, PERFORM VACUUM TESTING ON STRUCTURES PER THE REQUIREMENTS OF THE SPECIFICATIONS.
 4. AS-BUILT DRAWINGS AND TV REPORTS SHALL BE PROVIDED PRIOR TO FINAL ACCEPTANCE.
 5. ALL REQUIREMENTS HEREIN SHALL BE CONSIDERED INCIDENTAL TO THE APPLICABLE BID ITEMS. NO SEPARATE MEASUREMENT OR PAYMENT WILL BE MADE.



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NO.	DATE	BY	APPR	REVISIONS

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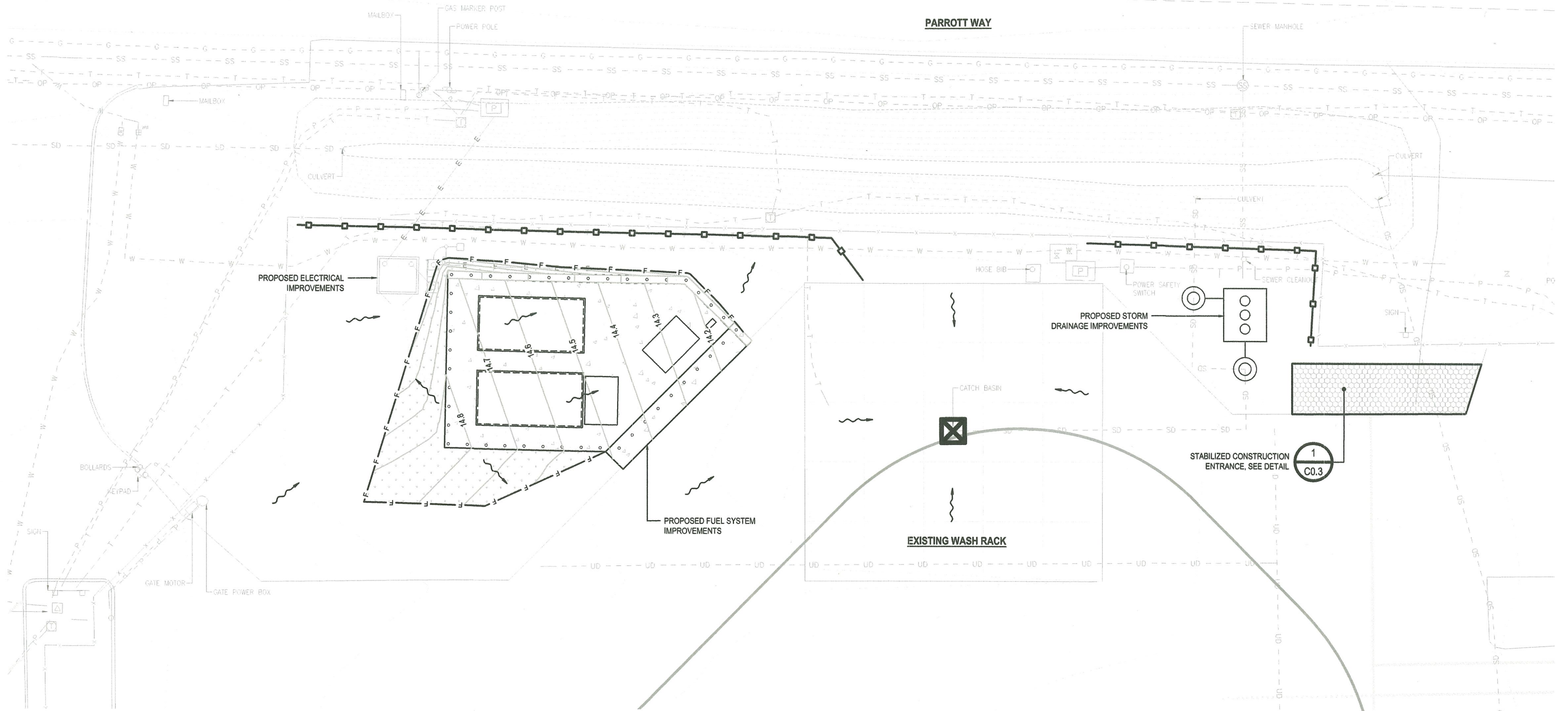
DATE: MAY 2023 PROJECT NO: 35005.010.02

60% DESIGN

SOUTHWEST WASHINGTON REGIONAL AIRPORT
TASK ORDER #5 - FINAL DESIGN FUEL SITE

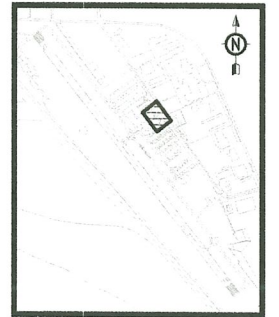
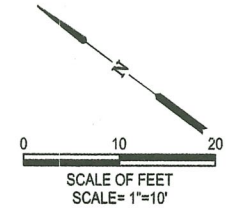
GRADING & DRAINAGE PLAN

DRAWING NO. **C-07**
SHEET NO. **11 OF 19**



- LEGEND**
- - - - - EXISTING CONTOUR LINE
 - — — — — PROPOSED CONTOUR LINE
 - TEMPORARY INLET PROTECTION, SEE WSDOT STANDARD PLAN I-40.20-00
 - SEEDING LIMITS, SEE GENERAL NOTE 2.
 - STABILIZED CONSTRUCTION ENTRANCE
 - FLOW DIRECTION
 - F - FILL LIMITS
 - □ - □ SILT FENCE

- GENERAL NOTES**
1. TEMPORARY INLET PROTECTION, STRAW WATTLES AND SILT FENCE SHALL BE REMOVED UPON COMPLETION OF CONSTRUCTION
 2. SEEDING SHALL BE PROVIDED FOR ALL AREAS BETWEEN THE GRADING LIMITS AND PROPOSED PAVEMENT REPLACEMENT AND ALL OTHER DISTURBED AREAS AS DIRECTED BY THE ENGINEER.



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KEYPLAN

C:\projects\SouthwestRegionalAirport\Bids\Bidding\2023\TaskOrder05\Final Design\Fuel Submittal\WSDOT\EROSION CONTROL PLAN.dwg



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DATE: MAY 2023 PROJECT NO: 35005.010.02

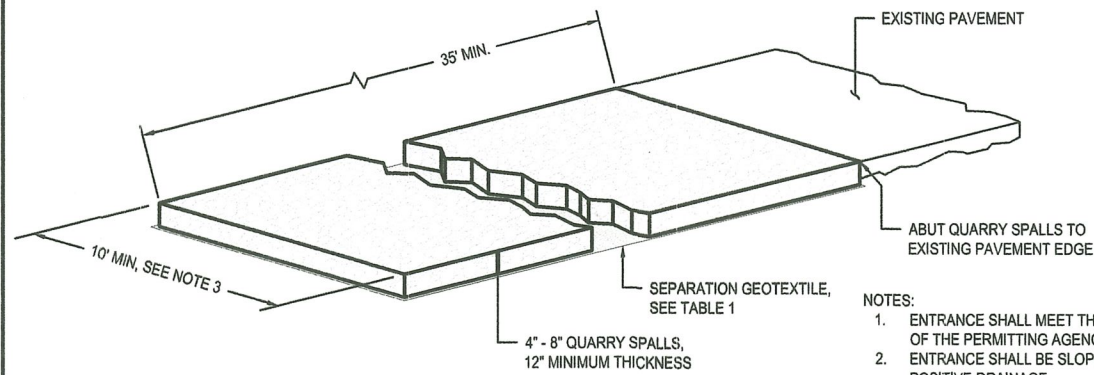
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**SOUTHWEST WASHINGTON REGIONAL AIRPORT
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EROSION CONTROL PLAN

