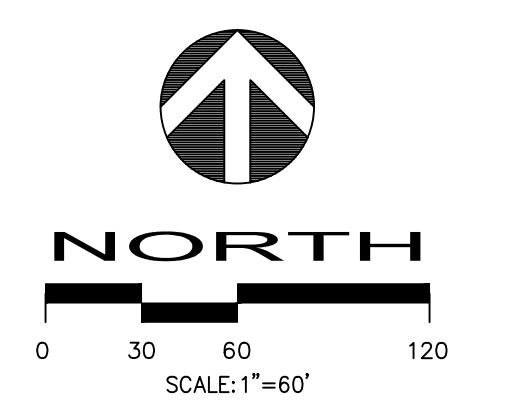


**APPENDIX A**  
**Area B2 Topographic Survey**

**LEGEND**

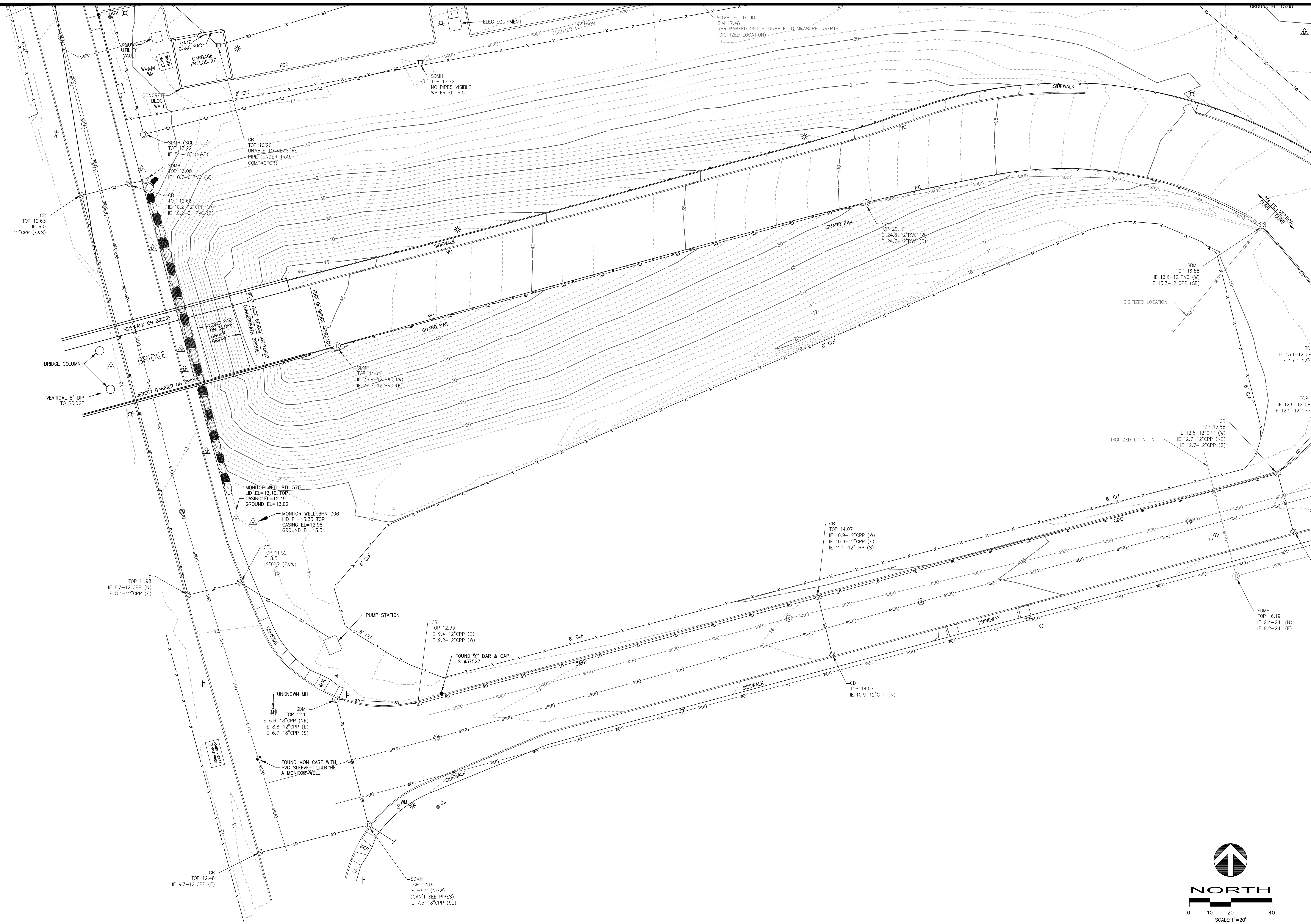
STORM DRAIN LINE	—
STORM DRAIN LINE FROM AS-BUILT RECORDS	---
WATER TONE LINE	—
WATER LINE FROM AS-BUILT RECORDS	---
SANITARY SEWER LINE	—
SANITARY SEWER LINE FROM AS-BUILT RECORDS	---
OVERHEAD UTILITY LINE	—
POWER TONE LINE	—
GAS TONE LINE	—
TELEPHONE TONE LINE	—
FENCE, AS NOTED	—
GUARD RAIL	—
FIBER OPTIC TONE	—
EDGE OF WETLAND	—
MONITOR WELL	⊕
STORM DRAIN MANHOLE	⊙
SEWER MANHOLE	⊙
SEWER CLEANOUT	⊙
CATCH BASIN	⊙
SION	⊙
AREA LIGHT	⊙
GUY ANCHOR	⊙
UTILITY POLE	⊙
WATER VALVE	⊙
WATER METER	⊙
FIRE HYDRANT	⊙
BOLLARD	⊙
ROCKERY	⊙
FLAG	⊙
ELECTRICAL BOX	⊙
JUNCTION BOX	⊙
UNKNOWN UTILITY MANHOLE	⊙
TELEPHONE MANHOLE	⊙
TELEPHONE PULL BOX	⊙
SEWER CLEANOUT	⊙
AREA DRAIN	⊙
STREET LIGHT	⊙
TRAFFIC SIGNAL POLE	⊙
TRAFFIC SIGNAL POLE WITH LIGHT	⊙
WATER MANHOLE	⊙
FIRE DEPARTMENT CONNECTION	⊙
GAS VALVE	⊙
GAS RISER	⊙
MOTION SENSOR	⊙
TELEPHONE RISER	⊙
CABLE TV BOX	⊙
EXTRUDED CONCRETE CURB	ECC
TYPICAL	(TYP)
CHAIN LINK FENCE	CLF
CONCRETE	CONC
PLANTER	PL
CONCRETE CURB & OUTER	CAG
ROLLED CURB	RC
EDGE OF PAVEMENT	EP
WHEELCHAIR RAMP	WCR
DECIDUOUS TREE	DEC
CONIFEROUS TREE	CON
ASPHALT	AC
CEDAR	C
WILLOW	W

**DATUM NOTES:**  
 HORIZONTAL DATUM IS NAD 83/91 PER CITY OF EVERETT MONUMENTATION.  
 VERTICAL DATUM IS NAVD 88 PER CITY OF EVERETT MONUMENTATION.





Plot Date: 7/14/2017 10:32 AM  
 By: Tyler J. Mischel  
 Save Date: 6/20/2017 11:50 AM  
 File: P:\050408\CAD\_Data\12017.06.08 DEA Survey\SV-TP-X-GEOE0029.dwg



TOPOGRAPHIC SURVEY  
**EVERETT SMELTER SITE**  
 LOWLAND MAPPING  
 GEO ENGINEERS  
 EVERETT, WASHINGTON

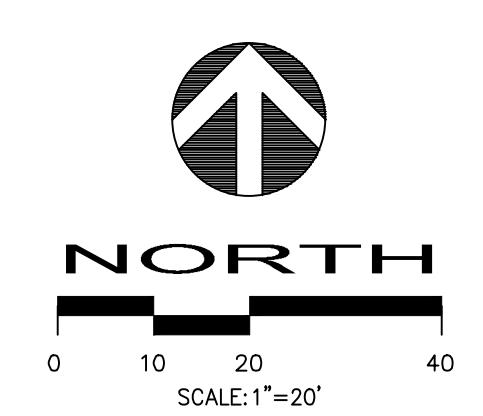
**DAVID EVANS AND ASSOCIATES INC.**  
 1620 W. Marine View Drive, Suite 200  
 Everett Washington 98201  
 Phone: 425.259.4099

REVISIONS: APPD.

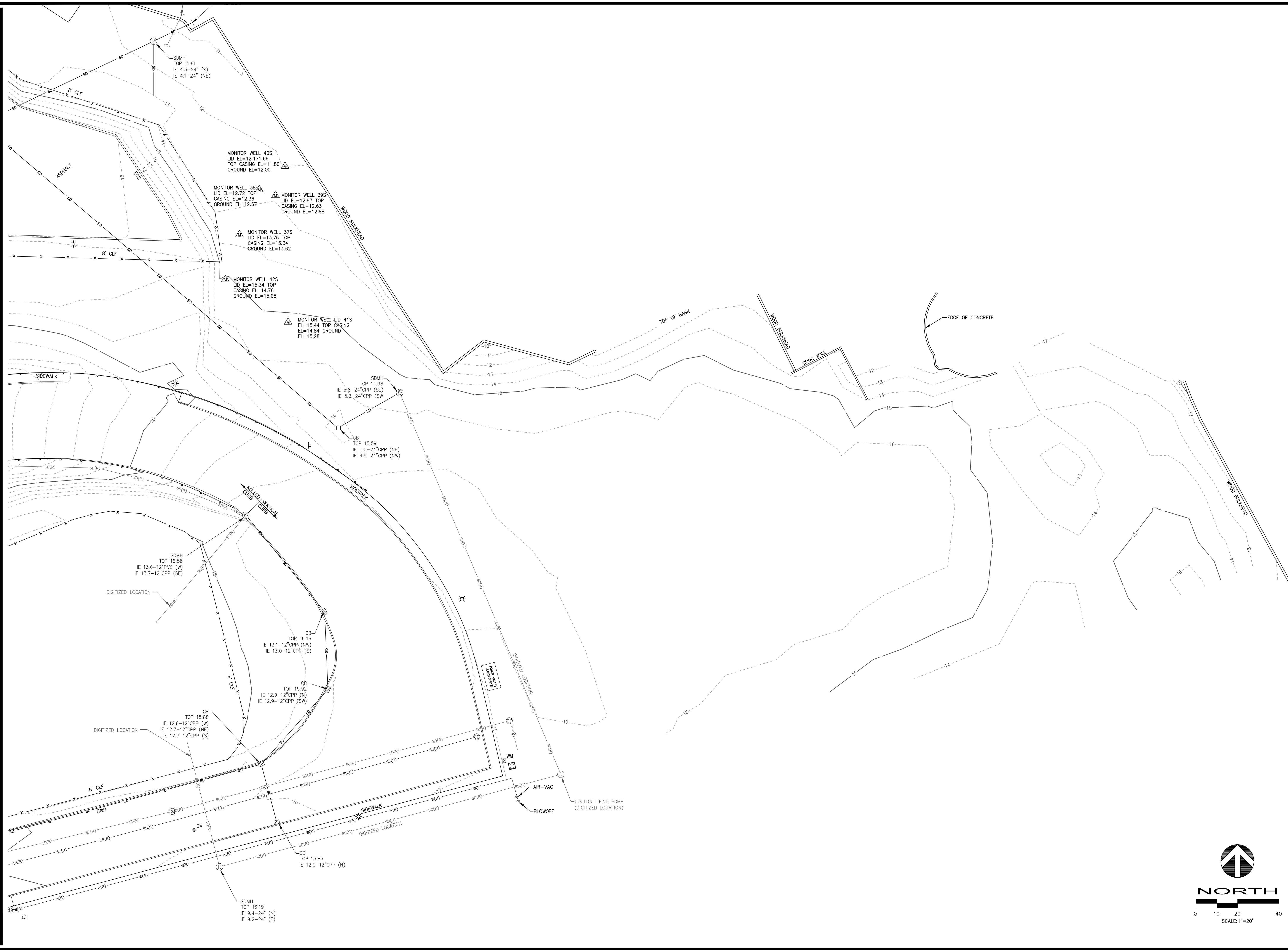
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 DRAWING FILE: SV-TP-X-GEOE0029.dwg  
 SHEET NO. 2  
 OF 6



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 By: Tye J. Michaud  
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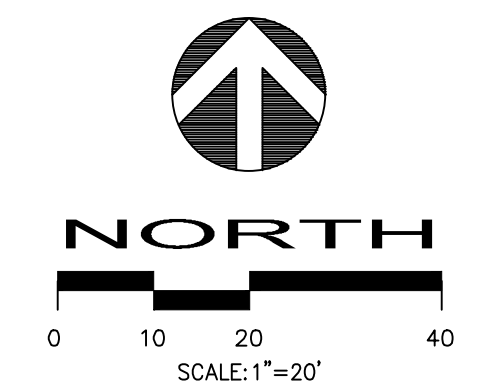
TOPOGRAPHIC SURVEY  
**EVERETT SMELTER SITE**  
**LOWLAND MAPPING**  
 GEO ENGINEERS  
 EVERETT, WASHINGTON

**DAVID EVANS AND ASSOCIATES INC.**  
 1620 W. Marine View Drive, Suite 200  
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 Phone: 425.259.4099

REVISIONS:	APPD.

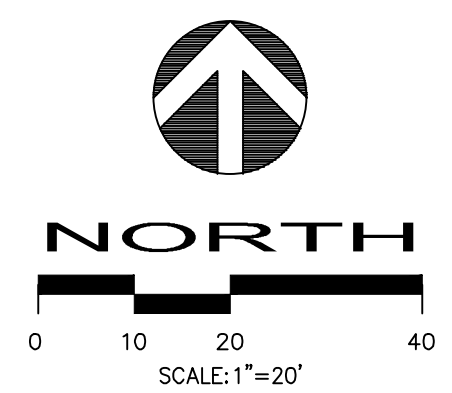
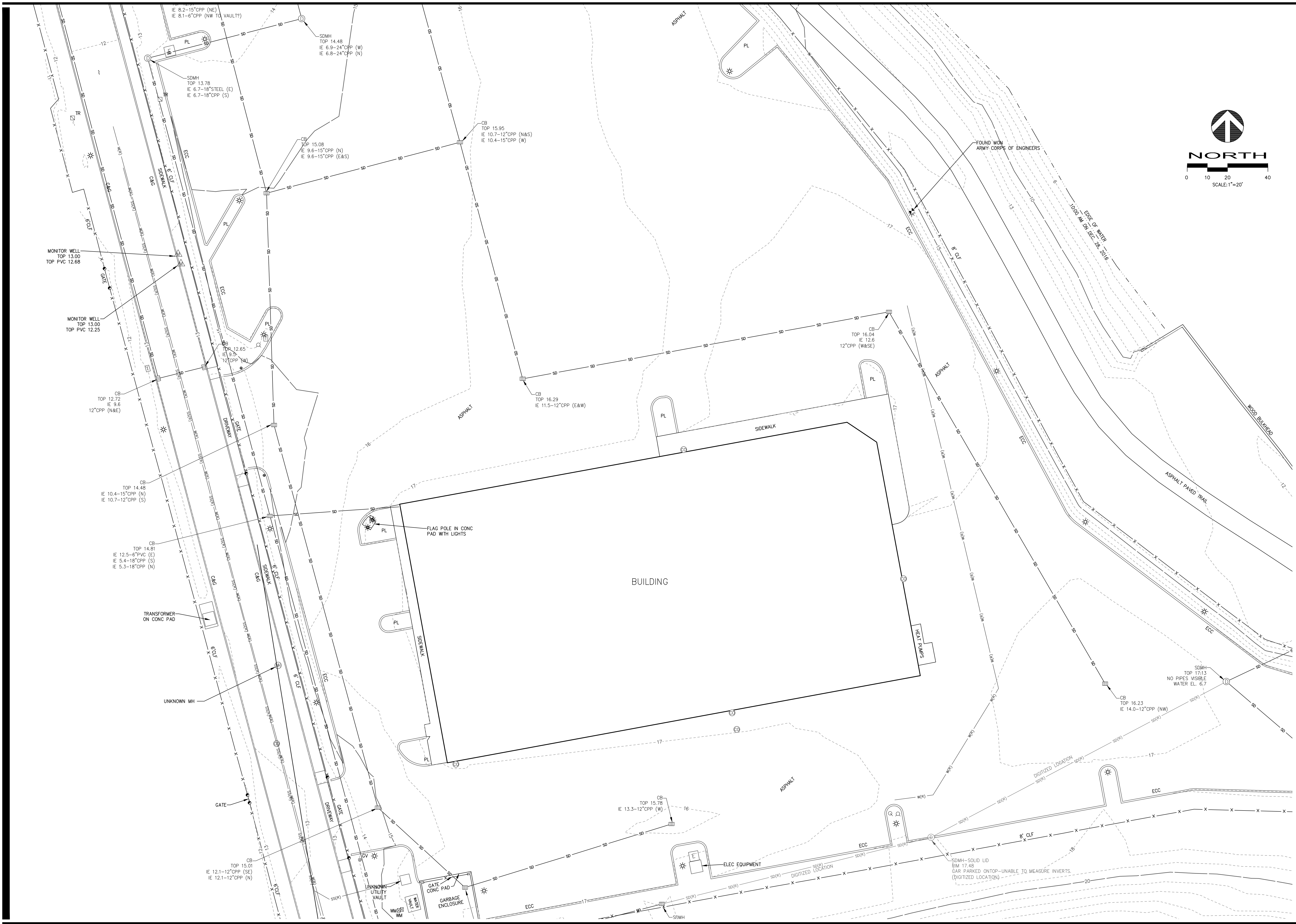
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 SHEET NO.  
**3**  
 OF 6





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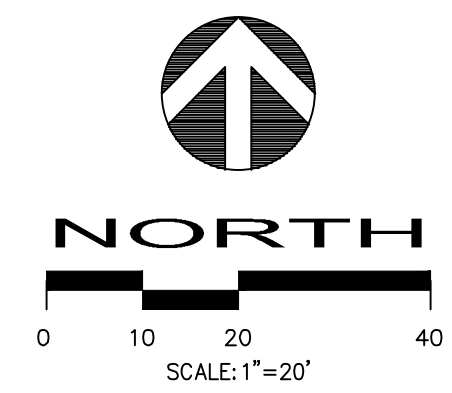


TOPOGRAPHIC SURVEY  
**EVERETT SMELTER SITE**  
**LOWLAND MAPPING**  
 GEO ENGINEERS  
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REVISIONS:	APPD.
DATE:	FEB 2, 2017
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DRAWN:	GGW
CHECKED:	
REVISION NUMBER:	
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 By: GJM File: F:\0504\08\CAD\_Data\in\2017\_06\_08 DEA Survey\SV-TP-X-GEOE0029.dwg



TOPOGRAPHIC SURVEY  
**EVERETT SMELTER SITE**  
**LOWLAND MAPPING**  
 GEO ENGINEERS  
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 Phone: 425.259.4099

REVISIONS: APPD.

DATE: FEB 2, 2017  
 DESIGN:  
 DRAWN: GGW  
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 REVISION NUMBER:

SCALE: 1"=20'

PROJECT NUMBER:  
**GEOE0029**

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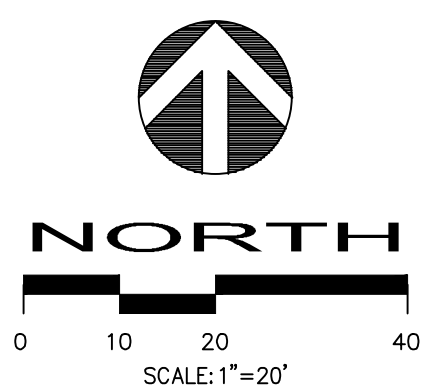
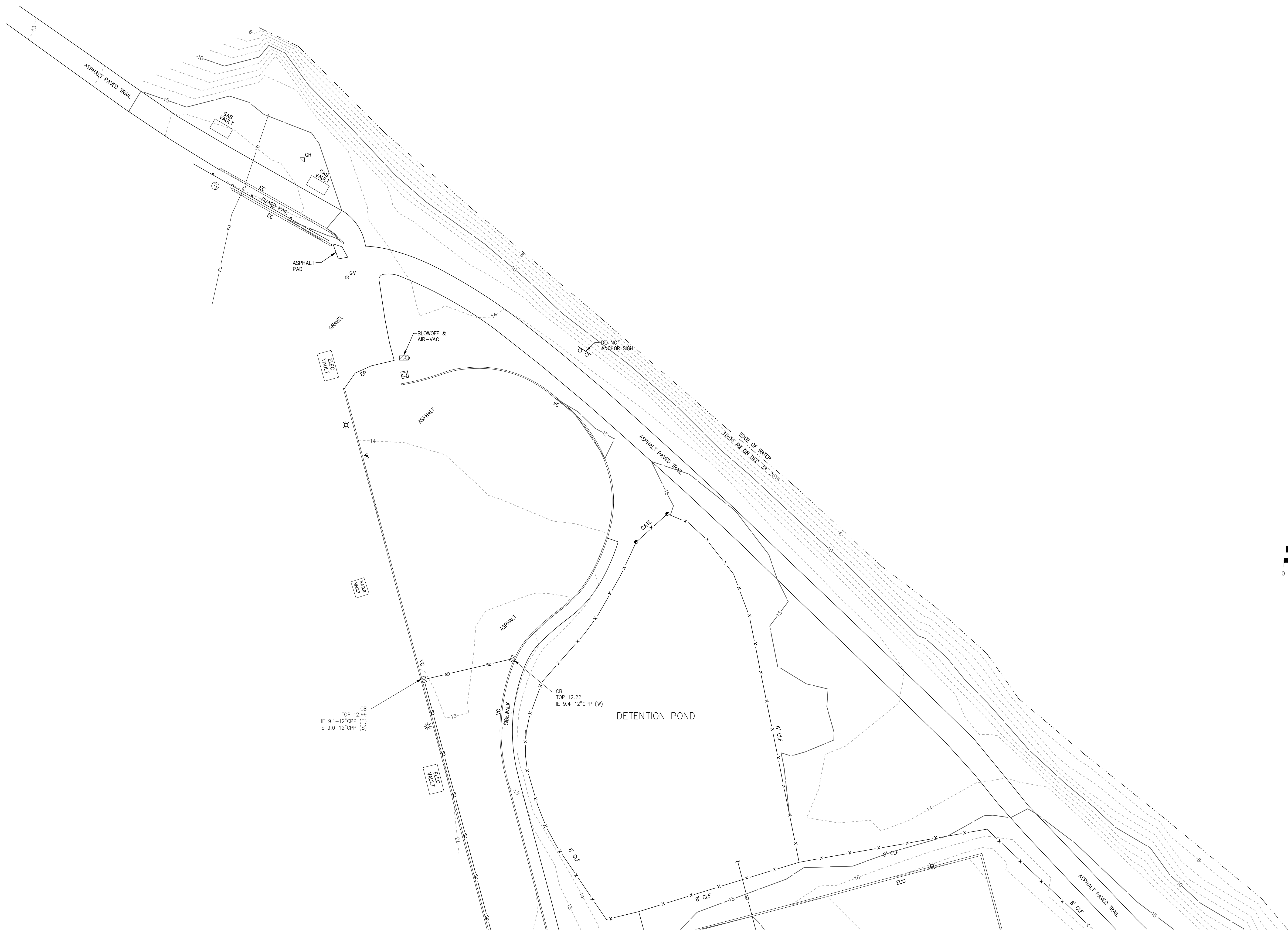
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**5**

OF 6



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 Save Date: 6/20/2017 11:50 AM  
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TOPOGRAPHIC SURVEY  
**EVERETT SMELTER SITE**  
**LOWLAND MAPPING**

GEO ENGINEERS  
 EVERETT, WASHINGTON

**DAVID EVANS**  
**AND ASSOCIATES INC.**  
 1620 W. Marine View Drive, Suite 200  
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REVISIONS: APPD.

DATE: FEB 2, 2017  
 DESIGN:  
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 CHECKED:  
 REVISION NUMBER:

SCALE: 1"=20'

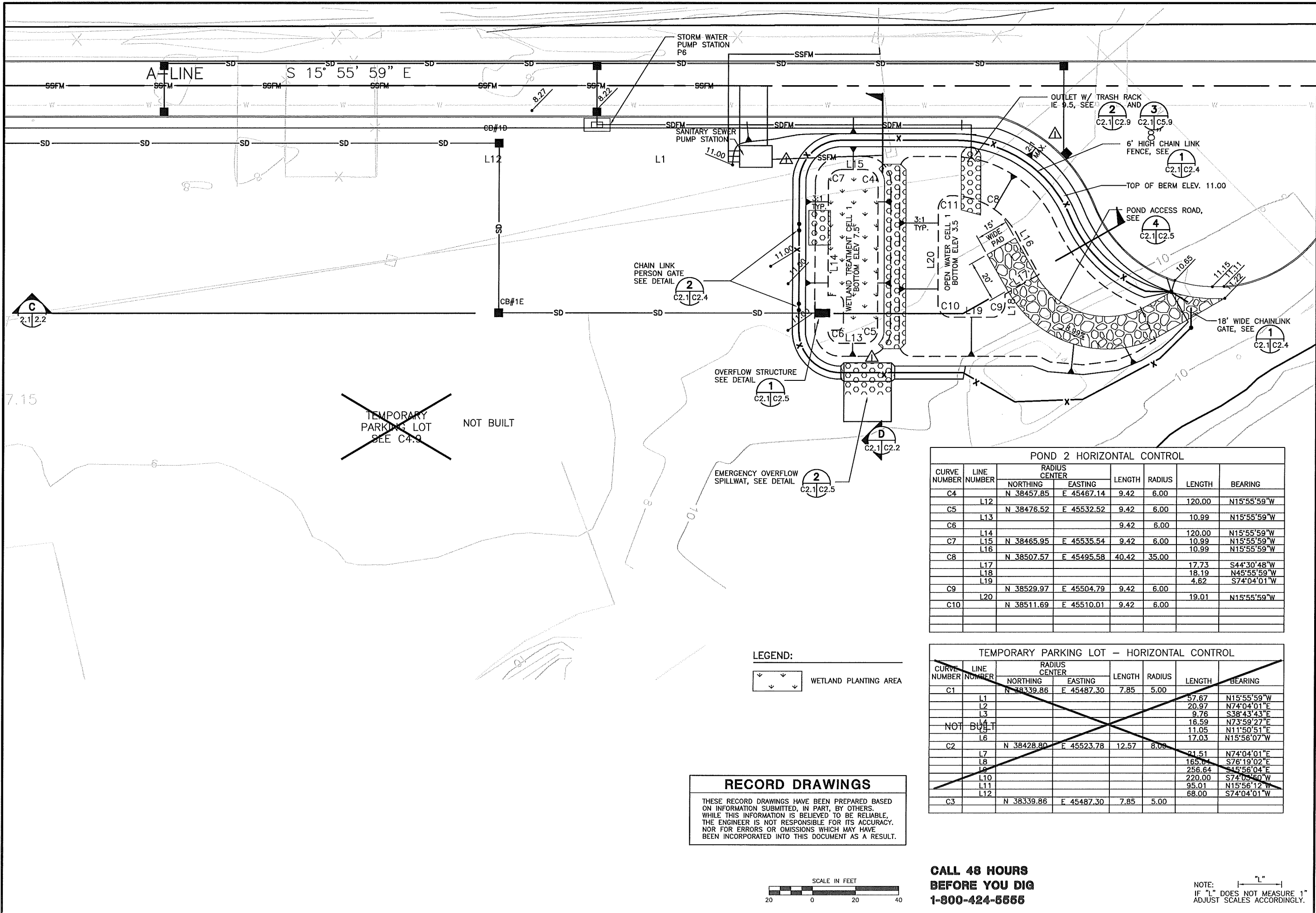
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SHEET NO.

**6**  
 OF 6

**APPENDIX B**  
**Port of Everett's Storm Drain System Record Drawings**



**POND 2 HORIZONTAL CONTROL**

CURVE NUMBER	LINE NUMBER	RADIUS CENTER		LENGTH	RADIUS	LENGTH	BEARING
		NORTHING	EASTING				
C4	L12	N 38457.85	E 45467.14	9.42	6.00	120.00	N15°55'59"W
C5	L13	N 38476.52	E 45532.52	9.42	6.00	10.99	N15°55'59"W
C6	L14			9.42	6.00	120.00	N15°55'59"W
C7	L15	N 38465.95	E 45535.54	9.42	6.00	10.99	N15°55'59"W
C8	L16	N 38507.57	E 45495.58	40.42	35.00	17.73	S44°30'48"W
	L17					18.19	N45°55'59"W
	L18					4.62	S74°04'01"W
C9	L19	N 38529.97	E 45504.79	9.42	6.00		
C10	L20	N 38511.69	E 45510.01	9.42	6.00	19.01	N15°55'59"W

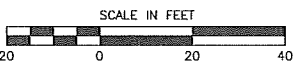
**TEMPORARY PARKING LOT - HORIZONTAL CONTROL**

CURVE NUMBER	LINE NUMBER	RADIUS CENTER		LENGTH	RADIUS	LENGTH	BEARING
		NORTHING	EASTING				
C1	L1	N 38339.86	E 45487.30	7.85	5.00	57.67	N15°55'59"W
	L2					20.97	N74°04'01"E
	L3					9.76	S38°43'43"E
	L4					18.59	N73°59'27"E
	L5					11.05	N11°50'51"E
	L6					17.03	N15°56'07"W
C2	L7	N 38428.80	E 45523.78	12.57	8.08	21.51	N74°04'01"E
	L8					165.64	S76°19'02"E
	L9					256.64	S45°56'04"E
	L10					220.00	S74°05'50"W
	L11					95.01	N15°56'12"W
C3	L12	N 38339.86	E 45487.30	7.85	5.00	68.00	S74°04'01"W

**LEGEND:**  
 WETLAND PLANTING AREA

**RECORD DRAWINGS**

THESE RECORD DRAWINGS HAVE BEEN PREPARED BASED ON INFORMATION SUBMITTED, IN PART, BY OTHERS. WHILE THIS INFORMATION IS BELIEVED TO BE RELIABLE, THE ENGINEER IS NOT RESPONSIBLE FOR ITS ACCURACY, NOR FOR ERRORS OR OMISSIONS WHICH MAY HAVE BEEN INCORPORATED INTO THIS DOCUMENT AS A RESULT.



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**1-800-424-5555**

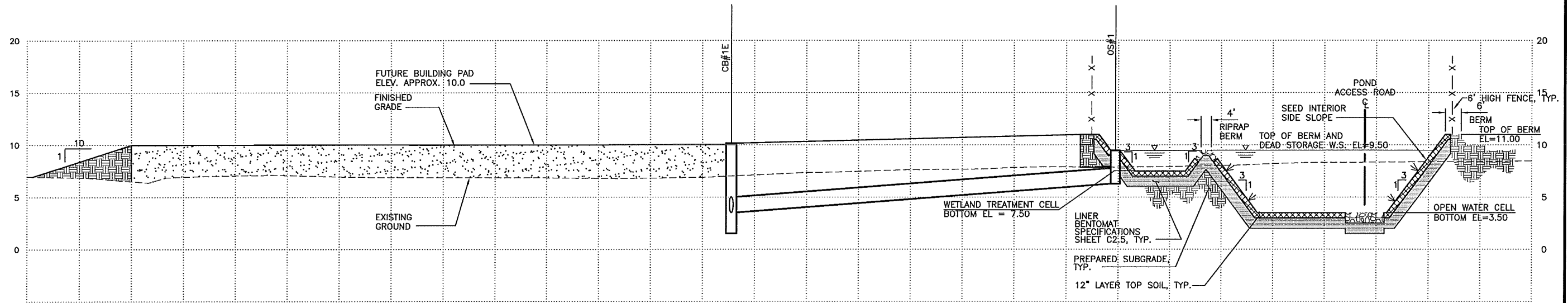
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 12/07/04 JAL ADDITIONAL SCOPE BY PORT OF EVERETT  
 11/15/04 JAL ADDENDUM  
 10/25/04 JAL ADDENDUM  
 1/13/06 JAL ADDENDUM

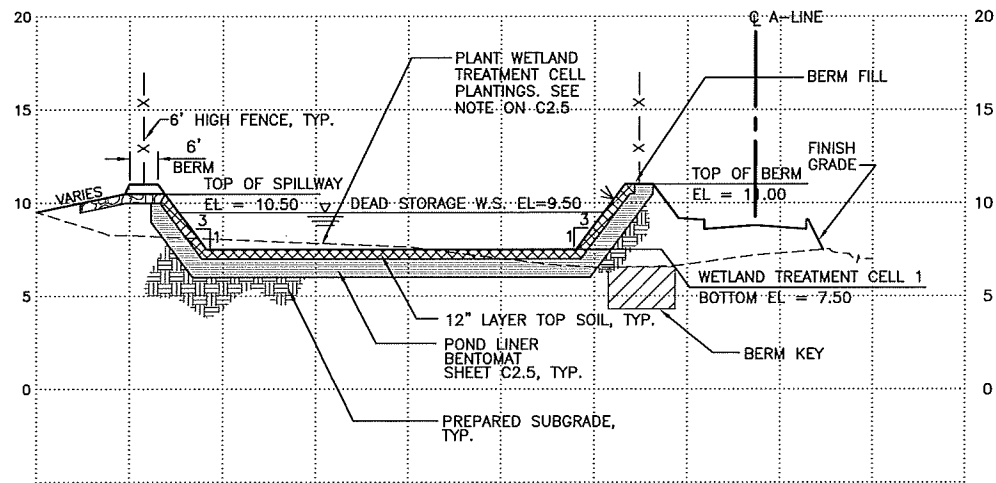
**Reid Middleton**  
 728 13th Street SW, Suite 200  
 Everett, Washington 98204  
 Ph: 425-741-3800

PORT OF EVERETT  
 RIVERSIDE BUSINESS PARK  
 STORMWATER QUALITY POND 1 AND  
 TEMPORARY PARKING LOT CONTROL PLAN

SCALE 1"=20'  
 DES. LKL SHEET NO.  
 DR. SRS  
 CH. MJW  
 F.B. - - OF SHEETS  
 DATE OCT. 2001  
 FILE NO. 21-99-041



**C SECTION-POND 1**  
 C2.1|C2.2 H=20', V=5'



**D SECTION - POND 1**  
 C2.3|C2.4 H=20', V=5'

**RECORD DRAWINGS**

THESE RECORD DRAWINGS HAVE BEEN PREPARED BASED ON INFORMATION SUBMITTED, IN PART, BY OTHERS. WHILE THIS INFORMATION IS BELIEVED TO BE RELIABLE, THE ENGINEER IS NOT RESPONSIBLE FOR ITS ACCURACY, NOR FOR ERRORS OR OMISSIONS WHICH MAY HAVE BEEN INCORPORATED INTO THIS DOCUMENT AS A RESULT.

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NOTE: IF "L" DOES NOT MEASURE 1" ADJUST SCALES ACCORDINGLY.

NO.	DATE	BY	REVISION



728 134th Street SW - Suite 200  
 Everett, Washington 98204  
 Ph. 425-741-3000

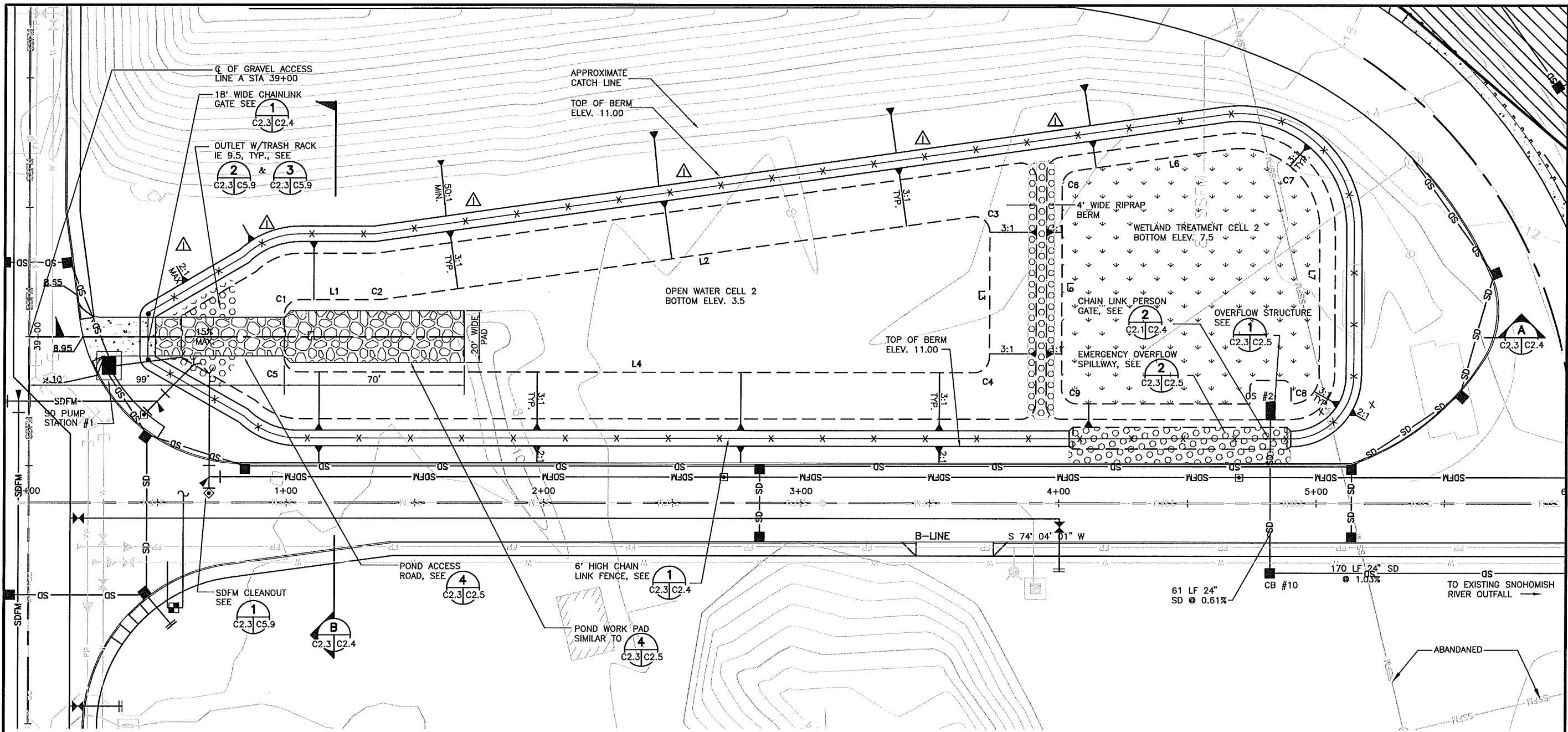
**Reid Middleton**

PORT OF EVERETT  
**RIVERSIDE BUSINESS PARK**  
**STORMWATER QUALITY POND 1**  
**DETAILS AND SECTIONS**

SCALE	AS SHOWN
DES	LKL SHEET NO.
DR	SRS
CH	MJW
F.B.	OF SHEETS
DATE	OCT. 2001
FILE NO.	21-99-041

**C2.2**





POND 2 HORIZONTAL CONTROL

CURVE NUMBER	LINE NUMBER	RADIUS CENTER		LENGTH	RADIUS	LENGTH	BEARING
		NORTHING	EASTING				
C1	L1	N 37627.5660	E 45767.0838	8.38	6.00	26.6	S15°55'59"E
C2	L2	N 37698.3331	E 45774.5461	10.26	60.00	288.44	N23°55'59"W
C3	L3	N 37730.6766	E 46010.1151	9.42	6.00	48.43	N285°55'59"W
C4	L4	N 37684.1029	E 46023.4109	9.42	6.00	282.00	N74°04'01"E
C5	L5	N 37612.1807	E 45771.4760	9.42	6.00	16.00	N105°55'59"E
C6	L6	N 37758.72	E 46043.71	8.59	6.00	60.11	S15°55'59"E
C7	L7	N 37760.25	E 46108.79	53.02	31.00	56.78	S285°55'59"W
C8	L8	N 37711.14	E 46143.61	17.28	11.00		
C9	L9	N 37683.54	E 46065.17	9.42	6.00	78.17	S74°04'01"W

- NOTES: 1. SEE SHEET C2.3 FOR SEEDING AND PLANTING SPECIFICATIONS.  
 2. POND LAYOUT IS REFERENCED TO THE INTERIOR BOTTOM OF BANK.  
 3. FOR DATUM SEE G1.1

LEGEND:

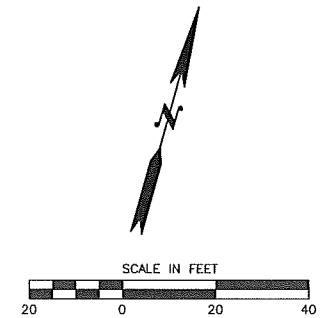


POND EARTHWORK  
 CUT = 2,830 C.Y.  
 FILL = 970 C.Y.

POND VOLUME  
 OPEN WATER CELL = 108,085 C.F.  
 WETLAND TREATMENT CELL = 20,887 C.F.  
 TOTAL DEAD STORAGE = 128,972 C.F.

RECORD DRAWINGS

THESE RECORD DRAWINGS HAVE BEEN PREPARED BASED ON INFORMATION SUBMITTED, IN PART, BY OTHERS. WHILE THIS INFORMATION IS BELIEVED TO BE RELIABLE, THE ENGINEER IS NOT RESPONSIBLE FOR ITS ACCURACY. NOR FOR ERRORS OR OMISSIONS WHICH MAY HAVE BEEN INCORPORATED INTO THIS DOCUMENT AS A RESULT.



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 1-800-424-5555

NOTE: IF "L" DOES NOT MEASURE 1" ADJUST SCALES ACCORDINGLY.

REVISION

NO. DATE BY

12/17/00 JAL ADDITIONAL SCOPE BY PORT OF EVERETT

12/07/00 JAL ADDITIONAL SCOPE BY PORT OF EVERETT

11/15/00 JAL ADDENDUM

10/25/00 JAL ADDENDUM

11/13/00 JAL ADDENDUM

11/13/00 JAL ADDENDUM

Port of Everett

728 134th Street SW Suite 200  
 Everett, Washington 98204  
 Ph: 425 741-3000

Reid Middleton

PORT OF EVERETT  
 RIVERSIDE BUSINESS PARK  
 STORMWATER QUALITY POND 2  
 PLAN

SCALE 1"=20'

DES: LKL SHEET NO.

DR: SRS

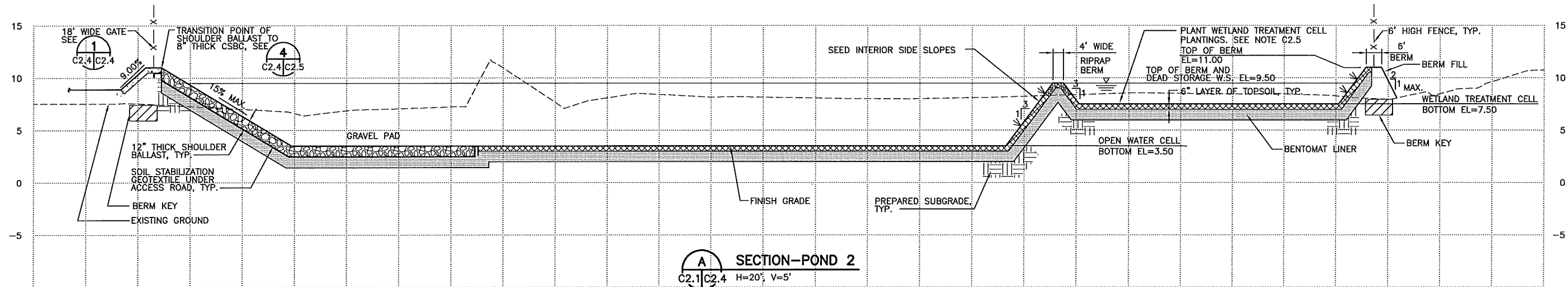
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F.D. --

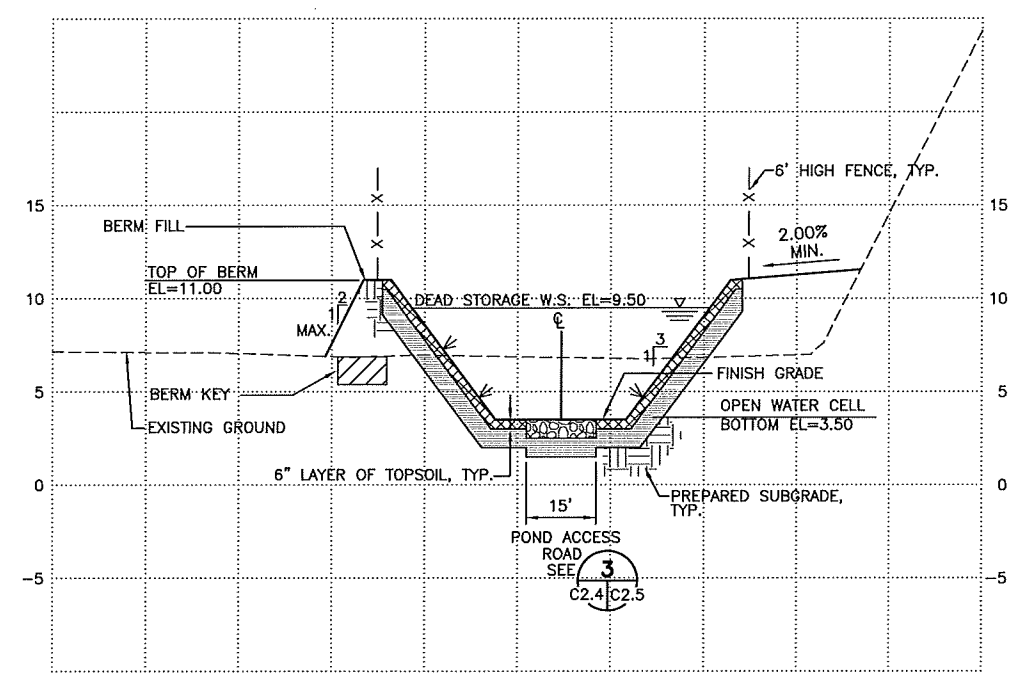
DATE OCT. 2001

FILE NO. 21-99-041

C2.3

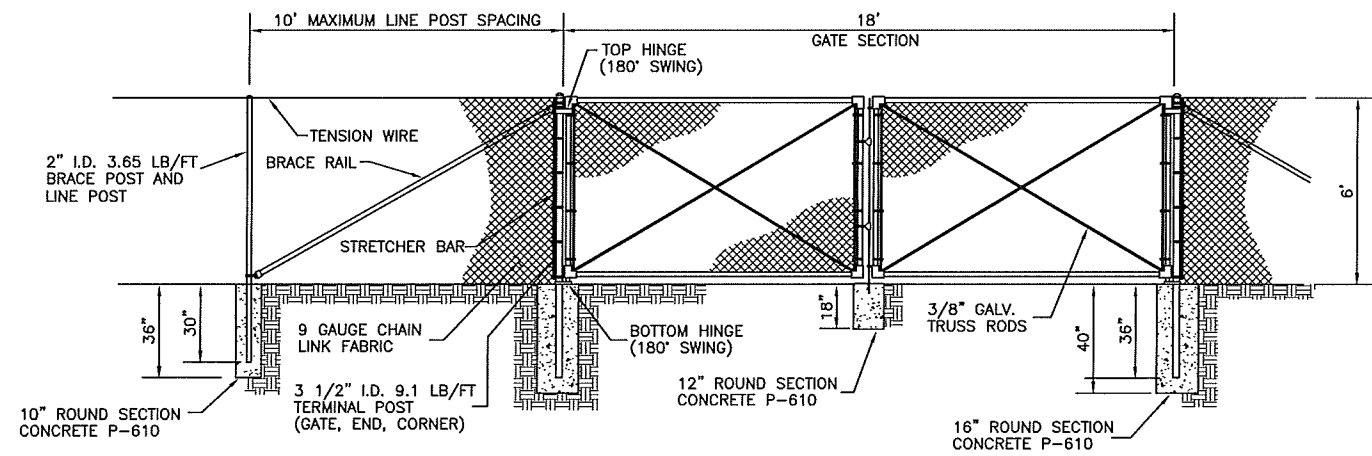


**A SECTION-POND 2**  
 C2.1/C2.4 H=20', V=5'

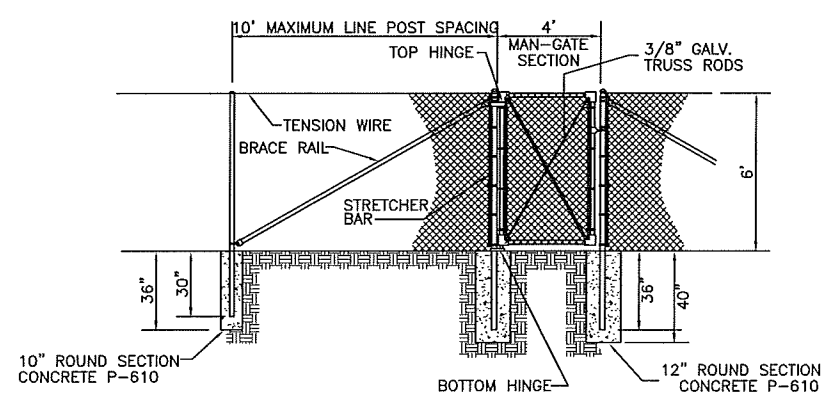


**B SECTION - POND 2**  
 C2.3/C2.4 H=20', V=5'

**NOTE:**  
 ALL STRUCTURAL FENCE MEMBERS, POSTS, RAILS, BRACE RAILS AND GATE FRAMEWORK SHALL BE GALVANIZED TUBULAR STEEL OF THE SIZES AND WEIGHTS SHOWN. GALVANIZING ON THE STRUCTURAL MEMBERS AND FABRIC SHALL BE A MINIMUM OF 2 OUNCES PER SQUARE FOOT.



**1 CHAIN LINK FENCE AND GATE DETAIL**  
 C2.1 & C2.3/C2.4 NOT TO SCALE



**2 PERSON GATE**  
 C2.1 & C2.3/C2.4 NOT TO SCALE

**RECORD DRAWINGS**  
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 IF "L" DOES NOT MEASURE 1" ADJUST SCALES ACCORDINGLY.

REVISION  
 NO. DATE BY  
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 Everett, Washington 98204  
 Ph: 425 741-3000  
**Reid Middleton**  
 PORT OF EVERETT  
 RIVERSIDE BUSINESS PARK  
 STORMWATER QUALITY POND 2  
 SECTIONS AND DETAILS  
 SCALE AS SHOWN  
 DES. LKL SHEET NO.  
 DR. SRS  
 CH. MJW  
 F.D. --- OF SHEETS  
 DATE OCT. 2001  
 FILE NO. 21-99-041  
**C2.4**

**WETLAND TREATMENT CELL PLANTING NOTES**

- REQUIRED DENSITY OF PLANTINGS IS A MINIMUM OF ONE PLANT PER 2.25 SQUARE FEET OUTSIDE OF THE SILVER LAKE DRAINAGE BASIN. PLANTS OF THE SAME TYPE SHALL BE PLANTED IN GROUPS, RATHER THAN IN A COMPLETELY RANDOM PATTERN. NATIVE PLANTS SUITED TO THE DEPTH OF WATER IN DIFFERENT PORTIONS OF THE WETLAND TREATMENT CELL SHALL BE HARDSTEM BULRUSH OR CATTAILS IN THE DEEPEST PART OF THE WETLAND TREATMENT CELL (12-30 INCHES OF WATER DEPTH). DEEP AND SHALLOW AREAS OF THE POND SHALL BE PLANTED WITH TWO OR MORE DIFFERENT SPECIES OF PLANTS.
- THE WETLAND TREATMENT CELL SHALL BE OVER-EXCAVATED A MINIMUM OF SIX INCHES AND BROUGHT UP TO FINAL GRADE WITH TOPSOIL MEETING CITY SPECIFICATIONS.
- NURSERY SOURCES FOR WETLAND VEGETATION ARE RECOMMENDED WHEREVER POSSIBLE. SMALL (2-4 INCH) CONTAINERS ARE ENCOURAGED TO AVOID TRANSPORTING LARGE AMOUNTS OF POTTING SOIL TO THE POND.
- USE NO FERTILIZER CONTAINING PHOSPHORUS IN POND OR SWALE AREAS.
- THE MINIMUM NUMBER OF EACH PLANT SHALL BE AS THE FOLLOWING:

POND	TYPE OF PLANT	MIN. NUMBER
1	HARDSTEM BULRUSH	378
1	CATTAILS	377
2	HARDSTEM BULRUSH	2,040
2	CATTAILS	2,039

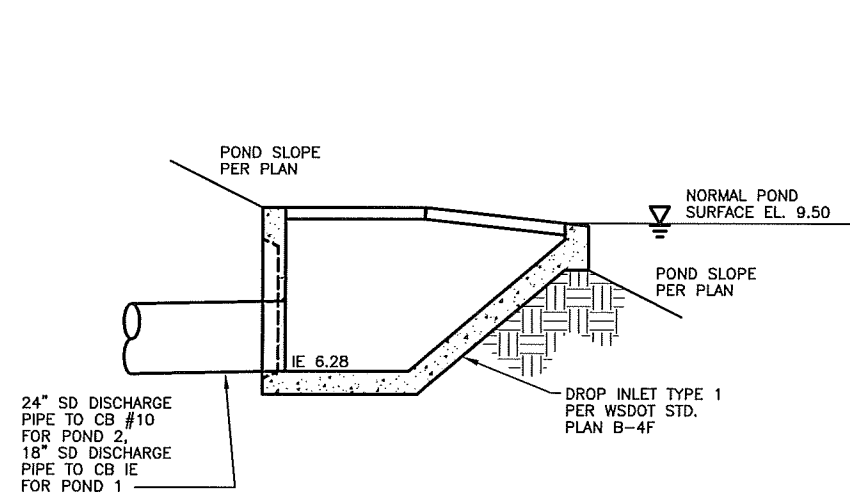
- TREES AND/OR SHRUBBERY SHALL NOT BE PLANTED ON POND RAISED BERMS OR EMBANKMENTS.

**POND SEEDING SPECIFICATIONS:**

GRASS SPECIES	% BY WEIGHT
MEADOW FOXTAIL	40%
ALTA FESCUE	25%
REDTOP BENT GRASS	20%
RED FESCUE	10%
BIRDSFOOT TREFOIL	5%

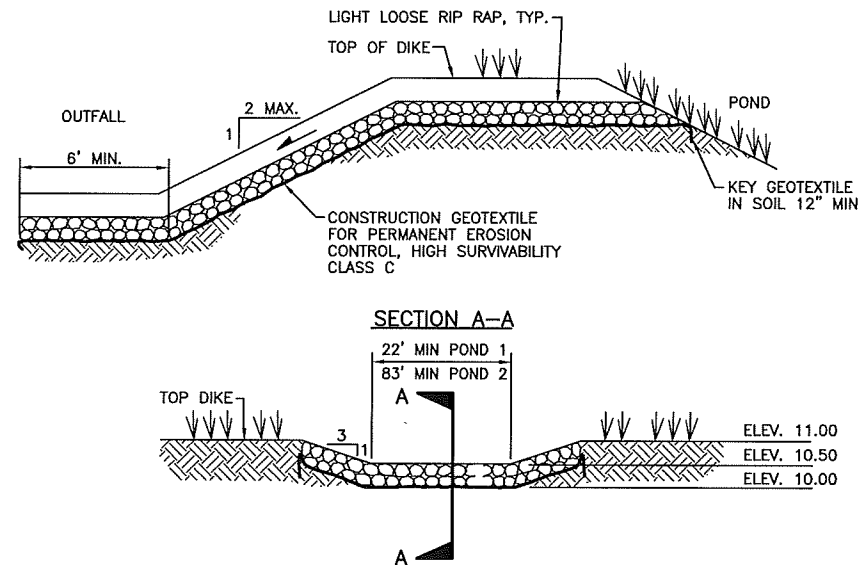
**NOTE:**

- GRASS SEED SHALL BE APPLIED AT 2.5 TO 3 LBS. PER 1000 SQ. FEET.



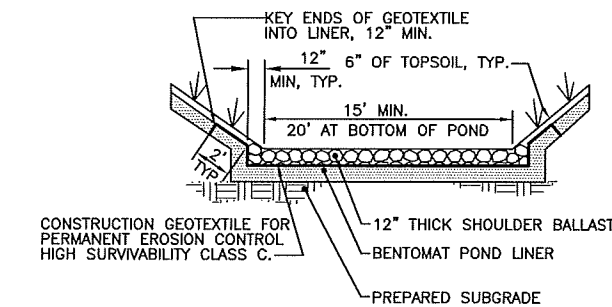
**1 OVERFLOW STRUCTURE**

VARIES | C2.5 NOT TO SCALE



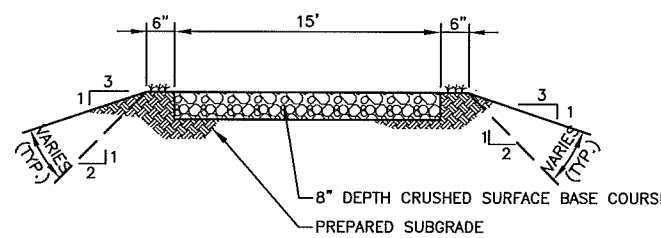
**2 EMERGENCY OVERFLOW SPILLWAY**

VARIES | C2.5 NOT TO SCALE



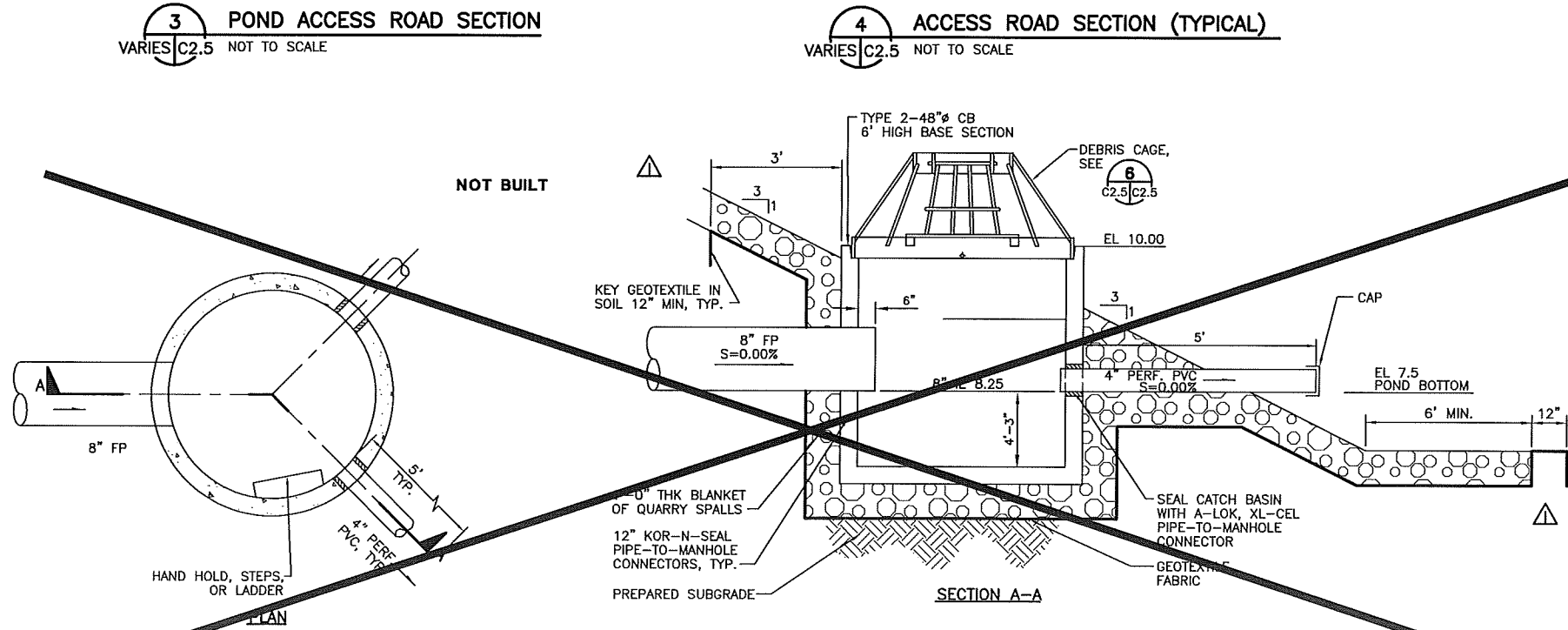
**3 POND ACCESS ROAD SECTION**

VARIES | C2.5 NOT TO SCALE



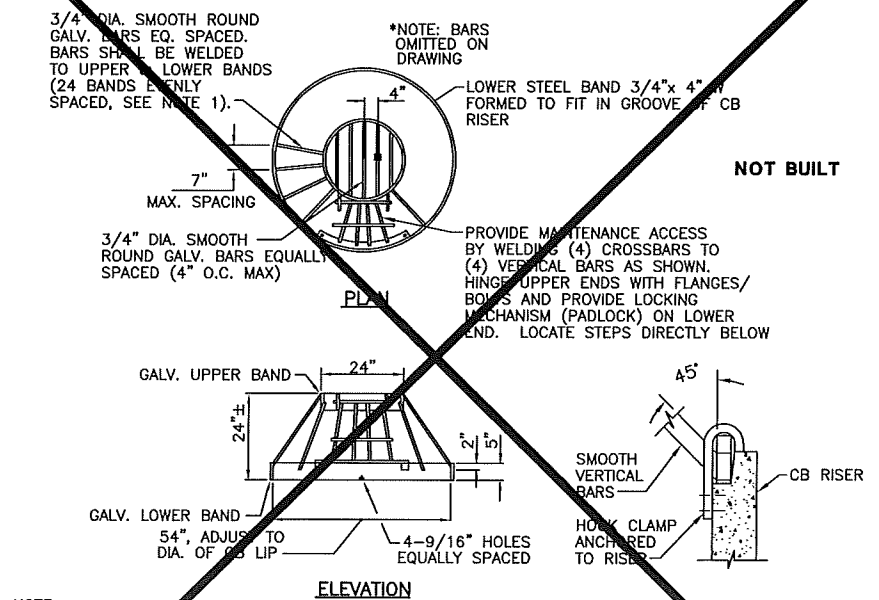
**4 ACCESS ROAD SECTION (TYPICAL)**

VARIES | C2.5 NOT TO SCALE



**5 PIPE PROTECTION DISCHARGE STRUCTURE**

VARIES | C2.5 NOT TO SCALE



**NOTE:**

- METAL PARTS MUST BE CORROSION RESISTANT: STEEL BARS MUST BE GALVANIZED.

**6 DEBRIS CAGE**

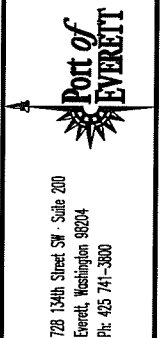
VARIES | C2.5 NOT TO SCALE

**RECORD DRAWINGS**  
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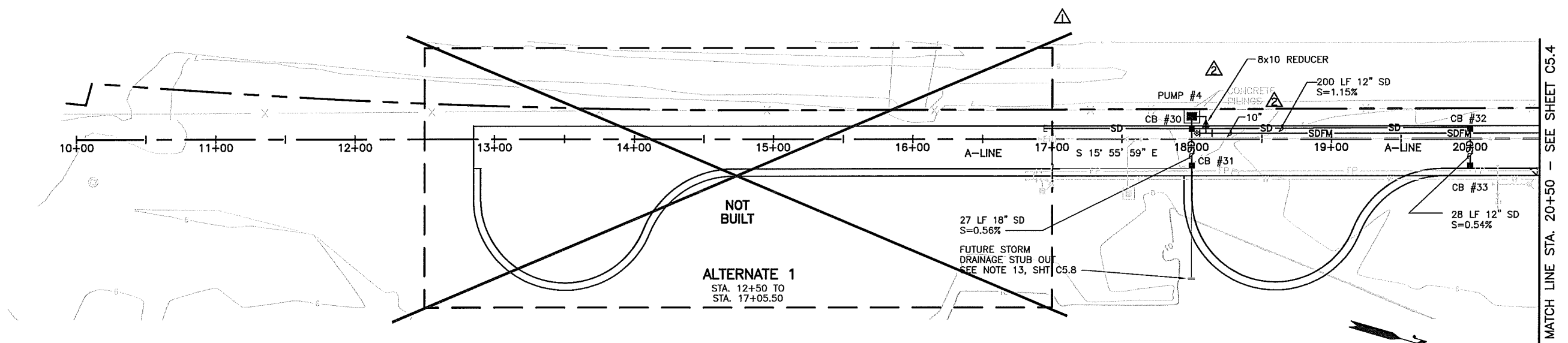
NO.	DATE	BY	REVISION
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2	12/07/00	JAL	ADDITIONAL SCOPE BY PORT OF EVERETT
3	11/15/00	JAL	ADDENDUM
4	10/25/00	JAL	ADDENDUM
5	11/13/00	JAL	ADDENDUM



**Red Middleton**  
 708 134th Street, SW - Suite 200  
 Everett, Washington 98204  
 P.O. 425 741-3800

PORT OF EVERETT  
**RIVERSIDE BUSINESS PARK**  
**STORMWATER QUALITY PONDS**  
**SECTIONS AND DETAILS**

SCALE AS SHOWN	
DES: LKL	SHEET NO.
DR: SRS	<b>C2.5</b>
CH: MJW	
F.B. ---	OF SHEETS
DATE: OCT. 2001	
FILE NO: 21-99-041	

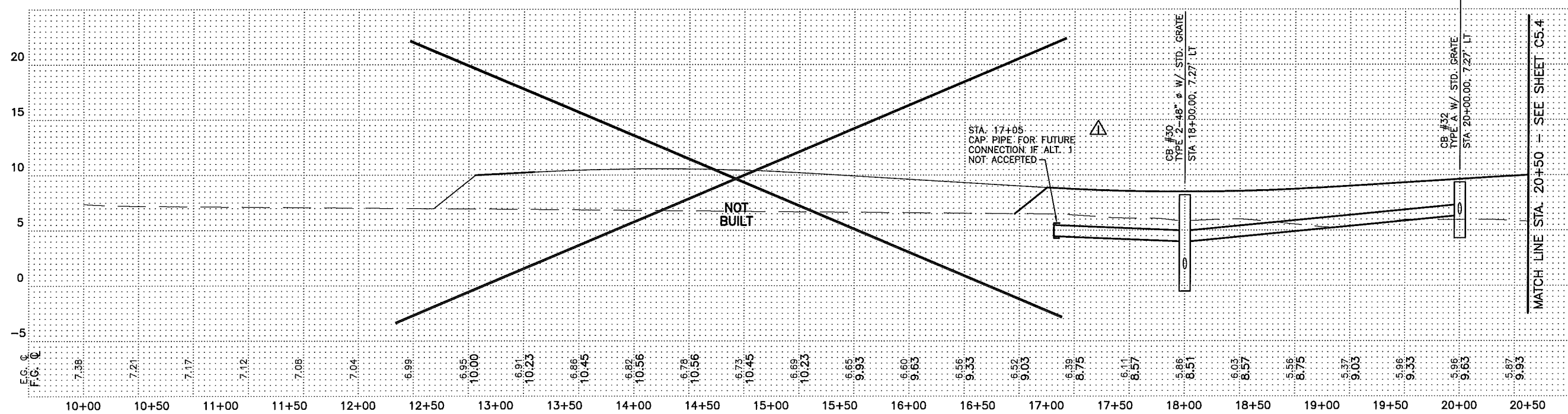


**STRUCTURE TABLE**

CB NO.	CB TYPE	G.E.	INVERTS	GRATE TYPE/ MANHOLE LID	STATION	OFFSET @ C TO CTR CB
PUMP #4			18" (E) = 1.25		18+00.00	16.00' LT
CB #30	2 - 48" DIA.	8.20	12" (S & N) = 4.00 18" (E & W) = 1.35	STANDARD	18+00.00	7.27' LT
CB #31	2 - 48" DIA.	8.20	18" (E & W) = 1.50	STANDARD	18+00.00	19.27' RT
CB #32	A	9.45	12" (E & S) = 6.30	STANDARD	20+00.00	8.16' LT
CB #33	A	9.45	12" (W) = 6.45	STANDARD	20+00.00	20.16' RT
*CB #34	A	9.35	12" (S & N) = 5.00	STANDARD	16+00.00	8.16' LT
*CB #35	A	9.35	12" (W) = 6.35	STANDARD	16+00.00	20.16' RT
*CB #36	A	10.30	12" (S,E & N) = 5.95	STANDARD	14+16.00	8.16' LT
*CB #37	A	10.00	12" (W) = 7.0	STANDARD	14+16.00	46.50' RT
*CB #38	A	9.80	12" (E & N) = 6.55	STANDARD	13+00.00	8.16' LT
*CB #39	A	9.70	12" (W) = 6.70	STANDARD	12+90.50	21.00' RT
CB #40	NOT USED					

\* CATCH BASINS INCLUDED IN BID ALTERNATIVE 1.

**NOTE:**  
1. FOR DATUM INFORMATION SEE SHEET G1.1



**RECORD DRAWINGS**

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**RECORD DRAWING**

NO. DATE BY

10/25/06 JAL

11/15/06 JAL

12/07/06 JAL

02/17/07 JAL

ADDITIONAL SCOPE BY PORT OF EVERETT

ADDITIONAL SCOPE BY PORT OF EVERETT

ADDENDUM

ADDENDUM

ADDENDUM

728 134th Street SW, Suite 200  
Everett, Washington 98204  
Ph: 425 741-3800

ReidMiddleton

PORT OF EVERETT

RIVERSIDE BUSINESS PARK

A-LINE STORM DRAINAGE PLAN & PROFILE

STA. 10+00 TO STA. 20+50

SCALE  
1" = 40' H, 1" = 5' V

DESIGNER: LKL

DRAWN: mg

CHECKED: MJW

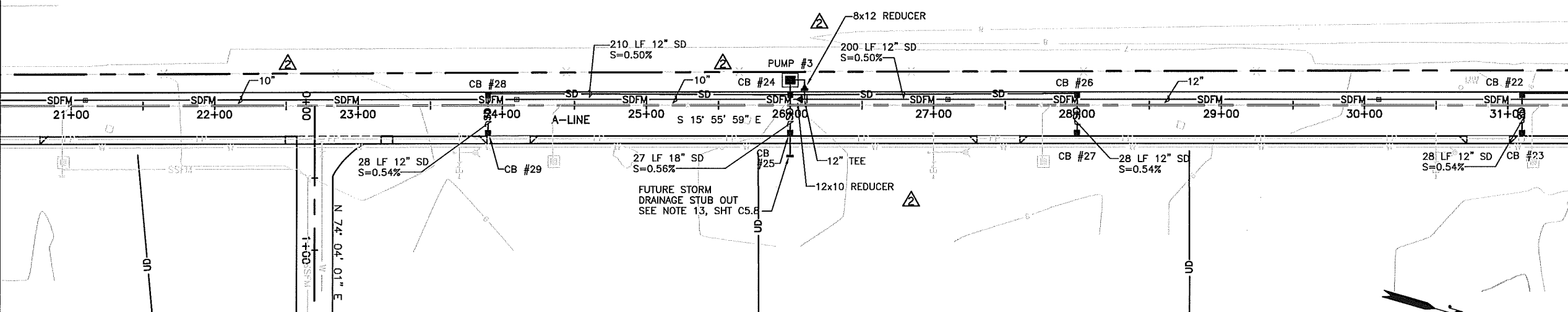
DATE: OCT. 2001

FILE NO.: 21-99-041



MATCH LINE STA. 20+50 - SEE SHEET C5.3

MATCH LINE STA. 31+50 - SEE SHEET C5.5



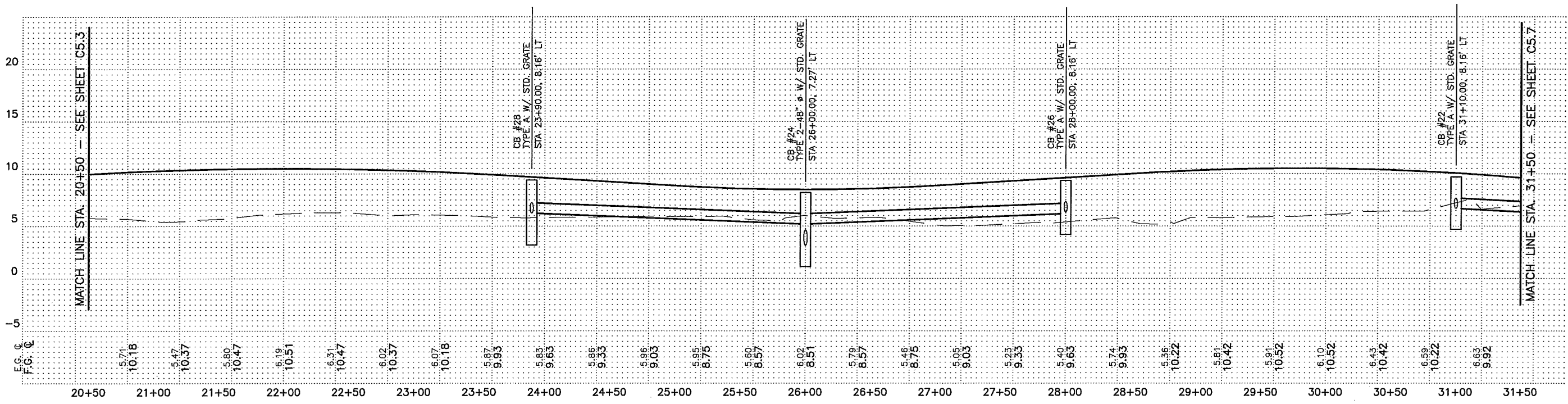
STRUCTURE TABLE

CB NO.	CB TYPE	G.E.	INVERTS	GRATE TYPE/ MANHOLE LID	STATION	OFFSET
CB #22	A	9.70	12" (E & N) = 6.55	STANDARD	31+10.00	8.16' LT
CB #23	A	9.70	12" (W) = 6.70	STANDARD	31+10.00	20.16' RT
PUMP #3			18" (E) = 2.95		26+00	16.00' RT
CB #24	2 - 48" DIA.	8.20	12" (S & N) = 5.20	STANDARD	26+00	7.27' LT
			18" (E & W) = 3.00			
CB #25	2 - 48" DIA.	8.20	18" (E & W) = 3.15	STANDARD	26+00	19.27' RT
CB #26	A	9.35	12" (E & S) = 6.20	STANDARD	28+00	8.16' LT
CB #27	A	9.35	12" (W) = 6.35	STANDARD	28+00	20.16' RT
CB #28	A	9.40	18" (E & N) = 6.25	STANDARD	23+90.00	8.16' LT
CB #29	A	9.40	12" (W) = 6.40	STANDARD	23+90.00	20.16' RT

NOTE:  
1. FOR DATUM INFORMATION SEE SHEET G1.1

MATCH LINE STA. 20+50 - SEE SHEET C5.3

MATCH LINE STA. 31+50 - SEE SHEET C5.7



**RECORD DRAWINGS**  
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NOTE:  
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Everett, Washington 98204  
Ph: 425 741-3900

**Reid Middleton**

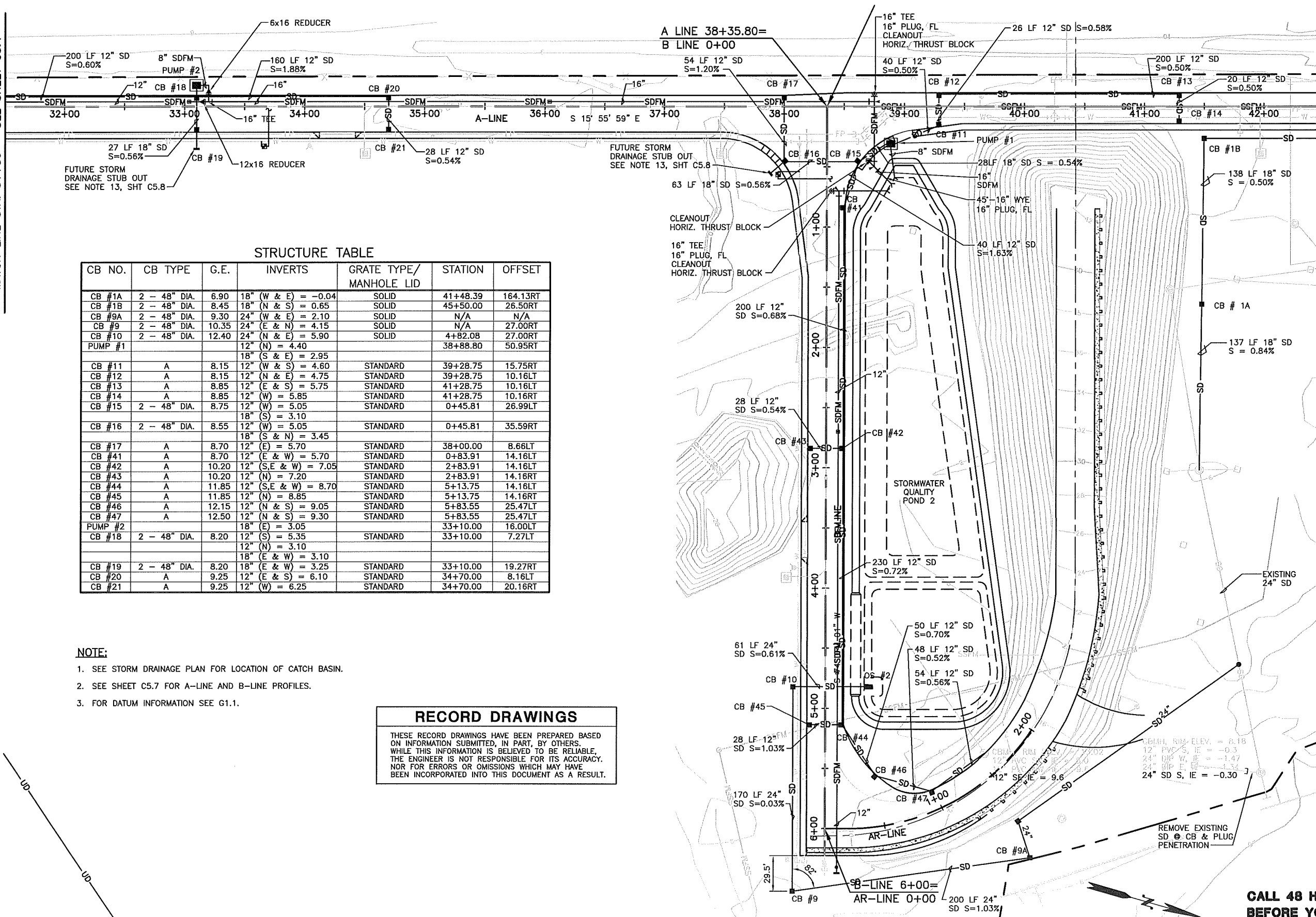
PORT OF EVERETT  
RIVERSIDE BUSINESS PARK  
A-LINE STORM DRAINAGE PLAN & PROFILE  
STA. 20+50 TO STA. 31+50

SCALE  
1"=40' H, 1"=5' V  
DES: LKL SHEET NO.  
DR: mg C5.4  
CH: MJW  
F.B.: -- OF SHEETS  
DATE OCT. 2001  
FILE NO. 21-99-041

NO.	DATE	BY	REVISION
1	7/17/00	JAL	REVISIONS PER CITY COMMENTS

MATCH LINE STA. 31+50 - SEE SHEET C5.4

MATCH LINE STA. 42+50 - SEE SHEET C5.6



STRUCTURE TABLE

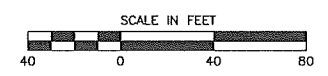
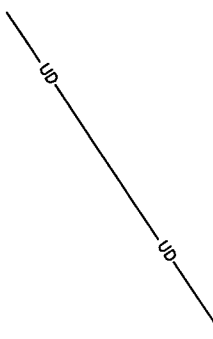
CB NO.	CB TYPE	G.E.	INVERTS	GRATE TYPE/ MANHOLE LID	STATION	OFFSET
CB #1A	2 - 48" DIA.	6.90	18" (W & E) = -0.04	SOLID	41+48.39	164.13RT
CB #1B	2 - 48" DIA.	8.45	18" (N & S) = 0.65	SOLID	45+50.00	26.50RT
CB #9A	2 - 48" DIA.	9.30	24" (W & E) = 2.10	SOLID	N/A	N/A
CB #9	2 - 48" DIA.	10.35	24" (E & N) = 4.15	SOLID	N/A	27.00RT
CB #10	2 - 48" DIA.	12.40	24" (N & E) = 5.90	SOLID	4+82.08	27.00RT
PUMP #1			12" (N) = 4.40		38+88.80	50.95RT
			18" (S & E) = 2.95			
CB #11	A	8.15	12" (W & S) = 4.60	STANDARD	39+28.75	15.75RT
CB #12	A	8.15	12" (N & E) = 4.75	STANDARD	39+28.75	10.16LT
CB #13	A	8.85	12" (E & S) = 5.75	STANDARD	41+28.75	10.16LT
CB #14	A	8.85	12" (W) = 5.85	STANDARD	41+28.75	10.16RT
CB #15	2 - 48" DIA.	8.75	12" (W) = 5.05	STANDARD	0+45.81	26.99LT
			18" (S) = 3.10			
CB #16	2 - 48" DIA.	8.55	12" (W) = 5.05	STANDARD	0+45.81	35.59RT
			18" (S & N) = 3.45			
CB #17	A	8.70	12" (E) = 5.70	STANDARD	38+00.00	8.66LT
CB #41	A	8.70	12" (E & W) = 5.70	STANDARD	0+83.91	14.16LT
CB #42	A	10.20	12" (S, E & W) = 7.05	STANDARD	2+83.91	14.16LT
CB #43	A	10.20	12" (N) = 7.20	STANDARD	2+83.91	14.16RT
CB #44	A	11.85	12" (S, E & W) = 8.70	STANDARD	5+13.75	14.16LT
CB #45	A	11.85	12" (N) = 8.85	STANDARD	5+13.75	14.16RT
CB #46	A	12.15	12" (N & S) = 9.05	STANDARD	5+83.55	25.47LT
CB #47	A	12.50	12" (N & S) = 9.30	STANDARD	5+83.55	25.47LT
PUMP #2			18" (E) = 3.05		33+10.00	16.00LT
CB #18	2 - 48" DIA.	8.20	12" (S) = 5.35	STANDARD	33+10.00	7.27LT
			12" (N) = 3.10			
			18" (E & W) = 3.10			
CB #19	2 - 48" DIA.	8.20	18" (E & W) = 3.25	STANDARD	33+10.00	19.27RT
CB #20	A	9.25	12" (E & S) = 6.10	STANDARD	34+70.00	8.16LT
CB #21	A	9.25	12" (W) = 6.25	STANDARD	34+70.00	20.16RT

**NOTE:**

- SEE STORM DRAINAGE PLAN FOR LOCATION OF CATCH BASIN.
- SEE SHEET C5.7 FOR A-LINE AND B-LINE PROFILES.
- FOR DATUM INFORMATION SEE G1.1.