DRAWING NO. **C-01**
SHEET NO. **5 OF 19**

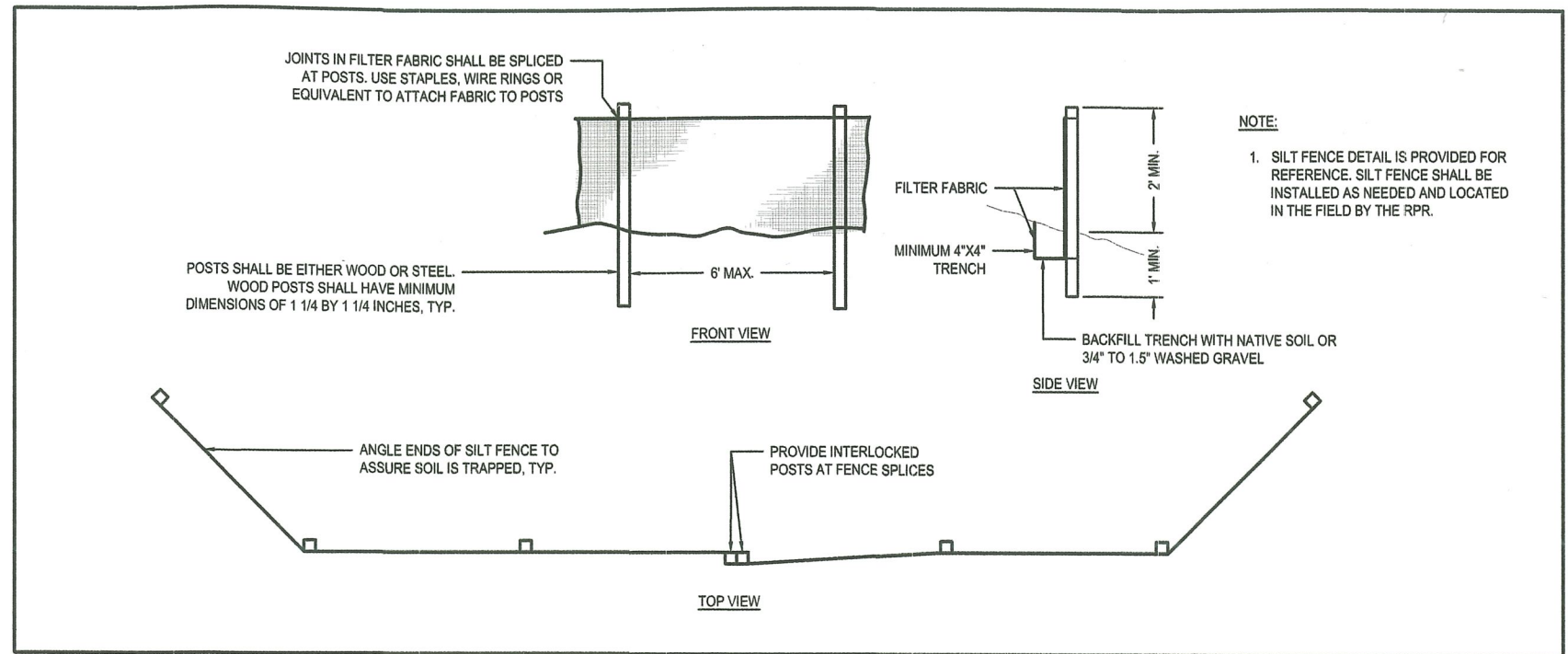
TABLE 1 - GEOTEXTILE STANDARDS	
GRAB TENSILE STRENGTH (ASTM D4751)	200 PSI MIN.
GRAB TENSILE ELONGATION (ASTM D4632)	30% MAX.
MULLEN BURST STRENGTH (ASTM D3786-80a)	400 PSI MIN.
AOS (ASTM D4751)	20-45 (US STANDARD SIEVE SIZE)



- NOTES:
- ENTRANCE SHALL MEET THE REQUIREMENTS OF THE PERMITTING AGENCY.
 - ENTRANCE SHALL BE SLOPED TO PROMOTE POSITIVE DRAINAGE.
 - THE ENTRANCE SHALL BE REMOVED AND RESTORED TO ORIGINAL CONDITION UPON COMPLETION OF THE PROJECT. RESTORATION SHALL BE CONSIDERED INCIDENTAL TO THE CONSTRUCTION ENTRANCE.

STABILIZED CONSTRUCTION ENTRANCE

SCALE=NTS



- NOTE:
- SILT FENCE DETAIL IS PROVIDED FOR REFERENCE. SILT FENCE SHALL BE INSTALLED AS NEEDED AND LOCATED IN THE FIELD BY THE RPR.

SILT FENCE

SCALE=NTS



- THE ESC MEASURES SHOWN ON THESE PLANS ARE MINIMUM REQUIREMENTS FOR THE ANTICIPATED SITE CONDITIONS. DURING THE CONSTRUCTION PERIOD THESE MEASURES SHALL BE UPGRADED AS NEEDED TO ENSURE THAT SEDIMENT AND SEDIMENT-LADEN WATER DOES NOT LEAVE THE CONSTRUCTION SITE, ENTER THE DRAINAGE SYSTEM, BE TRACKED ON PAVEMENT SURFACES, OR VIOLATE APPLICABLE WATER STANDARDS. THESE ESC FACILITIES SHALL BE UPGRADED AS NEEDED FOR UNEXPECTED STORM EVENTS AND MODIFIED TO ACCOUNT FOR CHANGING SITE CONDITIONS (E.G. RELOCATION/ADDITION OF SILT FENCE, ETC.). ALL NECESSARY MODIFICATIONS SHALL BE APPROVED BY THE RPR PRIOR TO IMPLEMENTATION.
- THE IMPLEMENTATION OF THESE ESC PLANS AND THE CONSTRUCTION, MAINTENANCE, REPLACEMENT, AND UPGRADE OF THESE ESC FACILITIES IS THE RESPONSIBILITY OF THE CONTRACTOR UNTIL ALL CONSTRUCTION IS COMPLETED AND APPROVED AND VEGETATION/LANDSCAPING IS ESTABLISHED.
- THE ESC FACILITIES SHOWN IN THESE PLANS 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.
- THE ESC FACILITIES SHALL BE INSPECTED DAILY BY THE CONTRACTOR AND MAINTAINED TO ENSURE CONTINUED PROPER FUNCTIONING.
- THE ESC FACILITIES ON INACTIVE SITES SHALL BE INSPECTED AND MAINTAINED A MINIMUM OF ONCE A MONTH OR WITHIN FORTY-EIGHT (48) HOURS FOLLOWING A STORM EVENT.
- THE CONTRACTOR SHALL BE REQUIRED TO COMPLETE AND MAINTAIN A STORMWATER POLLUTION PREVENTION PLAN (SWPPP) IN ACCORDANCE WITH SPECIFICATION C-102.

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DRAWN BY:
JCW
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TAW
SCALE:
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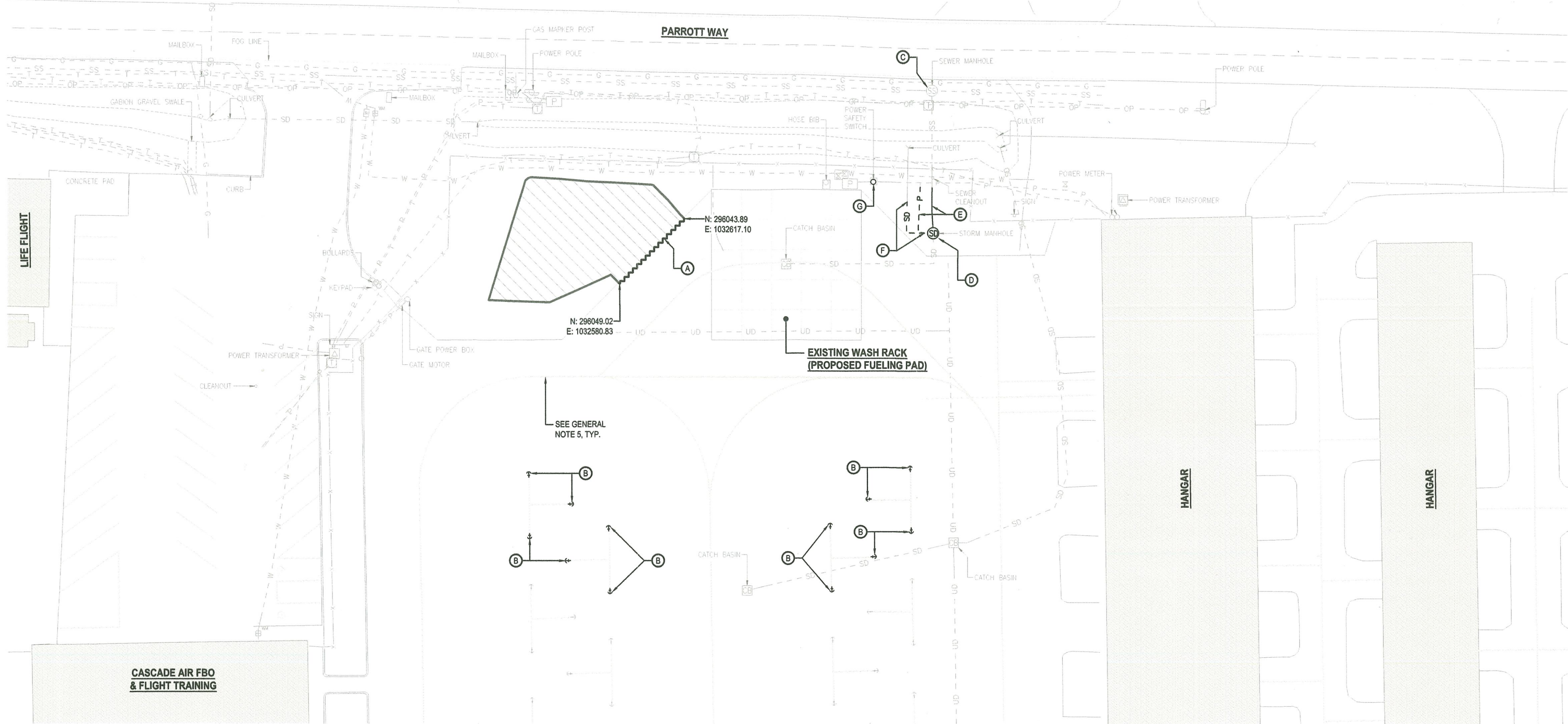
DATE:
MAY 2023

PROJECT NO:
35005.010.02

SOUTHWEST WASHINGTON REGIONAL AIRPORT
TASK ORDER #5 - FINAL DESIGN FUEL SITE

EROSION CONTROL NOTES & DETAILS

DRAWING NO.
C-02
SHEET NO.
6 OF 19



LEGEND

- PAVEMENT SAWCUT LINE, SEE GENERAL NOTE 3
- PROPOSED GRADING LIMITS, SEE GENERAL NOTE 4

GENERAL NOTES

1. THE CONTRACTOR SHALL DETERMINE THE EXACT LOCATION OF ALL UTILITIES BEFORE COMMENCING WORK, AND AGREES TO BE FULLY RESPONSIBLE FOR ANY AND ALL DAMAGES WHICH MIGHT BE OCCASIONED BY THE CONTRACTOR'S FAILURE TO EXACTLY LOCATE AND PRESERVE ANY AND ALL UNDERGROUND UTILITIES. DAMAGES SHALL BE REPAIRED BY THE AFFECTED UTILITY AT THE CONTRACTOR'S EXPENSE.
2. UNLESS NOTED OTHERWISE, EXISTING INFRASTRUCTURE TO REMAIN SHALL BE PROTECTED.
3. SAWCUTTING OF HMA PAVEMENT SHALL BE INCIDENTAL TO PAVEMENT REMOVAL BID ITEM AND NO SEPARATE MEASUREMENT OR PAYMENT WILL BE MADE.

GENERAL NOTES CONT.

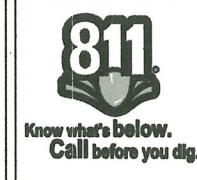
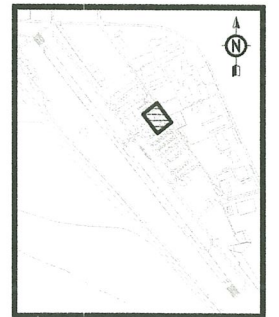
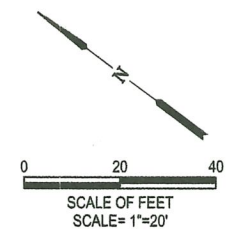
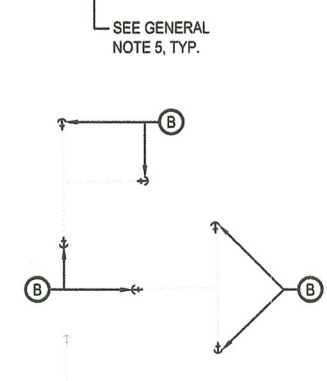
4. EXISTING UNPAVED AREAS WITHIN THE GRADING LIMITS SHALL BE STRIPPED TO A DEPTH OF 2-4 INCHES.
5. FOR PAVEMENT MARKING REMOVALS, SEE SHEET C-09.

KEYED NOTES

- (A) REMOVE EXISTING VEGETATION, SAWCUT AND REMOVE 6" STRIP OF EXISTING ASPHALT AT INTERFACE OF EXISTING HMA AND PROPOSED CONCRETE HARDSCAPE TO CREATE CLEAN PAVEMENT EDGE.
- (B) CUT OFF AND DISPOSE OF EXISTING STEEL TIE DOWN ANCHOR HOOKS. TURN CHAINS OVER TO AIRPORT. ABANDON CONCRETE ANCHORS IN PLACE.
- (C) PLUG EXISTING 4" PVC (SOUTHWEST)
- (D) REMOVE EXISTING MANHOLE AND THREE WAY VALVE. REFER TO ELECTRICAL PLANS FOR REMOVAL OF VALVE CONTROL WIRING. EXISTING PIPES MAY BE LOCATED WITHIN DUCTILE IRON CASING PIPES WHICH SHALL BE CUT BACK AS REQUIRED TO MAKE CONNECTIONS TO PROPOSED DRAINAGE STRUCTURE.

KEYED NOTES CONT.

- (E) REMOVE ABANDONED CONDUIT AND SEWER PIPE, AS NEEDED WITHIN THE EXCAVATION LIMITS. PLUG AND/OR CAP REMAINING OPEN ENDS OF PIPE OR CONDUIT.
- (F) ABANDON EXISTING STORM LINE BETWEEN FUTURE TIE IN POINTS. PLUG AND/OR CAP REMAINING OPEN ENDS OF PIPE. SEE GRADING AND DRAINAGE PLANS.
- (G) CUT OFF EXISTING POWER/CONTROL CONDUIT AND STEEL MOUNTING POST FLUSH WITH GRADE. PLUG CONDUIT AND POST OPENINGS WITH NON-SHRINK GROUT. REFER TO ELECTRICAL PLANS FOR WIRING REMOVALS.



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 CHECKED BY: TAW
 SCALE: AS NOTED

DATE: MAY 2023
 PROJECT NO: 35005.010.02

60% DESIGN

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 TASK ORDER #5 - FINAL DESIGN FUEL SITE

DEMOLITION PLAN 1 OF 2

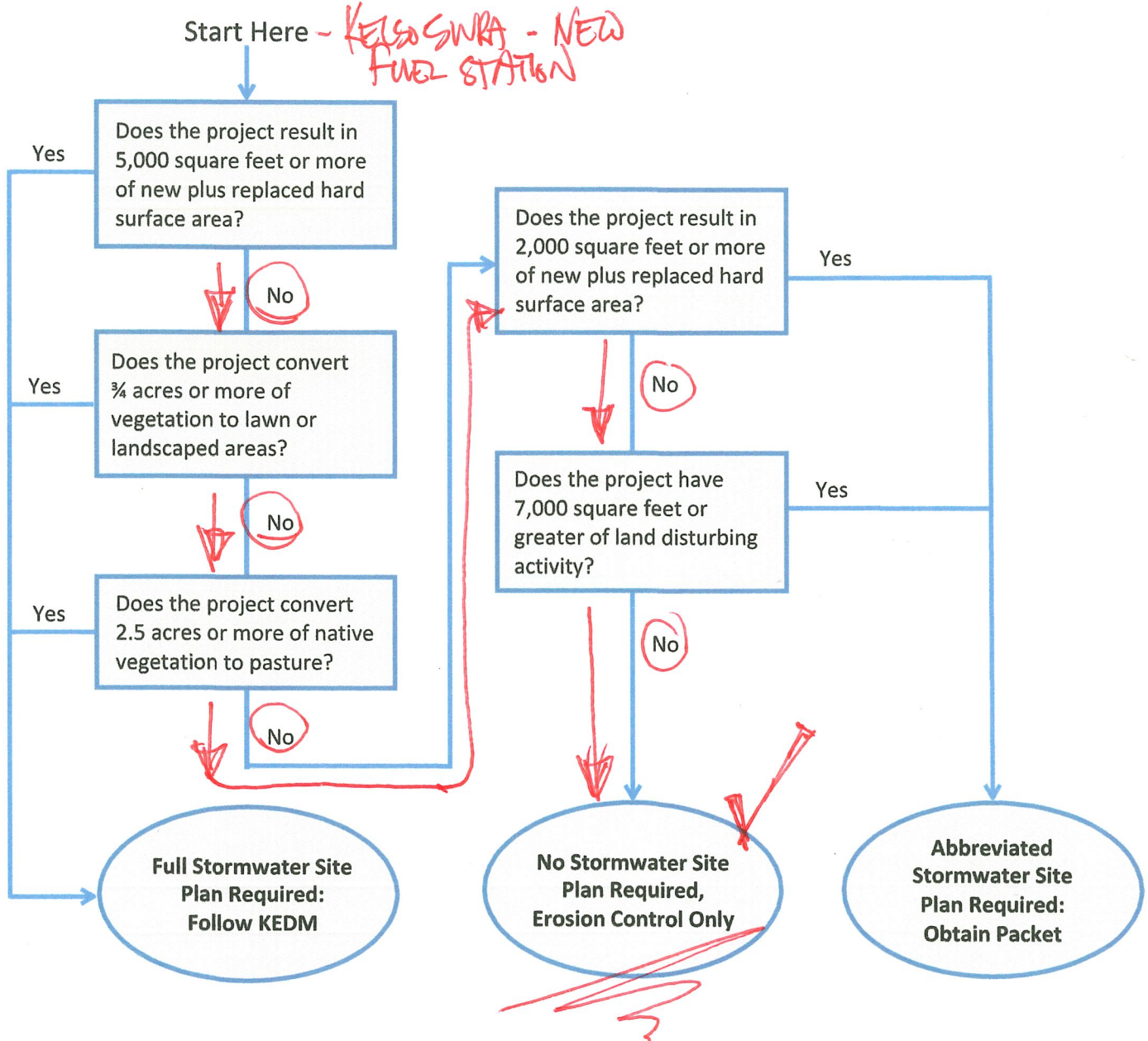
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 SHEET NO. **7 OF 19**

APPENDIX B. REDEVELOPMENT PROJECTS FLOW-CHART

What does it mean to convert vegetation?