**RECORD DRAWINGS**

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**RECORD DRAWING**

NO.	DATE	BY	REVISIONS PER CITY COMMENTS
1	7/17/00	JAL	

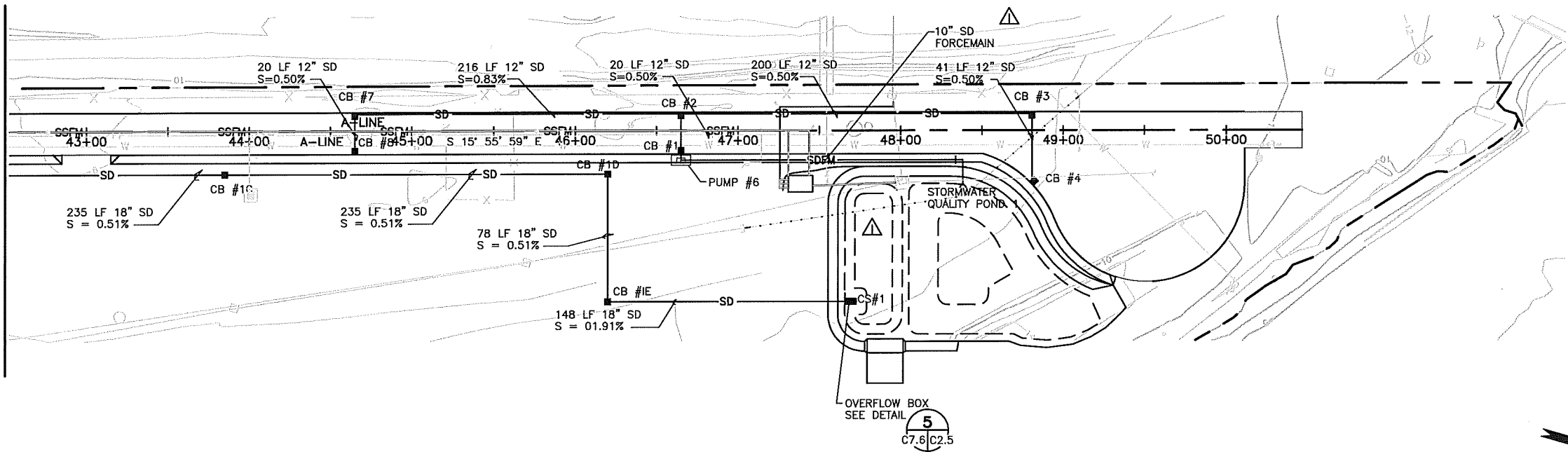
**Port of Everett**  
 728 134th Street SW, Suite 200  
 Everett, Washington 98204  
 Ph. 425 741-3800

**Reid Middleton**

PORT OF EVERETT  
 RIVERSIDE BUSINESS PARK  
 A-LINE STA. 31+50 TO STA. 42+50 AND  
 B-LINE STA. 0+00 TO STA. 6+22.05  
 STORM DRAINAGE PLAN

SCALE 1"=40' H. 1"=5' V.  
 DES. LKL SHEET NO. C5.5  
 DR. mg  
 CH. MJW  
 DATE OCT. 2001  
 FILE NO. 21-99-041

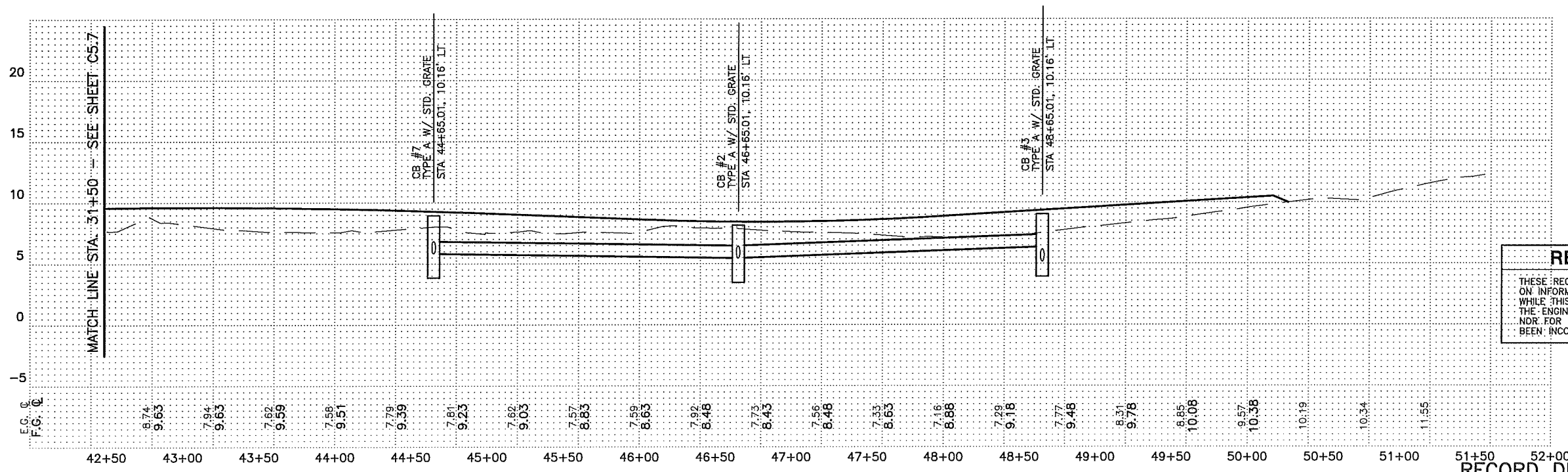
MATCH LINE STA. 42+50 - SEE SHEET C5.5



STRUCTURE TABLE

CB NO.	CB TYPE	G.E.	INVERTS	GRATE TYPE/ MANHOLE LID	STATION	OFFSET
CB #1C	2-48" DIA.	7.85	18" (N & S) = 1.85	SOLID	43+85.00	26.50' RT
CB #1D	2-48" DIA.	8.60	18" (E & S) = 3.05	SOLID	46+20.00	26.50' RT
CB #1E	2-48" DIA.	10.40	18" (N & W) = 3.45	SOLID	46+20.00	104.58' RT
PUMP #6		9.00	12" (W) = 3.90	STANDARD	46+65.01	18.00' RT
			12" (E) = 5.80			
			18" (N) = 1.45			
CB #2A	A	9.15	12" (E, W & S) = 5.90	STANDARD	46+70.00	36.50' RT
CB #2B	A	9.10	12" (N) = 6.10	STANDARD	46+30.00	36.50' RT
CB #2C	A	10.40	12" (S & W) = 6.95	STANDARD	46+70.00	136.50' RT
CB #2D	A	10.45	12" (N) = 7.75	STANDARD	45+10.00	136.50' RT
CB #8	A	8.95	12" (W) = 5.95	STANDARD	44+65.01	10.16' RT
CB #7	A	8.95	12" (E & N) = 5.85	STANDARD	44+65.01	10.16' RT
CB #6	NOT USED					
CB #5	A	11.10	12" (E & N) = 8.00	STANDARD	50+16.48	10.16' LT
CB #4	A	8.25	12" (W) = 5.25	STANDARD	48+65.01	10.16' RT
CB #3	A	9.15	12" (E & N) = 5.05	STANDARD	48+80.08	10.16' LT
CB #2	A	8.20	12" (W) = 4.05	STANDARD	48+80.08	10.16' LT
CB #1	A	8.20	12" (W & E) = 3.95	STANDARD	46+65.01	10.16' RT

NOTE:  
1. FOR DATUM INFORMATION SEE SHEET G1,1



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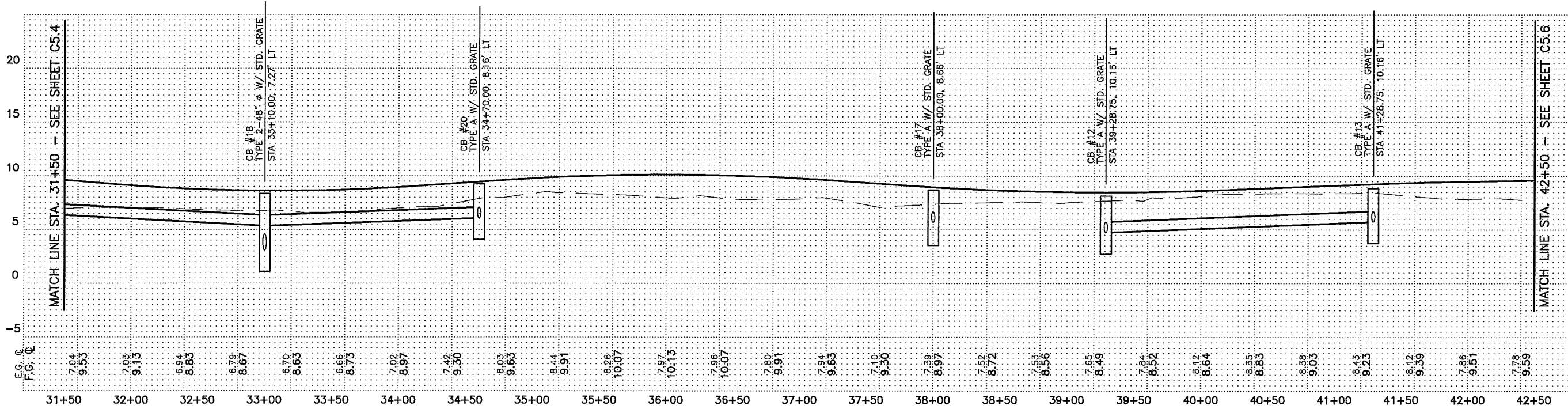
PORT OF EVERETT  
 RIVERSIDE BUSINESS PARK  
 A-LINE STORM DRAINAGE PLAN & PROFILE  
 STA. 42+50 TO STA. 51+55.72

REID MIDDLETON  
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 Everett, Washington 98204  
 Ph: 425-741-3800

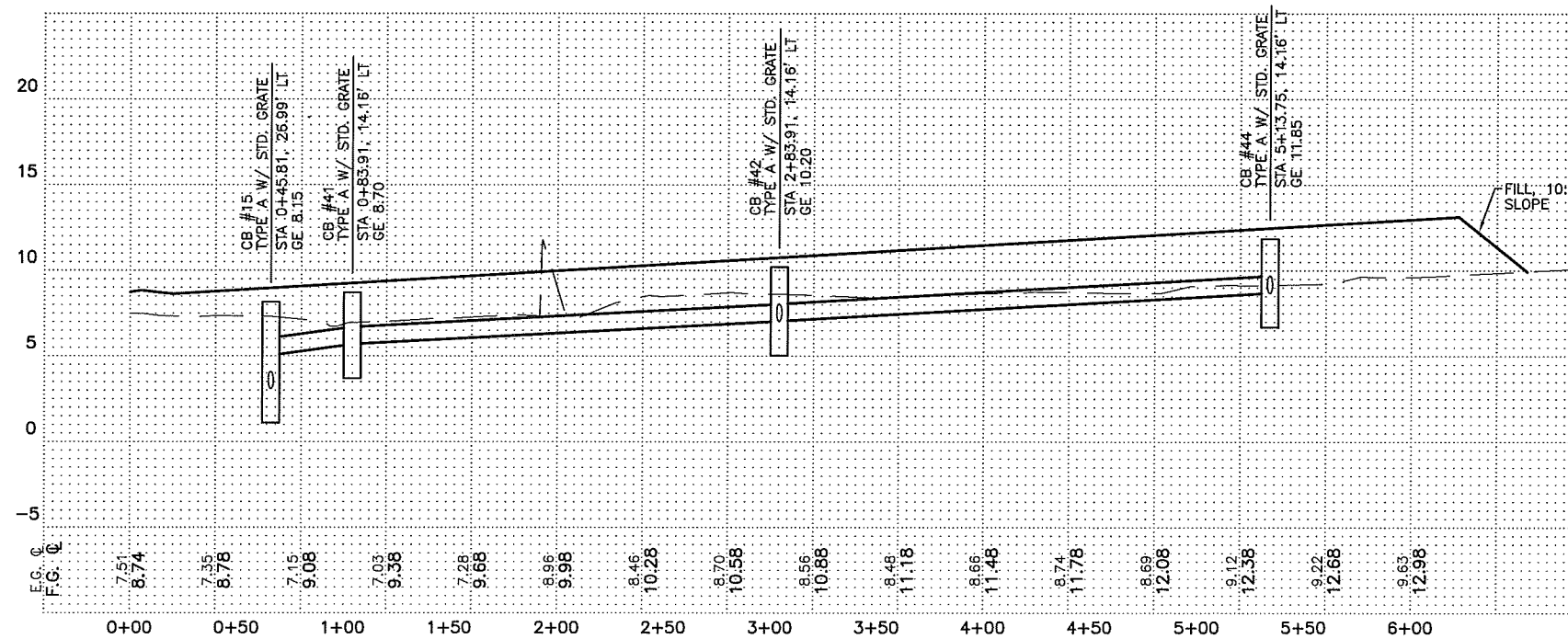
ADDITIONAL SCOPE BY PORT OF EVERETT  
 ADDITIONAL SCOPE BY PORT OF EVERETT  
 ADDENDUM  
 ADDENDUM  
 ADDENDUM  
 ADDENDUM

NO.	DATE	BY
1	12/17/08	JAL
2	12/07/08	JAL
3	11/15/08	JAL
4	10/25/08	JAL
5	11/13/08	JAL

SCALE 1" = 40' H, 1" = 5' V  
 DES: LKL  
 DR: mg  
 CH: MJW  
 F.B.:  
 DATE: OCT. 2001  
 SHEET NO. C5.6  
 OF SHEETS  
 FILE NO. 21-99-041



A-LINE PROFILE



B-LINE PROFILE

**NOTE:**

1. FOR DATUM INFORMATION SEE SHEET G1.1
2. SEE SHEET C5.5 FOR A-LINE AND B-LINE PLANS.

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PORT OF EVERETT  
RIVERSIDE BUSINESS PARK  
A-LINE STA. 31+50 TO STA. 42+50 AND  
B-LINE STA. 0+00 TO STA. 6+22.05  
STORM DRAINAGE PROFILE

SCALE	1"=40' H, 1"=5' V
DES.	LKL
DR.	mg
CH.	MJW
F.B.	
DATE	OCT. 2001
FILE NO.	21-99-041

SHEET NO. C5.7

REVISION

NO. DATE BY

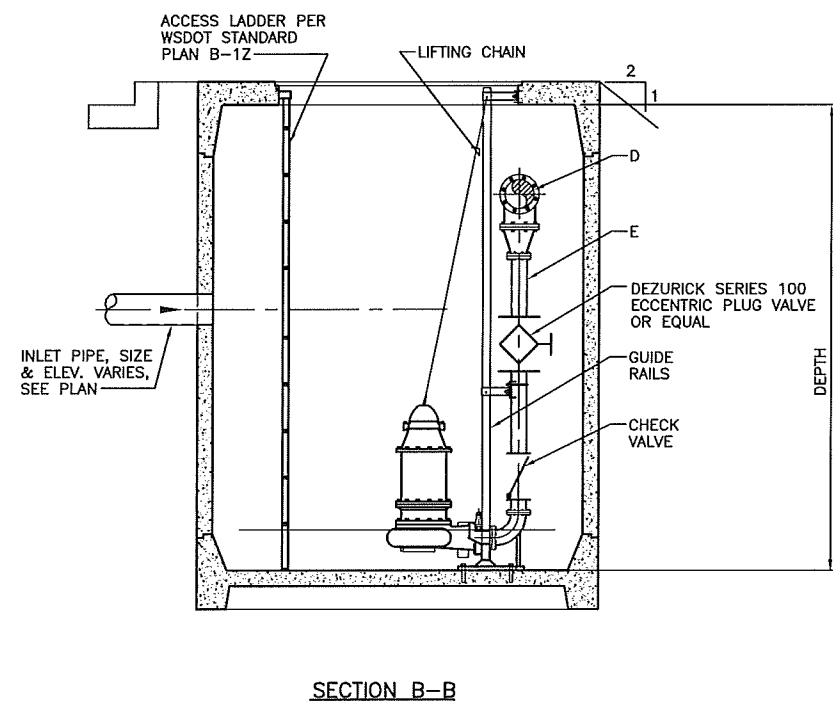
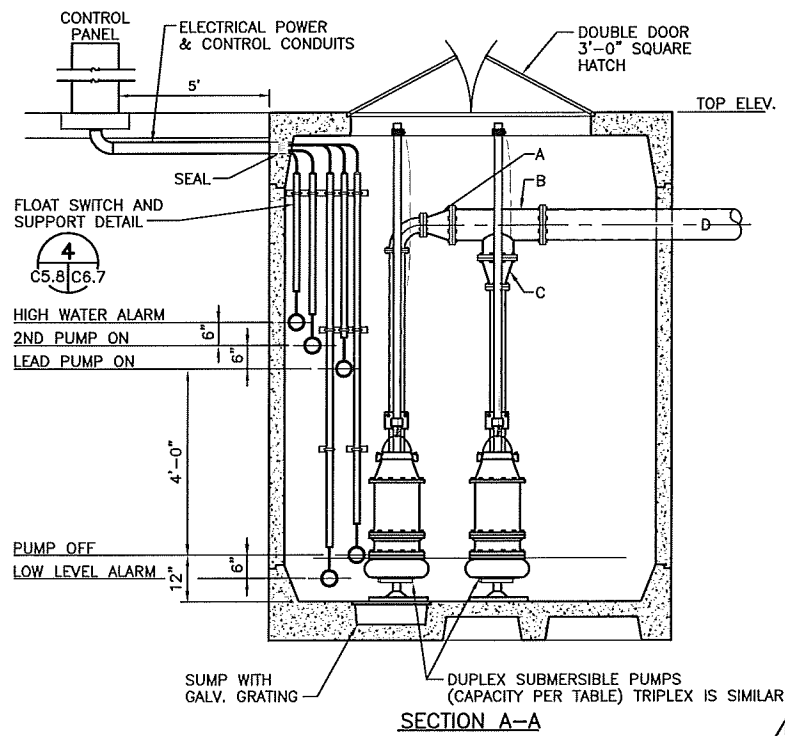
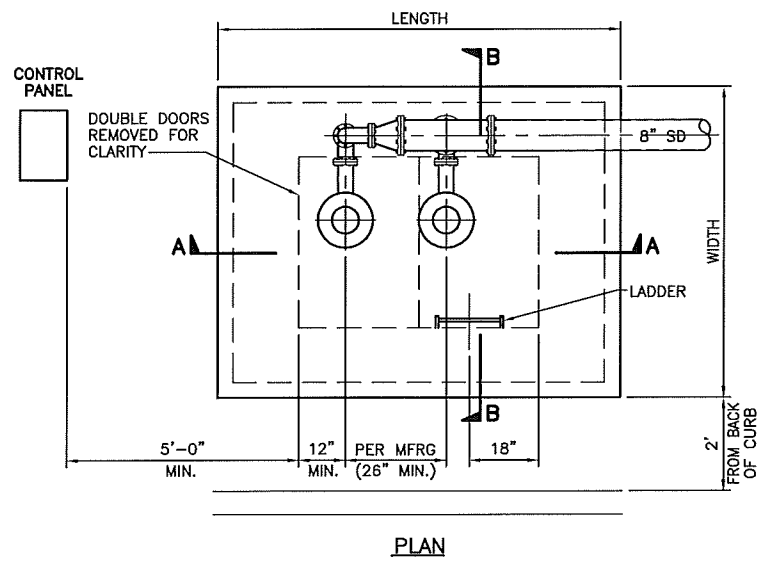


STORM DRAIN PUMP STATION DATA									
PUMP STATION #	INTERIOR DIMENSIONS			TOP ELEV.	PIPE AND FITTING DIMENSIONS				
	LENGTH	WIDTH	DEPTH		A.	B.	C.	D.	E.
1	8	6	12	9.10	8x4 REDUCER	8x8x8 TEE	8x4 REDUCER	8" SD	4" SD
2	8	6	10	8.50	6x4 REDUCER	6x6x6 TEE	6x4 REDUCER	6" SD	4" SD
3	8	6	10	8.50	8x4 REDUCER	8x8x8 TEE	8x4 REDUCER	8" SD	4" SD
4	12	6	10	8.50	8x4 REDUCER	8x8x8 TEE	8x4 REDUCER	8" SD	4" SD
6	12	6	11	9.00	6x10 REDUCER	10x10x10 TEE	6x10 REDUCER	10" SD	6" SD

STORM DRAIN PUMP DATA					
PUMP STATION #	STATION TYPE	CURVE POINT 1		CURVE POINT 2	
		Q GPM	TDH FT	Q GPM	TDH FT
1	DUPLEX	537	15	550	14.5
2	DUPLEX	500	17.5	625	15
3	DUPLEX	525	25	700	17.5
4	TRIPLEX	430	31.5	630	17.5
6	DUPLEX	1130	18.5	1350	17

- NOTES:**
- PUMP CAPACITY IS PER PUMP.
  - ALL PUMP STATIONS SHALL BE DUPLEX OR TRIPLEX, AS SHOWN ON THE TABLE. PROVIDE GUIDE RAILS TO ALLOW PUMP TO BE REMOVED FROM THE SURFACE.
  - PUMPS, LEVEL SWITCHES AND CONTROL PANEL SHALL BE THE RESPONSIBILITY OF A SINGLE VENDOR.
  - PUMPS SHALL ALTERNATE LEAD AND LAG.
  - PIPE AND FITTINGS SHALL BE GROOVED END CLDIP, CLASS 51 FOR 4" AND CLASS 50 FOR 6" AND LARGER. ALL HARDWARE SHALL BE GALVANIZED AFTER FABRICATION.
  - VAULT SHALL BE MODEL 687-LA OR 612-LA BY UTILITY VAULT, WITH EXTENSIONS. TOP SHALL BE MODEL 687-TL-2-332P OR 612-TL-2-332P WITH 3'-0" SQUARE LOCKING STEEL DOUBLE DOOR COVERS.
  - FOR TRIPLEX PUMP STATIONS, INSTALL AN ADDITIONAL FLOAT SWITCH FOR THE THIRD PUMP ON. SWITCH TO BE 6" ABOVE SECOND PUMP ON. RAISE HIGH WATER ALARM TO 6" ABOVE THIRD PUMP ON.

- STORM DRAINAGE NOTES:**
- NO PART OF THE DRAINAGE SYSTEM SHALL BE COVERED, CONCEALED, OR PUT INTO USE UNTIL IT HAS BEEN TESTED, INSPECTED, AND ACCEPTED BY THE CITY.
  - ALL STORM DRAIN WORK MUST BE STAKED BY SURVEY FOR LINE AND GRADE PRIOR TO STARTING CONSTRUCTION.
  - CATCH BASINS SHALL BE TYPE A, TYPE B AND TYPE 2 PER CITY/WSDOT STANDARD PLAN NUMBERS AS FOLLOWS:
- | CITY OF EVERETT STD. PLAN TITLE | STD. PLAN NO. |
|---------------------------------|---------------|
| CATCH BASIN TYPE A              | 402           |
| CATCH BASIN TYPE B              | 403           |
| CATCH BASIN TYPE 2 (48" TO 54") | 404           |
- | WSDOT STD. PLAN TITLE           | STD. PLAN |
|---------------------------------|-----------|
| CATCH BASIN TYPE 2 (60" TO 96") | B-1e      |
- STORM DRAIN (SD) PIPE SHALL BE ONE OF THE FOLLOWING:
    - DOUBLE WALLED (SMOOTH INTERIOR) CORRUGATED HIGH DENSITY POLYETHYLENE STORM SEWER PIPE (CPEP)
    - DUCTILE IRON PIPE (DIP)
- PIPE, PIPE JOINTS, AND FITTINGS SHALL MEET THE REQUIREMENTS OF AASHTO M294 TYPE S
- STORM DRAIN FORCE MAIN (SDFM) SHALL BE CL. 52 DUCTILE IRON PIPE.
  - SOLID LOCKING COVERS SHALL BE INSTALLED PER CITY STD. PLAN 406B. STANDARD GRATES SHALL BE INSTALLED PER CITY STD. PLAN 406A.
  - OFFSET DISTANCES ARE MEASURED FROM CONSTRUCTION LINES TO CENTERLINES OF STRUCTURES.
  - MINIMUM COVER FOR STORM DRAIN PIPE MATERIAL IS AS FOLLOWS:
    - HDPE & CPEP 2'-0" COVER
    - DIP 1'-0" COVER
  - CATCH BASINS LOCATED ALONG A CURB SHALL BE INSTALLED AT THE FOLLOWING DISTANCES MEASURED FROM THE FACE OF CURB TO THE CENTER OF STRUCTURE:
- | CB TYPE    | OFFSET (FT.) |
|------------|--------------|
| A          | 0.84         |
| 2-48" DIA. | 1.73         |
- BEDDING FOR PIPE IN TRENCHES SHALL BE PER STD. CITY PLAN 611. THE TYPICAL TRENCH SECTION SHALL BE PER STD. CITY PLAN 610. THE TYPICAL TRENCH COMPACTION SHALL BE PER STD. CITY PLAN 615.
  - STORMWATER DETENTION FACILITIES, STORM DRAINAGE PIPES, AND CATCH BASINS SHALL BE FLUSHED AND CLEANED PRIOR TO ACCEPTANCE.
  - SUBMIT - SUBMIT THE FOLLOWING ACCORDING TO THE CONDITIONS OF THE CONTRACT AND DIVISION 1 SPECIFICATION SECTIONS:
    - CATALOG CUTS AND SPECIFICATIONS FOR PIPE FITTINGS, MANHOLES, CATCH BASINS, CASTINGS AND ACCESSORIES
    - SIEVE ANALYSIS REPORTS FOR EACH AGGREGATE MATERIAL
    - WSDOT PIT CERTIFICATION
  - STUB-OUT FOR FUTURE STORM DRAINAGE SHALL BE 10 L.F. 18" SD AT 0.5%.



**1** STORM DRAIN PUMP STATION DETAIL  
C5.1-C5.7/C5.8 SCALE: 1/2"=1'-0"

**RECORD DRAWINGS**

THESE RECORD DRAWINGS HAVE BEEN PREPARED BASED ON INFORMATION SUBMITTED, IN PART, BY OTHERS. WHILE THIS INFORMATION IS BELIEVED TO BE RELIABLE, THE ENGINEER IS NOT RESPONSIBLE FOR ITS ACCURACY. NOR FOR ERRORS OR OMISSIONS WHICH MAY HAVE BEEN INCORPORATED INTO THIS DOCUMENT AS A RESULT.

NOTE: IF "L" DOES NOT MEASURE 1" ADJUST SCALES ACCORDINGLY.

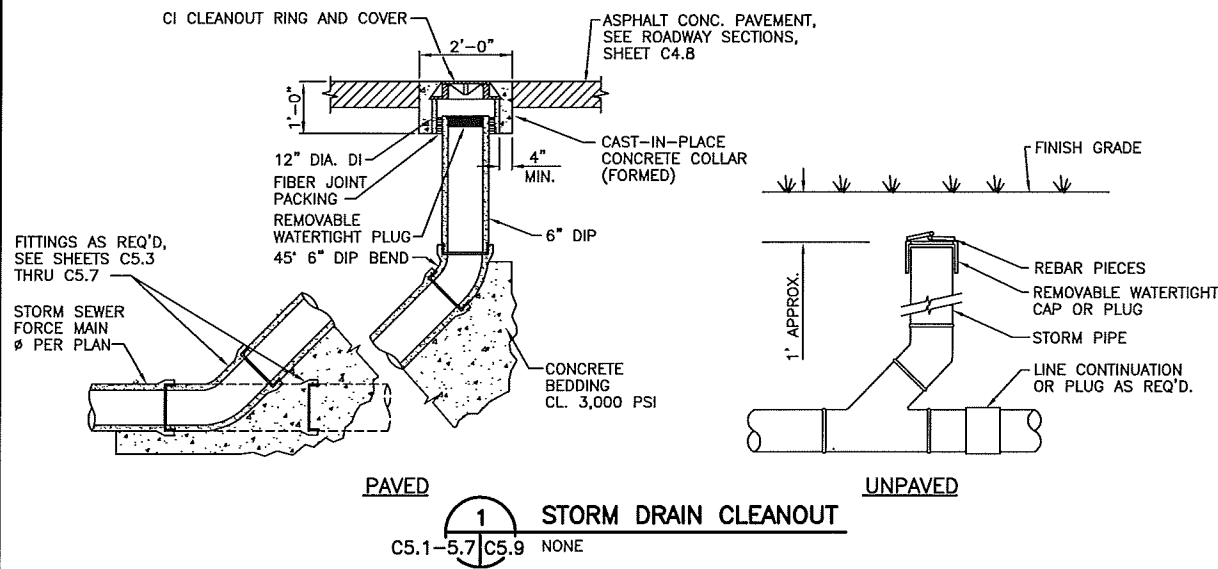
PORT OF EVERETT  
 RIVERSIDE BUSINESS PARK  
 STORM DRAINAGE NOTES & DETAILS

REID MIDDLETON  
 728 154th Street SW, Suite 200  
 Everett, Washington 98204  
 Ph: 425-741-3800

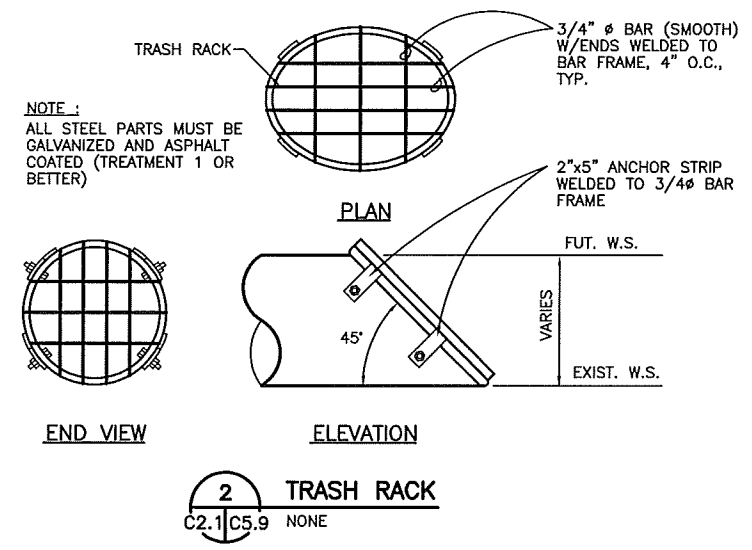
NO.	DATE	BY	REVISIONS PER CITY COMMENTS
7/7/00	JAL		
11/13/00	JAL		ADDENDUM

SCALE SHOWN: 1/2"=1'-0"

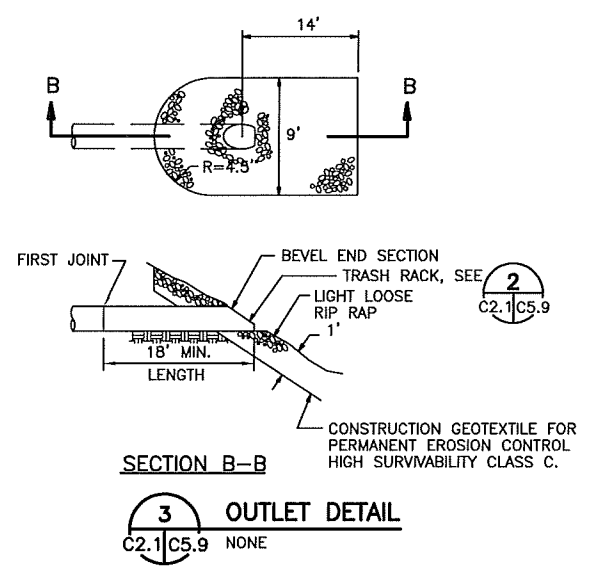
DES: JAL SHEET NO. C5.8  
 DR: KLS  
 CH: WHN  
 F.I.R. --- OF SEETS  
 DATE: OCT. 2001  
 FILE NO: 21-99-041



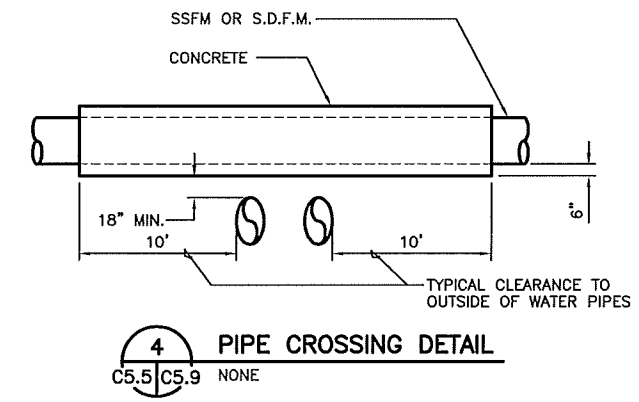
**1 STORM DRAIN CLEANOUT**  
C5.1-5.7 | C5.9 NONE



**2 TRASH RACK**  
C2.1 | C5.9 NONE



**3 OUTLET DETAIL**  
C2.1 | C5.9 NONE



**4 PIPE CROSSING DETAIL**  
C5.5 | C5.9 NONE

**RECORD DRAWINGS**

THESE RECORD DRAWINGS HAVE BEEN PREPARED BASED ON INFORMATION SUBMITTED, IN PART, BY OTHERS. WHILE THIS INFORMATION IS BELIEVED TO BE RELIABLE, THE ENGINEER IS NOT RESPONSIBLE FOR ITS ACCURACY, NOR FOR ERRORS OR OMISSIONS WHICH MAY HAVE BEEN INCORPORATED INTO THIS DOCUMENT AS A RESULT.

NOTE: IF "1" DOES NOT MEASURE 1" ADJUST SCALES ACCORDINGLY.

728 134th Street SW - Suite 200 Everett, Washington 98204 Ph: 425 741-3800	
<b>PORT OF EVERETT</b> <b>RIVERSIDE BUSINESS PARK</b> <b>STORM DRAINAGE DETAILS</b>	
SCALE SHOWN DES. JAL DR. KLS CH. WHN F.B. --- OF SHEETS	SHEET NO. <b>C5.9</b>
DATE OCT. 2001 FILE 21-99-041	

**APPENDIX C**  
**Storm Drain Video Survey Reports**

Pro-Vac  
 14023 131st St E  
 Orting, W.A. 98360  
 Phone: 253-848-5250



## Observations by Inspections

### SITE DATA

Mainline ID: CB #2-CB #5		City: Everett	Address: 625 Riverside Dr			
Upstream node: CB #2	Downstream node: CB #5	Pipe type: Polyethylene	Pipe shape: Circular	Pipe height: 12	Pipe width:	

### INSPECTION DATA

Scheduled date: 11/21/2016 8:33:38 AM		Start date/time: 11/21/2016 8:33:45 AM	End date/time: 11/21/2016 8:34:40 AM
Surveyed footage: 2.0	Status: Stopped	Operator: Kyle Osborn 253-442-4335	Work order no.:
Reason:	Weather: Dry	Condition:	
Comments			

### OBSERVATIONS

Footage	Rev.	Length	Clock From	Clock To	Code	Modifiers/Severity	Comment
0.0	No				Catch Basin		Start at CB #2
0.0	No				Water Level	>=75%	
2.0	No				START WITH FLOW		
2.0	No		3	9	Debris	>30%	
2.0	No				Abandoned Survey		Due to debris
2.0	No				STOP		

Pro-Vac  
 14023 131st St E  
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## Observations by Inspections

### SITE DATA

Mainline ID:		City:	Address:			
CB #1-CB #2_3		Everett	625 Riverside Dr			
Upstream node:	Downstream node:	Pipe type:	Pipe shape:	Pipe height:	Pipe width:	
CB #1	CB #2	Polyethylene	Circular	12		

### INSPECTION DATA

Scheduled date:		Start date/time:	End date/time:
11/21/2016 8:31:39 AM		11/21/2016 8:40:42 AM	11/21/2016 8:41:29 AM
Surveyed footage:	Status:	Operator:	Work order no.:
2.0	Stopped	Kyle Osborn 253-442-4335	
Reason:	Weather:	Condition:	
	Dry		
Comments			

### OBSERVATIONS

Footage	Rev.	Length	Clock From	Clock To	Code	Modifiers/Severity	Comment
0.0	No				Catch Basin		Start at CB #1
0.0	No				Water Level	100%	
2.0	No				START WITH FLOW		
2.0	No		3	9	Debris	>30%	
2.0	No				Abandoned Survey		Due to debris
2.0	No				STOP		



Pro-Vac  
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## Observations by Inspections

### SITE DATA

Mainline ID:		City:	Address:		
Upstream on Bridge-CB #6		Everett	315 Riverside Dr		
Upstream node:	Downstream node:	Pipe type:	Pipe shape:	Pipe height:	Pipe width:
Upstream on Bridge	CB #6	Ductile	Circular	12	

### INSPECTION DATA

Scheduled date:		Start date/time:	End date/time:
11/21/2016 9:16:54 AM		11/21/2016 9:20:41 AM	11/21/2016 9:22:30 AM
Surveyed footage:	Status:	Operator:	Work order no.:
38.3	Stopped	Kyle Osborn 253-442-4335	
Reason:	Weather:	Condition:	
	Dry		
Comments			

### OBSERVATIONS

Footage	Rev.	Length	Clock From	Clock To	Code	Modifiers/Severity	Comment
0.0	Yes				Manhole		Start at CB #6
0.0	Yes				Water Level	<25%	
6.0	Yes				START AGAINST FLOW		
38.3	Yes		2	10	Debris	>30%	
38.3	Yes				Abandoned Survey		Due to debris
38.3	Yes				STOP		

Pro-Vac  
 14023 131st St E  
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## Observations by Inspections

### SITE DATA

Mainline ID:		City:	Address:		
CB #6-CB #7_1		Everett	315 Riverside Dr		
Upstream node:	Downstream node:	Pipe type:	Pipe shape:	Pipe height:	Pipe width:
CB #6	CB #7	PVC	Circular	12	

### INSPECTION DATA

Scheduled date:		Start date/time:	End date/time:
11/21/2016 9:14:07 AM		11/21/2016 9:28:25 AM	11/21/2016 9:37:43 AM
Surveyed footage:	Status:	Operator:	Work order no.:
267.7	Stopped	Kyle Osborn 253-442-4335	
Reason:	Weather:	Condition:	
	Dry		
Comments			

### OBSERVATIONS

Footage	Rev.	Length	Clock From	Clock To	Code	Modifiers/Severity	Comment
0.0	No				Catch Basin		Start at MH #6
0.0	No				Water Level	<25%	
6.0	No				START WITH FLOW		
204.4	No				Deformed	<=10%	
242.4	No				Joint Offset		
267.7	No				Manhole		Stop at CB #7
267.7	No				STOP		

Pro-Vac  
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## Observations by Inspections

### SITE DATA

Mainline ID:		City:	Address:			
CB #7-CB #8		Everett	315 Riverside Dr			
Upstream node:	Downstream node:	Pipe type:	Pipe shape:	Pipe height:	Pipe width:	
CB #7	CB #8	PVC	Circular	12		

### INSPECTION DATA

Scheduled date:		Start date/time:	End date/time:
11/21/2016 9:58:19 AM		11/21/2016 10:00:03 AM	11/21/2016 10:06:15 AM
Surveyed footage:	Status:	Operator:	Work order no.:
200.4	Stopped	Kyle Osborn 253-442-4335	
Reason:	Weather:	Condition:	
	Dry		
Comments			

### OBSERVATIONS

Footage	Rev.	Length	Clock From	Clock To	Code	Modifiers/Severity	Comment
0.0	No				Manhole		Start at CB #7
0.0	No				Water Level	<25%	
6.0	No				START WITH FLOW		
200.4	No				Manhole		Stop at CB #8
200.4	No				STOP		

Pro-Vac  
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## Observations by Inspections

### SITE DATA

Mainline ID:		City:	Address:			
CB #8-CB #9		Everett	315 Riverside Dr			
Upstream node:	Downstream node:	Pipe type:	Pipe shape:	Pipe height:	Pipe width:	
CB #8	CB #9	Polyethylene	Circular	12		

### INSPECTION DATA

Scheduled date:		Start date/time:	End date/time:
11/21/2016 10:13:50 AM		11/21/2016 10:16:11 AM	11/21/2016 10:18:32 AM
Surveyed footage:	Status:	Operator:	Work order no.:
61.0	Stopped	Kyle Osborn 253-442-4335	
Reason:	Weather:	Condition:	
	Dry		
Comments			

### OBSERVATIONS

Footage	Rev.	Length	Clock From	Clock To	Code	Modifiers/Severity	Comment
0.0	No				Manhole		Start at CB #8
0.0	No				Water Level	<25%	
6.0	No				START WITH FLOW		
56.9	No		5	7	Debris	<=10%	
61.0	No				Catch Basin		Stop at CB #9
61.0	No				STOP		

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## Observations by Inspections

### SITE DATA

Mainline ID: CB #9-CB #10		City: Everett	Address: 315 Riverside Dr		
Upstream node: CB #9	Downstream node: CB #10	Pipe type: Polyethylene	Pipe shape: Circular	Pipe height: 12	Pipe width:

### INSPECTION DATA

Scheduled date: 11/21/2016 10:19:33 AM		Start date/time: 11/21/2016 10:24:53 AM	End date/time: 11/21/2016 10:26:54 AM
Surveyed footage: 37.5	Status: Stopped	Operator: Kyle Osborn 253-442-4335	Work order no.:
Reason:	Weather: Dry	Condition:	
Comments			

### OBSERVATIONS

Footage	Rev.	Length	Clock From	Clock To	Code	Modifiers/Severity	Comment
0.0	No				Catch Basin		Start at CB #9
0.0	No				Water Level	<25%	
6.0	No				START WITH FLOW		
30.1	No	5.7	5	7	Debris	<=10%	
37.5	No				Catch Basin		Stop at CB #10
37.5	No				STOP		



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## Observations by Inspections

### SITE DATA

Mainline ID: CB # 10-CB # 11		City: Everett	Address: 315 Riverside Dr		
Upstream node: CB # 10	Downstream node: CB # 11	Pipe type: Polyethylene	Pipe shape: Circular	Pipe height: 12	Pipe width:

### INSPECTION DATA

Scheduled date: 11/21/2016 10:29:33 AM		Start date/time: 11/21/2016 10:36:16 AM	End date/time: 11/21/2016 10:37:25 AM
Surveyed footage: 10.5	Status: Stopped	Operator: Kyle Osborn 253-442-4335	Work order no.:
Reason:	Weather: Dry	Condition:	
Comments			

### OBSERVATIONS

Footage	Rev.	Length	Clock From	Clock To	Code	Modifiers/Severity	Comment
0.0	Yes				Catch Basin		Start at CB #11
0.0	Yes				Water Level	<25%	
1.0	Yes	9.5	4	8	Debris	<=20%	
6.0	Yes				START AGAINST FLOW		
10.5	Yes				Abandoned Survey		Due to debris
10.5	Yes				STOP		

Pro-Vac  
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## Observations by Inspections

### SITE DATA

Mainline ID:		City:	Address:			
CB # 11-CB # 12		Everett	315 Riverside Dr			
Upstream node:	Downstream node:	Pipe type:	Pipe shape:	Pipe height:	Pipe width:	
CB # 11	CB # 12	Polyethylene	Circular	12		

### INSPECTION DATA

Scheduled date:		Start date/time:	End date/time:
11/21/2016 10:34:42 AM		11/21/2016 10:39:51 AM	11/21/2016 10:41:21 AM
Surveyed footage:	Status:	Operator:	Work order no.:
19.3	Stopped	Kyle Osborn 253-442-4335	
Reason:	Weather:	Condition:	
	Dry		
Comments			

### OBSERVATIONS

Footage	Rev.	Length	Clock From	Clock To	Code	Modifiers/Severity	Comment
0.0	No				Catch Basin		Start at CB #11
0.0	No				Water Level	<25%	
6.0	No				START WITH FLOW		
15.7	No	3.6	10	2	Broken		
19.3	No				Abandoned Survey		Due to broken pipe
19.3	No				STOP		

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## Observations by Inspections

### SITE DATA

Mainline ID: CB #13-CB #11		City: Everett	Address: 315 Riverside Dr		
Upstream node: CB #13	Downstream node: CB #11	Pipe type: Polyethylene	Pipe shape: Circular	Pipe height: 12	Pipe width:

### INSPECTION DATA

Scheduled date: 11/21/2016 10:48:12 AM		Start date/time: 11/21/2016 10:48:17 AM	End date/time: 11/21/2016 10:49:58 AM
Surveyed footage: 27.8	Status: Stopped	Operator: Kyle Osborn 253-442-4335	Work order no.:
Reason:	Weather: Dry	Condition:	
Comments			

### OBSERVATIONS

Footage	Rev.	Length	Clock From	Clock To	Code	Modifiers/Severity	Comment
0.0	Yes				Catch Basin		Start at CB #11
0.0	Yes				Water Level	<25%	
1.0	Yes	23.6	4	8	Debris	<=30%	
6.0	Yes				START AGAINST FLOW		
27.8	Yes				Catch Basin		Stop at CB #13
27.8	Yes				STOP		

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## Observations by Inspections

### SITE DATA

Mainline ID:		City:	Address:			
CB #11-CB #12		Everett	315 Riverside Dr			
Upstream node:	Downstream node:	Pipe type:	Pipe shape:	Pipe height:	Pipe width:	
CB #11	CB #12	Polyethylene	Circular	12		

### INSPECTION DATA

Scheduled date:		Start date/time:	End date/time:
11/21/2016 10:41:25 AM		11/21/2016 10:56:54 AM	11/21/2016 11:03:36 AM
Surveyed footage:	Status:	Operator:	Work order no.:
212.5	Stopped	Kyle Osborn 253-442-4335	
Reason:	Weather:	Condition:	
	Dry		
Comments			

### OBSERVATIONS

Footage	Rev.	Length	Clock From	Clock To	Code	Modifiers/Severity	Comment
0.0	Yes				Catch Basin		Start at CB #12
0.0	Yes				Water Level	<25%	
6.0	Yes				START AGAINST FLOW		
23.7	Yes		1	2	Crack		
54.7	Yes		2	3	Crack		
57.7	Yes	25.9	5	7	Debris	<=10%	
101.6	Yes	10.0			Deformed	>10%	
190.1	Yes				Deformed	<=10%	
212.4	Yes		10	2	Broken		
212.5	Yes				Abandoned Survey		Due to broke pipe
212.5	Yes				STOP		

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## Observations by Inspections

### SITE DATA

Mainline ID:		City:	Address:			
CB #12-CB #15		Everett	315 Riverside Dr			
Upstream node:	Downstream node:	Pipe type:	Pipe shape:	Pipe height:	Pipe width:	
CB #12	CB #15	Polyethylene	Circular	12		

### INSPECTION DATA

Scheduled date:		Start date/time:	End date/time:
11/21/2016 11:08:27 AM		11/21/2016 11:08:33 AM	11/21/2016 11:14:42 AM
Surveyed footage:	Status:	Operator:	Work order no.:
188.9	Stopped	Kyle Osborn 253-442-4335	
Reason:	Weather:	Condition:	
	Dry		
Comments			

### OBSERVATIONS

Footage	Rev.	Length	Clock From	Clock To	Code	Modifiers/Severity	Comment
0.0	No				Catch Basin		Start at CB #12
0.0	No				Water Level	<25%	
6.0	No				START WITH FLOW		
153.8	No		2		Deformed	<=10%	
187.1	No		4	8	Debris	<=10%	
188.9	No				Abandoned Survey		Due to debris
188.9	No				STOP		

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## Observations by Inspections

### SITE DATA

Mainline ID:		City:	Address:			
CB # 14-CB # 12		Everett	315 Riverside Dr			
Upstream node:	Downstream node:	Pipe type:	Pipe shape:	Pipe height:	Pipe width:	
CB # 14	CB # 12	Polyethylene	Circular	12		

### INSPECTION DATA

Scheduled date:		Start date/time:		End date/time:	
11/21/2016 11:15:24 AM		11/21/2016 11:18:50 AM		11/21/2016 11:20:52 AM	
Surveyed footage:	Status:	Operator:		Work order no.:	
13.5	Stopped	Kyle Osborn 253-442-4335			
Reason:	Weather:	Condition:			
	Dry				
Comments					

### OBSERVATIONS

Footage	Rev.	Length	Clock From	Clock To	Code	Modifiers/Severity	Comment
0.0	Yes				Catch Basin		Start at CB #12
0.0	Yes				Water Level	<25%	
6.0	Yes				START AGAINST FLOW		
6.0	Yes	7.5	4	8	Debris	<=20%	
13.5	Yes				Abandoned Survey		Due to debris
13.5	Yes				STOP		



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## Observations by Inspections

### SITE DATA

Mainline ID:		City:	Address:			
CB #15-CB #16		Everett	315 Riverside Dr			
Upstream node:	Downstream node:	Pipe type:	Pipe shape:	Pipe height:	Pipe width:	
CB #15	CB #16	Polyethylene	Circular	12		

### INSPECTION DATA

Scheduled date:		Start date/time:	End date/time:
11/21/2016 11:35:33 AM		11/21/2016 11:35:40 AM	11/21/2016 11:37:42 AM
Surveyed footage:	Status:	Operator:	Work order no.:
39.2	Stopped	Kyle Osborn 253-442-4335	
Reason:	Weather:	Condition:	
	Dry		
Comments			

### OBSERVATIONS

Footage	Rev.	Length	Clock From	Clock To	Code	Modifiers/Severity	Comment
0.0	No				Catch Basin		Start at CB #15
0.0	No				Water Level	<25%	
6.0	No				START WITH FLOW		
39.2	No				Manhole		Stop at CB #16
39.2	No				STOP		

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## Observations by Inspections

### SITE DATA

Mainline ID: CB #12-CB #15		City: Everett	Address: 315 Riverside Dr			
Upstream node: CB #12	Downstream node: CB #15	Pipe type: Polyethylene	Pipe shape: Circular	Pipe height: 12	Pipe width:	

### INSPECTION DATA

Scheduled date: 11/21/2016 11:14:48 AM		Start date/time: 11/21/2016 11:41:36 AM	End date/time: 11/21/2016 11:42:43 AM
Surveyed footage: 9.9	Status: Stopped	Operator: Kyle Osborn 253-442-4335	Work order no.:
Reason:	Weather: Dry	Condition:	
Comments			

### OBSERVATIONS

Footage	Rev.	Length	Clock From	Clock To	Code	Modifiers/Severity	Comment
0.0	Yes				Catch Basin		Start at CB #15
0.0	Yes				Water Level	<25%	
1.0	Yes	8.9	5	7	Debris	<=10%	
6.0	Yes				START AGAINST FLOW		
9.9	Yes				Abandoned Survey		Due to debris
9.9	Yes				STOP		

Pro-Vac  
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## Observations by Inspections

### SITE DATA

Mainline ID: CB # 14-CB # 12		City: Everett	Address: 315 Riverside Dr			
Upstream node: CB # 14	Downstream node: CB # 12	Pipe type: Polyethylene	Pipe shape: Circular	Pipe height: 12	Pipe width:	

### INSPECTION DATA

Scheduled date: 11/21/2016 11:20:57 AM		Start date/time: 11/21/2016 11:50:41 AM	End date/time: 11/21/2016 11:52:07 AM
Surveyed footage: 6.1	Status: Stopped	Operator: Kyle Osborn 253-442-4335	Work order no.:
Reason:	Weather: Dry	Condition:	
Comments			

### OBSERVATIONS

Footage	Rev.	Length	Clock From	Clock To	Code	Modifiers/Severity	Comment
0.0	No				Catch Basin		Start at CB # 14
0.0	No				Water Level	<25%	
6.0	No				START WITH FLOW		
6.0	No		4	8	Debris	<=20%	
6.1	No				Abandoned Survey		Due to debris
6.1	No				STOP		

Pro-Vac  
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## Observations by Inspections

### SITE DATA

Mainline ID:		City:	Address:			
CB #18-CB #17_1		Everett	315 Riverside Dr			
Upstream node:	Downstream node:	Pipe type:	Pipe shape:	Pipe height:	Pipe width:	
CB #18	CB #17	Polyethylene	Circular	12		

### INSPECTION DATA

Scheduled date:		Start date/time:	End date/time:
11/21/2016 11:54:20 AM		11/21/2016 12:02:48 PM	11/21/2016 12:03:44 PM
Surveyed footage:	Status:	Operator:	Work order no.:
11.0	Stopped	Kyle Osborn 253-442-4335	
Reason:	Weather:	Condition:	
	Dry		
Comments			

### OBSERVATIONS

Footage	Rev.	Length	Clock From	Clock To	Code	Modifiers/Severity	Comment
0.0	No				Catch Basin		Start at CB #18
0.0	No				Water Level	<25%	
1.0	No	10.0	3	9	Debris	>30%	
6.0	No				START WITH FLOW		
11.0	No				Abandoned Survey		Due to debris
11.0	No				STOP		

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## Observations by Inspections

### SITE DATA

Mainline ID: CB #17-CB #16		City: Everett	Address: 315 Riverside Dr		
Upstream node: CB #17	Downstream node: CB #16	Pipe type: Polyethylene	Pipe shape: Circular	Pipe height: 18	Pipe width:

### INSPECTION DATA

Scheduled date: 11/21/2016 11:53:55 AM		Start date/time: 11/21/2016 12:30:32 PM	End date/time: 11/21/2016 12:33:21 PM
Surveyed footage: 61.5	Status: Stopped	Operator: Kyle Osborn 253-442-4335	Work order no.:
Reason:	Weather: Dry	Condition:	
Comments			

### OBSERVATIONS

Footage	Rev.	Length	Clock From	Clock To	Code	Modifiers/Severity	Comment
0.0	Yes				Manhole		Start at CB #16
0.0	Yes				Water Level	>=25%	
6.0	Yes				START AGAINST FLOW		
26.2	Yes		1	6	Deposits	Medium	
26.2	Yes		1		Infiltration		
61.5	Yes				Manhole		Stop at CB #17
61.5	Yes				STOP		

Pro-Vac  
 14023 131st St E  
 Orting, W.A. 98360  
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## Observations by Inspections

### SITE DATA

Mainline ID:		City:	Address:			
CB #16-Pump #1		Everett	315 Riverside Dr			
Upstream node:	Downstream node:	Pipe type:	Pipe shape:	Pipe height:	Pipe width:	
CB #16	Pump #1	Polyethylene	Circular	18		

### INSPECTION DATA

Scheduled date:		Start date/time:	End date/time:
11/21/2016 12:36:57 PM		11/21/2016 12:37:21 PM	11/21/2016 12:39:12 PM
Surveyed footage:	Status:	Operator:	Work order no.:
23.8	Stopped	Kyle Osborn 253-442-4335	
Reason:	Weather:	Condition:	
	Dry		
Comments			

### OBSERVATIONS

Footage	Rev.	Length	Clock From	Clock To	Code	Modifiers/Severity	Comment
0.0	No				Manhole		Start at CB #16
0.0	No				Water Level	<25%	
6.0	No				START WITH FLOW		
23.8	No				Vault		Stop at Pump #1
23.8	No				STOP		

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## Observations by Inspections

### SITE DATA

Mainline ID: CB # 19-CB # 20		City: Everett	Address: 315 Riverside Dr		
Upstream node: CB # 19	Downstream node: CB # 20	Pipe type: Polyethylene	Pipe shape: Circular	Pipe height: 24	Pipe width:

### INSPECTION DATA

Scheduled date: 11/21/2016 1:05:31 PM		Start date/time: 11/21/2016 1:06:14 PM	End date/time: 11/21/2016 1:14:03 PM
Surveyed footage: 158.5	Status: Stopped	Operator: Kyle Osborn 253-442-4335	Work order no.:
Reason:	Weather: Dry	Condition:	
Comments			

### OBSERVATIONS

Footage	Rev.	Length	Clock From	Clock To	Code	Modifiers/Severity	Comment
0.0	No				Manhole		Start at CB # 19
0.0	No				Water Level	<25%	
6.0	No				START WITH FLOW		
26.8	No	14.2	6		Crack		
60.0	No	16.9			Sag		
85.5	No		10		Crack		
105.5	No	52.9			Sag		
158.4	No				Camera Under Water		
158.5	No				Abandoned Survey		Due to camera underwater
158.5	No				STOP		



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## Observations by Inspections

### SITE DATA

Mainline ID:		City:		Address:	
Pond Inlet-CB #19		Everett		315 Riverside Dr	
Upstream node:	Downstream node:	Pipe type:	Pipe shape:	Pipe height:	Pipe width:
Pond Inlet	CB #19	Polyethylene	Circular	24	

### INSPECTION DATA

Scheduled date:		Start date/time:		End date/time:	
11/21/2016 1:06:04 PM		11/21/2016 1:25:47 PM		11/21/2016 1:28:44 PM	
Surveyed footage:	Status:	Operator:		Work order no.:	
60.6	Stopped	Kyle Osborn 253-442-4335			
Reason:	Weather:	Condition:			
	Dry				
Comments					

### OBSERVATIONS

Footage	Rev.	Length	Clock From	Clock To	Code	Modifiers/Severity	Comment
0.0	Yes				Manhole		Start at CB #19
0.0	Yes				Water Level	<25%	
6.0	Yes				START AGAINST FLOW		
28.8	Yes	9.0			Sag		
60.6	Yes				Catch Basin		Stop at Pond Inlet
60.6	Yes				STOP		

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## Observations by Inspections

### SITE DATA

Mainline ID: CB #25-CB #26		City: Everett	Address: 315 Riverside Dr		
Upstream node: CB #25	Downstream node: CB #26	Pipe type: Polyethylene	Pipe shape: Circular	Pipe height: 12	Pipe width:

### INSPECTION DATA

Scheduled date: 11/21/2016 2:24:28 PM		Start date/time: 11/21/2016 2:24:35 PM	End date/time: 11/21/2016 2:26:58 PM
Surveyed footage: 41.3	Status: Stopped	Operator: Kyle Osborn 253-442-4335	Work order no.:
Reason:	Weather: Dry	Condition:	
Comments			

### OBSERVATIONS

Footage	Rev.	Length	Clock From	Clock To	Code	Modifiers/Severity	Comment
0.0	Yes				Catch Basin		Start at CB #26
0.0	Yes				Water Level	<25%	
1.0	Yes	23.7	4	8	Debris	<=20%	
6.0	Yes				START AGAINST FLOW		
41.3	Yes				Catch Basin		Stop at CB #25
41.3	Yes				STOP		

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## Observations by Inspections

### SITE DATA

Mainline ID: CB #26-CB #27		City: Everett	Address: 315 Riverside Dr			
Upstream node: CB #26	Downstream node: CB #27	Pipe type: Polyethylene	Pipe shape: Circular	Pipe height: 12	Pipe width:	

### INSPECTION DATA

Scheduled date: 11/21/2016 2:27:42 PM		Start date/time: 11/21/2016 2:29:10 PM	End date/time: 11/21/2016 2:31:45 PM
Surveyed footage: 39.3	Status: Stopped	Operator: Kyle Osborn 253-442-4335	Work order no.:
Reason:	Weather: Dry	Condition:	
Comments			

### OBSERVATIONS

Footage	Rev.	Length	Clock From	Clock To	Code	Modifiers/Severity	Comment
0.0	No				Catch Basin		Start at CB #26
0.0	No				Water Level	<25%	
6.0	No				START WITH FLOW		
20.3	No				Deformed	<=10%	
35.0	No	4.3			Sag		
39.3	No				Camera Under Water		
39.3	No				Abandoned Survey		camera Underwater and
39.3	No				STOP		

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## Observations by Inspections

### SITE DATA

Mainline ID:		City:	Address:			
CB #28-Pump #1		Everett	315 Riverside Dr			
Upstream node:	Downstream node:	Pipe type:	Pipe shape:	Pipe height:	Pipe width:	
CB #28	Pump #1	Polyethylene	Circular	12		

### INSPECTION DATA

Scheduled date:		Start date/time:	End date/time:
11/21/2016 2:45:09 PM		11/21/2016 2:45:15 PM	11/21/2016 2:49:47 PM
Surveyed footage:	Status:	Operator:	Work order no.:
52.8	Stopped	Kyle Osborn 253-442-4335	
Reason:	Weather:	Condition:	
	Dry		
Comments			

### OBSERVATIONS

Footage	Rev.	Length	Clock From	Clock To	Code	Modifiers/Severity	Comment
0.0	No				Catch Basin		Start at CB #28
0.0	No				Water Level	<25%	
1.0	No	10.9	5	7	Debris	<=10%	
6.0	No				START WITH FLOW		
28.3	No	21.8	4	8	Debris	<=10%	
52.8	No				Vault		Stop at Pump #1
52.8	No				STOP		

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## Observations by Inspections

### SITE DATA

Mainline ID: CB #29-CB #28_1		City: Everett	Address: 315 Riverside Dr		
Upstream node: CB #29	Downstream node: CB #28	Pipe type: Polyethylene	Pipe shape: Circular	Pipe height: 12	Pipe width:

### INSPECTION DATA

Scheduled date: 11/21/2016 2:51:08 PM		Start date/time: 11/21/2016 2:54:56 PM	End date/time: 11/21/2016 2:56:36 PM
Surveyed footage: 25.8	Status: Stopped	Operator: Kyle Osborn 253-442-4335	Work order no.:
Reason:	Weather: Dry	Condition:	
Comments			

### OBSERVATIONS

Footage	Rev.	Length	Clock From	Clock To	Code	Modifiers/Severity	Comment
0.0	Yes				Catch Basin		Start at CB #28
0.0	Yes				Water Level	<25%	
6.0	Yes				START AGAINST FLOW		
15.6	Yes	8.4	4	8	Debris	<=10%	
25.8	Yes				Catch Basin		Stop at CB #29
25.8	Yes				STOP		

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## Observations by Inspections

### SITE DATA

Mainline ID: CB #31-CB #30		City: Everett	Address: 315 Riverside Dr			
Upstream node: CB #31	Downstream node: CB #30	Pipe type: Polyethylene	Pipe shape: Circular	Pipe height: 12	Pipe width:	

### INSPECTION DATA

Scheduled date: 11/21/2016 2:57:55 PM		Start date/time: 11/22/2016 7:50:40 AM	End date/time: 11/22/2016 7:53:03 AM
Surveyed footage: 23.3	Status: Stopped	Operator: Kyle Osborn 253-442-4335	Work order no.:
Reason:	Weather: Dry	Condition:	
Comments			

### OBSERVATIONS

Footage	Rev.	Length	Clock From	Clock To	Code	Modifiers/Severity	Comment
0.0	No				Catch Basin		Start at CB #31
0.0	No				Water Level	<25%	
6.0	No				START WITH FLOW		
9.4	No				Joint Offset		
23.3	No				Catch Basin		Stop at CB #30
23.3	No				STOP		

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## Observations by Inspections

### SITE DATA

Mainline ID: CB #30-CB #29		City: Everett	Address: 315 Riverside Dr		
Upstream node: CB #30	Downstream node: CB #29	Pipe type: Polyethylene	Pipe shape: Circular	Pipe height: 12	Pipe width:

### INSPECTION DATA

Scheduled date: 11/21/2016 2:57:31 PM		Start date/time: 11/22/2016 8:03:50 AM	End date/time: 11/22/2016 8:18:59 AM
Surveyed footage: 203.1	Status: Stopped	Operator: Kyle Osborn 253-442-4335	Work order no.:
Reason:	Weather: Dry	Condition:	
Comments			

### OBSERVATIONS

Footage	Rev.	Length	Clock From	Clock To	Code	Modifiers/Severity	Comment
0.0	No				Catch Basin		Start at CB #30
0.0	No				Water Level	<25%	
1.0	No	16.0	5	7	Debris	<=10%	
6.0	No				START WITH FLOW		
17.0	No				Deformed	<=10%	
110.2	No	86.9	4	8	Debris	<=20%	
197.1	No				STOP		
203.1	No				Catch Basin		Stop at CB #29

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## Observations by Inspections

### SITE DATA

Mainline ID: CB #32-CB #31_1		City: Everett	Address: 315 Riverside Dr		
Upstream node: CB #32	Downstream node: CB #31	Pipe type: PVC	Pipe shape: Circular	Pipe height: 6	Pipe width:

### INSPECTION DATA

Scheduled date: 11/22/2016 8:50:34 AM		Start date/time: 11/22/2016 8:58:22 AM	End date/time: 11/22/2016 9:00:50 AM
Surveyed footage: 8.2	Status: Stopped	Operator: Kyle Osborn 253-442-4335	Work order no.:
Reason:	Weather: Dry	Condition:	
Comments			

### OBSERVATIONS

Footage	Rev.	Length	Clock From	Clock To	Code	Modifiers/Severity	Comment
0.0	Yes				Catch Basin		Start at CB #31
0.0	Yes				Water Level	<25%	
1.5	Yes				START AGAINST FLOW		
8.2	Yes				Catch Basin		Stop at CB #32
8.2	Yes				STOP		



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## Observations by Inspections

### SITE DATA

Mainline ID: CB #45-CB #44		City: Everett	Address: 315 Riverside Dr		
Upstream node: CB #45	Downstream node: CB #44	Pipe type: Polyethylene	Pipe shape: Circular	Pipe height: 12	Pipe width:

### INSPECTION DATA

Scheduled date: 11/22/2016 9:34:03 AM		Start date/time: 11/22/2016 9:34:35 AM	End date/time: 11/22/2016 9:39:08 AM
Surveyed footage: 107.4	Status: Stopped	Operator: Kyle Osborn 253-442-4335	Work order no.:
Reason:	Weather: Dry	Condition:	
Comments			

### OBSERVATIONS

Footage	Rev.	Length	Clock From	Clock To	Code	Modifiers/Severity	Comment
0.0	No				Catch Basin		Start at CB #45
0.0	No				Water Level	<25%	
6.0	No				START WITH FLOW		
107.4	No				Catch Basin		Stop at CB #44
107.4	No				STOP		

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## Observations by Inspections

### SITE DATA

Mainline ID:		City:	Address:		
CB #43-CB #42_1		Everett	315 Riverside Dr		
Upstream node:	Downstream node:	Pipe type:	Pipe shape:	Pipe height:	Pipe width:
CB #43	CB #42	Polyethylene	Circular	12	

### INSPECTION DATA

Scheduled date:		Start date/time:	End date/time:
11/22/2016 9:54:15 AM		11/22/2016 9:54:25 AM	11/22/2016 10:00:34 AM
Surveyed footage:	Status:	Operator:	Work order no.:
198.1	Stopped	Kyle Osborn 253-442-4335	
Reason:	Weather:	Condition:	
	Dry		
Comments			

### OBSERVATIONS

Footage	Rev.	Length	Clock From	Clock To	Code	Modifiers/Severity	Comment
0.0	No				Catch Basin		Start at CB #43
0.0	No				Water Level	<25%	
6.0	No				START WITH FLOW		
198.1	No				Catch Basin		Stop at CB #42
198.1	No				STOP		

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## Observations by Inspections

### SITE DATA

Mainline ID: CB #44-CB #43		City: Everett	Address: 315 Riverside Dr			
Upstream node: CB #44	Downstream node: CB #43	Pipe type: Polyethylene	Pipe shape: Circular	Pipe height: 12	Pipe width:	

### INSPECTION DATA

Scheduled date: 11/22/2016 10:07:43 AM		Start date/time: 11/22/2016 10:07:48 AM	End date/time: 11/22/2016 10:10:00 AM
Surveyed footage: 60.0	Status: Stopped	Operator: Kyle Osborn 253-442-4335	Work order no.:
Reason:	Weather: Dry	Condition:	
Comments			

### OBSERVATIONS

Footage	Rev.	Length	Clock From	Clock To	Code	Modifiers/Severity	Comment
0.0	Yes				Catch Basin		Start at CB #43
0.0	Yes				Water Level	<25%	
6.0	Yes				START AGAINST FLOW		
60.0	Yes				Catch Basin		Stop at CB #44
60.0	Yes				STOP		

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## Observations by Inspections

### SITE DATA

Mainline ID: CB #36-CB #37		City: Everett	Address: 315 Riverside Dr			
Upstream node: CB #36	Downstream node: CB #37	Pipe type: Polyethylene	Pipe shape: Circular	Pipe height: 12	Pipe width:	

### INSPECTION DATA

Scheduled date: 11/22/2016 10:19:42 AM		Start date/time: 11/22/2016 10:21:42 AM	End date/time: 11/22/2016 10:28:33 AM
Surveyed footage: 214.9	Status: Stopped	Operator: Kyle Osborn 253-442-4335	Work order no.:
Reason:	Weather: Dry	Condition:	
Comments			

### OBSERVATIONS

Footage	Rev.	Length	Clock From	Clock To	Code	Modifiers/Severity	Comment
0.0	Yes				Catch Basin		Start at CB #37
0.0	Yes				Water Level	<25%	
6.0	Yes				START AGAINST FLOW		
214.9	Yes				Catch Basin		Stop at CB #36
214.9	Yes				STOP		

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## Observations by Inspections

### SITE DATA

Mainline ID: CB #37-CB #38		City: Everett	Address: 315 Riverside Dr		
Upstream node: CB #37	Downstream node: CB #38	Pipe type: Polyethylene	Pipe shape: Circular	Pipe height: 12	Pipe width:

### INSPECTION DATA

Scheduled date: 11/22/2016 10:20:07 AM		Start date/time: 11/22/2016 10:32:55 AM	End date/time: 11/22/2016 10:39:06 AM
Surveyed footage: 186.7	Status: Stopped	Operator: Kyle Osborn 253-442-4335	Work order no.:
Reason:	Weather: Dry	Condition:	
Comments			

### OBSERVATIONS

Footage	Rev.	Length	Clock From	Clock To	Code	Modifiers/Severity	Comment
0.0	No				Catch Basin		Start at CB #37
0.0	No				Water Level	<25%	
6.0	No				START WITH FLOW		
186.7	No				Catch Basin		Stop at CB #38
186.7	No				STOP		

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## Observations by Inspections

### SITE DATA

Mainline ID:		City:	Address:			
CB #40-CB #39_1		Everett	315 Riverside Dr			
Upstream node:	Downstream node:	Pipe type:	Pipe shape:	Pipe height:	Pipe width:	
CB #40	CB #39	Polyethylene	Circular	12		

### INSPECTION DATA

Scheduled date:		Start date/time:	End date/time:
11/22/2016 10:46:32 AM		11/22/2016 10:49:55 AM	11/22/2016 10:54:00 AM
Surveyed footage:	Status:	Operator:	Work order no.:
115.9	Stopped	Kyle Osborn 253-442-4335	
Reason:	Weather:	Condition:	
	Dry		
Comments			

### OBSERVATIONS

Footage	Rev.	Length	Clock From	Clock To	Code	Modifiers/Severity	Comment
0.0	Yes				Catch Basin		Start at CB #39
0.0	Yes				Water Level	<25%	
6.0	Yes				START AGAINST FLOW		
115.9	Yes				Catch Basin		Stop at CB #40
115.9	Yes				STOP		

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## Observations by Inspections

### SITE DATA

Mainline ID: CB #38-CB #39		City: Everett	Address: 315 Riverside Dr			
Upstream node: CB #38	Downstream node: CB #39	Pipe type: Polyethylene	Pipe shape: Circular	Pipe height: 12	Pipe width:	

### INSPECTION DATA

Scheduled date: 11/22/2016 10:47:08 AM		Start date/time: 11/22/2016 10:57:46 AM	End date/time: 11/22/2016 11:02:04 AM
Surveyed footage: 123.3	Status: Stopped	Operator: Kyle Osborn 253-442-4335	Work order no.:
Reason:	Weather: Dry	Condition:	
Comments			

### OBSERVATIONS

Footage	Rev.	Length	Clock From	Clock To	Code	Modifiers/Severity	Comment
0.0	Yes				Catch Basin		Start at CB #39
0.0	Yes				Water Level	<25%	
6.0	Yes				START AGAINST FLOW		
123.3	Yes				Catch Basin		Stop at CB #38
123.3	Yes				STOP		

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## Observations by Inspections

### SITE DATA

Mainline ID: CB #39-CB #41		City: Everett	Address: 315 Riverside Dr		
Upstream node: CB #39	Downstream node: CB #41	Pipe type: Polyethylene	Pipe shape: Circular	Pipe height: 15	Pipe width:

### INSPECTION DATA

Scheduled date: 11/22/2016 10:47:34 AM		Start date/time: 11/22/2016 11:06:09 AM	End date/time: 11/22/2016 11:09:25 AM
Surveyed footage: 100.0	Status: Stopped	Operator: Kyle Osborn 253-442-4335	Work order no.:
Reason:	Weather: Dry	Condition:	
Comments			

### OBSERVATIONS

Footage	Rev.	Length	Clock From	Clock To	Code	Modifiers/Severity	Comment
0.0	No				Catch Basin		Start at CB #39
0.0	No				Water Level	<25%	
6.0	No				START WITH FLOW		
90.3	No				Sag		
100.0	No				Catch Basin		Stop at CB #41
100.0	No				STOP		



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## Observations by Inspections

### SITE DATA

Mainline ID:		City:		Address:	
Pond Inlet-CB #49		Everett		315 Riverside Dr	
Upstream node:	Downstream node:	Pipe type:	Pipe shape:	Pipe height:	Pipe width:
Pond Inlet	CB #49	Polyethylene	Circular	18	

### INSPECTION DATA

Scheduled date:		Start date/time:		End date/time:	
11/22/2016 11:04:12 AM		11/22/2016 11:31:35 AM		11/22/2016 11:36:02 AM	
Surveyed footage:	Status:	Operator:		Work order no.:	
146.3	Stopped	Kyle Osborn 253-442-4335			
Reason:	Weather:	Condition:			
	Dry				
Comments					

### OBSERVATIONS

Footage	Rev.	Length	Clock From	Clock To	Code	Modifiers/Severity	Comment
0.0	Yes				Manhole		Start at CB #49
0.0	Yes				Water Level	<25%	
6.0	Yes				START AGAINST FLOW		
21.1	Yes				Deformed	<=10%	
55.7	Yes		4	6	Broken		
146.3	Yes				Catch Basin		Stop at Pond Inlet
146.3	Yes				STOP		

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## Observations by Inspections

### SITE DATA

Mainline ID:		City:	Address:			
CB #46-CB #47		Everett	315 Riverside Dr			
Upstream node:	Downstream node:	Pipe type:	Pipe shape:	Pipe height:	Pipe width:	
CB #46	CB #47	Polyethylene	Circular	15		

### INSPECTION DATA

Scheduled date:		Start date/time:	End date/time:
11/22/2016 11:03:45 AM		11/22/2016 12:05:16 PM	11/22/2016 12:06:57 PM
Surveyed footage:	Status:	Operator:	Work order no.:
39.2	Stopped	Kyle Osborn 253-442-4335	
Reason:	Weather:	Condition:	
	Dry		
Comments			

### OBSERVATIONS

Footage	Rev.	Length	Clock From	Clock To	Code	Modifiers/Severity	Comment
0.0	No				Catch Basin		Start at CB #46
0.0	No				Water Level	<25%	
6.0	No				START WITH FLOW		
39.2	No				Manhole		Stop at CB #47
39.2	No				STOP		

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## Observations by Inspections

### SITE DATA

Mainline ID: CB #41-CB #46		City: Everett	Address: 315 Riverside Dr			
Upstream node: CB #41	Downstream node: CB #46	Pipe type: Polyethylene	Pipe shape: Circular	Pipe height: 15	Pipe width:	

### INSPECTION DATA

Scheduled date: 11/22/2016 11:03:17 AM		Start date/time: 11/22/2016 12:17:07 PM	End date/time: 11/22/2016 12:20:47 PM
Surveyed footage: 115.3	Status: Stopped	Operator: Kyle Osborn 253-442-4335	Work order no.:
Reason:	Weather: Dry	Condition:	
Comments			

### OBSERVATIONS

Footage	Rev.	Length	Clock From	Clock To	Code	Modifiers/Severity	Comment
0.0	No				Catch Basin		Start at CB #41
0.0	No				Water Level	<25%	
6.0	No				START WITH FLOW		
115.3	No				Manhole		Stop at CB #46
115.3	No				STOP		

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## Observations by Inspections

### SITE DATA

Mainline ID: CB #42-CB #41		City: Everett	Address: 315 Riverside Dr			
Upstream node: CB #42	Downstream node: CB #41	Pipe type: Polyethylene	Pipe shape: Circular	Pipe height: 15	Pipe width:	

### INSPECTION DATA

Scheduled date: 11/22/2016 11:02:46 AM		Start date/time: 11/22/2016 12:23:47 PM	End date/time: 11/22/2016 12:27:23 PM
Surveyed footage: 117.3	Status: Stopped	Operator: Kyle Osborn 253-442-4335	Work order no.:
Reason:	Weather: Dry	Condition:	
Comments			

### OBSERVATIONS

Footage	Rev.	Length	Clock From	Clock To	Code	Modifiers/Severity	Comment
0.0	Yes				Catch Basin		Start at CB #41
0.0	Yes				Water Level	<25%	
1.0	Yes	15.4	4	8	Debris	<=10%	
6.0	Yes				START AGAINST FLOW		
117.3	Yes				Catch Basin		Stop at CB #42
117.3	Yes				STOP		

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## Observations by Inspections

### SITE DATA

Mainline ID: CB #47-CB #48		City: Everett	Address: 315 Riverside Dr			
Upstream node: CB #47	Downstream node: CB #48	Pipe type: Polyethylene	Pipe shape: Circular	Pipe height: 15	Pipe width:	

### INSPECTION DATA

Scheduled date: 12/15/2016 7:38:31 AM		Start date/time: 12/15/2016 7:41:12 AM	End date/time: 12/15/2016 7:44:14 AM
Surveyed footage: 34.2	Status: Stopped	Operator: Kyle Osborn 253-442-4335	Work order no.:
Reason:	Weather: Dry	Condition:	
Comments			

### OBSERVATIONS

Footage	Rev.	Length	Clock From	Clock To	Code	Modifiers/Severity	Comment
0.0	Yes				Manhole		Start at CB #48
0.0	Yes				Water Level	<25%	
6.0	Yes				START AGAINST FLOW		
34.2	Yes				Manhole		Stop at CB #47
34.2	Yes				STOP		

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## Observations by Inspections

### SITE DATA

Mainline ID: CB #48-CB #50		City: Everett	Address: 315 Riverside Dr		
Upstream node: CB #48	Downstream node: CB #50	Pipe type: Polyethylene	Pipe shape: Circular	Pipe height: 18	Pipe width:

### INSPECTION DATA

Scheduled date: 12/15/2016 10:09:41 AM		Start date/time: 12/15/2016 10:11:53 AM	End date/time: 12/15/2016 10:42:37 AM
Surveyed footage: 237.2	Status: Stopped	Operator: Kyle Osborn 253-442-4335	Work order no.:
Reason:	Weather: Dry	Condition:	
Comments			

### OBSERVATIONS

Footage	Rev.	Length	Clock From	Clock To	Code	Modifiers/Severity	Comment
0.0	No				Manhole		Start at CB #48
0.0	No				Water Level	<25%	
6.0	No				START WITH FLOW		
237.1	No				Manhole		Stop at CB #50
237.2	No				STOP		

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## Observations by Inspections

### SITE DATA

Mainline ID: CB #49-CB #48		City: Everett	Address: 315 Riverside Dr			
Upstream node: CB #49	Downstream node: CB #48	Pipe type: Polyethylene	Pipe shape: Circular	Pipe height: 15	Pipe width:	

### INSPECTION DATA

Scheduled date: 11/22/2016 11:36:24 AM		Start date/time: 12/15/2016 10:53:00 AM	End date/time: 12/15/2016 10:55:39 AM
Surveyed footage: 77.8	Status: Stopped	Operator: Kyle Osborn 253-442-4335	Work order no.:
Reason:	Weather: Dry	Condition:	
Comments			

### OBSERVATIONS

Footage	Rev.	Length	Clock From	Clock To	Code	Modifiers/Severity	Comment
0.0	No				Manhole		Start at CB #49
0.0	No				Water Level	<25%	
1.0	No				General Observation		18 inch PE
6.0	No				START WITH FLOW		
77.8	No				Manhole		Stop at CB #48
77.8	No				STOP		

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## Observations by Inspections

### SITE DATA

Mainline ID: CB #20-CB #21		City: Everett	Address: 315 Riverside Dr			
Upstream node: CB #20	Downstream node: CB #21	Pipe type: Polyethylene	Pipe shape: Circular	Pipe height: 24	Pipe width:	

### INSPECTION DATA

Scheduled date: 12/16/2016 9:05:11 PM		Start date/time: 12/16/2016 9:05:34 PM	End date/time: 12/16/2016 9:11:42 PM
Surveyed footage: 201.4	Status: Stopped	Operator: Kyle Osborn 253-442-4335	Work order no.:
Reason:	Weather: Dry	Condition:	
Comments			

### OBSERVATIONS

Footage	Rev.	Length	Clock From	Clock To	Code	Modifiers/Severity	Comment
0.0	Yes				Manhole		Start at CB #21
0.0	Yes				Water Level	<25%	
6.0	Yes				START AGAINST FLOW		
201.4	Yes				Manhole		Stop at CB #20
201.4	Yes				STOP		



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## Observations by Inspections

### SITE DATA

Mainline ID:		City:	Address:			
CB #21-CB #22		Everett	315 Riverside Dr			
Upstream node:	Downstream node:	Pipe type:	Pipe shape:	Pipe height:	Pipe width:	
CB #21	CB #22	Polyethylene	Circular	24		

### INSPECTION DATA

Scheduled date:		Start date/time:	End date/time:
12/16/2016 9:17:24 PM		12/16/2016 9:17:55 PM	12/16/2016 9:19:38 PM
Surveyed footage:	Status:	Operator:	Work order no.:
33.5	Stopped	Kyle Osborn 253-442-4335	
Reason:	Weather:	Condition:	
	Dry		
Comments			

### OBSERVATIONS

Footage	Rev.	Length	Clock From	Clock To	Code	Modifiers/Severity	Comment
0.0	No				Manhole		Start at CB #21
0.0	No				Water Level	<25%	
6.0	No				START WITH FLOW		
33.5	No				Manhole		Stop at CB #22
33.5	No				STOP		

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## Observations by Inspections

### SITE DATA

Mainline ID: CB #33-CB #34_1		City: Everett	Address: 315 Riverside Dr		
Upstream node: CB #33	Downstream node: CB #34	Pipe type: Polyethylene	Pipe shape: Circular	Pipe height: 18	Pipe width:

### INSPECTION DATA

Scheduled date: 12/16/2016 9:49:01 PM		Start date/time: 12/16/2016 9:49:24 PM	End date/time: 12/16/2016 9:57:39 PM
Surveyed footage: 137.3	Status: Stopped	Operator: Kyle Osborn 253-442-4335	Work order no.:
Reason:	Weather: Dry	Condition:	
Comments			

### OBSERVATIONS

Footage	Rev.	Length	Clock From	Clock To	Code	Modifiers/Severity	Comment
0.0	No				Manhole		Start at CB #33
0.0	No				Water Level	<25%	
6.0	No				START WITH FLOW		
14.7	No				General Observation		Line is foggy
40.2	No		5	7	Broken		
52.5	No		5	7	Broken		
94.4	No		4	8	Debris	<=20%	
137.3	No				Manhole		Stop at CB #34
137.3	No				STOP		

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## Observations by Inspections

### SITE DATA

Mainline ID: CB #50-CB #33		City: Everett	Address: 315 Riverside Dr		
Upstream node: CB #50	Downstream node: CB #33	Pipe type: Polyethylene	Pipe shape: Circular	Pipe height: 18	Pipe width:

### INSPECTION DATA

Scheduled date: 12/16/2016 10:03:48 PM		Start date/time: 12/16/2016 10:04:03 PM	End date/time: 12/16/2016 10:12:24 PM
Surveyed footage: 235.6	Status: Stopped	Operator: Kyle Osborn 253-442-4335	Work order no.:
Reason:	Weather: Dry	Condition:	
Comments			

### OBSERVATIONS

Footage	Rev.	Length	Clock From	Clock To	Code	Modifiers/Severity	Comment
0.0	Yes				Manhole		Start at CB #33
0.0	Yes				Water Level	<25%	
6.0	Yes				START AGAINST FLOW		
102.3	Yes		6		Infiltration		
102.3	Yes		6		Fracture		
191.6	Yes		12		Infiltration		
214.7	Yes		12		Infiltration		
221.3	Yes		6		Infiltration		
221.3	Yes		6		Crack		
235.6	Yes				Manhole		Stop at CB #50
235.6	Yes				STOP		

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## Observations by Inspections

### SITE DATA

Mainline ID: CB # 19-CB # 20		City: Everett	Address: 315 Riverside Dr		
Upstream node: CB # 19	Downstream node: CB # 20	Pipe type: Polyethylene	Pipe shape: Circular	Pipe height: 24	Pipe width:

### INSPECTION DATA

Scheduled date: 11/21/2016 1:14:06 PM		Start date/time: 12/16/2016 10:26:36 PM	End date/time: 12/16/2016 10:33:33 PM
Surveyed footage: 170.0	Status: Stopped	Operator: Kyle Osborn 253-442-4335	Work order no.:
Reason:	Weather: Dry	Condition:	
Comments			

### OBSERVATIONS

Footage	Rev.	Length	Clock From	Clock To	Code	Modifiers/Severity	Comment
0.0	No				Manhole		Start at CB # 19
0.0	No				Water Level	<25%	
6.0	No				START WITH FLOW		
26.3	No	4.4	5	7	Fracture		
40.4	No		5	7	Broken		
170.0	No				Manhole		Stop at CB # 20
170.0	No				STOP		

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## Observations by Inspections

### SITE DATA

Mainline ID: CB #22-CB #23		City: Everett	Address: 315 Riverside Dr			
Upstream node: CB #22	Downstream node: CB #23	Pipe type: Polyethylene	Pipe shape: Circular	Pipe height: 24	Pipe width:	

### INSPECTION DATA

Scheduled date: 12/16/2016 9:34:55 PM	Start date/time: 12/16/2016 11:10:52 PM	End date/time: 12/16/2016 11:19:19 PM
Surveyed footage: 224.7	Status: Stopped	Operator: Kyle Osborn 253-442-4335
Reason:	Weather: Dry	Condition:
Comments		

### OBSERVATIONS

Footage	Rev.	Length	Clock From	Clock To	Code	Modifiers/Severity	Comment
0.0	No				Manhole		Start at CB #22
0.0	No				Water Level	<25%	
6.0	No				START WITH FLOW		
21.4	No	203.3			Deformed	<=10%	
84.2	No	44.7	5	7	Broken		
100.4	No		6		Infiltration		
109.9	No		6		Infiltration		
128.9	No		12		Infiltration		
167.2	No	5.2	5	7	Broken		
172.4	No	6.1	12		Infiltration		
224.7	No				Manhole		Stop at CB #23
224.7	No				STOP		

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## Observations by Inspections

### SITE DATA

Mainline ID:		City:	Address:			
CB #24-Outfall		Everett	315 Riverside Dr			
Upstream node:	Downstream node:	Pipe type:	Pipe shape:	Pipe height:	Pipe width:	
CB #24	Outfall	Polyethylene	Circular	24		

### INSPECTION DATA

Scheduled date:		Start date/time:	End date/time:
12/16/2016 11:33:51 PM		12/16/2016 11:33:58 PM	12/16/2016 11:36:05 PM
Surveyed footage:	Status:	Operator:	Work order no.:
16.5	Stopped	Kyle Osborn 253-442-4335	
Reason:	Weather:	Condition:	
	Dry		
Comments			

### OBSERVATIONS

Footage	Rev.	Length	Clock From	Clock To	Code	Modifiers/Severity	Comment
0.0	No				Manhole		Start at CB #24
0.0	No				Water Level	>=50%	
6.0	No				START WITH FLOW		
16.5	No				End of Pipe		Stop at Gate at Outfall
16.5	No				General Observation		only about 15 percent ar
16.5	No				STOP		

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## Observations by Inspections

### SITE DATA

Mainline ID: CB #23-CB #24_1		City: Everett	Address: 315 Riverside Dr		
Upstream node: CB #23	Downstream node: CB #24	Pipe type: Polyethylene	Pipe shape: Circular	Pipe height: 24	Pipe width:

### INSPECTION DATA

Scheduled date: 12/16/2016 11:41:34 PM		Start date/time: 12/16/2016 11:41:46 PM	End date/time: 12/16/2016 11:43:02 PM
Surveyed footage: 3.0	Status: Stopped	Operator: Kyle Osborn 253-442-4335	Work order no.:
Reason:	Weather: Dry	Condition:	
Comments			

### OBSERVATIONS

Footage	Rev.	Length	Clock From	Clock To	Code	Modifiers/Severity	Comment
0.0	Yes				Manhole		Start at CB #24
3.0	Yes				START AGAINST FLOW		
3.0	Yes				Water Level	>=75%	
3.0	Yes				General Observation		leeper heading upstream
3.0	Yes				Abandoned Survey		Due to debris
3.0	Yes				STOP		

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## Observations by Inspections

### SITE DATA

Mainline ID:		City:		Address:	
Upstream -CB #24		Everett		315 Riverside Dr	
Upstream node:	Downstream node:	Pipe type:	Pipe shape:	Pipe height:	Pipe width:
Upstream	CB #24	Polyethylene	Circular	12	

### INSPECTION DATA

Scheduled date:		Start date/time:		End date/time:	
12/16/2016 11:53:31 PM		12/16/2016 11:58:52 PM		12/17/2016 12:02:17 AM	
Surveyed footage:	Status:	Operator:		Work order no.:	
51.5	Stopped	Kyle Osborn 253-442-4335			
Reason:	Weather:	Condition:			
	Dry				
Comments					

### OBSERVATIONS

Footage	Rev.	Length	Clock From	Clock To	Code	Modifiers/Severity	Comment
0.0	Yes				Manhole		Start at CB #24
0.0	Yes				Water Level	<25%	
6.0	Yes				START AGAINST FLOW		
41.5	Yes	10.0	4	8	Debris	<=20%	
51.5	Yes				Abandoned Survey		Due to debris
51.5	Yes				STOP		





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## Main Inspections

Mainline ID: <b>GE CB 10 GE CB 11</b>	City: <b>EVERETT</b>	Address: <b>RIVERSIDE RD.</b>	Project name: <b>GEO ENGINEERS # 000504-068</b>
Upstream node: <b>GE CB 10</b>	Downstream node: <b>GE CB 11</b>	Start date/time: <b>3/21/2018 9:46 AM</b>	End date/time: <b>3/21/2018 9:50 AM</b>
Pipe shape: <b>Circular</b>	Pipe material: <b>Polyethylene</b>	Pipe height: <b>12.0 in.</b>	Pipe width:
Asset length:	Surveyed distance: <b>9.6 ft.</b>	Reason:	Work order no.:
Operator: <b>Aaron Aiu (253) 405-1592</b>	Weather: <b>Dry</b>	Status: <b>Completed</b>	
Comments:			

## Observations

Distance	Dir.	Length	From/To	Code	Modifier/Severity	Rating
0.0 ft.	U		/	Catch Basin		
0.0 ft.	U		/	Water Level	>=50%	
0.0 ft.	U	9.6 ft.	/	Debris	<=30%	
9.6 ft.	U		/	Abandoned Survey		



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## Main Inspections

Mainline ID: <b>GE ROOF DRAIN GE CB 50</b>	City: <b>EVERETT</b>	Address: <b>315 RIVERSIDE RD.</b>	Project name: <b>GEO ENGINEERS # 000504-068</b>
Upstream node: <b>ROOF DRAIN</b>	Downstream node: <b>GE CB 50</b>	Start date/time: <b>3/21/2018 9:59 AM</b>	End date/time: <b>3/21/2018 10:04 AM</b>
Pipe shape: <b>Circular</b>	Pipe material: <b>PVC</b>	Pipe height: <b>6.0 in.</b>	Pipe width:
Asset length:	Surveyed distance: <b>55.7 ft.</b>	Reason:	Work order no.:
Operator: <b>Aaron Aiu (253) 405-1592</b>	Weather: <b>Dry</b>	Status: <b>Completed</b>	
Comments:			

## Observations

Distance	Dir.	Length	From/To	Code	Modifier/Severity	Rating
0.0 ft.	U		/	Catch Basin		
0.0 ft.	U		/	Water Level	<25%	
54.2 ft.	U		/	Pipe Angle Change		
55.7 ft.	U		/	Cleanout		



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## Main Inspections

Mainline ID: <b>GE CB 47 GE PUMP STATION</b>	City: <b>EVERETT</b>	Address: <b>315 RIVERSIDE RD.</b>	Project name: <b>GEO ENGINEERS # 000504-068</b>
Upstream node: <b>GE CB 47</b>	Downstream node: <b>GE PUMP STATION</b>	Start date/time: <b>3/21/2018 10:18 AM</b>	End date/time: <b>3/21/2018 10:24 AM</b>
Pipe shape: <b>Circular</b>	Pipe material: <b>PVC</b>	Pipe height: <b>6.0 in.</b>	Pipe width:
Asset length:	Surveyed distance: <b>22.0 ft.</b>	Reason:	Work order no.:
Operator: <b>Aaron Aiu (253) 405-1592</b>	Weather: <b>Dry</b>	Status: <b>Completed</b>	
Comments:			

## Observations

Distance	Dir.	Length	From/To	Code	Modifier/Severity	Rating
0.0 ft.	D		/	Catch Basin		
0.0 ft.	D		/	Water Level	<25%	
11.0 ft.	D	11.0 ft.	/	Sag		
16.8 ft.	D		/	End of Pipe		



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## Main Inspections

Mainline ID: <b>GE CB 47 GE CB 48</b>	City: <b>EVERETT</b>	Address: <b>315 RIVERSIDE RD.</b>	Project name: <b>GEO ENGINEERS # 000504-068</b>
Upstream node: <b>GE CB 47</b>	Downstream node: <b>GE CB 48</b>	Start date/time: <b>3/21/2018 10:28 AM</b>	End date/time: <b>3/21/2018 10:34 AM</b>
Pipe shape: <b>Circular</b>	Pipe material: <b>Polyethylene</b>	Pipe height: <b>18.0 in.</b>	Pipe width:
Asset length:	Surveyed distance: <b>34.3 ft.</b>	Reason:	Work order no.:
Operator: <b>Aaron Aiu (253) 405-1592</b>	Weather: <b>Dry</b>	Status: <b>Completed</b>	
Comments:			

## Observations

Distance	Dir.	Length	From/To	Code	Modifier/Severity	Rating
0.0 ft.	U		/	Catch Basin		
0.0 ft.	U		/	Water Level	<25%	
29.0 ft.	U		/	Sag		
34.3 ft.	U		/	Catch Basin		



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## Main Inspections

Mainline ID: <b>GE CB 26 GE CB 27</b>	City: <b>EVERETT</b>	Address: <b>RIVERSIDE RD.</b>	Project name: <b>GEO ENGINEERS # 000504-068</b>
Upstream node: <b>GE CB 26</b>	Downstream node: <b>GE CB 27</b>	Start date/time: <b>3/21/2018 10:50 AM</b>	End date/time: <b>3/21/2018 11:00 AM</b>
Pipe shape: <b>Circular</b>	Pipe material: <b>Polyethylene</b>	Pipe height: <b>12.0 in.</b>	Pipe width:
Asset length:	Surveyed distance: <b>149.1 ft.</b>	Reason:	Work order no.:
Operator: <b>Aaron Aiu (253) 405-1592</b>	Weather: <b>Dry</b>	Status: <b>Completed</b>	
Comments:			

## Observations

Distance	Dir.	Length	From/To	Code	Modifier/Severity	Rating
0.0 ft.	U		/	Catch Basin		
0.0 ft.	U		/	Water Level	>=25%	
23.6 ft.	U		/	Water Level	>=75%	
25.8 ft.	U	52.3 ft.	/	Camera Under Water		
25.8 ft.	U	52.3 ft.	/	Sag		
109.0 ft.	U	12.3 ft.	/	Sag		
111.4 ft.	U	9.9 ft.	/	Debris	<=10%	
131.3 ft.	U	17.8 ft.	/	Sag		
146.3 ft.	U		12 /	Hole		
149.1 ft.	U		/	Debris	<=30%	
149.1 ft.	U		/	Abandoned Survey		



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## Main Inspections

Mainline ID: <b>GE CB 26 GE CB 27</b>	City: <b>EVERETT</b>	Address: <b>RIVERSIDE RD.</b>	Project name: <b>GEO ENGINEERS # 000504-068</b>
Upstream node: <b>GE CB 26</b>	Downstream node: <b>GE CB 27</b>	Start date/time: <b>3/21/2018 11:24 AM</b>	End date/time: <b>3/21/2018 11:28 AM</b>
Pipe shape: <b>Circular</b>	Pipe material: <b>Polyethylene</b>	Pipe height: <b>12.0 in.</b>	Pipe width:
Asset length:	Surveyed distance: <b>37.6 ft.</b>	Reason:	Work order no.:
Operator: <b>Aaron Aiu (253) 405-1592</b>	Weather: <b>Dry</b>	Status: <b>Completed</b>	
Comments:			

## Observations

Distance	Dir.	Length	From/To	Code	Modifier/Severity	Rating
0.0 ft.	D		/	Catch Basin		
0.0 ft.	D	37.6 ft.	/	Debris		
0.0 ft.	D		/	Water Level	<25%	
8.3 ft.	D	2.8 ft.	/	Sag		
20.0 ft.	D		/	Sag		
20.4 ft.	D		/	Deformed	<=10%	
32.8 ft.	D	4.8 ft.	/	Sag		
37.6 ft.	D		/	Abandoned Survey		
37.6 ft.	D		/	Debris	<=30%	



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## Main Inspections

Mainline ID: <b>GE CB 52 GE CB27</b>	City: <b>EVERETT</b>	Address: <b>RIVERSIDE RD.</b>	Project name: <b>GEO ENGINEERS # 000504-068</b>
Upstream node: <b>GE CB 52</b>	Downstream node: <b>GE CB 27</b>	Start date/time: <b>3/21/2018 11:04 AM</b>	End date/time: <b>3/21/2018 11:13 AM</b>
Pipe shape: <b>Circular</b>	Pipe material: <b>Polyethylene</b>	Pipe height: <b>12.0 in.</b>	Pipe width:
Asset length:	Surveyed distance: <b>216.1 ft.</b>	Reason:	Work order no.:
Operator: <b>Aaron Aiu (253) 405-1592</b>	Weather: <b>Dry</b>	Status: <b>Completed</b>	
Comments:			

## Observations

Distance	Dir.	Length	From/To	Code	Modifier/Severity	Rating
0.0 ft.	U		/	Catch Basin		
0.0 ft.	U		/	Water Level	<25%	
0.0 ft.	U	13.2 ft.	/	Sag		
5.0 ft.	U	209.4 ft.	12 / 12	Debris		
16.1 ft.	U		/	Joint Offset		
41.7 ft.	U	14.5 ft.	/	Sag		
58.7 ft.	U	4.5 ft.	/	Sag		
75.3 ft.	U	14.7 ft.	/	Sag		
107.3 ft.	U	22.9 ft.	/	Sag		
142.4 ft.	U		/	Sag		
143.0 ft.	U		2 /	Deformed	<=10%	
146.7 ft.	U	6.8 ft.	/	Sag		
162.9 ft.	U	8.3 ft.	/	Sag		
183.3 ft.	U	31.1 ft.	/	Sag		
198.9 ft.	U	5.2 ft.	/	Deformed	>10%	
216.1 ft.	U		/	Catch Basin		



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## Main Inspections

Mainline ID: <b>GE CB 53 GE PUMP STATION</b>	City: <b>EVERETT</b>	Address: <b>RIVERSIDE RD.</b>	Project name: <b>GEO ENGINEERS # 000504-068</b>
Upstream node: <b>GE CB 53</b>	Downstream node: <b>GE PUMP STATION</b>	Start date/time: <b>3/21/2018 11:19 AM</b>	End date/time: <b>3/21/2018 11:21 AM</b>
Pipe shape: <b>Circular</b>	Pipe material: <b>Polyethylene</b>	Pipe height: <b>12.0 in.</b>	Pipe width:
Asset length:	Surveyed distance: <b>2.1 ft.</b>	Reason:	Work order no.:
Operator: <b>Aaron Aiu (253) 405-1592</b>	Weather: <b>Dry</b>	Status: <b>Completed</b>	
Comments:			

## Observations

Distance	Dir.	Length	From/To	Code	Modifier/Severity	Rating
0.0 ft.	D		/	Catch Basin		
0.0 ft.	D		/	Water Level	<25%	
2.0 ft.	D		/	End of Pipe		





PROVAC  
 6622 112TH ST E.  
 Puyallup, WA 98373  
 Phone: (253) 435-4328  
 Fax: (253) 435-5788

## Main Inspections

Mainline ID: <b>GE CB 18 GE CB 17</b>	City: <b>EVERETT</b>	Address: <b>RIVERSIDE RD.</b>	Project name: <b>GEO ENGINEERS # 000504-068</b>
Upstream node: <b>GE CB 18</b>	Downstream node: <b>GE CB 17</b>	Start date/time: <b>3/21/2018 12:01 PM</b>	End date/time: <b>3/21/2018 12:05 PM</b>
Pipe shape: <b>Circular</b>	Pipe material: <b>Polyethylene</b>	Pipe height: <b>12.0 in.</b>	Pipe width:
Asset length:	Surveyed distance: <b>52.7 ft.</b>	Reason:	Work order no.:
Operator: <b>Aaron Aiu (253) 405-1592</b>	Weather: <b>Dry</b>	Status: <b>Completed</b>	
Comments:			

## Observations

Distance	Dir.	Length	From/To	Code	Modifier/Severity	Rating
0.0 ft.	D		/	Catch Basin		
0.0 ft.	D		/	Water Level	<25%	
0.0 ft.	D	17.8 ft.	/	Debris	<=30%	
17.8 ft.	D	34.7 ft.	/	Debris	<=10%	
17.8 ft.	D	34.7 ft.	/	Sag		
27.4 ft.	D		/	Joint Offset		
40.5 ft.	D		2 /	Hole		
51.2 ft.	D		2 / 5	Fracture	Circumfrential	
52.7 ft.	D		/	Catch Basin		



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## Main Inspections

Mainline ID: <b>GE CB 51 GE CB 52</b>	City: <b>EVERETT</b>	Address: <b>RIVERSIDE RD.</b>	Project name: <b>GEO ENGINEERS # 000504-068</b>
Upstream node: <b>GE CB 51</b>	Downstream node: <b>GE CB 52</b>	Start date/time: <b>3/21/2018 12:07 PM</b>	End date/time: <b>3/21/2018 12:14 PM</b>
Pipe shape: <b>Circular</b>	Pipe material: <b>Polyethylene</b>	Pipe height: <b>12.0 in.</b>	Pipe width:
Asset length:	Surveyed distance: <b>22.7 ft.</b>	Reason:	Work order no.:
Operator: <b>Aaron Aiu (253) 405-1592</b>	Weather: <b>Dry</b>	Status: <b>Completed</b>	
Comments:			

## Observations

Distance	Dir.	Length	From/To	Code	Modifier/Severity	Rating
0.0 ft.	D		/	Catch Basin		
0.0 ft.	D		/	Water Level	<25%	
0.0 ft.	D		/	Debris	<=20%	
7.2 ft.	D	15.5 ft.	/	Joint Offset		
22.7 ft.	D		/	Catch Basin		



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 Puyallup, WA 98373  
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 Fax: (253) 435-5788

## Main Inspections

Mainline ID: <b>GE CB 23 GE CB 24</b>	City: <b>EVERETT</b>	Address: <b>RIVERSIDE RD.</b>	Project name: <b>GEO ENGINEERS # 000504-068</b>
Upstream node: <b>GE CB 23</b>	Downstream node: <b>GE CB 24</b>	Start date/time: <b>3/21/2018 3:47 PM</b>	End date/time: <b>3/21/2018 3:50 PM</b>
Pipe shape: <b>Circular</b>	Pipe material:	Pipe height:	Pipe width:
Asset length:	Surveyed distance: <b>0.0 ft.</b>	Reason:	Work order no.:
Operator: <b>Aaron Aiu (253) 405-1592</b>	Weather: <b>Dry</b>	Status: <b>Completed</b>	
Comments:			

## Observations

Distance	Dir.	Length	From/To	Code	Modifier/Severity	Rating
0.0 ft.	U		/	Manhole		
0.0 ft.	U		/	Water Level	100%	
0.0 ft.	U		/	Debris	>30%	
0.0 ft.	U		/	Abandoned Survey		



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 Puyallup, WA 98373  
 Phone: (253) 435-4328  
 Fax: (253) 435-5788

## Main Inspections

Mainline ID: <b>GE CB 34 GE CB 35</b>	City: <b>EVERETT</b>	Address: <b>RIVERSIDE RD.</b>	Project name: <b>GEO ENGINEERS # 000504-068</b>
Upstream node: <b>GE CB 34</b>	Downstream node: <b>GE CB 35</b>	Start date/time: <b>3/21/2018 4:21 PM</b>	End date/time: <b>3/21/2018 4:29 PM</b>
Pipe shape: <b>Circular</b>	Pipe material: <b>Polyethylene</b>	Pipe height: <b>24.0 in.</b>	Pipe width:
Asset length:	Surveyed distance: <b>124.2 ft.</b>	Reason:	Work order no.:
Operator: <b>Aaron Aiu (253) 405-1592</b>	Weather: <b>Dry</b>	Status: <b>Completed</b>	
Comments:			

## Observations

Distance	Dir.	Length	From/To	Code	Modifier/Severity	Rating
0.0 ft.	D		/	Manhole		
0.0 ft.	D		/	Water Level	>=75%	
55.8 ft.	D		/	Water Level	100%	
56.1 ft.	D	67.9 ft.	/	Camera Under Water		
56.5 ft.	D	67.7 ft.	/	Debris	<=10%	
124.2 ft.	D		/	Abandoned Survey		

**APPENDIX D**  
**Laboratory Report**



23 March 2018

Abhijit R. Joshi  
GeoEngineers  
17425 Union Hill Road Suite 250  
Redmond, WA 98052

RE: Everett Smelter-Low Lands Area

Please find enclosed sample receipt documentation and analytical results for samples from the project referenced above.

Sample analyses were performed according to ARI's Quality Assurance Plan and any provided project specific Quality Assurance Plan. Each analytical section of this report has been approved and reviewed by an analytical peer, the appropriate Laboratory Supervisor or qualified substitute, and a technical reviewer.

Should you have any questions or problems, please feel free to contact us at your convenience.

<u>Associated Work Order(s)</u>	<u>Associated SDG ID(s)</u>
18C0296	N/A

-----

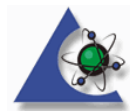
I certify that this data package is in compliance with the terms and conditions of the contract, both technically and for completeness, for other than the conditions detailed in the enclose Narrative. ARI, an accredited laboratory, certifies that the report results for which ARI is accredited meets all the requirements of the accrediting body. A list of certified analyses, accreditations, and expiration dates is included in this report.

Release of the data contained in this hardcopy data package has been authorized by the Laboratory Manager or his/her designee, as verified by the following signature.

Analytical Resources, Inc.

*The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.*

Amanda Volgardsen, Project Manager



# Chain of Custody Record & Laboratory Analysis Request

ARI Assigned Number: 18C0796 Turn-around Requested: Standard Page: 1 of 1  
 ARI Client Company: Geoengineers Phone: \_\_\_\_\_ Date: 3/16/18 Ice Present? \_\_\_\_\_  
 Client Contact: Abhijit Joshi No. of Coolers: \_\_\_\_\_ Cooler Temps: \_\_\_\_\_  
 Client Project Name: Everett Smelter Site Samplers: Conor Kingston

**Analytical Resources, Incorporated**  
 Analytical Chemists and Consultants  
 4611 South 134th Place, Suite 100  
 Tukwila, WA 98168  
 206-695-6200 206-695-6201 (fax)  
 www.arilabs.com



Sample ID	Date	Time	Matrix	No. Containers
CB8	3/16/18	12:30	W	2
CB9		12:40		
CB10		12:50		
CB11		13:00		

Analysis Requested		Notes/Comments	
As, Pb	Disolved		
As, Pb	Total		
			Hold
			Hold
			Hold
			Run

Comments/Special Instructions: Disolved Samples were field filtered

Relinquished by: (Signature) [Signature] Received by: (Signature) Stephane Fianu  
 Printed Name: Conor Kingston Printed Name: Stephane Fianu  
 Company: Geoengineers Company: ARI  
 Date & Time: 3/16/18 17:30 Date & Time: 3/16/18 17:28

**Limits of Liability:** ARI will perform all requested services in accordance with appropriate methodology following ARI Standard Operating Procedures and the ARI Quality Assurance Program. This program meets standards for the industry. The total liability of ARI, its officers, agents, employees, or successors, arising out of or in connection with the requested services, shall not exceed the invoiced amount for said services. The acceptance by the client of a proposal for services by ARI release ARI from any liability in excess thereof, notwithstanding any provision to the contrary in any contract, purchase order or co-signed agreement between ARI and the Client.

**Sample Retention Policy:** All samples submitted to ARI will be appropriately discarded no sooner than 90 days after receipt or 60 days after submission of hardcopy data, whichever is longer, unless alternate retention schedules have been established by work-order or contract.





WORK ORDER

18C0296

Client: GeoEngineers	Project Manager: Amanda Volgardsen
Project: Everett Smelter-Low Lands Area	Project Number: 000504-068-02

Preservation Confirmation

Container ID	Container Type	pH	
18C0296-01 A	HDPE NM, 500 mL, 1:1 HNO3	7.2	Pass
18C0296-02 A	HDPE NM, 500 mL, 1:1 HNO3 (FF)	7.2	Pass
18C0296-03 A	HDPE NM, 500 mL, 1:1 HNO3	7.2	Pass
18C0296-04 A	HDPE NM, 500 mL, 1:1 HNO3 (FF)	7.2	Pass
18C0296-05 A	HDPE NM, 500 mL, 1:1 HNO3	7.2	Pass
18C0296-06 A	HDPE NM, 500 mL, 1:1 HNO3 (FF)	7.2	Pass
18C0296-07 A	HDPE NM, 500 mL, 1:1 HNO3	7.2	Pass
18C0296-08 A	HDPE NM, 500 mL, 1:1 HNO3 (FF)	7.2	Pass

*SBW*

Preservation Confirmed By

*03/19/18*

Date





# Cooler Receipt Form

ARI Client: Geoengineers  
 COC No(s): \_\_\_\_\_ NA  
 Assigned ARI Job No: 18C0296

Project Name: \_\_\_\_\_  
 Delivered by: Fed-Ex UPS Courier Hand Delivered Other: \_\_\_\_\_  
 Tracking No: \_\_\_\_\_ NA

**Preliminary Examination Phase:**

Were intact, properly signed and dated custody seals attached to the outside of to cooler? YES NO  
 Were custody papers included with the cooler? YES NO  
 Were custody papers properly filled out (ink, signed, etc.) YES NO  
 Temperature of Cooler(s) (°C) (recommended 2.0-6.0 °C for chemistry) 13.4  
 Time: \_\_\_\_\_  
 If cooler temperature is out of compliance fill out form 00070F Temp Gun ID#: D002565

Cooler Accepted by: SEF Date: 3/16/18 Time: 1728

**Complete custody forms and attach all shipping documents**

**Log-In Phase:**

Was a temperature blank included in the cooler? YES NO  
 What kind of packing material was used? ... Bubble-Wrap Wet Ice Gel Packs Baggies Foam Block Paper Other: \_\_\_\_\_  
 Was sufficient ice used (if appropriate)? NA YES NO  
 Were all bottles sealed in individual plastic bags? YES NO  
 Did all bottles arrive in good condition (unbroken)? YES NO  
 Were all bottle labels complete and legible? YES NO  
 Did the number of containers listed on COC match with the number of containers received? YES NO  
 Did all bottle labels and tags agree with custody papers? YES NO  
 Were all bottles used correct for the requested analyses? YES NO  
 Do any of the analyses (bottles) require preservation? (attach preservation sheet, excluding VOCs)... NA YES NO  
 Were all VOC vials free of air bubbles? NA YES NO  
 Was sufficient amount of sample sent in each bottle? YES NO  
 Date VOC Trip Blank was made at ARI... NA  
 Was Sample Split by ARI : NA YES Date/Time: \_\_\_\_\_ Equipment: \_\_\_\_\_ Split by: \_\_\_\_\_  
 Samples Logged by: SBW Date: 03/19/18 Time: 0820

**\*\* Notify Project Manager of discrepancies or concerns \*\***

Sample ID on Bottle	Sample ID on COC	Sample ID on Bottle	Sample ID on COC

**Additional Notes, Discrepancies, & Resolutions:**

By: \_\_\_\_\_ Date: \_\_\_\_\_

			Small → "sm" (< 2 mm)
			Peabubbles → "pb" (2 to < 4 mm)
			Large → "lg" (4 to < 6 mm)
			Headspace → "hs" (> 6 mm)



# Cooler Temperature Compliance Form

Cooler#:		Temperature(°C): <u>13.4</u>	
Sample ID	Bottle Count	Bottle Type	
<u>Samples received above 6°</u>			

Cooler#:		Temperature(°C):	
Sample ID	Bottle Count	Bottle Type	

Cooler#:		Temperature(°C):	
Sample ID	Bottle Count	Bottle Type	

Cooler#:		Temperature(°C):	
Sample ID	Bottle Count	Bottle Type	

Completed by: SEF Date: 3/16/10 Time: 1728



GeoEngineers  
17425 Union Hill Road Suite 250  
Redmond WA, 98052

Project: Everett Smelter-Low Lands Area  
Project Number: 000504-068-02  
Project Manager: Abhijit R. Joshi

**Reported:**  
23-Mar-2018 16:56

## Case Narrative

### **Sample receipt**

Samples as listed on the preceding page were received March 16, 2018 under ARI work order 18C0296. For details regarding sample receipt, please refer to the Cooler Receipt Form.

### **Total and Dissolved Lead - EPA Method 200.8**

The samples were digested and analyzed within the recommended holding times.

Initial and continuing calibrations were within method requirements.

The method blanks were clean at the reporting limits.

The LCS percent recoveries were within control limits.

### **Total and Dissolved Arsenic UCT-KED - EPA Method 200.8**

The samples were digested and analyzed within the recommended holding times.

Initial and continuing calibrations were within method requirements.

The method blanks were clean at the reporting limits.

The LCS percent recoveries were within control limits.



GeoEngineers

17425 Union Hill Road Suite 250

Redmond, WA 98052

Project: Everett Smelter-Low Lands Area

Project Number: 000504-068-02

Project Manager: Abhijit R. Joshi

**Reported:**

03/23/2018 16:56

**ANALYTICAL REPORT FOR SAMPLES**

Laboratory ID	Sample ID	Matrix	Date Sampled	Date Received
18C0296-01	CB8	Water	03/16/18 12:30	03/16/18 17:28
18C0296-02	CB8	Water	03/16/18 12:30	03/16/18 17:28
18C0296-03	CB9	Water	03/16/18 12:40	03/16/18 17:28
18C0296-04	CB9	Water	03/16/18 12:40	03/16/18 17:28
18C0296-05	CB10	Water	03/16/18 12:50	03/16/18 17:28
18C0296-06	CB10	Water	03/16/18 12:50	03/16/18 17:28
18C0296-07	CB11	Water	03/16/18 13:00	03/16/18 17:28
18C0296-08	CB11	Water	03/16/18 13:00	03/16/18 17:28

## QUALIFIERS AND NOTES

<u>Qualifier</u>	<u>Definition</u>
U	This analyte is not detected above the applicable reporting or detection limit.
J	Estimated concentration value detected below the reporting limit.
D	The reported value is from a dilution
DET	Analyte DETECTED
ND	Analyte NOT DETECTED at or above the reporting limit
NR	Not Reported
dry	Sample results reported on a dry weight basis
RPD	Relative Percent Difference



Form I  
INORGANIC ANALYSIS DATA SHEET

CB11

EPA 200.8  
Total Metals

Laboratory: Analytical Resources, Inc.  
Client: GeoEngineers  
Project: Everett Smelter-Low Lands Area  
Matrix: Water Laboratory ID: 18C0296-07 SDG: 18C0296  
Sampled: 03/16/18 13:00 Prepared: 03/20/18 05:11 File ID: XDT\_m2180321-068  
% Solids: 0.00 Preparation: REN EPA 600/4-79-020 4.1.4 HNO3 Analyzed: 03/21/18 20:38  
Batch: BGC0525 Sequence: SGC0310 Initial/Final: 25 mL / 25 mL  
Instrument: ICPMS2 Calibration: BC00051

CAS NO.	Analyte	Concentration (ug/L)	Dilution Factor	MDL	MRL	Q
7439-92-1	Lead-208	6.87	1	0.0680	0.100	



Form I  
INORGANIC ANALYSIS DATA SHEET

CB11

EPA 200.8  
Dissolved Metals

Laboratory: Analytical Resources, Inc.  
Client: GeoEngineers  
Project: Everett Smelter-Low Lands Area  
Matrix: Water Laboratory ID: 18C0296-08 SDG: 18C0296  
Sampled: 03/16/18 13:00 Prepared: 03/20/18 06:32 File ID: XDT\_m2180320-126  
% Solids: 0.00 Preparation: REN EPA 600/4-79-020 4.1.4 HNO3 Analyzed: 03/20/18 23:31  
Batch: BGC0526 Sequence: SGC0297 Initial/Final: 25 mL / 25 mL  
Instrument: ICPMS2 Calibration: BC00048

CAS NO.	Analyte	Concentration (ug/L)	Dilution Factor	MDL	MRL	Q
7439-92-1	Lead-208, Dissolved	0.100	1	0.0680	0.100	U



## PREPARATION BATCH SUMMARY

### EPA 200.8

Laboratory: Analytical Resources, Inc.

SDG: 18C0296

Client: GeoEngineers

Project: Everett Smelter-Low Lands Area

Batch: BGC0525 Batch Matrix: Water

Preparation: REN EPA 600/4-79-020 4.1.4 HNO3 matrix

SAMPLE NAME	LAB SAMPLE ID	LAB FILE ID	DATE PREPARED	OBSERVATIONS
CB11	18C0296-07	XDT_m2180321-068	03/20/18 05:11	
Blank	BGC0525-BLK1	XDT_m2180320-026	03/20/18 05:11	
LCS	BGC0525-BS1	XDT_m2180320-030	03/20/18 05:11	





## PREPARATION BATCH SUMMARY

### EPA 200.8

Laboratory: Analytical Resources, Inc. SDG: 18C0296  
Client: GeoEngineers Project: Everett Smelter-Low Lands Area  
Batch: BGC0526 Batch Matrix: Water Preparation: REN EPA 600/4-79-020 4.1.4 HNO3 matrix

SAMPLE NAME	LAB SAMPLE ID	LAB FILE ID	DATE PREPARED	OBSERVATIONS
CB11	18C0296-08	XDT_m2180320-126	03/20/18 06:32	
Blank	BGC0526-BLK1	XDT_m2180320-074	03/20/18 06:32	
LCS	BGC0526-BS1	XDT_m2180320-078	03/20/18 06:32	



**Form I**  
**METHOD BLANK DATA SHEET**  
**EPA 200.8**  
Dissolved Metals

Blank

Batch: BGC0526

Laboratory ID: BGC0526-BLK1

Prepared: 03/20/18 06:32

Matrix: Water

Preparation: REN EPA 600/4-79-020 4

Analyzed: 03/20/18 18:47

Sequence: SGC0297

Calibration: BC00048

Instrument: ICPMS2

CAS NO.	Analyte	Concentration (ug/L)	Dilution Factor	MDL	MRL	Q
7439-92-1	Lead-208	ND	1	0.0680	0.100	U



**Form I**  
**METHOD BLANK DATA SHEET**

Blank

**EPA 200.8**  
Total Metals

Batch: BGC0525

Laboratory ID: BGC0525-BLK1

Prepared: 03/20/18 05:11

Matrix: Water

Preparation: REN EPA 600/4-79-020 4

Analyzed: 03/20/18 14:26

Sequence: SGC0297

Calibration: BC00048

Instrument: ICPMS2

CAS NO.	Analyte	Concentration (ug/L)	Dilution Factor	MDL	MRL	Q
7439-92-1	Lead-208	ND	1	0.0680	0.100	U

**INSTRUMENT BLANKS**  
**EPA 200.8**

Laboratory: Analytical Resources, Inc.

SDG: 18C0296

Client: GeoEngineers

Project: Everett Smelter-Low Lands Area

Instrument ID: ICPMS2

Calibration: BC00048

Sequence: SGC0297

Date Analyzed: 03/20/18 13:21

Lab Sample ID	Analyte	Found	MDL	MRL	Units	C
SGC0297-ICB1	Lead-208 (dissolved)	0.00200	0.068	0.100	ug/L	
SGC0297-ICB1	Lead-208	0.00200	0.068	0.100	ug/L	
SGC0297-CCB1	Lead-208	0.00300	0.068	0.100	ug/L	
SGC0297-CCB1	Lead-208 (dissolved)	0.00300	0.068	0.100	ug/L	
SGC0297-CCB2	Lead-208 (dissolved)	0.00300	0.068	0.100	ug/L	
SGC0297-CCB2	Lead-208	0.00300	0.068	0.100	ug/L	
SGC0297-CCB3	Lead-208 (dissolved)	0.00200	0.068	0.100	ug/L	
SGC0297-CCB3	Lead-208	0.00200	0.068	0.100	ug/L	
SGC0297-CCB4	Lead-208 (dissolved)	0.0170	0.068	0.100	ug/L	
SGC0297-CCB4	Lead-208	0.0170	0.068	0.100	ug/L	
SGC0297-CCB5	Lead-208 (dissolved)	0.00700	0.068	0.100	ug/L	
SGC0297-CCB5	Lead-208	0.00700	0.068	0.100	ug/L	
SGC0297-CCB6	Lead-208 (dissolved)	0.00700	0.068	0.100	ug/L	
SGC0297-CCB6	Lead-208	0.00700	0.068	0.100	ug/L	
SGC0297-CCB7	Lead-208 (dissolved)	0.00300	0.068	0.100	ug/L	
SGC0297-CCB7	Lead-208	0.00300	0.068	0.100	ug/L	
SGC0297-CCB8	Lead-208 (dissolved)	0.00300	0.068	0.100	ug/L	
SGC0297-CCB8	Lead-208	0.00300	0.068	0.100	ug/L	
SGC0297-CCB9	Lead-208 (dissolved)	0.0110	0.068	0.100	ug/L	
SGC0297-CCB9	Lead-208	0.0110	0.068	0.100	ug/L	
SGC0297-CCBA	Lead-208 (dissolved)	0.00600	0.068	0.100	ug/L	
SGC0297-CCBA	Lead-208	0.00600	0.068	0.100	ug/L	
SGC0297-CCBB	Lead-208	0.00200	0.068	0.100	ug/L	
SGC0297-CCBB	Lead-208 (dissolved)	0.00200	0.068	0.100	ug/L	



# INSTRUMENT BLANKS

## EPA 200.8

Laboratory: Analytical Resources, Inc.

SDG: 18C0296

Client: GeoEngineers

Project: Everett Smelter-Low Lands Area

Instrument ID: ICPMS2

Calibration: BC00051

Sequence: SGC0310

Date Analyzed: 03/21/18 15:47

Lab Sample ID	Analyte	Found	MDL	MRL	Units	C
SGC0310-ICB1	Lead-208	0.00	0.068	0.100	ug/L	
SGC0310-CCB1	Lead-208	-0.00100	0.068	0.100	ug/L	
SGC0310-CCB2	Lead-208	0.00100	0.068	0.100	ug/L	
SGC0310-CCB3	Lead-208	0.00	0.068	0.100	ug/L	
SGC0310-CCB4	Lead-208	-0.00100	0.068	0.100	ug/L	
SGC0310-CCB5	Lead-208	0.00500	0.068	0.100	ug/L	
SGC0310-CCB6	Lead-208	-0.00100	0.068	0.100	ug/L	
SGC0310-CCB7	Lead-208	-0.00100	0.068	0.100	ug/L	
SGC0310-CCB8	Lead-208	-0.00100	0.068	0.100	ug/L	
SGC0310-CCB9	Lead-208	-0.00200	0.068	0.100	ug/L	



## LCS / LCS DUPLICATE RECOVERY

### EPA 200.8

Total Metals

Laboratory: <u>Analytical Resources, Inc.</u>	SDG: <u>18C0296</u>
Client: <u>GeoEngineers</u>	Project: <u>Everett Smelter-Low Lands Area</u>
Matrix: <u>Water</u>	Analyzed: <u>03/20/18 14:47</u>
Batch: <u>BGC0525</u>	Laboratory ID: <u>BGC0525-BS1</u>
Preparation: <u>REN EPA 600/4-79-020 4.1.4 HNO3 matrix</u>	Sequence Name: <u>LCS</u>
Initial/Final: <u>25 mL / 25 mL</u>	

COMPOUND	SPIKE ADDED (ug/L)	LCS CONCENTRATION (ug/L)	Q	LCS % REC. #	QC LIMITS REC.
Lead-208	25.0	27.6		111	80 - 120

\* Indicates values outside of QC limits



## LCS / LCS DUPLICATE RECOVERY

### EPA 200.8

Dissolved Metals

Laboratory: <u>Analytical Resources, Inc.</u>	SDG: <u>18C0296</u>
Client: <u>GeoEngineers</u>	Project: <u>Everett Smelter-Low Lands Area</u>
Matrix: <u>Water</u>	Analyzed: <u>03/20/18 19:08</u>
Batch: <u>BGC0526</u>	Laboratory ID: <u>BGC0526-BS1</u>
Preparation: <u>REN EPA 600/4-79-020 4.1.4 HNO3 matrix</u>	Sequence Name: <u>LCS</u>
Initial/Final: <u>25 mL / 25 mL</u>	

COMPOUND	SPIKE ADDED (ug/L)	LCS CONCENTRATION (ug/L)	Q	LCS % REC. #	QC LIMITS REC.
Lead-208 (dissolved)	25.0	28.7		115	80 - 120

\* Indicates values outside of QC limits



## INITIAL CALIBRATION DATA

### EPA 200.8

Laboratory: Analytical Resources, Inc.

SDG: 18C0296

Client: GeoEngineers

Project: Everett Smelter-Low Lands Area

Calibration: BC00048

Instrument: ICPMS2

Calibration Date: 03/20/2018 12:32

Compound	Level 01		Level 02		Level 03		Level 04		Level 05		Level 06	
		RF		RF		RF		RF		RF		RF
Lead-208	0	0	0.1	31650	10	29315.2	20	28772.75	50	27918.82	100	26836.96
Lead-208, Dissolved	0	0	0.1	31650	10	29315.2	20	28772.75	50	27918.82	100	26836.96







## INITIAL CALIBRATION DATA

### EPA 200.8

Laboratory: Analytical Resources, Inc.

SDG: 18C0296

Client: GeoEngineers

Project: Everett Smelter-Low Lands Area

Calibration: BC00051

Instrument: ICPMS2

Calibration Date: 03/21/2018 14:59

Compound	Level 01		Level 02		Level 03		Level 04		Level 05		Level 06	
		RF		RF		RF		RF		RF		RF
Lead-208	0	0	0.1	26790	10	24227.7	20	23752.25	50	22872.24	100	21192.44



## INITIAL CALIBRATION DATA

### EPA 200.8

Laboratory: Analytical Resources, Inc.

SDG: 18C0296

Client: GeoEngineers

Project: Everett Smelter-Low Lands Area

Calibration: BC00051

Instrument: ICPMS2

Calibration Date: 03/21/2018 14:59

COMPOUND	Mean RF	RF RSD	Linear COD	Quad COD	COD Limit	Q
Lead-208	19805.77	49.9	0.9983		0.998	



# INITIAL AND CONTINUING CALIBRATION CHECK

## EPA 200.8

Laboratory: Analytical Resources, Inc.

SDG: 18C0296

Client: GeoEngineers

Project: Everett Smelter-Low Lands Area

Instrument ID: ICPMS2

Calibration: BC00048

Control Limit: +/- 10.00%

Sequence: SGC0297

Lab Sample ID	Analyte	True	Found	%R	Units	Method
SGC0297-ICV1	Lead-208	50.000	52.0	104	ug/L	EPA 200.8
	Lead-208 (dissolved)	50.000	52.0	104	ug/L	EPA 200.8
SGC0297-CCV1	Lead-208	50.000	51.0	102	ug/L	EPA 200.8
	Lead-208 (dissolved)	50.000	51.0	102	ug/L	EPA 200.8
SGC0297-CCV2	Lead-208	50.000	52.2	104	ug/L	EPA 200.8
	Lead-208 (dissolved)	50.000	52.2	104	ug/L	EPA 200.8
SGC0297-CCV3	Lead-208	50.000	51.1	102	ug/L	EPA 200.8
	Lead-208 (dissolved)	50.000	51.1	102	ug/L	EPA 200.8
SGC0297-CCV4	Lead-208	50.000	52.3	105	ug/L	EPA 200.8
	Lead-208 (dissolved)	50.000	52.3	105	ug/L	EPA 200.8
SGC0297-CCV5	Lead-208	50.000	53.2	106	ug/L	EPA 200.8
	Lead-208 (dissolved)	50.000	53.2	106	ug/L	EPA 200.8
SGC0297-CCV6	Lead-208	50.000	52.0	104	ug/L	EPA 200.8
	Lead-208 (dissolved)	50.000	52.0	104	ug/L	EPA 200.8
SGC0297-CCV7	Lead-208	50.000	52.7	105	ug/L	EPA 200.8
	Lead-208 (dissolved)	50.000	52.7	105	ug/L	EPA 200.8
SGC0297-CCV8	Lead-208	50.000	50.7	101	ug/L	EPA 200.8
	Lead-208 (dissolved)	50.000	50.7	101	ug/L	EPA 200.8
SGC0297-CCV9	Lead-208	50.000	49.1	98.2	ug/L	EPA 200.8
	Lead-208 (dissolved)	50.000	49.1	98.2	ug/L	EPA 200.8
SGC0297-CCVA	Lead-208	50.000	50.2	100	ug/L	EPA 200.8
	Lead-208 (dissolved)	50.000	50.2	100	ug/L	EPA 200.8
SGC0297-CCVB	Lead-208	50.000	53.5	107	ug/L	EPA 200.8
	Lead-208 (dissolved)	50.000	53.5	107	ug/L	EPA 200.8

\* Values outside of QC limits



# INITIAL AND CONTINUING CALIBRATION CHECK

## EPA 200.8

Laboratory: Analytical Resources, Inc.

SDG: 18C0296

Client: GeoEngineers

Project: Everett Smelter-Low Lands Area

Instrument ID: ICPMS2

Calibration: BC00051

Control Limit: +/- 10.00%

Sequence: SGC0310

Lab Sample ID	Analyte	True	Found	%R	Units	Method
SGC0310-ICV1	Lead-208	50.000	49.7	99.5	ug/L	EPA 200.8
SGC0310-CCV1	Lead-208	50.000	50.6	101	ug/L	EPA 200.8
SGC0310-CCV2	Lead-208	50.000	50.0	99.9	ug/L	EPA 200.8
SGC0310-CCV3	Lead-208	50.000	51.1	102	ug/L	EPA 200.8
SGC0310-CCV4	Lead-208	50.000	52.4	105	ug/L	EPA 200.8
SGC0310-CCV5	Lead-208	50.000	51.3	103	ug/L	EPA 200.8
SGC0310-CCV6	Lead-208	50.000	51.6	103	ug/L	EPA 200.8
SGC0310-CCV7	Lead-208	50.000	51.9	104	ug/L	EPA 200.8
SGC0310-CCV8	Lead-208	50.000	51.7	103	ug/L	EPA 200.8
SGC0310-CCV9	Lead-208	50.000	51.1	102	ug/L	EPA 200.8

\* Values outside of QC limits



# ANALYSIS BATCH (SEQUENCE) SUMMARY

## EPA 200.8

Laboratory: Analytical Resources, Inc.

SDG: 18C0296

Client: GeoEngineers

Project: Everett Smelter-Low Lands Area

Sequence: SGC0297

Instrument: ICPMS2

Calibration: BC00048

Sample Name	Lab Sample ID	Lab File ID	Matrix	Analysis Date/Time
CAL 0	SGC0297-CAL1	XDT_m2180320-006	NA	03/20/18 12:32
CAL 0	SGC0297-CAL1	XDT_m2180320-006	NA	03/20/18 12:32
CAL 1 - LOW CHECK	SGC0297-CAL2	XDT_m2180320-007	NA	03/20/18 12:37
CAL 1 - LOW CHECK	SGC0297-CAL2	XDT_m2180320-007	NA	03/20/18 12:37
CAL 2	SGC0297-CAL3	XDT_m2180320-008	NA	03/20/18 12:42
CAL 2	SGC0297-CAL3	XDT_m2180320-008	NA	03/20/18 12:42
CAL 3	SGC0297-CAL4	XDT_m2180320-009	NA	03/20/18 12:48
CAL 3	SGC0297-CAL4	XDT_m2180320-009	NA	03/20/18 12:48
CAL 4	SGC0297-CAL5	XDT_m2180320-010	NA	03/20/18 12:53
CAL 4	SGC0297-CAL5	XDT_m2180320-010	NA	03/20/18 12:53
CAL 5	SGC0297-CAL6	XDT_m2180320-011	NA	03/20/18 13:00
CAL 5	SGC0297-CAL6	XDT_m2180320-011	NA	03/20/18 13:00
Initial Cal Check	SGC0297-ICV1	XDT_m2180320-014	NA	03/20/18 13:15
Initial Cal Check	SGC0297-ICV1	XDT_m2180320-014	NA	03/20/18 13:15
Initial Cal Blank	SGC0297-ICB1	XDT_m2180320-015	NA	03/20/18 13:21
Initial Cal Blank	SGC0297-ICB1	XDT_m2180320-015	NA	03/20/18 13:21
Calibration Check	SGC0297-CCV1	XDT_m2180320-016	NA	03/20/18 13:26
Calibration Check	SGC0297-CCV1	XDT_m2180320-016	NA	03/20/18 13:26
Calibration Blank	SGC0297-CCB1	XDT_m2180320-017	NA	03/20/18 13:32
Calibration Blank	SGC0297-CCB1	XDT_m2180320-017	NA	03/20/18 13:32
Instrument RL Check	SGC0297-CRL1	XDT_m2180320-018	NA	03/20/18 13:37
Instrument RL Check	SGC0297-CRL1	XDT_m2180320-018	NA	03/20/18 13:37
Interference Check A	SGC0297-IFA1	XDT_m2180320-019	NA	03/20/18 13:42
Interference Check A	SGC0297-IFA1	XDT_m2180320-019	NA	03/20/18 13:42
Interference Check B	SGC0297-IFB1	XDT_m2180320-020	NA	03/20/18 13:47
Interference Check B	SGC0297-IFB1	XDT_m2180320-020	NA	03/20/18 13:47
LR200	SGC0297-HCV1	XDT_m2180320-021	NA	03/20/18 13:55
LR200	SGC0297-HCV1	XDT_m2180320-021	NA	03/20/18 13:55
LR300	SGC0297-HCV2	XDT_m2180320-022	NA	03/20/18 14:00
LR300	SGC0297-HCV2	XDT_m2180320-022	NA	03/20/18 14:00
Calibration Check	SGC0297-CCV2	XDT_m2180320-024	NA	03/20/18 14:15



# ANALYSIS BATCH (SEQUENCE) SUMMARY

## EPA 200.8

Laboratory: Analytical Resources, Inc.

SDG: 18C0296

Client: GeoEngineers

Project: Everett Smelter-Low Lands Area

Sequence: SGC0297

Instrument: ICPMS2

Calibration: BC00048

Sample Name	Lab Sample ID	Lab File ID	Matrix	Analysis Date/Time
Calibration Check	SGC0297-CCV2	XDT_m2180320-024	NA	03/20/18 14:15
Calibration Blank	SGC0297-CCB2	XDT_m2180320-025	NA	03/20/18 14:21
Calibration Blank	SGC0297-CCB2	XDT_m2180320-025	NA	03/20/18 14:21
Blank	BGC0525-BLK1	XDT_m2180320-026	Water	03/20/18 14:26
ZZZZZ	18C0307-01	XDT_m2180320-028	Water	03/20/18 14:36
ZZZZZ	18C0307-01	XDT_m2180320-028	Water	03/20/18 14:36
ZZZZZ	18C0307-01	XDT_m2180320-028	Water	03/20/18 14:36
ZZZZZ	18C0307-01	XDT_m2180320-028	Water	03/20/18 14:36
ZZZZZ	18C0307-01	XDT_m2180320-028	Water	03/20/18 14:36
LCS	BGC0525-BS1	XDT_m2180320-030	Water	03/20/18 14:47
ZZZZZ	18C0299-01	XDT_m2180320-033	Water	03/20/18 15:02
ZZZZZ	18C0299-01	XDT_m2180320-033	Water	03/20/18 15:02
ZZZZZ	18C0305-01	XDT_m2180320-034	Water	03/20/18 15:07
ZZZZZ	18C0305-01	XDT_m2180320-034	Water	03/20/18 15:07
ZZZZZ	18C0305-01	XDT_m2180320-034	Water	03/20/18 15:07
ZZZZZ	18C0306-01	XDT_m2180320-035	Water	03/20/18 15:12
ZZZZZ	18C0306-01	XDT_m2180320-035	Water	03/20/18 15:12
Calibration Check	SGC0297-CCV3	XDT_m2180320-036	NA	03/20/18 15:20
Calibration Check	SGC0297-CCV3	XDT_m2180320-036	NA	03/20/18 15:20
Calibration Blank	SGC0297-CCB3	XDT_m2180320-037	NA	03/20/18 15:26
Calibration Blank	SGC0297-CCB3	XDT_m2180320-037	NA	03/20/18 15:26
ZZZZZ	BGC0507-BLK1	XDT_m2180320-038	Solid	03/20/18 15:31
ZZZZZ	18C0285-01	XDT_m2180320-040	Solid	03/20/18 15:41
ZZZZZ	18C0285-01	XDT_m2180320-040	Solid	03/20/18 15:41
ZZZZZ	18C0285-01	XDT_m2180320-040	Solid	03/20/18 15:41
ZZZZZ	18C0285-01	XDT_m2180320-040	Solid	03/20/18 15:41
ZZZZZ	18C0285-01	XDT_m2180320-040	Solid	03/20/18 15:41
ZZZZZ	BGC0507-BS1	XDT_m2180320-042	Solid	03/20/18 15:52
ZZZZZ	18C0284-01	XDT_m2180320-043	Water	03/20/18 15:57
ZZZZZ	18C0305-01RE1	XDT_m2180320-044	Water	03/20/18 16:02
Calibration Check	SGC0297-CCV4	XDT_m2180320-048	NA	03/20/18 16:25



## ANALYSIS BATCH (SEQUENCE) SUMMARY

### EPA 200.8

Laboratory:	<u>Analytical Resources, Inc.</u>	SDG:	<u>18C0296</u>
Client:	<u>GeoEngineers</u>	Project:	<u>Everett Smelter-Low Lands Area</u>
Sequence:	<u>SGC0297</u>	Instrument:	<u>ICPMS2</u>
		Calibration:	<u>BC00048</u>

Sample Name	Lab Sample ID	Lab File ID	Matrix	Analysis Date/Time
Calibration Check	SGC0297-CCV4	XDT_m2180320-048	NA	03/20/18 16:25
Calibration Blank	SGC0297-CCB4	XDT_m2180320-049	NA	03/20/18 16:31
Calibration Blank	SGC0297-CCB4	XDT_m2180320-049	NA	03/20/18 16:31
Calibration Check	SGC0297-CCV5	XDT_m2180320-060	NA	03/20/18 17:30
Calibration Check	SGC0297-CCV5	XDT_m2180320-060	NA	03/20/18 17:30
Calibration Blank	SGC0297-CCB5	XDT_m2180320-061	NA	03/20/18 17:36
Calibration Blank	SGC0297-CCB5	XDT_m2180320-061	NA	03/20/18 17:36
<i>ZZZZZ</i>	18C0292-01	XDT_m2180320-070	Water	03/20/18 18:23
<i>ZZZZZ</i>	18C0292-01	XDT_m2180320-070	Water	03/20/18 18:23
<i>ZZZZZ</i>	18C0292-02	XDT_m2180320-071	Water	03/20/18 18:28
<i>ZZZZZ</i>	18C0292-02	XDT_m2180320-071	Water	03/20/18 18:28
Calibration Check	SGC0297-CCV6	XDT_m2180320-072	NA	03/20/18 18:36
Calibration Check	SGC0297-CCV6	XDT_m2180320-072	NA	03/20/18 18:36
Calibration Blank	SGC0297-CCB6	XDT_m2180320-073	NA	03/20/18 18:42
Calibration Blank	SGC0297-CCB6	XDT_m2180320-073	NA	03/20/18 18:42
Blank	BGC0526-BLK1	XDT_m2180320-074	Water	03/20/18 18:47
<i>ZZZZZ</i>	18C0312-10	XDT_m2180320-076	Water	03/20/18 18:57
LCS	BGC0526-BS1	XDT_m2180320-078	Water	03/20/18 19:08
<i>ZZZZZ</i>	18C0292-07	XDT_m2180320-079	Water	03/20/18 19:14
<i>ZZZZZ</i>	18C0292-07	XDT_m2180320-079	Water	03/20/18 19:14
<i>ZZZZZ</i>	18C0175-02	XDT_m2180320-083	Water	03/20/18 19:34
Calibration Check	SGC0297-CCV7	XDT_m2180320-084	NA	03/20/18 19:42
Calibration Check	SGC0297-CCV7	XDT_m2180320-084	NA	03/20/18 19:42
Calibration Blank	SGC0297-CCB7	XDT_m2180320-085	NA	03/20/18 19:48
Calibration Blank	SGC0297-CCB7	XDT_m2180320-085	NA	03/20/18 19:48
<i>ZZZZZ</i>	18C0244-01	XDT_m2180320-086	Water	03/20/18 19:53
<i>ZZZZZ</i>	18C0175-04	XDT_m2180320-094	Water	03/20/18 20:36
<i>ZZZZZ</i>	18C0175-05	XDT_m2180320-095	Water	03/20/18 20:41
Calibration Check	SGC0297-CCV8	XDT_m2180320-096	NA	03/20/18 20:49
Calibration Check	SGC0297-CCV8	XDT_m2180320-096	NA	03/20/18 20:49
Calibration Blank	SGC0297-CCB8	XDT_m2180320-097	NA	03/20/18 20:55





## ANALYSIS BATCH (SEQUENCE) SUMMARY

### EPA 200.8

Laboratory: Analytical Resources, Inc.

SDG: 18C0296

Client: GeoEngineers

Project: Everett Smelter-Low Lands Area

Sequence: SGC0297

Instrument: ICPMS2

Calibration: BC00048

Sample Name	Lab Sample ID	Lab File ID	Matrix	Analysis Date/Time
Calibration Blank	SGC0297-CCB8	XDT_m2180320-097	NA	03/20/18 20:55
ZZZZZ	18C0255-01	XDT_m2180320-098	Water	03/20/18 21:00
ZZZZZ	18C0269-01	XDT_m2180320-099	Water	03/20/18 21:06
ZZZZZ	18C0269-01	XDT_m2180320-099	Water	03/20/18 21:06
ZZZZZ	18C0248-01	XDT_m2180320-105	Water	03/20/18 21:36
ZZZZZ	18C0248-01	XDT_m2180320-105	Water	03/20/18 21:36
ZZZZZ	18C0248-01	XDT_m2180320-105	Water	03/20/18 21:36
ZZZZZ	18C0248-01	XDT_m2180320-105	Water	03/20/18 21:36
ZZZZZ	18C0256-01	XDT_m2180320-106	Water	03/20/18 21:41
ZZZZZ	18C0256-01	XDT_m2180320-106	Water	03/20/18 21:41
ZZZZZ	18C0256-01	XDT_m2180320-106	Water	03/20/18 21:41
ZZZZZ	18C0256-01	XDT_m2180320-106	Water	03/20/18 21:41
ZZZZZ	18C0256-01	XDT_m2180320-106	Water	03/20/18 21:41
Calibration Check	SGC0297-CCV9	XDT_m2180320-108	NA	03/20/18 21:56
Calibration Check	SGC0297-CCV9	XDT_m2180320-108	NA	03/20/18 21:56
Calibration Blank	SGC0297-CCB9	XDT_m2180320-109	NA	03/20/18 22:02
Calibration Blank	SGC0297-CCB9	XDT_m2180320-109	NA	03/20/18 22:02
ZZZZZ	18C0306-01RE1	XDT_m2180320-110	Water	03/20/18 22:07
ZZZZZ	18C0258-01	XDT_m2180320-112	Water	03/20/18 22:17
Calibration Check	SGC0297-CCVA	XDT_m2180320-120	NA	03/20/18 22:59
Calibration Check	SGC0297-CCVA	XDT_m2180320-120	NA	03/20/18 22:59
Calibration Blank	SGC0297-CCBA	XDT_m2180320-121	NA	03/20/18 23:05
Calibration Blank	SGC0297-CCBA	XDT_m2180320-121	NA	03/20/18 23:05
ZZZZZ	18C0228-01	XDT_m2180320-122	Water	03/20/18 23:10
ZZZZZ	18C0250-01	XDT_m2180320-124	Water	03/20/18 23:21
ZZZZZ	18C0250-01	XDT_m2180320-124	Water	03/20/18 23:21
CB11	18C0296-08	XDT_m2180320-126	Water	03/20/18 23:31
ZZZZZ	18C0307-02	XDT_m2180320-127	Water	03/20/18 23:36
ZZZZZ	18C0307-02	XDT_m2180320-127	Water	03/20/18 23:36
ZZZZZ	18C0309-01	XDT_m2180320-128	Water	03/20/18 23:41
Calibration Check	SGC0297-CCVB	XDT_m2180320-129	NA	03/20/18 23:48



# ANALYSIS BATCH (SEQUENCE) SUMMARY

## EPA 200.8

Laboratory: Analytical Resources, Inc.

SDG: 18C0296

Client: GeoEngineers

Project: Everett Smelter-Low Lands Area

Sequence: SGC0297

Instrument: ICPMS2

Calibration: BC00048

Sample Name	Lab Sample ID	Lab File ID	Matrix	Analysis Date/Time
Calibration Check	SGC0297-CCVB	XDT_m2180320-129	NA	03/20/18 23:48
Calibration Blank	SGC0297-CCBB	XDT_m2180320-130	NA	03/20/18 23:54
Calibration Blank	SGC0297-CCBB	XDT_m2180320-130	NA	03/20/18 23:54



## ANALYSIS BATCH (SEQUENCE) SUMMARY

### EPA 200.8

Laboratory: Analytical Resources, Inc.

SDG: 18C0296

Client: GeoEngineers

Project: Everett Smelter-Low Lands Area

Sequence: SGC0310

Instrument: ICPMS2

Calibration: BC00051

Sample Name	Lab Sample ID	Lab File ID	Matrix	Analysis Date/Time
CAL 0	SGC0310-CAL1	XDT_m2180321-006	NA	03/21/18 14:59
CAL 1 - LOW CHECK	SGC0310-CAL2	XDT_m2180321-007	NA	03/21/18 15:04
CAL 2	SGC0310-CAL3	XDT_m2180321-008	NA	03/21/18 15:09
CAL 3	SGC0310-CAL4	XDT_m2180321-009	NA	03/21/18 15:14
CAL 4	SGC0310-CAL5	XDT_m2180321-010	NA	03/21/18 15:19
CAL 5	SGC0310-CAL6	XDT_m2180321-011	NA	03/21/18 15:26
Initial Cal Check	SGC0310-ICV1	XDT_m2180321-014	NA	03/21/18 15:41
Initial Cal Blank	SGC0310-ICB1	XDT_m2180321-015	NA	03/21/18 15:47
Calibration Check	SGC0310-CCV1	XDT_m2180321-016	NA	03/21/18 15:52
Calibration Blank	SGC0310-CCB1	XDT_m2180321-017	NA	03/21/18 15:58
Instrument RL Check	SGC0310-CRL1	XDT_m2180321-018	NA	03/21/18 16:03
Interference Check A	SGC0310-IFA1	XDT_m2180321-019	NA	03/21/18 16:08
Interference Check B	SGC0310-IFB1	XDT_m2180321-020	NA	03/21/18 16:13
LR200	SGC0310-HCV1	XDT_m2180321-021	NA	03/21/18 16:21
LR300	SGC0310-HCV2	XDT_m2180321-022	NA	03/21/18 16:26
Calibration Check	SGC0310-CCV2	XDT_m2180321-025	NA	03/21/18 16:47
Calibration Blank	SGC0310-CCB2	XDT_m2180321-026	NA	03/21/18 16:53
ZZZZZ	BGC0552-BLK1	XDT_m2180321-027	Water	03/21/18 16:58
ZZZZZ	18C0320-01	XDT_m2180321-029	Water	03/21/18 17:08
ZZZZZ	18C0320-01	XDT_m2180321-029	Water	03/21/18 17:08
ZZZZZ	18C0320-01	XDT_m2180321-029	Water	03/21/18 17:08
ZZZZZ	18C0320-01	XDT_m2180321-029	Water	03/21/18 17:08
ZZZZZ	18C0320-01	XDT_m2180321-029	Water	03/21/18 17:08
ZZZZZ	18C0320-01	XDT_m2180321-029	Water	03/21/18 17:08
ZZZZZ	18C0320-01	XDT_m2180321-029	Water	03/21/18 17:08
ZZZZZ	18C0320-01	XDT_m2180321-029	Water	03/21/18 17:08
ZZZZZ	18C0320-01	XDT_m2180321-029	Water	03/21/18 17:08
ZZZZZ	18C0320-01	XDT_m2180321-029	Water	03/21/18 17:08
ZZZZZ	BGC0552-BS1	XDT_m2180321-032	Water	03/21/18 17:24
ZZZZZ	18C0317-01	XDT_m2180321-033	Water	03/21/18 17:29
ZZZZZ	18C0317-01	XDT_m2180321-033	Water	03/21/18 17:29
ZZZZZ	18C0317-01	XDT_m2180321-033	Water	03/21/18 17:29
Calibration Check	SGC0310-CCV3	XDT_m2180321-037	NA	03/21/18 17:53



## ANALYSIS BATCH (SEQUENCE) SUMMARY

### EPA 200.8

Laboratory:	<u>Analytical Resources, Inc.</u>	SDG:	<u>18C0296</u>
Client:	<u>GeoEngineers</u>	Project:	<u>Everett Smelter-Low Lands Area</u>
Sequence:	<u>SGC0310</u>	Instrument:	<u>ICPMS2</u>
		Calibration:	<u>BC00051</u>

Sample Name	Lab Sample ID	Lab File ID	Matrix	Analysis Date/Time
Calibration Blank	SGC0310-CCB3	XDT_m2180321-038	NA	03/21/18 17:59
Calibration Check	SGC0310-CCV4	XDT_m2180321-049	NA	03/21/18 18:57
Calibration Blank	SGC0310-CCB4	XDT_m2180321-050	NA	03/21/18 19:03
ZZZZZ	BGC0382-BLK1	XDT_m2180321-051	Solid	03/21/18 19:08
ZZZZZ	18C0182-01	XDT_m2180321-053	Solid	03/21/18 19:18
ZZZZZ	18C0182-01	XDT_m2180321-053	Solid	03/21/18 19:18
ZZZZZ	18C0182-01	XDT_m2180321-053	Solid	03/21/18 19:18
ZZZZZ	BGC0382-BS1	XDT_m2180321-055	Solid	03/21/18 19:29
ZZZZZ	18C0141-01	XDT_m2180321-056	Solid	03/21/18 19:34
ZZZZZ	18C0141-01	XDT_m2180321-056	Solid	03/21/18 19:34
ZZZZZ	18C0141-01	XDT_m2180321-056	Solid	03/21/18 19:34
ZZZZZ	18C0141-02	XDT_m2180321-057	Solid	03/21/18 19:39
ZZZZZ	18C0141-02	XDT_m2180321-057	Solid	03/21/18 19:39
ZZZZZ	18C0141-02	XDT_m2180321-057	Solid	03/21/18 19:39
ZZZZZ	18C0141-03	XDT_m2180321-058	Solid	03/21/18 19:44
ZZZZZ	18C0141-03	XDT_m2180321-058	Solid	03/21/18 19:44
ZZZZZ	18C0141-03	XDT_m2180321-058	Solid	03/21/18 19:44
Calibration Check	SGC0310-CCV5	XDT_m2180321-061	NA	03/21/18 20:01
Calibration Blank	SGC0310-CCB5	XDT_m2180321-062	NA	03/21/18 20:07
ZZZZZ	18C0244-01	XDT_m2180321-063	Water	03/21/18 20:12
ZZZZZ	18C0244-01	XDT_m2180321-063	Water	03/21/18 20:12
CB11	18C0296-07	XDT_m2180321-068	Water	03/21/18 20:38
ZZZZZ	18C0182-02	XDT_m2180321-069	Solid	03/21/18 20:43
ZZZZZ	18C0182-02	XDT_m2180321-069	Solid	03/21/18 20:43
ZZZZZ	18C0182-02	XDT_m2180321-069	Solid	03/21/18 20:43
Calibration Check	SGC0310-CCV6	XDT_m2180321-073	NA	03/21/18 21:05
Calibration Blank	SGC0310-CCB6	XDT_m2180321-074	NA	03/21/18 21:11
ZZZZZ	18C0309-01	XDT_m2180321-084	Water	03/21/18 22:03
Calibration Check	SGC0310-CCV7	XDT_m2180321-085	NA	03/21/18 22:11
Calibration Blank	SGC0310-CCB7	XDT_m2180321-086	NA	03/21/18 22:17
ZZZZZ	18C0256-01	XDT_m2180321-095	Water	03/21/18 23:08



## ANALYSIS BATCH (SEQUENCE) SUMMARY

### EPA 200.8

Laboratory: Analytical Resources, Inc.

SDG: 18C0296

Client: GeoEngineers

Project: Everett Smelter-Low Lands Area

Sequence: SGC0310

Instrument: ICPMS2

Calibration: BC00051

Sample Name	Lab Sample ID	Lab File ID	Matrix	Analysis Date/Time
Calibration Check	SGC0310-CCV8	XDT_m2180321-097	NA	03/21/18 23:20
Calibration Blank	SGC0310-CCB8	XDT_m2180321-098	NA	03/21/18 23:26
ZZZZZ	18C0323-04	XDT_m2180321-102	Water	03/21/18 23:46
ZZZZZ	18C0323-04	XDT_m2180321-102	Water	03/21/18 23:46
ZZZZZ	18C0323-04	XDT_m2180321-102	Water	03/21/18 23:46
ZZZZZ	18C0323-04	XDT_m2180321-102	Water	03/21/18 23:46
ZZZZZ	18C0323-04	XDT_m2180321-102	Water	03/21/18 23:46
ZZZZZ	18C0323-04	XDT_m2180321-102	Water	03/21/18 23:46
ZZZZZ	18C0323-05	XDT_m2180321-103	Water	03/21/18 23:51
ZZZZZ	18C0323-05	XDT_m2180321-103	Water	03/21/18 23:51
ZZZZZ	18C0323-05	XDT_m2180321-103	Water	03/21/18 23:51
ZZZZZ	18C0323-05	XDT_m2180321-103	Water	03/21/18 23:51
ZZZZZ	18C0323-05	XDT_m2180321-103	Water	03/21/18 23:51
ZZZZZ	18C0323-05	XDT_m2180321-103	Water	03/21/18 23:51
ZZZZZ	18C0314-03	XDT_m2180321-104	Water	03/21/18 23:56
ZZZZZ	18C0320-01RE1	XDT_m2180321-106	Water	03/22/18 00:07
Calibration Check	SGC0310-CCV9	XDT_m2180321-109	NA	03/22/18 00:23
Calibration Blank	SGC0310-CCB9	XDT_m2180321-110	NA	03/22/18 00:29



# ICP INTERFERENCE CHECK SAMPLE

## EPA 200.8

Laboratory: Analytical Resources, Inc.

SDG: 18C0296

Client: GeoEngineers

Project: Everett Smelter-Low Lands Area

Instrument ID: ICPMS2

Calibration: BC00048

Sequence: SGC0297

Standard ID: G001820

Lab Sample ID	Analyte	True	Found	%R	Units
SGC0297-IFA1	Lead-208	0	0.0450		ug/L
	Lead-208 (dissolved)	0	0.0450		ug/L

\* Indicates %R outside of QC limits

NOTE: True value and %R are populated only for analytes found in the interference check standards, and will be seen only if those analytes were requested.



# ICP INTERFERENCE CHECK SAMPLE

## EPA 200.8

Laboratory: Analytical Resources, Inc.

SDG: 18C0296

Client: GeoEngineers

Project: Everett Smelter-Low Lands Area

Instrument ID: ICPMS2

Calibration: BC00048

Sequence: SGC0297

Standard ID: G001820

Lab Sample ID	Analyte	True	Found	%R	Units
SGC0297-IFB1	Lead-208	0	0.0370		ug/L
	Lead-208 (dissolved)	0	0.0370		ug/L

\* Indicates %R outside of QC limits

NOTE: True value and %R are populated only for analytes found in the interference check standards, and will be seen only if those analytes were requested.



# ICP INTERFERENCE CHECK SAMPLE

## EPA 200.8

Laboratory: Analytical Resources, Inc.

SDG: 18C0296

Client: GeoEngineers

Project: Everett Smelter-Low Lands Area

Instrument ID: ICPMS2

Calibration: BC00051

Sequence: SGC0310

Standard ID: G001820

Lab Sample ID	Analyte	True	Found	%R	Units
SGC0310-IFA1	Lead-208	0	0.0400		ug/L

\* Indicates %R outside of QC limits

NOTE: True value and %R are populated only for analytes found in the interference check standards, and will be seen only if those analytes were requested.





# ICP INTERFERENCE CHECK SAMPLE

## EPA 200.8

Laboratory: Analytical Resources, Inc.

SDG: 18C0296

Client: GeoEngineers

Project: Everett Smelter-Low Lands Area

Instrument ID: ICPMS2

Calibration: BC00051

Sequence: SGC0310

Standard ID: G001820

Lab Sample ID	Analyte	True	Found	%R	Units
SGC0310-IFB1	Lead-208	0	0.0350		ug/L

\* Indicates %R outside of QC limits

NOTE: True value and %R are populated only for analytes found in the interference check standards, and will be seen only if those analytes were requested.

## DETECTION LEVEL STANDARD

### EPA 200.8

Laboratory: Analytical Resources, Inc.

SDG: 18C0296

Client: GeoEngineers

Project: Everett Smelter-Low Lands Area

Instrument ID: ICPMS2

Calibration: BC00048

Sequence: SGC0297

Lab Sample ID: SGC0297-CRL1

Analyte	True	Found	%R	Units	QC Limits
Lead-208	0.10000	0.112	112	ug/L	50 - 150
Lead-208 (dissolved)	0.10000	0.112	112	ug/L	50 - 150

\* Values outside of QC limits

## DETECTION LEVEL STANDARD

### EPA 200.8

Laboratory: Analytical Resources, Inc.

SDG: 18C0296

Client: GeoEngineers

Project: Everett Smelter-Low Lands Area

Instrument ID: ICPMS2

Calibration: BC00051

Sequence: SGC0310

Lab Sample ID: SGC0310-CRL1

Analyte	True	Found	%R	Units	QC Limits
Lead-208	0.10000	0.107	107	ug/L	50 - 150

\* Values outside of QC limits



# HIGH-CONCENTRATION CALIBRATION VERIFICATION

EPA 200.8

**Laboratory:** Analytical Resources, Inc.

**SDG:** 18C0296

**Client:** GeoEngineers

**Project:** Everett Smelter-Low Lands Area

**Calibration:** BC00051

**Laboratory ID:** SGC0310-HCV1

**Sequence:** SGC0310

**Standard ID:** G002195

<b>ANALYTE</b>	<b>EXPECTED (ug/L)</b>	<b>FOUND (ug/L)</b>	<b>% DRIFT</b>	<b>QC LIMIT</b>
Lead-208	200.00	212	5.8	10.00

\* Values outside of QC limits



# HIGH-CONCENTRATION CALIBRATION VERIFICATION

EPA 200.8

**Laboratory:** Analytical Resources, Inc.

**SDG:** 18C0296

**Client:** GeoEngineers

**Project:** Everett Smelter-Low Lands Area

**Calibration:** BC00051

**Laboratory ID:** SGC0310-HCV2

**Sequence:** SGC0310

**Standard ID:** G001767

<b>ANALYTE</b>	<b>EXPECTED (ug/L)</b>	<b>FOUND (ug/L)</b>	<b>% DRIFT</b>	<b>QC LIMIT</b>
Lead-208	300.00	340	13.2	10.00

\* Values outside of QC limits



# HIGH-CONCENTRATION CALIBRATION VERIFICATION

EPA 200.8

**Laboratory:** Analytical Resources, Inc.

**SDG:** 18C0296

**Client:** GeoEngineers

**Project:** Everett Smelter-Low Lands Area

**Calibration:** BC00048

**Laboratory ID:** SGC0297-HCV1

**Sequence:** SGC0297

**Standard ID:** G002195

<b>ANALYTE</b>	<b>EXPECTED (ug/L)</b>	<b>FOUND (ug/L)</b>	<b>% DRIFT</b>	<b>QC LIMIT</b>
Lead-208	200.00	212	5.8	10.00
Lead-208 (dissolved)	200.00	212	5.8	10.00

\* Values outside of QC limits



# HIGH-CONCENTRATION CALIBRATION VERIFICATION

EPA 200.8

**Laboratory:** Analytical Resources, Inc.

**SDG:** 18C0296

**Client:** GeoEngineers

**Project:** Everett Smelter-Low Lands Area

**Calibration:** BC00048

**Laboratory ID:** SGC0297-HCV2

**Sequence:** SGC0297

**Standard ID:** G001767

ANALYTE	EXPECTED (ug/L)	FOUND (ug/L)	% DRIFT	QC LIMIT
Lead-208	300.00	320	6.5	10.00
Lead-208 (dissolved)	300.00	320	6.5	10.00

\* Values outside of QC limits

## HOLDING TIME SUMMARY

**Analysis: EPA 200.8**

Laboratory: Analytical Resources, Inc.

SDG: 18C0296

Client: GeoEngineers

Project: Everett Smelter-Low Lands Area

Sample Name	Date Collected	Date Received	Date Prepared	Days to Prep	Max Days to Prep	Date Analyzed	Days to Analysis	Max Days to Analysis	Q
CB11 18C0296-07	03/16/18 13:00	03/16/18 17:28	03/20/18 05:11	3	180	03/21/18 20:38	5	180	
CB11 18C0296-08	03/16/18 13:00	03/16/18 17:28	03/20/18 06:32	3	180	03/20/18 23:31	4	180	

\* Indicates hold time exceedance.





Analytical  
Resources,  
Incorporated

# METHOD DETECTION AND REPORTING LIMITS

## EPA 200.8

Laboratory: Analytical Resources, Inc.

SDG: 18C0296

Client: GeoEngineers

Project: Everett Smelter-Low Lands Area

Matrix: Water

Instrument: ICPMS2

Analyte	MDL	RL	Units
Lead-208	0.0680	0.100	ug/L
Lead-208 (dissolved)	0.0680	0.100	ug/L



Form I  
INORGANIC ANALYSIS DATA SHEET

CB11

EPA 200.8 UCT-KED  
Total Metals

Laboratory: Analytical Resources, Inc.  
Client: GeoEngineers  
Project: Everett Smelter-Low Lands Area  
Matrix: Water Laboratory ID: 18C0296-07 SDG: 18C0296  
Sampled: 03/16/18 13:00 Prepared: 03/20/18 05:11 File ID: XDT\_m2180320-125  
% Solids: 0.00 Preparation: REN EPA 600/4-79-020 4.1.4 HNO3 Analyzed: 03/20/18 23:26  
Batch: BGC0525 Sequence: SGC0297 Initial/Final: 25 mL / 25 mL  
Instrument: ICPMS2 Calibration: BC00048

CAS NO.	Analyte	Concentration (ug/L)	Dilution Factor	MDL	MRL	Q
7440-38-2	Arsenic-75a	1.74	1	0.0220	0.200	



Form I  
INORGANIC ANALYSIS DATA SHEET

CB11

EPA 200.8 UCT-KED  
Dissolved Metals

Laboratory: Analytical Resources, Inc.  
 Client: GeoEngineers  
 Project: Everett Smelter-Low Lands Area  
 Matrix: Water Laboratory ID: 18C0296-08 SDG: 18C0296  
 Sampled: 03/16/18 13:00 Prepared: 03/20/18 06:32 File ID: XDT\_m2180320-126  
 % Solids: 0.00 Preparation: REN EPA 600/4-79-020 4.1.4 HNO3 Analyzed: 03/20/18 23:31  
 Batch: BGC0526 Sequence: SGC0297 Initial/Final: 25 mL / 25 mL  
 Instrument: ICPMS2 Calibration: BC00048

CAS NO.	Analyte	Concentration (ug/L)	Dilution Factor	MDL	MRL	Q
7440-38-2	Arsenic-75a, Dissolved	1.24	1	0.0220	0.200	



## PREPARATION BATCH SUMMARY EPA 200.8 UCT-KED

Laboratory:	<u>Analytical Resources, Inc.</u>	SDG:	<u>18C0296</u>
Client:	<u>GeoEngineers</u>	Project:	<u>Everett Smelter-Low Lands Area</u>
Batch:	<u>BGC0525</u>	Batch Matrix:	<u>Water</u>
		Preparation:	<u>REN EPA 600/4-79-020 4.1.4 HNO<sub>3</sub> matrix</u>

SAMPLE NAME	LAB SAMPLE ID	LAB FILE ID	DATE PREPARED	OBSERVATIONS
CB11	18C0296-07	XDT_m2180320-125	03/20/18 05:11	
Blank	BGC0525-BLK1	XDT_m2180320-026	03/20/18 05:11	
LCS	BGC0525-BS1	XDT_m2180320-030	03/20/18 05:11	



**PREPARATION BATCH SUMMARY**  
**EPA 200.8 UCT-KED**

Laboratory: Analytical Resources, Inc.

SDG: 18C0296

Client: GeoEngineers

Project: Everett Smelter-Low Lands Area

Batch: BGC0526 Batch Matrix: Water

Preparation: REN EPA 600/4-79-020 4.1.4 HNO3 matrix

SAMPLE NAME	LAB SAMPLE ID	LAB FILE ID	DATE PREPARED	OBSERVATIONS
CB11	18C0296-08	XDT_m2180320-126	03/20/18 06:32	
Blank	BGC0526-BLK2	XDT_m2180321-087	03/20/18 06:32	Added 3/22/2018 by CC
LCS	BGC0526-BS2	XDT_m2180321-091	03/20/18 06:32	Added 3/22/2018 by CC



**Form I**  
**METHOD BLANK DATA SHEET**  
**EPA 200.8 UCT-KED**  
Total Metals

Blank

Batch: BGC0525

Laboratory ID: BGC0525-BLK1

Prepared: 03/20/18 05:11

Matrix: Water

Preparation: REN EPA 600/4-79-020 4

Analyzed: 03/20/18 14:26

Sequence: SGC0297

Calibration: BC00048

Instrument: ICPMS2

CAS NO.	Analyte	Concentration (ug/L)	Dilution Factor	MDL	MRL	Q
7440-38-2	Arsenic-75a	ND	1	0.0220	0.200	U



**Form I**  
**METHOD BLANK DATA SHEET**  
**EPA 200.8 UCT-KED**  
Dissolved Metals

Blank

Batch: BGC0526

Laboratory ID: BGC0526-BLK2

Prepared: 03/20/18 06:32

Matrix: Water

Preparation: REN EPA 600/4-79-020 4

Analyzed: 03/21/18 22:22

Sequence: SGC0310

Calibration: BC00051

Instrument: ICPMS2

CAS NO.	Analyte	Concentration (ug/L)	Dilution Factor	MDL	MRL	Q
7440-38-2	Arsenic-75a	ND	1	0.0220	0.200	U

**INSTRUMENT BLANKS**  
**EPA 200.8 UCT-KED**

Laboratory: Analytical Resources, Inc.

SDG: 18C0296

Client: GeoEngineers

Project: Everett Smelter-Low Lands Area

Instrument ID: ICPMS2

Calibration: BC00048

Sequence: SGC0297

Date Analyzed: 03/20/18 13:21

Lab Sample ID	Analyte	Found	MDL	MRL	Units	C
SGC0297-ICB1	Arsenic-75a (dissolved)	0.00800	0.022	0.200	ug/L	
SGC0297-ICB1	Arsenic-75a	0.00800	0.022	0.200	ug/L	
SGC0297-CCB1	Arsenic-75a	0.0130	0.022	0.200	ug/L	
SGC0297-CCB1	Arsenic-75a (dissolved)	0.0130	0.022	0.200	ug/L	
SGC0297-CCB2	Arsenic-75a (dissolved)	0.0190	0.022	0.200	ug/L	
SGC0297-CCB2	Arsenic-75a	0.0190	0.022	0.200	ug/L	
SGC0297-CCB3	Arsenic-75a (dissolved)	0.0230	0.022	0.200	ug/L	
SGC0297-CCB3	Arsenic-75a	0.0230	0.022	0.200	ug/L	
SGC0297-CCB4	Arsenic-75a (dissolved)	0.0140	0.022	0.200	ug/L	
SGC0297-CCB4	Arsenic-75a	0.0140	0.022	0.200	ug/L	
SGC0297-CCB5	Arsenic-75a (dissolved)	0.0100	0.022	0.200	ug/L	
SGC0297-CCB5	Arsenic-75a	0.0100	0.022	0.200	ug/L	
SGC0297-CCB6	Arsenic-75a (dissolved)	0.0200	0.022	0.200	ug/L	
SGC0297-CCB6	Arsenic-75a	0.0200	0.022	0.200	ug/L	
SGC0297-CCB7	Arsenic-75a (dissolved)	0.0150	0.022	0.200	ug/L	
SGC0297-CCB7	Arsenic-75a	0.0150	0.022	0.200	ug/L	
SGC0297-CCB8	Arsenic-75a (dissolved)	0.0140	0.022	0.200	ug/L	
SGC0297-CCB8	Arsenic-75a	0.0140	0.022	0.200	ug/L	
SGC0297-CCB9	Arsenic-75a (dissolved)	0.00600	0.022	0.200	ug/L	
SGC0297-CCB9	Arsenic-75a	0.00600	0.022	0.200	ug/L	
SGC0297-CCBA	Arsenic-75a (dissolved)	0.00	0.022	0.200	ug/L	
SGC0297-CCBA	Arsenic-75a	0.00	0.022	0.200	ug/L	
SGC0297-CCBB	Arsenic-75a	0.00300	0.022	0.200	ug/L	
SGC0297-CCBB	Arsenic-75a (dissolved)	0.00300	0.022	0.200	ug/L	



**INSTRUMENT BLANKS**  
**EPA 200.8 UCT-KED**

Laboratory: Analytical Resources, Inc.