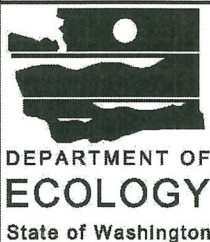
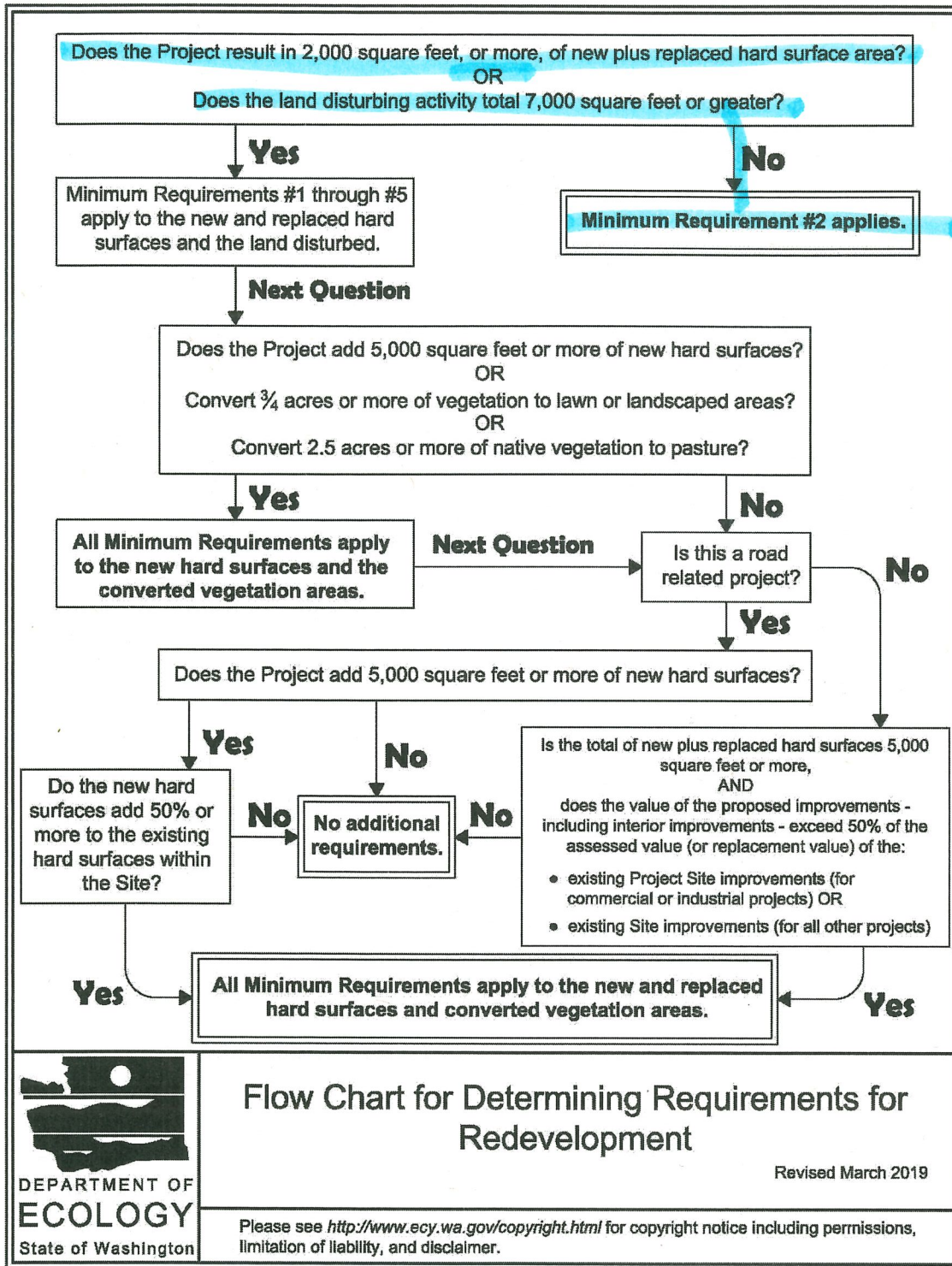
The areas on a project site where native vegetation, pasture, scrub/shrub, or unmaintained non-native vegetation (e.g., Himalayan blackberry) are replaced with lawn or landscaped areas or where native vegetation is replaced with pasture.

Stormwater Review Types for Development and Construction Projects



Refer to the Kelso Engineering Design Manual, online at www.kelso.gov/engineering/engineering-documents, for more information or clarification of stormwater requirements within Kelso. You may also contact the City of Kelso's Engineering Department at (360) 423-6590 or at engineering@kelso.gov.

Figure I-3.2: Flow Chart for Determining Requirements for Redevelopment



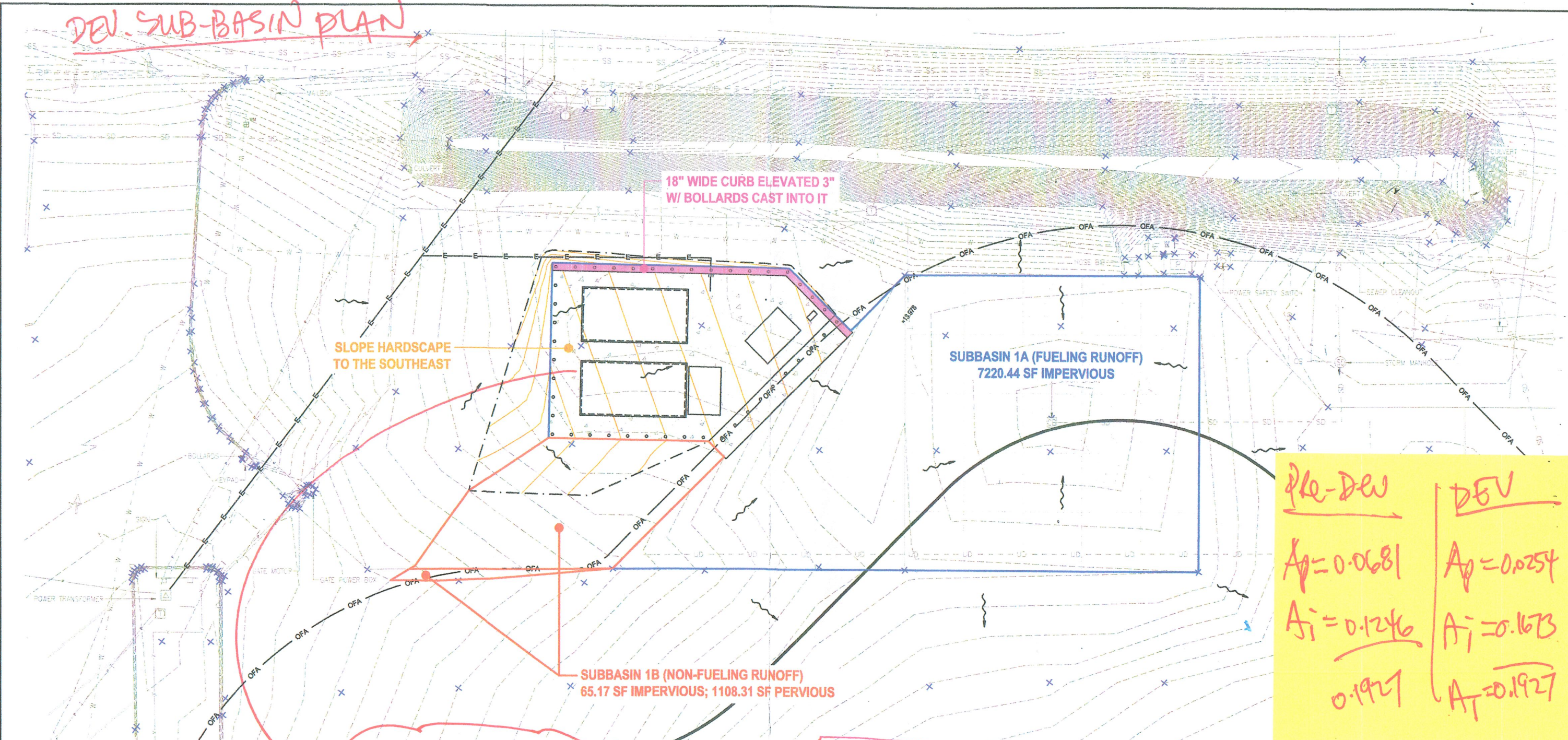
Flow Chart for Determining Requirements for Redevelopment

Revised March 2019

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APPENDIX C. DEVELOPED STORM WATER SUB-BASIN PLAN

DEV. SUB-BASIN PLAN



18" WIDE CURB ELEVATED 3" W/ BOLLARDS CAST INTO IT

SLOPE HARDSCAPE TO THE SOUTHEAST

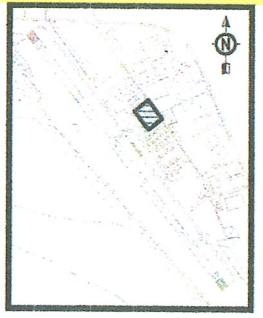
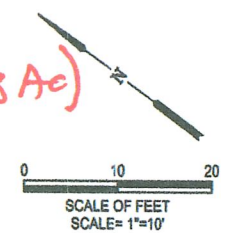
SUBBASIN 1A (FUELING RUNOFF)
7220.44 SF IMPERVIOUS

SUBBASIN 1B (NON-FUELING RUNOFF)
65.17 SF IMPERVIOUS; 1108.31 SF PERVIOUS

<u>Pre-Dev</u>	<u>DEV</u>
$A_p = 0.0681$	$A_p = 0.0254$
$A_i = 0.1246$	$A_i = 0.1673$
0.1927	$A_T = 0.1927$

New Impervious Area:
Fuel tank pad: 1858.87 SF
(0.0427 Ac)

WQ Treatment Area:
 $A_i = 7220.44 + 65.17 = 7285.61 \text{ SF}$ (0.1673 Ac)
 $A_p = 1108.31 \text{ SF}$ (0.0254 Ac)
 $A_{\text{Total}} = 8393.92 \text{ SF}$ (0.1927 Ac)



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DATE: MAY 2023 PROJECT NO: 35005.010.02

DESIGNED BY: -
DRAWN BY: -
CHECKED BY: -
SCALE: AS NOTED

SOUTHWEST WASHINGTON REGIONAL AIRPORT
TASK ORDER #5 - FINAL DESIGN FUEL SITE

SITE OVERVIEW

DRAWING NO. EX 1
SHEET NO. 1 OF 1

APPENDIX D. STORM WATER QUALITY FACILITY SIZING CALCULATIONS

KELSO SWRA NEW FUEL SITE
STORMWATER QUALITY ANALYSIS

WVHM2012
PROJECT REPORT

Project Name: default
Site Name: Kelso SWRA
Site Address: 2215 Parrott Way
City : Kelso
Report Date: 5/10/2023
Gage : Longview
Data Start : 1955/10/01
Data End : 2009/09/30
Precip Scale: 1.14
Version Date: 2023/01/27
Version : 4.2.19