SDG: 18C0296

Client: GeoEngineers

Project: Everett Smelter-Low Lands Area

Instrument ID: ICPMS2

Calibration: BC00051

Sequence: SGC0310

Date Analyzed: 03/21/18 15:47

Lab Sample ID	Analyte	Found	MDL	MRL	Units	C
SGC0310-ICB1	Arsenic-75a (dissolved)	0.00800	0.022	0.200	ug/L	
SGC0310-ICB1	Arsenic-75a	0.00800	0.022	0.200	ug/L	
SGC0310-CCB1	Arsenic-75a	0.0170	0.022	0.200	ug/L	
SGC0310-CCB1	Arsenic-75a (dissolved)	0.0170	0.022	0.200	ug/L	
SGC0310-CCB2	Arsenic-75a (dissolved)	0.00300	0.022	0.200	ug/L	
SGC0310-CCB2	Arsenic-75a	0.00300	0.022	0.200	ug/L	
SGC0310-CCB3	Arsenic-75a (dissolved)	0.00600	0.022	0.200	ug/L	
SGC0310-CCB3	Arsenic-75a	0.00600	0.022	0.200	ug/L	
SGC0310-CCB4	Arsenic-75a (dissolved)	0.00500	0.022	0.200	ug/L	
SGC0310-CCB4	Arsenic-75a	0.00500	0.022	0.200	ug/L	
SGC0310-CCB5	Arsenic-75a (dissolved)	0.00700	0.022	0.200	ug/L	
SGC0310-CCB5	Arsenic-75a	0.00700	0.022	0.200	ug/L	
SGC0310-CCB6	Arsenic-75a (dissolved)	0.00600	0.022	0.200	ug/L	
SGC0310-CCB6	Arsenic-75a	0.00600	0.022	0.200	ug/L	
SGC0310-CCB7	Arsenic-75a (dissolved)	0.0100	0.022	0.200	ug/L	
SGC0310-CCB7	Arsenic-75a	0.0100	0.022	0.200	ug/L	
SGC0310-CCB8	Arsenic-75a (dissolved)	0.0110	0.022	0.200	ug/L	
SGC0310-CCB8	Arsenic-75a	0.0110	0.022	0.200	ug/L	
SGC0310-CCB9	Arsenic-75a	0.0160	0.022	0.200	ug/L	
SGC0310-CCB9	Arsenic-75a (dissolved)	0.0160	0.022	0.200	ug/L	



**LCS / LCS DUPLICATE RECOVERY**  
**EPA 200.8 UCT-KED**  
Dissolved Metals

Laboratory:	<u>Analytical Resources, Inc.</u>	SDG:	<u>18C0296</u>
Client:	<u>GeoEngineers</u>	Project:	<u>Everett Smelter-Low Lands Area</u>
Matrix:	<u>Water</u>	Analyzed:	<u>03/21/18 22:44</u>
Batch:	<u>BGC0526</u>	Laboratory ID:	<u>BGC0526-BS2</u>
Preparation:	<u>REN EPA 600/4-79-020 4.1.4 HNO3 matrix</u>	Sequence Name:	<u>LCS</u>
Initial/Final:	<u>25 mL / 25 mL</u>		

COMPOUND	SPIKE ADDED (ug/L)	LCS CONCENTRATION (ug/L)	Q	LCS % REC. #	QC LIMITS REC.
Arsenic-75a (dissolved)	25.0	26.5		106	80 - 120

\* Indicates values outside of QC limits



**LCS / LCS DUPLICATE RECOVERY**  
**EPA 200.8 UCT-KED**  
Total Metals

Laboratory:	<u>Analytical Resources, Inc.</u>	SDG:	<u>18C0296</u>
Client:	<u>GeoEngineers</u>	Project:	<u>Everett Smelter-Low Lands Area</u>
Matrix:	<u>Water</u>	Analyzed:	<u>03/20/18 14:47</u>
Batch:	<u>BGC0525</u>	Laboratory ID:	<u>BGC0525-BS1</u>
Preparation:	<u>REN EPA 600/4-79-020 4.1.4 HNO3 matrix</u>	Sequence Name:	<u>LCS</u>
Initial/Final:	<u>25 mL / 25 mL</u>		

COMPOUND	SPIKE ADDED (ug/L)	LCS CONCENTRATION (ug/L)	Q	LCS % REC. #	QC LIMITS REC.
Arsenic-75a	25.0	26.4		106	80 - 120

\* Indicates values outside of QC limits



## INITIAL CALIBRATION DATA

### EPA 200.8 UCT-KED

Laboratory: Analytical Resources, Inc.

SDG: 18C0296

Client: GeoEngineers

Project: Everett Smelter-Low Lands Area

Calibration: BC00048

Instrument: ICPMS2

Calibration Date: 03/20/2018 12:32

Compound	Level 01		Level 02		Level 03		Level 04		Level 05		Level 06	
		RF		RF		RF		RF		RF		RF
Arsenic-75a	0	0	0.2	190	10	183	20	184.15	50	181.44	100	177.13
Arsenic-75a, Dissolved	0	0	0.2	190	10	183	20	184.15	50	181.44	100	177.13





## INITIAL CALIBRATION DATA

### EPA 200.8 UCT-KED

Laboratory: Analytical Resources, Inc.

SDG: 18C0296

Client: GeoEngineers

Project: Everett Smelter-Low Lands Area

Calibration: BC00051

Instrument: ICPMS2

Calibration Date: 03/21/2018 14:59

Compound	Level 01		Level 02		Level 03		Level 04		Level 05		Level 06	
		RF		RF		RF		RF		RF		RF
Arsenic-75a	0	0	0.2	140	10	147.6	20	147.4	50	142.86	100	139.62
Arsenic-75a, Dissolved	0	0	0.2	140	10	147.6	20	147.4	50	142.86	100	139.62



# INITIAL AND CONTINUING CALIBRATION CHECK

## EPA 200.8 UCT-KED

 Laboratory: Analytical Resources, Inc.

 SDG: 18C0296

 Client: GeoEngineers

 Project: Everett Smelter-Low Lands Area

 Instrument ID: ICPMS2

 Calibration: BC00048

 Control Limit: +/- 10.00%

 Sequence: SGC0297

Lab Sample ID	Analyte	True	Found	%R	Units	Method
SGC0297-ICV1	Arsenic-75a	50.000	46.9	93.8	ug/L	EPA 200.8 UCT-KEI
	Arsenic-75a (dissolved)	50.000	46.9	93.8	ug/L	EPA 200.8 UCT-KEI
SGC0297-CCV1	Arsenic-75a	50.000	49.7	99.4	ug/L	EPA 200.8 UCT-KEI
	Arsenic-75a (dissolved)	50.000	49.7	99.4	ug/L	EPA 200.8 UCT-KEI
SGC0297-CCV2	Arsenic-75a	50.000	48.1	96.2	ug/L	EPA 200.8 UCT-KEI
	Arsenic-75a (dissolved)	50.000	48.1	96.2	ug/L	EPA 200.8 UCT-KEI
SGC0297-CCV3	Arsenic-75a	50.000	50.0	100	ug/L	EPA 200.8 UCT-KEI
	Arsenic-75a (dissolved)	50.000	50.0	100	ug/L	EPA 200.8 UCT-KEI
SGC0297-CCV4	Arsenic-75a	50.000	49.5	99.0	ug/L	EPA 200.8 UCT-KEI
	Arsenic-75a (dissolved)	50.000	49.5	99.0	ug/L	EPA 200.8 UCT-KEI
SGC0297-CCV5	Arsenic-75a	50.000	50.7	101	ug/L	EPA 200.8 UCT-KEI
	Arsenic-75a (dissolved)	50.000	50.7	101	ug/L	EPA 200.8 UCT-KEI
SGC0297-CCV6	Arsenic-75a	50.000	48.3	96.6	ug/L	EPA 200.8 UCT-KEI
	Arsenic-75a (dissolved)	50.000	48.3	96.6	ug/L	EPA 200.8 UCT-KEI
SGC0297-CCV7	Arsenic-75a	50.000	55.6	111	ug/L	EPA 200.8 UCT-KEI
	Arsenic-75a (dissolved)	50.000	55.6	111	ug/L	EPA 200.8 UCT-KEI
SGC0297-CCV8	Arsenic-75a	50.000	48.8	97.6	ug/L	EPA 200.8 UCT-KEI
	Arsenic-75a (dissolved)	50.000	48.8	97.6	ug/L	EPA 200.8 UCT-KEI
SGC0297-CCV9	Arsenic-75a	50.000	48.8	97.6	ug/L	EPA 200.8 UCT-KEI
	Arsenic-75a (dissolved)	50.000	48.8	97.6	ug/L	EPA 200.8 UCT-KEI
SGC0297-CCVA	Arsenic-75a	50.000	49.3	98.6	ug/L	EPA 200.8 UCT-KEI
	Arsenic-75a (dissolved)	50.000	49.3	98.6	ug/L	EPA 200.8 UCT-KEI
SGC0297-CCVB	Arsenic-75a	50.000	49.8	99.6	ug/L	EPA 200.8 UCT-KEI
	Arsenic-75a (dissolved)	50.000	49.8	99.6	ug/L	EPA 200.8 UCT-KEI

\* Values outside of QC limits



# INITIAL AND CONTINUING CALIBRATION CHECK

## EPA 200.8 UCT-KED

Laboratory: Analytical Resources, Inc.

SDG: 18C0296

Client: GeoEngineers

Project: Everett Smelter-Low Lands Area

Instrument ID: ICPMS2

Calibration: BC00051

Control Limit: +/- 10.00%

Sequence: SGC0310

Lab Sample ID	Analyte	True	Found	%R	Units	Method
SGC0310-ICV1	Arsenic-75a	50.000	47.3	94.6	ug/L	EPA 200.8 UCT-KEI
	Arsenic-75a (dissolved)	50.000	47.3	94.6	ug/L	EPA 200.8 UCT-KEI
SGC0310-CCV1	Arsenic-75a	50.000	49.8	99.7	ug/L	EPA 200.8 UCT-KEI
	Arsenic-75a (dissolved)	50.000	49.8	99.7	ug/L	EPA 200.8 UCT-KEI
SGC0310-CCV2	Arsenic-75a	50.000	49.9	99.8	ug/L	EPA 200.8 UCT-KEI
	Arsenic-75a (dissolved)	50.000	49.9	99.8	ug/L	EPA 200.8 UCT-KEI
SGC0310-CCV3	Arsenic-75a	50.000	50.0	100	ug/L	EPA 200.8 UCT-KEI
	Arsenic-75a (dissolved)	50.000	50.0	100	ug/L	EPA 200.8 UCT-KEI
SGC0310-CCV4	Arsenic-75a	50.000	52.0	104	ug/L	EPA 200.8 UCT-KEI
	Arsenic-75a (dissolved)	50.000	52.0	104	ug/L	EPA 200.8 UCT-KEI
SGC0310-CCV5	Arsenic-75a	50.000	50.5	101	ug/L	EPA 200.8 UCT-KEI
	Arsenic-75a (dissolved)	50.000	50.5	101	ug/L	EPA 200.8 UCT-KEI
SGC0310-CCV6	Arsenic-75a	50.000	50.1	100	ug/L	EPA 200.8 UCT-KEI
	Arsenic-75a (dissolved)	50.000	50.1	100	ug/L	EPA 200.8 UCT-KEI
SGC0310-CCV7	Arsenic-75a	50.000	50.4	101	ug/L	EPA 200.8 UCT-KEI
	Arsenic-75a (dissolved)	50.000	50.4	101	ug/L	EPA 200.8 UCT-KEI
SGC0310-CCV8	Arsenic-75a	50.000	50.4	101	ug/L	EPA 200.8 UCT-KEI
	Arsenic-75a (dissolved)	50.000	50.4	101	ug/L	EPA 200.8 UCT-KEI
SGC0310-CCV9	Arsenic-75a	50.000	53.1	106	ug/L	EPA 200.8 UCT-KEI
	Arsenic-75a (dissolved)	50.000	53.1	106	ug/L	EPA 200.8 UCT-KEI

\* Values outside of QC limits



## ANALYSIS BATCH (SEQUENCE) SUMMARY

### EPA 200.8 UCT-KED

Laboratory: Analytical Resources, Inc.

SDG: 18C0296

Client: GeoEngineers

Project: Everett Smelter-Low Lands Area

Sequence: SGC0297

Instrument: ICPMS2

Calibration: BC00048

Sample Name	Lab Sample ID	Lab File ID	Matrix	Analysis Date/Time
CAL 0	SGC0297-CAL1	XDT_m2180320-006	NA	03/20/18 12:32
CAL 0	SGC0297-CAL1	XDT_m2180320-006	NA	03/20/18 12:32
CAL 1 - LOW CHECK	SGC0297-CAL2	XDT_m2180320-007	NA	03/20/18 12:37
CAL 1 - LOW CHECK	SGC0297-CAL2	XDT_m2180320-007	NA	03/20/18 12:37
CAL 2	SGC0297-CAL3	XDT_m2180320-008	NA	03/20/18 12:42
CAL 2	SGC0297-CAL3	XDT_m2180320-008	NA	03/20/18 12:42
CAL 3	SGC0297-CAL4	XDT_m2180320-009	NA	03/20/18 12:48
CAL 3	SGC0297-CAL4	XDT_m2180320-009	NA	03/20/18 12:48
CAL 4	SGC0297-CAL5	XDT_m2180320-010	NA	03/20/18 12:53
CAL 4	SGC0297-CAL5	XDT_m2180320-010	NA	03/20/18 12:53
CAL 5	SGC0297-CAL6	XDT_m2180320-011	NA	03/20/18 13:00
CAL 5	SGC0297-CAL6	XDT_m2180320-011	NA	03/20/18 13:00
Initial Cal Check	SGC0297-ICV1	XDT_m2180320-014	NA	03/20/18 13:15
Initial Cal Check	SGC0297-ICV1	XDT_m2180320-014	NA	03/20/18 13:15
Initial Cal Blank	SGC0297-ICB1	XDT_m2180320-015	NA	03/20/18 13:21
Initial Cal Blank	SGC0297-ICB1	XDT_m2180320-015	NA	03/20/18 13:21
Calibration Check	SGC0297-CCV1	XDT_m2180320-016	NA	03/20/18 13:26
Calibration Check	SGC0297-CCV1	XDT_m2180320-016	NA	03/20/18 13:26
Calibration Blank	SGC0297-CCB1	XDT_m2180320-017	NA	03/20/18 13:32
Calibration Blank	SGC0297-CCB1	XDT_m2180320-017	NA	03/20/18 13:32
Instrument RL Check	SGC0297-CRL1	XDT_m2180320-018	NA	03/20/18 13:37
Instrument RL Check	SGC0297-CRL1	XDT_m2180320-018	NA	03/20/18 13:37
Interference Check A	SGC0297-IFA1	XDT_m2180320-019	NA	03/20/18 13:42
Interference Check A	SGC0297-IFA1	XDT_m2180320-019	NA	03/20/18 13:42
Interference Check B	SGC0297-IFB1	XDT_m2180320-020	NA	03/20/18 13:47
Interference Check B	SGC0297-IFB1	XDT_m2180320-020	NA	03/20/18 13:47
LR200	SGC0297-HCV1	XDT_m2180320-021	NA	03/20/18 13:55
LR200	SGC0297-HCV1	XDT_m2180320-021	NA	03/20/18 13:55
LR300	SGC0297-HCV2	XDT_m2180320-022	NA	03/20/18 14:00
LR300	SGC0297-HCV2	XDT_m2180320-022	NA	03/20/18 14:00
Calibration Check	SGC0297-CCV2	XDT_m2180320-024	NA	03/20/18 14:15



## ANALYSIS BATCH (SEQUENCE) SUMMARY

### EPA 200.8 UCT-KED

Laboratory:	<u>Analytical Resources, Inc.</u>	SDG:	<u>18C0296</u>
Client:	<u>GeoEngineers</u>	Project:	<u>Everett Smelter-Low Lands Area</u>
Sequence:	<u>SGC0297</u>	Instrument:	<u>ICPMS2</u>
		Calibration:	<u>BC00048</u>

Sample Name	Lab Sample ID	Lab File ID	Matrix	Analysis Date/Time
Calibration Check	SGC0297-CCV2	XDT_m2180320-024	NA	03/20/18 14:15
Calibration Blank	SGC0297-CCB2	XDT_m2180320-025	NA	03/20/18 14:21
Calibration Blank	SGC0297-CCB2	XDT_m2180320-025	NA	03/20/18 14:21
Blank	BGC0525-BLK1	XDT_m2180320-026	Water	03/20/18 14:26
ZZZZZ	18C0307-01	XDT_m2180320-028	Water	03/20/18 14:36
ZZZZZ	18C0307-01	XDT_m2180320-028	Water	03/20/18 14:36
ZZZZZ	18C0307-01	XDT_m2180320-028	Water	03/20/18 14:36
ZZZZZ	18C0307-01	XDT_m2180320-028	Water	03/20/18 14:36
ZZZZZ	18C0307-01	XDT_m2180320-028	Water	03/20/18 14:36
LCS	BGC0525-BS1	XDT_m2180320-030	Water	03/20/18 14:47
ZZZZZ	18C0272-04	XDT_m2180320-031	Water	03/20/18 14:52
ZZZZZ	18C0272-04	XDT_m2180320-031	Water	03/20/18 14:52
ZZZZZ	18C0272-02	XDT_m2180320-032	Water	03/20/18 14:57
ZZZZZ	18C0272-02	XDT_m2180320-032	Water	03/20/18 14:57
ZZZZZ	18C0305-01	XDT_m2180320-034	Water	03/20/18 15:07
ZZZZZ	18C0305-01	XDT_m2180320-034	Water	03/20/18 15:07
ZZZZZ	18C0305-01	XDT_m2180320-034	Water	03/20/18 15:07
ZZZZZ	18C0305-01	XDT_m2180320-034	Water	03/20/18 15:07
ZZZZZ	18C0306-01	XDT_m2180320-035	Water	03/20/18 15:12
ZZZZZ	18C0306-01	XDT_m2180320-035	Water	03/20/18 15:12
ZZZZZ	18C0306-01	XDT_m2180320-035	Water	03/20/18 15:12
ZZZZZ	18C0306-01	XDT_m2180320-035	Water	03/20/18 15:12
Calibration Check	SGC0297-CCV3	XDT_m2180320-036	NA	03/20/18 15:20
Calibration Check	SGC0297-CCV3	XDT_m2180320-036	NA	03/20/18 15:20
Calibration Blank	SGC0297-CCB3	XDT_m2180320-037	NA	03/20/18 15:26
Calibration Blank	SGC0297-CCB3	XDT_m2180320-037	NA	03/20/18 15:26
ZZZZZ	18C0285-01	XDT_m2180320-040	Solid	03/20/18 15:41
ZZZZZ	18C0285-01	XDT_m2180320-040	Solid	03/20/18 15:41
ZZZZZ	18C0285-01	XDT_m2180320-040	Solid	03/20/18 15:41
ZZZZZ	18C0285-01	XDT_m2180320-040	Solid	03/20/18 15:41
ZZZZZ	18C0285-01	XDT_m2180320-040	Solid	03/20/18 15:41



## ANALYSIS BATCH (SEQUENCE) SUMMARY

### EPA 200.8 UCT-KED

Laboratory:	<u>Analytical Resources, Inc.</u>	SDG:	<u>18C0296</u>
Client:	<u>GeoEngineers</u>	Project:	<u>Everett Smelter-Low Lands Area</u>
Sequence:	<u>SGC0297</u>	Instrument:	<u>ICPMS2</u>
		Calibration:	<u>BC00048</u>

Sample Name	Lab Sample ID	Lab File ID	Matrix	Analysis Date/Time
ZZZZZ	18C0285-01	XDT_m2180320-040	Solid	03/20/18 15:41
ZZZZZ	18C0284-01	XDT_m2180320-043	Water	03/20/18 15:57
Calibration Check	SGC0297-CCV4	XDT_m2180320-048	NA	03/20/18 16:25
Calibration Check	SGC0297-CCV4	XDT_m2180320-048	NA	03/20/18 16:25
Calibration Blank	SGC0297-CCB4	XDT_m2180320-049	NA	03/20/18 16:31
Calibration Blank	SGC0297-CCB4	XDT_m2180320-049	NA	03/20/18 16:31
ZZZZZ	18C0201-02	XDT_m2180320-052	Water	03/20/18 16:46
ZZZZZ	18C0201-02	XDT_m2180320-052	Water	03/20/18 16:46
ZZZZZ	18C0270-01	XDT_m2180320-056	Water	03/20/18 17:07
ZZZZZ	18C0270-01	XDT_m2180320-056	Water	03/20/18 17:07
ZZZZZ	18C0270-03	XDT_m2180320-057	Water	03/20/18 17:12
ZZZZZ	18C0270-03	XDT_m2180320-057	Water	03/20/18 17:12
Calibration Check	SGC0297-CCV5	XDT_m2180320-060	NA	03/20/18 17:30
Calibration Check	SGC0297-CCV5	XDT_m2180320-060	NA	03/20/18 17:30
Calibration Blank	SGC0297-CCB5	XDT_m2180320-061	NA	03/20/18 17:36
Calibration Blank	SGC0297-CCB5	XDT_m2180320-061	NA	03/20/18 17:36
ZZZZZ	18C0262-02	XDT_m2180320-064	Water	03/20/18 17:52
ZZZZZ	18C0262-02	XDT_m2180320-064	Water	03/20/18 17:52
ZZZZZ	18C0270-02	XDT_m2180320-068	Water	03/20/18 18:13
ZZZZZ	18C0270-02	XDT_m2180320-068	Water	03/20/18 18:13
ZZZZZ	18C0270-04	XDT_m2180320-069	Water	03/20/18 18:18
ZZZZZ	18C0270-04	XDT_m2180320-069	Water	03/20/18 18:18
ZZZZZ	18C0292-01	XDT_m2180320-070	Water	03/20/18 18:23
ZZZZZ	18C0292-01	XDT_m2180320-070	Water	03/20/18 18:23
ZZZZZ	18C0292-01	XDT_m2180320-070	Water	03/20/18 18:23
ZZZZZ	18C0292-01	XDT_m2180320-070	Water	03/20/18 18:23
ZZZZZ	18C0292-01	XDT_m2180320-070	Water	03/20/18 18:23
ZZZZZ	18C0292-02	XDT_m2180320-071	Water	03/20/18 18:28
ZZZZZ	18C0292-02	XDT_m2180320-071	Water	03/20/18 18:28
ZZZZZ	18C0292-02	XDT_m2180320-071	Water	03/20/18 18:28
ZZZZZ	18C0292-02	XDT_m2180320-071	Water	03/20/18 18:28



## ANALYSIS BATCH (SEQUENCE) SUMMARY

### EPA 200.8 UCT-KED

Laboratory:	<u>Analytical Resources, Inc.</u>	SDG:	<u>18C0296</u>
Client:	<u>GeoEngineers</u>	Project:	<u>Everett Smelter-Low Lands Area</u>
Sequence:	<u>SGC0297</u>	Instrument:	<u>ICPMS2</u>
		Calibration:	<u>BC00048</u>

Sample Name	Lab Sample ID	Lab File ID	Matrix	Analysis Date/Time
<i>ZZZZZ</i>	18C0292-02	XDT_m2180320-071	Water	03/20/18 18:28
Calibration Check	SGC0297-CCV6	XDT_m2180320-072	NA	03/20/18 18:36
Calibration Check	SGC0297-CCV6	XDT_m2180320-072	NA	03/20/18 18:36
Calibration Blank	SGC0297-CCB6	XDT_m2180320-073	NA	03/20/18 18:42
Calibration Blank	SGC0297-CCB6	XDT_m2180320-073	NA	03/20/18 18:42
<i>ZZZZZ</i>	18C0292-07	XDT_m2180320-079	Water	03/20/18 19:14
Calibration Check	SGC0297-CCV7	XDT_m2180320-084	NA	03/20/18 19:42
Calibration Check	SGC0297-CCV7	XDT_m2180320-084	NA	03/20/18 19:42
Calibration Blank	SGC0297-CCB7	XDT_m2180320-085	NA	03/20/18 19:48
Calibration Blank	SGC0297-CCB7	XDT_m2180320-085	NA	03/20/18 19:48
Calibration Check	SGC0297-CCV8	XDT_m2180320-096	NA	03/20/18 20:49
Calibration Check	SGC0297-CCV8	XDT_m2180320-096	NA	03/20/18 20:49
Calibration Blank	SGC0297-CCB8	XDT_m2180320-097	NA	03/20/18 20:55
Calibration Blank	SGC0297-CCB8	XDT_m2180320-097	NA	03/20/18 20:55
<i>ZZZZZ</i>	18C0255-01	XDT_m2180320-098	Water	03/20/18 21:00
<i>ZZZZZ</i>	18C0255-01	XDT_m2180320-098	Water	03/20/18 21:00
<i>ZZZZZ</i>	18C0269-01	XDT_m2180320-099	Water	03/20/18 21:06
<i>ZZZZZ</i>	18C0269-01	XDT_m2180320-099	Water	03/20/18 21:06
<i>ZZZZZ</i>	18C0269-01	XDT_m2180320-099	Water	03/20/18 21:06
<i>ZZZZZ</i>	18C0269-01	XDT_m2180320-099	Water	03/20/18 21:06
<i>ZZZZZ</i>	18C0269-01	XDT_m2180320-099	Water	03/20/18 21:06
<i>ZZZZZ</i>	18C0273-01	XDT_m2180320-100	Water	03/20/18 21:11
<i>ZZZZZ</i>	18C0273-01	XDT_m2180320-100	Water	03/20/18 21:11
<i>ZZZZZ</i>	18C0273-02	XDT_m2180320-101	Water	03/20/18 21:16
<i>ZZZZZ</i>	18C0273-02	XDT_m2180320-101	Water	03/20/18 21:16
<i>ZZZZZ</i>	18C0273-03	XDT_m2180320-102	Water	03/20/18 21:21
<i>ZZZZZ</i>	18C0273-03	XDT_m2180320-102	Water	03/20/18 21:21
<i>ZZZZZ</i>	18C0273-04	XDT_m2180320-103	Water	03/20/18 21:26
<i>ZZZZZ</i>	18C0273-04	XDT_m2180320-103	Water	03/20/18 21:26
<i>ZZZZZ</i>	18C0273-05	XDT_m2180320-104	Water	03/20/18 21:31
<i>ZZZZZ</i>	18C0273-05	XDT_m2180320-104	Water	03/20/18 21:31
Calibration Check	SGC0297-CCV9	XDT_m2180320-108	NA	03/20/18 21:56



## ANALYSIS BATCH (SEQUENCE) SUMMARY

### EPA 200.8 UCT-KED

Laboratory:	<u>Analytical Resources, Inc.</u>	SDG:	<u>18C0296</u>
Client:	<u>GeoEngineers</u>	Project:	<u>Everett Smelter-Low Lands Area</u>
Sequence:	<u>SGC0297</u>	Instrument:	<u>ICPMS2</u>
		Calibration:	<u>BC00048</u>

Sample Name	Lab Sample ID	Lab File ID	Matrix	Analysis Date/Time
Calibration Check	SGC0297-CCV9	XDT_m2180320-108	NA	03/20/18 21:56
Calibration Blank	SGC0297-CCB9	XDT_m2180320-109	NA	03/20/18 22:02
Calibration Blank	SGC0297-CCB9	XDT_m2180320-109	NA	03/20/18 22:02
ZZZZZ	18C0306-01RE1	XDT_m2180320-110	Water	03/20/18 22:07
ZZZZZ	18C0258-01	XDT_m2180320-112	Water	03/20/18 22:17
ZZZZZ	18C0258-01	XDT_m2180320-112	Water	03/20/18 22:17
ZZZZZ	18C0262-01	XDT_m2180320-113	Water	03/20/18 22:22
ZZZZZ	18C0262-01	XDT_m2180320-113	Water	03/20/18 22:22
ZZZZZ	18C0262-03	XDT_m2180320-114	Water	03/20/18 22:27
ZZZZZ	18C0262-03	XDT_m2180320-114	Water	03/20/18 22:27
ZZZZZ	18C0262-05	XDT_m2180320-115	Water	03/20/18 22:32
ZZZZZ	18C0262-05	XDT_m2180320-115	Water	03/20/18 22:32
ZZZZZ	18C0262-07	XDT_m2180320-116	Water	03/20/18 22:37
ZZZZZ	18C0262-07	XDT_m2180320-116	Water	03/20/18 22:37
ZZZZZ	18C0262-04	XDT_m2180320-117	Water	03/20/18 22:42
ZZZZZ	18C0262-04	XDT_m2180320-117	Water	03/20/18 22:42
ZZZZZ	18C0262-06	XDT_m2180320-118	Water	03/20/18 22:47
ZZZZZ	18C0262-06	XDT_m2180320-118	Water	03/20/18 22:47
ZZZZZ	18C0262-08	XDT_m2180320-119	Water	03/20/18 22:52
ZZZZZ	18C0262-08	XDT_m2180320-119	Water	03/20/18 22:52
Calibration Check	SGC0297-CCVA	XDT_m2180320-120	NA	03/20/18 22:59
Calibration Check	SGC0297-CCVA	XDT_m2180320-120	NA	03/20/18 22:59
Calibration Blank	SGC0297-CCBA	XDT_m2180320-121	NA	03/20/18 23:05
Calibration Blank	SGC0297-CCBA	XDT_m2180320-121	NA	03/20/18 23:05
ZZZZZ	18C0247-01	XDT_m2180320-123	Water	03/20/18 23:16
ZZZZZ	18C0250-01	XDT_m2180320-124	Water	03/20/18 23:21
CB11	18C0296-07	XDT_m2180320-125	Water	03/20/18 23:26
CB11	18C0296-08	XDT_m2180320-126	Water	03/20/18 23:31
ZZZZZ	18C0307-02	XDT_m2180320-127	Water	03/20/18 23:36
ZZZZZ	18C0307-02	XDT_m2180320-127	Water	03/20/18 23:36
ZZZZZ	18C0307-02	XDT_m2180320-127	Water	03/20/18 23:36



## ANALYSIS BATCH (SEQUENCE) SUMMARY

### EPA 200.8 UCT-KED

Laboratory:	<u>Analytical Resources, Inc.</u>	SDG:	<u>18C0296</u>
Client:	<u>GeoEngineers</u>	Project:	<u>Everett Smelter-Low Lands Area</u>
Sequence:	<u>SGC0297</u>	Instrument:	<u>ICPMS2</u>
		Calibration:	<u>BC00048</u>

Sample Name	Lab Sample ID	Lab File ID	Matrix	Analysis Date/Time
<i>ZZZZZ</i>	18C0307-02	XDT_m2180320-127	Water	03/20/18 23:36
<i>ZZZZZ</i>	18C0307-02	XDT_m2180320-127	Water	03/20/18 23:36
<i>ZZZZZ</i>	18C0309-01	XDT_m2180320-128	Water	03/20/18 23:41
<i>ZZZZZ</i>	18C0309-01	XDT_m2180320-128	Water	03/20/18 23:41
<i>ZZZZZ</i>	18C0309-01	XDT_m2180320-128	Water	03/20/18 23:41
Calibration Check	SGC0297-CCVB	XDT_m2180320-129	NA	03/20/18 23:48
Calibration Check	SGC0297-CCVB	XDT_m2180320-129	NA	03/20/18 23:48
Calibration Blank	SGC0297-CCBB	XDT_m2180320-130	NA	03/20/18 23:54
Calibration Blank	SGC0297-CCBB	XDT_m2180320-130	NA	03/20/18 23:54



## ANALYSIS BATCH (SEQUENCE) SUMMARY

### EPA 200.8 UCT-KED

Laboratory: Analytical Resources, Inc.

SDG: 18C0296

Client: GeoEngineers

Project: Everett Smelter-Low Lands Area

Sequence: SGC0310

Instrument: ICPMS2

Calibration: BC00051

Sample Name	Lab Sample ID	Lab File ID	Matrix	Analysis Date/Time
CAL 0	SGC0310-CAL1	XDT_m2180321-006	NA	03/21/18 14:59
CAL 0	SGC0310-CAL1	XDT_m2180321-006	NA	03/21/18 14:59
CAL 1 - LOW CHECK	SGC0310-CAL2	XDT_m2180321-007	NA	03/21/18 15:04
CAL 1 - LOW CHECK	SGC0310-CAL2	XDT_m2180321-007	NA	03/21/18 15:04
CAL 2	SGC0310-CAL3	XDT_m2180321-008	NA	03/21/18 15:09
CAL 2	SGC0310-CAL3	XDT_m2180321-008	NA	03/21/18 15:09
CAL 3	SGC0310-CAL4	XDT_m2180321-009	NA	03/21/18 15:14
CAL 3	SGC0310-CAL4	XDT_m2180321-009	NA	03/21/18 15:14
CAL 4	SGC0310-CAL5	XDT_m2180321-010	NA	03/21/18 15:19
CAL 4	SGC0310-CAL5	XDT_m2180321-010	NA	03/21/18 15:19
CAL 5	SGC0310-CAL6	XDT_m2180321-011	NA	03/21/18 15:26
CAL 5	SGC0310-CAL6	XDT_m2180321-011	NA	03/21/18 15:26
Initial Cal Check	SGC0310-ICV1	XDT_m2180321-014	NA	03/21/18 15:41
Initial Cal Check	SGC0310-ICV1	XDT_m2180321-014	NA	03/21/18 15:41
Initial Cal Blank	SGC0310-ICB1	XDT_m2180321-015	NA	03/21/18 15:47
Initial Cal Blank	SGC0310-ICB1	XDT_m2180321-015	NA	03/21/18 15:47
Calibration Check	SGC0310-CCV1	XDT_m2180321-016	NA	03/21/18 15:52
Calibration Check	SGC0310-CCV1	XDT_m2180321-016	NA	03/21/18 15:52
Calibration Blank	SGC0310-CCB1	XDT_m2180321-017	NA	03/21/18 15:58
Calibration Blank	SGC0310-CCB1	XDT_m2180321-017	NA	03/21/18 15:58
Instrument RL Check	SGC0310-CRL1	XDT_m2180321-018	NA	03/21/18 16:03
Instrument RL Check	SGC0310-CRL1	XDT_m2180321-018	NA	03/21/18 16:03
Interference Check A	SGC0310-IFA1	XDT_m2180321-019	NA	03/21/18 16:08
Interference Check A	SGC0310-IFA1	XDT_m2180321-019	NA	03/21/18 16:08
Interference Check B	SGC0310-IFB1	XDT_m2180321-020	NA	03/21/18 16:13
Interference Check B	SGC0310-IFB1	XDT_m2180321-020	NA	03/21/18 16:13
LR200	SGC0310-HCV1	XDT_m2180321-021	NA	03/21/18 16:21
LR200	SGC0310-HCV1	XDT_m2180321-021	NA	03/21/18 16:21
LR300	SGC0310-HCV2	XDT_m2180321-022	NA	03/21/18 16:26
LR300	SGC0310-HCV2	XDT_m2180321-022	NA	03/21/18 16:26
Calibration Check	SGC0310-CCV2	XDT_m2180321-025	NA	03/21/18 16:47





## ANALYSIS BATCH (SEQUENCE) SUMMARY

### EPA 200.8 UCT-KED

Laboratory:	<u>Analytical Resources, Inc.</u>	SDG:	<u>18C0296</u>
Client:	<u>GeoEngineers</u>	Project:	<u>Everett Smelter-Low Lands Area</u>
Sequence:	<u>SGC0310</u>	Instrument:	<u>ICPMS2</u>
		Calibration:	<u>BC00051</u>

Sample Name	Lab Sample ID	Lab File ID	Matrix	Analysis Date/Time
Calibration Check	SGC0310-CCV2	XDT_m2180321-025	NA	03/21/18 16:47
Calibration Blank	SGC0310-CCB2	XDT_m2180321-026	NA	03/21/18 16:53
Calibration Blank	SGC0310-CCB2	XDT_m2180321-026	NA	03/21/18 16:53
ZZZZZ	BGC0552-BLK1	XDT_m2180321-027	Water	03/21/18 16:58
ZZZZZ	18C0320-01	XDT_m2180321-029	Water	03/21/18 17:08
ZZZZZ	18C0320-01	XDT_m2180321-029	Water	03/21/18 17:08
ZZZZZ	18C0320-01	XDT_m2180321-029	Water	03/21/18 17:08
ZZZZZ	18C0320-01	XDT_m2180321-029	Water	03/21/18 17:08
ZZZZZ	18C0320-01	XDT_m2180321-029	Water	03/21/18 17:08
ZZZZZ	18C0320-01	XDT_m2180321-029	Water	03/21/18 17:08
ZZZZZ	18C0320-01	XDT_m2180321-029	Water	03/21/18 17:08
ZZZZZ	BGC0552-BS1	XDT_m2180321-032	Water	03/21/18 17:24
ZZZZZ	18C0317-01	XDT_m2180321-033	Water	03/21/18 17:29
ZZZZZ	18C0317-01	XDT_m2180321-033	Water	03/21/18 17:29
ZZZZZ	18C0317-01	XDT_m2180321-033	Water	03/21/18 17:29
ZZZZZ	18C0317-01	XDT_m2180321-033	Water	03/21/18 17:29
Calibration Check	SGC0310-CCV3	XDT_m2180321-037	NA	03/21/18 17:53
Calibration Check	SGC0310-CCV3	XDT_m2180321-037	NA	03/21/18 17:53
Calibration Blank	SGC0310-CCB3	XDT_m2180321-038	NA	03/21/18 17:59
Calibration Blank	SGC0310-CCB3	XDT_m2180321-038	NA	03/21/18 17:59
Calibration Check	SGC0310-CCV4	XDT_m2180321-049	NA	03/21/18 18:57
Calibration Check	SGC0310-CCV4	XDT_m2180321-049	NA	03/21/18 18:57
Calibration Blank	SGC0310-CCB4	XDT_m2180321-050	NA	03/21/18 19:03
Calibration Blank	SGC0310-CCB4	XDT_m2180321-050	NA	03/21/18 19:03
ZZZZZ	BGC0382-BLK1	XDT_m2180321-051	Solid	03/21/18 19:08
ZZZZZ	18C0182-01	XDT_m2180321-053	Solid	03/21/18 19:18
ZZZZZ	18C0182-01	XDT_m2180321-053	Solid	03/21/18 19:18
ZZZZZ	18C0182-01	XDT_m2180321-053	Solid	03/21/18 19:18
ZZZZZ	18C0182-01	XDT_m2180321-053	Solid	03/21/18 19:18
ZZZZZ	BGC0382-BS1	XDT_m2180321-055	Solid	03/21/18 19:29
ZZZZZ	18C0141-01	XDT_m2180321-056	Solid	03/21/18 19:34
ZZZZZ	18C0141-01	XDT_m2180321-056	Solid	03/21/18 19:34



## ANALYSIS BATCH (SEQUENCE) SUMMARY

### EPA 200.8 UCT-KED

Laboratory:	<u>Analytical Resources, Inc.</u>	SDG:	<u>18C0296</u>
Client:	<u>GeoEngineers</u>	Project:	<u>Everett Smelter-Low Lands Area</u>
Sequence:	<u>SGC0310</u>	Instrument:	<u>ICPMS2</u>
		Calibration:	<u>BC00051</u>

Sample Name	Lab Sample ID	Lab File ID	Matrix	Analysis Date/Time
ZZZZZ	18C0141-01	XDT_m2180321-056	Solid	03/21/18 19:34
ZZZZZ	18C0141-01	XDT_m2180321-056	Solid	03/21/18 19:34
ZZZZZ	18C0141-01	XDT_m2180321-056	Solid	03/21/18 19:34
ZZZZZ	18C0141-02	XDT_m2180321-057	Solid	03/21/18 19:39
ZZZZZ	18C0141-02	XDT_m2180321-057	Solid	03/21/18 19:39
ZZZZZ	18C0141-02	XDT_m2180321-057	Solid	03/21/18 19:39
ZZZZZ	18C0141-02	XDT_m2180321-057	Solid	03/21/18 19:39
ZZZZZ	18C0141-02	XDT_m2180321-057	Solid	03/21/18 19:39
ZZZZZ	18C0141-02	XDT_m2180321-057	Solid	03/21/18 19:39
ZZZZZ	18C0141-03	XDT_m2180321-058	Solid	03/21/18 19:44
ZZZZZ	18C0141-03	XDT_m2180321-058	Solid	03/21/18 19:44
ZZZZZ	18C0141-03	XDT_m2180321-058	Solid	03/21/18 19:44
ZZZZZ	18C0141-03	XDT_m2180321-058	Solid	03/21/18 19:44
ZZZZZ	18C0141-03	XDT_m2180321-058	Solid	03/21/18 19:44
Calibration Check	SGC0310-CCV5	XDT_m2180321-061	NA	03/21/18 20:01
Calibration Check	SGC0310-CCV5	XDT_m2180321-061	NA	03/21/18 20:01
Calibration Blank	SGC0310-CCB5	XDT_m2180321-062	NA	03/21/18 20:07
Calibration Blank	SGC0310-CCB5	XDT_m2180321-062	NA	03/21/18 20:07
ZZZZZ	18C0244-01	XDT_m2180321-063	Water	03/21/18 20:12
ZZZZZ	18C0175-02	XDT_m2180321-064	Water	03/21/18 20:18
ZZZZZ	18C0175-02	XDT_m2180321-064	Water	03/21/18 20:18
ZZZZZ	18C0175-04	XDT_m2180321-065	Water	03/21/18 20:23
ZZZZZ	18C0175-04	XDT_m2180321-065	Water	03/21/18 20:23
ZZZZZ	18C0175-05	XDT_m2180321-066	Water	03/21/18 20:28
ZZZZZ	18C0175-05	XDT_m2180321-066	Water	03/21/18 20:28
ZZZZZ	18C0292-07	XDT_m2180321-067	Water	03/21/18 20:33
ZZZZZ	18C0292-07	XDT_m2180321-067	Water	03/21/18 20:33
ZZZZZ	18C0292-07	XDT_m2180321-067	Water	03/21/18 20:33
ZZZZZ	18C0292-07	XDT_m2180321-067	Water	03/21/18 20:33
ZZZZZ	18C0182-02	XDT_m2180321-069	Solid	03/21/18 20:43
ZZZZZ	18C0182-02	XDT_m2180321-069	Solid	03/21/18 20:43
ZZZZZ	18C0182-02	XDT_m2180321-069	Solid	03/21/18 20:43



## ANALYSIS BATCH (SEQUENCE) SUMMARY

### EPA 200.8 UCT-KED

Laboratory:	<u>Analytical Resources, Inc.</u>	SDG:	<u>18C0296</u>
Client:	<u>GeoEngineers</u>	Project:	<u>Everett Smelter-Low Lands Area</u>
Sequence:	<u>SGC0310</u>	Instrument:	<u>ICPMS2</u>
		Calibration:	<u>BC00051</u>

Sample Name	Lab Sample ID	Lab File ID	Matrix	Analysis Date/Time
<i>ZZZZZ</i>	18C0182-02	XDT_m2180321-069	Solid	03/21/18 20:43
<i>ZZZZZ</i>	18C0182-02	XDT_m2180321-069	Solid	03/21/18 20:43
Calibration Check	SGC0310-CCV6	XDT_m2180321-073	NA	03/21/18 21:05
Calibration Check	SGC0310-CCV6	XDT_m2180321-073	NA	03/21/18 21:05
Calibration Blank	SGC0310-CCB6	XDT_m2180321-074	NA	03/21/18 21:11
Calibration Blank	SGC0310-CCB6	XDT_m2180321-074	NA	03/21/18 21:11
<i>ZZZZZ</i>	18C0309-01	XDT_m2180321-084	Water	03/21/18 22:03
Calibration Check	SGC0310-CCV7	XDT_m2180321-085	NA	03/21/18 22:11
Calibration Check	SGC0310-CCV7	XDT_m2180321-085	NA	03/21/18 22:11
Calibration Blank	SGC0310-CCB7	XDT_m2180321-086	NA	03/21/18 22:17
Calibration Blank	SGC0310-CCB7	XDT_m2180321-086	NA	03/21/18 22:17
Blank	BGC0526-BLK2	XDT_m2180321-087	Water	03/21/18 22:22
<i>ZZZZZ</i>	18C0312-10	XDT_m2180321-089	Water	03/21/18 22:32
<i>ZZZZZ</i>	18C0312-10	XDT_m2180321-089	Water	03/21/18 22:32
<i>ZZZZZ</i>	18C0312-10	XDT_m2180321-089	Water	03/21/18 22:32
LCS	BGC0526-BS2	XDT_m2180321-091	Water	03/21/18 22:44
<i>ZZZZZ</i>	18C0283-06	XDT_m2180321-096	Water	03/21/18 23:13
Calibration Check	SGC0310-CCV8	XDT_m2180321-097	NA	03/21/18 23:20
Calibration Check	SGC0310-CCV8	XDT_m2180321-097	NA	03/21/18 23:20
Calibration Blank	SGC0310-CCB8	XDT_m2180321-098	NA	03/21/18 23:26
Calibration Blank	SGC0310-CCB8	XDT_m2180321-098	NA	03/21/18 23:26
<i>ZZZZZ</i>	18C0323-04	XDT_m2180321-102	Water	03/21/18 23:46
<i>ZZZZZ</i>	18C0323-04	XDT_m2180321-102	Water	03/21/18 23:46
<i>ZZZZZ</i>	18C0323-04	XDT_m2180321-102	Water	03/21/18 23:46
<i>ZZZZZ</i>	18C0323-04	XDT_m2180321-102	Water	03/21/18 23:46
<i>ZZZZZ</i>	18C0323-04	XDT_m2180321-102	Water	03/21/18 23:46
<i>ZZZZZ</i>	18C0323-04	XDT_m2180321-102	Water	03/21/18 23:46
<i>ZZZZZ</i>	18C0323-05	XDT_m2180321-103	Water	03/21/18 23:51
<i>ZZZZZ</i>	18C0323-05	XDT_m2180321-103	Water	03/21/18 23:51
<i>ZZZZZ</i>	18C0323-05	XDT_m2180321-103	Water	03/21/18 23:51
<i>ZZZZZ</i>	18C0323-05	XDT_m2180321-103	Water	03/21/18 23:51



## ANALYSIS BATCH (SEQUENCE) SUMMARY

### EPA 200.8 UCT-KED

Laboratory:	<u>Analytical Resources, Inc.</u>	SDG:	<u>18C0296</u>
Client:	<u>GeoEngineers</u>	Project:	<u>Everett Smelter-Low Lands Area</u>
Sequence:	<u>SGC0310</u>	Instrument:	<u>ICPMS2</u>
		Calibration:	<u>BC00051</u>

Sample Name	Lab Sample ID	Lab File ID	Matrix	Analysis Date/Time
<i>ZZZZZ</i>	18C0323-05	XDT_m2180321-103	Water	03/21/18 23:51
<i>ZZZZZ</i>	18C0323-05	XDT_m2180321-103	Water	03/21/18 23:51
<i>ZZZZZ</i>	18C0314-03	XDT_m2180321-104	Water	03/21/18 23:56
<i>ZZZZZ</i>	18C0314-03	XDT_m2180321-104	Water	03/21/18 23:56
Calibration Check	SGC0310-CCV9	XDT_m2180321-109	NA	03/22/18 00:23
Calibration Check	SGC0310-CCV9	XDT_m2180321-109	NA	03/22/18 00:23
Calibration Blank	SGC0310-CCB9	XDT_m2180321-110	NA	03/22/18 00:29
Calibration Blank	SGC0310-CCB9	XDT_m2180321-110	NA	03/22/18 00:29



# ICP INTERFERENCE CHECK SAMPLE

## EPA 200.8 UCT-KED

Laboratory: Analytical Resources, Inc.

SDG: 18C0296

Client: GeoEngineers

Project: Everett Smelter-Low Lands Area

Instrument ID: ICPMS2

Calibration: BC00048

Sequence: SGC0297

Standard ID: G001820

Lab Sample ID	Analyte	True	Found	%R	Units
SGC0297-IFA1	Arsenic-75a	0	0.0400		ug/L
	Arsenic-75a (dissolved)	0	0.0400		ug/L

\* Indicates %R outside of QC limits

NOTE: True value and %R are populated only for analytes found in the interference check standards, and will be seen only if those analytes were requested.



# ICP INTERFERENCE CHECK SAMPLE

## EPA 200.8 UCT-KED

Laboratory: Analytical Resources, Inc.

SDG: 18C0296

Client: GeoEngineers

Project: Everett Smelter-Low Lands Area

Instrument ID: ICPMS2

Calibration: BC00048

Sequence: SGC0297

Standard ID: G001820

Lab Sample ID	Analyte	True	Found	%R	Units
SGC0297-IFB1	Arsenic-75a	20.000	19.482	97.4	ug/L
	Arsenic-75a (dissolved)	20.000	19.482	97.4	ug/L

\* Indicates %R outside of QC limits

NOTE: True value and %R are populated only for analytes found in the interference check standards, and will be seen only if those analytes were requested.



# ICP INTERFERENCE CHECK SAMPLE

## EPA 200.8 UCT-KED

Laboratory: Analytical Resources, Inc.

SDG: 18C0296

Client: GeoEngineers

Project: Everett Smelter-Low Lands Area

Instrument ID: ICPMS2

Calibration: BC00051

Sequence: SGC0310

Standard ID: G001820

Lab Sample ID	Analyte	True	Found	%R	Units
SGC0310-IFA1	Arsenic-75a	0	0.0390		ug/L
	Arsenic-75a (dissolved)	0	0.0390		ug/L

\* Indicates %R outside of QC limits

NOTE: True value and %R are populated only for analytes found in the interference check standards, and will be seen only if those analytes were requested.



# ICP INTERFERENCE CHECK SAMPLE

## EPA 200.8 UCT-KED

Laboratory: Analytical Resources, Inc.

SDG: 18C0296

Client: GeoEngineers

Project: Everett Smelter-Low Lands Area

Instrument ID: ICPMS2

Calibration: BC00051

Sequence: SGC0310

Standard ID: G001820

Lab Sample ID	Analyte	True	Found	%R	Units
SGC0310-IFB1	Arsenic-75a	20.000	19.825	99.1	ug/L
	Arsenic-75a (dissolved)	20.000	19.825	99.1	ug/L

\* Indicates %R outside of QC limits

NOTE: True value and %R are populated only for analytes found in the interference check standards, and will be seen only if those analytes were requested.



## DETECTION LEVEL STANDARD

### EPA 200.8 UCT-KED

Laboratory: Analytical Resources, Inc.

SDG: 18C0296

Client: GeoEngineers

Project: Everett Smelter-Low Lands Area

Instrument ID: ICPMS2

Calibration: BC00048

Sequence: SGC0297

Lab Sample ID: SGC0297-CRL1

Analyte	True	Found	%R	Units	QC Limits
Arsenic-75a	0.20000	0.190	95.0	ug/L	50 - 150
Arsenic-75a (dissolved)	0.20000	0.190	95.0	ug/L	50 - 150

\* Values outside of QC limits

## DETECTION LEVEL STANDARD

### EPA 200.8 UCT-KED

Laboratory: Analytical Resources, Inc.

SDG: 18C0296

Client: GeoEngineers

Project: Everett Smelter-Low Lands Area

Instrument ID: ICPMS2

Calibration: BC00051

Sequence: SGC0310

Lab Sample ID: SGC0310-CRL1

Analyte	True	Found	%R	Units	QC Limits
Arsenic-75a	0.20000	0.198	99.0	ug/L	50 - 150
Arsenic-75a (dissolved)	0.20000	0.198	99.0	ug/L	50 - 150

\* Values outside of QC limits



# HIGH-CONCENTRATION CALIBRATION VERIFICATION

## EPA 200.8 UCT-KED

**Laboratory:** Analytical Resources, Inc.

**SDG:** 18C0296

**Client:** GeoEngineers

**Project:** Everett Smelter-Low Lands Area

**Calibration:** BC00048

**Laboratory ID:** SGC0297-HCV1

**Sequence:** SGC0297

**Standard ID:** G002195

ANALYTE	EXPECTED (ug/L)	FOUND (ug/L)	% DRIFT	QC LIMIT
Arsenic-75a	200.00	200	0.008	10.00
Arsenic-75a (dissolved)	200.00	200	0.008	10.00

\* Values outside of QC limits



# HIGH-CONCENTRATION CALIBRATION VERIFICATION

## EPA 200.8 UCT-KED

**Laboratory:** Analytical Resources, Inc.

**SDG:** 18C0296

**Client:** GeoEngineers

**Project:** Everett Smelter-Low Lands Area

**Calibration:** BC00048

**Laboratory ID:** SGC0297-HCV2

**Sequence:** SGC0297

**Standard ID:** G001767

<b>ANALYTE</b>	<b>EXPECTED (ug/L)</b>	<b>FOUND (ug/L)</b>	<b>% DRIFT</b>	<b>QC LIMIT</b>
Arsenic-75a	300.00	292	-2.6	10.00
Arsenic-75a (dissolved)	300.00	292	-2.6	10.00

\* Values outside of QC limits



# HIGH-CONCENTRATION CALIBRATION VERIFICATION

## EPA 200.8 UCT-KED

**Laboratory:** Analytical Resources, Inc.

**SDG:** 18C0296

**Client:** GeoEngineers

**Project:** Everett Smelter-Low Lands Area

**Calibration:** BC00051

**Laboratory ID:** SGC0310-HCV1

**Sequence:** SGC0310

**Standard ID:** G002195

<b>ANALYTE</b>	<b>EXPECTED (ug/L)</b>	<b>FOUND (ug/L)</b>	<b>% DRIFT</b>	<b>QC LIMIT</b>
Arsenic-75a	200.00	197	-1.3	10.00
Arsenic-75a (dissolved)	200.00	197	-1.3	10.00

\* Values outside of QC limits



# HIGH-CONCENTRATION CALIBRATION VERIFICATION

## EPA 200.8 UCT-KED

**Laboratory:** Analytical Resources, Inc.

**SDG:** 18C0296

**Client:** GeoEngineers

**Project:** Everett Smelter-Low Lands Area

**Calibration:** BC00051

**Laboratory ID:** SGC0310-HCV2

**Sequence:** SGC0310

**Standard ID:** G001767

ANALYTE	EXPECTED (ug/L)	FOUND (ug/L)	% DRIFT	QC LIMIT
Arsenic-75a	300.00	304	1.4	10.00
Arsenic-75a (dissolved)	300.00	304	1.4	10.00

\* Values outside of QC limits

## HOLDING TIME SUMMARY

### Analysis: EPA 200.8 UCT-KED

Laboratory: Analytical Resources, Inc.

SDG: 18C0296

Client: GeoEngineers

Project: Everett Smelter-Low Lands Area

Sample Name	Date Collected	Date Received	Date Prepared	Days to Prep	Max Days to Prep	Date Analyzed	Days to Analysis	Max Days to Analysis	Q
CB11 18C0296-07	03/16/18 13:00	03/16/18 17:28	03/20/18 05:11	3	180	03/20/18 23:26	4	180	
CB11 18C0296-08	03/16/18 13:00	03/16/18 17:28	03/20/18 06:32	3	180	03/20/18 23:31	4	180	

\* Indicates hold time exceedance.



Analytical  
Resources,  
Incorporated

# METHOD DETECTION AND REPORTING LIMITS

## EPA 200.8 UCT-KED

Laboratory: Analytical Resources, Inc.

SDG: 18C0296

Client: GeoEngineers

Project: Everett Smelter-Low Lands Area

Matrix: Water

Instrument: ICPMS2

Analyte	MDL	RL	Units
Arsenic-75a	0.0220	0.200	ug/L
Arsenic-75a (dissolved)	0.0220	0.200	ug/L



**APPENDIX E**  
**SEPA Checklist and DNS for the Lowland Area**

WAC 197-11-970 Determination of nonsignificance (DNS).

DETERMINATION OF NONSIGNIFICANCE

Description of proposal: Cleanup actions will be conducted at the Everett Smelter Lowlands cleanup site. This site is being cleaned up under the authority to the Model Toxic Control Act, Ch 70.105D RCW, and the Model Toxic Control Action Cleanup Regulation, Chapter 173-340 WAC. The proposed cleanup action will excavate arsenic contaminated soil and debris, install a reactive barrier wall, install and maintain low permeability caps and decommission some underdrain piping. Monitoring will be completed to confirm remedy success.

Proponent: Washington State Department of Ecology

Location of proposal, including street address, if any: The site is on the peninsula of North Everett, east of East Marine View Drive and west of the Snohomish River.

Lead agency: Washington State Department of Ecology

The lead agency for this proposal has determined that it does not have a probable significant adverse impact on the environment. An environmental impact statement (EIS) is not required under RCW 43.21C.030 (2)(c). This decision was made after review of a completed environmental checklist and other information on file with the lead agency. This information is available to the public on request.

- There is no comment period for this DNS.
- This DNS is issued after using the optional DNS process in WAC 197-11-355. There is no further comment period on the DNS.
- This DNS is issued under WAC 197-11-340(2); the lead agency will not act on this proposal for 30 days from the date below. Comments must be submitted by September 20, 2016

Responsible official: Robert W. Warren

Position/title: Section Manager, Toxic Cleanup Program, Northwest Regional Office Phone: 425-649-5054

Address: Washington State Department of Ecology, 3190 160<sup>th</sup> Avenue SE, Bellevue, Washington, 98008

Date. 8-4-16 Signature [Handwritten Signature]

(OPTIONAL)

- You may appeal this determination to (name) \_\_\_\_\_  
at (location) \_\_\_\_\_  
no later than (date) \_\_\_\_\_  
by (method) .....

You should be prepared to make specific factual objections.  
Contact \_\_\_\_\_ to read or ask about the procedures for SEPA appeals.

- There is no agency appeal.

# **SEPA ENVIRONMENTAL CHECKLIST**

**UPDATED 2014**

## ***Purpose of checklist:***

Governmental agencies use this checklist to help determine whether the environmental impacts of your proposal are significant. This information is also helpful to determine if available avoidance, minimization or compensatory mitigation measures will address the probable significant impacts or if an environmental impact statement will be prepared to further analyze the proposal.

## ***Instructions for applicants:***

This environmental checklist asks you to describe some basic information about your proposal. Please answer each question accurately and carefully, to the best of your knowledge. You may need to consult with an agency specialist or private consultant for some questions. You may use "not applicable" or "does not apply" only when you can explain why it does not apply and not when the answer is unknown. You may also attach or incorporate by reference additional studies reports. Complete and accurate answers to these questions often avoid delays with the SEPA process as well as later in the decision-making process.

The checklist questions apply to all parts of your proposal, even if you plan to do them over a period of time or on different parcels of land. Attach any additional information that will help describe your proposal or its environmental effects. The agency to which you submit this checklist may ask you to explain your answers or provide additional information reasonably related to determining if there may be significant adverse impact.

## ***Instructions for Lead Agencies:***

Please adjust the format of this template as needed. Additional information may be necessary to evaluate the existing environment, all interrelated aspects of the proposal and an analysis of adverse impacts. The checklist is considered the first but not necessarily the only source of information needed to make an adequate threshold determination. Once a threshold determination is made, the lead agency is responsible for the completeness and accuracy of the checklist and other supporting documents.

## ***Use of checklist for nonproject proposals:***

For nonproject proposals (such as ordinances, regulations, plans and programs), complete the applicable parts of sections A and B plus the [SUPPLEMENTAL SHEET FOR NONPROJECT ACTIONS \(part D\)](#). Please completely answer all questions that apply and note that the words "project," "applicant," and "property or site" should be read as "proposal," "proponent," and "affected geographic area," respectively. The lead agency may exclude (for non-projects) questions in Part B - Environmental Elements –that do not contribute meaningfully to the analysis of the proposal.

## **A. Background**

### **1. Name of proposed project, if applicable:**

Everett Smelter Lowland Area Cleanup

### **2. Name of applicant:**

Washington State Department of Ecology,

**3. Address and phone number of applicant and contact person:**

Sandra Matthews Site Manager  
Toxics Cleanup Program, Northwest Regional Office  
WA Department of Ecology  
3190 160th Avenue SE  
Bellevue, WA 98008-5452  
425-649-7206  
425-649-7161-fax  
[smat461@ecy.wa.gov](mailto:smat461@ecy.wa.gov)

**4. Date checklist prepared:**

June 20, 2016

**5. Agency requesting checklist:**

Washington State Department of Ecology

**6. Proposed timing or schedule (including phasing, if applicable):**

Timing will be based on available funding. Initial work will include removal of source material.

**7. Do you have any plans for future additions, expansion, or further activity related to or connected with this proposal? If yes, explain.**

No

**8. List any environmental information you know about that has been prepared, or will be prepared, directly related to this proposal.**

The following reports have been prepared in support of this work:

Columbia Geotechnical Associates, Inc., 2015, "A Cultural Resource Assessment for the Everett Smelter Site Lowland Project, Everett, Washington," December 2015.

GeoEngineers, Inc., 2016, "Draft Cleanup Action Plan, Everett Smelter Lowland Area, Everett, Washington," For the Washington State Department of Ecology, June 30, 2016.

GeoEngineers, Inc., 2016, "Supplemental Remedial Investigation and Feasibility Study Report, Everett Smelter Lowland Area, Everett, Washington," For the Washington State Department of Ecology, GEI File No. 0504-068-01, March 31, 2016.

GeoEngineers, Inc., 2015, "Wetland Delineation Report, Everett Smelter Site – Lowland Area, Everett, Washington," For the Washington State Department of Ecology, GEI File No. 0504-068-02, December 21, 2015.

**9. Do you know whether applications are pending for governmental approvals of other proposals directly affecting the property covered by your proposal? If yes, explain.**

No

**10. List any government approvals or permits that will be needed for your proposal, if known.**

The anticipated cleanup action will need to comply with both substantive and procedural requirements of applicable laws and regulations:

- Federal Clean Water Act (CWA) Section 404 Permit, U.S. Army Corps of Engineers Nationwide Permit #38 anticipated
- Federal CWA Section 401 Water Quality Certification (WQC)
- Federal Coastal Zone Management Act Consistency
- Federal Endangered Species Act consultation
- Washington State Hydraulic Project Approval (HPA)
- Washington State Environmental Policy Act (SEPA) Determination
- Washington State Construction Stormwater General Permit (CSWGP)
- Washington State Well Drilling and Well Construction Regulations
- Washington State Department of Transportation (WSDOT)/City of Everett Right-of-Way Permit
- Washington State Dangerous Waste Regulations
- City of Everett Shoreline Permit
- City of Everett Grading Permit
- City of Everett Critical Areas Ordinance Permit
- City of Everett Discharge to Publicly Owned Treatment Works (POTW) Permit

**11. Give brief, complete description of your proposal, including the proposed uses and the size of the project and site. There are several questions later in this checklist that ask you to describe certain aspects of your proposal. You do not need to repeat those answers on this page. (Lead agencies may modify this form to include additional specific information on project description.)**

The Cleanup actions vary over the site as follows:

Area A1-Maintain area as a roadway, 1200 square yards (sy)- protect or temporarily reroute utilities, excavate and dispose of contaminated material (approximately 2,500 tons of hazardous material and 9,500 tons of non-hazardous material) at approved offsite facilities, perform verification soil sampling, import clean material to backfill and restore

disturbed surfaces. Complete a year of post action monitoring in existing and newly installed wells.

Area A2- Area to be used for industrial development, 1,700 square yards- excavate and dispose of approximately 6,000 tons of non-hazardous contaminated material offsite, perform verification soil sampling, import clean material to backfill and restore surfaces. Complete a year of post action monitoring in existing and newly installed wells.

Area B1-Road right of way and undeveloped land now to become a mixed commercial project. A low permeability cap to be installed over a 46,000 sy area. An environmental convenient will be filed by the property owner to maintain the integrity of the cap. Work will include clearing of 8,900 sy. An asphalt or concrete cap will be placed over a minimum of 1 foot of clean soil. Within this area, 1.2 acres of wetland will be capped and mitigated for in an alternate location either by wetland mitigation bank or constructed wetland. These wetland impacts will occur in three wetlands (Wetlands A, B, and C) that consist of one Category II and two Category III wetlands. Post-construction monitoring will be completed after the cap installation.

Area B2-Maintain area as a truck maintenance facility with the asphalt cap in place. Use institutional controls, an environmental convenient will be filed by the property owner to bar use of groundwater at the site and maintain the integrity of the cap. Construct a permeable reactive barrier (PRB) along the shoreline of Area B2 to intercept and treat shallow groundwater contamination. The specific design components of the PRB will be determined as part of the engineering design process. Post-construction monitoring will be completed after the remedy installation. Work will include clearing of 1,400 sy. Lining and repair of approximately 1,600 linear feet of storm pipe.

Area B3- Undeveloped area to be used for industrial development. Maintain 6 feet of clean soil, low permeability cap above impacted material. Use institutional controls (environmental convenient will be filed by the property owner) to bar use of groundwater at the site and maintain the cap. Post-construction monitoring will be completed after the remedy installation.

Area C1- Undeveloped area to be used for industrial development. Use institutional controls, an environmental convenient will be filed by the property owner to bar use of groundwater at the site and maintain a low permeability cap of 6 feet of clean soil, above impacted material. Post-construction monitoring will be completed after the remedy installation.

Area C2 and C3- Undeveloped area a vegetated steep slope. Use institutional controls to restrict access to soil. Install 6,000 lineal feet (LF) of fence to limit access to the area.

Area C4- Right of way area to remain. Install a plastic cap and a one foot soil cap over a 400 sy area. Use institutional controls to restrict access to soil.

Area C5- Undeveloped area to be used for industrial development. Use institutional controls to bar use of groundwater at the site and maintain a 6 feet cap of clean soil, low permeability cap above impacted material. An environmental convenient will be filed by the property owner to maintain the integrity of the cap. Abandon 1,000 lf of underdrain system. Post-construction monitoring will be completed after the remedy installation.

Area C6- PUD substation to remain. Monitored natural attenuation.

Area D1, D2 and D3- Outfalls. Use institutional controls to restrict use and sediment management. Post-construction monitoring will be completed after the remedy installation.

Area D4, - Outfall. Use institutional controls to restrict use and sediment management. Post-construction monitoring will be completed after the remedy installation.

**12. Location of the proposal. Give sufficient information for a person to understand the precise location of your proposed project, including a street address, if any, and section, township, and range, if known. If a proposal would occur over a range of area, provide the range or boundaries of the site(s). Provide a legal description, site plan, vicinity map, and topographic map, if reasonably available. While you should submit any plans required by the agency, you are not required to duplicate maps or detailed plans submitted with any permit applications related to this checklist.**

T29N R5E SECTIONs 8, 9, 16, 17

The site is on the peninsula of North Everett, east of East Marine View Drive and west of the Snohomish River. The site has multiple addresses. See Figure 1 for area locations.

## **B. ENVIRONMENTAL ELEMENTS**

### **1. Earth**

a. General description of the site  
(circle one): Flat, rolling, hilly, steep slopes, mountainous,  
other \_\_\_\_\_

The site is mostly flat, except for the steep slope on western boundary from East Marine View Drive to the east.

b. What is the steepest slope on the site (approximate percent slope)?

In the steepest areas (northern part of the western boundary) the slope is about 65%.

c. What general types of soils are found on the site (for example, clay, sand, gravel, peat, muck)? If you know the classification of agricultural soils, specify them and note any

agricultural land of long-term commercial significance and whether the proposal results in removing any of these soils.

In the steep slope areas of the site, the soil is mainly Alderwood-Everett gravelly sandy loams, 25 to 70 percent slopes; Alderwood-Urban land complex, 8 to 15 percent slopes; and Alderwood gravelly sandy loam, 15 to 30 percent slopes. The rest of the site is categorized as Urban land. No agricultural land is present on or adjacent to the site.

d. Are there surface indications or history of unstable soils in the immediate vicinity? If so, describe.

The southern portion of the site is not mapped on Ecology's Puget Sound landslide map. Areas C2 and C3 are mapped as unstable soils.

e. Describe the purpose, type, total area, and approximate quantities and total affected area of any filling, excavation, and grading proposed. Indicate source of fill.

Clean tested fill from a supplier will be used to backfill areas and cap areas.

A1- approximately 12,000 tons of contaminated soil will be excavated and disposed of in an area about 1,200 square yards.

A2- approximately 6,000 tons of contaminated soil will be excavated and disposed of in an area about 1,700 square yards.

B1- A low permeability cap will be installed over an approximately 46,000 square yard area. Part of the area is already capped and that cap will be maintained.

B2- A low permeability cap will be installed over an approximately 16,000 square yard area.

C4- A low permeability cap will be installed over an approximately 400 square yard area.

f. Could erosion occur as a result of clearing, construction, or use? If so, generally describe.

Yes, in the area along the western boundary of the site. This is why the remedy select for this area has minimal clearing. During removal construction activities there is an opportunity for erosion. Best management practices (BMPs) will be used during construction to minimize this potential. These include shoring, slope engineering, etc.

g. About what percent of the site will be covered with impervious surfaces after project construction (for example, asphalt or buildings)?

The site has approximately 20% impervious surface. Post remediation the site may be 35% impervious or more. Remediation of the site will increase the potential for development in this industrial area. Industrial development usually means paved surface with storm water management. Based on the zoning, cleanup of the site will encourage increased impervious surface at the site.

h. Proposed measures to reduce or control erosion, or other impacts to the earth, if any:



The goal is to minimize the potential for erosion by implementing BMPS, contingency planning and scheduling and staging of the work to minimize the potential for erosion. Dust control measures like watering dry soils prior and during excavation.

## 2. Air

- a. What types of emissions to the air would result from the proposal during construction, operation, and maintenance when the project is completed? If any, generally describe and give approximate quantities if known.

Depending on the weather, a minor amount of dust may occur when removing the soil and replacing with clean soil; however, strict dust control measures will be implemented to prevent the spread on contaminated dust. Emissions from construction equipment.

- b. Are there any off-site sources of emissions or odor that may affect your proposal? If so, generally describe.

No

- c. Proposed measures to reduce or control emissions or other impacts to air, if any:

The sites will be watered, if needed, prior and during construction to minimize dust.

## 3. Water

- a. Surface Water:

- 1) Is there any surface water body on or in the immediate vicinity of the site (including year-round and seasonal streams, saltwater, lakes, ponds, wetlands)? If yes, describe type and provide names. If appropriate, state what stream or river it flows into.

The eastern boundary of the Lowlands site is the Snohomish River, there are four wetlands (Wetlands A-D). Wetlands A-C are part of a drainage ditches that drain into the Snohomish River through an outfall. The site is located near to where the Snohomish River enters Puget Sound so estuarine conditions occur. Wetlands A, B, and C are located in Area B1 and Wetland D is located in Area C5. They are in an area of limited public access and not connected to other habitat.

- 2) Will the project require any work over, in, or adjacent to (within 200 feet) the described waters? If yes, please describe and attach available plans.

Yes, the working area B2 is within 200 feet of the Snohomish River shoreline. A permeable reactive barrier wall will be installed in the shallow aquifer. Within area B1, a total of 1.2 acres of wetland impacts will occur in Wetlands A, B, and C. These areas will be capped with a low permeability material.

- 3) Estimate the amount of fill and dredge material that would be placed in or removed from surface water or wetlands and indicate the area of the site that would be affected. Indicate the source of fill material.

Area B1- Approximately 46,000 square yards of fill will be placed in three wetlands (Wetlands A-C). The wetlands consist of palustrine emergent and palustrine scrub/shrub classes. A pond of about 26,000 square yards will be drained. A low permeability cap of clean, tested fill will be placed. Source of the fill is unidentified at this time.

- 4) Will the proposal require surface water withdrawals or diversions? Give general description, purpose, and approximate quantities if known.

No surface water will be withdrawn for use in the project. Area B1- Work to be done in dry season. Pond and wetland in the area will be drained to install the low permeability cap.

- 5) Does the proposal lie within a 100-year floodplain? If so, note location on the site plan.

Areas A2, B2, B3, C1, C5 and C6 lie in the 100year flood plain.

- 6) Does the proposal involve any discharges of waste materials to surface waters? If so, describe the type of waste and anticipated volume of discharge.

No

b. Ground Water:

- 1) Will groundwater be withdrawn from a well for drinking water or other purposes? If so, give a general description of the well, proposed uses and approximate quantities withdrawn from the well. Will water be discharged to groundwater? Give general description, purpose, and approximate quantities if known.

No

- 2) Describe waste material that will be discharged into the ground from septic tanks or other sources, if any (for example: Domestic sewage; industrial, containing the following chemicals . . . ; agricultural; etc.). Describe the general size of the system, the number of such systems, the number of houses to be served (if applicable), or the number of animals or humans the system(s) are expected to serve.

N/A

c. Water runoff (including storm water):

- 1) Describe the source of runoff (including storm water) and method of collection and disposal, if any (include quantities, if known). Where will this water flow? Will this water flow into other waters? If so, describe.

The total quantity of runoff is unknown. Run-off from E. Marine View Drives enters the site along its western boundary, down the steep slope and in pipes. Runoff from the roads over the Lowlands falls or is piped to the drainage conveyance system (ditches, wetland, pipes and ponds) Area B1 has a drainage ditch and a wetland pond then through an outfall on the Snohomish River. Area B2 has constructed storm water ponds at the north and south ends.

- 2) Could waste materials enter ground or surface waters? If so, generally describe.

No

- 3) Does the proposal alter or otherwise affect drainage patterns in the vicinity of the site? If so, describe.

Yes, in Area B1 – The remedy cap in this area will include the loss of about 1.2 acres of wetland and redirection of runoff in that area. The overall drainage pattern will remain the same.

- d. Proposed measures to reduce or control surface, ground, and runoff water, and drainage pattern impacts, if any:

None.

#### 4. Plants

- a. Check the types of vegetation found on the site:

- \_x\_ deciduous tree: alder, maple, aspen, other
- \_x\_ evergreen tree: fir, cedar, pine, other
- \_x\_ shrubs
- \_x\_ grass
- \_\_\_ pasture
- \_\_\_ crop or grain
- \_\_\_ Orchards, vineyards or other permanent crops.
- \_x\_ wet soil plants: cattail, buttercup, bullrush, skunk cabbage, other
- \_\_\_ water plants: water lily, eelgrass, milfoil, other
- \_\_\_ other types of vegetation

- b. What kind and amount of vegetation will be removed or altered?

Grass, blackberries, Scotts broom, ferns, morning glory, ivy, and maple saplings will be removed.

- c. List threatened and endangered species known to be on or near the site.

None known

- d. Proposed landscaping, use of native plants, or other measures to preserve or enhance vegetation on the site, if any:

Wetland mitigation for B1 will be on a not yet identified alternate site. Other areas will be hydroseeded with a native blend of seed.

- e. List all noxious weeds and invasive species known to be on or near the site.

Blackberry, English ivy, Scott's broom

#### 5. Animals

a. List any birds and other animals which have been observed on or near the site or are known to be on or near the site. Examples include:

birds: eagle, songbirds, osprey:  
mammals: coyote, beaver:  
fish: salmon, trout, shellfish,

b. List any threatened and endangered species known to be on or near the site.

There are no endangered species in the area of the site. The following species are threatened:

- Oregon Spotted Frog, *Rana pretiosa*,
- Marbled Murrelet *Brachyramphus marmoratus*
- Streaked Horned Lark *Eremophila alpestris strigata*
- Yellow-billed Cuckoo *Coccyzus americanus*
- Bull Trout *Salvelinus confluentus*

The North American Wolverine *Gulo luscus* is proposed for threatened

The site is part of critical habitat for Bull Trout [*Salvelinus confluentus*], and Chinook Salmon [*Oncorhynchus (=Salmo) tshawytscha*]

c. Is the site part of a migration route? If so, explain.

Yes. The site is in the migratory route of the following birds:

- Bald Eagle *Haliaeetus leucocephalus*
- Black Swift *Cypseloides niger*
- Calliope Hummingbird *Stellula calliope*
- Caspian Tern *Hydroprogne caspia*
- Cassin's Finch *Carpodacus cassinii*
- Fox Sparrow *Passerella iliaca*
- Marbled Godwit *Limosa fedoa*
- Olive-sided Flycatcher *Contopus cooperi*
- Peregrine Falcon *Falco peregrinus*
- Purple Finch *Carpodacus purpureus*
- Rufous Hummingbird *Selasphorus rufus*
- Short-eared Owl *Asio flammeus*
- Western Grebe *Aechmophorus occidentalis*
- Willow Flycatcher *Empidonax traillii*

d. Proposed measures to preserve or enhance wildlife, if any:

The remediation of the site will leave a healthier environment for humans and wildlife.

e. List any invasive animal species known to be on or near the site.

None known

## 6. Energy and natural resources

- a. What kinds of energy (electric, natural gas, oil, wood stove, solar) will be used to meet the completed project's energy needs? Describe whether it will be used for heating, manufacturing, etc.

During remediation activities, diesel fuel will be used to run machines and vehicles and electric pumps. No power needs are required after work is complete.

- b. Would your project affect the potential use of solar energy by adjacent properties?  
If so, generally describe.

No

- c. What kinds of energy conservation features are included in the plans of this proposal?  
List other proposed measures to reduce or control energy impacts, if any:

Agency policy requires an evaluation of green construction practices for construction projects. Items includes use of alternative fuels, scheduling to conserve trips and recycling.

## 7. Environmental health

- a. Are there any environmental health hazards, including exposure to toxic chemicals, risk of fire and explosion, spill, or hazardous waste, that could occur as a result of this proposal?  
If so, describe.

The objective of the project is to remove contaminated material from the project site, to reduce the risk to human health and the environment. When working with machinery, there is always a potential of a release due to equipment failure. Part of the work includes a spill prevention plan with cleanup procedures.

- 1) Describe any known or possible contamination at the site from present or past uses.

Contaminates known to have been present in the Lowlands area include metals (arsenic, lead, cadmium, mercury, chromium), petroleum, pentachlorophenol, carcinogenic polyaromatic hydrocarbons, and polychlorinated biphenyls, creosote, and chromated copper arsenate. Most of this past contamination has been addressed. Cleanup of this area is ongoing. This project is focus on the cleanup of metals (arsenic, lead and mercury)

- 2) Describe existing hazardous chemicals/conditions that might affect project development and design. This includes underground hazardous liquid and gas transmission pipelines located within the project area and in the vicinity.

There is a natural gas pipeline along the west side of the area in the south and crosses the site to the Snohomish River south of the SR529 overpass. Other active utilities are mainly below roadways.

- 3) Describe any toxic or hazardous chemicals that might be stored, used, or produced during the project's development or construction, or at any time during the operating life of the project.

Contractors may store fuel or lubricants for machinery onsite during remediation activities.

- 4) Describe special emergency services that might be required.

No special procedures will be required

- 5) Proposed measures to reduce or control environmental health hazards, if any:

As part of the work, a spill prevention and countermeasures plan will be developed with emergency and cleanup procedures.

#### **b. Noise**

- 1) What types of noise exist in the area which may affect your project (for example: traffic, equipment, operation, other)?

There is a high traffic state route over the site. There are rail lines in the area. These rail lines adjacent to some of the areas being cleaned up.

- 2) What types and levels of noise would be created by or associated with the project on a short-term or a long-term basis (for example: traffic, construction, operation, other)? Indicate what hours noise would come from the site.

The cleanup work will create additional truck traffic and construction noise (excavators, dump trucks, backhoes) during the day hours (7am to 4 pm).

- 3) Proposed measures to reduce or control noise impacts, if any:

Work will have restricted hours to assist the noise and traffic flow. Specifics for each area will be described in the required project traffic control plan.

#### **8. Land and shoreline use**

- a. What is the current use of the site and adjacent properties? Will the proposal affect current land uses on nearby or adjacent properties? If so, describe.

The site is mainly industrial, light manufacturing. Some sections are undeveloped. A few undeveloped parcels are zoned commercial. The project will not affect the land use.

- b. Has the project site been used as working farmlands or working forest lands? If so, describe. How much agricultural or forest land of long-term commercial significance will be converted to other uses as a result of the proposal, if any? If resource lands have not been designated, how many acres in farmland or forest land tax status will be converted to nonfarm or nonforest use?

No

- 1) Will the proposal affect or be affected by surrounding working farm or forest land normal business operations, such as oversized equipment access, the application of pesticides, tilling, and harvesting? If so, how:

The surrounding area is residential and mixed use residential/commercial space with the river on one side. No farm land and it will not affect the normal business.

c. Describe any structures on the site.

Area B2- Large over 30,000 square foot building used for truck repair, sales, service.

Area C5 is adjacent to a mobile trailer office for the transfer station.

There are no structures on the other areas.

d. Will any structures be demolished? If so, what?

No

e. What is the current zoning classification of the site?

The site is zoned M-2-Heavy Manufacturing, except 3 parcels zoned as C-2 –Heavy Commercial-Light Industrial

f. What is the current comprehensive plan designation of the site?

The January 2014 City of Everett Growth Management Comprehensive Plan Land Use Map has the site zoned as 5.1- Heavy Industrial, and the three above referenced parcels zoned as 5.3-Light Industrial.

g. If applicable, what is the current shoreline master program designation of the site?

The current shoreline master program designation is Urban Industrial. The Urban Industrial designation is to provide areas for high intensity water-dependent and water-related industrial uses along navigation channels accessible to shallow draft vessels, and to ensure optimum use of shorelines that are presently industrial in nature while protecting and restoring ecological functions.

h. Has any part of the site been classified as a critical area by the city or county? If so, specify.

No

i. Approximately how many people would reside or work in the completed project?

Unknown

j. Approximately how many people would the completed project displace?

None

k. Proposed measures to avoid or reduce displacement impacts, if any:

N/A

l. Proposed measures to ensure the proposal is compatible with existing and projected land uses and plans, if any:

N/A

m. Proposed measures to ensure the proposal is compatible with nearby agricultural and forest lands of long-term commercial significance, if any:

N/A

## 9. Housing

a. Approximately how many units would be provided, if any? Indicate whether high, middle, or low-income housing.

None

b. Approximately how many units, if any, would be eliminated? Indicate whether high, middle, or low-income housing.

N/A

c. Proposed measures to reduce or control housing impacts, if any:

N/A

## 10. Aesthetics

a. What is the tallest height of any proposed structure(s), not including antennas; what is the principal exterior building material(s) proposed?

None proposed

b. What views in the immediate vicinity would be altered or obstructed?

No

c. Proposed measures to reduce or control aesthetic impacts, if any:



N/A

### 11. Light and glare

- a. What type of light or glare will the proposal produce? What time of day would it mainly occur?

None. The work will occur on weekdays between 7 am and 4pm.

- b. Could light or glare from the finished project be a safety hazard or interfere with views?

No.

- c. What existing off-site sources of light or glare may affect your proposal?

None known.

- d. Proposed measures to reduce or control light and glare impacts, if any:

N/A

### 12. Recreation

- a. What designated and informal recreational opportunities are in the immediate vicinity?

A golf course is within 1000 feet of the area, Legion Memorial Golf Course. A walking trail along the east side of B2. The Snohomish River along the eastern boundary of the Lowlands area.

- b. Would the proposed project displace any existing recreational uses? If so, describe.

No. There may be a temporary closure of the walking path during installation of the remedy at B2.

- c. Proposed measures to reduce or control impacts on recreation, including recreation opportunities to be provided by the project or applicant, if any:

The path has limited access. It is a segment of a system that hasn't been completed and is not attached to any other segment. There are minimal impacts for the short term closure of this path.

### 13. Historic and cultural preservation

- a. Are there any buildings, structures, or sites, located on or near the site that are over 45 years old listed in or eligible for listing in national, state, or local preservation registers located on or near the site? If so, specifically describe.

Yes. There is one site, 45SN358 (Snohomish River Bridge) referenced by Craig Holstine & Oscar R. Bob George is considered eligible for listing in the National Register of Historic Places (NRHP).

Completed in 1954 the bridge is considered to be an exceptional example of a 1950s-era bridge built in Washington.

- b. Are there any landmarks, features, or other evidence of Indian or historic use or occupation? This may include human burials or old cemeteries. Are there any material evidence, artifacts, or areas of cultural importance on or near the site? Please list any professional studies conducted at the site to identify such resources.

No.

- c. Describe the methods used to assess the potential impacts to cultural and historic resources on or near the project site. Examples include consultation with tribes and the department of archeology and historic preservation, archaeological surveys, historic maps, GIS data, etc.

A Cultural Resource Assessment was completed for the Lowlands site. Nine sites were identified in the vicinity of the site. None of the nine will be affected by the project.

- d. Proposed measures to avoid, minimize, or compensate for loss, changes to, and disturbance to resources. Please include plans for the above and any permits that may be required.

All work will be completed with an inadvertent discovery plan. If something that may be historically significant is discovered, work will cease and an evaluation will be conducted.

#### 14. **Transportation**

- a. Identify public streets and highways serving the site or affected geographic area and describe proposed access to the existing street system. Show on site plans, if any.

East Marine View Drive and the northbound on-ramp to SR 529 will be impacted during the remediation work at A1. Also the access to Riverside Business Park and Riverside Road. A traffic revision plan will be designed communicate detours and alternate routes. Because of the importance of the intersection and the limited alternatives route, work will be scheduled and performed with a partial closure of the intersection.

- b. Is the site or affected geographic area currently served by public transit? If so, generally describe. If not, what is the approximate distance to the nearest transit stop?

No. The closest transit stop is the corner of 7<sup>th</sup> and East Marine View Drive.

- c. How many additional parking spaces would the completed project or non-project proposal have? How many would the project or proposal eliminate?

None, no spots added or deleted

- d. Will the proposal require any new or improvements to existing roads, streets, pedestrian, bicycle or state transportation facilities, not including driveways? If so, generally describe (indicate whether public or private).

No, the roads that will be part of the active work will be replaced as they are. In A1, E. Marine Drive will be repaved. In area B2, if the walking path is disturbed it will be replaced. The design is not complete so the exact location and design of the PRB is not complete.

e. Will the project or proposal use (or occur in the immediate vicinity of) water, rail, or air transportation? If so, generally describe.

No

f. How many vehicular trips per day would be generated by the completed project or proposal? If known, indicate when peak volumes would occur and what percentage of the volume would be trucks (such as commercial and nonpassenger vehicles). What data or transportation models were used to make these estimates?

Unknown. Remediation activities will unencumber the site for development. A large portion of the traffic may be commercial because the area is zoned for manufacturing industrial purposes.

g. Will the proposal interfere with, affect or be affected by the movement of agricultural and forest products on roads or streets in the area? If so, generally describe.

No

h. Proposed measures to reduce or control transportation impacts, if any:

Scheduling and partial closure methods will be used to reduce transportation impacts.

### 15. Public services

a. Would the project result in an increased need for public services (for example: fire protection, police protection, public transit, health care, schools, other)? If so, generally describe.

No

b. Proposed measures to reduce or control direct impacts on public services, if any.

No

### 16. Utilities

a. Circle utilities currently available at the site:

Electricity, natural gas, water, refuse service, telephone, sanitary sewer, septic system, other \_\_\_\_\_

The site has access to electricity, natural gas, water, refuse service, telephone, sanitary sewer, and fiber optic.

- b. Describe the utilities that are proposed for the project, the utility providing the service, and the general construction activities on the site or in the immediate vicinity which might be needed.

No utilities are proposed for this project. The existing utilities will remain. And no additional will be installed for this project.

### C. Signature

The above answers are true and complete to the best of my knowledge. I understand that the lead agency is relying on them to make its decision.

Signature: \_\_\_\_\_

Name of signee \_\_Sandra Matthews\_\_\_\_\_

Position and Agency/Organization \_\_Site Manger TCP-NWRO Ecology\_\_\_\_\_

Date Submitted: \_\_\_\_\_

### D. supplemental sheet for nonproject actions

(IT IS NOT NECESSARY to use this sheet for project actions)

Because these questions are very general, it may be helpful to read them in conjunction with the list of the elements of the environment.

When answering these questions, be aware of the extent the proposal, or the types of activities likely to result from the proposal, would affect the item at a greater intensity or at a faster rate than if the proposal were not implemented. Respond briefly and in general terms.

1. How would the proposal be likely to increase discharge to water; emissions to air; production, storage, or release of toxic or hazardous substances; or production of noise?

Proposed measures to avoid or reduce such increases are:

2. How would the proposal be likely to affect plants, animals, fish, or marine life?

Proposed measures to protect or conserve plants, animals, fish, or marine life are:

3. How would the proposal be likely to deplete energy or natural resources?

Proposed measures to protect or conserve energy and natural resources are:

4. How would the proposal be likely to use or affect environmentally sensitive areas or areas designated (or eligible or under study) for governmental protection; such as parks, wilderness, wild and scenic rivers, threatened or endangered species habitat, historic or cultural sites, wetlands, floodplains, or prime farmlands?

Proposed measures to protect such resources or to avoid or reduce impacts are:

5. How would the proposal be likely to affect land and shoreline use, including whether it would allow or encourage land or shoreline uses incompatible with existing plans?

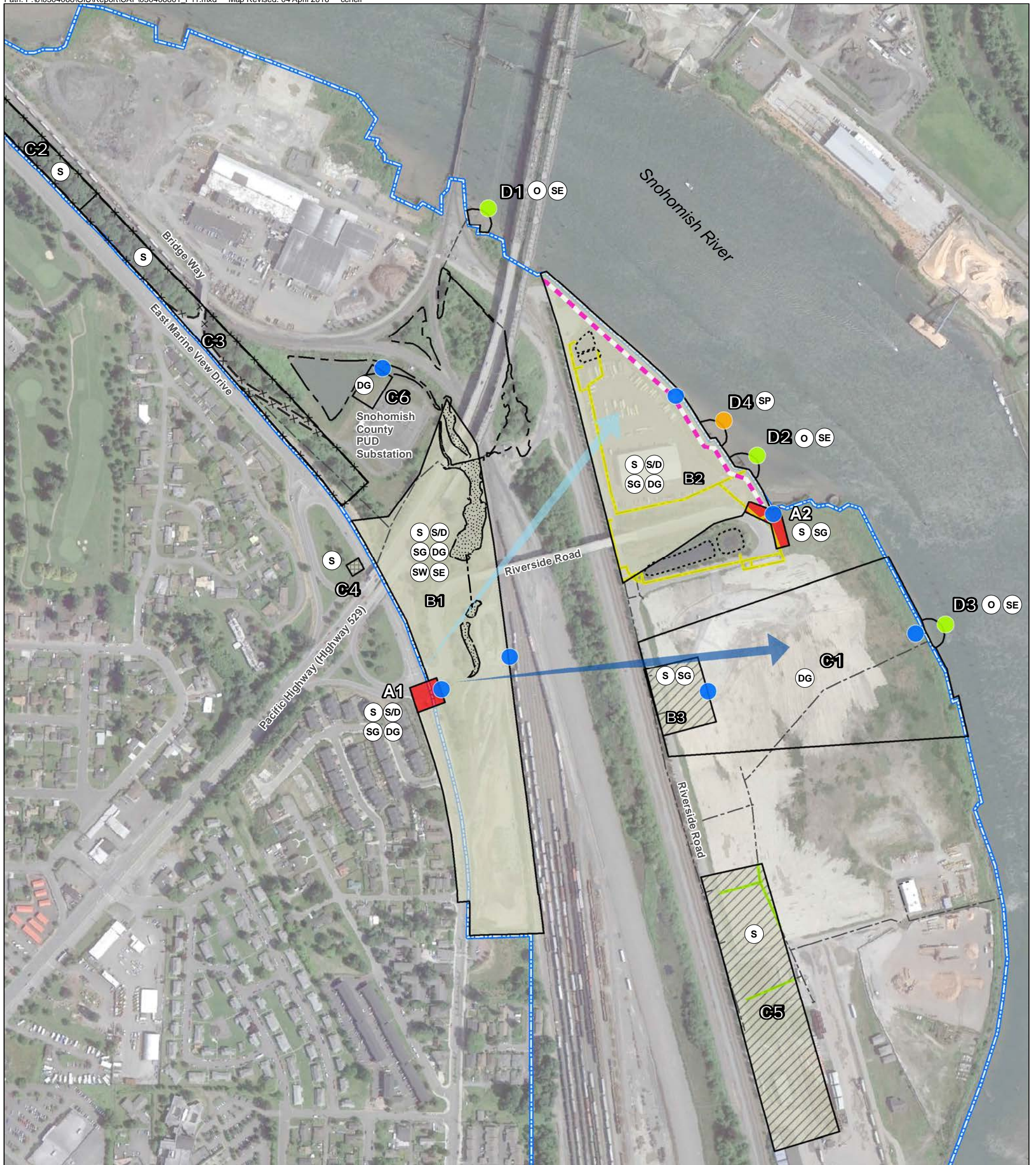
Proposed measures to avoid or reduce shoreline and land use impacts are:

6. How would the proposal be likely to increase demands on transportation or public services and utilities?

Proposed measures to reduce or respond to such demand(s) are:

7. Identify, if possible, whether the proposal may conflict with local, state, or federal laws or requirements for the protection of the environment.





<b>LEGEND</b>		<b>Proposed Remedial Actions</b>			
	Everett Smelter - Lowland Area		Perform excavation and off-site disposal of contaminated media		Install fence
	Remedial Action Area and its Identification		Maintain existing clean soil cover and asphalt/concrete surfaces of streets, sidewalks and/or parking lots. Construct a low-permeability cap with drainage controls (asphalt/concrete cap and/or a minimum of 1-foot of soil cover with underlying plastic or similar) over the portions that contain contaminated media <sup>1</sup> and currently do not have this kind of protective capping/cover.		Install permeable reactive barrier (PRB) to treat shallow contaminated groundwater
	Surface Water Features (Wetland, Pond or Ditch)		Maintain the existing 6-feet of clean soil cover.		Cut and plug (or backfill with grout slurry) underdrains that are potentially responsible for transport of contaminants from Area C5 to the outfall at Area D3
	Stormwater Basin		Construct a low-permeability cap with drainage controls consisting a minimum of 1-foot of soil cover with underlying plastic or similar.		Repair, install linings or replace stormwater pipes that may allow infiltration and are potentially responsible for transport of contaminants from Area B2 to the outfall at Area D2
	Stormwater Pipe, Culvert and/or Under Drain		Dewater, treat (if necessary) and dispose surface water that discharges as outfall-water at Area D1		Monitor groundwater conditions at/downgradient of the area to evaluate performance of the remedies/natural attenuation processes/compliance with the cleanup standards.
	Shallow Groundwater Flow Direction				Monitor outfall-water and sediment conditions at the area to evaluate performance of the remedies/natural recovery processes/compliance with the cleanup standards.
	Deep Groundwater Flow Direction				Monitor seep-water conditions at the area to evaluate performance of the remedies/natural attenuation processes/compliance with the cleanup standards.
<b>Contaminated Media<sup>1</sup></b>					
	Soil		Surface Water		
	Slag or Debris		Seep Water		
	Shallow Groundwater		Outfall Water		
	Deep Groundwater		Sediment		

**Summary of Proposed Cleanup Actions**

Everett Smelter Site, Lowland Area  
Everett, Washington

**GEOENGINEERS** **Figure 1**

Notes:  
 1. Locations and depths of contamination at the Lowland Area are presented in the RI/FS Report (GeoEngineers, 2015a). 2. The locations of all features shown are approximate.  
 3. This drawing is for information purposes. It is intended to assist in showing features discussed in an attached document. GeoEngineers, Inc. cannot guarantee the accuracy and content of electronic files. The master file is stored by GeoEngineers, Inc. and will serve as the official record of this communication.  
 Data Source: GoogleEarth Pro, 2013. Snohomish County GIS, 2012.



**APPENDIX F**  
**Cultural Resources Assessment**





A CULTURAL RESOURCE ASSESSMENT FOR THE  
EVERETT SMELTER SITE LOWLAND PROJECT,  
EVERETT, WASHINGTON

**Prepared for  
Geoengineers**

December 18, 2015

**Prepared by  
Columbia Geotechnical Associates Inc.  
Brett R. Lenz, PhD, LEG**

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## Introduction

This Cultural Resource Assessment Report is prepared for the Everett Smelter Site Lowland Area (Lowland Area) located in northeast Everett, Washington (Figure 1). The Everett Smelter Site is comprised of two areas: the Upland Area and the Lowland Area. The Lowland Area is generally situated between Marine View Drive and the Snohomish River and is located east of the Everett Smelter Upland Area where a former lead smelter and an associated arsenic extraction facility operated from approximately 1892 to 1912 (Hydrometrics, 1995). The general area that was occupied by the former smelter is shown in relation to the Upland and Lowland areas in Figure 2.

The Everett Smelter Site is being cleaned up by Washington State Department of Ecology (DOE). Remedial actions proposed for the Lowland Area are detailed in the Draft Supplemental Remedial Investigation and Feasibility Study (RI/FS) Report (GeoEngineers, 2015). This report has been prepared to identify cultural resources that may be present within the remedial action areas of the Lowland Area and evaluate the potential effects of proposed remedial actions on cultural resources.

### Lowland Area Contamination

Operations at the former smelter facility resulted in contamination of the Lowland Area with metals. Smelter-related contaminant sources can be generally grouped into three categories:

- Slag that was poured from the Upland Area down a slope east of the smelter onto the Lowland Area during smelter operations;
- Fallout from smelter “smokestack” (stack) emissions; and
- Residual contaminated materials that were left in the ground at the time the smelter was demolished.

Smelter-related contamination was largely undocumented until its discovery in 1990 (SAIC, 2010). The list of metals that has been investigated related to former smelter operations includes arsenic, lead, cadmium, mercury, thallium, antimony, zinc and copper. Lead and arsenic are the primary contaminants of concern resulting from smelter operations.

### Nature of Undertaking and Project Area of Potential Effect

Some of the proposed remedial actions in the Lowland Area will be covered under a JARPA permit and a US Army Corps permit is anticipated; these remedial actions meet the definition of an “undertaking” for the purposes of Section 106 of the National Historic Preservation Act (NHPA) (16USC§470f). Section 106 of the NHPA is a consultation process that requires state and federal agencies to take into account the effects of their actions on historic properties. Historic properties are archaeological sites, traditional cultural properties and buildings and structures that are listed in or eligible for the National Register of Historic Places (NRHP). The Section 106 regulations are found in 36 CFR Part 800.

According to Section 106 of the NHPA, a project’s Area of Potential Effect (APE) is the “geographic area within which (the) undertaking may cause changes in the character or use of historic properties” (36CFR 8002(c)). The cultural resources survey was completed to identify potential cultural resources and support remedial actions that are proposed for the Lowland Area. Figure 1 is a USGS map showing

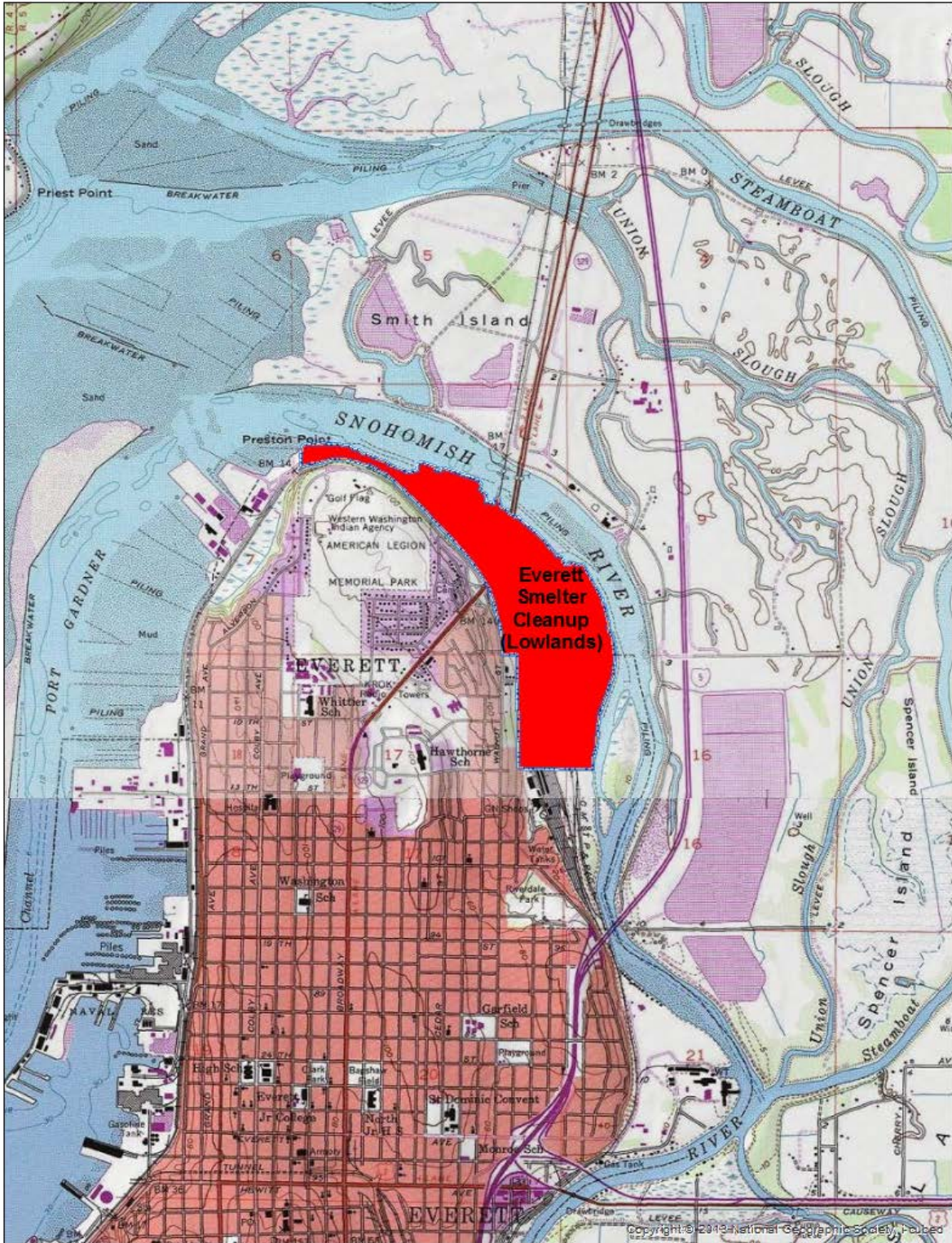


Figure 1. USGS Topographic Map showing location of the APE (i.e. Lowland Area).

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the location of the APE (i.e. Lowland Area) within Sections 8, 9, 16 and 17, Township 29N, and Range 5 E.

The geographic extent of the Everett Smelter Site Lowland Area shown in Figures 1 and 2 was identified as part of work performed under a Community Protection Measures program and the boundaries of the Upland and Lowland areas were identified in Exhibit A of the Enforcement Order for the “Everett Smelter” Site (DE 97TC-N119; Ecology, March 14, 1997). The 1997 Enforcement Order and Everett Smelter Site Final Cleanup Action Plan (FCAP) for the Upland Area (Ecology, 1999) describe that separate cleanup actions would be implemented for the Upland and Lowland areas. The FCAP also states that cleanup of the Lowland Area may require additional remedial actions in the Upland Area to address contamination in the Lowland Area (ex. groundwater contamination). The final boundary of the Lowland Area is based on the extent of contamination that is determined to be the result of impacts from the smelter.

The boundary between the Upland and Lowland Areas is generally Marine View Drive. The Lowland Area includes the relatively steep slope that extends from adjacent to and east of Marine View Drive, down to the generally flat area that extends from the base of the slope to the Snohomish River. Before the early 1900s, the low, generally flat area comprising the majority of the Lowland Area was a floodplain of the Snohomish River. Approximately 5 to 15 feet of fill has been placed over the area from the early 1900s to present (2014). Most of the fill placed in the Lowland Area was dredged from the Snohomish River (ASARCO, 2000).

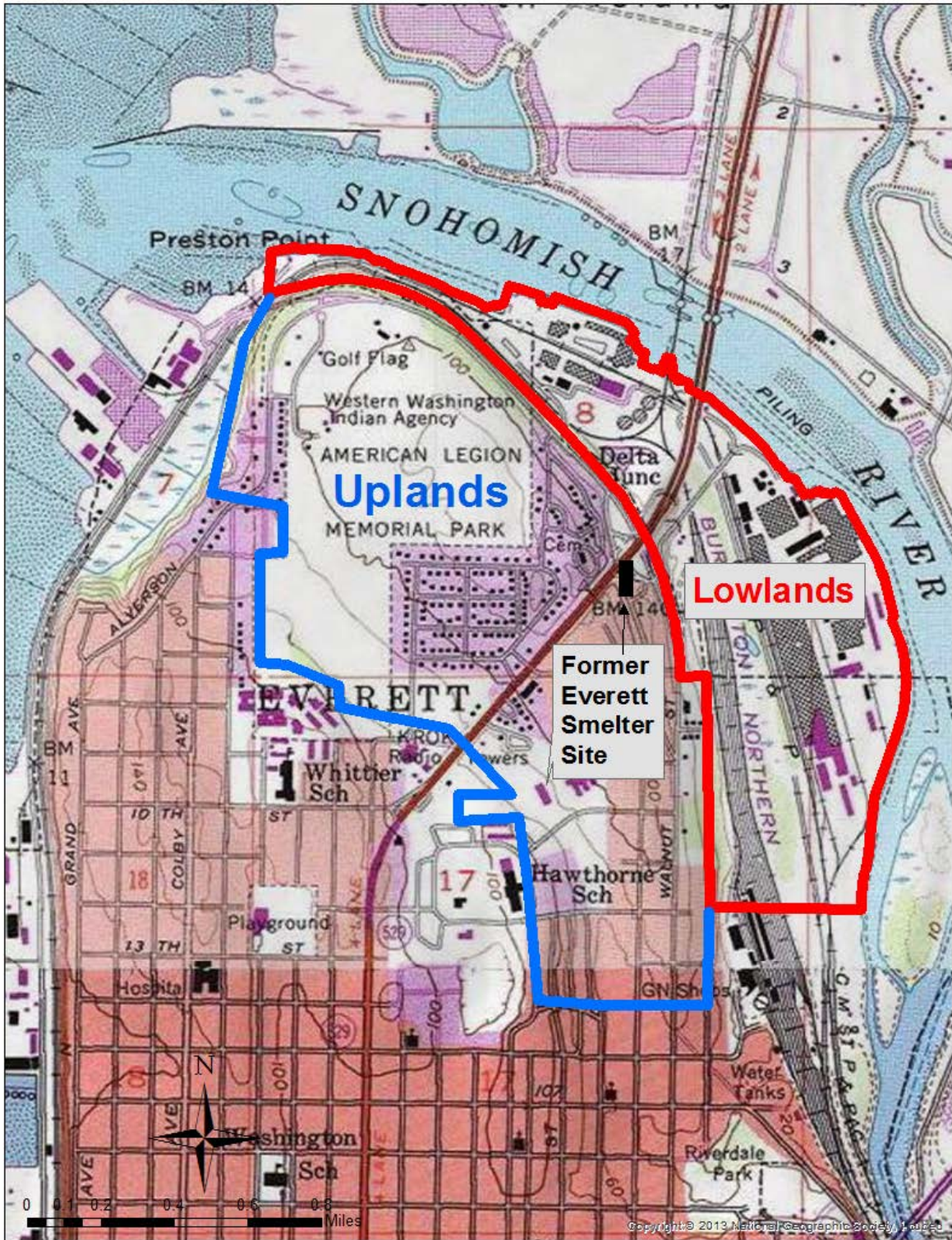
#### Remedial Action Areas within the Area of Potential Effect

Four broad remedial action area groups covering fifteen areas are defined under the preferred remedial alternative for the Lowland Area (Figure 3; GeoEngineers, 2015). Table 1 identifies the depth to native soil in each of the areas and therefore, it also represents the depth to potential buried prehistoric cultural resources. Along with specificities of the proposed treatment, we used this depth data to tailor the extent of our survey work; similarly, our recommendations were based in part on this data.

The areas are named under primary headings of A-D. Remedial action area group A in total comprises 0.6 acres and is divided into two areas, A1 and A2. It is proposed that both of these areas will be excavated and contaminated materials will be disposed off-site. In addition, groundwater conditions will be monitored to evaluate performance of the remedies, natural attenuation processes and compliance with the cleanup standards.

Remedial action area group B comprises 27.5 acres and is divided into three areas, B1, B2 and B3. Remedial actions proposed for these areas involve maintaining the existing pavement and constructing (where necessary) a cap over the portions that contain contaminated material. Cap types include an asphalt/concrete cap, a minimum of 1 foot of clean soil cover with underlying layer of plastic (or similar) or a minimum of 6-feet of clean soil cover. Remedial actions within area B1 also includes dewatering, treating (if necessary), and disposing surface water that discharges as outfall-water at area





**Figure 2.** Map showing the entire cleanup area, including the APE (labeled as Lowlands).

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D1. Remedial actions within area B2 also includes repairing, lining or replacing storm water pipes that may allow infiltration and are potentially responsible for transport of contaminants from area B2 to the outfall at area D2. Groundwater conditions will be monitored to evaluate performance of the remedies, natural attenuation processes and compliance with the cleanup standards.

Remedial action area group C encompasses 29.14 acres and is divided into 6 areas (C1-C6). Remedial actions proposed for these areas primarily involve maintaining the existing pavement/soil cover with the exception of area C4. Remedial action within area C4 consist of constructing a cap. Cap types include an asphalt/concrete cap, a minimum of 1 foot of clean soil cover with underlying layer of plastic (or similar) or a minimum of 6-feet of clean soil cover. Remedial actions within area C2 and C3 also includes constructing a perimeter fence. Remedial actions within area C5 also includes cutting and plugging underdrains that are potentially responsible for transport of contaminants from area C5 to the outfall at area D3. Groundwater conditions will be monitored to evaluate performance of the remedies, natural attenuation processes and compliance with the cleanup standards.

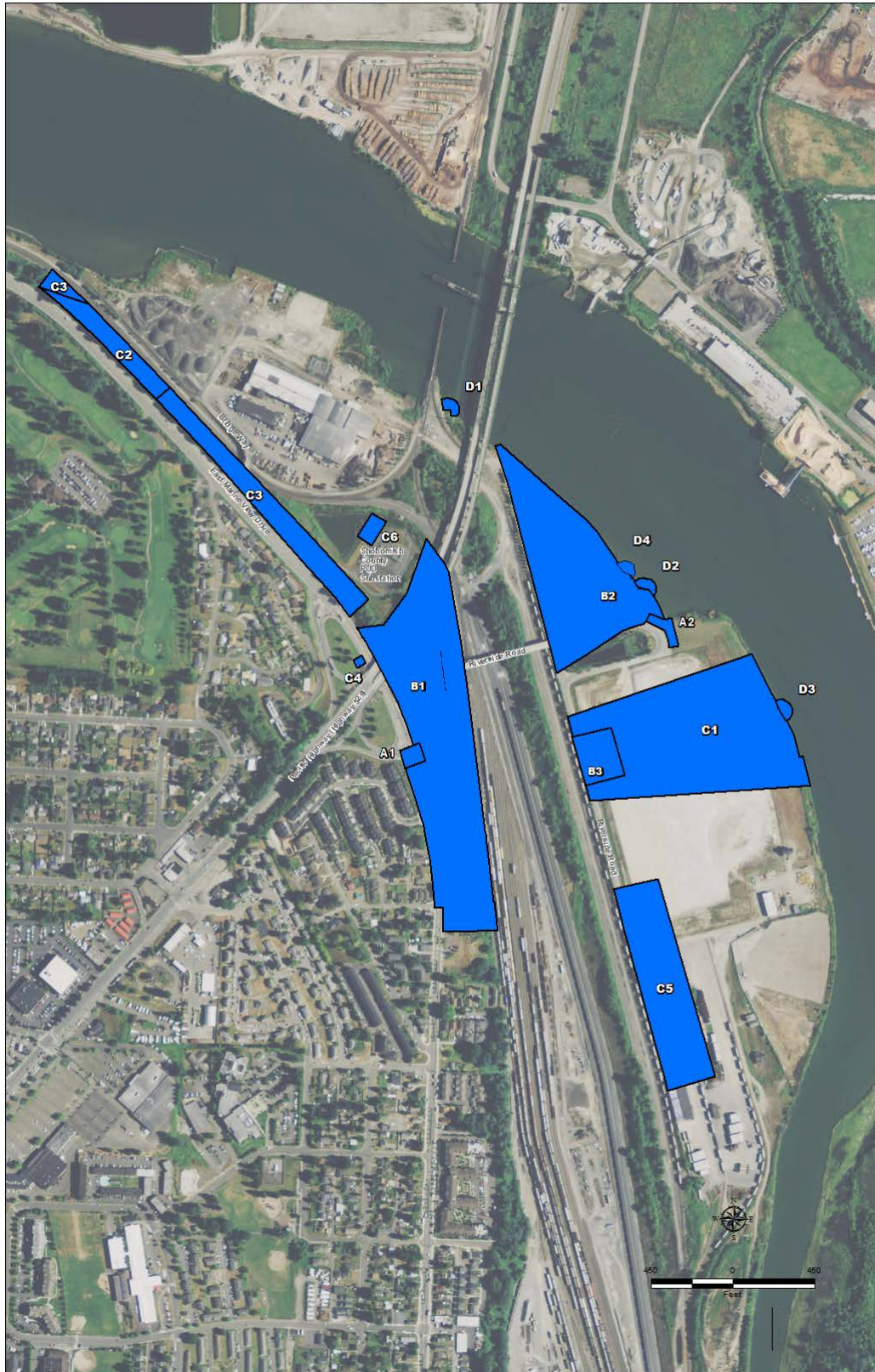
Remedial action area group D is divided into four areas (D1-D4) which are located along the shoreline of the Snohomish River. Remedial actions proposed for these areas include monitoring outfall-water and seep water (as applicable) and sediment conditions to evaluate performance of the remedies, natural attenuation processes and compliance with the cleanup standards.

#### *National Register of Historic Places Criteria*

Historic properties are any prehistoric or historic districts, sites, buildings, structures, or objects included in, or eligible for inclusion in, the NRHP. Historic properties may be significant for their importance in history, archaeology, engineering and culture. Archaeological sites include both prehistoric and historic-period sites 50 years of age or older. Cultural resources may include Traditional Cultural Properties (TCPs) associated with the cultural practices or beliefs of a living community that are rooted in that community's history and are important in maintaining the continuing cultural identity of the community. The following NRHP criteria serve as the basis for evaluating a property's eligibility for listing at the national, state, and local levels. The quality of significance in American history, architecture, archaeology, and culture is possible in districts, sites, buildings, structures, and objects that possess integrity of location, design, setting, material, workmanship, feeling, and association, and:

- A. that are associated with events that have made a significant contribution to the broad patterns of our history; or
- B. that are associated with the lives of persons significant in our past; or
- C. that embody the distinctive characteristics of type, period, or method of construction or that represent the work of a master, or that possess high artistic values, or that represent a significant and distinguishable entity whose components may lack individual distinction; or
- D. that has yielded, or may be likely to yield, information important in prehistory or history (36CFR360.4).





**Figure 3.** Location of Remedial Action Area Groups.



**Table 1.** Depth to native soil for each of the remedial action areas within APE.

Area ID	Area Type	Area (Acre)	Approximate Depth to Native Soil (below ground surface: feet)
A1	Land	0.3	>10 feet
A2	Land	0.3	>10 feet
B1	Land	16.75	>10 feet
B2	Land	10.5	>10 feet
B3	Land	1.5	>10 feet
C1	Land	15	>10 feet
C2	Land	2	0 feet
C3	Land	4.75	0 feet
C4	Land	0.06	>10 feet
C5	Land	7	>10 feet
C6	Land	0.33	>10 feet
D1	Marine/Shoreline	0.15	At shoreline
D2	Marine/Shoreline	0.15	At shoreline
D3	Marine/Shoreline	0.15	At shoreline
D4	Marine/Shoreline	0.15	At shoreline

### *City of Everett Preservation Program*

The City of Everett has actively worked to use historic preservation as a method of retaining the economic vitality of this historical community. The Everett Historical Commission became a Certified Local Government in 1988 and has consistently worked to inventory historic resources in the city. In 1989 the Everett Historical Commission completed a historic property inventory of selected buildings on Hewitt Avenue. In 2011 the Hewitt Avenue NRHP Historic District was established and includes 44 buildings and a BNSF railroad tunnel. Similarly, the Riverside Historic Overlay was established and is located just to the south of the APE.

On March 23, 2011, the Everett City Council adopted the Downtown Historic Preservation Plan. The plan addresses historic preservation opportunities for the city's commercial core. The City's Comprehensive Plan and the Everett Downtown Plan both outline a vision that includes retaining downtown historical character through economic diversification, preservation, and rehabilitation (City of Everett 2011). Many of the homes in the Everett smelter upland area are likely eligible for the NRHP; no such historic homes are located within the APE (i.e. Lowland Area).

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## Background Research

Researchers conducted archaeological, ethnographic and historical literature review of local and regional source material at the Everett Museum of History, Everett Public Library, and online sources. Background record searches included a review of the historic and archaeological site files on the Department of Archaeology and Historic Preservation's WISAARD database, a review of early General Land Office maps, county atlases, early plat maps, historical aerial photographs and published local histories.

Archaeological investigation of the properties included an overview of the APE based on DAHP archaeological records and consideration of prior archaeological research in the vicinity of the APE. Project researchers initiated background investigations in October, 2015. Geoengineers provided an overview of the proposed Project, engineering drawings and other project details. Additional historical information about the APE was obtained from the Everett Public Library - Northwest History Room (EPL). Researchers reviewed the historical county atlases, Sanborn Fire Insurance Maps, city directories, historical photograph collections and historic property inventory records.

Research indicated that the historical development of the general project vicinity is well documented in the Hewitt Avenue Historic District NRHP Nomination Form (Furesz 2010) and the Hewitt Avenue Corridor Survey (Dilgard and Riddle 1973). The NRHP nomination included buildings along Hewitt Avenue from Wetmore east to Lombard Street, which is due south of the APE.

## Environmental Context

### *Sedimentary and Geomorphic Context*

The proposed project encompasses several different landforms including the Snohomish River floodplain and an upland terrace, which have different potential in associated archaeological site types. Upper Pleistocene glaciation formed the topographic setting of the project vicinity and post-glacial incision of the Snohomish River has continued to transform the local landscape.

The Puget Lobe of the Cordilleran Ice Sheet advanced into the Puget Lowlands of Western Washington and crossed the project area more than 17,000 years ago (Porter and Swanson 1998). The glacier held its position for more than 1000 years, then receded, forming embayments, including the one the Snohomish River occupies now.

Glacial drift left by the glacial retreat was dissected by the glacial meltwater, leaving broad deposits of sand and gravel across the project area. Upland sediments retain original depositional characteristics, and lowland, reworked alluvial deposits are comprised in large part of similar regional sediments. Shovel probes excavated for this project were dominated by the characteristic gravelly sand to loam.

### *Flora and Fauna*

The project is located within the Western Hemlock vegetation zone, characterized by western hemlock, cedar, and Douglas fir with a shrub-rich understory (J.F. Franklin and C.T. Dyrness 1988). The landscape has not changed significantly over the last 7,000 years. The recent to modern climate in the project

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vicinity is temperate, with moderate, relatively dry summers and mild, cool winters.

The natural vegetation of the area has been modified to varying degrees by logging, agriculture, and urban development since the mid-1800s. Historically, the area was covered with dense forests consisting of Douglas fir, western hemlock (*Tsuga heterophylla*), western red cedar (*Thuja plicata*), bigleaf maple (*Acer amplum*), red alder (*Alnus rubra*), willow (*Salix L.*), and vine maple (*Acer circinatum* Pursh). Ferns, mosses, salal (*Gaultheria shallon*), Oregon grape (*Mahonia aquifolium*), ocean spray (*Holodiscus discolor*), snowberry (*Symphoricarpos*), wild rose (*Rosa L.*), red huckleberry (*Vaccinium parvifolium*), blackberry (*Rubus Eubatus*), and salmonberry (*Rubus spectabilis*) were abundant (J.F. Franklin and C.T. Dyrness 1988).

Where available, these plants continue to support a diverse range of fauna. While few species thrive in the area today, the historic period landscape would have supported a greater number of plants and animals. Black-tailed deer (*O. hemionus columbianus*), bear (*Ursus americanus*), bobcat (*felis rufus*), cougar (*Puma concolor*), wolf (*Canis lupus*), elk (*Cervus elaphus*), raccoon (*Procyon lotor*), skunk (*Mephitis*), beaver (*Castor Canadensis*), pheasants (*Phasianus colchicus torquatus*), waterfowl, heron (*Cochlearius cochlearius*), salmon and trout (*Oncorhynchus*) are some of the resources common to the area.

Marine resources of the area include several species of salmon, steelhead, flounder, perch, rockfish, dogfish, lingcod, herring, smelt and sole. Freshwater fish in the vicinity of the site today include lamprey, trout, whitefish, peamouth, pikeminnow, dace, shiner, sucker, and a variety of introduced game fish. Mussel, clams, oysters, sea urchins, and other shellfish are available in a variety of intertidal environments. Marine mammals, including killer and gray whale, harbor seals, sea lions and porpoises occupy the area seasonally or year-round.

### Ethnographic Context

The native occupants of the project area were the Northern Lushootseed-speaking Salish peoples who shared ties with other Puget Sound cultures (Suttles and Lane 1990) who today include the Stillaguamish Tribe of Indians, the Swinomish Indian Tribal Community, the Upper Skagit Indian Tribe and the Tulalip Tribes (among whose members include the Snohomish).

Coastal Salish people relied on a diet of fish, roots, berries, and wild game. There is evidence to suggest there was a marginal difference in diet between coast-dwelling groups of Puget Sound and the more inland peoples. Inland groups who lived along rivers focused more on upland game animals rather than marine resources (Bryan 1963).

Local people lived in clustered cedar plank houses at the winter village below where Legion Park is now located (45SN61). A cedar-post-fortified village at Hebolb (45SN17), which means "place where the water boils out of the ground," consisted of a potlatch house, four large winter houses, and several small winter houses (Tweddell 1974). Another local named place east of the APE and across the Snohomish River, near the I5 crossing, is called yuxwal, meaning "cold spring".

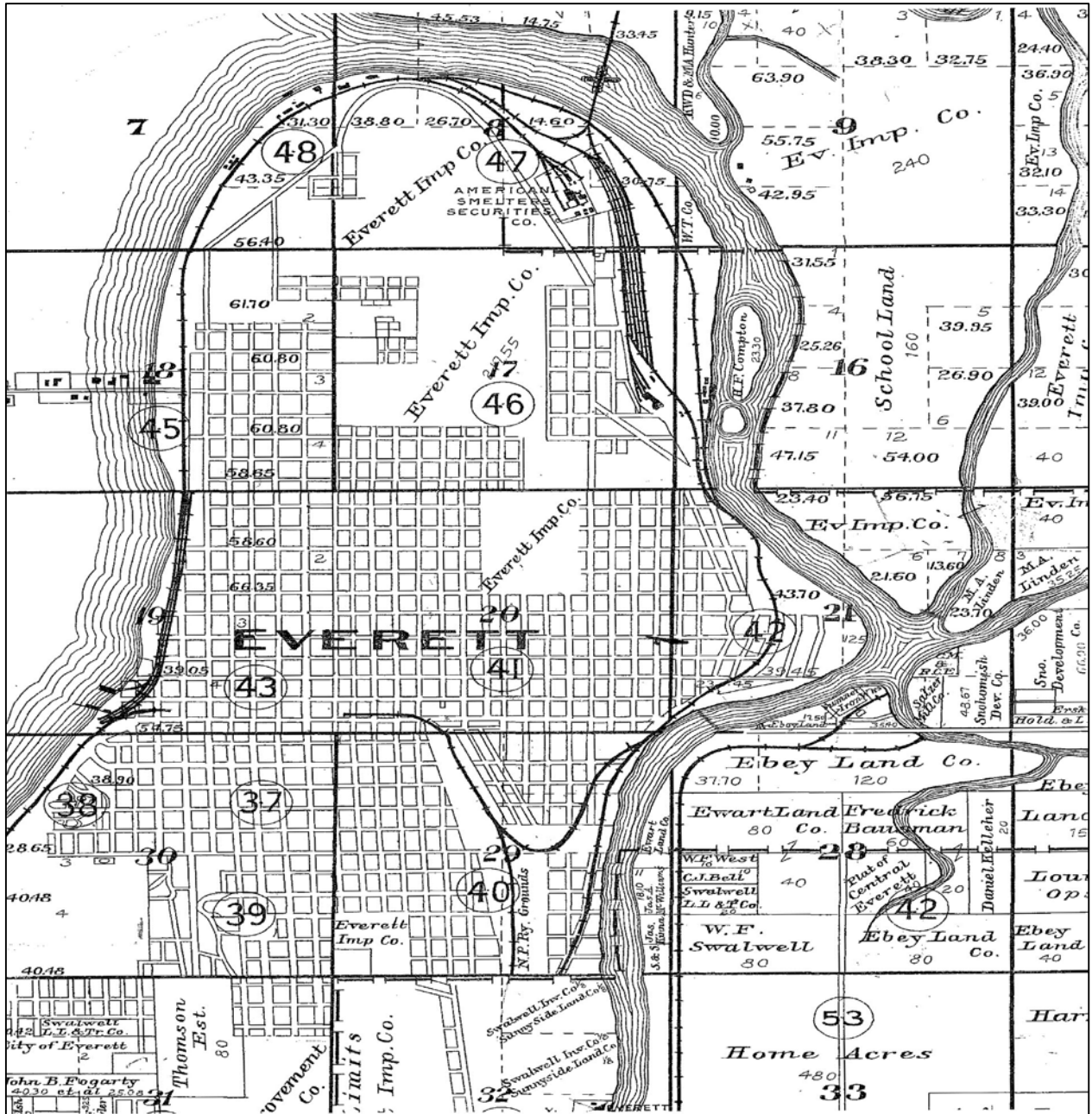
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## Historical Context

The city of Everett developed on Port Gardner Bay where Snohomish Indian people had resided for centuries. In the years following the establishment of Washington Territory in 1853, the Snohomish were relocated to the nearby Tulalip Reservation. The donation land claim act combined with the area's abundant natural resources brought an influx of Euroamerican loggers, farmers and fishermen in the 1870-80s. By the 1890s, Port Gardner Bay became an industrial boom town thanks to a group of East Coast Investors that formed the Everett Land Company (named for the son of investor Charles Colby). This new business venture enjoyed the support of Tacoma lumberman Henry Hewitt, the Rucker Brothers, Colgate Hoyt and of one of period's wealthiest men, John D. Rockefeller. Today, many of the city's streets reflect the names of these early developers (Fursez2011).

The Everett Land Company correctly anticipated that the peninsula at the mouth of the Snohomish River would be the point where the Great Northern railway would first touch the Puget Sound making it an excellent location for industrial development (City of Everett 2011 and Dilgard and Riddle 1989). The Everett Land Company hired large numbers of laborers, including many Asian and European immigrants to build the port facilities and roads. Hewitt Avenue was built to extend east from the port, serving as the primary commercial corridor. The industrial shorefront soon included "a paper mill, barge works, a nail factory, lumber and shingle mills, and a smelter to refine ores that would come from the Monte Cristo mines east of the city" (City of Everett 2011).

By 1893, the City of Everett incorporated, but in the same year the nation-wide financial panic caused a recession leaving the new city insolvent while industry stagnated causing many to be out of work. It was during this time that Rockefeller pulled his support. The Everett Land Company looked to James J. Hill, owner of the Great Northern Railway to stimulate the local economy. Hill bought out the company and renamed it the Everett Improvement Company. Local businesses were encouraged responding favorably to Hill's investment in the community with a flurry of new development. Another major boost occurred when Hill's neighbor in St. Paul, Minnesota, Frederick Weyerhaeuser, invested in Everett establishing the headquarters of the Weyerhaeuser Timber Company, on the Everett waterfront. The company eventually became the largest lumber company in the world. A historic overview of Everett notes "Hill and Weyerhaeuser were magnets for new industries that included waterfront canneries, fisheries, shipyard and ironworks, and that solidified Everett's identity as an industrial city." (City of Everett 2011). Figure 4 is a 1910 map showing early Everett with several Everett Improvement Company parcels identified, as well as the location of the ASARCO smelter.



**Figure 4.** This 1910 map shows the land holdings of the Everett Improvement Company, the smelter and the railroad line located in the lowland area, which extends from the river (on right) west to Port Gardner Bay (Anderson Maps 1910).

With this new growth the city's population grew from 8,000 in 1900 to approximately 30,000 in 1915. The unchecked growth in industrial development, continuous stream of laborers seeking work and working conditions that included low pay and dangerous conditions eventually led to labor unrest. In 1916, a strike resulting in the Pacific Northwest's bloodiest labor violence occurred. Known as the "Everett Massacre," the incident took place at the Everett waterfront when a boat load of Workers of the World sought to peacefully protest the layoffs of shingle mill workers. Some 200 vigilantes hired by the Snohomish County sheriff began firing at the boat as it arrived in Everett. In the end 7 lay dead and over 45 were wounded (City of Everett 2011).

During World War I, Everett played an important role in providing lumber for the war effort, but by the Great Depression of the 1930s Everett was hit especially hard as the wood industry waned nationally. As a result, the lumber and shingle mills began making paper an industry that remained strong through the 1960s (Dilgard and Riddle 1989). Events of World War II also stimulated the local economy with the establishment of Boeing's airplane parts factory in downtown Everett. Boeing continued to operate some of its primary facilities in Everett (City of Everett 2011; Fursez 2010).

### *History of the Everett Smelter Site*

The most comprehensive account of the smelter operations are contained in a document by Hydrometrics (1995). The following discussion is based in large part on their original research of the Asarco company archives in New York. Table 2 provides an abbreviated summary of the smelter history, organized by year of operation.

The discovery of ore deposits in the Cascade Mountains spurred the development of the Everett smelting and refining operation. The smelter was constructed in 1892, by the Puget Sound Reduction Company (PSRC) after the land was purchased from the Everett Land Company. By 1894 the facility was operational, and included a sulfide mill, two roasters to remove arsenic, ore bunkers, a dust chamber, a sample building, a furnace house, and an engine house (Woodhouse, 1979). Nearly all mines in the Pacific Northwest, from British Columbia to Montana and south to Oregon, contributed to the ore that was refined at the smelter, however the main supplier of ore was from the Monte Cristo district located just east of Everett. The history of production at the smelter is clearly intermittent, producing gold and silver bullion and refined lead and Dore (a semi-pure alloy of gold and silver) bars.

Expansion of the smelter took place in 1901 in order to treat ever-increasing volumes of available ore. The smelter was sold in 1903 to the Federal Mining & Smelting Company (FMSC) and was closed temporarily until March 1904, when Asarco assumed operational control. Within four years Asarco consolidated its operations and began sending Dore bars to other Asarco smelters; processing of lead ended in February 1908.

While the lead smelting operations closed, the arsenic extraction facility continued to process arsenic-rich ores until finally ceasing operations in February 1912. The plant was dismantled the same year and much of the machinery was moved to the Tacoma smelter. In order to salvage bricks the stacks were toppled in 1915 and the remainder of buildings were moved to the Norwegian-Pacific shipyards.

Asarco sold the property in the 1920s, much of it going to Charles Spreisterbach, who developed the area for residential use through the 1930s and 1940s, and the area has been used for residential purposes since.

**Table 2** History of the Smelter Locale

<b>Year</b>	<b>Activity</b>
1892	Land for the smelter was purchased from Everett Land Company by Puget Sound Reduction Company and construction of the smelter began.
1894	Lead smelting initiated
1898	Arsenic extraction facilities were added to the smelter, the first in the United States; arsenic extraction begins.
1901	The smelter was expanded to produce more arsenic than was previously produced.
1902	Records are not complete, however arsenic production was 1,353 tons. The smelter was sold to the Federal Mining and Smelting Company and then to American Smelting and Refining Company (ASARCO). Smelter temporarily closes.
1903	Smelter is sold to the Federal Mining & Smelting Company and temporarily closed.
1904	Smelter is reopened.
1904-08	119,495 tons of ore was smelted and 30,733 tons of lead was produced. Lead smelting ceases but arsenic extraction continues.
1912	Arsenic extraction was shut down and the smelter began to be dismantled. Some in-ground materials such as foundations, parts of flues and waste products were left in the ground.
1915	Everett smelter stacks were toppled for brick recovery.
1917	Dismantling completed
1920s to 30s	ASARCO sells the smelter properties. The last property was sold in 1936.
1930s to 40s	Former smelter property developed for residential purposes.
1956	The East Marine View Drive/Pacific Highway interchange was constructed.
1990	Everett smelter site rediscovery

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## Prehistoric Context

Cultural development in the Puget Sound is summarized by a number of authors (Ames and Maschner 1999; Blukis Onat 1987; Bryan 1963; Forsman and Lewarch 2001; Greengo and Houston 1970; Hadja 1990; Hollenbeck 1987; Kidd 1964). These authors divide prehistoric cultural sequences into multiple phases or periods through time.

The first human occupation of Washington State may date back about 14,000 years to the Manis Mastodon site at Sequim, where a possible bone point and the spirally fractured bones of a mastodon suggest human hunting and butchering (Gustafson et al. 1979). The next phase of human occupation in Washington was between 13,000 and 13,500 years ago and referred to as the Clovis culture. There have been a few isolated locales identified in southern and central Puget Sound, but no campsite of this culture has yet been found in Washington. Following the Clovis period, there are the Early (approximately 12,000 to 7,000 years ago), then the Middle (7,000 to 3,500 years ago) and Late (3,500 to 150 years ago) periods. Sites deposited during the Early period, typically occur on high marine and river terraces, sometimes at a significant distance from modern water courses, and consist of concentrations of cobble cores, flakes, large ovate knives, and broad-stemmed and leaf-shaped projectile points (Wessen 1990).

Eustatic Sea Level rise continued through the Early period into the Middle period, eventually stabilizing between 7-5 thousand years ago. This period of time marks a significant shift in the overall environmental scheme which allowed for the establishment of a concentrated littoral adaptation. Archaeological evidence defining this period is seen in significant, widely spread changes in subsistence economy and residential patterns. Few, yet persistent lanceolate points, not uncommon in Olcott assemblages are present during this time and ground stone, bone and antler tools, and smaller, triangular projectile points are common.

During the Late Period (3,500 to 150 years ago) human lifeways changed radically, as people focused increasingly on aquatic resources; the number and diversity of sites markedly increased. People maintained permanent villages on the coast and along the lower reaches of inland rivers (Chatters 1989; 1990). They used these as home bases and storage warehouses for fish, shellfish, game, and plant foods systematically gathered during the warmer seasons. Shell-middens built up in coastal settings (Grabert 1988). Cemeteries are found adjacent to larger villages, midden sites, and fishing camps and petroglyph sites occasionally occur in higher upland environments. Small camps, left by hunters, fishers, plant gatherers, and traders are found from the lowlands well into the mountains, but usually remain close to larger, permanent sources of water. Typically, these sites are located along trade routes that linked communities living east and west of the Cascades (Burtchard 2003). Open, temporary camps, occurring as lithic scatters, are common in these settings. Blazed cedars, stripped of bark in order to make basketry or with planks removed from the base of their trunks, are still found in the lowlands (Gunther 1973).

## Historic Property Inventory

There are seven resources over 50 years of age located within the APE. These include the Snohomish River Bridge (SN358), five isolated, abandoned utility poles (sites 45SN470-474) and two relatively indistinct commercial buildings. There are literally hundreds of historic age properties located adjacent



to the APE in the Uplands area, which is undergoing cleanup under a separate project.

### Previous Cultural Resource Studies

Until 1975, little systematic archaeological investigation had been undertaken in Snohomish County. Dunnell and Fuller (1975) conducted the first large-scale survey of the Everett-Mukilteo area and identified several prehistoric sites, locating nine previously unrecorded sites, most of which have been revisited in some form since, but are not located within the APE. In a later regional overview, Miss and Campbell (1991) compiled a complete database of prehistoric archaeological resources in Snohomish County and in the process relocated several previously recorded sites. Recent cultural resource surveys conducted as a result of infrastructure placement and/or replacement requirements in the vicinity of the APE as well as a handful of additional local surveys are presented in table 3. Two recent surveys (Jones & Stokes 2007 and Shantry 2007) identified cultural resources not previously recorded. The Jones & Stokes survey took place within the APE; none of the sites recorded during that survey are eligible for the National Register of Historic Places and none will be affected by the cleanup project.

**Table 3.** Cultural Resource Surveys in the vicinity of the APE

Author/ Affiliation	Date	Project Name	Results
Dunnell/Fuller (NPS)	1975	An Archaeological Survey of Everett Harbor and the Lower Snohomish Estuary-Delta	Nine sites recorded, one relocated
Miss/Campbell (NWAA)	1991	Prehistoric Cultural Resources of Snohomish County, Washington.	33/98 sites relocated, one new site
Johnson (PRA)	2000	Proposed California Street Overpass, Everett, WA	No Cultural Resources
Shong (NWAA)	2003	Monitoring Results for the Everett Water Pipeline Replacement No.2 and 3 (Phase 5) Township 29 North, Range 5 East, Sections 26, and 28	No Cultural Resources
Roedel (LAAS)	2004	Everett HOV Historic, Cultural, and Archaeological Resource Assessment, Interstate 5 HOV, SR 526 to SR 2 Vicinity, Snohomish County, Washington	No Cultural Resources
Juell (NWAA)	2006	Archaeological Site Assessment Sound Transit's Sounder Everett to Seattle Commuter Rail System, King and Snohomish Counties, WA	No Cultural Resources
Shantry (NWAA)	2007	Cultural Resource Assessment for the Everett Riverfront Master Plan and Redevelopment Project Snohomish County, Washington	One isolate
Jones & Stokes	2007	Everett Rail Yard Improvement Project-Cultural Resources Survey and Discipline Report. November 2007. (J&S 00255.07) Bellevue, Washington. Prepared	11 new sites recorded
Hartmann (CRC)	2008	Cultural Resources Assessment for the Swift Bus Rapid Transit Project, Technical Memo 0711A-3, Snohomish County, Washington	No Cultural Resources

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## Previously Recorded Archaeological Sites

This section includes a brief description of the archaeological and historical (buildings) resources identified previously in the project area and within the APE. The lowland area is located in an industrial development area along the Snohomish River shoreline. Due south of the property is a large residential neighborhood with many historical homes.

There are nine previously recorded archaeological sites in the vicinity of the APE; 45SN17, 45SN61, 45SN358, 45SN411, and sites 45SN470-474, none of which will be affected by the proposed remedial actions. Table 4 summarizes these archaeological and historical sites.

Recorded by John Mattson in 1960, 45SN17, the Preston's Point site is a prehistoric to historic shell midden located at the mouth of the Snohomish River approximately 0.5 miles west of the APE. In 1974, Fuller and Mattson excavated a portion of the site, exposing the midden. A relatively typical coastal midden, it contained shell debris, mammal and fish bones, and fire-cracked rock. Unlike most coastal middens the site also contained wooden structural features. As a result of finding structural features Fuller and Mattson interpreted the site to be the historic Snohomish winter village site of Hebolb (Fuller and Mattson 1974). 45SN17 is considered eligible for listing in the National Register of Historic Places (NRHP); the proposed remedial actions will not impact this site.

The Legion Park Site (45SN61) is located at the mouth of the Snohomish River in present day Legion Park, overlooking site 45SN17. Recorded by John Mattson in 1976, it is noted as including Olcott artifacts which were exposed during construction of Legion Park. Subsequent investigations have not identified any additional artifacts. This site is not considered eligible for listing in the NRHP and the proposed remedial actions will not affect it in any way as it is located well outside the APE.

The Tower Street Site (45SN411) was recorded by Goetz and Tingwall in 2007 as a historic refuse scatter located at the edge of a broad terrace near the intersection of Tower Street and Broadway. Modern refuse is located on the surface and historic refuse is recorded 20 to 50 centimeters below the ground surface. Based on the presence of glass, ceramic, and metal artifacts, Tingwall and Goetz (2007) estimate that the site dates to the 1930s and attribute its presence to domestic meal preparation. This site is not eligible for listing in the NRHP and the proposed remedial actions will not affect it in any way.

The Snohomish River Bridge (45SN358) is located in the northern portion of the APE (Figures 5 and 6). Completed in 1954 the bridge is considered to be an exceptional example of a 1950s-era bridge built in Washington. It is one of two lift-span bridges built in the 1950s and one of only eight lift-span bridges listed on the NRHP in Washington State. The Snohomish River Bridge is eligible for listing in the NRHP under Criterion A for its association with bridge building in Washington in the 1950s. It is also eligible under Criterion C for its type, period, materials and method of construction. The bridge meets the threshold for eligibility established by Criteria Consideration G for properties not yet 50 years old for its exceptional engineering significance. Located just outside of the APE and west of the Snohomish River Bridge is BNSF Bridge # 10. Built in 1922, this 260-ft. steel swing-span bridge replaced a wooden truss swing-span bridge built in 1900. BNSF still uses this bridge and while this bridge is not documented in the DAHP database, it is listed on the nomination form for 45SN358. The proposed remedial actions will not affect Snohomish River Bridge or BNSF Bridge # 10 in any way.

Identified by Cowan and Cooper in 2009, sites 45SN470-474 are a cluster of abandoned wooden utility poles. The poles are located underneath the Snohomish River Bridge, each pole being separated by approximately 25 feet. At least one of the poles has a perpendicular wooden support crossbeam affixed to the top that would have held wire and glass insulators. Cut wire hangs from some of the poles. No numbers or identifying marks were found on the poles; it appears that the poles were abandoned in place when newer poles were installed. Cowan and Cooper suggest that these historic utility poles may represent the early to mid- 20th century communication infrastructure associated with the development of BNSF rail yard, but they are not eligible for the NRHP and the proposed remedial actions will not affect the sites in any way.

Table 4. Cultural Resource Sites in the Vicinity of the APE

Site	Site Type	Distance from APE	Reference/Affiliation
45SN17	Prehistoric to Historic Shell	.5mile	Mattson, 1960
45SN61	Prehistoric (Olcott?)	.5 mile	Mattson, 1976
45SN358	Snohomish River Bridge	Within APE	Craig Holstine & Oscar R. Bob George National Register of Historic Places
45SN411	Historic Refuse Scatter	.75 mile	Goetz and Tingwall 2007
45SN470	Isolate--Historic Utility Pole	Within APE	Cowan and Cooper, 2009/ICF Jones and Stokes
45SN471	Isolate---Historic Utility Pole	Within APE	Cowan and Cooper, 2009/ICF Jones and Stokes
45SN472	Isolate---Historic Utility Pole	Within APE	Cowan and Cooper, 2009/ICF Jones and Stokes
45SN473	Isolate---Historic Utility Pole	Within APE	Cowan and Cooper, 2009/ICF Jones and Stokes
45SN474	Isolate---Historic Utility Pole	Within APE	Cowan and Cooper, 2009/ICF Jones and Stokes

## Field Survey

Field investigations began with a close ground inspection across the APE to identify any readily observable cultural materials or features. Following the surface survey, shovel probes (SP) were judgmentally placed in areas C2 and C3 in an attempt to locate any buried cultural materials or features (Figure 7; Appendix 1). Areas C2 and C3 were the only areas within the APE that had native soil at the ground surface, and therefore they are the only areas where we were able to directly test for buried archaeological resources. Areas C2 and C3 are very steep and SPs were placed primarily along the northern half of the areas in the interest of safety. Shovel probes were excavated as cylindrical holes approximately 30-50cm in diameter and up to a depth of just less than one meter, depending on buried geologic deposits and conditions within the subsurface. Soil excavated from each SP was screened using ¼" hardware cloth. Notes were recorded in a working project log with SP location, depth, and other general descriptive notes.

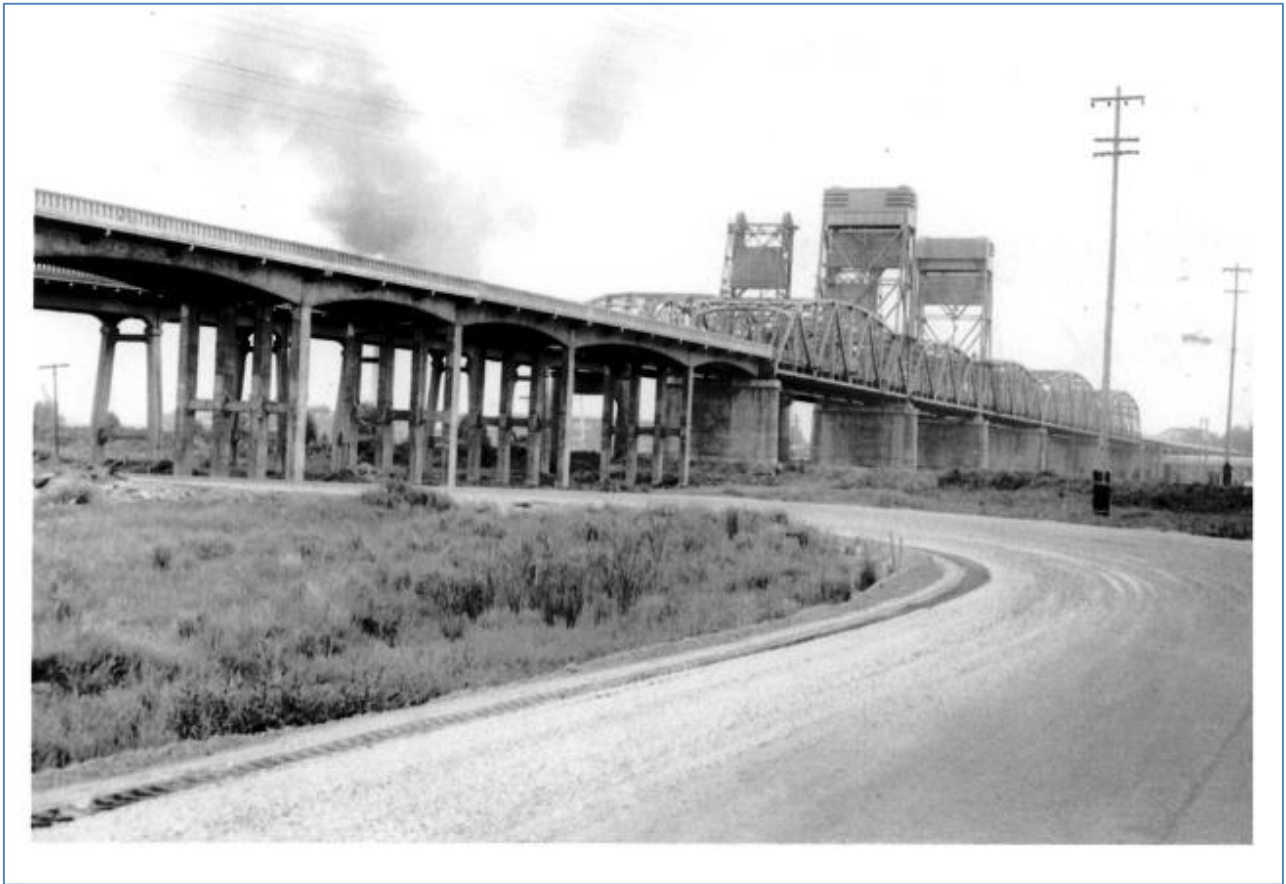


Figure 5. Snohomish River Bridge just after construction in 1954.

### Archaeological Potential and Research Design

Knowledge of the geologic processes associated with landforms in the APE can assist in identifying buried archaeological resources. The mapped parent material immediately underlying the project consists of glacial sediment. Glacial sediments in upland settings predate the observed record of humans in the Pacific Northwest, and effectively constitute “archaeological bedrock,” a marker sediment beneath which no potential archaeological deposits may exist. Archaeological resources may lie deeply buried beneath historic period fill in the lowland areas. Large midden sites representing winter villages and smaller sites related to camping and shellfish processing are common in similar settings. Several archaeological sites are recorded near the APE but no prehistoric recorded sites are known to exist on or immediately adjacent to the APE. Given this baseline understanding of the project location, we anticipated the possibility of identifying sites dating from the late Pleistocene through the historic period.



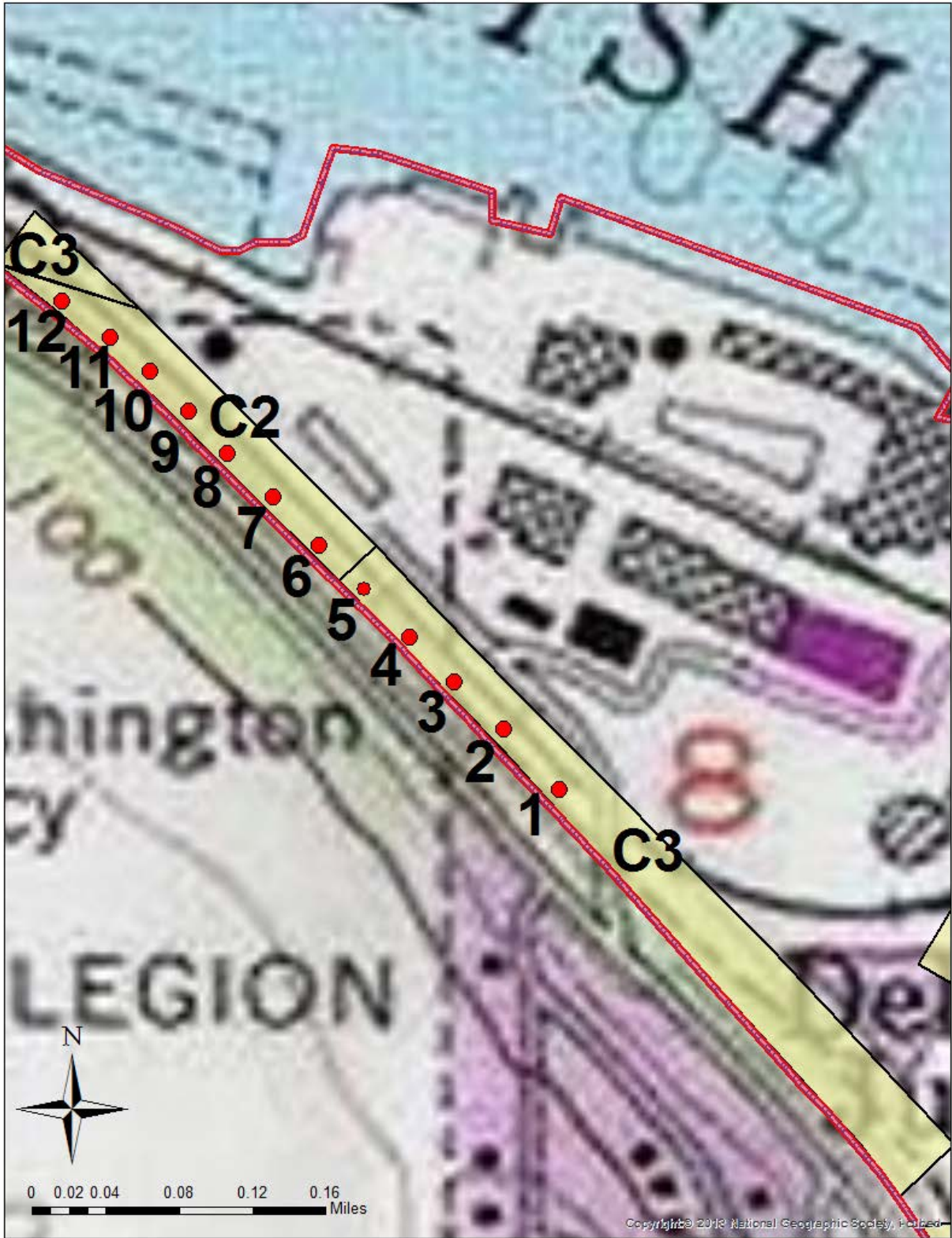
**Figure 6.** Archaeological Isolates 45SN470-474 are located underneath the bridge and along the Railroad tracks.

### Results of Field Survey

CGA archaeologists conducted the fieldwork portion of the archaeological investigation in the second week of October 2015. Weather conditions were overcast and pleasant during the survey week. The physical field investigation was conducted in a systematic fashion, first surveying the APE ground surface before shifting the focus of the investigation to the subsurface examination of the APE footprint. Twelve shovel probes were placed across areas C2 and C3. While a couple of the shovel probes had plastic fragments in the shallow subsurface, the remainder of the probes were void of any cultural material. This is likely attributable to the fact that the C2 and C3 areas are located on the edge of the steep terrace overlooking the Snohomish River. The probe sediments were remarkably uniform with glacial sediments located almost immediately in each shovel probe.

No prehistoric or historic cultural resources, materials, or features were encountered as a result of the field survey. The Snohomish River Bridge is located within the APE, but not within the vicinity of any of the remedial action areas; it will not be affected by the proposed remedial actions.





**Figure 7.** Location of shovel probes within areas C2 and C3 on USGS topographic quad.

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## Conclusion and Recommendations

The Everett Smelter Site Lowland Area remedial action location is a known industrial use area occupied by the Everett smelter from the late 1800s until the early 1900s as well as historic lumber mills operated by Weyerhaeuser between 1910s and 1980s. Similar alluvial environments along the Snohomish River also hold large prehistoric village sites that date at least to the Middle Period of cultural development through the Historic Period. The majority of the APE has been affected by historic fill episodes which have buried the native sediment with meters of fill (Table 1). Such disturbances limit the possibility of identifying buried archaeological deposits; archaeological monitoring during the remedial actions might identify unknown resources. Of nine previously recorded archaeological sites in the vicinity of the APE (i.e. 45SN17, 45SN61, 45SN358, 45SN411, and sites 45SN470-474), only two sites 45SN17 (historical shell midden) and 45SN358 (Snohomish River Bridge) are considered eligible for listing in the NRHP. None of these nine archaeological sites will be affected by proposed remedial actions within the Lowland Area.

Of the fifteen remedial action areas, twelve of them have no potential to affect cultural resources (Areas B1, B3, C1 through C6, and D1 through D4). No additional cultural resource work is recommended for these areas. In the unanticipated circumstance that cultural deposits are encountered during surface remediation work at these locations, all work at the discovery location shall stop and the project proponent shall contact the State of Washington Department of Ecology, and the Department of Archaeology and Historic Preservation (Contact information is in Appendix 2). Work should remain halted at the discovery location until appropriate consultation and investigations have been carried out. In the unlikely event of the inadvertent discovery of human remains, work should be immediately halted in the area, the discovery covered and secured against further disturbance, and contact initiated with law enforcement personnel, the DAHP State Physical Anthropologist, and authorized representatives of the concerned Indian Tribes.

Remedial action areas A1 and A2 are proposed to be excavated to native soil, and the shoreline portion of area B2 is proposed for installation of permeable reactive barrier (PRB) for groundwater remediation, which may require excavation to native soil. These remedial action activities have the potential to encounter buried archaeology that is not presently known, and therefore need to be monitored by a professional archaeologist. The archaeological monitoring will include a report describing the monitoring and its outcomes. Aforementioned notifications and procedures will be followed if any cultural resources and/or human remains are observed during these remedial action activities.

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## APPENDIX 1

### Shovel Probe Data Table

<b>Shovel Probe 1</b>		
<b>Depth (cm)</b>	<b>Sediment Description</b>	<b>Observations</b>
0-15	Gravelly medium sand with duff surface	No Cultural Material
15-30	Gravelly medium to coarse sand	No Cultural Material
30+	Gravelly sand	No Cultural Material
Notes: Extremely steep bank, difficult to traverse		
<b>Shovel Probe 2</b>		
<b>Depth (cm)</b>	<b>Sediment Description</b>	<b>Observations</b>
0-15	Gravelly medium sand with duff surface	No Cultural Material
15-30	Gravelly medium to coarse sand	No Cultural Material
30+	Gravelly sand	No Cultural Material
Notes: Extremely steep bank, difficult to traverse		
<b>Shovel Probe 3</b>		
<b>Depth (cm)</b>	<b>Sediment Description</b>	<b>Observations</b>
0-15	Gravelly medium sand with duff surface	No Cultural Material
15-40	Gravelly medium to coarse sand	No Cultural Material
40+	Gravelly sand	No Cultural Material
Notes: Extremely steep bank, difficult to traverse		
<b>Shovel Probe 4</b>		
<b>Depth (cm)</b>	<b>Sediment Description</b>	<b>Observations</b>
0-15	Gravelly medium to loamy sand with duff surface	Plastic Fragments; No Additional Cultural Material
15-50	Gravelly medium to coarse sand	No Cultural Material
50+	Gravelly sand	No Cultural Material
Notes: Extremely steep bank, difficult to traverse		
<b>Shovel Probe 5</b>		
<b>Depth (cm)</b>	<b>Sediment Description</b>	<b>Observations</b>
0-15	Gravelly medium sand with duff surface	No Cultural Material
15-40	Gravelly medium to coarse sand	No Cultural Material
40+	Gravelly sand	No Cultural Material
Notes: Extremely steep bank, difficult to traverse		
<b>Shovel Probe 6</b>		
<b>Depth (cm)</b>	<b>Sediment Description</b>	<b>Observations</b>
0-15	Gravelly medium sandy loam with duff surface	Margin of plastic plate with "Minnie Mouse"; No additional Cultural Material
15-40	Gravelly medium to coarse sand	No Cultural Material
40+	Gravelly sand	No Cultural Material
Notes: Extremely steep bank, difficult to traverse		

<b>Shovel Probe 7</b>		
<b>Depth (cm)</b>	<b>Sediment Description</b>	<b>Observations</b>
0-15	Gravelly medium sand with duff surface	Plastic fragments; No Cultural Material
15-30	Gravelly medium to coarse sand	No Cultural Material
30+	Gravelly sand	No Cultural Material
Notes: Extremely steep bank, difficult to traverse		
<b>Shovel Probe 8</b>		
<b>Depth (cm)</b>	<b>Sediment Description</b>	<b>Observations</b>
0-15	Gravelly medium sand with duff surface	No Cultural Material
15-30	Gravelly medium to coarse sand	No Cultural Material
30+	Gravelly sand	No Cultural Material
Notes: Extremely steep bank, difficult to traverse		
<b>Shovel Probe 9</b>		
<b>Depth (cm)</b>	<b>Sediment Description</b>	<b>Observations</b>
0-15	Gravelly medium sand with duff surface	No Cultural Material
15-30	Gravelly medium to coarse sand	No Cultural Material
30+	Gravelly sand	No Cultural Material
Notes: Extremely steep bank, difficult to traverse		
<b>Shovel Probe 10</b>		
<b>Depth (cm)</b>	<b>Sediment Description</b>	<b>Observations</b>
0-15	Gravelly medium sand with duff surface	No Cultural Material
15-30	Gravelly medium to coarse sand	No Cultural Material
30+	Gravelly sand	No Cultural Material
Notes: Extremely steep bank, difficult to traverse		
<b>Shovel Probe 11</b>		
<b>Depth (cm)</b>	<b>Sediment Description</b>	<b>Observations</b>
0-15	Gravelly medium sand with duff surface	No Cultural Material
15-50	Gravelly medium to coarse sand	No Cultural Material
50+	Gravelly sand	No Cultural Material
Notes: Extremely steep bank, difficult to traverse		
<b>Shovel Probe 12</b>		
<b>Depth (cm)</b>	<b>Sediment Description</b>	<b>Observations</b>
0-15	Gravelly medium sand with duff surface	No Cultural Material
15-50	Gravelly medium to coarse sand	No Cultural Material
50+	Gravelly sand	No Cultural Material
Notes: Extremely steep bank, difficult to traverse		

---

## APPENDIX 2

### PROJECT CONTACT LIST

DAHP: Telephone 360-586-3065

Snohomish Tribe, Michael Evans: Telephone 425-671-1387

Stillaguamish Tribe, Shawn Yanity: Telephone 360-652-7362 ext. 228

Swinomish Tribe, Larry Campbell: Telephone 360-466-7352

Tulalip Tribe, Richard Young: Telephone 360-716-2652

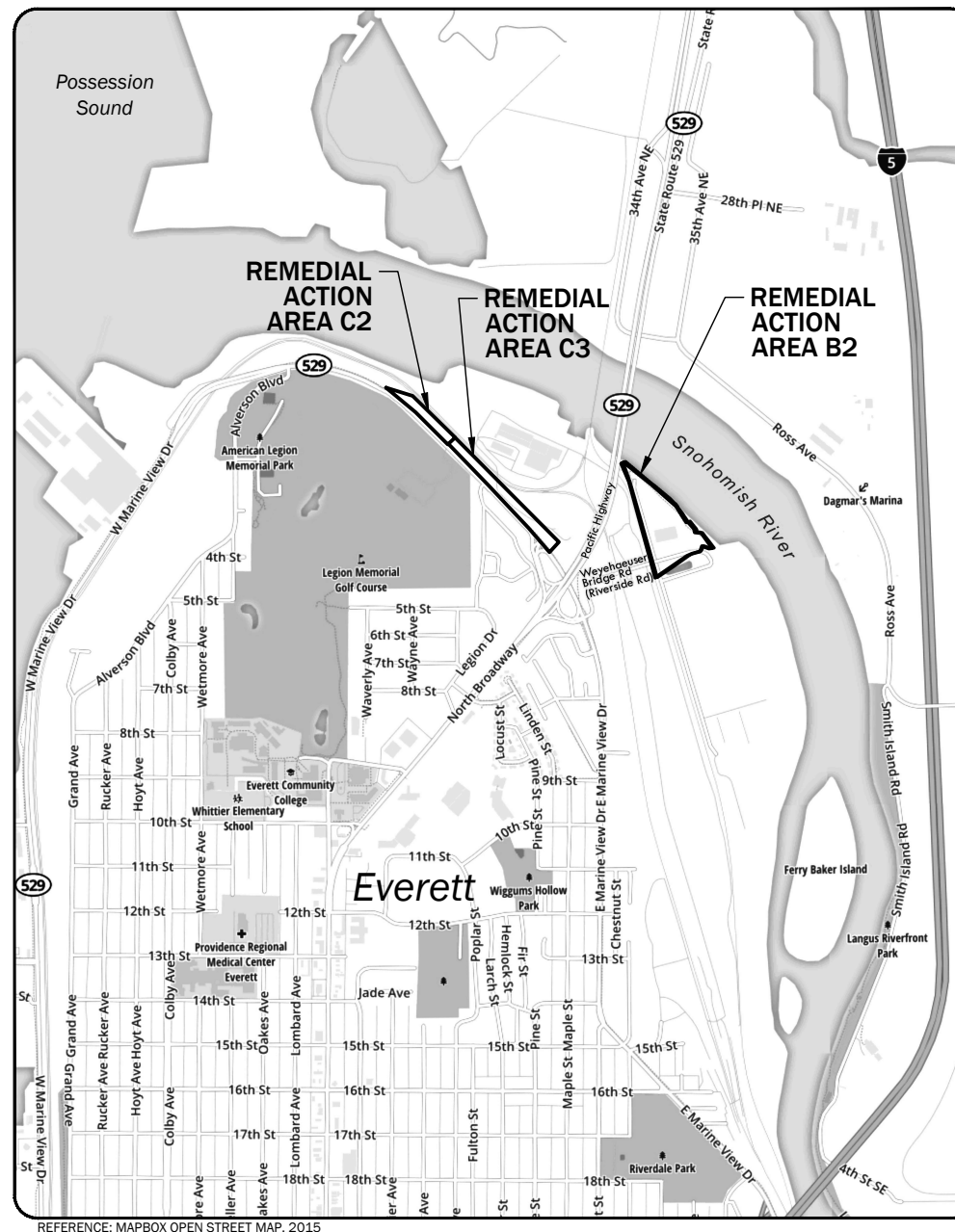
**APPENDIX G**  
**Preliminary Plans and Specifications**

# WASHINGTON STATE DEPARTMENT OF ECOLOGY

## EVERETT SMELTER SITE LOWLAND AREA REMEDIAL ACTION REMEDIAL ACTION AREAS B2, C2 AND C3

### SHEET INDEX:

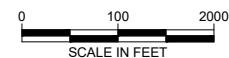
- G-1 COVER SHEET
- CD-1 AREA B2 PROJECT OVERVIEW
- CD-2 AREA B2 EXISTING SITE CONDITIONS PHOTOGRAPHS
- CD-3 AREA B2 EXISTING SITE PLAN (1 OF 2)
- CD-4 AREA B2 EXISTING SITE PLAN (2 OF 2)
- CD-5 AREA B2 EXISTING STORM DRAIN SYSTEM
- CD-6 AREA B2 STORM DRAIN DEFECTS - INFLOW NETWORK TO SOUTH DETENTION POND
- CD-7 AREA B2 STORM DRAIN DEFECTS - INFLOW NETWORK TO NORTH DETENTION POND
- CD-8 AREA B2 STORM DRAIN DEFECTS - OUTFLOW NETWORK
- CD-9 AREA B2 SITE PREPARATION AND TESC PLAN (1 OF 2)
- CD-10 AREA B2 SITE PREPARATION AND TESC PLAN (2 OF 2)
- CD-11 AREA B2 STORM DRAIN POINT REPAIRS PLAN
- CD-12 AREA B2 STORM DRAIN CIPP REHABILITATION PLAN
- CF-1 AREAS C2 AND C3 PROJECT OVERVIEW
- CF-2 AREAS C2 AND C3 EXISTING SITE CONDITIONS PHOTOGRAPHS
- CF-3 AREAS C2 AND C3 FENCE CONSTRUCTION PLAN (1 OF 2)
- CF-4 AREAS C2 AND C3 FENCE CONSTRUCTION PLAN (2 OF 2)
- D-1 TEMPORARY FACILITIES AND TESC DETAILS
- D-2 TRENCHING AND PAVEMENT PATCHING DETAILS
- D-3 CHAIN LINK FENCE DETAILS



REFERENCE: MAPBOX OPEN STREET MAP, 2015

### VICINITY MAP

SCALE: 1" = 1000'



### CONTACTS:

**SITE MANAGER**  
WASHINGTON STATE DEPARTMENT OF ECOLOGY  
SANDRA MATTHEWS, LG, LHG  
3190 160TH AVENUE SE  
BELLEVUE, WA 98008  
425-649-7206  
smat461@ecy.wa.gov

### ENVIRONMENTAL ENGINEER

GEOENGINEERS, INC.  
ABHIJIT R. JOSHI, PE  
600 STEWART STREET, SUITE 1700  
SEATTLE, WA 98101  
206-728-2674  
ajoshi@geoengineers.com

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206-728-2674  
WWW.GEOENGINEERS.COM

DEPARTMENT OF  
**ECOLOGY**  
State of Washington

EVERETT SMELTER SITE LOWLAND AREA REMEDIAL ACTION  
REMEDIAL ACTION AREAS B2, C2 AND C3  
EVERETT, WASHINGTON

COVER SHEET

DRAWN: TJM	PROJ NO:
DESIGN: WC	SHEET 1 OF 20
CHECKED: ARJ	DATE: 06.29.2018
SHEET NO.	G-1

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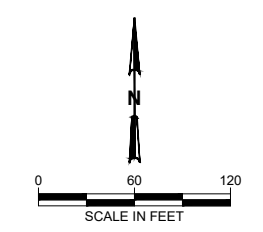


**LEGEND**

- PROJECT BOUNDARY
- U6 STORM DRAIN SEGMENT ID NUMBER
- STORM DRAIN
- CATCH BASIN
- MANHOLE
- STORM DRAIN PIPE TO BE REHABILITATED WITH CIPP LINING
- POINT REPAIR LOCATION

PHOTOGRAPH DESIGNATION SHEET LOCATED ON P-2  
CD-2 DIRECTION OF PHOTOGRAPH

- PROJECT SUMMARY - AREA B2:**
1. PROVIDE TEMPORARY SITE CONTROLS INCLUDING SITE SECURITY FENCING, TEMPORARY TRAFFIC CONTROLS, AND TEMPORARY EROSION AND SEDIMENT CONTROL (TESC). PROVIDE TRAFFIC CONTROLS FOR ACTIVE WORKING AREAS IN RIGHTS-OF-WAY AS REQUIRED BY THE CITY OF EVERETT AND/OR OTHER AGENCIES.
  2. PERFORM A VIDEO AND PHOTOGRAPH DOCUMENTATION OF THE EXISTING SITE CONDITIONS, INCLUDING BUT NOT LIMITED TO, SURFACE FEATURES WITHIN AND IMMEDIATELY ADJACENT TO THE WORK AREAS, SUCH AS STRUCTURES, PAVEMENT, SIDEWALKS, LANDSCAPING, PARKING AREA AND ROADS, ETC.
  3. GROUT AND PLUG THE ABANDONED SEGMENT U12.
  4. INSTALL TEMPORARY STORMWATER BYPASS PIPELINES FROM NORTH AND SOUTH DETENTION PONDS TO CONVEY STORMWATER DISCHARGE FROM THE DETENTION PONDS TO THE SNOHOMISH RIVER. THE DISCHARGE POINT SHALL BE LOCATED IN THE IMMEDIATE VICINITY OF THE EXISTING OUTFALL. THE CONTRACTOR SHALL BE RESPONSIBLE FOR OBTAINING NECESSARY PERMITS.
  5. PLUG DETENTION POND OUTFALLS TO TEMPORARILY DISCONTINUE STORMWATER DISCHARGE VIA OUTFLOW NETWORK PIPES.
  6. COVER CATCH BASINS WITHIN THE PROJECT AREA TO TEMPORARILY DISCONTINUE STORMWATER RUNOFF FROM ENTERING INFLOW NETWORK PIPING. CONTRACTOR SHALL COLLECT AND PUMP STORMWATER RUNOFF ACCUMULATED, IF ANY, ON THE GROUND SURFACE TO ONSITE WATER STORAGE TANKS.
  7. PLUG OUTFALL PIPE TEMPORARILY TO STOP TIDAL WATER FROM SNOHOMISH RIVER BACKFLOW INTO THE OUTFLOW NETWORK PIPES.
  8. PERFORM PRE-INSTALLATION CLEANING OF THE ENTIRE STORM DRAIN SYSTEM, INCLUDING STORMWATER INFLOW AND OUTFLOW NETWORKS, CATCH BASINS AND MANHOLES. CONTRACTOR SHALL USE HIGH PRESSURE WATER JETTING OR EQUIVALENT METHODS APPROVED BY ECOLOGY. CONSTRUCTION WATER/SEDIMENT GENERATED FROM THE STORM DRAIN CLEANING SHALL BE PUMPED TO ONSITE STORAGE TANKS FOR CHARACTERIZATION AND DISPOSAL.
  9. PERFORM PRE-INSTALLATION CLOSED-CIRCUIT TELEVISION (CCTV) VIDEO INSPECTION OF THE STORM DRAIN INFLOW AND OUTFLOW NETWORKS, CATCH BASINS AND MANHOLES AFTER THE PRESSURE CLEANING IS COMPLETED. CONTRACTOR SHALL VERIFY CONDITIONS OF THE DEFECTS THAT ARE PROVIDED IN THE CONTRACT DRAWINGS AND SHALL IDENTIFY ANY ADDITIONAL DEFECTS THAT REQUIRE POINT REPAIRS.
  10. IF ADDITIONAL DEFECTS ARE IDENTIFIED DURING THE PRE-INSTALLATION VIDEO INSPECTION, CONTRACTOR SHALL PROVIDE DOCUMENTATION INCLUDING DESCRIPTIONS, VIDEOS AND PHOTOGRAPHS REGARDING THE DEFECTS OF STORM PIPES, CATCH BASINS AND MANHOLES, AND PROPOSED REPAIR METHODS TO ECOLOGY FOR REVIEW AND APPROVAL.
  11. PERFORM POINT REPAIRS ON STORM PIPES, AS APPROVED BY ECOLOGY, AND MANAGE DEMOLITION DEBRIS AND CONTAMINATED SOIL GENERATED FROM POINT REPAIRS IN ACCORDANCE WITH THE CONTRACT DOCUMENTS.
  12. PERFORM REPAIR ON CATCH BASINS AND MANHOLES AS APPROVED BY ECOLOGY.
  13. INSTALL CIPP LINING ON THE STORM DRAIN SEGMENTS AS APPROVED BY ECOLOGY AND IN ACCORDANCE WITH THE MANUFACTURER'S RECOMMENDATIONS AND THE CONTRACT DOCUMENTS. CIPP LININGS AND REPAIRS ARE BEING PERFORMED TO ELIMINATE INFILTRATION OF CONTAMINATED MEDIA (GROUNDWATER AND/OR SOIL) AND TRANSPORT OF CONTAMINANTS IN STORM DRAIN SYSTEM TO THE SNOHOMISH RIVER.
  14. PERFORM A POST-INSTALLATION VIDEO INSPECTION OF THE STORM DRAIN SEGMENTS AFTER CIPP LINING INSTALLATION FOR REVIEW AND APPROVAL BY ECOLOGY.
  15. REMOVE TEMPORARY CATCH BASIN COVERS, PLUGS IN THE OUTFALL AND BYPASS, PIPELINES.
  16. RESTORE SITE TO PRE-EXISTING CONDITIONS.