Low Flow Threshold for POC 1 : 50 Percent of the 2 Year

High Flow Threshold for POC 1: 50 year

PREDEVELOPED LAND USE

Name : Basin 1
Bypass: No

GroundWater: No

<u>Pervious Land Use</u>	<u>acre</u>
C, Lawn, Flat	.0681

Pervious Total 0.0681

<u>Impervious Land Use</u>	<u>acre</u>
PARKING FLAT	0.1246

Impervious Total 0.1246

Basin Total 0.1927

Element Flows To:

Surface	Interflow	Groundwater
---------	-----------	-------------

MITIGATED LAND USE

Name : Basin 1
Bypass: No

GroundWater: No

Pervious Land Use acre
C, Lawn, Flat .0254

Pervious Total 0.0254

Impervious Land Use acre
PARKING FLAT 0.1673

Impervious Total 0.1673

Basin Total 0.1927

Element Flows To:
Surface Interflow Groundwater

ANALYSIS RESULTS

Stream Protection Duration

Predeveloped Landuse Totals for POC #1
Total Pervious Area:0.0681
Total Impervious Area:0.1246

Mitigated Landuse Totals for POC #1
Total Pervious Area:0.0254
Total Impervious Area:0.1673

Flow Frequency Return Periods for Predeveloped. POC #1

<u>Return Period</u>	<u>Flow(cfs)</u>
2 year	0.077509
5 year	0.117782
10 year	0.147945
25 year	0.190011
50 year	0.224231
100 year	0.260937

Flow Frequency Return Periods for Mitigated. POC #1

<u>Return Period</u>	<u>Flow(cfs)</u>
2 year	0.092376
5 year	0.135502
10 year	0.166958
25 year	0.209948
50 year	0.244319
100 year	0.280698

Water Quality BMP Flow and Volume for POC #1

On-line facility volume: 0.0249 acre-feet
On-line facility target flow: 0.0336 cfs.
Adjusted for 15 min: 0.0336 cfs.
Off-line facility target flow: 0.0184 cfs.
Adjusted for 15 min: 0.0184 cfs.

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PROJECT NAME Kelso SWRA CALCULATED BY TW DATE 5/10/23
 PROJECT NO 35005.010.03 CHECKED BY _____ DATE _____
 SUBJECT CPS Vault Design SHEET NO. _____ OF _____

SIZE CPS VAULT -

online WQ Flow Rate = 0.0336 cfs
 offline WQ Flow Rate = 0.0184 cfs

$$\begin{aligned}
 \text{ sizing treatment gpm} &= 0.0336 \text{ cfs} \times \frac{60 \text{ s}}{\text{min}} \times \frac{7.48 \text{ gal}}{\text{cf}} \\
 &= \boxed{15 \text{ gpm}} \text{ Design Flow Rate.}
 \end{aligned}$$

100 yr Flow Rate = 0.2807 cfs

$$0.2807 \text{ cfs} \times \frac{60 \text{ s}}{\text{min}} \times \frac{7.48 \text{ gal}}{\text{cf}} = \boxed{126 \text{ gpm}}$$

* Use 660-CPS (ouicastle Precast)

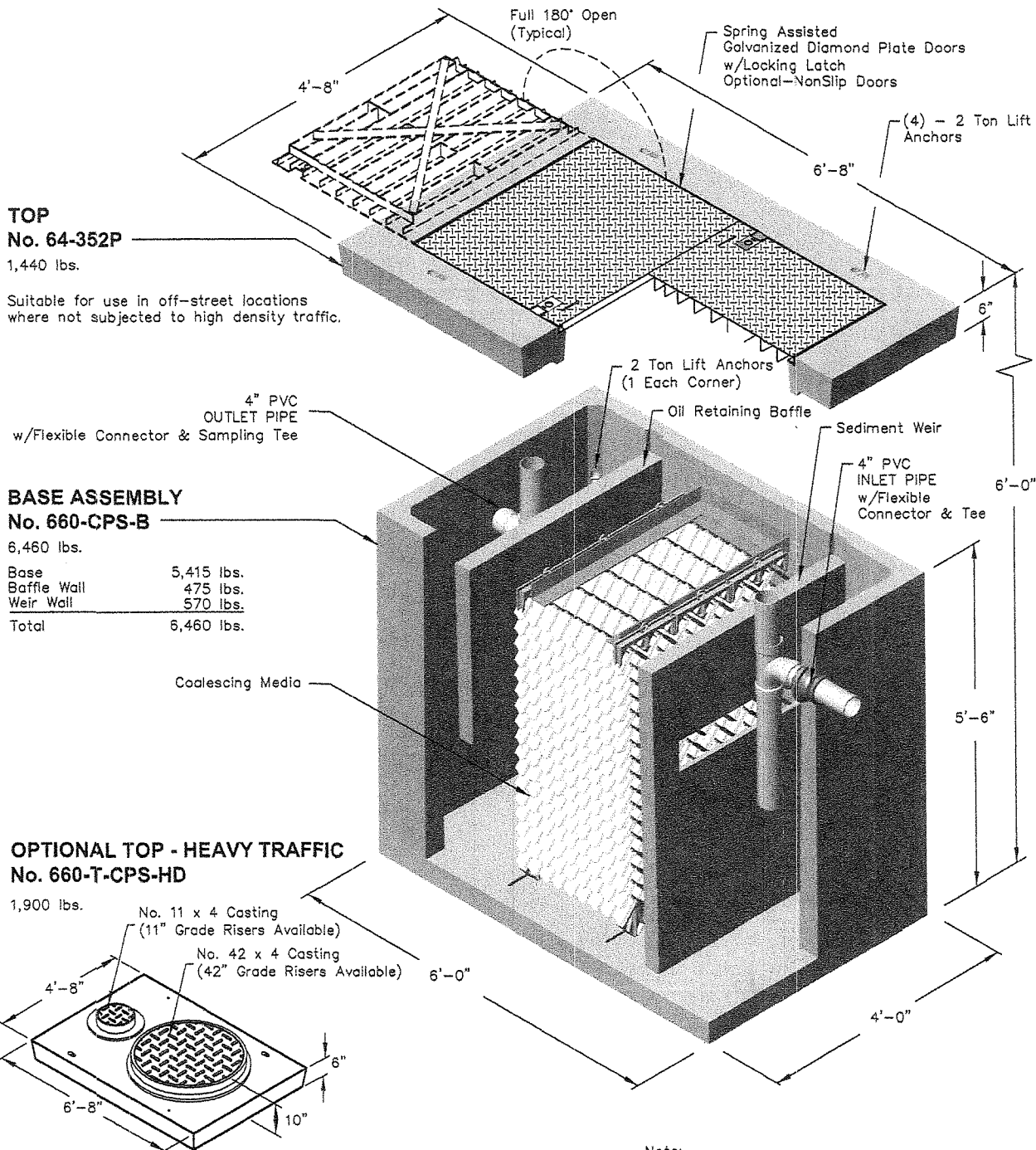
max design flow rate = 105 gpm >> 15 gpm

max process flow rate = 565 gpm >> 126 gpm

"ON-LINE" installation recommended.

660-CPS

Projected Coalescing Plate Area = 444 Sq.Ft.
 *Design Flow Rate = 105 GPM (see back page)
 Maximum Process Flow = 565 GPM



TOP
No. 64-352P
 1,440 lbs.

Suitable for use in off-street locations where not subjected to high density traffic.

BASE ASSEMBLY
No. 660-CPS-B

6,460 lbs.

Base	5,415 lbs.
Baffle Wall	475 lbs.
Weir Wall	570 lbs.
Total	6,460 lbs.

Coalescing Media


OPTIONAL TOP - HEAVY TRAFFIC
No. 660-T-CPS-HD

1,900 lbs.

No. 11 x 4 Casting
 (11" Grade Risers Available)
 No. 42 x 4 Casting
 (42" Grade Risers Available)