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REGISTERED PROFESSIONAL ENGINEER

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REMEDIAL ACTION AREAS B2, C2 AND C3  
EVERETT, WASHINGTON

**AREA B2 PROJECT OVERVIEW**

DRAWN: TJM	PROJ NO:
DESIGN: WC	SHEET 2 OF 20
CHECKED: ARJ	DATE: 06.29.2018
SHEET NO.	<b>CD-1</b>

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P-1  
CD-2 VIEW SOUTH - RIVERSIDE ROAD



P-2  
CD-2 VIEW NORTHEAST - NORTH POND PUMP STATION AREA



P-3  
CD-2 VIEW SOUTH - NORTH DETENTION POND



P-4  
CD-2 VIEW NORTH - RIVERSIDE ROAD



P-5  
CD-2 VIEW WEST - SOUTH OF BUILDING PARKING AREA



P-6  
CD-2 VIEW NORTHWEST - SOUTH OF OUTFALL



P-7  
CD-2 VIEW NORTH - RIVERSIDE ROAD AND PARKING AREA



P-8  
CD-2 VIEW EAST - RIVERSIDE ROAD BRIDGE APPROACH



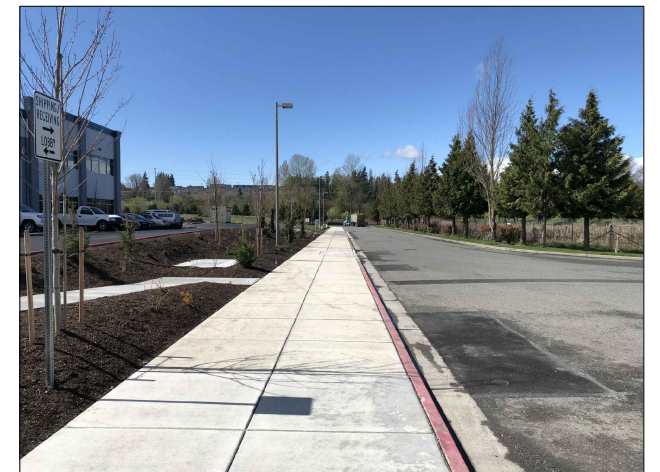
P-9  
CD-2 VIEW EAST - RIVERSIDE ROAD SOUTH EMBANKMENT



P-10  
CD-2 VIEW NORTHEAST - SOUTH POND PUMP STATION AREA



P-11  
CD-2 VIEW WEST - RIVERSIDE ROAD EAST OF SOUTH POND



P-12  
CD-2 VIEW WEST - RIVERSIDE ROAD SOUTH OF SOUTH POND

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 REGISTERED PROFESSIONAL ENGINEER



EVERETT SMELTER SITE LOWLAND AREA REMEDIAL ACTION  
 REMEDIAL ACTION AREAS B2, C2 AND C3  
 EVERETT, WASHINGTON

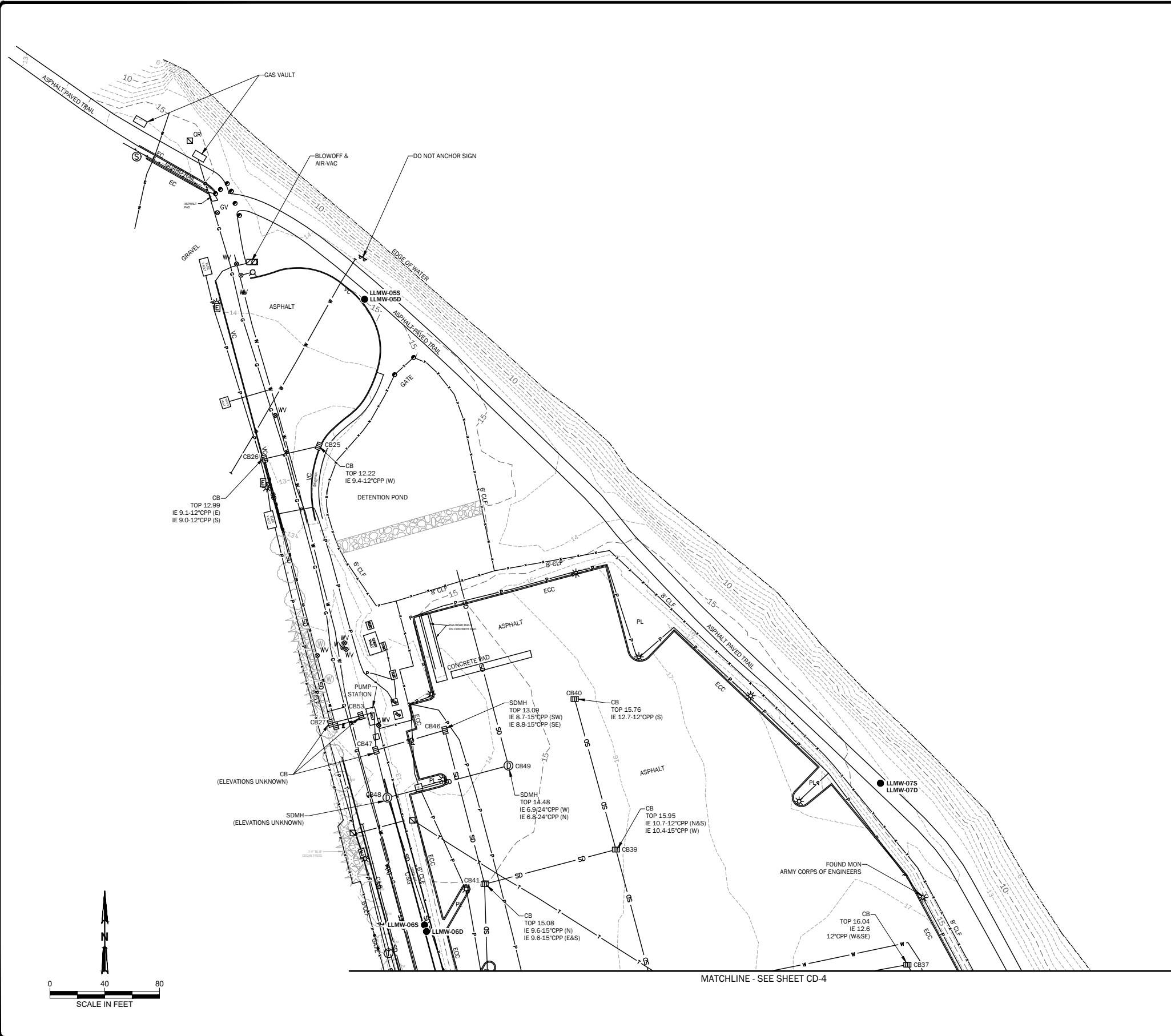
**AREA B2 EXISTING SITE CONDITIONS PHOTOGRAPHS**

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DESIGN: WC	SHEET 3 OF 20
CHECKED: ARJ	DATE: 06.29.2018
SHEET NO.	<b>CD-2</b>

**DRAFT SUBMITTAL - NOT FOR CONSTRUCTION**



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LEGEND	
SD	STORM DRAIN LINE
SD(R)	STORM DRAIN LINE FROM AS-BUILT RECORDS
SS(R)	SANITARY SEWER LINE FROM AS-BUILT RECORDS
W	WATER LINE
W(R)	WATER LINE FROM AS-BUILT RECORDS
P	POWER TONE LINE
T	TELEPHONE TONE LINE
G	GAS LINE
---	CURB LINE
---	GUARD RAIL
⊙	SEWER MANHOLE
⊕	STORM DRAIN MANHOLE
⊖	POWER MANHOLE
Ⓣ	TELEPHONE MANHOLE
⊕	UNKNOWN UTILITY MANHOLE
▣	CATCH BASIN
⊙	CLEANOUT
*	AREA LIGHT
⊙*	STREET LIGHT
⊠	ELECTRICAL BOX
⊠TR	TELEPHONE RISER
⊠WM	WATER METER
⊙WV	WATER VALVE
⊠	SIGN
⊕	FIRE HYDRANT
⊕	FIRE DEPARTMENT CONNECTION
⊠GM	GAS METER
⊠GR	GAS RISER
⊙GV	GAS VALVE
●	BOLLARD
PL	PLANTER
C&G	CONCRETE CURB AND GUTTER
CLF	CHAINLINK FENCE
ECC	EXTRUDED CONCRETE CURB
VC	VERTICAL CURB
WCR	WHEELCHAIR RAMP
● LLMW-07S	MONITORING WELL LOCATION
- - - - -	EXISTING CONTOUR

- NOTES:**
1. AREA B2 EXISTING SITE PLAN IS BASED ON SURVEY COMPLETED BY DAVID, EVANS AND ASSOCIATES, INC. IN DECEMBER 2016.
  2. HORIZONTAL DATUM: WASHINGTON STATE PLANE, NORTH ZONE, NORTH AMERICAN DATUM 1983, WITH THE 1991 RE-ADJUSTMENT (NAD 83/91) PER CITY OF EVERETT MONUMENTATION.
  3. VERTICAL DATUM: NORTH AMERICAN VERTICAL DATUM 1988 (NAVD88) PER CITY OF EVERETT MONUMENTATION.
  4. SURVEY CONTROL POINT FOR THE PROJECT IS CITY OF EVERETT "E132", A 3-INCH BRASS DISC LOCATED IN GRASS IN THE NORTHWEST CORNER OF EAST MARINE VIEW DRIVE AND RIVERSIDE ROAD INTERSECTION. COORDINATES FOR "E132" ARE 371515.9390N AND 1308377.2110E, AND ELEVATION IS 60.01'.
  5. LOCATIONS OF UTILITIES ARE APPROXIMATE. THE CONTRACTOR SHALL COMPLETE UTILITY LOCATES PRIOR TO ANY EARTH DISTURBING ACTIVITIES.

MATCHLINE - SEE SHEET CD-4

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REGISTERED PROFESSIONAL ENGINEER

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REMEDIAL ACTION AREAS B2, C2 AND C3  
EVERETT, WASHINGTON

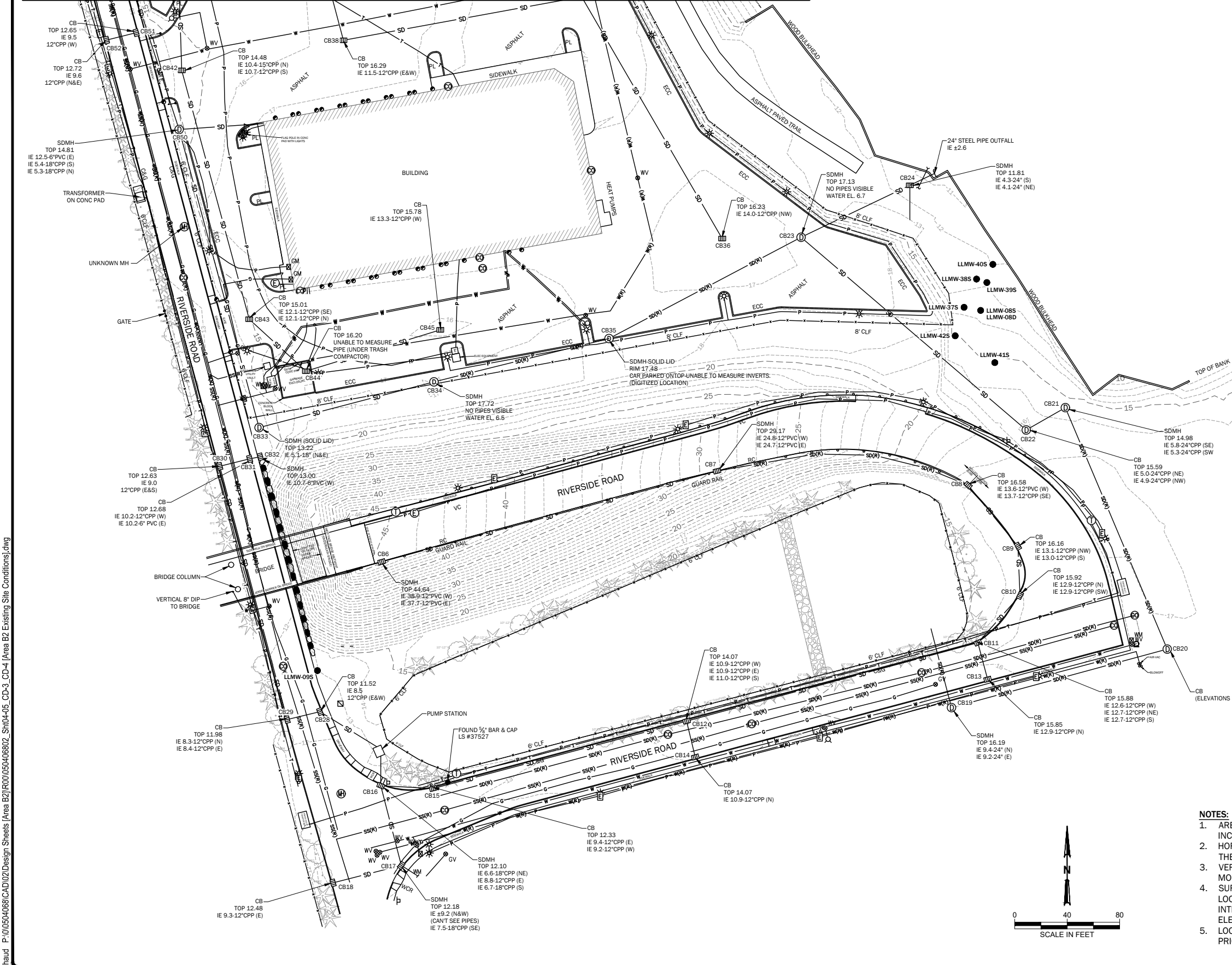
**AREA B2 EXISTING SITE PLAN (1 OF 2)**

DRAWN: TJM	PROJ NO:
DESIGN: WC	SHEET 4 OF 20
CHECKED: ARJ	DATE: 06.29.2018
SHEET NO.	<b>CD-3</b>

**DRAFT SUBMITTAL - NOT FOR CONSTRUCTION**

MATCHLINE - SEE SHEET CD-3

- LEGEND**
- SD STORM DRAIN LINE
  - SD(R) STORM DRAIN LINE FROM AS-BUILT RECORDS
  - SS(R) SANITARY SEWER LINE FROM AS-BUILT RECORDS
  - W WATER LINE
  - W(R) WATER LINE FROM AS-BUILT RECORDS
  - P POWER TONE LINE
  - T TELEPHONE TONE LINE
  - G GAS LINE
  - CLF CURB LINE
  - GR GUARD RAIL
  - ⊙ SEWER MANHOLE
  - ⊕ STORM DRAIN MANHOLE
  - ⊖ POWER MANHOLE
  - ⊗ TELEPHONE MANHOLE
  - ⊘ UNKNOWN UTILITY MANHOLE
  - ▣ CATCH BASIN
  - ⊙ CLEANOUT
  - ⊛ AREA LIGHT
  - ⊛ STREET LIGHT
  - ⊞ ELECTRICAL BOX
  - ⊞ TR TELEPHONE RISER
  - ⊞ WM WATER METER
  - ⊞ WV WATER VALVE
  - ⊞ SIGN
  - ⊞ FIRE HYDRANT
  - ⊞ FIRE DEPARTMENT CONNECTION
  - ⊞ GM GAS METER
  - ⊞ GR GAS RISER
  - ⊞ GV GAS VALVE
  - BOLLARD
  - PL PLANTER
  - C&G CONCRETE CURB AND GUTTER
  - CLF CHAINLINK FENCE
  - ECC EXTRUDED CONCRETE CURB
  - VC VERTICAL CURB
  - WCR WHEELCHAIR RAMP
  - LLMW-415 MONITORING WELL LOCATION
  - - - - -60- - - - - EXISTING CONTOUR



- NOTES:**
1. AREA B2 EXISTING SITE PLAN IS BASED ON SURVEY COMPLETED BY DAVID, EVANS AND ASSOCIATES, INC. IN DECEMBER 2016.
  2. HORIZONTAL DATUM: WASHINGTON STATE PLANE, NORTH ZONE, NORTH AMERICAN DATUM 1983, WITH THE 1991 RE-ADJUSTMENT (NAD 83/91) PER CITY OF EVERETT MONUMENTATION.
  3. VERTICAL DATUM: NORTH AMERICAN VERTICAL DATUM 1988 (NAVD88) PER CITY OF EVERETT MONUMENTATION.
  4. SURVEY CONTROL POINT FOR THE PROJECT IS CITY OF EVERETT "E132", A 3-INCH BRASS DISC LOCATED IN GRASS IN THE NORTHWEST CORNER OF EAST MARINE VIEW DRIVE AND RIVERSIDE ROAD INTERSECTION. COORDINATES FOR "E132" ARE 371515.9390N AND 1308377.2110E, AND ELEVATION IS 60.01'.
  5. LOCATIONS OF UTILITIES ARE APPROXIMATE. THE CONTRACTOR SHALL COMPLETE UTILITY LOCATES PRIOR TO ANY EARTH DISTURBING ACTIVITIES.

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EVERETT SMELTER SITE LOWLAND AREA REMEDIAL ACTION  
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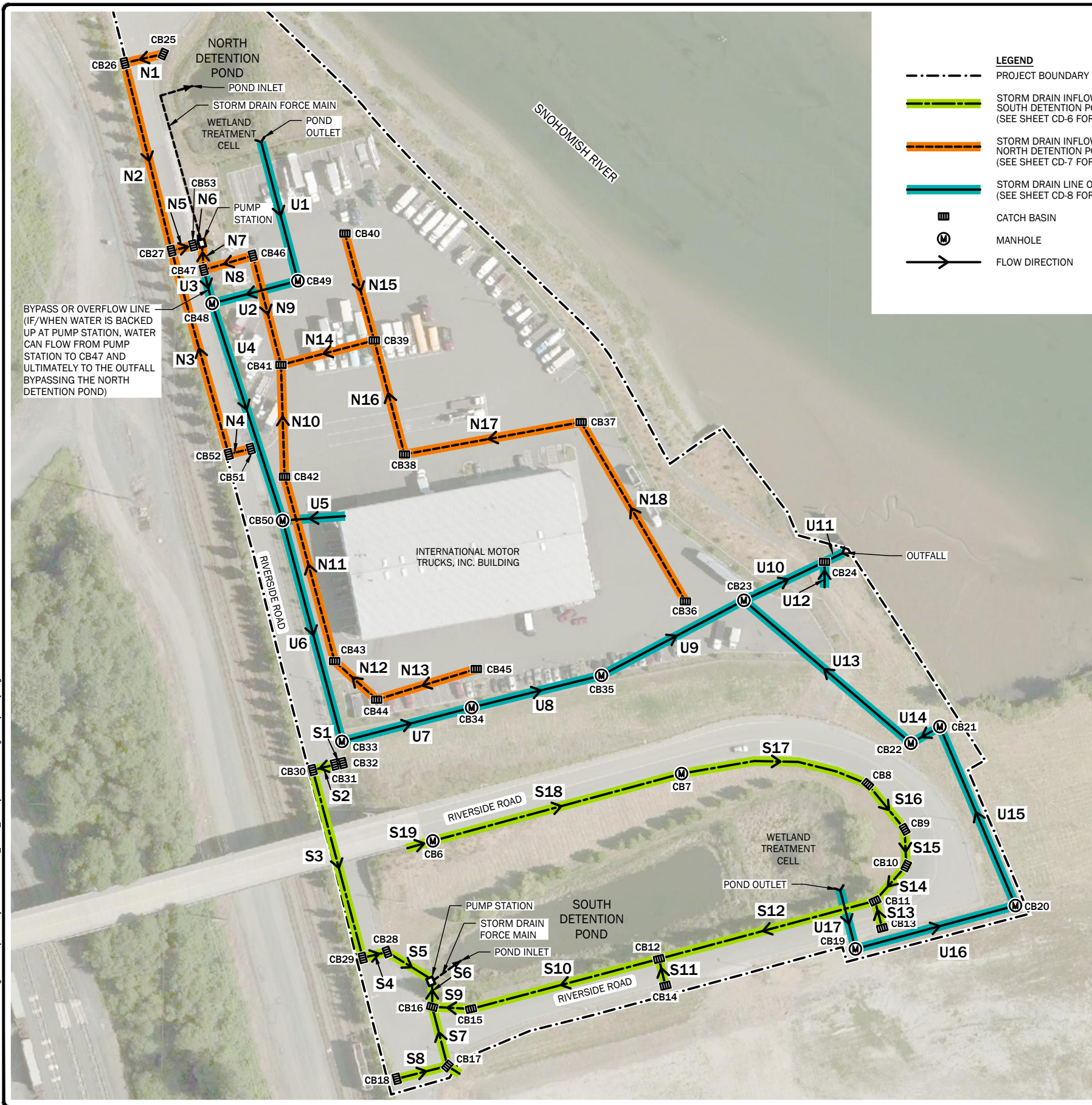
**AREA B2 EXISTING SITE PLAN (2 OF 2)**

DRAWN: TJM	PROJ NO:
DESIGN: WC	SHEET 5 OF 20
CHECKED: ARJ	DATE: 06.29.2018
SHEET NO.	<b>CD-4</b>

**DRAFT SUBMITTAL - NOT FOR CONSTRUCTION**



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- LEGEND**
- PROJECT BOUNDARY
  - STORM DRAIN INFLOW NETWORK TO SOUTH DETENTION POND (SEE SHEET CD-6 FOR CONDITIONS)
  - STORM DRAIN INFLOW NETWORK TO NORTH DETENTION POND (SEE SHEET CD-7 FOR CONDITIONS)
  - STORM DRAIN LINE OUTFLOW NETWORK (SEE SHEET CD-8 FOR CONDITIONS)
  - ▣ CATCH BASIN
  - ⊙ MANHOLE
  - FLOW DIRECTION

**EXISTING STORM DRAIN SYSTEM DETAILS**

Storm Drain Segment ID	Upgradient Storm Drain Structures		Downgradient Storm Drain Structures		Approximate Segment Length (feet)	Pipe Diameter (inches)	Pipe Material	Pipe Invert Elevation (feet, NAVD88)	
	Structure Type	ID	Structure Type	ID				Upgradient	Downgradient
<b>Inflow Network to South Detention Pond</b>									
S1	CB	CB32	CB	CB31	7	6	PVC	10.7	10.2
S2	CB	CB31	CB	CB30	24	12	CPP	10.2	9.0
S3	CB	CB30	CB	CB29	202	12	CPP	9.0	8.3
S4	CB	CB29	CB	CB28	24	12	CPP	8.4	8.5
S5	CB	CB28	NA	Pump Station	50	12	CPP	8.5	NA
S6	CB	CB16	NA	Pump Station	21	18	CPP	6.6	NA
S7	CB	CB17	CB	CB16	61	18	CPP	9.2	6.7
S8	CB	CB18	CB	CB17	54	12	CPP	9.3	9.2
S9	CB	CB15	CB	CB16	43	12	CPP	9.2	8.8
S10	CB	CB12	CB	CB15	200	12	CPP	10.9	9.4
S11	CB	CB14	CB	CB12	28	12	CPP	10.9	11.0
S12	CB	CB11	CB	CB12	230	12	CPP	12.7	10.9
S13	CB	CB13	CB	CB11	29	12	CPP	12.9	12.7
S14	CB	CB10	CB	CB11	49	12	CPP	12.9	12.7
S15	CB	CB9	CB	CB10	36	12	CPP	13.0	12.9
S16	CB	CB8	CB	CB9	64	12	CPP	13.7	13.1
S17	CB	CB7	CB	CB8	196	12	PVC	24.7	13.6
S18	CB	CB6	CB	CB7	265	12	PVC	37.7	24.8
S19	NA	NA	CB	CB6	>38	12	PVC	NA	38.9
<b>Inflow Network to North Detention Pond</b>									
N1	CB	CB25	CB	CB26	41	12	CPP	9.4	9.1
N2	CB	CB26	CB	CB27	201	12	CPP	9.0	7.6
N3	CB	CB52	CB	CB27	216	12	CPP	9.6	7.6
N4	CB	CB51	CB	CB52	24	12	CPP	9.5	9.6
N5	CB	CB27	CB	CB53	22	12	CPP	7.6	7.7
N6	CB	CB53	Pump Station	Pump Station	2	12	CPP	NA	NA
N7	CB	CB47	Pump Station	Pump Station	24	6	CPP	NA	8.1
N8	CB	CB46	CB	CB47	39	15	CPP	8.7	8.2
N9	CB	CB41	CB	CB46	113	15	CPP	9.6	8.8
N10	CB	CB42	CB	CB41	115	15	CPP	10.7	9.6
N11	CB	CB43	CB	CB42	196	12	CPP	12.1	10.7
N12	CB	CB44	CB	CB43	60	12	CPP	NA	12.1
N13	CB	CB45	CB	CB44	108	12	CPP	13.3	NA
N14	CB	CB39	CB	CB41	99	15	CPP	10.4	9.6
N15	CB	CB40	CB	CB39	113	12	CPP	12.7	10.7
N16	CB	CB38	CB	CB39	121	12	CPP	11.5	10.7
N17	CB	CB37	CB	CB38	184	12	CPP	12.6	11.5
N18	CB	CB36	CB	CB37	211	12	CPP	14.0	12.6
<b>Outflow Network</b>									
U1	Pond Outlet	North Pond	MH	CB49	148	24	CPP	9.78*	6.8
U2	MH	CB49	MH	CB48	78	24	CPP	6.9	6.7
U3	CB	CB47	MH	CB48	37	15	CPP	NA	NA
U4	MH	CB48	MH	CB50	236	18	CPP	6.7	5.3
U5	NA	Roof Drain	MH	CB50	62	6	PVC	NA	12.5
U6	MH	CB50	MH	CB33	234	18	CPP	5.4	5.1
U7	MH	CB33	MH	CB34	136	NA	NA	5.1	4.41*
U8	MH	CB34	MH	CB35	136	NA	NA	4.41*	NA
U9	MH	CB35	MH	CB23	167	NA	NA	NA	NA
U10	MH	CB23	CB	CB24	92	24	Steel	NA	4.1
U11	CB	CB24	Storm Pipe	Outfall	26	24	Steel	4.1	2.6
U12	NA**	NA**	CB	CB24	>51.5	12	PVC	NA	NA
U13	MH	CB22	MH	CB23	224	24	CPP	4.9	NA
U14	MH	CB21	MH	CB22	30	24	CPP	5.3	5.0
U15	MH	CB20	MH	CB21	201	24	CPP	7.45*	5.8
U16	MH	CB19	MH	CB20	173	24	CPP	9.2	7.45*
U17	Pond Outlet	South Pond	MH	CB19	64	24	CPP	9.78*	9.4

**NOTES:**

1. CB = CATCH BASIN; MH = MANHOLE; CPP = CORRUGATED POLYETHYLENE PIPE; PVC = POLYVINYL CHLORIDE PIPE; NA = NOT AVAILABLE OR NOT KNOWN.
2. STORM DRAIN SYSTEM DETAILS ARE BASED ON SURVEY COMPLETED BY DAVID, EVANS AND ASSOCIATES, INC. IN DECEMBER 2016 UNLESS OTHERWISE SPECIFIED.

\* INFORMATION OBTAINED FROM THE PORT OF EVERETT RECORD DRAWINGS OF RIVERSIDE BUSINESS PARK, OCT, 2001, DRAWING SHEETS C2.1 TO C2.5 AND C5.3 TO C5.9.

\*\* THE PIPE WAS IDENTIFIED TO BE PLUGGED PER PORT OF EVERETT 2001 RECORD DRAWINGS.

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EVERETT SMELTER SITE LOWLAND AREA REMEDIAL ACTION  
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**AREA B2 EXISTING STORM DRAIN SYSTEM**

DRAWN: TJM	PROJ NO:
DESIGN: WC	SHEET 6 OF 20
CHECKED: ARJ	DATE: 06.29.2018
SHEET NO.	<b>CD-5</b>

**DRAFT SUBMITTAL - NOT FOR CONSTRUCTION**



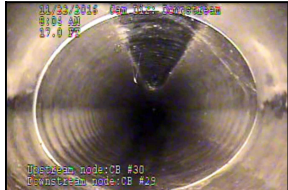
Plotted: 06/29/2019, 12:48 | Imichaud | P:\0504068\CAD\02\Design\_Sheets | Area B2\1R0010504\68802\_Sht07\_CD-6 | Area B2 SD Defects - South Detention Pond.dwg

**SEGMENT S2: CB30 – CB31**



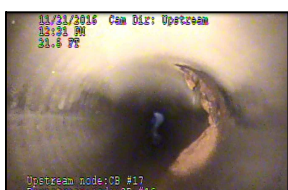
PIPE JOINT OFFSET AT 11 FT FROM CB31

**SEGMENT S3: CB29 – CB30**



DEFORMED PIPE AT 17 FT FROM CB30

**SEGMENT S7: CB16 – CB17**



DEPOSIT AND INFILTRATION AT 26 FT FROM CB16

**SEGMENT S8: CB17 – CB18**



SAGGED PIPE AT 18 FT FROM CB18



JOINT OFFSET AT 27 FT FROM CB18



FRACTURE AT 41 FT FROM CB18



FRACTURE AT 51 FT FROM CB18

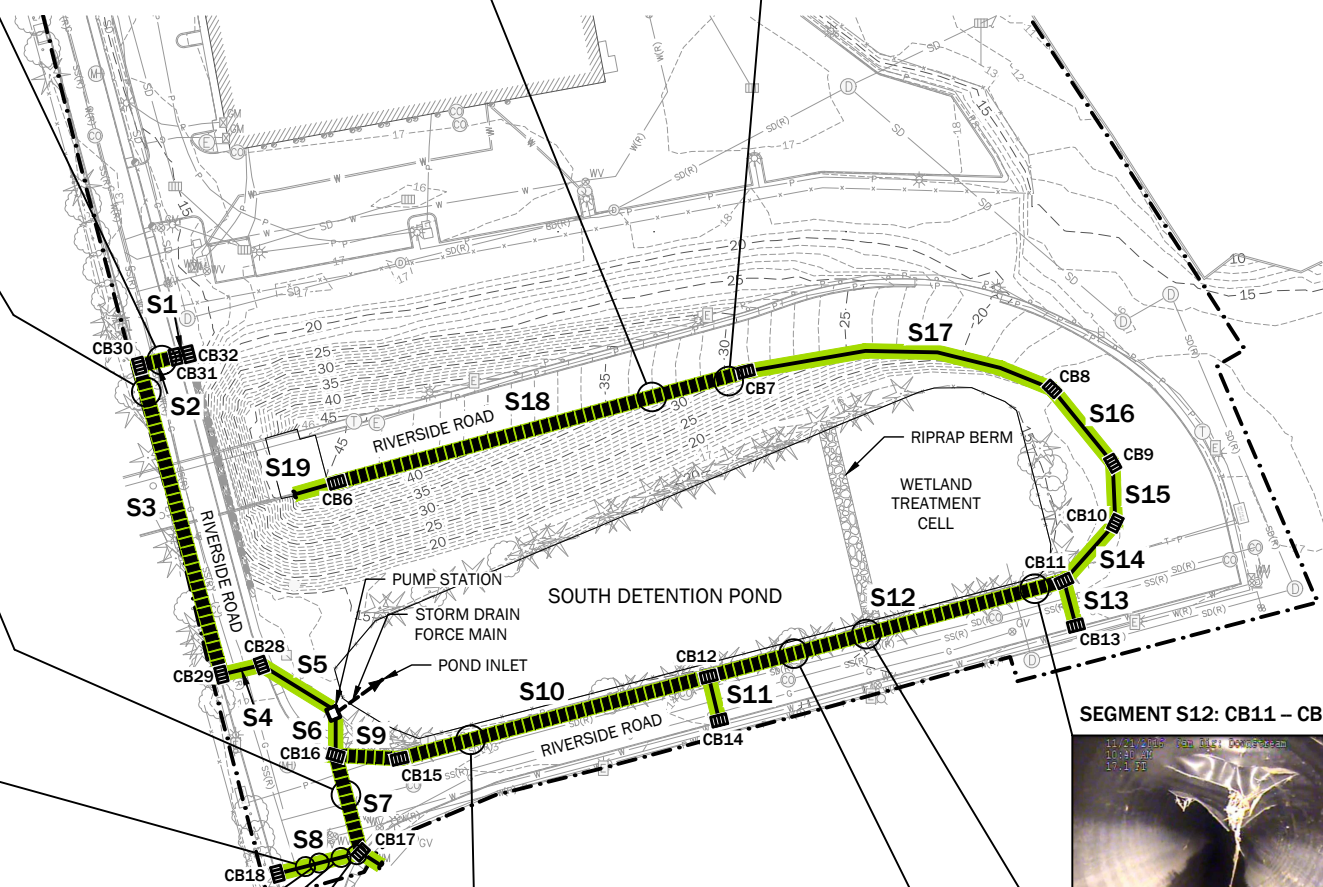
**SEGMENT S18: CB6 – CB7**



DEFORMED PIPE AT 204 FT FROM CB6



JOINT OFFSET AT 242 FT FROM CB6



**SEGMENT S10: CB12 – CB15**



CRACK ON PIPE AT 154 FT FROM CB12



CRACK ON PIPE AT 55 FT FROM CB12

**SEGMENT S12: CB11 – CB12**



BROKEN PIPE AT 19 FT FROM CB11



DEFORMED PIPE AT 102 FT FROM CB12



CRACK ON PIPE AT 55 FT FROM CB12

**LEGEND**

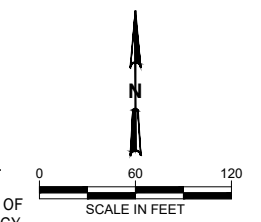
- PROJECT BOUNDARY
- S14** STORM DRAIN SEGMENT ID NUMBER
- ██████████ STORM DRAIN SEGMENT WITH DEFECTS
- ██████████ STORM DRAIN
- ▣ CATCH BASIN
- Ⓜ MANHOLE

**SUMMARY OF EXISTING STORM DRAIN CONDITIONS  
INFLOW NETWORK TO SOUTH DETENTION POND**

STORM DRAIN SEGMENT ID	VIDEO SURVEY COMPLETED (YES/NO/ABANDONED)	DEBRIS OR SEDIMENT IN STORM PIPE	STORM PIPE DEFECTS					
			BROKEN/FRACTURE	DEFORMED	CRACKS	JOINT SEPARATION	SAG	INFILTRATION
S1	YES							
S2	YES					X		
S3	YES	X		X				
S4	YES	X						
S5	YES	X						
S6	YES							
S7	YES	X						X
S8	YES	X	X			X	X	
S9	YES							
S10	ABANDONED <sup>a</sup>	X			X			
S11	ABANDONED <sup>b</sup>	X						
S12	ABANDONED <sup>c</sup>	X	X	X	X			
S13	YES	X						
S14	ABANDONED <sup>d</sup>	X						
S15	YES	X						
S16	YES	X						
S17	YES			X			X	
S18	YES							
S19	ABANDONED <sup>e</sup>	X						

- TABLE NOTES:**
- a TWO VIDEO SURVEYS COMPLETED. VIDEO SURVEY WAS STARTED AT CB12 AND ABANDONED AT 188.9 FEET DUE TO DEBRIS. VIDEO SURVEY WAS STARTED AT CB15 AND ABANDONED AT 9.9 FEET DUE TO DEBRIS.
  - b TWO VIDEO SURVEYS COMPLETED. VIDEO SURVEY WAS STARTED AT CB12 AND ABANDONED AT 13.5 FEET DUE TO DEBRIS. VIDEO SURVEY WAS STARTED AT CB14 AND ABANDONED AT 6.1 FEET DUE TO DEBRIS.
  - c TWO VIDEO SURVEYS COMPLETED. VIDEO SURVEY WAS STARTED AT CB11 AND ABANDONED AT 19.3 FEET DUE TO BROKEN PIPE. VIDEO SURVEY WAS STARTED AT CB12 AND ABANDONED AT 212.5 FEET DUE TO BROKEN PIPE.
  - d VIDEO SURVEY WAS STARTED AT CB11 AND ABANDONED AT 10.5 FEET DUE TO DEBRIS.
  - e VIDEO SURVEY WAS STARTED AT CB6 AND ABANDONED AT 38.3 FEET DUE TO DEBRIS.

- GENERAL NOTES:**
1. THE EXISTING STORM PIPE DEFECTS AS SHOWN ON THIS DRAWING ARE SNAPSHOTS OF THE VIDEO SURVEYS PERFORMED IN 2017 AND 2018 BY ECOLOGY AND ARE INTENDED FOR ILLUSTRATION. THE ORIGINAL VIDEOS AND INSPECTION REPORTS ARE INCLUDED IN THE CONTRACT DOCUMENTS FOR CONTRACTOR'S REVIEW. CONTRACTOR IS SOLELY RESPONSIBLE FOR REVIEWING VIDEO SURVEYS PERFORMED BY ECOLOGY AND VERIFYING STORM DRAIN PIPE DEFECTS THAT REQUIRE REPAIRS.
  2. THE CONTRACTOR SHALL BE RESPONSIBLE FOR PERFORMING PRE-INSTALLATION VIDEO INSPECTIONS AS REQUIRED IN THE CONTRACT DOCUMENTS. ADDITIONAL STORM PIPE DEFECTS MAY BE IDENTIFIED AFTER THE PRE-INSTALLATION PRESSURE WASHING AND VIDEO INSPECTIONS TO BE CONDUCTED BY THE CONTRACTOR AS PART OF THE CONTRACT WORK.
  3. CONTRACTOR SHALL INSPECT CATCH BASINS AND MANHOLES AS PART OF THE PRE-INSTALLATION INSPECTION.
  4. AFTER THE PRE-INSTALLATION VIDEO INSPECTION, THE CONTRACTOR SHALL SUBMIT A LOG WITH DESCRIPTION OF IDENTIFIED STORM PIPE, CATCH BASIN AND MANHOLES DEFECTS AND PROPOSED REPAIR METHODS TO ECOLOGY FOR REVIEW AND APPROVAL.



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EVERETT SMELTER SITE LOWLAND AREA REMEDIAL ACTION  
REMEDIAL ACTION AREAS B2, C2 AND C3  
EVERETT, WASHINGTON

**AREA B2 STORM DRAIN DEFECTS -  
INFLOW NETWORK TO SOUTH DETENTION POND**

DRAWN: TJM | PROJ NO:  
DESIGN: WC | SHEET 7 OF 20  
CHECKED: ARJ | DATE: 06.29.2018  
SHEET NO. **CD-6**

**DRAFT SUBMITTAL - NOT FOR CONSTRUCTION**



Plotted: 06/29/2019, 12:49 | imichaud | P:\0504068\CAD\02\Design\_Sheets | Area B2\IR001050406802\_Sht08\_CD-7 | Area B2 SD Defects - North Detention Pond.dwg

**SEGMENT N2: CB26 – CB27**



DEFORMED PIPE AT 20 FT FROM CB26



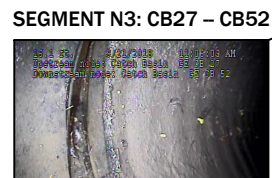
SAGGED PIPE AT 35 FT FROM CB26



FRACTURE ON PIPE AT 146 FT FROM CB27



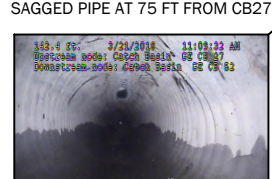
BROKEN PIPE AT 90 FT FROM CB27



JOINT OFFSET AT 16 FT FROM CB27



SAGGED PIPE AT 75 FT FROM CB27

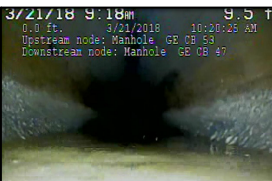


DEFORMED PIPE AT 143 FT FROM CB27



DEFORMED PIPE AT 199 FT FROM CB27

**SEGMENT N7: CB47 – CB53**



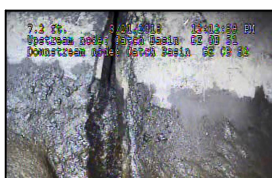
SAGGED PIPE AT 11 FT FROM CB47

**SEGMENT N14: CB39 – CB41**

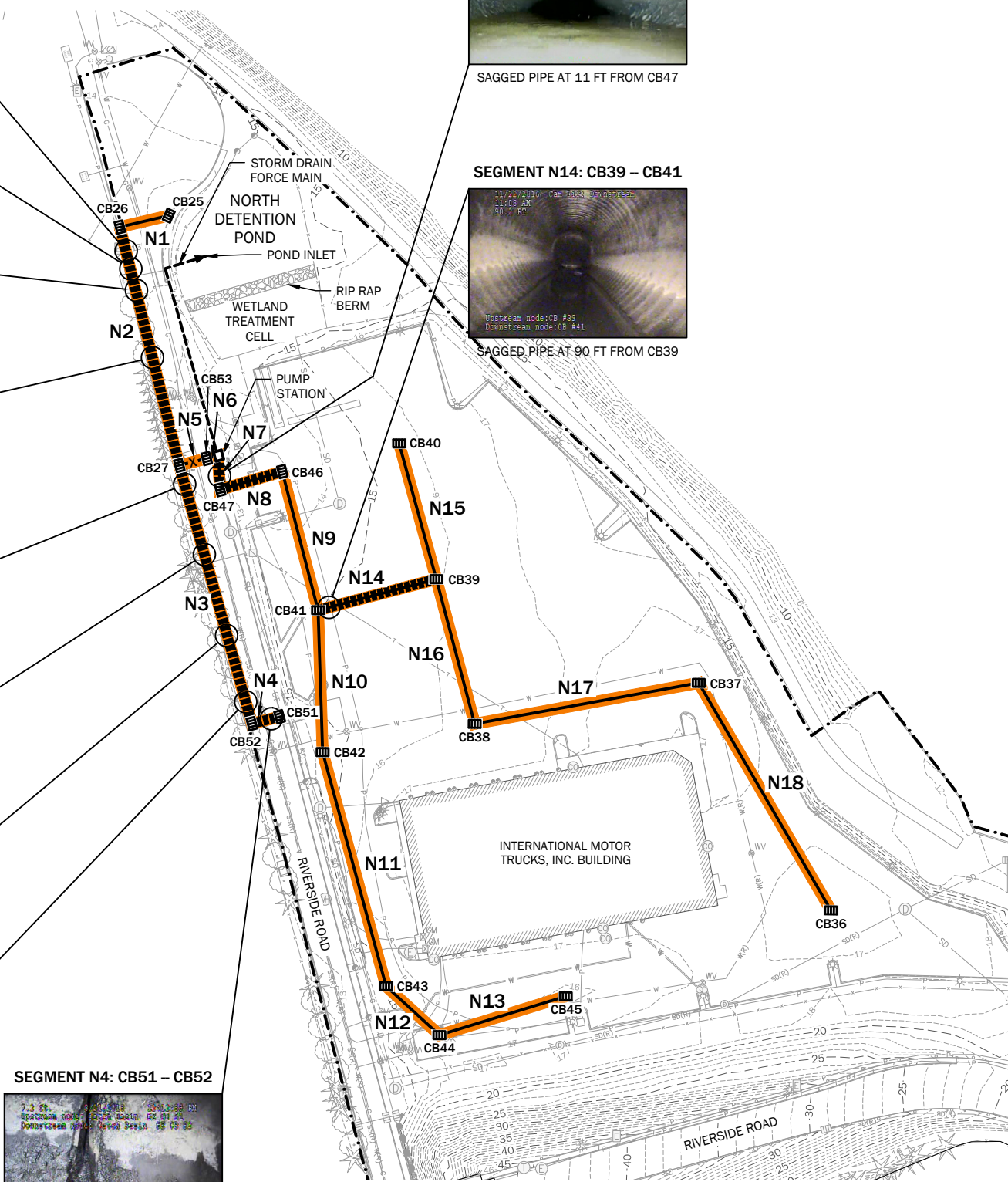


SAGGED PIPE AT 90 FT FROM CB39

**SEGMENT N4: CB51 – CB52**



JOINT OFFSET AT 7 FT FROM CB51



**LEGEND**

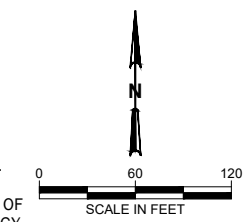
- PROJECT BOUNDARY
- N6** STORM DRAIN SEGMENT ID NUMBER
- ██████████ STORM DRAIN SEGMENT WITH DEFECTS
- ██████████ STORM DRAIN
- X-X-X- CONDITIONS COULD NOT BE ASSESSED SINCE THE SEGMENT REMAINED INUNDATED WITH WATER DURING THE VIDEO SURVEY
- ▣ CATCH BASIN
- Ⓜ MANHOLE

**SUMMARY OF EXISTING STORM DRAIN CONDITIONS  
INFLOW NETWORK TO NORTH DETENTION POND**

STROM DRAIN SEGMENT ID	VIDEO SURVEY COMPLETED (YES/NO/ABANDONED)	DEBRIS OR SEDIMENT IN STORM PIPE	STORM PIPE DEFECTS					
			BROKEN/FRACTURE	DEFORMED	CRACKS	JOINT SEPARATION	SAG	INFILTRATION
N1	YES	X						
N2	ABANDONED <sup>a</sup>	X	X	X			X	
N3	YES	X		X		X	X	
N4	YES	X				X		
N5	NO <sup>b</sup>							
N6	YES							
N7	YES						X	
N8	YES							
N9	YES							
N10	YES	X						
N11	YES							
N12	YES							
N13	YES							
N14	YES						X	
N15	YES							
N16	YES							
N17	YES							
N18	YES							

**TABLE NOTES:**  
 a TWO VIDEO SURVEYS COMPLETED. VIDEO SURVEY STARTED AT CB26 WAS ABANDONED AT 37.6 FEET DUE TO DEBRIS AND CAMERA UNDERWATER. VIDEO SURVEY STARTED AT CB27 WAS ABANDONED AT 149.1 FEET DUE TO DEBRIS AND CAMERA UNDERWATER.  
 b VIDEO SURVEY COULD NOT BE PERFORMED AS THE SEGMENT WAS INUNDATED WITH WATER.

**GENERAL NOTES:**  
 1. THE EXISTING STORM PIPE DEFECTS AS SHOWN ON THIS DRAWING ARE SNAPSHOTS OF THE VIDEO SURVEYS PERFORMED IN 2017 AND 2018 BY ECOLOGY AND ARE INTENDED FOR ILLUSTRATION. THE ORIGINAL VIDEOS AND INSPECTION REPORTS ARE INCLUDED IN THE CONTRACT DOCUMENTS FOR CONTRACTOR'S REVIEW. CONTRACTOR IS SOLELY RESPONSIBLE FOR REVIEWING VIDEO SURVEYS PERFORMED BY ECOLOGY AND VERIFYING STORM DRAIN PIPE DEFECTS THAT REQUIRE REPAIRS.  
 2. THE CONTRACTOR SHALL BE RESPONSIBLE FOR PERFORMING PRE-INSTALLATION VIDEO INSPECTIONS AS REQUIRED IN THE CONTRACT DOCUMENTS. ADDITIONAL STORM PIPE DEFECTS MAY BE IDENTIFIED AFTER THE PRE-INSTALLATION PRESSURE WASHING AND VIDEO INSPECTIONS TO BE CONDUCTED BY THE CONTRACTOR AS PART OF THE CONTRACT WORK.  
 3. CONTRACTOR SHALL INSPECT CATCH BASINS AND MANHOLES AS PART OF THE PRE-INSTALLATION INSPECTION.  
 4. AFTER THE PRE-INSTALLATION VIDEO INSPECTION, THE CONTRACTOR SHALL SUBMIT A LOG WITH DESCRIPTION OF IDENTIFIED STORM PIPE, CATCH BASIN AND MANHOLES DEFECTS AND PROPOSED REPAIR METHODS TO ECOLOGY FOR REVIEW AND APPROVAL.



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 EVERETT, WASHINGTON

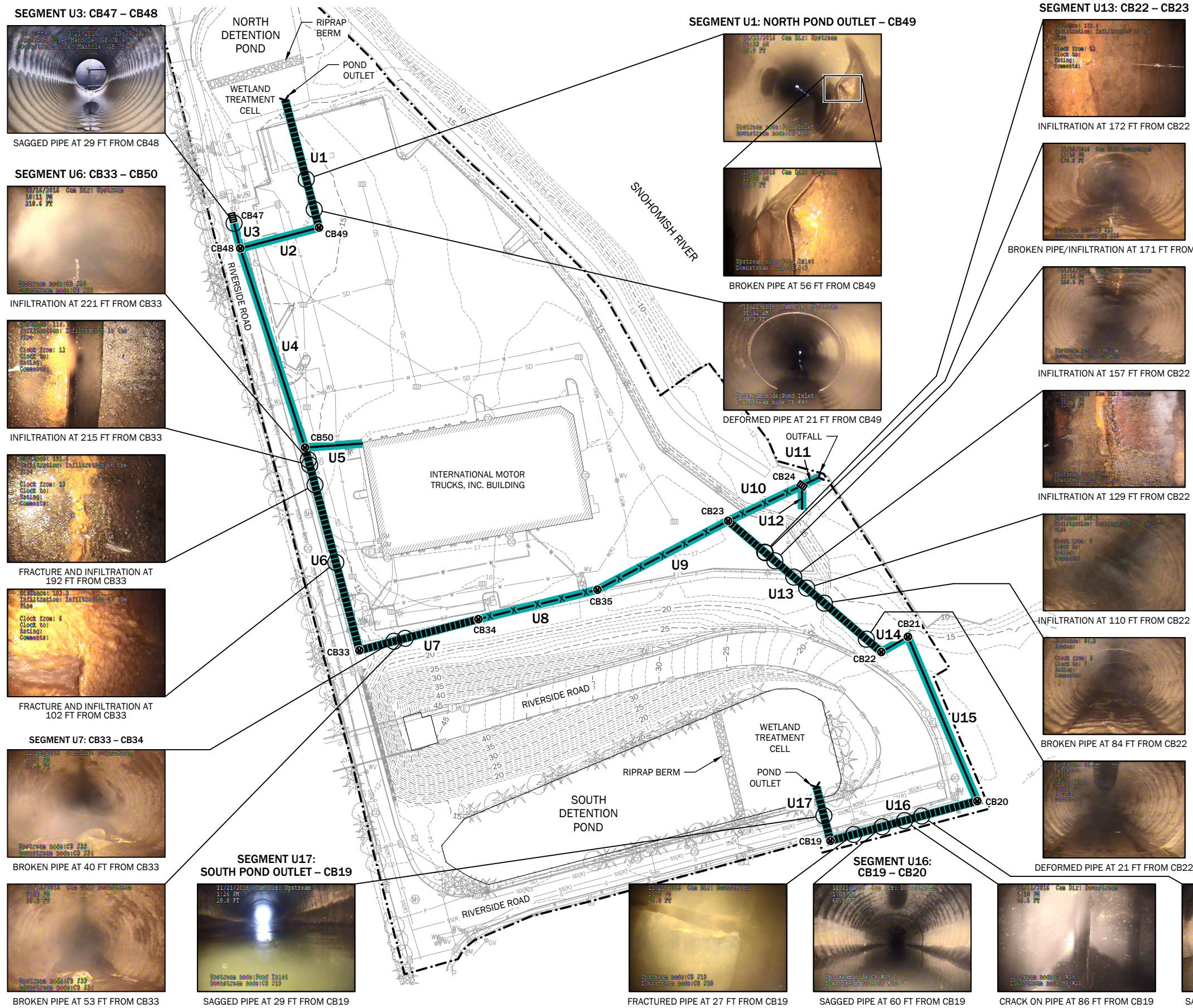
**AREA B2 STORM DRAIN DEFECTS -  
 INFLOW NETWORK TO NORTH DETENTION POND**

DRAWN: TJM	PROJ NO:
DESIGN: WC	SHEET 8 OF 20
CHECKED: ARJ	DATE: 06.29.2018
SHEET NO.	<b>CD-7</b>

**DRAFT SUBMITTAL - NOT FOR CONSTRUCTION**



Plotted: 06/29/2019, 12:50 | t:imichaud | P:\0504068\CAD\02\Design\_Sheets\Area B2\IR00050406802\_Sht09\_CD-8\Area B2 SD Defects - Outflow Network.dwg



**LEGEND**

- PROJECT BOUNDARY
- U6 STORM DRAIN SEGMENT ID NUMBER
- ██████████ STORM DRAIN SEGMENT WITH DEFECTS
- ██████████ STORM DRAIN
- X-X-X- CONDITIONS COULD NOT BE ASSESSED SINCE THE SEGMENT REMAINED INUNDATED WITH WATER DURING THE VIDEO SURVEY
- CATCH BASIN
- ⊙ MANHOLE

**SUMMARY OF EXISTING STORM DRAIN CONDITIONS  
OUTFLOW NETWORK**

STORM DRAIN SEGMENT ID	VIDEO SURVEY COMPLETED (YES/NO/ABANDONED)	DEBRIS OR SEDIMENT IN STORM PIPE	STORM PIPE DEFECTS					
			BROKEN/FRACTURE	DEFORMED	CRACKS	JOINT SEPARATION	SAG	INFILTRATION
U1	YES		X	X				
U2	YES							
U3	YES						X	
U4	YES							
U5	YES							
U6	YES		X		X			X
U7	YES	X	X					
U8	ABANDONED <sup>a</sup>	X						
U9	NO <sup>b</sup>	X						
U10	NO <sup>b</sup>	X						
U11	YES							
U12	ABANDONED <sup>c</sup>	X						
U13	YES		X	X				X
U14	YES							
U15	YES							
U16	YES		X		X		X	
U17	YES						X	

**TABLE NOTES:**

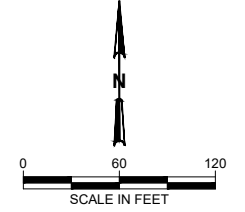
a VIDEO SURVEY WAS STARTED AT CB34 AND ABANDONED AT 124.2 FEET DUE TO CAMERA UNDERWATER. THE SURVEYED PORTION OF THE SEGMENT WAS ALSO PARTIALLY/FULLY INUNDATED WITH WATER AND THEREFORE CONDITIONS COULD NOT BE ASSESSED.

b VIDEO SURVEY COULD NOT BE PERFORMED AS THE SEGMENT WAS INUNDATED WITH WATER.

c VIDEO SURVEY WAS STARTED AT CB24 AND ABANDONED AT 51.5 FEET DUE TO DEBRIS. THE PORT OF EVERETT 2001 RECORD DRAWINGS IDENTIFY THIS LINE TO BE PLUGGED.

**GENERAL NOTES:**

- THE EXISTING STORM PIPE DEFECTS AS SHOWN ON THIS DRAWING ARE SNAPSHOTS OF THE VIDEO SURVEYS PERFORMED IN 2017 AND 2018 BY ECOLOGY AND ARE INTENDED FOR ILLUSTRATION. THE ORIGINAL VIDEOS AND INSPECTION REPORTS ARE INCLUDED IN THE CONTRACT DOCUMENTS FOR CONTRACTOR'S REVIEW. CONTRACTOR IS SOLELY RESPONSIBLE FOR REVIEWING VIDEO SURVEYS PERFORMED BY ECOLOGY AND VERIFYING STORM DRAIN PIPE DEFECTS THAT REQUIRE REPAIRS.
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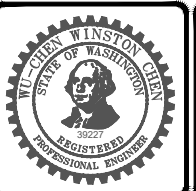


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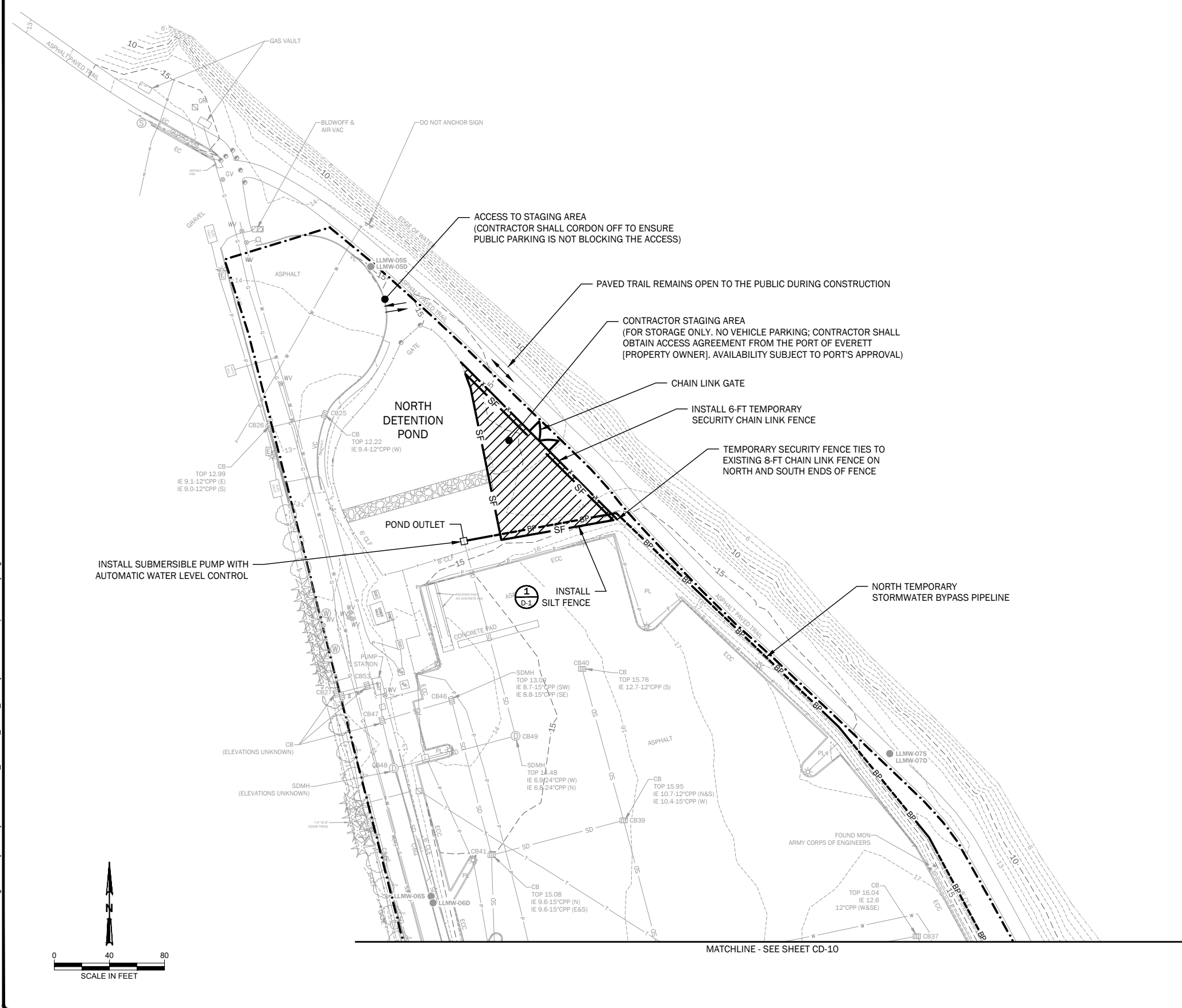
**AREA B2 STORM DRAIN DEFECTS -  
OUTFLOW NETWORK TO OUTFALL**

DRAWN: TJM	PROJ NO:
DESIGN: WC	SHEET 9 OF 20
CHECKED: ARJ	DATE: 06.29.2018
SHEET NO.	<b>CD-8</b>

**DRAFT SUBMITTAL - NOT FOR CONSTRUCTION**



Plotted: 06/29/2019, 12:51 | imichaud | P:\0504068\CAD\02\Design\_Sheets\Area B2\10-11\_CD-09\_CD-10\Area B2 Site Prep and TESC.dwg

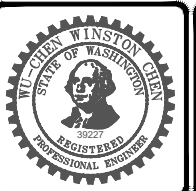


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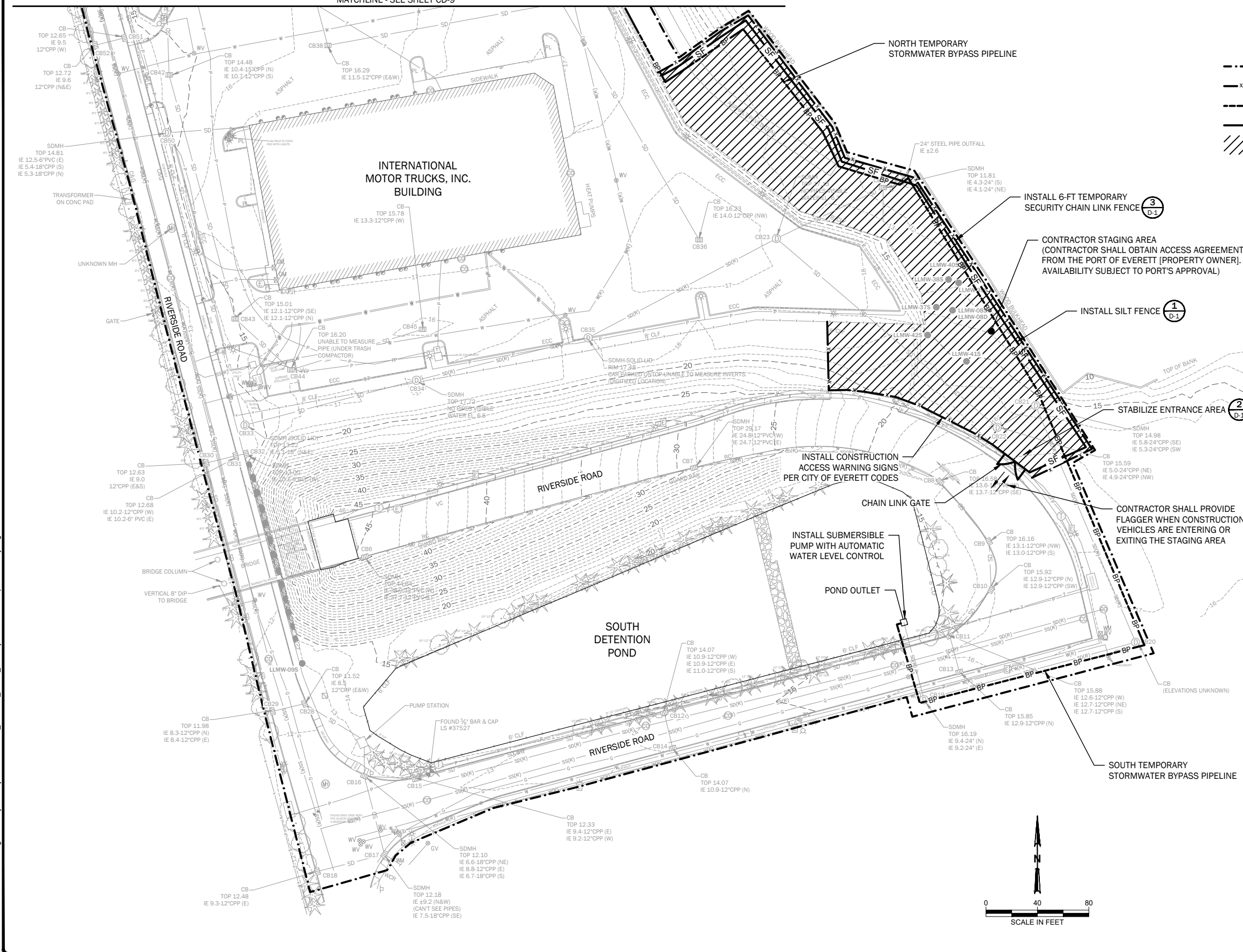
EVERETT SMELTER SITE LOWLAND AREA REMEDIAL ACTION  
REMEDIAL ACTION AREAS B2, C2 AND C3  
EVERETT, WASHINGTON

**AREA B2 SITE PREPARATION AND TESC PLAN (1 OF 2)**

DRAWN: TJM	PROJ NO:
DESIGN: WC	SHEET 10 OF 20
CHECKED: ARJ	DATE: 06.29.2018
SHEET NO.	<b>CD-9</b>

**DRAFT SUBMITTAL - NOT FOR CONSTRUCTION**

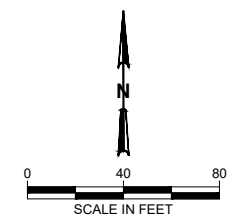
MATCHLINE - SEE SHEET CD-9



**LEGEND**

- PROJECT BOUNDARY
- x-x-x- TEMPORARY CHAIN LINK FENCE
- BP-BP- TEMPORARY STORMWATER BYPASS PIPELINE
- SF- SILT FENCE
- ▨ CONTRACTOR STAGING AREA
- LLMW-405 EXISTING MONITORING WELL

- NOTES:**
1. THE CONTRACTOR SHALL LOCATE ALL UTILITIES PRIOR TO PERFORMING EARTH DISTURBING ACTIVITIES.
  2. PROTECT EXISTING MONITORING WELLS LOCATED ON SITE INCLUDING WELLS LOCATED WITHIN THE CONTRACTOR STAGING AREA.
  3. INSTALL SILT FENCE OR SIMILAR AROUND AREAS THAT ARE EXCAVATED FOR POINT REPAIRS (SEE SHEET CD-11 FOR POINT REPAIR LOCATIONS).
  4. INSTALL TEMPORARY SECURITY FENCING IN ACTIVE STORM DRAIN WORK AREAS INCLUDING, BUT NOT LIMITED TO, CONTRACTOR STAGING AREA, DEMOLITION, HIGH-PRESSURE CLEANING, POINT REPAIRS, CIPP LINING AND SITE RESTORATION.
  5. TEMPORARILY COVER CATCH BASINS WITHIN THE PROJECT BOUNDARY WITH SOLID COVERS TO PREVENT STORMWATER RUNOFF FROM ENTERING THE STORM DRAIN LINES EXCEPT WHEN THE CATCH BASINS ARE BEING USED DURING WORK ACTIVITIES SUCH AS CLEANING, POINT REPAIR OR CIPP LINING.
  6. THE CONTRACTOR SHALL COMPLY WITH THE OSHA SAFETY REQUIREMENTS AT ALL TIMES INCLUDING WHEN WORKING INSIDE CONFINED SPACE SUCH AS A MANHOLE OR CATCH BASIN.
  7. THE CONTRACTOR STAGING AREA SHALL BE ESTABLISHED TO PROVIDE SUFFICIENT ROOM TO PARK CONTRACTOR EQUIPMENT AND VEHICLES.
  8. THE CONTRACTOR SHALL INSTALL TEMPORARY STORMWATER BYPASSES MEETING THE REQUIREMENTS IN THE DRAWINGS AND SPECIFICATIONS.
  9. INSTALL TEMPORARY BYPASSES AT THE LOCATIONS SHOWN ON THIS DRAWING. THE CONTRACTOR MAY PROPOSE BYPASS LINES MODIFICATION BASED ON FIELD CONDITIONS. THE CONTRACTOR SHALL SUBMIT A BYPASS PLAN FOR REVIEW AND APPROVAL BY ECOLOGY.
  10. THE CONTRACTOR SHALL INSPECT THE BYPASS PIPELINES DAILY AND DURING ACTIVE USE OF THE BYPASS. REPAIR ANY BROKEN PIPES OR LEAKS IMMEDIATELY. THE CONTRACTOR SHALL BE RESPONSIBLE FOR STORMWATER THAT IS SPILLED AND RELEASED, OR LEAKED WITHIN THE PROJECT AREA.



Plotted: 06/29/2019, 12:51 | imichaud | P:\05054068\CAD\02\Design\_Sheets | Area B2\Site Prep and TESC.dwg

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**AREA B2 SITE PREPARATION AND TESC PLAN (2 OF 2)**

DRAWN: TJM	PROJ NO:
DESIGN: WC	SHEET 11 OF 20
CHECKED: ARJ	DATE: 06.29.2018
SHEET NO.	<b>CD-10</b>

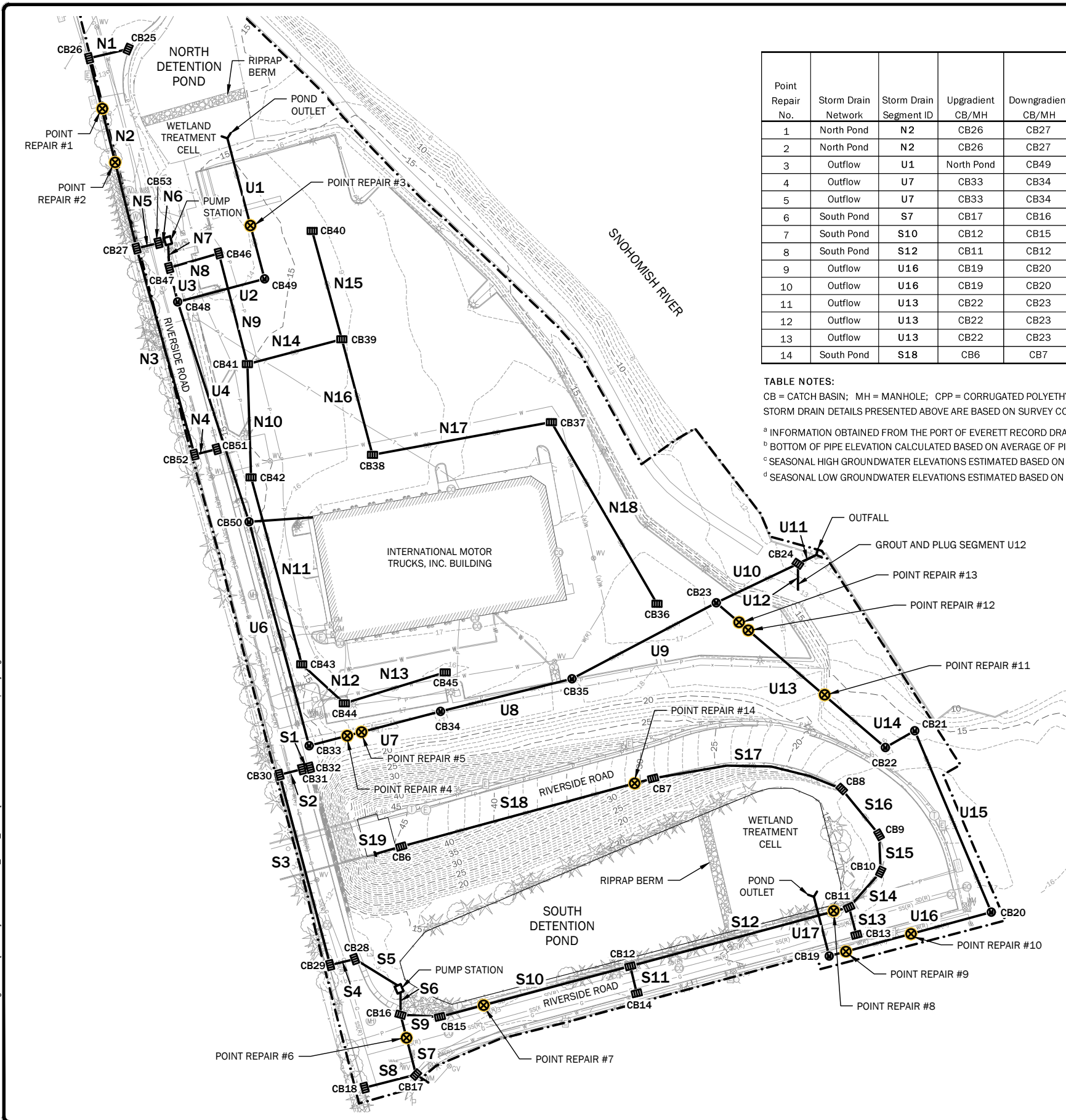
**DRAFT SUBMITTAL - NOT FOR CONSTRUCTION**



SUMMARY OF STORM DRAIN POINT REPAIRS INFORMATION

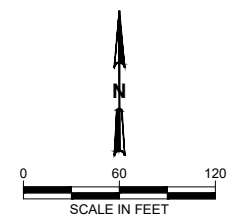
Point Repair No.	Storm Drain Network	Storm Drain Segment ID	Upgradient CB/MH	Downgradient CB/MH	Pipe Diameter (inches)	Pipe Material	Pipe Invert Elevation (feet, NAVD88)		Storm Pipe Defect and Approximate Point Repair Location	Approx. Ground Surface Elevation (feet, NAVD88)	Approx. Depth from Ground Surface to Bottom of Pipe <sup>b</sup> (feet)	Est. Seasonal High Groundwater Elevation <sup>c</sup> (feet, NAVD88)	Est. Seasonal Low Groundwater Elevation <sup>d</sup> (feet, NAVD88)
							Upgradient	Downgradient					
1	North Pond	N2	CB26	CB27	12	CPP	9.0	7.6	Fracture at 146 feet from CB27	12.8	4.5	8.5	6.5
2	North Pond	N2	CB26	CB27	12	CPP	9.0	7.6	Broken at 90 feet from CB27	12.8	4.5	8.5	6.5
3	Outflow	U1	North Pond	CB49	24	CPP	9.78 <sup>a</sup>	6.8	Broken at 56 feet from CB49	14.5	6.2	8.6	7.0
4	Outflow	U7	CB33	CB34	18	CPP	5.1	4.41 <sup>a</sup>	Broken at 40 feet from CB33	16.2	11.4	8.2	5.0
5	Outflow	U7	CB33	CB34	18	CPP	5.1	4.41 <sup>a</sup>	Broken at 53 feet from CB33	16.5	11.7	8.2	5.0
6	South Pond	S7	CB17	CB16	18	CPP	9.2	6.7	Deposit at 26 feet from CB16	12.1	4.2	8.5	6.0
7	South Pond	S10	CB12	CB15	12	CPP	10.9	9.4	Fracture at 154 feet from CB12	13.2	3.1	9.0	7.0
8	South Pond	S12	CB11	CB12	12	CPP	12.7	10.9	Broken at 19 feet from CB11	15.8	4.0	9.5	9.0
9	Outflow	U16	CB19	CB20	24	CPP	9.2	7.45 <sup>a</sup>	Fracture at 27 feet from CB19	14.5	6.2	9.5	8.5
10	Outflow	U16	CB19	CB20	24	CPP	9.2	7.45 <sup>a</sup>	Fracture at 86 feet from CB19	15.2	6.9	9.5	8.5
11	Outflow	U13	CB22	CB23	24	CPP	4.9	NA	Broken at 84 feet from CB22	16.2	11.3	8.5	6.0
12	Outflow	U13	CB22	CB23	24	CPP	4.9	NA	Broken at 157 feet from CB22	17.8	12.9	8.5	6.0
13	Outflow	U13	CB22	CB23	24	CPP	4.9	NA	Broken at 171 feet from CB22	17.8	12.9	8.5	6.0
14	South Pond	S18	CB6	CB7	12	CPP	37.7	24.8	Joint offset at 242 feet from CB6	30.0	5.0	8.5	6.0

TABLE NOTES:  
 CB = CATCH BASIN; MH = MANHOLE; CPP = CORRUGATED POLYETHYLENE PIPE; PVC = POLYVINYL CHLORIDE PIPE; NA = NOT AVAILABLE OR NOT KNOWN  
 STORM DRAIN DETAILS PRESENTED ABOVE ARE BASED ON SURVEY COMPLETED BY DAVID, EVANS AND ASSOCIATES, INC. IN DECEMBER 2016.  
<sup>a</sup> INFORMATION OBTAINED FROM THE PORT OF EVERETT RECORD DRAWINGS OF RIVERSIDE BUSINESS PARK, OCT, 2001, DRAWING SHEETS C2.1 TO C2.5 AND C5.3 TO C5.9.  
<sup>b</sup> BOTTOM OF PIPE ELEVATION CALCULATED BASED ON AVERAGE OF PIPE INVERT ELEVATIONS OF THE STORM PIPE SEGMENT IN UPGRADIENT AND DOWNGRADIENT MANHOLES/CATCH BASINS.  
<sup>c</sup> SEASONAL HIGH GROUNDWATER ELEVATIONS ESTIMATED BASED ON THE DECEMBER 5, 2017 SHALLOW AQUIFER GROUNDWATER SNAPSHOT ELEVATIONS DURING HIGH TIDE.  
<sup>d</sup> SEASONAL LOW GROUNDWATER ELEVATIONS ESTIMATED BASED ON THE AUGUST 21, 2017 SHALLOW AQUIFER GROUNDWATER SNAPSHOT ELEVATIONS DURING LOW TIDE.



- LEGEND**
- PROJECT BOUNDARY
  - U6 STORM DRAIN SEGMENT ID NUMBER
  - ⊗ POINT REPAIR LOCATION
  - ▣ CATCH BASIN
  - ⊙ MANHOLE
  - STORM DRAIN

- CONSTRUCTION NOTES:**
1. INSTALL TEMPORARY SECURITY FENCING OR BARRIER AND TRAFFIC CONTROL DEVICES (AS NECESSARY) AROUND THE POINT REPAIR AREAS DURING CONSTRUCTION ACTIVITIES.
  2. INSTALL SILT FENCE OR SIMILAR AROUND POINT REPAIR AREAS.
  3. POINT REPAIR BY EXCAVATION SHALL BE CONDUCTED IN ACCORDANCE WITH STANDARD TRENCH SECTION SHOWN ON DETAIL 4 OF SHEET D-2 UNLESS OTHERWISE APPROVED BY ECOLOGY.
  4. EXCAVATED MATERIAL SHALL BE MANAGED IN ACCORDANCE WITH THE REQUIREMENTS OF THE DRAWINGS AND SPECIFICATIONS.
  5. SAW CUT ASPHALT AND CONCRETE PAVEMENT WITHIN THE POINT REPAIR AREAS AS NECESSARY. CUTS SHALL BE STRAIGHT AND FREE OF RAGGED EDGES.
  6. STORM PIPE REPLACEMENT SECTION SHALL BE INSTALLED IN ACCORDANCE WITH PIPE BEDDING DETAILS SHOWN ON DETAIL 5 OF SHEET D-2.