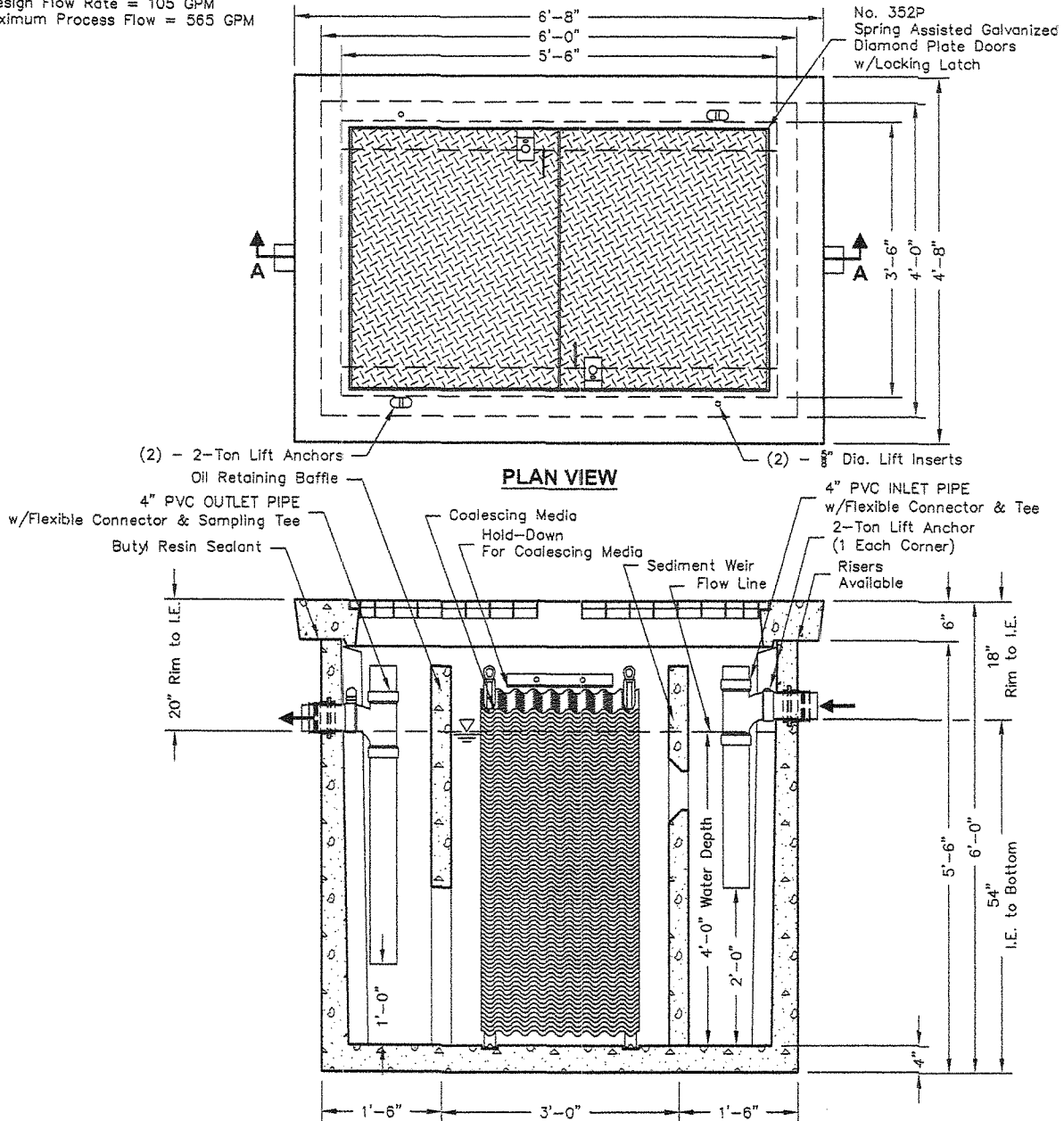
Note:
 - 660-CPS is available set up for future installation of coalescing media and designated as 660-CPS-R.

Note: Designed for 0 to 5'-0" of Cover

 Oldcastle Precast PO Box 323, Wilsonville, Oregon 97070-0323 Tel: (503) 682-2844 Fax: (503) 682-2657	660-CPS	660-CPS OIL / WATER SEPARATOR COALESCING - 105 GPM
	File Name: 020-660CPS	
	Issue Date: 2018	
oldcastleprecast.com/wilsonville		

660-CPS

Projected Coalescing Plate Area = 444 Sq.Ft.
 *Design Flow Rate = 105 GPM
 Maximum Process Flow = 565 GPM




SECTION AA

*DESIGN FLOW RATE	EFFLUENT QUALITY	100% COLLECTED
105 GPM	10 ppm	60 Micron

Basic Design Information: *
 Influent Characteristics
 - Oil Specific Gravity = 0.88
 - Operating Temperature = 50°
 - Influent Oil Concentration = 100 ppm
 - Mean Oil Droplet Size = 130 Microns
 - .033 ft./min. Critical Oil Droplet Predicted Rise Rate

- Notes:**
- Static Water Depth = 4'-0"
 - Prior to "Startup" of system, fill with clean water to bottom of outlet pipe. For best results, fill to flow line.
 - Follow Regular Inspection, Cleaning, & Maintenance Schedule (See Clean Out & Maintenance).

*Basic Design Information per Washington State Department of Ecology; User to Adjust Estimates for Variations in Real Conditions.

 PO Box 323, Wilsonville, Oregon 97070-0323 Tel: (503) 682-2844 Fax: (503) 682-2657	660-CPS	660-CPS OIL / WATER SEPARATOR COALESCING - 105 GPM
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	oldcastleprecast.com/wilsonville	

**APPENDIX E. STORM WATER QUALITY FACILITY OPERATIONS &
MAINTENANCE REQUIREMENTS**

Table V-A.17: Maintenance Standards - Coalescing Plate Oil/Water Separators

Maintenance Component	Defect	Condition When Maintenance is Needed	Results Expected When Maintenance is Performed
General	Monitoring	Inspection of discharge water for obvious signs of poor water quality.	Effluent discharge from vault should be clear with no thick visible sheen.
	Sediment Accumulation	Sediment depth in bottom of vault exceeds 6-inches in depth and/or visible signs of sediment on plates.	No sediment deposits on vault bottom and plate media, which would impede flow through the vault and reduce separation efficiency.
	Trash and Debris Accumulation	Trash and debris accumulated in vault, or pipe inlet/outlet, floatables and non-floatables.	Trash and debris removed from vault, and inlet/outlet piping.
	Oil Accumulation	Oil accumulation that exceeds 1-inch at the water surface.	Oil is extracted from vault using vactoring methods. Coalescing plates are cleaned by thoroughly rinsing and flushing. Should be no visible oil depth on water.
	Damaged Coalescing Plates	Plate media broken, deformed, cracked and/or showing signs of failure.	A portion of the media pack or the entire plate pack is replaced depending on severity of failure.
	Damaged Pipes	Inlet or outlet piping damaged or broken and in need of repair.	Pipe repaired and or replaced.
	Baffles	Baffles corroding, cracking, warping and/or showing signs of failure as determined by maintenance/inspection person.	Baffles repaired or replaced to specifications.
	Vault Structure Damage - Includes Cracks in Walls, Bottom, Damage to Frame and/or Top Slab	Cracks wider than 1/2-inch or evidence of soil particles entering the structure through the cracks, or maintenance/inspection personnel determine that the vault is not structurally sound. Cracks wider than 1/2-inch at the joint of any inlet/outlet pipe or evidence of soil particles entering through the cracks.	Vault replaced or repairs made so that vault meets design specifications and is structurally sound. Vault repaired so that no cracks exist wider than 1/4-inch at the joint of the inlet/outlet pipe.
	Access Ladder Damaged	Ladder is corroded or deteriorated, not functioning properly, not securely attached to structure wall, missing rungs, cracks, and misaligned.	Ladder replaced or repaired and meets specifications, and is safe to use as determined by inspection personnel.

IV-6 Transfer of Liquid or Solid Materials

Source Control BMPs

S409 BMPs for Fueling At Dedicated Stations

Description of Pollutant Sources: A fueling station is a facility dedicated to the transfer of fuels from a stationary pumping station to mobile vehicles or equipment. It includes above or underground fuel storage facilities. Fueling may occur at:

- General service gas stations
- 24-hour convenience stores
- Construction sites
- Maintenance yards
- Warehouses
- Car washes
- Manufacturing establishments
- Port facilities
- Marinas
- Boatyards
- Businesses with fleet vehicles.

Typical causes of stormwater contamination at fueling stations include leaks/spills of fuels, lubrication oils, radiator coolants, and vehicle washwater.

Pollutant Control Approach: New or substantially remodeled* fueling stations must be constructed on an impervious concrete pad under a roof to keep out rainfall and stormwater run-on. The facility must use a treatment BMP for contaminated stormwater and wastewaters in the fueling containment area.

** Substantial remodeling includes (but is not limited to) replacing the canopy, or relocating or adding one or more fuel dispensers in such a way that modifies the Portland cement concrete (or equivalent) paving in the fueling area.*

Applicable Operational BMPs:

- Prepare an emergency spill response and cleanup plan (spill plan) per [S426 BMPs for Spills of Oil and Hazardous Substances](#).
- Train employees on the proper use of fuel dispensers and on the spill plan.
- Have a designated trained person(s) available either on site or on call at all times to promptly

and properly implement the spill plan and immediately cleanup all spills.

- If the fueling station is unattended by a trained person during operating hours, the spill plan must be visible to all customers and untrained employees using the station, and the spill kit must also be accessible and fully stocked at all times.
- The person conducting the fuel transfer must be present at the fueling pump during fuel transfer, particularly at unattended or self-serve stations.
- Keep suitable cleanup materials, such as dry adsorbent materials, on site to allow prompt cleanup of a spill.
- Do not use dispersants to clean up spills or sheens unless properly removed for disposal following application. Dispersants are not allowed to enter storm drains, surface waters, treatment systems, or sanitary sewers.
- Post signs in accordance with the requirements in the Uniform Fire Code (UFC) or International Fire Code (IFC). For example, post “No Topping Off” signs (topping off gas tanks causes spillage and vents gas fumes to the air).
- Make sure that the automatic shut-off on the fuel nozzle is functioning properly.
- Refer to [S439 BMPs for In-Water and Over-Water Fueling](#) for BMPs for in-water or over-water fueling operations

Applicable Structural Source Control BMPs:

For new or substantially remodeled fueling stations:

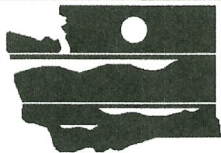
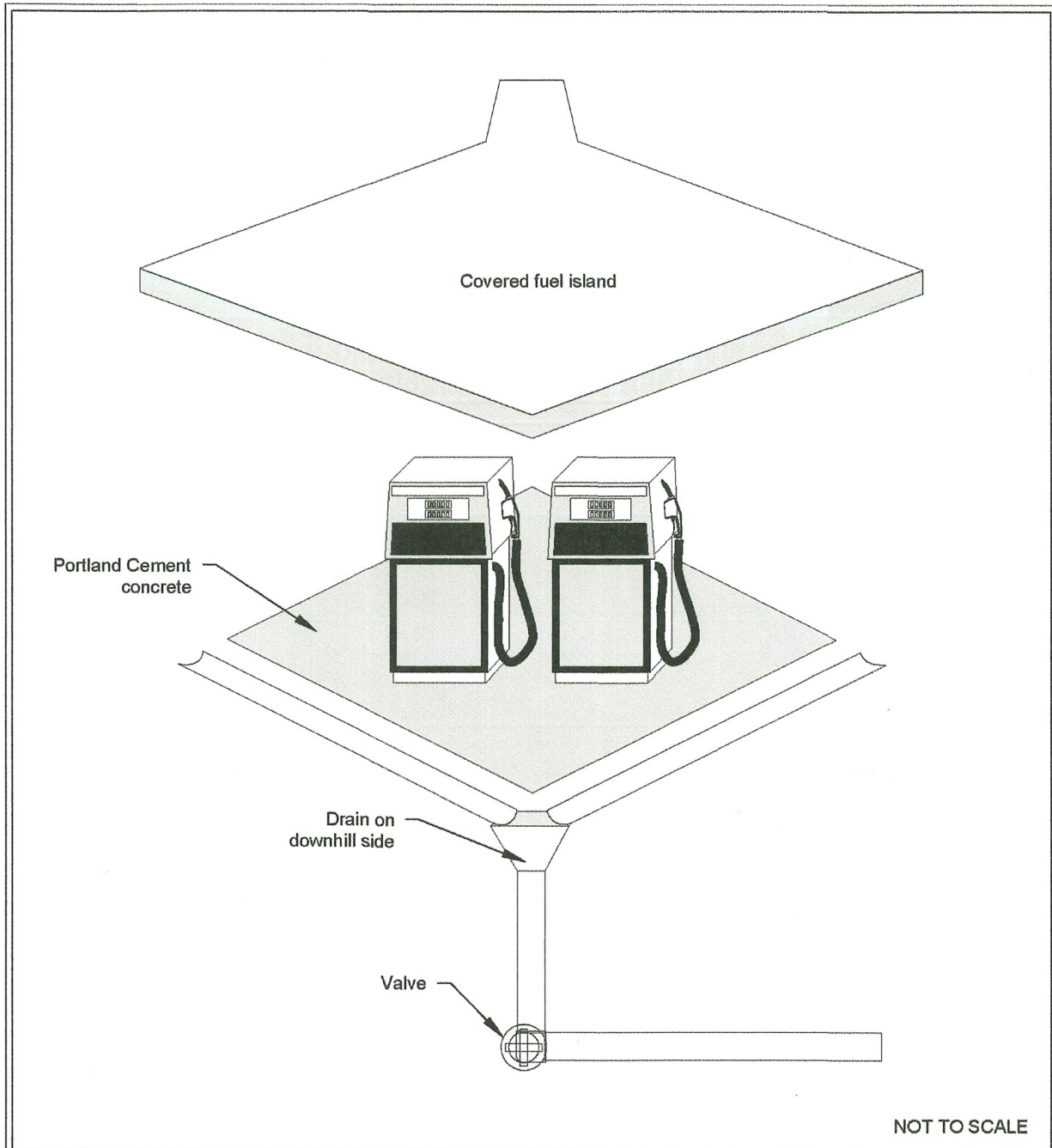
- Design the fueling island to:
 - Minimize stormwater contamination.
 - Control spills (dead-end sump or spill control separator in compliance with the UFC or IFC).
 - Collect stormwater and/or wastewater and direct it to an appropriate treatment system.
- Slope the concrete containment pad around the fueling island toward drains; either trench drains, catch basins and/or a dead-end sump. The slope of the drains shall not be less than 1 percent (Section 7901.8 of the UFC, Section 5703.6.8 of the IFC).
- Drains from containment pads must have a normally closed shutoff valve. The valve may be opened to convey contaminated stormwater to oil removal treatment such as an API or CP oil/water separator (see [V-13 Oil and Water Separator BMPs](#)), catchbasin insert, or equivalent treatment, and then to a basic treatment BMP (as described in [III-1.2 Choosing Your Runoff Treatment BMPs](#)) or to a sanitary sewer, if approved by the sewer authority. Discharges from treatment systems to storm sewer or surface water or to the ground must not display ongoing or recurring visible sheen and must not contain a significant amount of oil and grease.
- The spill control capacity must be sized in compliance with Section 7901.8 of the UFC. The

spill control capacity may be acquired by either an underground system including a sump, or an above ground containment area consisting of a containment pad with berms.

The fueling island may be designed as a spill containment pad with a sill or berm raised to a minimum of four inches (per Section 7901.8 of the UFC) to prevent the runoff of spilled liquids and to prevent run-on of stormwater from the surrounding area. All stormwater collected on the containment pad must discharge to treatment with a normally closed valve downstream of the treatment.

- The fueling pad must be paved with Portland cement concrete, or equivalent. Ecology does not consider asphalt an equivalent material.
- The fueling island must have a roof or canopy to prevent the direct entry of precipitation onto the spill containment pad (see [Figure IV-6.1: Covered Fuel Island](#)). The roof or canopy should, at a minimum, cover the spill containment pad (within the grade break or fuel dispensing area) and preferably extend 3 feet on each side for roofs and canopies 10 feet or less in height and 5 feet on each side for roofs and canopies greater than 10 feet in height. Overhangs reduce the introduction of windblown rain. Measure the overhang relative to the berm or other hydraulic grade break for the spill containment pad.

Figure IV-6.1: Covered Fuel Island



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State of Washington

Covered Fuel Island

Revised June 2016

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- Convey all roof drains to storm drains outside the fueling containment area.
- Convey stormwater collected on the fuel island containment pad to a sanitary sewer system, if approved by the sanitary authority, or to an approved treatment system such as an oil/water separator and a basic treatment BMP. (Basic treatment BMPs are listed in III-1.2 Choosing Your Runoff Treatment BMPs). Discharges from treatment systems to storm drains or surface water or to the ground must not display ongoing or recurring visible sheen and must not contain oil and grease.
- Alternatively, collect stormwater from the fuel island containment pad and hold for proper off-site disposal.
- Approval from the local sewer authority is required for conveyance of any fuel-contaminated stormwater to a sanitary sewer. The discharged stormwater must comply with pretreatment regulations (WAC 173-216-060). These regulations prohibit discharges that could "cause fire or explosion." State and federal pretreatment regulations define an explosive or flammable mixture, based on a flash point determination of the mixture. Stormwater could be conveyed to a sanitary sewer system if it is determined not to be explosive.
- Transfer the fuel from the delivery tank trucks to the fuel storage tank in impervious contained areas and ensure that appropriate overflow protection is used. Alternatively, cover nearby storm drains during the filling process and use drip pans under all hose connections.

Additional BMP for Vehicles 10 feet in height or greater

A roof or canopy may not be feasible at fueling stations that regularly fuel vehicles that are 10 feet in height or greater, particularly at industrial or WSDOT sites. At those types of fueling facilities, the following BMPs apply, as well as the applicable BMPs and fire prevention (UFC requirements) of this BMP for fueling stations:

- If a roof or canopy is impractical, the concrete fueling pad must be equipped with emergency spill control including a shutoff valve for drainage from the fueling area. Maintain the valve in the closed position in the event of a spill. Clean up spills and dispose of materials off-site in accordance with S426 BMPs for Spills of Oil and Hazardous Substances.
- The valve may be opened to convey contaminated stormwater to a sanitary sewer, if approved by the sewer authority, or to oil removal treatment such as an API or CP oil/water separator (see V-13 Oil and Water Separator BMPs), catchbasin insert, or equivalent treatment, and then to a basic treatment BMP (as described in III-1.2 Choosing Your Runoff Treatment BMPs). Discharges from treatment systems to storm sewer or surface water or to the ground must not display ongoing or recurring visible sheen and must not contain a significant amount of oil and grease.

You are here: [2019 SWMMWW](#) > [Volume IV - Source Control BMP Library](#) > [IV-6 Transfer of Liquid or Solid Materials Source Control BMPs](#) > [S426 BMPs for Spills of Oil and Hazardous Substances](#)

S426 BMPs for Spills of Oil and Hazardous Substances

Description of Pollutant Sources: Washington Administrative Code requires owners or operators of facilities engaged in drilling, producing, gathering, storing, processing, transferring, distributing, refining, or consuming oil and/or oil products to have a Spill Prevention and Emergency Cleanup Plan (SPECP). The SPECP is required if the above ground storage capacity of the facility is 1,320 gallons or more of oil. Additionally, the SPECP is required if the facility, due to its location, could reasonably be expected to discharge oil in harmful quantities, as defined in 40 CFR Part 110, into or upon the navigable waters of the United States or adjoining shorelines {40 CFR 112.1 (b)}. Onshore and offshore facilities, which, due to their location, could not reasonably be expected to discharge oil into or upon the navigable waters of the United States or adjoining shorelines are exempt from these regulations {40 CFR 112.1(d)(1)(i)}. State Law requires owners of businesses that produce dangerous wastes to have a SPECP. These businesses should refer to [Washington State/Federal Emergency Spill Cleanup Requirements](#) (see [I-2.15 Other Requirements](#)). The federal definition of oil is oil of any kind or any form, including, but not limited to petroleum, fuel oil, sludge, oil refuse, and oil mixed with wastes other than dredged spoil.