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 REMEDIAL ACTION AREAS B2, C2 AND C3  
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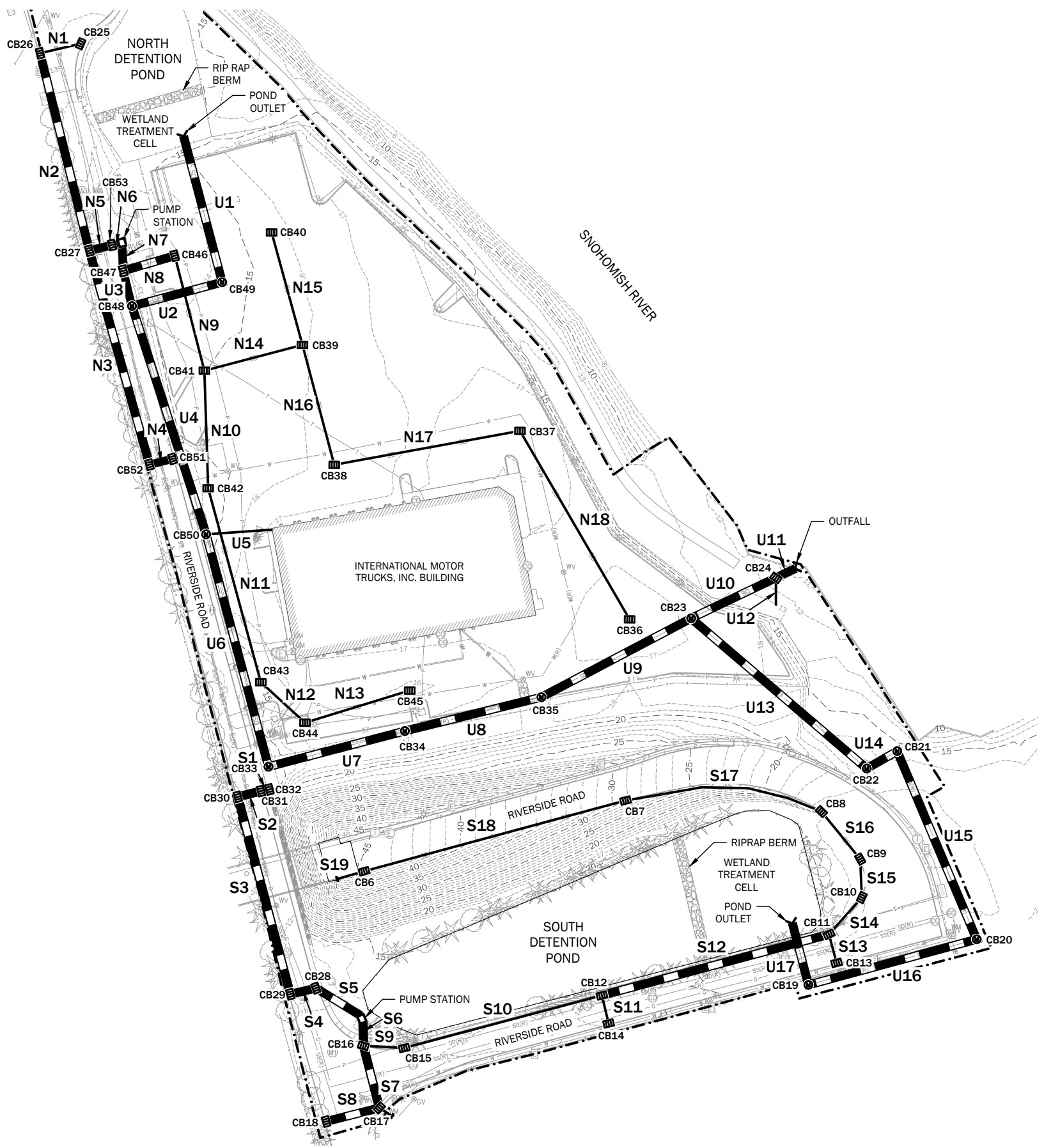
**AREA B2 STORM DRAIN POINT REPAIRS PLAN**

DRAWN: TJM	PROJ NO:
DESIGN: WC	SHEET 12 OF 20
CHECKED: ARJ	DATE: 06.29.2018
SHEET NO.	<b>CD-11</b>

Plotted: 06/29/2019, 12:52 | Imichaud | P:\0504068\CAD\02\Design\_Sheets | Area B2\Storm Drain Point Repairs.dwg

**DRAFT SUBMITTAL - NOT FOR CONSTRUCTION**

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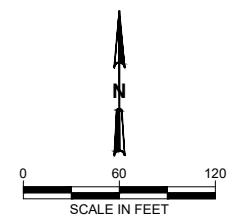
**LEGEND**

- PROJECT BOUNDARY
- S14** STORM DRAIN SEGMENT ID NUMBER
- STORM DRAIN THAT REQUIRES CIPP REHABILITATION
- STORM DRAIN PIPE
- CATCH BASIN
- MANHOLE

**SUMMARY OF CIPP REHABILITATION STORM DRAIN SEGMENTS**

Storm Drain Segment ID	Upgradient CB/MH	Downgradient CB/MH	Estimated Segment Length (feet)	Pipe Diameter (inches)	Pipe Material	Number of Point Repairs Required Prior to CIPP Rehab
<b>INFLOW NETWORK TO SOUTH DETENTION POND</b>						
S2	CB31	CB30	24	12	CPP	-
S3	CB30	CB29	202	12	CPP	-
S4	CB29	CB28	24	12	CPP	-
S5	CB28	Pump Station	50	12	CPP	-
S6	CB16	Pump Station	21	18	CPP	-
S7	CB17	CB16	61	18	CPP	1
S8	CB18	CB17	54	12	CPP	-
S12	CB11	CB12	230	12	CPP	1
<b>INFLOW NETWORK TO NORTH DETENTION POND</b>						
N2	CB26	CB27	201	12	CPP	2
N3	CB52	CB27	24	12	CPP	-
N4	CB51	CB52	214	12	CPP	-
N5	CB27	CB53	22	12	CPP	-
N6	CB53	Pump Station	2	12	CPP	-
N7	CB47	Pump Station	24	6	CPP	-
N8	CB46	CB47	39	15	CPP	-
<b>OUTFLOW NETWORK</b>						
U1	North Pond	CB49	148	24	CPP	1
U2	CB49	CB48	78	24	CPP	-
U3	CB47	CB48	37	15	CPP	-
U4	CB48	CB50	236	18	CPP	-
U6	CB50	CB33	234	18	CPP	-
U7	CB33	CB34	136	NA	NA	2
U8	CB34	CB35	136	NA	NA	-
U9	CB35	CB23	167	NA	NA	-
U10	CB23	CB24	92	24	Steel	-
U11	CB24	Outfall	26	24	Steel	-
U13	CB22	CB23	224	24	CPP	3
U14	CB21	CB22	30	24	CPP	-
U15	CB20	CB21	201	24	CPP	-
U16	CB19	CB20	173	24	CPP	2
U17	South Pond	CB19	64	24	CPP	-

**NOTES:**  
 CPP = CORRUGATED POLYETHYLENE PIPE  
 PVC = POLYVINYL CHLORIDE PIPE  
 NA = NOT AVAILABLE OR NOT KNOWN



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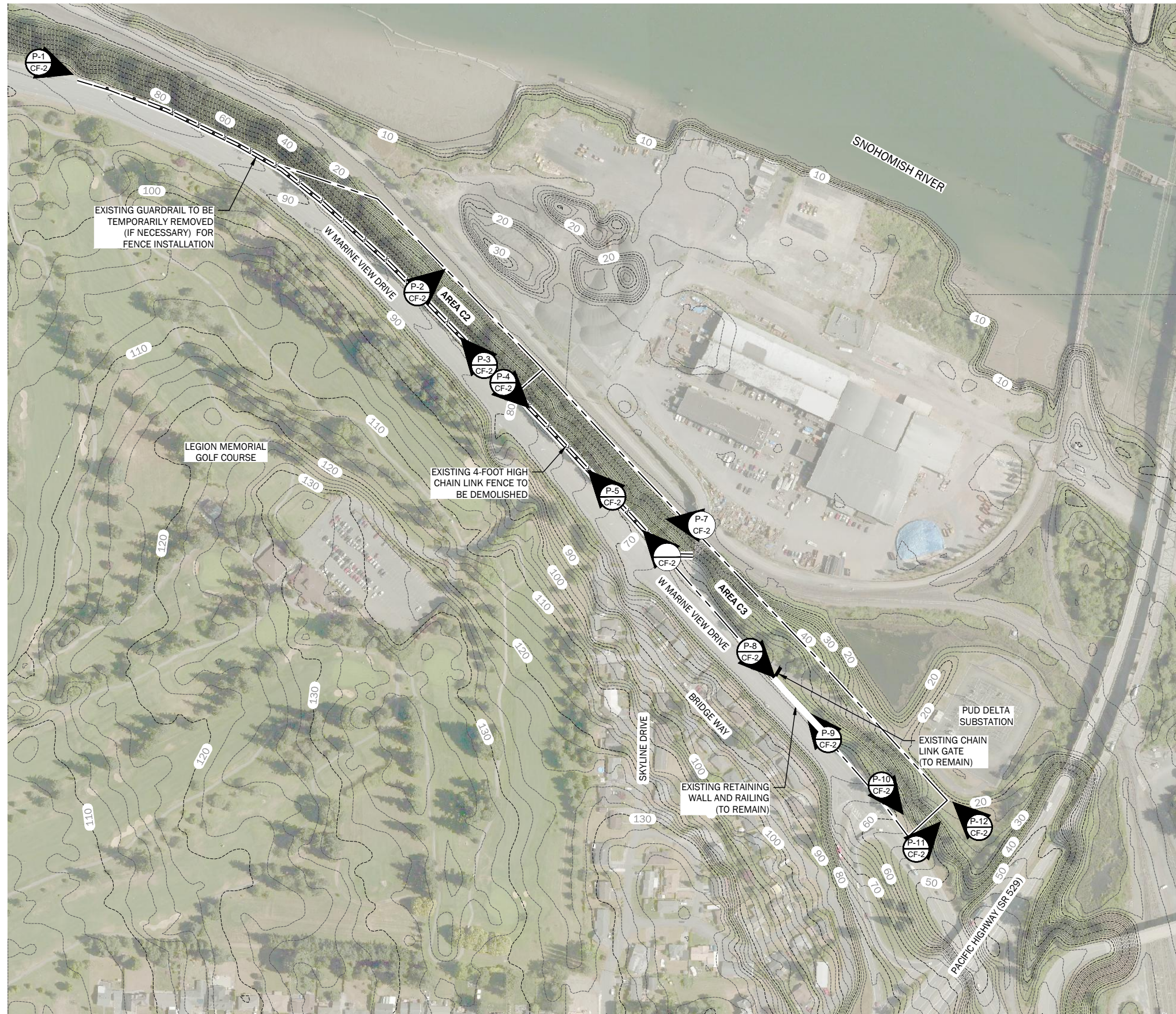
**AREA B2 STORM DRAIN CIPP REHABILITATION PLAN**

DRAWN: TJM	PROJ NO:
DESIGN: WC	SHEET 13 OF 20
CHECKED: ARJ	DATE: 06.29.2018
SHEET NO.	<b>CD-12</b>

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Plotted: 06/28/2019, 13:06 | imichaud | P:\0504068\CAD\02\Design\_Sheets | Area B2\1R00\050406802\_Sht14\_Cf-1 | Areas C2 and C3 Project Overview.dwg



**LEGEND**

- REMEDIAL ACTION BOUNDARY
- EXISTING GUARD RAIL
- x-x-x- EXISTING 4-FT HIGH CHAIN LINK FENCE

PHOTOGRAPH DESIGNATION: P-2  
 SHEET LOCATED ON: CF-2

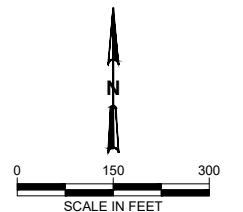
---> DIRECTION OF PHOTOGRAPH

**PROJECT SUMMARY - AREAS C2 AND C3:**

1. TEMPORARILY REMOVE THE EXISTING GUARDRAILS CAREFULLY IN AREAS C2 AND C3 ALONG MARINE VIEW DRIVE IF NECESSARY FOR ACCESS. STORE THE GUARDRAILS TEMPORARILY FOR RESTORATION AFTER NEW FENCING IS INSTALLED. PROVIDE TRAFFIC CONTROL MEASURES IN THE AREAS WHERE GUARDRAILS ARE TEMPORARILY REMOVED IN ACCORDANCE WITH THE REQUIREMENTS OF WSDOT.
2. REMOVE THE EXISTING CHAIN LINK FENCE IN AREA C2 FOR RECYCLING. DEMOLISH THE EXISTING FENCE POST CONCRETE FOOTINGS AS NECESSARY FOR INSTALLATION OF THE NEW FENCES. DISPOSE OF THE CONCRETE DEBRIS AT APPROVED CONSTRUCTION DEMOLITION LANDFILL.
3. STAKE OUT OR MARK NEW CHAIN LINK FENCE ALIGNMENT FOR APPROVAL BY ECOLOGY.
4. INSTALL NEW CHAIN LINK FENCING AND GATES AT LOCATIONS SHOWN ON THE DRAWINGS AND WHERE APPROVED BY ECOLOGY, OR AS DIRECTED BY ECOLOGY. THE NEW CHAIN LINK FENCING SHALL BE 6 FEET HIGH CONSTRUCTED IN ACCORDANCE WITH THE WSDOT STANDARD PLAN L-20.10-03, TYPE 3, AND WSDOT STANDARD SPECIFICATIONS SECTION 8-12.
5. RESTORE THE GUARDRAILS TO PRE-CONSTRUCTION CONDITIONS.
6. CLEAN UP THE WORK AREAS. DISPOSE OF EXCESS MATERIALS RESULTING FROM THE INSTALLATION PROPERLY.

**SURVEY NOTES:**

1. BASE TOPOGRAPHY FROM CITY OF EVERETT LIDAR SURVEY DATED 2009
2. HORIZONTAL DATUM: NORTH AMERICAN DATUM OF 1983 (NAD83)
3. VERTICAL DATUM: NORTH AMERICAN VERTICAL DATUM OF 1988 (NAVD88)



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**AREAS C2 AND C3 PROJECT OVERVIEW**

DRAWN: TJM	PROJ NO:
DESIGN: WC	SHEET 14 OF 20
CHECKED: ARJ	DATE: 06.29.2018
SHEET NO.	<b>CF-1</b>

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P-1  
CF-2 VIEW SOUTHEAST: NORTH END OF EXISTING 4-FT CHAIN LINK FENCE



P-2  
CF-2 VIEW NORTHWEST - EXISTING 4-FT CHAIN LINK FENCE AND GUARDRAIL



P-3  
CF-2 VIEW NORTHWEST - EAST MARINE VIEW DRIVE



P-4  
CF-2 VIEW SOUTHEAST - EAST MARINE VIEW DRIVE



P-5  
CF-2 VIEW NORTHWEST - GUARDRAIL AND FENCE



P-6  
CF-2 VIEW NORTHWEST - SOUTH END OF GUARDRAIL AND 4-FT CHAIN LINK FENCE



P-7  
CF-2 VIEW NORTHWEST - RAILROAD TRACKS EAST OF AREAS C2 AND C3



P-8  
CF-2 VIEW SOUTHEAST - PUD DELTA SWITCHING STATION ACCESS ROAD GATE



P-9  
CF-2 VIEW NORTHWEST - RETAINING WALL AND RAILING



P-10  
CF-2 VIEW NORTHWEST - NORTHEAST BOUNDARY OF AREA C3



P-11  
CF-2 VIEW SOUTHEAST - SOUTHWEST BOUNDARY OF AREA C3



P-12  
CF-2 VIEW NORTHEAST - AREA SOUTH OF AREA C3

Plotted: 06/29/2019, 13:07 | imichaud P:\0504068\CAD\02\Design\_Sheets\Area B2\1R00\050406802\_Sht15\_Cf-2\Areas C2 and C3 Existing Site Conditions Photos.jpg

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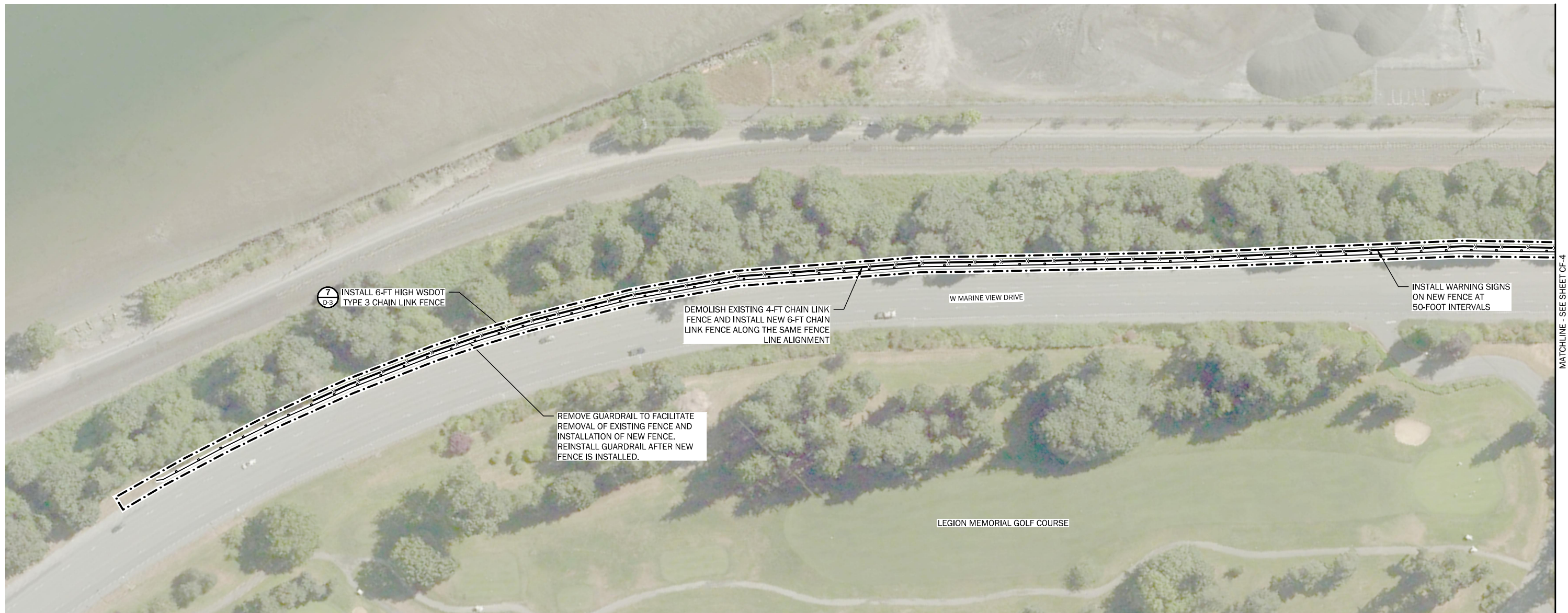
**AREAS C2 AND C3 EXISTING SITE CONDITIONS PHOTOGRAPHS**

DRAWN: TJM	PROJ NO:
DESIGN: WC	SHEET 15 OF 20
CHECKED: ARJ	DATE: 06.29.2018
SHEET NO.	<b>CF-2</b>

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Plotted: 06/28/2019, 13:09 | imichaud | P:\0504068\CAD\02\Design\_Sheets | Area B2\1R00\050406802\_Sht16-17\_Cf-3\_Cf-4 | Areas C2 and C3 Fence Construction Plan.dwg



MATCHLINE - SEE SHEET CF-4

**LEGEND**

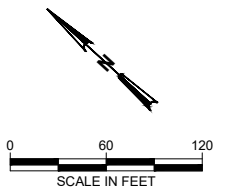
	PROJECT BOUNDARY
	EXISTING GUARDRAIL
	NEW 6-FT HIGH CHAIN LINK FENCE

**NOTES:**

1. CONTRACTOR IS RESPONSIBLE FOR RETAINING UTILITY LOCATING SERVICE AND VERIFYING UTILITY LOCATIONS IN THE AREA AFFECTED BY THE WORK.
2. CONTRACTOR SHALL PROTECT ALL UTILITIES OUTSIDE OF THE WORK AND SHALL REPAIR ANY DAMAGED BY THEIR ACTIVITIES AT THE CONTRACTOR'S EXPENSE.
3. CONTRACTOR SHALL OBTAIN CITY OF EVERETT'S AND WASHINGTON STATE DEPARTMENT OF TRANSPORTATION (WSDOT'S) PERMIT AS REQUIRED PRIOR TO COMMENCING THE WORK ACTIVITIES. CONTRACTOR SHALL PROVIDE PEDESTRIAN ACCESS AND USE OF SIDEWALKS ALONG MARINE VIEW DRIVE AT ALL TIMES.
4. CONTRACTOR SHALL POST TEMPORARY SIGNAGE FOR DIRECTING PEDESTRIAN AND VEHICULAR TRAFFIC AROUND THE WORK AREA AS NECESSARY AND AS REQUIRED BY THE CITY OF EVERETT/WSDOT PERMIT.

**CONSTRUCTION NOTES:**

1. THE CONTRACTOR SHALL LAY OUT AND MARK THE NEW FENCE LINE LOCATIONS WITH MARKING FLAGS BASED ON THE DRAWINGS FOR ECOLOGY'S APPROVAL PRIOR TO INSTALLATION.
2. SOME CLEARING OF GRASS AND SHRUBS WILL BE REQUIRED DURING THE FENCE INSTALLATION. THE CLEARING SHALL BE LIMITED TO THE EXTENT REQUIRED FOR THE WORK. NO TREE REMOVAL SHALL BE PERFORMED WITHOUT THE PERMISSION OF ECOLOGY.
3. SOIL EXCAVATED DURING FENCE POST BASE INSTALLATION SHALL BE HANDLED AS CONTAMINATED MATERIAL AND DISPOSED IN ACCORDANCE WITH THE REQUIREMENTS IN SPECIFICATIONS.
4. CONTRACTOR SHALL SURVEY THE NEW FENCES AFTER INSTALLATION IS COMPLETE.



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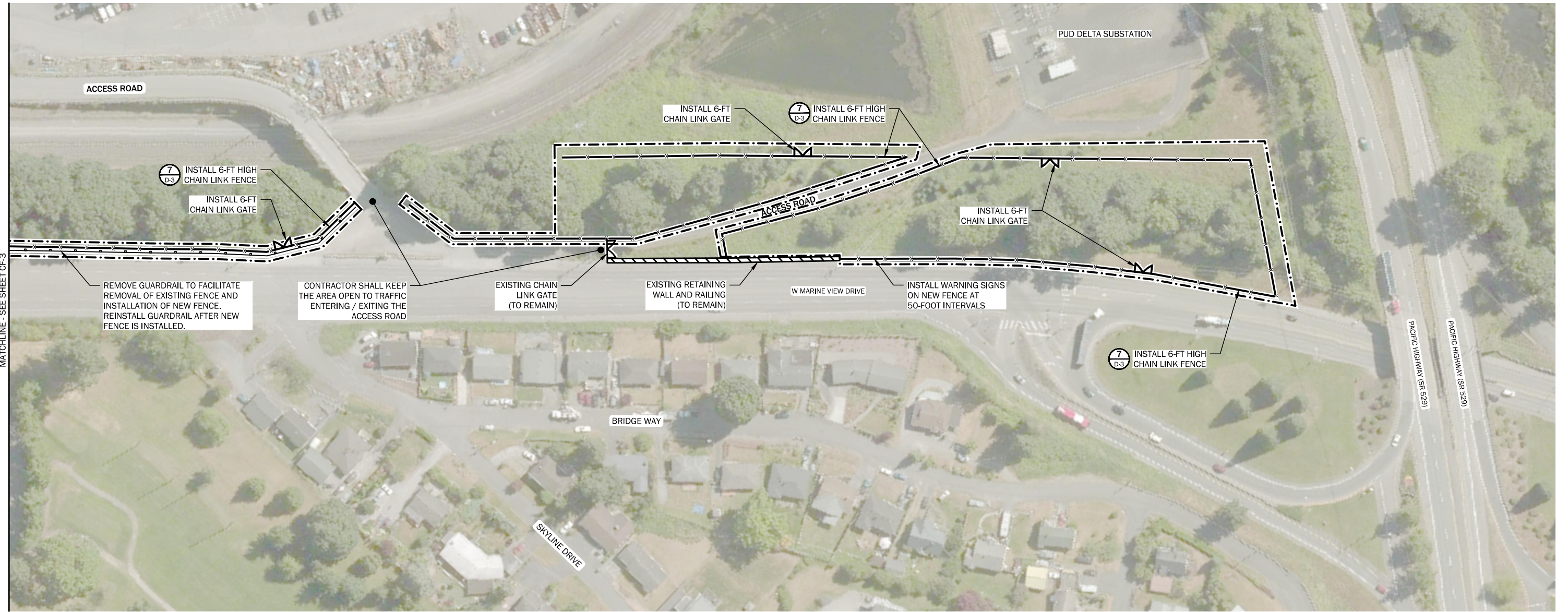
**AREAS C2 AND C3 FENCE CONSTRUCTION PLAN (1 OF 2)**

DRAWN: TJM	PROJ NO:
DESIGN: WC	SHEET 16 OF 20
CHECKED: ARJ	DATE: 06.29.2018
SHEET NO.	<b>CF-3</b>




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 MATCHLINE - SEE SHEET CF-3



**LEGEND**

	PROJECT BOUNDARY
	EXISTING GUARDRAIL
	NEW 6-FT HIGH CHAIN LINK FENCE

- NOTES:**
- CONTRACTOR IS RESPONSIBLE FOR RETAINING UTILITY LOCATING SERVICE AND VERIFYING UTILITY LOCATIONS IN THE AREA AFFECTED BY THE WORK.
  - CONTRACTOR SHALL PROTECT ALL UTILITIES OUTSIDE OF THE WORK AND SHALL REPAIR ANY DAMAGED BY THEIR ACTIVITIES AT THE CONTRACTOR'S EXPENSE.
  - CONTRACTOR SHALL OBTAIN CITY OF EVERETT'S AND WASHINGTON STATE DEPARTMENT OF TRANSPORTATION (WSDOT'S) PERMIT AS REQUIRED PRIOR TO COMMENCING THE WORK ACTIVITIES. CONTRACTOR SHALL PROVIDE PEDESTRIAN ACCESS AND USE OF SIDEWALKS ALONG MARINE VIEW DRIVE AT ALL TIMES.
  - CONTRACTOR SHALL POST TEMPORARY SIGNAGE FOR DIRECTING PEDESTRIAN AND VEHICULAR TRAFFIC AROUND THE WORK AREA AS NECESSARY AND AS REQUIRED BY THE CITY OF EVERETT/WSDOT PERMIT.

- CONSTRUCTION NOTES:**
- THE CONTRACTOR SHALL LAY OUT AND MARK THE NEW FENCE LINE LOCATIONS WITH MARKING FLAGS BASED ON THE DRAWINGS FOR ECOLOGY'S APPROVAL PRIOR TO INSTALLATION.
  - SOME CLEARING OF GRASS AND SHRUBS WILL BE REQUIRED DURING THE FENCE INSTALLATION. THE CLEARING SHALL BE LIMITED TO THE EXTENT REQUIRED FOR THE WORK. NO TREE REMOVAL SHALL BE PERFORMED WITHOUT THE PERMISSION OF ECOLOGY.
  - SOIL EXCAVATED DURING FENCE POST BASE INSTALLATION SHALL BE HANDLED AS CONTAMINATED MATERIAL AND DISPOSED IN ACCORDANCE WITH THE REQUIREMENTS IN SPECIFICATIONS.
  - CONTRACTOR SHALL SURVEY THE NEW FENCES AFTER INSTALLATION IS COMPLETE.

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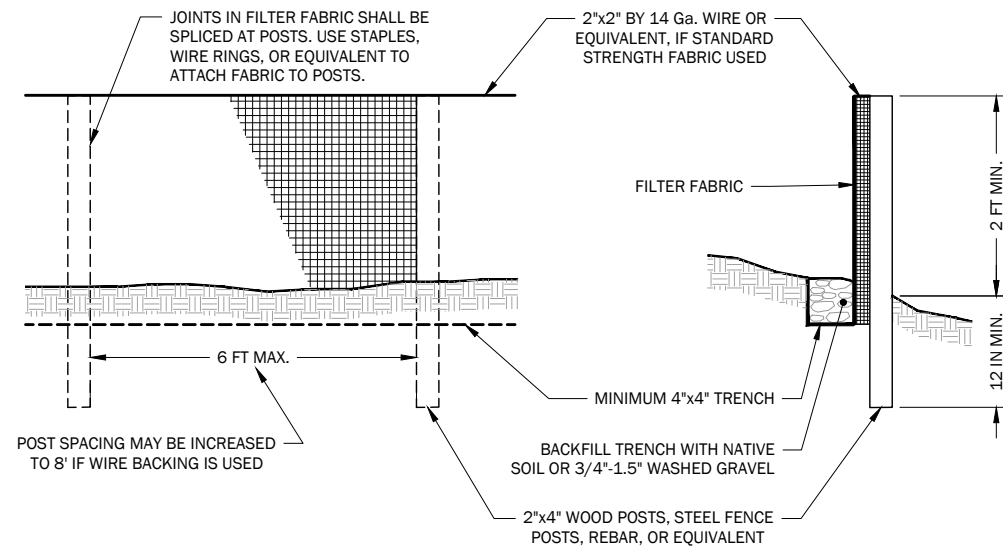
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REMEDIAL ACTION AREAS B2, C2 AND C3  
EVERETT, WASHINGTON

**AREAS C2 AND C3 FENCE CONSTRUCTION PLAN (2 OF 2)**

DRAWN: TJM	PROJ NO:
DESIGN: WC	SHEET 17 OF 20
CHECKED: ARJ	DATE: 06.29.2018
SHEET NO.	<b>CF-4</b>

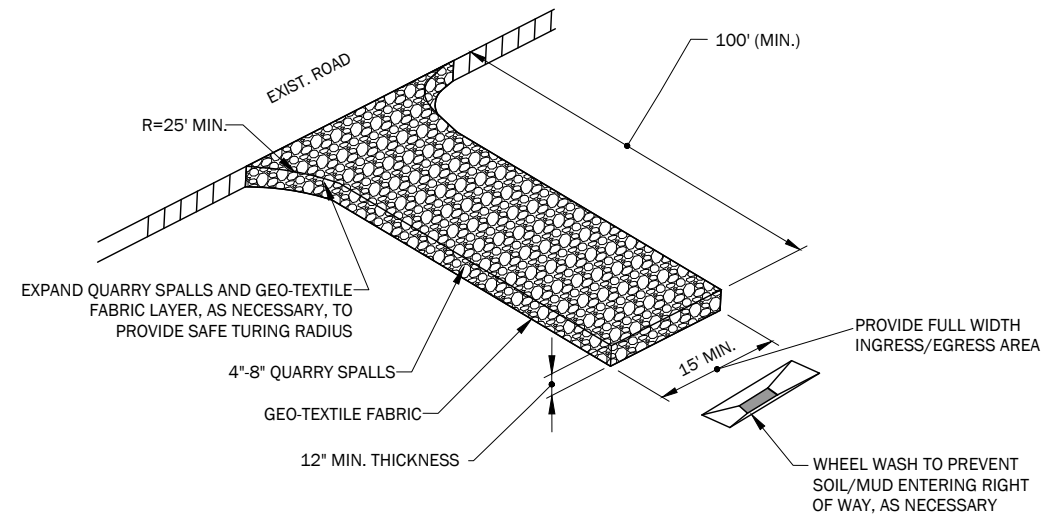
**DRAFT SUBMITTAL - NOT FOR CONSTRUCTION**





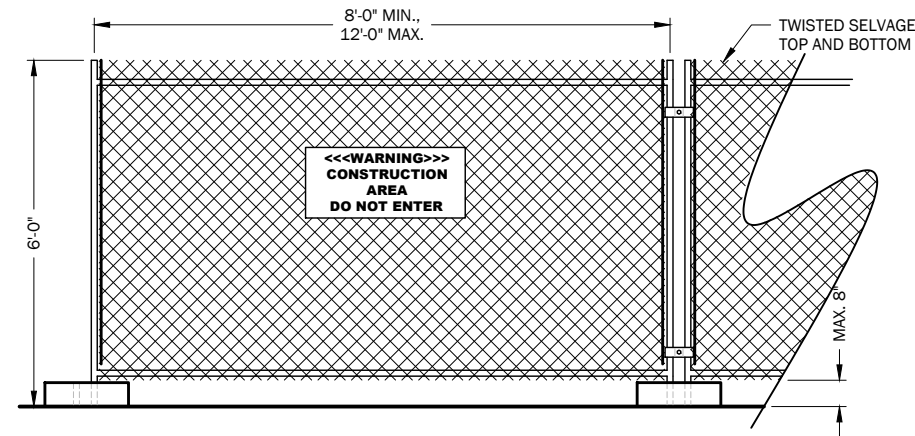
NOTE:  
FILTER FABRIC FENCES SHALL BE INSTALLED ALONG CONTOUR WHENEVER POSSIBLE

**SILT FENCE DETAIL**  
SCALE: NOT TO SCALE



NOTE:  
STABILIZED ACCESS SHALL BE USED IN ALL AREAS OF THE SITE WITH VEHICLE TRAFFIC AND PARKING, OTHER MEANS OF PROVIDING STABILIZED ACCESS WILL BE CONSIDERED.

**STABILIZED CONSTRUCTION ENTRANCE/EXIT DETAIL**  
SCALE: NOT TO SCALE



NOTES:  
1. CHAIN LINK FABRIC TO BE MIN. 11 GAUGE, GALVANIZED. NO RUSTED OR EXCESSIVELY MALFORMED FABRIC.  
2. FENCE BASES SHALL BE OF SUFFICIENT WEIGHT and/or SPREAD TO ADEQUATELY SUPPORT EACH PANEL.  
3. PANEL-TO-PANEL CONNECTIONS SHALL BE MADE AT A MIN. TWO LOCATIONS PER CONNECTION UNLESS OTHERWISE APPROVED.  
4. PROVIDE CONSTRUCTION WARNING SIGNAGE 50'O.C. ALONG FENCING INSTALLATION.  
5. PROVIDE PRIVACY SCREEN.

**TEMPORARY CHAIN-LINK FENCE DETAIL**  
SCALE: NOT TO SCALE

- TESC NOTES:**
- THE PROJECT SITE IS COVERED UNDER AN EXISTING NPDES PERMIT. CONTRACTORS WILL BE REQUIRED TO ADHERE TO THE PERMIT REQUIREMENTS AND CONDITIONS. A COPY OF THE NPDES PERMIT IS PROVIDED IN THE CONTRACT DOCUMENTS.
  - TEMPORARY EROSION AND SEDIMENT CONTROL (TESC) MEASURES AND BEST MANAGEMENT PRACTICES (BMPS) SHALL BE IMPLEMENTED AND MAINTAINED IN ACCORDANCE WITH THE 2014 STORMWATER MANAGEMENT MANUAL FOR WESTERN WASHINGTON (SWMMWW) AT ALL TIMES.
  - CONTRACTOR SHALL PREPARE TESC PLAN DETAILING TESC APPROACH THAT INCORPORATE MINIMUM REQUIREMENTS ESTABLISHED HEREIN FOR ECOLOGY'S APPROVAL. ADHERE TO THE ECOLOGY APPROVED PLAN FROM START TO FINISH OF ACTIVITIES REQUIRING TESC.
  - CONTRACTOR SHALL BE RESPONSIBLE FOR IMPLEMENTING AND MAINTAINING ALL TESC MEASURES REQUIRED DURING ALL CONSTRUCTION ACTIVITIES, INCLUDING BUT NOT LIMITED TO:
    - MAINTAIN ON HAND, ALL EQUIPMENT AND MATERIALS REQUIRED TO IMPLEMENT TESC MEASURES
    - CLEARING LIMITS SHALL BE MARKED PRIOR TO INITIATING CONSTRUCTION ACTIVITIES AND MAINTAINED THROUGH THE DURATION OF CONSTRUCTION
    - CONTRACTOR SHALL IMPLEMENT DUST CONTROL MEASURES AT ALL TIMES DURING EARTH-DISTURBING OR EXCAVATED MATERIAL HANDLING ACTIVITIES. THE RELEASE OF DUST, ODOR, AIRBORNE CONTAMINANTS SHALL BE MINIMIZED AND LIMITED TO ACCEPTABLE LEVELS.
    - INSTALL SILT FENCE AS APPLICABLE FOR SEDIMENT CONTROL IN ACCORDANCE WITH EROSION AND SEDIMENT CONTROL DETAILS SHOWN ON THE DRAWINGS.
    - UNPAVED AREAS USED BY CONTRACTOR SHALL BE STABILIZED USING QUARRY SPALLS OR OTHER RELEVANT MATERIAL TO MINIMIZE THE TRACKING OF SEDIMENT ONTO ADJACENT ROADS.
    - TO THE EXTENT PRACTICAL, OFFSITE SURFACE FLOWS ENTERING WORK AREAS SHALL BE REDIRECTED TO ADJACENT VEGETATED AREAS TO ALLOW INFILTRATION.
    - CONTRACTOR SHALL INSPECT TESC MEASURES DAILY AND IMMEDIATELY PERFORM ANY REQUIRED MAINTENANCE OR REPAIRS AS NEEDED TO ASSURE CONTINUED PERFORMANCE OF THEIR INTENDED FUNCTION
    - CONTRACTOR SHALL MODIFY THE TESC MEASURES AS NEEDED TO ENSURE PROTECTION DURING STORM EVENTS AND TO ENSURE THAT SEDIMENT AND SEDIMENT-LADEN WATER DO NOT LEAVE THE SITE.
  - CONTRACTOR SHALL STORE EXCAVATION SOIL AND DEBRIS SEPARATE FROM STOCKPILES FOR CLEAN BACKFILL MATERIAL TO PREVENT CROSS-CONTAMINATION.
  - ALL CONSTRUCTION EQUIPMENT (EARTHWORK EQUIPMENT, TRUCK AND TRAILERS, CONSTRUCTION VEHICLES, HAND TOOLS, ETC.) THAT HAVE BEEN IN CONTACT WITH CONTAMINATED OR POTENTIALLY CONTAMINATED SOIL OR WATER SHALL BE DECONTAMINATED PRIOR TO LEAVING/DEMobilIZING FROM THE SITE AND PRIOR TO USING SUCH EQUIPMENT IN OTHER CLEAN AREAS OF THE SITE.
  - STREET SWEEPING AND STREET CLEANING SHALL BE EMPLOYED BY CONTRACTOR TO PREVENT SEDIMENT FROM BEING TRACKED OFF SITE. VISUAL MONITORING OF THE BMPS WILL BE CONDUCTED BY THE CONTRACTOR'S SITE CESCL INSPECTOR AT LEAST ONCE EVERY CALENDAR WEEK AND WITHIN 24 HOURS OF ANY RAINFALL EVENT THAT CAUSES A DISCHARGE FROM THE SITE. THE CESCL INSPECTOR SHALL EVALUATE AND DOCUMENT THE EFFECTIVENESS OF THE INSTALLED BMPS AND DETERMINE IF IT IS NECESSARY TO REPAIR, REPLACE, OR ADD ANY OF THE BMPS TO IMPROVE THE QUALITY OF STORMWATER DISCHARGES. IF THE SITE BECOMES INACTIVE AND IS TEMPORARILY STABILIZED, THE INSPECTION FREQUENCY WILL BE REDUCED TO ONCE EVERY MONTH.
  - THE CONTRACTOR WILL BE REQUIRED TO SUBMIT WEEKLY REPORTS TO ECOLOGY SUMMARIZING THE MEASURES TAKEN TO MEET CONDITIONS DESCRIBED IN THE TESC PLAN. CONTRACTOR SHALL SUBMIT A COPY OF ALL REPORTS TO ECOLOGY.
  - CONTRACTOR SHALL REMOVE TESC BMPS WITHIN 30 DAYS AFTER THE FINAL SITE STABILIZATION IS ACHIEVED OR AFTER THE TEMPORARY BMPS ARE NO LONGER NEEDED. DISTURBED SOIL RESULTING FROM REMOVAL OF BMPS OR VEGETATION SHALL BE STABILIZED AND RESTORED.

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NO.	DATE	BY	REVISION

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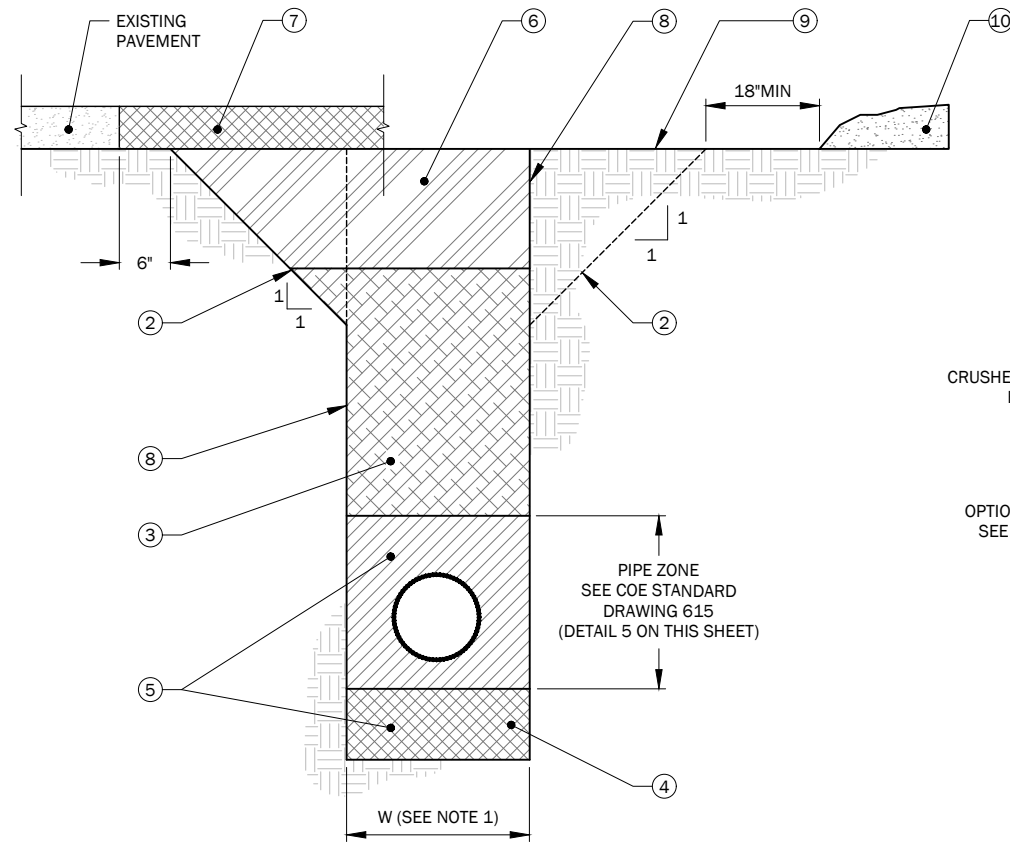


EVERETT SMELTER SITE LOWLAND AREA REMEDIAL ACTION  
REMEDIAL ACTION AREAS B2, C2 AND C3  
EVERETT, WASHINGTON

**TEMPORARY FACILITIES AND TESC DETAILS**

DRAWN: TJM	PROJ NO:
DESIGN: WC	SHEET 18 OF 20
CHECKED: ARJ	DATE: 06.29.2018
SHEET NO.	<b>D-1</b>

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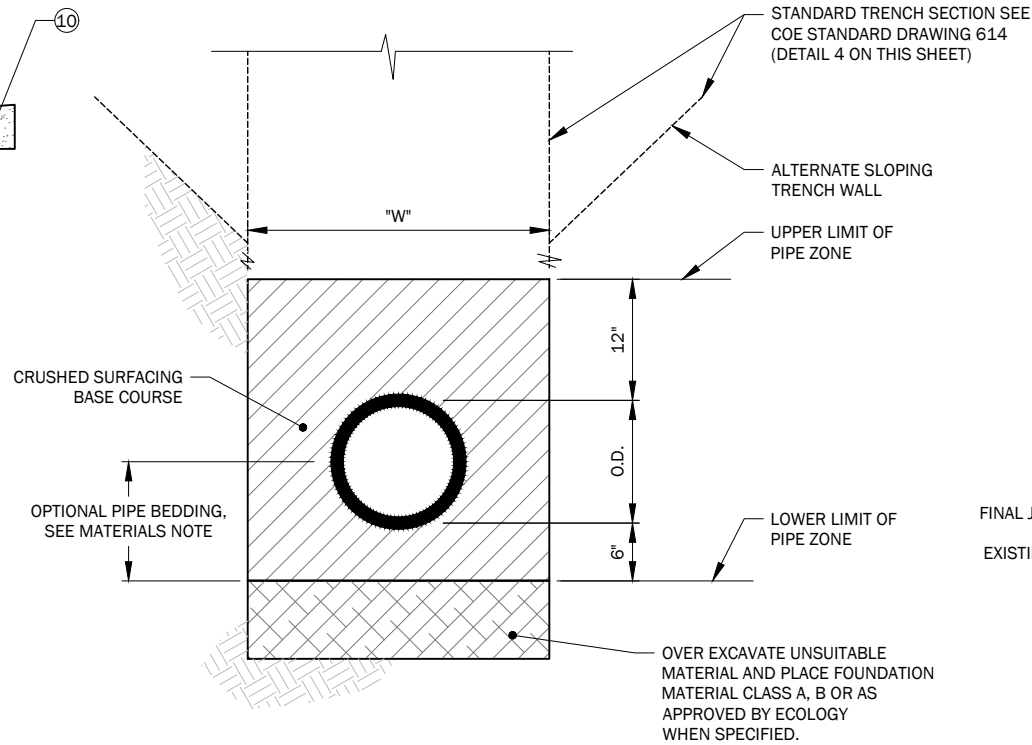


**NOTES:**

1. W = MAXIMUM WIDTH OF TRENCH. FOR PIPES 15" OR LESS IN DIA W=40". FOR PIPES 18" OR GREATER W=1.5 X I.D. + 18". PIPE MUST BE CENTERED IN TRENCH.
2. ALTERNATE SLOPING TRENCH WALL TO MEET O.S.H.A. REQUIREMENTS (NO SLOPES STEEPER THAN 1:1 EXCEPT FOR ROCK).
3. IMPORTED GRAVEL BORROW. COMPACT TO 90% MAXIMUM DENSITY.
4. FOUNDATION GRAVEL IF REQUIRED BY THE ENGINEER TO REPLACE UNSUITABLE MATERIAL. SHALL BE FOUNDATION MATERIAL CLASS A, B OR AS APPROVED BY ECOLOGY.
5. FOR ADDITIONAL COMPACTION INFORMATION SEE COE STANDARD DWG 615 (DETAIL 5 ON THIS SHEET).
6. IF DIRECTED BY ECOLOGY THE TOP THREE TO FIVE FEET OF BACKFILL SHALL BE COMPACTED TO 95% MAXIMUM DENSITY. BACKFILL SHALL BE IMPORTED GRAVEL BORROW.
7. SEE COE STANDARD DWG 326 FOR PAVEMENT PATCH DETAILS (DETAIL 6 ON THIS SHEET).
8. VERTICAL TRENCH WALLS WITH SHORING TO CONFORM TO O.S.H.A. REGULATIONS.
9. SUBGRADE OR GROUND SURFACE IN NON-PAVED AREAS.
10. STOCKPILED BACKFILL MATERIAL.
11. FOR ALL TRENCHING WITHIN THE ROADWAY BACKFILL ABOVE THE PIPE ZONE SHALL BE CONTROLLED DENSITY FILL. SEE SECTION 3-9.6 & 3-20.1 OF COE STANDARDS.

**TYPICAL TRENCH SECTION  
STORM DRAIN POINT REPAIR**

REFERENCE: COE STANDARD DRAWING 614  
NOT TO SCALE



**LIMITS OF TRENCH:**

1. W = MAXIMUM WIDTH OF TRENCH. FOR PIPES 15" OR LESS IN DIAMETER W = 40". FOR PIPES 18" OR GREATER W = 1 1/2 x I.D. + 18". PIPE MUST BE CENTERED IN TRENCH.

**MATERIALS:**

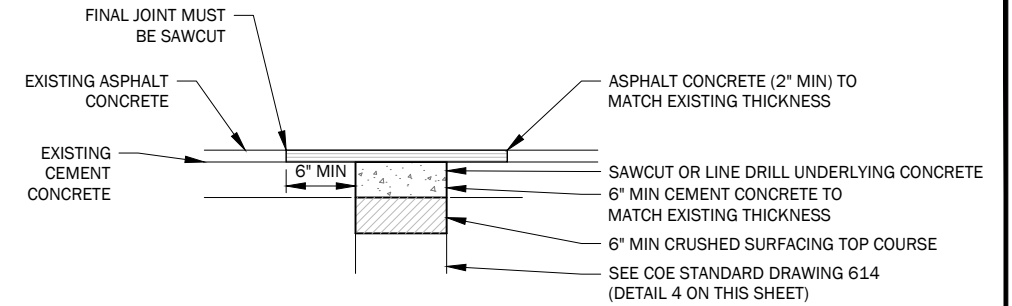
1. PIPE BEDDING MATERIAL SHALL BE CRUSHED SURFACING BASE COURSE CONFORMING TO SECTION 9-03.9(3) OF THE STANDARD SPECIFICATIONS FOR ROAD, BRIDGE AND MUNICIPAL CONSTRUCTION WSDOT/APWA.
2. OPTIONAL PIPE BEDDING (TO SPRING-LINE) FOR PIPE 15" DIA AND LARGER: PEA GRAVEL OR 3/4" CLEAN ROCK CHIPS AS APPROVED IN ADVANCE BY ENGINEER.
3. OVER EXCAVATION AND PLACEMENT OF FOUNDATION MATERIAL, IF REQUIRED SHALL BE FOUNDATION MATERIAL CLASS A OR B CONFORMING TO SECTION 9-03.17 OF THE STANDARD SPECIFICATIONS FOR ROAD, BRIDGE AND MUNICIPAL CONSTRUCTION WSDOT/APWA.

**PROCEDURE FOR COMPACTION:**

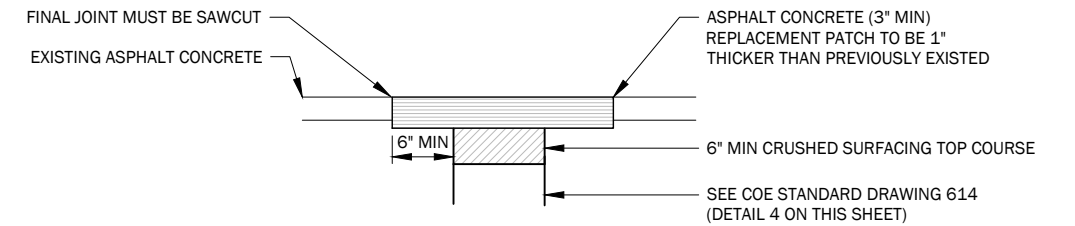
1. PROVIDE UNIFORM SUPPORT UNDER PIPE BARREL.
2. COMPACT BEDDING MATERIAL TO 90% MAXIMUM DENSITY EXCEPT DIRECTLY OVER PIPE, HAND TAMP ONLY.
3. HAND TAMP UNDER PIPE HAUNCHES FOR ALL BEDDING MATERIALS.
4. FOR ADDITIONAL COMPACTION INFORMATION SEE COE STANDARD DWG 615.

**PIPE BEDDING DETAIL**

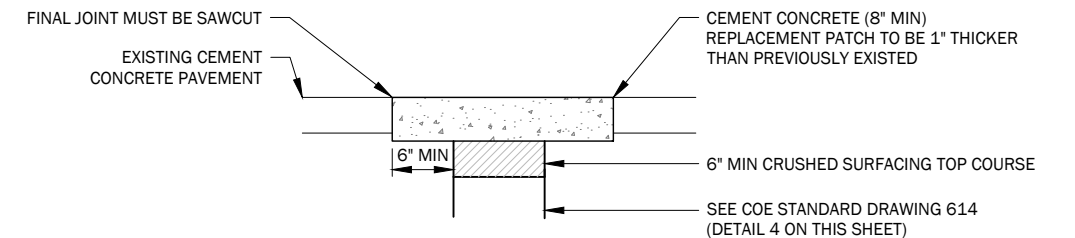
REFERENCE: COE STANDARD DRAWING 615  
NOT TO SCALE



**EXISTING ASPHALT CONCRETE OVER CEMENT CONCRETE**



**EXISTING ASPHALT CONCRETE OVER PREPARED GRADE**



**EXISTING CEMENT CONCRETE OVER PREPARED GRADE**

**NOTES**

1. ALL TRENCHES IN ROADWAY AREAS SHALL BE BACKFILLED AND PATCHED WITH TEMPORARY ASPHALT AT THE END OF EACH WORK DAY, UNLESS PERMISSION IS GRANTED TO DO OTHERWISE BY ECOLOGY.
2. ALL TEMPORARY PATCHES ON TRENCHES SHALL BE PERMANENTLY PATCHED WITHIN 2 WEEKS OF COMPLETION OF WORK WITHIN ROADWAY AREA.
3. CEMENT CONCRETE FOR PATCHING SHALL BE COMMERCIAL MIX AS CALLED OUT IN WSDOT STANDARD SPECIFICATIONS 5-05.

**PAVEMENT PATCHING DETAILS**

REFERENCE: COE STANDARD DRAWING 326  
NOT TO SCALE



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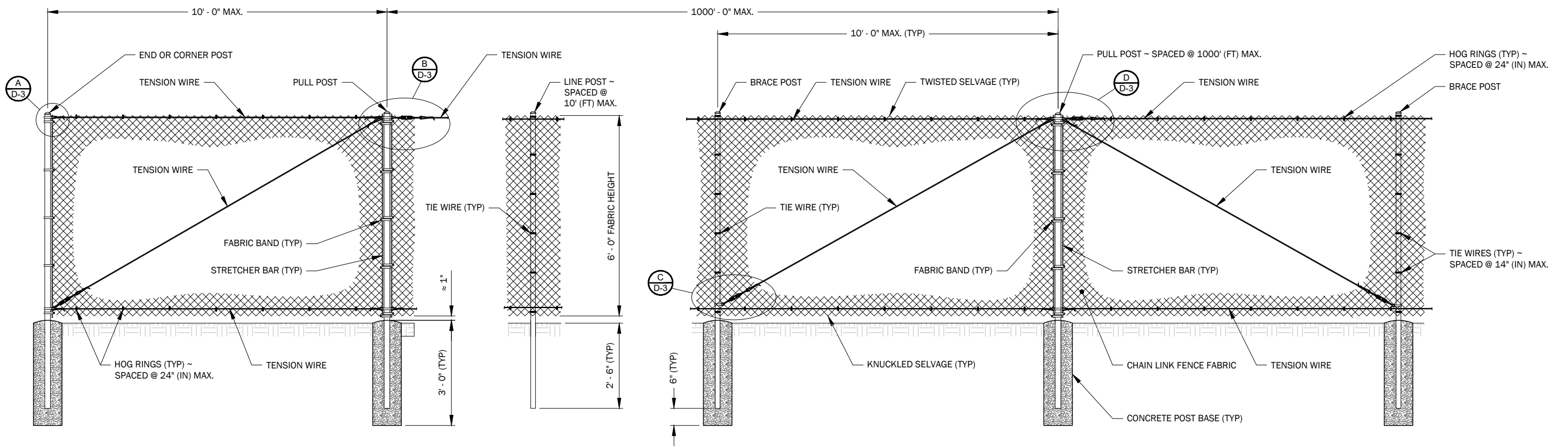
State of Washington

EVERETT SMELTER SITE LOWLAND AREA REMEDIAL ACTION  
REMEDIAL ACTION AREAS B2, C2 AND C3  
EVERETT, WASHINGTON

**TRENCHING AND PAVEMENT PATCHING DETAILS**

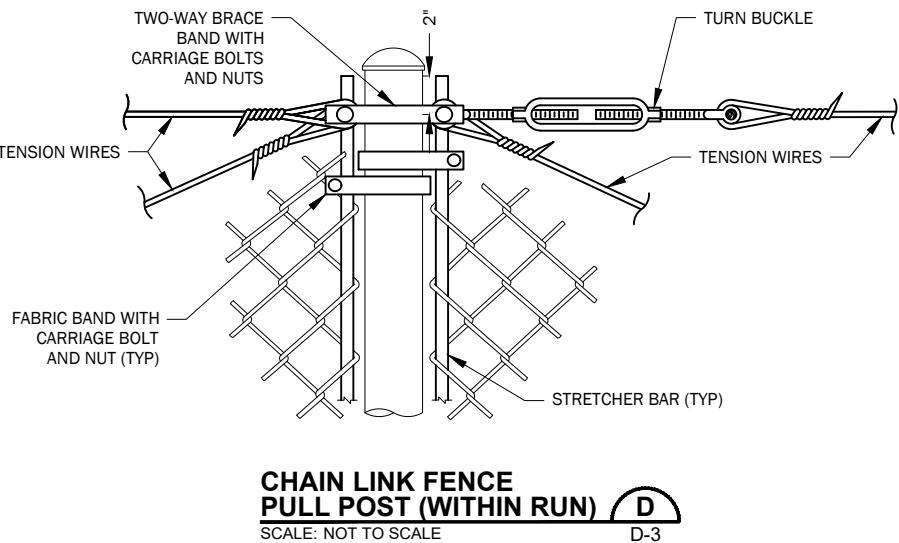
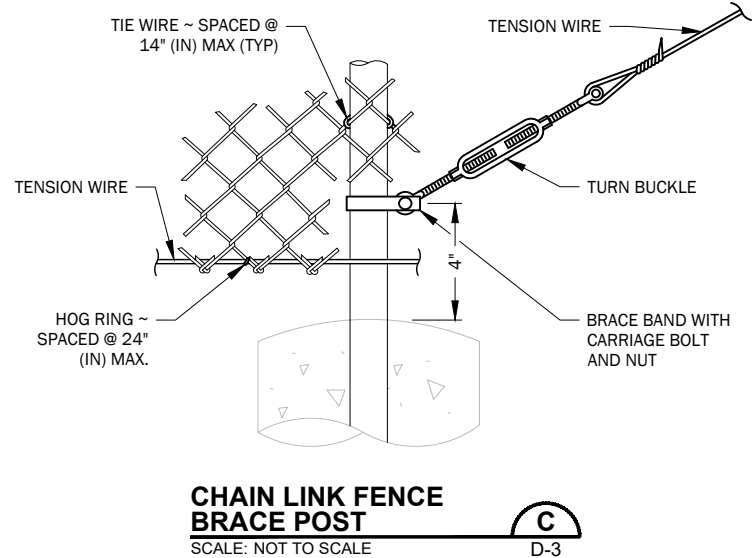
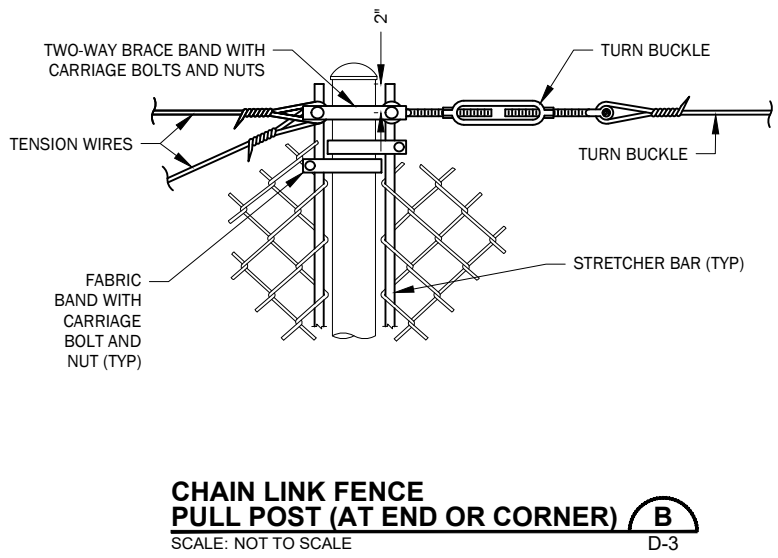
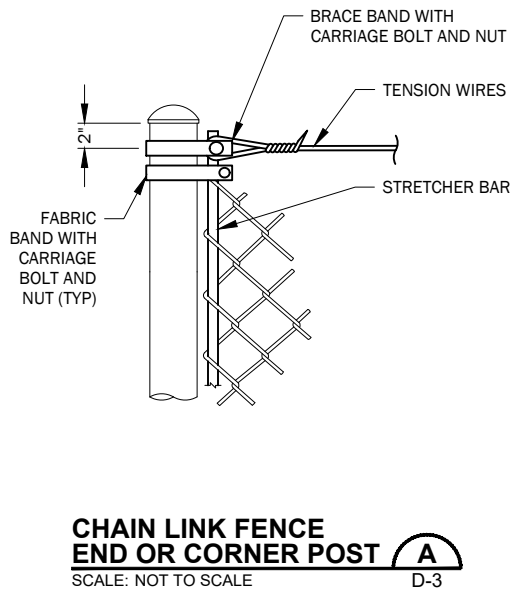
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DESIGN: WC	SHEET 19 OF 20
CHECKED: ARJ	DATE: 06.29.2018
SHEET NO. <b>D-2</b>	

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- NOTES:**
1. REFER TO WSDOT STANDARD SPECIFICATIONS 8-12 FOR DETAILS AND CONSTRUCTION REQUIREMENTS.
  2. ALL CONCRETE POST BASES SHALL BE 10" (IN) MINIMUM DIAMETER.
  3. ALONG THE TOP AND BOTTOM, USING HOG RINGS, FASTEN THE CHAIN LINK FENCE FABRIC TO THE TENSION WIRE WITHIN THE LIMITS OF THE FIRST FULL FABRIC WEAVE.
  4. DETAILS ARE ILLUSTRATIVE AND SHALL NOT LIMIT HARDWARE DESIGN OR POST SELECTION OF ANY PARTICULAR FENCE TYPE.

**PERMANENT CHAIN LINK FENCE DETAIL 7**  
 SCALE: NOT TO SCALE  
 REFERENCE: WSDOT STANDARD PLAN L-20.10-03 CHAIN LINK FENCE TYPE 3



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EVERETT SMELTER SITE LOWLAND AREA REMEDIAL ACTION  
 REMEDIAL ACTION AREAS B2, C2 AND C3  
 EVERETT, WASHINGTON

**CHAIN LINK FENCE DETAILS**

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SHEET NO.	<b>D-3</b>

**DRAFT SUBMITTAL - NOT FOR CONSTRUCTION**

**Preliminary Specifications  
Area B2 Storm Drain Repairs, and Areas C2 and C3 Fencing/Signage  
Everett Smelter Site Lowland Area  
Everett, Washington**

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- 01 10 00 – PROJECT SUMMARY
- 01 14 13 – ACCESS TO SITE
- 01 20 00 – PRICE AND PAYMENT PROCEDURES
- 01 22 00 – UNIT PRICES
- 01 25 00 – SUBSTITUTION PROCEDURES
- 01 26 13 – REQUESTS FOR INTERPRETATION (RFI)
- 01 31 00 – PROJECT MANAGEMENT AND COORDINATION
- 01 33 00 – SUBMITTAL PROCEDURES
- 01 35 23 – HEALTH, SAFETY AND EMERGENCY REQUIREMENTS
- 01 35 43 – GREEN CONSTRUCTION PRACTICES
- 01 41 00 – REGULATORY REQUIREMENTS
- 01 42 00 – REFERENCES
- 01 45 00 – CONSTRUCTION QUALITY CONTROL
- 01 51 00 – TEMPORARY UTILITIES
- 01 52 00 – CONSTRUCTION FACILITIES
- 01 57 00 – TEMPORARY ENVIRONMENTAL CONTROL
- 01 57 13 – TEMPORARY EROSION AND SEDIMENT CONTROL
- 01 57 50 – DUST AND AIR EMISSIONS CONTROL
- 01 60 00 – PRODUCTS
- 01 74 00 – CLEANING AND WASTE MANAGEMENT
- 01 77 00 – CLOSEOUT PROCEDURES
- 01 78 39 – PROJECT RECORD DOCUMENTS

DIVISION 02 - EXISTING CONDITIONS

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- 02 22 00 – EXISTING CONDITIONS ASSESSMENT
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DIVISION 31 - EARTHWORK

- 31 23 19 – DEWATERING
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- 32 17 00 – PAVEMENT MARKINGS AND SIGNAGE
- 32 31 13 – CHAIN LINK FENCE
- 32 90 00 – PLANTING
- 32 91 13 – SOIL PREPARATION
- 32 92 23 – SODDING

DIVISION 33 - UTILITIES

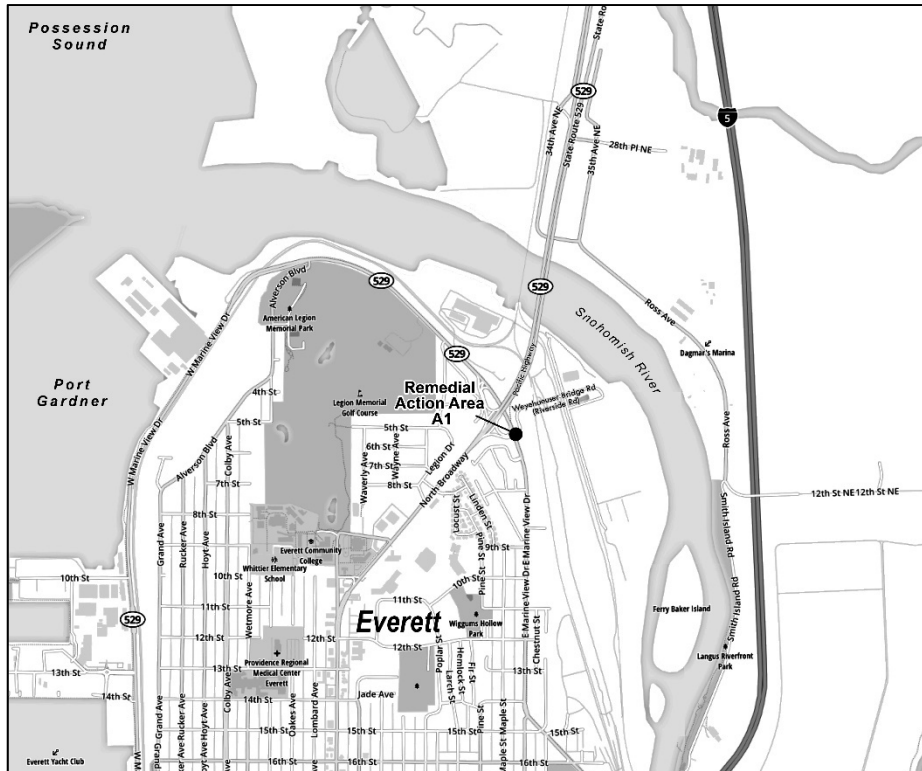
- 33 42 03 – STORM DRAIN CLEANING
- 33 42 05 – TELEVISION INSPECTION
- 33 42 07 – MANHOLE REHABILITATION
- 33 42 09 – TEMPORARY STORMWATER BYPASS
- 33 42 10 – STORM DRAIN POINT REPAIR
- 33 42 30 – CURED-IN-PLACE PIPE (CIPP)



**PART 1 – GENERAL**

**1.01 THE PROJECT**

- A. Project Title: EVERETT SMELTER SITE LOWLAND AREA CLEANUP REMEDIAL ACTION AREAS B2, C2 AND C3, EVERETT, WASHINGTON
- B. The Project: The Project comprises remedial activities in Remedial Action Areas B2, C2 and C3 (referred to as Areas B2, C2 and C3, respectively herein), as part of the Everett Smelter Site Lowland Area Cleanup. The scope of the remedial activities in the remedial action areas include storm drain rehabilitation in Area B2, and installation of chain link fences in Areas C2 and C3.
  - 1. Area B2: Based on video survey of the existing storm drain system in Area B2, defects on the storm pipes including such as fractures, joint offsets, etc., have been observed which allow groundwater in the soils in Area B2 contaminated with arsenic and slag to infiltrate into the storm drain pipes. The Project consists of installation of temporary bypass, high-pressure cleaning and video inspection of the existing storm drain and catch basins/manholes, point repair of defective storm drain pipes, installation of cured-in-place pipe (CIPP) lining to rehabilitate the storm drain pipes, and rehabilitate catch basins/manholes. The Project also includes restoration of existing surface features, e.g., pavement, sidewalks, curb and gutter and landscaped areas removed or demolished during the Project.
  - 2. Areas C2 and C3: The scope of remedial activities in Areas C2 and C3 comprises installation of new 6-foot high chain link fences and warning signage in portions of the perimeters of Areas C2 and C3. Prior to the new fencing installation, remove guardrail along the eastern side of West Marine View Drive temporarily for new fencing construction, demolish existing 4-foot high chain link fence, install new fencing and restore guardrail. After installation of new chain link fences and warning signage, restore areas affected by the work activities.
- C. Project Locations: Locations of Areas B2, C2 and C3 are indicated on the map below. Area B2 is located in the northern portion of the Riverside Business Park, and Areas C2 and C3 are located north of the intersection of East/West Marine Drive and Riverside Road (Weyerhaeuser Bridge Road).



**1.02 SUMMARY OF WORK INCLUDED IN THE CONTRACT**

- A. Area B2 Summary of Work: The Work includes, but is not limited to, the following:
  1. Prepare Project submittals per the Contract Documents and implement Project health and safety related Work.
  2. Provide temporary site controls including site security fencing, temporary traffic controls, temporary erosion and sediment controls (TESC).
  3. Obtain all permits necessary to perform the work activities.
  4. Provide a traffic control plan for performing all work in roads as required by the City of Everett and/or other agencies.
  5. Install temporary aboveground stormwater bypass pipelines from the North and South Detention Pond outlets to the outfall located in the southeast corner of Area B2. Plug the outflow pipes at the locations indicated on the Drawings to prevent water and waste materials resulting from the work activities from discharging to the Snohomish River during construction.
  6. Perform high-pressure cleaning of the existing storm drain lines, catch basins and manholes including the inflow networks to the north and south detention ponds and outflow from the detention ponds to the outfall, and catch basins and manholes. Collect and store the



water and waste materials resulting from the cleaning operation on site for characterization, discharge the water to authorized sanitary discharge point and solids to an offsite licensed landfill facility.

7. Perform pre-installation closed-circuit television (CCTV) video inspections of the storm drain lines after the cleaning is completed to: (1) identify any defects that affect the CIPP installation and require point repairs; (2) inspect the catch basins and manholes to identify any defects in the structures that require repairs or replacements. Provide a log with description and photographs of defects and proposed repair methods to the Owner for review and approval.
  8. Perform point repairs and catch basin and manhole repairs using the methods approved by the Owner.
  9. Place demolished asphalt, concrete and other non-contaminated materials into roll-off bins or load directly onto haul trucks for offsite disposal at a licensed landfill. No stockpiling of demolition debris is permitted.
  10. Place soil excavated from point repairs directly into roll-off bins. Soil samples will be collected by the Owner for waste profiling and offsite disposal at an approved landfill facility. No stockpiling of contaminated soil is permitted.
  11. Install CIPP lining in designated storm drain segments as indicated on the Drawings and as directed by the Engineer. Perform post-installation video inspections to verify the CIPP installation has been completed in accordance with the Drawings and Specifications.
  12. Remove the temporary bypass pipelines and the plugs from the detention pond overflow structures.
  13. Clean up and restore work areas to pre-construction conditions including but not limited to pavement, sidewalks, and landscaped areas.
- B. Areas C2 and C3 Summary of Work: The Work includes, but is not limited to, the following:
1. Obtain all required permits prior to performing the work activities.
  2. Remove the existing guardrails along East Marine View Drive carefully, store the guardrails for restoration.
  3. Demolish the existing 4-foot high chain link fence, including the aboveground posts and chain link fabrics and dispose of at an approved recycling facility.
  4. Demolish the subsurface concrete footings of the existing fencing only as necessary for installation of the new chain link fence. If the removal of footing is required, the lateral and vertical extents of concrete footing excavations should be minimized to reduce the amount of potentially contaminated soils been removed. Store the

excavated soils on site in roll-off bins provided by the Contractor for sampling and analysis by the Owner prior to offsite disposal. Transport the waste materials to an approved landfill facility.

5. Stake out or mark the new chain link fence locations with the presence of the Engineer.
6. Clear the areas where the new fences will be constructed. The cleared aboveground vegetation shall be disposed of at a yard waste recycling landfill.
7. Soils and tree roots excavated for concrete footing installations shall be stored in roll-off bins for characterization by the Owner prior to offsite disposal at an approved landfill facility.
8. Install the new 6-foot high chain link fences and warning signages at the marked locations in accordance with requirements in the Drawings and Specifications.
9. Clean up the work areas and dispose of excess materials resulted from the installation.

### **1.03 TIME FOR COMPLETION**

- A. Substantial Completion: The Project shall be Substantially Complete 120 calendar days after the date of Notice to Proceed. See **SECTION 01 77 00 – CLOSEOUT PROCEDURES** for requirements for Substantial Completion.
  1. Weekends and legal holidays work restrictions are accounted for and included in the 120 calendar days of contract time allowed for this Project.
- B. Final Completion: The Contractor shall achieve Final Completion 60 calendar days after the date of Substantial Completion. See **SECTION 01 77 00 – CLOSEOUT PROCEDURES** for requirements for Final Completion.

### **1.04 LIQUIDATED DAMAGES AND ACTUAL DAMAGES**

- A. If the Contractor fails to achieve Substantial Completion in the required contract time, the Contractor authorizes Ecology to deduct liquidated damages from Project Progress Payments in the amount of \$1,000.00 per calendar day until Contractor achieves Substantial Completion.
- B. In the event Contractor fails to achieve Final Completion within the time stipulated after Substantial Completion, the Contractor shall be subject to actual damages incurred by Ecology until Contractor achieves Final Completion.

### **1.05 WORK OPERATION LIMITATIONS**

- A. Work days for this Project are Monday through Friday. Except in emergency circumstances or authorized by Ecology, Contractor shall not perform Work

during weekends (Saturday and Sunday) and Legal Holidays as defined and designated by the State of Washington Department of Revenue.

1. Contractor shall be responsible for maintaining a safe and stable Project area during all periods of time when Work is not permitted.
  2. Contractor is permitted to inspect Work areas from public rights-of-way during periods of time when Work is not permitted for the purpose of verifying site safety and stability, and the security of Project materials and equipment.
  3. Weekends and legal holidays work restrictions are accounted for in the allowed contract time for this Project.
- B. Allowable construction hours within the City of Everett are 7 AM to 5 PM, Monday through Friday, unless the City requests for different hours. The Contractor will be required to get approval from Ecology and the City to work outside allowable construction hours. No work will be allowed on weekends or holidays unless otherwise approved by Ecology.
- C. Any variation from allowable work hours or work on weekends or Holidays will be subject to approval by Ecology. Contractor shall submit notice to Ecology no less than 7 days prior to requesting any necessary variation from allowable work hours, to allow for adequate review and coordination of staff. Contractor's notice to Ecology shall include Work activities to be conducted outside of allowable work hours, the hours and days that those activities will be conducted, and the requested duration of the change in normal work hours.
- D. Emergency repairs of equipment outside of allowable work hours may be performed without 48-hour notice, but Contractor shall verbally notify Ecology prior to such emergency maintenance.

#### **1.06 PERMITS, LICENSES AND FEES**

- A. Ecology has obtained the following permits for construction tasks identified in the Contract Documents. These permits individually and collectively contain conditions that will impact the means and methods available for use by the Contractor. Prior to bidding, the Contractor shall review these permits to familiarize itself with the conditions identified. The permits obtained by Ecology include:
1. State Environmental Policy Act (SEPA) Determination of Nonsignificance (DNS);
  2. National Pollutant Discharge Elimination System (NPDES) Construction Stormwater General Permit (CSWGP) (Permit # WAR-301681); and
  3. City of Everett Public Works Permit.
- B. The Contractor shall obtain all other permits from authorities having jurisdiction and from serving utility companies and agencies, necessary to

**DIVISION 01 – GENERAL REQUIREMENTS**  
**SECTION 01 10 00 – PROJECT SUMMARY**

**DRAFT**

complete Work described in the Contract Documents. These permits include, but are not limited to, permits associated with shoring, temporary pedestrian bypass, wastewater discharge authorization and utility reconnection.

- C. The Contractor shall review the requirements of all permits/substantive requirements and shall ensure that the Contract Work is executed in accordance with the permit requirements.
- D. The CSWGP will be transferred to the Contractor for the duration of the construction. The permit shall be transferred back to Ecology following the completion of the construction. The Contractor shall be responsible for implementing the temporary erosion and sediment control (TESC) Plan and for fulfilling the objectives stated in the Construction Stormwater General Permit. TESC features shall be provided and maintained to ensure that discharges from the site comply with Project's CSWGP. There may be substantial penalties levied by Ecology for failure by the Contractor to implement the provisions of the CSWGP. Fines up to \$10,000.00 per day can be levied for infractions.
- E. Any fines resulting from the Contractor's inability to comply with Project permit conditions shall be the responsibility of the Contractor. Any such fines or penalties incurred by Ecology, as permittee, which are due to the actions of the Contractor, shall be withheld from progress payments until the fines/penalties are paid by the Contractor to Ecology. If the fines/penalties attributable to the Contractor are not paid by Final Completion, Ecology will reduce the Contract Sum by the amount of the fines owed to Ecology.
- F. Licenses: Contractor shall obtain all licenses associated with construction activities, such as business licenses, contractors' licenses and vehicle and equipment licenses. All costs for licenses shall be included in the Contract Sum.
- G. Test and Inspection Fees: Contractor shall pay all fees charged by authorities having jurisdiction and from serving utility companies and agencies, for tests and inspections conducted by those authorities, companies and agencies. Ecology shall reimburse Contractor for actual amount of such fees, without mark-up.
- H. For Ecology's records, submit copies of permits, licenses, certifications, inspection reports, releases, jurisdictional settlements, notices, receipts for fee payments, judgments, and similar documents, correspondence, and records established in conjunction with compliance with standards and regulations bearing upon performance of the Work. Maintain copies at Project Site.

**PART 2 – PRODUCTS (NOT USED)**

**PART 3 – EXECUTION (NOT USED)**

**DIVISION 01 – GENERAL REQUIREMENTS  
SECTION 01 10 00 – PROJECT SUMMARY**

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END OF SECTION

**PART 1 – GENERAL**

**1.01 SUMMARY**

- A. This section includes requirements and restrictions related to the Work activities performed at the Project Site, including use of premises, access roads and parking.

**1.02 CONTRACTOR'S USE OF PROJECT SITE**

- A. Contractor shall confine all operations, including the storage of materials, to the designated Work areas of the Project Site as shown on the Contract Drawings, or as otherwise approved in writing by Ecology and/or Ecology's Representative.
- B. Contractor shall be responsible for arranging for, and paying the costs of any necessary off-site storage.
- C. Contractor's use of the premises shall be limited to the Work being performed in accordance with the Contract Documents.
- D. Contractor shall not occupy, cross, or otherwise use any of the Work areas until applicable permits and permissions have been obtained from regulating agencies.
- E. Contractor shall be responsible for the security and safety of Contractor's equipment, facilities, and Work areas. Ecology or Ecology's Representative shall not be liable for loss or damage of Contractor's tools, vehicles, equipment, or materials, whatever the cause.
- F. Contractor shall be responsible for any damage to roadways, facilities, utilities, trees or structures on, or adjacent to, the site due to negligence, carelessness, actions, errors or omissions on the part of the Contractor.

**1.03 ACCESS ROADS**

- A. Contractor vehicles shall enter and exit the Work areas only at the locations designated on the Contract Drawings or as otherwise approved in writing by Ecology and/or Ecology's Representative.
- B. Contractor shall be responsible for obtaining any permits (that are not obtained by Ecology) and paying any fees necessary for Contractor's use of public streets or roads.
- C. Contractor shall provide traffic controls to manage pedestrian and vehicular traffic affected by construction in accordance with the requirements of the City of Everett and Contract Documents.
- D. Contractor shall, at all times, provide for unimpeded access for emergency vehicles through the Project Site and to nearby properties.

**1.04 PARKING**

- A. Contractor shall park vehicles and construction equipment only in contractor staging area(s) or other areas approved by Ecology for such purposes.
- B. Vehicles shall not be parked in any locations where they impede traffic or access to areas where Work is being conducted.

**1.05 ECOLOGY'S USE OF PROJECT SITE**

- A. Contractor shall provide Ecology, Ecology's Representatives, and others, as designated, access to the Work in progress.
  - 1. Ecology and Ecology's Representatives shall be authorized to enter the Project Site to observe and document the Work activities and coordinate communications and activities involving the Contractor, Ecology, and Ecology's Representative.
  - 2. The number of Ecology's Representatives shall be determined at Ecology's discretion depending on the type and sensitivity of the Work being performed.
  - 3. Contractor shall provide Ecology's Representatives all reasonable access to the Work to photograph, document, measure, sample, or other activities as required by Ecology.

**PART 2 – PRODUCTS (NOT USED)**

**PART 3 – EXECUTION (NOT USED)**

END OF SECTION



**PART 1 – GENERAL**

**1.01 RELATED WORK DESCRIBED ELSEWHERE**

- A. The provisions and intent of the Contract, including the **SECTION 00 72 00 - GENERAL CONDITIONS** and **SECTION 00 73 00 - SUPPLEMENTAL CONDITIONS** apply to this work as if specified in this section. Work related to this section is described throughout Contract Documents.
- B. Individual submittals are required in accordance with the pertinent sections of Contract Documents.

**1.02 PAYMENT PROCEDURES**

- A. “Pencil Copies” of the monthly pay estimates shall be presented to Ecology or Ecology’s Representative not more than three (3) days prior to the anticipated submittal of the “formal” pay estimate. The Contractor shall hold a meeting with Ecology or Ecology’s Representative, required subcontractor representatives to discuss the quantities to be included in the pay estimate for the respective month. Upon agreement of the quantities performed, the Contractor shall complete the pay estimate for submittal.
- B. Monthly pay estimates shall clearly identify the work performed for the given time period based on a percentage of work completed for lump sum bid items and actual quantities installed for unit price items.
- C. Prior to submitting pay estimates to Ecology, the Contractor and Ecology or Ecology’s Representative shall review the work accomplished to agree upon percentage of Work completed using the project’s schedule of values.
- D. Following review, the Contractor shall prepare an original pay estimate with complete supporting documentation attached and submit electronically (preferred method in support of Ecology’s “Green” contracting practices) to the attention of Joe Ward, Ecology Contracts Officer. The pay estimate shall be emailed to:

Email: joe.ward@ecy.wa.gov

Mail address:

Washington State Department of Ecology  
Toxics Cleanup Program, PO Box 47600  
Olympia, WA 98504

Attn: Joseph Ward, P.E.

- E. The Ecology Contracts Officer will review the amount invoiced to verify costs are in accordance with the Ecology Project Manager’s recommendations, authorized scope of work, proposed rates, and the terms and conditions of the Contract. Once verified, the Ecology Contracts Officer approves the pay estimate for payment and forwards to Ecology’s finance department for processing. Payments for approved pay estimates shall be

made within thirty (30) days of receipt by the Ecology Contracts Officer, unless the pay estimate has been returned to the Contractor for revision(s) and resubmittal. Pay estimates requiring revision(s) will be returned to the Contractor per Article 6.04 Progress Payments of **SECTION 00 72 00 – GENERAL CONDITIONS**.

**1.03 PAYMENT PRICING**

- A. Pricing for the various lump sum or unit prices in the Bid Form, as further specified herein, shall include all compensation to be received by the Contractor for furnishing all tools, equipment, supplies, and manufactured articles, and for all labor, operations, and incidentals appurtenant to the items of work being described, as necessary to complete the various items of the work in accordance with the requirements of the Contract Documents.
- B. Pricing also includes all costs of compliance with the regulations of public agencies having jurisdiction, including safety and health requirements of the Occupational Safety and Health Administration of the U.S. Department of Labor (OSHA).
- C. No separate payment will be made for any item that is not specifically set forth in the Bid Form, and all costs therefore shall be included in the prices named in the Bid Form for the various appurtenant items of work.
- D. All other work not specifically mentioned in the measurement and payment sections identified below shall be considered incidental to the work performed and merged into the various unit and lump sum prices bid. Payment for work under one item will not be paid for under any other item.
- E. Ecology reserves the right to make changes should unforeseen conditions necessitate such changes. Where work is on a unit price basis, the actual quantities occasioned by such changes will govern the compensation.

**1.04 MEASUREMENT FOR PAYMENT**

- A. Measurement for payment shall be in accordance with the schedules below and shall be based upon: 1) Lump Sum/Known Quantity bid items as stipulated in the Bid Form. Payment shall be considered full compensation for furnishing all labor, materials and equipment to complete the Work specified, to include all direct, indirect and overhead costs, and profit.
- B. Trench Excavation Safety Provisions: If any of Lump Sum or Unit Price Bid Item contains any work which requires trenching exceeding a depth of four feet, all costs for trench safety shall be included in the appropriate Bid items for adequate trench safety systems as necessary, in compliance with Chapter 39.04 RCW, 49.17 RCW and WAC 296-155-650.
- C. In measuring all acceptably completed items of work, Ecology will:
  - 1. Use United States standard measure;

**DIVISION 01 – GENERAL REQUIREMENTS**  
**SECTION 01 20 00 – PRICE AND PAYMENT PROCEDURES**

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2. Make all measurements as described in this section, unless individual specifications require otherwise;
  3. Follow methods generally recognized as conforming to good engineering practice;
  4. Conform to the usual practice of carrying measurements and computations to the proper significant figure or fraction of units for each item; and
  5. Measure horizontally or vertically (unless otherwise specified).
- D. The terms listed below shall be defined as follows in all measurements under this section:
1. “Lump Sum” (when used as an item of payment): complete payment for the work described for that item in the contract. Lump sum payments also may be made based on percent of completion. Minor adjustments to the work shall be assumed to be incidental with regard to global lump sum work items such as health and safety, survey, mobilization, and other similar items.
  2. “Ton”: 2,000 pounds of weight.
  3. “Gallon”: measurement shall be in U.S. gallons, as measured by the licensed disposal facility at the time of disposal.
  4. “Hour”: hourly rate for equipment and personnel, including fees, taxes, and any other incidentals. Prevailing wage rates shall apply for the work in this Contract.
- E. For each item listed below, Ecology will use the method of measurement described.
1. Standard Manufactured Items: measured by the manufacturer’s identification gage, unit weight, section dimension, etc. Ecology will accept manufacturing tolerances set by each industry unless cited specifications require more stringent tolerances.
- F. No measurement will be made for:
1. Work performed or materials placed outside lines shown in the Plans or set by Ecology;
  2. Materials wasted, used or disposed of in a manner contrary to the contract;
  3. Rejected materials (including those rejected after placement if the rejection resulted in the Contractor’s failure to comply with the contract);
  4. Hauling and disposing of rejected materials;
  5. Material remaining on hand after the work is completed; or
  6. Any other work or material contrary to any contract provision.

**DIVISION 01 – GENERAL REQUIREMENTS**  
**SECTION 01 20 00 – PRICE AND PAYMENT PROCEDURES**

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- G. Lump Sum/Known Quantity, any alternate bid items, and any Unit Price Bid items are identified in **SECTION 00 41 43 – SUMMARY OF PAY ITEMS AND QUANTITIES.**

**PART 2 – PRODUCTS (NOT USED)**

**PART 3 – EXECUTION (NOT USED)**

END OF SECTION

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**PART 1 – GENERAL**

**1.01 GENERAL**

- A. For all unit price work, the Contract Sum shall include an amount equal to the sum of the unit price for each pay item times the estimated quantity of each item as indicated in the Bid Form. The estimated quantities shown on Bid Form are not guaranteed and are solely for the purpose of comparison of bids and determining an initial Contract Sum. Quantities and measurements supplied, placed or removed in the Work in accordance with the Contract Documents and verified by Ecology's Representative will determine payment.

**1.02 DEFINITIONS**

- A. Unit price, stated on the Bid Proposal Form, is a price per unit of measurement for materials, labor, and all other aspects of the specific element of Work added to or deducted from the Contract Sum by appropriate modification, if the quantities of Work required by the Contract Documents are increased or decreased. The unit prices shall be in effect for all additional material required to be added to or material deducted from the quantities in the Contract Documents.
- B. Actual quantities will be determined during construction and may result in a net deletion from the Contract Sum and subsequent credit to Ecology, or an addition to the Contract Sum.
1. Adjustments to the Contract Sum will be by Change Order based on the Unit prices.
- C. Unit prices shall include all labor, material, cost for delivery, equipment, installation, temporary facilities and coordination/ supervision to complete all the Work described for the unit price. Overhead and profit will be added as part of the Change Order process in accordance with **SECTION 00 72 00 – GENERAL CONDITIONS**, Part 7 – Changes. Unit Prices shall not include applicable State and Local Sales Taxes, but shall include all other taxes, including but not limited to, income, excise, and business and occupation taxes.

**1.03 UNIT PRICE MEASUREMENT BASIS**

- A. If not specifically noted in other Sections, measurements taken for the purposes of quantities for calculation are always to be measured as units-in-place.
1. Ecology has the right to reject Contractor measurements and have an independent surveyor acceptable to both parties verify quantities.

**DIVISION 01 – GENERAL REQUIREMENTS  
SECTION 01 22 00 – UNIT PRICES**

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**PART 2 – PRODUCTS (NOT USED)**

**PART 3 – EXECUTION (NOT USED)**

END OF SECTION

**PART 1 – GENERAL**

**1.01 DESCRIPTION**

- A. Requests for changes in products, materials, means and methods, scheduling changes, and/or equipment construction required by Contract Documents that may be proposed by the Contractor after Award of the Contract are considered Substitution requests.

**1.02 SUBMITTAL**

- A. Requests for substitution submitted by the Contractor will be considered by Ecology if received no later than thirty (30) calendar days after Notice to Proceed or no sooner than ten (10) working days before the use of the substitution on a Project Site after Work has commenced.
  - 1. Requests for substitution that do not comply with this Specification may be considered or rejected at the sole discretion of Ecology.
- B. Contractor shall submit each request for substitution in writing for consideration to Ecology.
  - 1. Submit request for substitutions in the form and in accordance with **SECTION 01 33 00 – SUBMITTAL PROCEDURES**.
  - 2. Email is acceptable for submitting requests for substitutions in writing.
- C. In the submitted request for substitution, the Contractor shall identify the product, or installation method to be replaced for each request, the related Contract Document Section(s) and complete documentation showing compliance with the requirements for substitutions. Where appropriate, the following information shall be included:
  - 1. Product Data, including drawings and descriptions of Products, fabrication and installation procedures.
  - 2. Samples, where applicable or requested.
  - 3. A detailed comparison of significant qualities of the proposed substitution with those of the Work as specified. Significant qualities may include elements such as size, weight, durability, performance and visual effect.
  - 4. Coordination information, including a list of changes or modifications needed to other parts of the Work and to construction performed by Ecology and separate contractors that will become necessary to accommodate the proposed substitution.
  - 5. A statement indicating the substitution's effect on the Contractor's Construction Progress Schedule compared to the schedule without



- approval of the substitution. Also indicate the effect of the proposed substitution on overall Contract Time.
6. Cost information, including the net change, if any, in the Contract Sum.
  7. Certification by the Contractor that the substitution proposed is equal-to or better in every significant respect to that required by the Contract Documents, and that it will perform adequately in the application indicated. Include the Contractor's waiver of rights to additional payment or time that may subsequently become necessary because of the failure of the substitution to perform adequately.
- D. Within two (2) calendar weeks of receipt of the request for substitution, Ecology will request additional information or documentation necessary for evaluation of the request.
1. If a decision on use of a proposed substitute cannot be made or obtained within the time allocated, use the product specified by name in the Contract Documents.
  2. If applicable, formal acceptance of a change in the Contract Documents will be requested in accordance with Part 7 – Changes of **SECTION 00 72 00 – GENERAL CONDITIONS**.