Pollutant Control Approach: Maintain, update, and implement a Spill Prevention and Emergency Cleanup Plan.

Applicable Operational BMPs:

The businesses and public agencies identified in [Appendix IV-A: Urban Land Uses and Pollutant Generating Sources](#) required to prepare and implement a Spill Prevention and Emergency Cleanup Plan shall implement the following:

- Prepare a Spill Prevention and Emergency Cleanup Plan (SPECP), which includes:
 - A description of the facility including the owner's name and address.
 - The nature of the activity at the facility.
 - The general types of chemicals used or stored at the facility.
 - A site plan showing the location of storage areas for chemicals, the locations of storm drains, the areas draining to them, and the location and description of any devices to stop spills from leaving the site such as positive control valves.
 - Cleanup procedures.
 - Notification procedures used in the event of a spill, such as notifying key personnel. Agencies such as Ecology, local fire department(s), Washington State Patrol, and the local Sewer Authority, shall be notified.
 - The name of the designated person with overall spill cleanup and notification responsibility.

- Train key personnel in the implementation of the SPEC. Prepare a summary of the plan and post it at appropriate points in the building, identifying the spill cleanup coordinators, location of cleanup kits, and phone numbers of regulatory agencies to contact in the event of a spill.
- Update the SPEC regularly.
- Immediately notify Ecology, the local jurisdiction, and the local Sewer Authority if a spill may reach sanitary or storm sewers, ground water, or surface water, in accordance with federal and Ecology spill reporting requirements.
- Immediately clean up spills. Do not use emulsifiers for cleanup unless there is an appropriate disposal method for the resulting oily wastewater. Do not wash absorbent material down a floor drain or into a storm sewer.
- Locate emergency spill containment and cleanup kit(s) in high-potential spill areas. The contents of the kit shall be appropriate for the type and quantities of chemical liquids stored at the facility.

Recommended Additional Operational BMP:

Spill kits should include appropriately lined drums, absorbent pads, and granular or powdered materials for neutralizing acids or alkaline liquids where applicable. In fueling areas: Package absorbent material in small bags for easy use and make available small drums for storage of absorbent and/or used absorbent. Deploy spill kits in a manner that allows rapid access and use by employees.

Washington State Department of Ecology

2019 Stormwater Management Manual for Western Washington (2019 SWMMWW)

Publication No.19-10-021

S428 BMPs for Storage of Liquids in Permanent Aboveground Tanks

Description of Pollutant Sources: Aboveground tanks containing liquids (excluding uncontaminated water) may be equipped with a valved drain, vent, pump, and bottom hose connection. Aboveground tanks may be heated with steam heat exchangers equipped with steam traps, if required. Leaks and spills can occur at connections and during liquid transfer. Oil and grease, organics, acids, alkalis, and heavy metals in tank water and condensate drainage can also cause stormwater contamination at storage tanks.

Pollutant Control Approach: Install secondary containment or a double-walled tank. Slope the containment area to a drain with a sump. Operators may need to discharge stormwater collected in the containment area to a Runoff Treatment BMP such as BMP T11.10: API (Baffle type) Separator or BMP T11.11: Coalescing Plate (CP) Separator, or an equivalent BMP. Add safeguards against accidental releases including protective guards around tanks to protect against vehicle or forklift damage, and tagging valves to reduce human error. *Tank water and condensate discharges are process wastewater that may need an NPDES Permit.*

Applicable Operational BMPs:

- Inspect the tank containment areas regularly for leaks/spills, cracks, corrosion, etc. to identify problem components such as fittings, pipe connections, and valves.
- Place adequately sized drip pans beneath all mounted taps and drip/spill locations during filling/unloading of tanks. Operators may need valved drain tubing in mounted drip pans.
- Vacuum sweep and clean the tank storage area regularly, if paved.
- Replace or repair tanks that are leaking, corroded, or otherwise deteriorating.
- Storage of flammable, ignitable, and reactive chemicals and materials must comply with the stricter of local zoning codes, local fire codes, the Uniform Fire Code (UFC), UFC standards, or the National Electric Code.

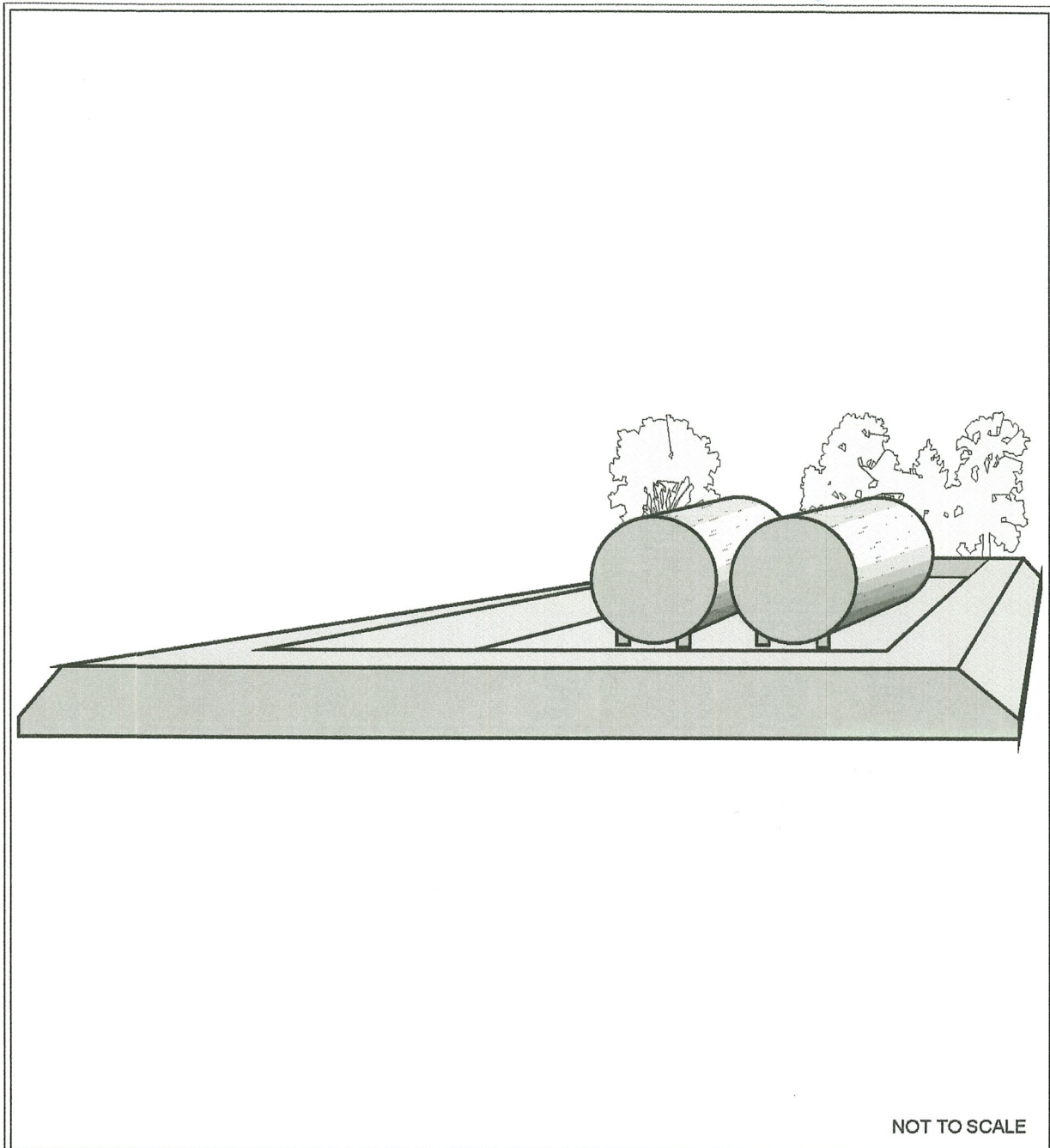
Applicable Structural BMPs:

- Locate permanent tanks in impervious (Portland cement concrete or equivalent) secondary containment surrounded by dikes as illustrated in Figure IV-5.5: Above-Ground Tank Storage, or use UL Approved double-walled tanks. The dike must be of sufficient height to provide a containment volume of either 10 percent of the total enclosed tank volume or 110 percent of the volume contained in the largest tank, whichever is greater.
- Slope the secondary containment to drain to a normally closed valve, for the collection of small

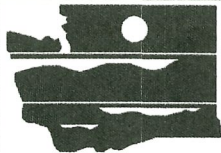
spills.

- Include a tank overfill protection system to minimize the risk of spillage during loading.

Figure IV-5.5: Above-Ground Tank Storage



NOT TO SCALE



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State of Washington

Above-Ground Tank Storage

Revised June 2016

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Applicable Treatment BMPs:

- Depending on the kind of liquid being stored, the potential and type of stormwater contamination will vary and may require specialized treatment.
- For an uncovered tank containment area, equip the outlet from the spill-containment sump with a normally closed shutoff valve. Operators may open this valve manually or automatically, only to convey contaminated stormwater to approved treatment or disposal, or to convey uncontaminated stormwater to a storm sewer. Evidence of contamination can include the presence of visible sheen, color, or turbidity in the runoff, or existing or historical operational problems at the facility. Use simple pH tests with litmus or pH paper for areas subject to acid or alkaline contamination.
- At petroleum tank farms, convey stormwater contaminated with floating oil or debris in the contained area to a sanitary sewer with the sewer authority's approval or through BMP T11.10: API (Baffle type) Separator or BMP T11.11: Coalescing Plate (CP) Separator, or other approved treatment prior to discharge to the storm drain or surface water.

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