### **1.03 MINIMUM CONDITIONS FOR CONSIDERATION**

- A. The Contractor's substitution request will be received and considered by Ecology when one or more of the applicable conditions in this Paragraph are determined by Ecology to be satisfactory.
1. Extensive revisions to Contract Documents are not required.
  2. Proposed changes are in keeping with the general intent of Contract Documents.
  3. The request is timely, fully documented and properly submitted.
  4. The request is for a Product with an "or equal" clause or similar language in the Contract Documents.
  5. There were no bidder requested substitutions for this Product or method approved prior to the Award of the Contract. These approved Products must all meet the substitution conditions before any new Products or methods will be approved.
  6. The specified Product or method of construction cannot be provided within the Contract Time. The request will not be considered if the Product or method cannot be provided as a result of failure to pursue the work promptly or coordinate activities properly.

7. The specified Product or method of construction cannot receive necessary approval by a governing authority, and the requested substitution can be approved.
  8. A substantial advantage is offered to Ecology, in terms of cost, time, energy conservation or other considerations of merit, after deducting offsetting responsibilities Ecology may be required to bear. Additional responsibilities for Ecology may include additional compensation to the Ecology's Representative for redesign and evaluation services, increased cost of other construction by Ecology or separate contractors, and similar considerations.
  9. The specified Product or method of construction cannot be provided in a manner that is compatible with other materials, and where the Contractor certifies that the substitution will overcome the incompatibility.
  10. The specified Product or method of construction cannot be coordinated with other materials, and where the Contractor certifies that the proposed substitution can be coordinated.
  11. The specified Product or method of construction cannot provide a warranty required by the Contract Documents and where the Contractor certifies that the proposed substitution can be coordinated.
- B. The determination that a substitution is satisfactory is solely at the discretion of Ecology.
- C. The Contractor's submittal and Ecology's acceptance of Shop Drawings, Product Data or Samples that relate to construction activities not complying with the Contract Documents does not constitute an acceptable or valid request for substitution, nor does it constitute approval.

**PART 2 – PRODUCTS (NOT USED)**

**PART 3 – EXECUTION (NOT USED)**

END OF SECTION

**PART 1 – GENERAL**

**1.01 DESCRIPTION**

- A. A document submitted by the Contractor requesting clarification of a portion of the Contract Documents are hereinafter referred to as a Request for Interpretation (RFI).
- B. Should the Contractor be unable to determine from the Contract Documents the exact material, process, or system to be installed; or when the elements of construction are required to occupy the same space (interference); or when an item of Work is described differently at more than one place in the Contract Documents; the Contractor shall request Ecology or Ecology's Representative make an interpretation of the requirements of the Contract Documents to resolve such matters. The Contractor shall comply with procedures specified in this Section to make RFIs.
- C. The Contractor shall prepare and maintain a log of RFIs. At any time requested by Ecology, the Contractor shall furnish copies of the log showing all outstanding and closed RFIs.

**PART 2 – PRODUCTS (NOT USED)**

**PART 3 – EXECUTION**

**3.01 SUBMISSION**

- A. RFIs shall be prepared and submitted in accordance with the following:
  - 1. RFIs shall be provided in writing to Ecology by the Contractor.
  - 2. Each RFI shall be given a discrete, consecutive number.
  - 3. Each page of the RFI and each attachment to the RFI shall bear the Project name, date, RFI number, and a descriptive title.
  - 4. Each RFI should contain a clear and legible statement of the Work element where interpretation is requested, including specific reference(s) to the pertinent Sections and Paragraphs of the Contract Documents. This statement should summarize clearly the reasons why the RFI is being submitted by the Contractor.
  - 5. Contractor shall sign all RFIs attesting to good faith effort to determine from the Contract Documents the information requested for interpretation.
  - 6. Contractor shall be responsible for delays resulting from the necessity to resubmit an RFI due to insufficient or incorrect information presented in the RFI.

**DIVISION 01 – GENERAL REQUIREMENTS**  
**SECTION 01 26 13 – REQUESTS FOR INTERPRETATION (RFI)**

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- B. Contractor shall carefully study the Contract Documents to ensure that information sufficient for interpretation of requirements of the Contract Documents is not included.
  - 1. RFIs that request interpretation of requirements clearly indicated in the Contract Documents will be returned without interpretation.
  - 2. Frivolous RFIs shall be subject to reimbursement from Contractor to Ecology for costs incurred in review of the frivolous RFIs by Ecology or Ecology’s Representative. Assessment of frivolous RFIs shall be at the sole discretion of Ecology.
- C. Subcontractor-Initiated and Supplier-Initiated RFIs: RFIs from subcontractors and material suppliers shall be submitted through, be reviewed by, and be attached to an RFI prepared, signed, and submitted by the Contractor. RFIs submitted directly by Subcontractors or material suppliers will be returned unanswered to the Contractor.
  - 1. Contractor shall review all Subcontractor- and supplier-initiated RFIs and take actions to resolve issues of coordination, sequencing, and layout of the Work.
  - 2. RFIs submitted to request clarification of issues related to means, methods, techniques, and sequences of construction or for establishing trade jurisdictions and scopes of subcontracts will be returned without interpretation. Such issues are solely the Contractor’s responsibility.
  - 3. Contractor shall be responsible for delays resulting from the necessity to resubmit an RFI due to insufficient or incorrect information presented in the RFI.
- D. In all cases in which RFIs are issued to request clarification of issues related to means, methods, techniques, and sequences of construction, the Contractor shall furnish all information required for Ecology or Ecology’s Representative to analyze and/or understand the circumstances causing the RFI and prepare a clarification or direction as to how the Contractor shall proceed.
  - 1. If information included with this type of RFI by the Contractor is insufficient, the RFI will be returned unanswered.
- E. Ecology shall review RFIs and respond to the Contractor within ten (10) business days of receipt. RFIs received after 12:00 noon shall be considered received on the next regular working day for the purpose of establishing the start of the 10-day response period.
- F. RFIs shall not be used for the following purposes:
  - 1. To request approval of submittals (refer to **SECTION 01 33 00 – SUBMITTAL PROCEDURES**).

**DIVISION 01 – GENERAL REQUIREMENTS**  
**SECTION 01 26 13 – REQUESTS FOR INTERPRETATION (RFI)**

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2. To request approval of substitutions (refer to **SECTION 01 25 00 – SUBSTITUTION PROCEDURES**).
  3. For Change Order Proposals (refer to Part 7 - Changes in **SECTION 00 72 00 – GENERAL CONDITIONS**).
  4. To request different methods of performing Work than those specified in the Contract Documents.
- G. In the event the Contractor believes a response to an RFI by either Ecology or Ecology’s Representative will result in additional cost or time, the Contractor shall not proceed with the Work indicated in the RFI until authorized to proceed by Ecology. Contractor shall respond as specified in Part 7 - Changes in **SECTION 00 72 00 – GENERAL CONDITIONS**.

END OF SECTION

**PART 1 – GENERAL**

**1.01 PROJECT SUPERVISION**

**A. Contractor's Supervision**

1. The Contractor shall provide the services of a full-time, experienced and qualified construction field superintendent who shall be assigned to the job during the course of the Work. The person designated as construction field superintendent shall have direct charge of the work and shall be authorized to accept and execute all orders and directions issued by Ecology. The construction field superintendent shall be readily available during normal work hours for consultation with Ecology and be physically on the job Site during Site activities. The construction field superintendent shall not be removed or replaced during the entire course of the contract work without the written approval of Ecology.
2. The Contractor shall manage the Project. The Contractor shall inform Ecology or Ecology's Representative with information throughout the work so that they can make informed and effective decisions.
3. Unprofessional behavior of any kind by contractor and subcontractor personnel is unacceptable and will not be tolerated on this Project.
  - a. Ecology will direct the Contractor to immediately remove any contractor or subcontractor personnel from the Project, for the duration of the Project, that exhibit unprofessional behavior to Ecology, Ecology representatives, the property owner, or general public, and replace with competent personnel that are acceptable to Ecology.
  - b. Upon notification by Ecology, the Contractor's failure to immediately address and correct any displays of unprofessional behavior by its personnel or by subcontractor personnel, or to remove personnel exhibiting such behavior when directed to do so by Ecology is grounds for termination of the contract for cause.

**B. Ecology's Supervision**

1. Ecology's Project Manager or Ecology's Representative will represent Ecology on the site.

**1.02 MEETINGS**

The Contractor's project manager and/or project superintendent shall attend, at a minimum, the following meetings with Ecology or Ecology's Representative:

**A. Public Meetings**

1. Contractor shall participate in public meetings and conferences scheduled and conducted by Ecology. Ecology will coordinate with the Contractor for all these meetings to determine appropriate representation, discuss the meeting agenda, and minimize impacts and consequences on the Work.
  - a. Public meetings are anticipated on or near the beginning of the Contract Time.
  - b. A public meeting is possible at or near the end of the Contract Time, at the discretion of Ecology.
  - c. Contractor is not responsible for preparing and distributing either agenda or minutes for public meetings and conferences scheduled and conducted by Ecology.
  
- B. Preconstruction Meeting
  1. Following the award, Ecology will notify the selected bidder of the time and date of a preconstruction meeting. The preconstruction meeting will be conducted in Everett and may include a site visit to Project Site. The following are requested to attend and suggested agenda:
    - a. Ecology:
      - 1) Ecology Contracts Manager (as required)
      - 2) Ecology Project Manager
      - 3) Ecology's Representative
    - b. Contractor's Representatives:
      - 1) Superintendent
      - 2) Contract Administrator (if required)
      - 3) Major Subcontractors (as required)
      - 4) Major Suppliers (as required)
    - c. Representatives of the City of Everett Public Works Department and other representatives as determined by the City of Everett.
    - d. Suggested Agenda:
      - 1) Communications and routing
      - 2) Schedule of Values
      - 3) Execution of the Contract
      - 4) Discussion of the General Conditions
      - 5) Discussion of the Special Conditions



- 6) Discussion of the Project Specific Requirements
- 7) Discussion of the Technical Specifications
- 8) Change Order Process
- 9) Terms and Conditions of Payment
- 10) Use of the Project Site
- 11) Responsibility for temporary facilities, controls, and erosion best management practices
- 12) Parking availability
- 13) Work and temporary storage areas
- 14) Security
- 15) Progress cleaning
- 16) Working hours
- 17) Topics requested by the City of Everett, Contractor, or Ecology
- 18) Site visit
- 19) Other issues, if any

**C. Weekly Progress Meetings**

1. Ecology will schedule and administer weekly progress meetings throughout progress of the work. Time and date of progress meetings will be determined by Ecology at a later date.
2. Ecology will arrange meetings, prepare standard agenda with copies for participants, preside at meetings, record minutes and distributes copies within 5 working days to the Contractor, meeting participants, and others affected by decisions made.
3. Attendance is required for the Contractor's job superintendent, major subcontractors and suppliers, Ecology, and others as appropriate to the agenda topics for each meeting.
4. Standard Agenda
  - a. Review and correct or approve minutes of the previous progress meeting.
  - b. Review site safety and health issues identified since the last meeting by Contractor, Ecology, Ecology's Representatives, and the public.
  - c. This may include NPDES permit compliance, erosion control, or other safety and health issues.

- d. Review items of significance that could affect progress of the Work.
- e. Topics for discussion as appropriate to the status of the Work.
- f. Contractor's Construction Progress Schedule.
- g. Progress since last meeting.
- h. Determination whether each activity is on time, ahead of schedule, or behind schedule in relation to the Contractor's Construction Progress Schedule.
- i. Determine how construction behind schedule will be expedited and secure commitments from parties involved to do so.
- j. Discuss schedule revisions to ensure that current and subsequent Work activities will be completed within the Contract Time.
- k. Review of Contractor's Redline Drawings.
- l. Review status of Submittals, Substitutions, RFIs, Work Change Directives, Change Orders, Schedule Modification Requests, Project Record, and other documents under preparation or review by either Contractor or Ecology.
- m. Review present and future needs of each entity present, including the following:
  - 1) Interface requirements
  - 2) Sequence of operations
  - 3) Status of submittals
  - 4) Deliveries
  - 5) Off-site fabrication
  - 6) Access
  - 7) Site utilization
  - 8) Temporary facilities and controls
  - 9) Work hours
  - 10) Progress cleaning
  - 11) Quality and work standards
  - 12) Change Orders and RFIs
  - 13) Documentation of information for payment requests

D. Special Meetings

1. Contractor's project manager and/or project superintendent shall attend special meetings that may be held at Ecology's request when a problem or deficiency is present or likely to occur. The purpose of these meetings will be to define and discuss a problem or recurring work deficiency, review alternative solutions, and identify a plan to efficiently and effectively resolve the problem or deficiency.
2. Contractor's project manager and/or project superintendent shall attend other meetings at Ecology's request to coordinate Contractor's activities with related work being conducted by Ecology.
3. Contractor's project manager and/or project superintendent's attendance at off-site meetings with regulatory agencies or other parties shall be arranged as necessary. Contractor shall participate in off-site meetings at no additional cost to Ecology.

E. Health and Safety Meetings

1. Contractor shall conduct health and safety meetings for Contractor personnel as required by Contractor's health and safety plan, including but not limited to daily tailgate safety meetings. Ecology may attend Contractor's health and safety meetings, as needed, to be aware of work conditions or health and safety concerns that could affect the normal business activities of Ecology's or Ecology's Representative's employees or tenants, or the coordination or execution of work under other contracts.

**1.03 NOTIFICATION POINTS**

- A. The Contractor shall notify Ecology at all milestone points prior to proceeding further, to allow inspection of the Contractor work progress. Ecology or Ecology's Representative may request additional Notification points based on review of the above information provided by the Contractor.

**1.04 CONSTRUCTION SCHEDULE SUBMITTALS**

- A. Project Schedule: The Contractor shall submit a Preliminary Project Schedule in accordance with the submittal timing requirements identified in **SECTION 01 33 00 – SUBMITTAL PROCEDURES**. The schedule shall be a Critical Path Method (CPM) schedule developed by the Precedence Diagramming Method (PDM). The schedule shall be used to evaluate progress of work based on the Schedule of Values. The schedule shall show the Contractor's planned order and interdependence of activities, and sequence of work. The schedule shall be updated weekly or as often as requested by Ecology. The Project Schedule shall display the following information, at a minimum:
1. Date of Notice to Proceed;

2. Activities (resources, durations, individual responsible for activity, early starts, late starts, early finishes, late finishes, etc.);
  3. Utility shutdowns;
  4. Interrelationships and dependence of activities;
  5. Planned vs. actual status for each activity;
  6. Preliminary punch list;
  7. Substantial completion;
  8. Punch list;
  9. Final inspection;
  10. Final completion; and
  11. Float time.
- B. The Contractor shall update the Progress Schedule on a weekly basis, and bring the required number of copies to the Weekly Progress Meeting. At a minimum, schedule updates shall reflect the following information:
1. The actual duration and sequence of as-constructed Work activities, including changed Work.
  2. Approved time extensions.
  3. Unresolved requests for time extensions shall be reflected in the Schedule Update by assuming no time extension will be granted, and by showing the effects to follow-on activities necessary to physically complete the project within the currently authorized time for completion.
  4. Any construction delays or other conditions that affect the progress of the Work.
  5. Any modifications to the as-planned sequence or duration of remaining activities.
  6. Any modifications to the Critical Path.
  7. The Physical Completion of all remaining Work in the remaining Contract time.
- C. Refer to **SECTION 00 72 00 - GENERAL CONDITIONS** and **SECTION 00 73 00 - SUPPLEMENTAL CONDITIONS**, Part 3.02 – Construction Schedule for additional requirements.
- D. Schedule of Values: Provide a detailed cost break down of lump sum bid items to Ecology for approval in accordance with the submittal timing requirements identified in **SECTION 01 33 00 – SUBMITTAL PROCEDURES**. Furnish a fair evaluation of actual cost of each Work item listed. This will be used in processing Contractor's request for partial payment. Submittal of breakdown does not affect the Contract terms. The schedule of values shall at a minimum address, each work activity required

for remediation and restoration of the Project Site. Costs for any permit shall be listed separately.

- E. Project Management and Coordination Plan: Submit Project Management and Coordination Plan in accordance with the submittal timing requirements identified in **SECTION 01 33 00 – SUBMITTAL PROCEDURES**. The plan shall identify following:
1. Resume of Project Superintendent(s).
  2. Identification of key personnel and their contacts.
  3. List of major sub-contractor and their key personnel's contacts.
  4. Detailed project staffing plan showing staffing levels for each task and phase of Work.
  5. List of major Equipment, Systems, and Materials.
  6. List of permits and approvals to be obtained by Contractor, including contact names, titles and phone numbers.

#### **1.05 CONSTRUCTION SCHEDULE REGARDING SUBMITTALS**

- A. The Contractor is hereby notified that Ecology will not defer liquidated damages or waive specified requirements due to project delays resulting from Contractor actions or inaction (including Contractor insufficient planning) or other causes, including but not limited to:
1. Contractor's late or inadequately packaged submittals, or submittals that require more than two Ecology reviews before approval by Ecology.
  2. The Contractor shall specifically note that restoration activity is seasonally dependent and these specifications may contain various requirements with fixed calendar dates and should the Contractor fail to complete the work as indicated by these dates, then the Contractor may be required to complete alternate or supplemental work. Examples include 1) restoring pavement surfacing, 2) restoring the remediation area with sod (where applicable) should the allowed latest date for seeding pass, and 3) implementing additional TESC measures for enhanced protection of the work due to late paving, seeding or sodding, in order to stabilize the site for the winter.
  3. The Contractor shall specifically note that requirements for import soil (including topsoil) require the Contractor to identify and test multiple materials from multiple suppliers to obtain material that meets the specifications. Ecology has completed reasonable due diligence in identifying material specifications and identifying suppliers that may meet the specifications; however, the Contractor is cautioned that the quality of soils (particularly topsoil) provided by any given supplier can vary over time, particularly with respect to the presence of chemical contaminants, changes is component

gradation or component blended ratios. The Contractor shall include material testing as line items in the project schedule.

**1.06 DIRECTION FROM ECOLOGY**

- A. All direction regarding the Project shall be obtained from Ecology.

**1.07 ECOLOGY WORK CHANGE DIRECTIVES**

- A. Work Change Directives are the written form of communication Ecology shall use to direct changes, additions, and/or subtractions to the Project Scope in accordance with Part 7 – Changes of **SECTION 00 72 00 – GENERAL CONDITIONS** for this Project.
1. Use of Work Change Directives shall include Ecology changes to scheduled Work (such as Suspension of Work for Cause or Convenience) or other coordination with municipal officials, and/or other Persons.
  2. Work Change Directives shall be clearly labeled as such by Ecology, to distinguish these documents from all other written communications between Ecology, Ecology's Representative, Contractor and Subcontractor(s), etc.
- B. Receipt of a Work Change Directive from Ecology shall be considered a request for a Change Order Proposal from Contractor. Contractor shall comply with this request as required in Part 7 – Changes of **SECTION 00 72 00 – GENERAL CONDITIONS**.
1. For the purposes of determining Change Order Proposal deadlines as required in this Section of the General Conditions, Contractor shall assume Notice has been given by Ecology starting the next business day after the date on the Work Change Directive memo.
  2. As a Work Change Directive is a change to the Contract Documents, Contractor shall still provide Ecology a Change Order Proposal even if no equitable adjustment to Contract Sum and/or Contract Time will be requested by Contractor.

**PART 2 – PRODUCTS – (NOT USED)**

**PART 3 – EXECUTION – (NOT USED)**

END OF SECTION

**PART 1 – GENERAL**

**1.01 DESCRIPTION OF WORK**

- A. This Section specifies administrative general and procedural requirements for submittals required for performance of the Work.
- B. Additional requirements for administrative submittals are provided in other Sections of the Contract Documents. Such submittals include, but are not limited to:
  - 1. Permits.
  - 2. Applications for Payment.
  - 3. Contractor's Construction Progress Schedule and Progress Schedule updates.
  - 4. Guarantees.
  - 5. Representative product samples.
  - 6. Substitutions.
  - 7. Submittals related to each Work element.

**1.02 SUBMITTALS**

- A. The Contractor shall submit the Contractor's Schedule of Submittals in accordance with the submittal timing requirements identified in the Submittal Schedule in this Section. Schedule of Submittals shall include updates to reflect the progression of the Project.
  - 1. The Contractor shall prepare and keep current, for review by Ecology, the Contractor's Schedule of Submittals which shall be coordinated with the Contractor's Project Schedule.
  - 2. The Contractor's Schedule of Submittals shall provide sufficient time for Ecology submittal review as described in this Section.

**PART 2 – PRODUCTS (NOT USED)**

**PART 3 – EXECUTION**

**3.01 SUBMITTAL PROCEDURES**

- A. Contractor shall coordinate preparation and processing of submittals with performance of construction activities. Transmit each submittal to Ecology sufficiently in advance of performance of related construction activities to avoid delay.
  - 1. Contractor shall coordinate each submittal with fabrication, purchasing, testing, delivery, other submittals and related activities that require sequential activity.



2. Contractor shall coordinate transmittal of different types of submittals for related elements of the Work so processing will not be delayed by the need to review submittals concurrently for coordination.
    - a. Ecology reserves the right to withhold action on a submittal requiring coordination with other submittals until related submittals are received.
  3. Contractor shall allow sufficient review time so that installation will not be delayed as a result of the time required to process submittals, including time for resubmits.
    - a. Allow two (2) weeks for initial Ecology review.
    - b. Allow additional time if processing must be delayed to permit coordination with subsequent submittals.
    - c. Ecology shall promptly advise the Contractor when a submittal being processed must be delayed for coordination.
    - d. If an intermediate submittal is necessary, process the same as the initial submittal.
    - e. Allow two (2) weeks for reprocessing each submittal.
    - f. No extension of Contract Time will be authorized because of failure to transmit submittals to Ecology sufficiently in advance of the Work to permit processing.
- B. During submittal preparation, place a permanent label or title block on each submittal for identification. Indicate the name of the entity that prepared each submittal on the label or title block.
1. Include the following information on the label for processing and recording action taken:
    - a. Project name.
    - b. Date.
    - c. Name and address of Ecology as the Project Owner.
    - d. Name and address of Contractor.
    - e. Name and address of Subcontractor(s), if appropriate.
    - f. Name and address of supplier(s), if appropriate.
    - g. Name of manufacturer(s), if appropriate.
    - h. Section number(s) and title(s) of appropriate Contract Documents.
    - i. References, as appropriate, to other shop drawings, submittals or other documentation previously provided by Contractor to Ecology.

- C. Package each submittal appropriately for transmittal and handling. Each submittal shall be transmitted directly by Contractor to Ecology. Submittals received from sources other than the Contractor will be returned without action.
  - 1. Contractor shall review all submittals transmitted to Ecology, and mark in submittal the Contractor’s review and approval.
  - 2. Contractor shall record all deviations from Contract Document requirements, including minor variations and limitations. All submittals shall include Contractor’s certification that information complies with Contract Document requirements.
  - 3. Submittals received without the Contractor’s review and approval markings will be returned without comment and must be properly reviewed, marked and resubmitted.

**3.02 ECOLOGY’S MARK OF ACTIONS FOR SUBMITTALS**

- A. Except submittals for information, record, or similar purposes, where action and return is required or requested, Ecology shall review each submittal, mark to indicate action taken, and return promptly.
  - 1. Compliance with specified characteristics described herein is the Contractor’s responsibility.
- B. Ecology will mark each submittal with a uniform, self-explanatory notation describing, as follows, the action indicated for that submittal.
  - 1. Where submittals are marked “Approved” that part of the Work covered by the submittal may proceed, provided it complies with requirements of the Contract Documents; final acceptance will depend upon that compliance.
  - 2. Where submittals are marked “Approved as Noted”, that part of the Work covered by the submittal may proceed, provided it complies with notations or corrections on the submittal and requirements of the Contract Documents; final acceptance will depend on that compliance.
  - 3. When submittal is marked “Not Approved, Revise and Resubmit”, do not proceed with that part of the Work covered by the submittal, including purchasing, fabrication, delivery or other activity. Revise or prepare a new submittal in accordance with the notations; resubmit without delay.

Repeat if necessary to obtain a different mark of action.

    - a. Do not permit submittals marked “Not Approved, Revise and Resubmit” to be used at the Project Site, or elsewhere where Work is in progress.

4. Where a submittal is primarily for information or record purposes, special processing or other activity, the submittal will be returned, marked “Action Not Required.”

**3.03 SUBMITTAL SCHEDULE**

- A. Check each Specification Section for the complete submittal requirements.
  1. The Submittal Schedule identifies in broad terms the general nature of the submittals that are required from the Contractor.
  2. The information contained in this Submittals Schedule is provided for the convenience of the Contractor.
  3. This list may not be complete.
  4. This list does not include submittals required in Division 00.
- B. References to “prior to use”, “prior to installation or similar, in the Latest Allowable Submittal Date is the requirement for the Contractor to have received a submittal approval from Ecology.

<b>Project Manual Section</b>	<b>Section Title</b>	<b>Submittal</b>	<b>Submittal Date</b>
01 10 00	Project Summary	Permits, licenses, certifications, inspection reports, releases, jurisdictional settlements, notices, receipts for fee payments, judgments, and similar documents, correspondence, and records	Ongoing, as specified
01 20 00	Price and Payment Procedures	Monthly Pay Estimate, Pencil Copy	3 days prior to Formal Pay Estimate
		Monthly Pay Estimate, Formal Copy	Monthly
01 31 00	Project Management and Coordination	Preliminary Project Schedule	3 weeks prior to Pre-Construction Meeting
		Progress Schedule	Every week
		Schedule of Values	3 weeks prior to Pre-Construction Meeting
		Project Management and Coordination Plan	3 weeks prior to Pre-Construction Meeting

**DIVISION 01 – GENERAL REQUIREMENTS  
SECTION 01 33 00 – SUBMITTAL PROCEDURES**

**DRAFT**

<b>Project Manual Section</b>	<b>Section Title</b>	<b>Submittal</b>	<b>Submittal Date</b>
01 33 00	Submittal Procedures	Contractor's Schedule of Submittals	3 weeks prior to Pre-Construction Meeting and Every week thereafter
01 35 23	Health and Safety Requirements	Site-specific Health and Safety Plan	3 weeks prior to Pre-Construction Meeting
		Certificates of Personnel HASP Training	3 weeks prior to Pre-Construction Meeting
		Summary of Daily Safety Meeting Minutes	As part of progress payment request
01 35 43	Green Construction Practices	Green Cleanup Project Work Plan	Prior to mobilization
01 51 00	Temporary Utilities	List of temporary utilities and their planned locations and sizes	3 weeks prior to Pre-Construction Meeting
		Copies of permits and inspection reports	Prior to installation and commencing operation of utilities
01 52 00	Construction Facilities	Drawings illustrating layout of construction facilities	3 weeks prior to Pre-Construction Meeting
		Temporary Pedestrian Bypass Plan	4 weeks prior to Pre-construction Meeting
		Copy of City's permit for bypass work	As soon as the permit is obtained from the City
01 57 00	Temporary Environmental Control	Spill Prevention Control and Countermeasures (SPCC) Plan	3 weeks prior to Pre-Construction Meeting
		Vehicle Inspection Logs	As requested by Ecology
01 57 13	Temporary Erosion and Sedimentation Controls	TESC and Environmental Controls Plan	3 weeks prior to Pre-Construction Meeting
		SWPPP (including CESCL designation and contact number)	3 weeks prior to Pre-Construction Meeting; Update as required as submit weekly

**DIVISION 01 – GENERAL REQUIREMENTS  
SECTION 01 33 00 – SUBMITTAL PROCEDURES**

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<b>Project Manual Section</b>	<b>Section Title</b>	<b>Submittal</b>	<b>Submittal Date</b>
		NPDES Transfer of Coverage Form	3 weeks prior to Pre-Construction Meeting
		Product Catalog Cuts	As requested by Ecology
		Monthly Discharge Reports	Monthly to WebDMR
01 57 50	Dust and Air Emissions Control	Air Monitoring Plan	3 weeks prior to Pre-Construction Meeting
		Air monitoring results	Within 24 hours of monitoring (shall include a CIH review of monitoring results)
01 60 00	Products	Initial list of products	With the Preliminary Progress Schedule
		Final list of products	Within 10 days after Ecology's response to initial list
01 74 00	Cleaning and Waste Management	Material Safety Data Sheets of cleaning materials and agents	Prior to bringing onsite
01 77 00	Closeout Procedures	Draft Project Record	At Substantial Completion Inspection
		Final Project Record	Prior to Final Completion
01 78 39	Project Record Documents	Progress As-Built Drawings	Prior to Progress Payment
		Final As-Built Drawings	14 days after Substantial Completion
02 21 13	Surveys	Surveying Plan and Schedule	3 weeks prior to Pre-Construction Meeting
		Surveyor Qualifications	3 weeks prior to Pre-Construction Meeting
		Areas C2 and C3 Post Construction As-Built chain link fence and gates locations survey	Within 3 weeks after the completion of site restoration as per post-restoration surveys

**DIVISION 01 – GENERAL REQUIREMENTS  
SECTION 01 33 00 – SUBMITTAL PROCEDURES**

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<b>Project Manual Section</b>	<b>Section Title</b>	<b>Submittal</b>	<b>Submittal Date</b>
02 22 00	Existing Conditions Assessments	Photos, videos and notes to document existing surface and aboveground features and utilities	3 days prior to commencing clearing, grubbing or demolition activities
		Photos, videos and notes to document existing underground features and utilities	On a weekly basis (or more frequently)
02 41 00	Demolition, Clearing and Grubbing	Site Demolition and Utility Management Plan	3 weeks prior to Pre-Construction Meeting
		Recycling/disposal facility weight tickets	As part of progress payment request
02 61 15	Transport and Disposal of Contaminated Materials	Transport and Disposal Plan	3 weeks prior to Pre-Construction Meeting
		Truck Log	Daily
		Copies of waste manifests and bill of lading	As soon as received by the contractor
		Weight tickets	As part of progress payment request
31 50 00	Excavation Support and Protection	Certificates of Disposal	As part of final payment request
		Shoring Designer Qualifications	3 weeks prior to Pre-Construction Meeting
		Excavation Support and Protection Plan	3 weeks prior to Pre-Construction Meeting
		Copy of City permit for shoring work	As soon as the permit is obtained from the City
31 23 19	Dewatering	Dewatering Plan	3 weeks prior to Pre-Construction Meeting
31 23 20	Construction Water Management	Construction Water Management Plan	3 weeks prior to Pre-Construction Meeting
		List of proposed off-site treatment and disposal facilities (if applicable)	3 weeks prior to Pre-Construction Meeting

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SECTION 01 33 00 – SUBMITTAL PROCEDURES**

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<b>Project Manual Section</b>	<b>Section Title</b>	<b>Submittal</b>	<b>Submittal Date</b>
		Copy of Disposal Authorization Permit from the City or Disposal approval from off-site treatment/disposal facility	Prior to disposing of construction water
		Results of construction water sampling and analysis	As soon as the contractor receives the results from laboratory
		Records of location and quantity of water disposed	Weekly
		Records of disposal of accumulated sediment	As soon as the contractor receives the records
31 23 23	Backfill	Material supplier and testing laboratories name, address, contact and certification	3 weeks prior to Pre-Construction Meeting
		Name, address and qualifications of testing firm used for field density (on-site compaction) testing	3 weeks prior to Pre-Construction Meeting
		Material Submittals	3 weeks prior to importing material on site
		Results of field density testing	Daily
		Certified waybills/weight tickets for each type of imported material	Weekly
31 23 30	Import Material Chemical Criteria	Testing laboratories name, address, contact and certification	3 weeks prior to Pre-Construction Meeting
		Chemical analytical results	3 weeks prior to importing material on site
32 01 16	Pavement Patching	Product Data	3 weeks prior to Pre-Construction Meeting



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<b>Project Manual Section</b>	<b>Section Title</b>	<b>Submittal</b>	<b>Submittal Date</b>
		Mixing Plants/ WAPA; concrete mix components and mix design Documentation	3 weeks prior to Pre-Construction Meeting
32 17 00	Pavement Markings and Signage	Product Data (including manufacturers specifications and application instructions)	3 weeks prior to Pre-Construction Meeting
		Proposed application method	3 weeks prior to Pre-Construction Meeting
32 90 00	Planting	Landscape Installer and Lead Foreman qualifications	3 weeks prior to Pre-Construction Meeting
		Plant Materials – list, verification of supplier(s) and quantities, proof of deposit	3 weeks prior to Pre-Construction Meeting
		Product Info for other Materials in this section	3 weeks prior to Pre-Construction Meeting
		Mulch – product data, supplier, and sample	3 weeks prior to Pre-Construction Meeting
32 91 13	Soil Preparation	Soil Product Data and Samples	3 weeks prior to Pre-Construction Meeting
		Current Test Reports	3 weeks prior to Pre-Construction Meeting
		Description of Soil Preparation Methods	3 weeks prior to Pre-Construction Meeting
32 92 23	Sodding	Product Data and Order	3 weeks prior to Pre-Construction Meeting
		Fertilizer and Other Product Data	3 weeks prior to Pre-Construction Meeting
		Maintenance Log	Monthly during Maintenance and Finishing Period
33 42 03	Storm Drain Cleaning	Storm Drain Cleaning and Disposal Plan	3 weeks prior to Pre-Construction Meeting
		Copy of permits	2 weeks prior to Pre-Construction Meeting

**DIVISION 01 – GENERAL REQUIREMENTS  
SECTION 01 33 00 – SUBMITTAL PROCEDURES**

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<b>Project Manual Section</b>	<b>Section Title</b>	<b>Submittal</b>	<b>Submittal Date</b>
33 42 05	Television Inspection	Work schedule, H&S and traffic control plan, listing of CCTV equipment; qualifications of CCTV sub-contractor	3 weeks prior to Pre-Construction Meeting
		Inspection reports and copy of CCTV inspection videos	1 week after each video inspection
33 42 07	Manhole Rehabilitation	Catch Basin and Manhole Rehabilitation Plan	3 weeks prior to Pre-Construction Meeting
33 42 09	Temporary Stormwater Bypass	Stormwater Bypass Plan	3 weeks prior to Pre-Construction Meeting
33 42 10	Storm Drain Point Repair	Storm Drain Repair Plan	3 weeks prior to Pre-Construction Meeting
33 42 30	Cured-in-Place Pipe (CIPP)	Manufacturer's lining tube certification; laboratory test results	3 weeks prior to use

END OF SECTION

**PART 1 – GENERAL**

**1.01 DESCRIPTION OF WORK**

- A. Contractor shall be responsible for initiating, maintaining, and supervising all safety precautions and programs in connection with the performance of the Work.
- B. In carrying out its responsibilities according to the Contract Documents, Contractor shall protect the lives and health of employees performing the Work, and other persons who may be affected by the Work; prevent damage to property, materials, supplies, and equipment, whether onsite or stored offsite; and prevent damage to other properties adjacent to the site. Contractor shall comply with all applicable laws, ordinances, rules, regulations, and orders of any public body having jurisdiction for the safety of persons or property, or to protect them from damage, injury, or loss; shall erect and maintain all necessary safeguards for such safety and protection; and shall notify owners of adjacent property and utilities when prosecution of the Work may affect them.
- C. Contractor shall fulfill the health and safety requirements specified in **SECTION 33 42 10 – STORM DRAIN POINT REPAIR** and other work activities involving excavation and handling of contaminated materials.
- D. Nothing provided in this Section shall be construed as imposing any duty upon Ecology or Ecology's Representatives with regard to, or as constituting any express or implied assumption of control or responsibility over, Project Site safety, or over any other safety conditions relating to employees or agents of Contractor or any of its Subcontractors, or the public.

**1.02 SUBMITTAL**

- A. The Contractor shall submit a Site-specific health and safety plan as follows:
  - 1. This health and safety plan must be followed by the Contractor and a minimum of one (1) copy shall be available and accessible at the Project Site at all times.
  - 2. Where Work is being performed in different areas of the overall Project Site, multiple copies of the health and safety plan shall be available and accessible to Contract or personnel in each of those areas.
- B. Submit certificates of personnel training to Ecology prior to the pre-construction meeting and updated during the project as needed.
- C. Submit a summary of minutes from daily safety meetings to Ecology as part of the progress payment request.

- D. Provide submittals for Ecology’s review in accordance with the submittal timings requirements of Section 01 33 00 – Submittal Procedures.

**PART 2 – PRODUCTS (NOT USED)**

**PART 3 – EXECUTION**

**3.01 PERSONNEL DISCLOSURE AND TRAINING**

- A. Contractor shall provide all persons working on the Project Site with information and training on hazardous chemicals in their work at the time of their initial assignment, and whenever a new hazard is introduced into their work area.

1. Information: At a minimum, Contractor shall inform persons working on the Project Site of:

- a. The requirements of Chapter 296-62 WAC, General Occupational Health Standards.
- b. The requirements of Chapter 296-848 WAC, Arsenic and Lead.
- c. Any operations in their work area where hazardous chemicals are present. Based on the results of remedial investigations at the Site, the maximum concentrations in milligrams/kilogram (mg/kg) of Arsenic and Lead observed were:

- Area B2: 531 and 5,619 mg/kg, respectively;
- Areas C2 and C3: 82 and 194 mg/kg, respectively.

The Contractor shall refer to the Remedial Action Areas B2, C2 and C3 Engineering Design Report (EDR) for additional details regarding concentrations of arsenic and lead within the Project area.

- d. The location and availability of written hazard communication programs, including the required list(s) of hazardous chemicals and Material Safety Data Sheets (MSDS) required by Chapter 296-62 WAC.

2. Training: At a minimum, Contractor shall provide training for persons working on the Project Site, which includes:

- a. Contractor’s and their sub-contractor’s personnel shall be trained in accordance with the requirements of Chapter 296-62/-843 WAC, Occupational Safety and Health Administration (OSHA) and Washington Industrial Safety and Health Act (WISHA). Contractor’s and their sub-contractors personnel that have potential for exposure to site contamination shall be

- current on their OSHA 40-hour Hazardous Waste Operations and Emergency Response Standards (HAZWOPER) training.
- b. Methods and observations that may be used to detect the presence or release of a hazardous chemical in the work area (such as monitoring conducted by the employer, continuous monitoring devices, visual appearance or odor of hazardous chemicals when being released, etc.).
  - c. The physical and health hazards of the chemicals in the work area.
  - d. The measures such persons can take to protect themselves from these hazards, including specific procedures Contractor, or its Subcontractors, or others have implemented to protect those on the Project Site from exposure to hazardous chemicals, such as appropriate work practices, emergency procedures, and personal protective equipment to be used.
3. The details of the hazard communication program developed by Contractor or its Subcontractors, including an explanation of the labeling system and the MSDS, and how employees can obtain and use the appropriate hazard information.

### **3.02 EXPOSURE AND SAFETY MANAGEMENT**

- A. Contractor shall notify Ecology in writing a minimum of twenty-one (21) calendar days in advance if there is a risk of exposure of the public to hazardous chemicals used during Work. This written notification shall include all the information specified in this Paragraph and a discussion of the potential risks and control methods to be used by the Contractor to minimize the exposure of non-construction personnel and the public in close proximity to the Work.
- B. Contractor shall provide all assistance and guidance promptly to Ecology necessary to achieving and maintaining a safe work site.
- C. Contractor's responsibility for hazardous, toxic, or harmful substances shall include the following duties:
  1. Contractor shall not keep, use, dispose, transport, generate, or sell on or about the Project Site any substances now or hereafter designated as, or which are subject to regulation as, hazardous, toxic, dangerous, or harmful by any federal, state, or local law, regulation, statute or ordinance (hereinafter collectively referred to as "hazardous substances"), in violation of any such law, regulation, statute, or ordinance, but in no case shall any such hazardous substance be stored more than 90 days on the Project Site.
  2. Contractor shall promptly notify Ecology of all spills or releases of any hazardous substances that are otherwise required to be reported to any regulatory agency and pay the cost of cleanup. Contractor

**DIVISION 01 – GENERAL REQUIREMENTS**  
**SECTION 01 35 23 – HEALTH, SAFETY AND EMERGENCY REQUIREMENTS**

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shall promptly notify Ecology of all failures to comply with any federal, state, or local law, regulation, or ordinance; all inspections of the Project Site by any regulatory entity concerning the same; all regulatory orders or fines; and all responses or interim cleanup actions taken by or proposed to be taken by any government entity or private party on the Project Site.

- D. All Work shall be performed with due regard for the safety of the public. Contractor shall perform the Work so as to cause a minimum of interruption of vehicular traffic or inconvenience to pedestrians.
  - 1. All arrangements to care for such traffic shall be Contractor's responsibilities.
  - 2. All expenses involved in the maintenance of traffic by way of detours shall be borne by Contractor.
- E. Contractor shall maintain an accurate record of exposure data on all incidents relating to the Work resulting in death, traumatic injury, occupational disease, or damage to property, materials, supplies, or equipment. Contractor shall immediately report any such incident to Ecology. Ecology shall, at all times, have a right of access to all records of exposure.
- F. The Contractor shall furnish, erect, and maintain such fences, barriers, lights, and signs and provide such flagging and guards as are necessary in the opinion of Ecology to give adequate warning to the public of the construction and of any dangerous condition which may be encountered as a result thereof.
- G. The Contractor shall meet all safety requirements of WAC 296-155-650 Part N, EXCAVATION, TRENCHING, AND SHORING when excavating over four feet in depth.
- H. Contractor shall supervise construction activities to ensure that no part of the Work, completed or in progress, shall be subject to harmful, dangerous, damaging, or otherwise deleterious exposure during the construction period. Where applicable, such exposures include, but are not limited to, the following:
  - 1. Excessive static or dynamic loading
  - 2. Excessively high or low temperatures
  - 3. Thermal shock
  - 4. Excessive high or low humidity
  - 5. Water or ice
  - 6. Solvents
  - 7. Chemicals
  - 8. Asphalt roofing tar

9. Puncture
10. Abrasion
11. Heavy traffic
12. Soiling, staining and corrosion
13. Rodent and insect infestation
14. Combustion
15. Electrical current
16. Unusual wear or other misuse
17. Misalignment
18. Contact between incompatible materials
19. Excessive weathering
20. Unprotected storage
21. Improper shipping or handling
22. Theft
23. Vandalism
24. Overspray from painting and fireproofing

**3.03 EMERGENCIES**

- A. In an emergency affecting the safety of life or the Work or of adjoining property, Contractor is permitted to act, at its discretion, to prevent such threatened loss or injury, and Contractor shall so act if so authorized or instructed.
- B. Contractor shall maintain an accurate record of exposure data on all incidents relating to the Work resulting in death, traumatic injury, occupational disease, or damage to property, materials, supplies, or equipment. Contractor shall immediately report any such incident to Ecology. Ecology shall, at all times, have a right of access to all records of exposure.

**3.04 HEALTH AND SAFETY PLAN REQUIREMENTS**

- A. Prepare a site Health and Safety Plan in accordance with OSHA 29 CFR 1910.120 and all applicable Washington State regulations. As a minimum, the Contractor's Site Health and Safety Plan shall set forth definite procedures for informing workers about health and safety, for instructing workers in safe practices, for assuring that workers are using appropriate safety equipment and safe work practices and for reporting accidents. Also include:



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1. Description of work to be performed and anticipated chemical and/or physical hazards associated with the work.
2. A series of maps of the Site illustrating the locations of anticipated hazards and areas of control for those hazards.
3. Hazardous material inventory and material safety data sheets (MSDSs) for all chemicals which will be brought on site.
4. Engineering controls/equipment to be used to protect against anticipated hazards.
5. Personal protective equipment and clothing including head, foot, skin, eye, ear and respiratory protection.
6. Procedures which will be used for:
  - a. Lockout/tagout;
  - b. Fall protection;
  - c. Trenching, shoring, excavation support and bracing;
  - d. Hazards;
  - e. Suspect materials;
  - f. Confined-space entry (excavations, manholes, vaults, storage tanks, or other items);
  - g. Odorous conditions and toxic gases.
7. Exposure monitoring to be used to evaluate actual hazards compared with anticipated conditions.
8. Site housekeeping procedures and personal hygiene practices.
9. Personnel and equipment decontamination plan.
10. Administrative controls.
11. Emergency plan including:
  - a. Locations of and route to nearest hospital.
  - b. Locations of first aid kits, fire extinguishers, and portable eye washes.
  - c. Person who will be responsible in the event of an emergency.
  - d. Site personnel trained in first aid and/or CPR.
12. Medical surveillance program for site personnel before, during, and after completion of site work.
13. Name and qualifications of person preparing the H&S PLAN and person designated to implement and enforce the plan.
14. Signatory page for site personnel and visitors to acknowledge receipt, understanding, and agreement to comply with the plan.

- B. Conduct daily tailgate safety meetings/job safety briefings and prepare minutes to be submitted to Ecology upon request. The Contractor shall prepare his/her own form on which to document daily safety meetings. This form shall be completed each workday and filed as part of the project record. The Contractor shall submit a summary of minutes from daily safety meetings as part of the progress payment request.
- C. If Health and Safety issues arise frequently, the Contractor may be required to provide an additional full-time Health and Safety professional on site, at the expense of the Contractor, to ensure compliance with all applicable Health and Safety rules and regulations.

**3.05 CONTRACTOR'S SITE SAFETY AND HEALTH OFFICER**

- A. Contractor shall provide a person designated as the Site Safety and Health Officer, who is thoroughly trained in rescue procedures, HAZWOPER, and the use of all necessary safety equipment, air monitoring equipment, and gas detectors. The person must be present at all times while work is being performed and conduct testing, as necessary.
- B. The Contractor's designated Site Safety and Health Officer shall conduct inspections of the site in accordance with the H&S PLAN to determine the H&S PLAN's effectiveness and shall immediately correct any deficiencies identified.
- C. The Site Safety and Health Officer shall be empowered with the delegated authority to order any person or worker on the project site to follow the safety rules. Failure to observe these rules is sufficient cause for removal of the person or worker(s) from this project.
- D. The Site Safety and Health Officer is responsible for determining the extent to which any safety equipment must be utilized, depending on conditions encountered at the site.

**3.06 PERSONAL PROTECTIVE EQUIPMENT**

- A. The Project Site is designated for Level C personal protective equipment (PPE) as defined by OSHA at all times when there is a risk of exposure to air borne contaminants. This includes but is not limited to contaminated material excavation, handling, stockpiling and loading activities. If site conditions permit after construction starts, downgrading to Level D may be allowed based on results of air monitoring (to be performed by the Contractor) and if agreed by Ecology.
- B. Level D PPE as defined by OSHA shall be allowed during site preparation activities prior to commencing contaminated soil disturbing activities on the Project site.

END OF SECTION

**PART 1 – GENERAL**

**1.01 SUMMARY**

- A. Cleaning up contaminated sites involves the use of energy, water, and other natural resources. Site cleanup activities can create an environmental footprint beyond the site itself. Because the environmental footprint of a remediation activity may exceed the site physical boundary, Green Remediation best management practices (BMPs) can be used to minimize the footprint and maximize environmental outcomes.
- B. Ecology desires to minimize its environmental impact in all phases of cleanup actions, including construction, and refers to this as Green Remediation. To meet this intent, to the extent practicable, the Contractor shall explore and implement green remediation strategies and applications in the performance of the requirements of this project to maximize use of sustainable construction practices, reduce energy and water usage, promote demolition and construction materials reuse and recycling and use of recycled content materials, and minimizing impacts from site cleanup activities through controls on construction activities to preserve and protect our land, air, and water resources.
- C. These guiding principles are the foundation for developing and implementing green construction practices:
  - 1. Minimize total energy use and increase the percentage of energy use from renewable resources.
  - 2. Minimize air pollution and greenhouse gas emissions.
  - 3. Reduce water use and negative impacts on water resources.
  - 4. Improve materials management and reduce, reuse and recycle material and waste.
  - 5. Protect ecosystems during site cleanup.
  - 6. Consider climate change.

**1.02 RELATED SECTIONS**

- A. Section 01 33 00 – Submittal Procedures
- B. Section 01 51 00 – Temporary Utilities
- C. Section 01 52 00 – Construction Facilities
- D. Section 01 55 26 – Traffic Control
- E. Section 01 57 10 – Temporary Environmental Control
- F. Section 01 57 13 – Temporary Erosion and Sediment Control

- G. Section 01 57 50 – Dust and Air Emissions Controls
- H. Section 01 60 00 – Products

**1.03 REFERENCES**

- A. ASTM E 2893-16(E1) Standard Guide for Greener Cleanups.

**PART 2 – PRODUCTS (NOT USED)**

**PART 3 - EXECUTION**

**3.01 GREEN CLEANUP PROJECT WORK PLAN**

- A. Prior to start of work the Contractor shall submit a Green Cleanup Project Work Plan that shall identify and describe each green remediation practice it proposes to use and how it will be implemented, to include those practices that are required by the contract documents and those that are independently proposed by the Contractor. This plan will include, at a minimum, practices that:
  - 1. Incorporate equipment emission reduction controls and describe procedures for equipment operations that identify measures to operate equipment to minimize emissions including engine idling reduction procedures, use of biodiesel and/or ultra low sulfur fuels only, and use clean technology equipment designed to reduce exhaust emissions.
  - 2. Minimize transportation requirements on the project by use of the least impacting transportation methods practical, combining trips, use of backhaul.
  - 3. Maximize use of products containing recycled materials (i.e., compost materials; concrete, backfill material, erosion control materials) that satisfy the specified performance requirements for project materials, and procedures for material recycling, reuse, and waste minimization.
  - 4. Use material suppliers that are in close proximity of the project work sites.
  - 5. Use, to the maximum extent possible, the Green and Sustainable Site Cleanup BMPs from the list provided herein, and describes how they will be implemented.
- B. The Plan shall include a format for reporting/documenting best practices used on the project as part of Contractor’s weekly project progress updates that includes the following measures:

1. Equipment inventory and emission reduction controls on each piece of equipment.
2. Equipment use based on hour meters.
3. Total quantity of fuel in gallons used each week and type of fuel used.
4. Disposal of construction wastes as identified in Part 3, paragraph 3.04. The Contractor shall include a section on materials reuse, recycling, waste stream reduction, and resource conservation measures employed as part of the weekly project progress reports. This section will document what measures are in place to keep uncontaminated wastes out of landfills or disposal facilities. These actions are intended to conserve energy or other natural resources, thereby reducing negative impacts of a cleanup action.

### **3.02 PROTECTION OF LAND, AIR, AND WATER RESOURCES**

- A. Contractor shall consider and incorporate both temporary and permanent site controls to minimize impacts from site clearing, excavation, backfill, and grading operations that should include:
  1. Minimizing noise created over ambient noise levels.
  2. Use of dust control measures.
  3. Retaining construction water runoff and developing a method for reuse of water on site or use of recycled water for equipment wash down and dust control.
  4. Disposal of construction debris at recycling centers.
  5. Following erosion and sediment control practices including silt curtains and other similar barriers to prevent silt laden runoff from stormwater or other sources from leaving the project site without treatment.
  6. Maintaining a responsive oil spills cleanup capability including materials on site.
  7. No burning of any kind on the project site.
  8. Use of native landscape materials, plastic sheeting, and recycled wood waste mulches to stabilize construction sites and minimize erosion.

### **3.03 EQUIPMENT EMISSIONS CONTROLS**

- A. The Contractor shall include the following actions, as applicable, to reduce equipment exhaust emissions from the project site and which shall be included in its Plan, to include:

1. Alternative Fuel Use and Clean Technologies: The Contractor is encouraged to use clean technologies and/or fuels on all diesel equipment to the extent practicable and/or feasible. The preference is for clean diesel technologies, but alternative fuels, such as biodiesel, ultra low sulfur diesel fuel, or natural gas-powered vehicles are acceptable options. These alternative fuels will be used where they are available within a reasonable distance to the sites. For equipment retrofits, the Contractor will employ the Best Available Control Technology on non-road and on-road diesel powered equipment used at a site. Examples of clean diesel technologies include diesel particulate filters (DPFs), and diesel oxidation catalysis (DOCs). For alternative fuel usage, the Contractor shall use commercial available biodiesel blends, with the goal to use at least a B20 blend (i.e., 20% biodiesel and 80% petro diesel) or ultra low sulfur diesel fuels, in the equipment engines that are used at the site.
2. No-Idle Practices: In addition to using alternative fuel, the Contractor shall use methods to control nuisance odors associated with diesel emissions from construction equipment including the following:
  - a. Turning off diesel combustion engines on construction equipment not in active use, and on trucks that are idling while waiting to load or unload material for 5 minutes or more; and
  - b. Locating diesel equipment away from the general public and sensitive receptors.
  - c. Idling of diesel powered vehicles and equipment must not be permitted during periods of non-active vehicle use. Diesel powered engines shall not be allowed to idle for more than 5 consecutive minutes in a 60-minute period when the equipment is: not in use, occupied by an operator, or otherwise in motion, except as follows:
    - When equipment is forced to remain motionless because of traffic conditions or mechanical difficulties over which the operator has no control,
    - When it is necessary to operate auxiliary systems installed on the equipment, only when such system operation is necessary to accomplish the intended use of the equipment,
    - To bring the equipment to the manufacturers recommended operating temperature,
    - When the ambient temperature is below forty (40) degrees F or above eighty (80) degrees F, or

- When equipment is being repaired.
3. Clean Air Technologies: In performance of all activities under this contract, the contractor shall, where feasible, use cleaner engines, cleaner fuel and cleaner diesel control technology on diesel-powered equipment with engines greater than 50 horsepower whether the equipment is owned or rented. Cleaner engines include non-road engines meeting Tier 1 or cleaner standards and on-road engines meeting 2004 On highway Heavy Duty Engine Emission Standards or cleaner, whether the equipment is owned or rented. Cleaner fuels include biodiesel blends or ultra low sulfur diesel. Cleaner diesel control technology includes EPA or California Air Resources Board (“CARB”) verified diesel particulate filters (“DPFs”) or diesel oxidation catalysts (“DOCs”).
  4. Engine Maintenance: Contractors perform routine and scheduled engine inspections and conduct preventative maintenance, giving any problems identified immediate attention. Perform routine engine cleaning and use environmentally friendly lubricants (i.e., bio-based) where available and where specified as an approved lubricant by engine and equipment manufacturers.
  5. Transportation Alternatives: The Contractor shall transport material to and from the site by truck, rail, barge, or other method or a combination of methods as site requirements may dictate, and when feasible, to an Ecology approved facility in accordance with local, state, and federal regulations.

### **3.04 CONSTRUCTION MATERIALS HANDLING AND DISPOSAL**

- A. Disposal of Construction Demolition Debris and Unsuitable Materials: To the greatest extent possible, the Contractor shall minimize the amount of waste disposal in landfills by seeking opportunities to reduce, reuse or recycle demolition materials that are not contaminated by hazardous substances. The Contractor shall dispose of uncontaminated, recyclable, or salvable demolition materials by a combination of salvage, reuse, or recycling at a facility approved by the Department of Ecology. The Contractor shall submit receipts, scale tickets, and/or waybills to Ecology documenting disposal and/or recycling. Recyclable materials may include building materials such as lumber and other wood products, metal, concrete, rebar, pipe materials, and asphalt, but shall not include materials impacted by contaminated soils.

### **3.05 GREEN REMEDIATION AND SUSTAINABLE BEST MANAGEMENT PRACTICES**



A. Table 1 identifies the BMPs that the Contractor shall incorporate, where practical, into the project requirements.

**Table 1: Green Remediation and Sustainable Best Management Practices**

Action	Potentially Applicable to Site?	Potential Benefits			
		Air	Energy	Water	Land
Use alternate fuels such as biodiesel, ultra low sulfur diesel, and E85.		Reduces air emissions from on-site construction equipment and from trucking waste materials.	Reduces use of petroleum products in on-site construction equipment and in trucking waste materials.		Less toxic to the environment should a leak occur.
Require vehicles and construction equipment to use idle reduction technologies		Reduces direct and indirect green-house gas and other emissions, e.g., CO, CO <sub>2</sub> , VOCs, NO <sub>x</sub> , SO <sub>x</sub> .	Reduces fuel use in on-site construction equipment and vehicles.		Reduces noise impacts.
Sequence work to minimize double-handling of materials.		Reduces air emissions from on-site construction equipment. Reduces nuisance dust.	Reduces fuel use in on-site construction equipment.	Reduces water quality impacts from erosion	Restores land sooner.
Use on-site renewable energy to power elements of the remedy, e.g., wind and solar power for treatment system.			Reduces purchased energy.		May be an asset to redevelopment if left on site after cleanup.

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**SECTION 01 35 43 – GREEN CONSTRUCTION PRACTICES**

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Action	Potentially Applicable to Site?	Potential Benefits			
		Air	Energy	Water	Land
Purchase green energy to power elements of the remedy		Reduces air impacts of cleanup.			
Use permeable surface soil barriers, e.g., vegetated top soil or gravel				Reduces stormwater runoff.	Increases post cleanup marketability of developable sites.
Reclaim grey water for reuse.				Reduces water use.	
Use engineered surface soil barriers, e.g., pavement, cover system.		Reduces air emissions from on-site construction equipment and from trucking.	Reduces fuel use in on-site construction equipment and in trucking waste materials.		Reduces waste material requiring off-site disposal.
Use in-situ remediation technologies (e.g. monitored natural attenuation; chemical oxidation).		May reduce air emissions by reducing excavation and materials handling.	Reduces fuel use in on-site construction equipment and in trucking waste materials.		Less intrusive, especially if structures present like roads, utilities and valuable buildings.
Use cleanup technologies that permanently destroy contaminants (incineration, treatment).			May be more energy intensive.		Reduces future contaminant migration concerns; eliminates need for long term maintenance and monitoring.
Use treated soils to backfill excavation.		Reduces emissions from trucking in clean fill.			Reduces clean fill material requirements.

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Action	Potentially Applicable to Site?	Potential Benefits			
		Air	Energy	Water	Land
Retain existing structures on site.		Reduces air emissions from demolition activities.	Reduces fuel used for demolition and in trucking wastes off site.		Preserves structures for future redevelopment; provides link to the past.
Recycle waste materials generated during cleanup					Reduces material requiring off-site disposal.
Collect rain water for on-site use e.g., dust control.				Reduces water use; stormwater impacts.	
Install temporary dewatering systems to lower groundwater.				Reduces potential ground and surface water impacts.	Better control of limits of excavation.

END OF SECTION

**PART 1 – GENERAL**

**1.01 AUTHORITY OF CODES, ORDINANCES AND STANDARDS**

- A. All codes, ordinances and standards referenced in the Contract Documents shall have the full force and effect as though printed in the entirety in the Contract Documents.

**1.02 PRECEDENCE OF CODES, ORDINANCES AND STANDARDS**

- A. Where specified requirements differ from the requirements of applicable codes, ordinances and standards, the more stringent requirements shall take precedence.
- B. Where the Contract Documents requires or describe products or execution of better quality, higher standard or greater size than required by applicable codes, ordinances and standards, the Contract Documents shall take precedence so long as such increase is legal.
- C. Where no requirements are identified in the Contract Documents, comply with all requirements of applicable codes, ordinances and standards of authorities having jurisdiction.

**1.03 APPLICABLE CODES, LAWS AND ORDINANCES**

- A. Performance of the Work shall be governed by all applicable laws, ordinances, rules and regulations of Federal, State and local governmental agencies and jurisdictions having authority over the Project.
- B. Performance of the Work shall meet or exceed the minimum requirements of the series of Codes published by the International Code Council (ICC) and the National Electrical Code (NEC), as adopted and interpreted by local authorities having jurisdiction.
- C. Performance of the Work shall be accomplished in conformance with all rules and regulations of public utilities, utility districts and other agencies serving the facility.
- D. Where such laws, ordinances, rules and regulations require more care or greater time to accomplish Work, or require better quality, higher standards or greater size of products, Work shall be accomplished in conformance to such requirements with no change to the Contract Time and Contract Sum, except where changes in laws, ordinances, rules and regulations occur subsequent to the execution date of the Contract Documents.

**1.04 DATE OF CODES, LAWS AND ORDINANCES**

- A. The applicable edition of all codes shall be that adopted at the time of issuance of permits by authorities having jurisdiction or the execution of the Contract Documents, whichever is applicable, and shall include all modifications and additions adopted by that jurisdiction and Ecology. The

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applicable date of laws and ordinances shall be that of the date of performance of the Work.

**PART 2 – PRODUCTS (NOT USED)**

**PART 3 – EXECUTION (NOT USED)**

END OF SECTION

**PART 1 - GENERAL**

**1.01 GENERAL**

- A. Applicable standards of the construction industry have the same force and effect (and are made a part of the Contract Documents by reference) as if directly copied or bound herein.
- B. Any reference to Washington Department of Transportation (WASHDOT, WSDOT) Standard Specifications is to that document's technical sections only.

**1.02 PUBLICATION DATES**

- A. When compliance with an industry standard is required, comply with the standard in effect on Bid Date.

**1.03 USE OF REFERENCES**

- A. The Project Manual contains references to various standards, standard specifications, codes, practices and requirements for products, execution, tests and inspections. These reference standards are published and issued by the agencies, associations, organizations and societies listed in this Section or identified in individual Sections.
  - 1. Wherever term "Agency" occurs in Standard Specifications, it shall be understood to mean the term used for Ecology for purposes of the Contract.
  - 2. Wherever terms "Ecology's Representative" or "Engineer" occurs in Standard Specifications, it shall be understood to mean A/E for purposes of the Contract, unless otherwise specified by Ecology.
  - 3. Standard Specifications shall be as amended and adopted by the jurisdiction in which the Project is located.
  - 4. Where reference is made to Standard Details, such reference shall be to the Standard Details accompanying the Standard Specifications, as amended and adopted by the jurisdiction in which the Project is located.
- B. Specifications and Standards of ASTM International (ASTM) and the American National Standards Institute (ANSI) are identified in the Project Manual by abbreviation and number only and may not be further identified by title, date, revision or amendment.
- C. Reference standards are not furnished with the Project Manual because it is presumed that Contractor, Subcontractors, manufacturers, suppliers, trades and crafts are familiar with these generally recognized standards of the construction industry.

1. Copies of references standards may be obtained from publishing sources.
- D. When an edition or effective date of a reference is not given, it shall be understood to be the current edition or latest revision published as of the date of the permit issued by authorities having jurisdiction or the execution of the Contract Documents, whichever is applicable.
  1. All amendments, changes, errata and supplements as of the effective date shall be included.
- E. Where compliance with two or more standards is specified and the standards establish different or conflicting requirements for minimum quantities or quality levels, comply with the most stringent requirement. Refer uncertainties and requirements that are different, but apparently equal, to Ecology for a decision before proceeding.
  1. The quantity or quality level shown or specified shall be the minimum provided or performed. The actual installation may comply exactly with the minimum quantity or quality specified, or it may exceed the minimum within reasonable limits. To comply with these requirements, indicated numeric values are minimum or maximum, as appropriate, for the context of the requirements. Refer uncertainties to Ecology for a decision before proceeding.
- F. Contractor shall obtain and maintain at the Project Site copies of referenced codes and standards identified in the Project Manual in order to properly execute the Work.

#### **1.04 DEFINITIONS OF TERMS**

- A. Additional words and terms may be used in the Project Manual and are defined as follows:
  1. And/or: If used, shall mean that either or both of the items so joined are required.
  2. Applicable: As appropriate for the particular condition, circumstance or situation.
  3. Approve(d): Approval action shall be limited to the duties and responsibilities of the party giving approval, as stated in the Contract Documents. Approvals shall be valid only if obtained in writing and shall not apply to matters regarding the means, methods, techniques, sequences and procedures of construction. Approval shall not relieve the Contractor from responsibility to fulfill the Contract.
  4. Directed: Limited to duties and responsibilities of Ecology or Ecology's Representative as stated in the Contract Documents, meaning as instructed by Ecology or Ecology's Representative, in writing, regarding matters other than the means, methods,



techniques, sequences and procedures of construction. Terms such as directed, requested, authorized, selected, approved, required and permitted mean directed by Ecology, directed by Ecology's Representative, requested by Ecology, and similar phrases. No implied meaning shall be interpreted to extend the responsibility of Ecology, Ecology's Representative or other responsible design professional into the Contractor's supervision of construction.

5. Equal or equivalent: As determined by Ecology, Ecology's Representative or other responsible design professional as being equivalent, considering such attributes as durability, finish, function, suitability, quality, utility, performance and aesthetic features.
6. Furnish: Means supply and deliver, to the Project Site, ready for unloading, unpacking, assembly, installation and similar operation.
7. Indicated: The term indicated refers to graphic representations, notes, schedules or Paragraphs in the Project Manual, and similar requirements in the Contract Documents.
8. Install: Describes operations at the Project Site including the actual unloading, unpacking, assembly, erection, placing, anchoring, applying, working to dimension, finishing, curing, protecting, cleaning and similar operations.
9. Installer: Refers to the Contractor or an entity engaged by the Contractor, such as an employee, Subcontractor or sub-subcontractor for performance of a particular construction activity, including installation, erection, application and similar operation. Installers are required to be experienced in the operations they are engaged to perform.
  - a. Experienced Installer: The term experienced, when used with installer, means having a minimum of 5 previous Projects similar in size to this Project, knowing the precautions necessary to perform the Work, and being familiar with requirements of authorities having jurisdiction over the Work.
10. Jobsite: Same as Site.
11. Necessary: With due considerations of the conditions of the Project and as determined in the professional judgment of the responsible design professional as being necessary for performance of the Work in conformance with the requirements of the Contract Documents, but excluding matters regarding the means, methods, techniques, sequences and procedures of construction.
12. Noted: Same as Indicated.
13. Per: Same as "in accordance with", "according to" or "in compliance with".
14. Product: Material, system or equipment.

15. Project Site: Same as Site, Project Area, and Work Area.
16. Proper: As determined by Ecology, Ecology’s Representative or other responsible design professional as being proper for the Work, excluding matters regarding the means, methods, techniques, sequences and procedures of construction, which are solely the Contractor’s responsibility to determine.
17. Provide: Means furnish and install, complete and ready for the intended use.
18. Regulation: Includes laws, ordinances, statutes and lawful orders issued by authorities having jurisdiction, as well as rules, conventions and agreements within the construction industry that control performance of the Work.
19. Required: Necessary for the performance of the Work in conformance with the requirements of the Contract Documents, excluding matters regarding the means, methods, techniques, sequences and procedures of construction, such as:
  - a. Regulatory requirements of authorities having jurisdiction.
  - b. Requirements of referenced standards.
  - c. Requirements generally recognized as accepted construction practices of the locale.
  - d. Notes, schedules and graphic representations in the Project Manual
  - e. Requirements specified or referenced in the Project Manual
  - f. Duties and responsibilities stated in the Contract Documents
20. Scheduled: Same as Indicated.
21. Selected: As selected by Ecology, Ecology’s Representative or other responsible design professional from the full selection of the manufacturer’s products, unless specifically limited in the Contract Documents to a particular quality, color, texture or price range.
22. Shown: Same as Indicated.
23. Site: Same as Work Area, Project Area, or Project Site; the areas or spaces occupied by the Project and including adjacent areas and other related areas occupied or used by the Contractor for construction activities, either exclusively or with others performing other construction on the Project.
24. Supply: See Furnish.
25. Testing and Inspection Agency: An independent entity engaged to perform specific inspection or tests, at the Project Site or elsewhere,

and to report on, and, if required, to interpret, results of those inspections or test.

26. Testing Laboratory: Same as Testing and Inspection Agency.

**1.05 ABBREVIATIONS AND NAMES**

A. The following acronyms or abbreviations, referenced in the Contract documents, are defined to mean the associated name. Applicable standards include, but are not limited to the following:

- |     |          |  |
|-----|----------|--|
| 1.  | ACI      | American Concrete Institute                      |
| 2.  | ANSI     | American National Standards Institute            |
| 3.  | As or as | Arsenic  |
| 4.  | CCA      | Chromated Copper Arsenate                        |
| 5.  | CESCL    | Certified Erosion and Sediment Control Lead      |
| 6.  | CPSC     | U.S. Consumer Product Safety Commission          |
| 7.  | CRZ      | Critical Root Zone                               |
| 8.  | Ecology  | Washington State Department of Ecology           |
| 9.  | EPA      | U.S. Environmental Protection Agency             |
| 10. | ESC      | Erosion and Sediment Control                     |
| 11. | IBC      | International Building Code                      |
| 12. | L&I      | Washington State Labor & Industries              |
| 13. | MSDS     | Material Safety Data Sheet                       |
| 14. | MTCA     | Model Toxics Control Act                         |
| 15. | NPDES    | National Pollution Discharge Elimination System  |
| 16. | Pb or pb | Lead   |
| 17. | OSHA     | U.S. Occupational Safety & Health Administration |
| 18. | RCRA     | Resource Conservation and Recovery Act           |
| 19. | RCW      | Revised Code of Washington                       |
| 20. | SEPA     | State Environmental Policy Act                   |
| 21. | SVOCs    | Semi-volatile organic compounds                  |
| 22. | SWPPP    | Stormwater Pollution Prevention Plan             |
| 23. | TESC     | Temporary Erosion and Sediment Control           |
| 24. | TPCHD    | Tacoma-Pierce County Health District             |
| 25. | TPH      | Total petroleum hydrocarbons                     |
| 26. | VOCs     | Volatile organic compounds                       |
| 27. | WAC      | Washington Administrative Code                   |
| 28. | WDA      | Waste Disposal Authorization                     |
| 29. | WSDOT    | Washington State Department of Transportation    |

B. Typical abbreviations for units include, but are not limited to the following:

- |     |            |                                 |
|-----|------------|---------------------------------|
| 1.  | µg/L       | micrograms per liter            |
| 2.  | AC or ac   | alternating current             |
| 3.  | Amp        | ampere                          |
| 4.  | C          | Celsius                         |
| 5.  | CFM or cfm | cubic feet per minute           |
| 6.  | CM or cm   | centimeter                      |
| 7.  | CY or cy   | cubic yard                      |
| 8.  | DC or dc   | direct current                  |
| 9.  | DEG or deg | degrees                         |
| 10. | F          | Fahrenheit                      |
| 11. | FPM or fpm | feet per minute                 |
| 12. | FPS or fps | feet per second                 |
| 13. | FT or ft   | foot or feet                    |
| 14. | Gal or gal | gallons                         |
| 15. | GPM or gpm | gallons per minute              |
| 16. | IN or in   | inch or inches                  |
| 17. | Kip or kip | thousand pounds                 |
| 18. | KSF or ksf | thousand pounds per square foot |
| 19. | KSI or ksi | thousand pounds per square inch |
| 20. | KV or kv   | kilovolt                        |
| 21. | KVA or kva | kilovolt amperes                |
| 22. | KW or kw   | kilowatt                        |
| 23. | KWH or kwh | kilowatt hour                   |
| 24. | LBF or lbf | pounds force                    |
| 25. | LF or lf   | lineal foot                     |
| 26. | LS         | lump sum                        |
| 27. | M or m     | meter                           |
| 28. | Mg/kg      | milligrams per kilogram         |
| 29. | MM or mm   | millimeter                      |
| 30. | MPH or mph | miles per hour                  |
| 31. | PCF or pcf | pounds per cubic foot           |

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- |     |            |   |
|-----|------------|---|
| 32. | PPM or ppm | parts per million (typically mg/kg for solid waste) |
| 33. | PSF or psf | pounds per square foot                              |
| 34. | PSI or psi | pounds per square inch                              |
| 35. | SF or sf   | square foot or feet                                 |
| 36. | SY or sy   | square yard   |
| 37. | V or v     | volts   |

**PART 2 – PRODUCTS (NOT USED)**

**PART 3 – EXECUTION (NOT USED)**

END OF SECTION

**PART 1 - GENERAL**

**1.01 DESCRIPTION OF WORK**

- A. This section describes the Contractor's general quality control requirements, duties, and responsibilities during execution of the Contract Work. Detailed quality control requirements are presented in individual specification sections.
- B. The Contractor shall establish, provide, and maintain an effective Quality Control Program that details the methods and procedures that will be taken to assure that all materials and completed construction conform to requirements of the Contract Documents and Manufacturer recommendations. Although the guidelines are established and certain minimum requirements are specified herein and elsewhere in the Contract Documents, the Contractor shall assume full responsibility for accomplishing the stated purpose.
- C. The Contractor shall be prepared to discuss and present, at the Preconstruction Meeting, its understanding of the quality control requirements. The Contractor shall not begin any construction or production of materials to be incorporated into the completed work until the Quality Control Plan has been reviewed and approved by Ecology or Ecology's Representative.

**1.02 CONTROL OF INSTALLATION**

- A. Monitor quality control over suppliers, manufacturers, products, services, site conditions, and workmanship, to produce work of specified quality.
- B. Comply with manufacturer's instructions, including each step in the sequence.
- C. Should manufacturer's instructions conflict with Contract Documents, request clarification from Ecology or Ecology's Representative before proceeding.
- D. Comply with specified standards as minimum quality for the work except where more stringent tolerances, codes or specified requirements indicate higher standards or more precise workmanship.
- E. Perform work by persons qualified to produce required and specified quality.

**1.03 REFERENCES AND STANDARDS**

- A. For products or workmanship specified by association, trade, or other consensus standards, comply with the requirements of the standard, except where more rigid requirements are specified by applicable codes.

- B. Conform to reference standard by date of issue current on date of contract documents, except where a specific date is established by code.
- C. Obtain copies of standards where required by product specification sections.

#### **1.04 TESTING SERVICES**

- A. Necessary materials testing shall be performed by an independent testing laboratory during the execution of the Work. Access to the area necessary to perform the testing and/or to secure the material for testing shall be provided by the Contractor.
- B. Testing does not relieve the Contractor from performing work to contract requirements.
- C. Retesting required because of non-performance to specified requirements shall be performed by the same independent firm. Payment for retesting will be charged to the Contractor by deducting testing charges from the contract sum.
- D. Subsequent sampling and testing, required as the work progresses to assure continued control of materials and compliance with all requirements of Contract documents, shall be the responsibility of Ecology, except as required by other sections of these specifications.

#### **1.05 SUBMITTALS**

- A. The Contractor shall provide the Quality Control Plan to Ecology or Ecology's Representative in accordance with **Section 01 33 00 – Submittal Procedures**.

### **PART 2 - PRODUCTS**

#### **2.01 CONTRACTORS DAILY REPORT REQUIREMENTS**

- A. Date the report is issued.
- B. Project name and Ecology contract number.
- C. Work performed each day.
- D. Name of workers and subcontractors performing work each day including hours worked by each person.
- E. Type of equipment and hours used each day.
- F. Surveys completed.
- G. Submittals made.
- H. Samples collected.



- I. Tests completed and results, or schedule for receiving results.
- J. Test results received.
- K. Weather conditions, summary of stormwater management, monitoring completed and results, BMPs modified, stormwater released, and contingencies implemented.
- L. Identification of bid item quantities used each day, or percent complete for lump sum items.
- M. Identification of potential items that may result in schedule overruns or added costs.

### **PART 3 – EXECUTION**

#### **3.01 CONTRACTOR QUALITY CONTROL**

A. Documentation

The Contractor shall maintain current quality control records of all inspections and tests performed. These records shall include factual evidence that the required inspections or tests have been performed, including type and number of inspections or tests involved; results of inspections or tests; nature of defects, deviations, causes for rejection, proposed corrective action; and corrective actions taken.

B. Non-compliance

Ecology or Ecology's Representative may notify the Contractor of any non-compliance with project quality control requirements. The Contractor shall, after receipt of such notice, immediately take corrective action. Failure to take corrective action shall be grounds for Ecology to withhold payment for those items not performed based on the costs for the items as listed in the Schedule of Values.

In cases where quality control activities do not comply with either the Contractor's Quality Control Plan or the contract provisions, or where the Contractor fails to properly operate and maintain an effective Quality Control Program, as determined by Ecology or Ecology's Representative, Ecology or Ecology's Representative may:

1. Direct the Contractor to replace ineffective or unqualified quality control personnel or subcontractors.
2. Carry out the functions and operations of the Contractor's Quality Control Plan. Costs incurred by Ecology to operate the Quality Control Program plan or to otherwise remedy the Contractor's non-compliance with quality-related provisions of the Contract shall be deducted from the total amount due the Contractor.

3. Order the Contractor to stop operations until appropriate corrective actions are taken.
- C. Any failure by Ecology to notify the Contractor of any non-compliance with any of the foregoing requirements shall not be deemed as a waiver of its enforcement rights hereunder and that the Contractor is still bound by the terms and conditions of said requirement.

**3.02 CONTRACTOR’S DAILY REPORT**

- A. Contractor shall provide Ecology with a written daily report at the end of each day’s work. The Contractors Daily Report shall describe the work accomplished that day and address each item listed in Article 2.01 of this Section. The Contractor’s Daily Reports will be one of the agenda items discussed at the weekly project meeting described in **Section 01 31 00 – Project Management and Coordination**.

END OF SECTION

**PART 1 – GENERAL**

**1.01 TEMPORARY UTILITY SOURCES**

- A. Contractor shall anticipate furnishing all temporary utility needs to complete the Work. This shall include, but not be limited to, electricity and water for dust control and irrigation.
- B. Where such temporary connections can be made, the utility service consumed shall be charged to and paid for by the Contractor.
- C. Contractor shall, at its expense and in a skillful manner satisfactory to Ecology, install and maintain the temporary connections and distribution lines, together with appropriate protective devices and all meters required to measure the amount of each utility used.
- D. Prior to the date of Final Completion unless otherwise authorized by Ecology in writing, Contractor shall remove all temporary connections, distribution lines, meters and associated equipment and materials.

**1.02 TEMPORARY ELECTRICAL SERVICE**

- A. If required, the Contractor shall furnish and install electrical service from nearest appropriate transformer location. Contractor shall furnish and install main service disconnect and over-current protection. Contractor shall furnish and install electrical connections from main service disconnect to Contractor's facilities and equipment and to office trailers, if provided.
- B. Alternately, Contractor may provide electrical power to temporary facilities with an appropriate dedicated whisper-quiet generator that satisfies the City of Everett's Noise Ordinance.
- C. A licensed electrician shall perform all electrical work.
- D. Contractor shall pay all electric usage costs necessary for the Work including, but not limited to, Contractor's field office, excavation dewatering, and water treatment facilities (if applicable).
- E. All electrical connections shall meet appropriate National Electrical Manufacturer Association (NEMA) ratings consistent with the intended service.
- F. Contractor shall coordinate with local electric utility and obtain any necessary inspections and permits.
- G. Contractor shall provide grounded electrical extension cords and use "hard-service" cords where exposed to abrasion and traffic. Waterproof connectors shall be provided by Contractor to connect separate lengths of electric cords, if single lengths will not reach areas where construction activities are in progress.
- H. Contractor shall provide weatherproof, grounded electric power service and distribution system of sufficient size, capacity and power characteristics during construction period. Include meters, transformers, overload

**DIVISION 01 – GENERAL REQUIREMENTS**  
**SECTION 01 51 00 – TEMPORARY UTILITIES**

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protected disconnects, automatic ground-fault interrupters and main distribution switch gear.

**1.03 TEMPORARY SEWER/STORMWATER/DRAINAGE DISPOSAL**

- A. If neither sewers nor drainage facilities can be lawfully used for discharge of effluent, provide containers to remove and dispose of effluent off the site in a lawful manner. Refer to Section 31 23 20 – Construction Water Management for disposal requirements of water generated during construction activities.

**1.04 TEMPORARY WATER SERVICE**

- A. Contractor shall provide, maintain, and pay for suitable quantity and quality of water service for dust control and decontamination. Treatment wastewater cannot be used for this purpose.
- B. Contractor shall provide water conveyance from the water service terminus to any locations on the Project Site where water is used.
- C. Where such temporary connections can be made, the utility service consumed shall be charged to and paid for by the Contractor.
- D. Contractor shall provide, maintain, and pay for a suitable quantity of potable drinking water. Contractor shall provide potable water approved by local health authorities, in sufficient quantity to perform the Work and comply with state regulations and requirements. Subcontractor shall furnish drinking water in Subcontractor's field office trailer and, if necessary at other locations near the Work being conducted.
- E. Contractor shall, at its expense and in a skillful manner satisfactory to Ecology, install and maintain the temporary connections and distribution lines, together with appropriate protective devices and all meters required to measure the amount of each utility used.
- F. Prior to the date of Final Completion unless otherwise authorized by Ecology in writing, Contractor shall remove all temporary connections, distribution lines, meters and associated equipment and materials.

**1.05 SUBMITTALS**

- A. Contractor shall prepare and submit a list of temporary utilities and identify planned locations and sizes of temporary utilities that the Contractor plans to use for construction.
- B. Contractor shall provide copies of permits and inspection reports obtained from utility providers.

**PART 2 – PRODUCTS (NOT USED)**

**PART 3 – EXECUTION**

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**3.01 GENERAL INSTALLATION**

- A. Contractor shall use qualified personnel for installation of temporary utilities, and shall relocate and modify facilities during the course of construction as required.
- B. The Contractor may engage the appropriate local utility company to install temporary service or connect to existing service, provided such installation or connection does not interfere with utility service or add cost to Ecology.
  - 1. Contractor is responsible for obtaining easements to bring temporary utilities to Project Site areas, with no addition acceptable to either Contract Sum or Contract Time.
  - 2. Usage of utilities for temporary construction facilities are not chargeable to Ecology and will not be accepted as the basis of an increase to either Contract Sum or Contract Time.
- C. Contractor shall provide each temporary utility ready for use when needed to avoid delay to the Work, and shall maintain and modify each facility as required.
  - 1. Do not remove until facilities are no longer needed.

END OF SECTION

**PART 1 – GENERAL**

**1.01 DESCRIPTION OF WORK**

- A. Temporary construction support facilities required for the Work include, but are not limited to, the following:
  - 1. First aid facilities.
  - 2. Fire extinguishers.
  - 3. Sanitary services, including drinking water.
  - 4. Temporary field offices.
  - 5. Construction fencing, barriers, barricades, warning signs and lights.
- B. Contractor shall comply with industry standards and applicable laws and regulations of authorities having jurisdiction, including but not limited to:
  - 1. Building Code requirements, including local requirements, standards and regulations where more restrictive.
  - 2. Health and safety regulations.
  - 3. Utility company regulations.
  - 4. Police, Fire Department and Rescue Squad rules.
  - 5. Environmental protection regulations.
- C. Contractor shall keep temporary services and facilities clean and neat in appearance.
  - 1. Operate in a safe and efficient manner.
  - 2. Take necessary fire prevention measures.
  - 3. Do not overload facilities or permit them to interfere with progress.
  - 4. Do not allow hazardous, dangerous or unsanitary conditions, or public nuisances to develop or persist on the Project Site.
- D. Contractor shall provide protection, operate temporary facilities and conduct construction in ways and by methods that comply with environmental regulations, and minimize the possibility that air, waterways and soil might be contaminated or polluted; or that any other undesirable effects might result.
  - 1. Avoid use of tools and equipment which produce harmful noise.
  - 2. Restrict use of noise making tools and equipment to hours that will minimize complaints from persons or other entities located in or near the Project Site.

**1.02 SUBMITTALS**

- A. Prepare and submit drawings that illustrate layout of construction facilities including temporary field office locations, contractor staging and parking areas for construction equipment and personnel vehicles.

**PART 2 – PRODUCTS**

**2.01 MATERIALS AND EQUIPMENT**

- A. Provide new materials to be used or, if acceptable to Ecology, undamaged previously-used materials in serviceable condition. Provide materials suitable for the use intended.
- B. Contractor shall provide sufficient first aid supplies and equipment to comply with governing regulations and requirements.
- C. Contractor shall provide hand-carried, portable, UL22 rated, class “ABC” dry chemical extinguishers, or a combination of extinguishers of National Fire Protection Association (NFPA) recommended classes for the exposures.
  - 1. Comply with NFPA 10 and 241 for classification, extinguishing agent and size required by location and class of fire exposures.
  - 2. Provide additional protection as may be required by the local Fire Marshal.
- D. For safety barriers, sidewalk bridges, and similar uses, Contractor shall provide UL labeled fire treated 2x4 studs and minimum 5/8” thick exterior plywood.

**PART 3 – EXECUTION**

**3.01 GENERAL INSTALLATION**

- A. Contractor shall use qualified personnel for installation of temporary facilities, and shall relocate and modify facilities during the course of construction as required.
- B. Contractor shall provide each facility ready for use when needed to avoid delay to the Work, and shall maintain and modify each facility as required.
  - 1. Do not remove until facilities are no longer needed.
  - 2. Remove prior to Substantial Completion or as agreed to by Ecology.
- C. Contractor shall locate staging areas, sanitary facilities and other temporary construction and support facilities for easy access.

**3.02 SANITARY AND OFFICE FACILITIES**

- A. Sanitary Facilities



1. Contractor shall install and maintain self-containing, single-occupant sanitary toilet facilities for the duration of the Project. Toilets shall be of the chemical type and shall be removed prior to Final Completion.
  2. Contractor shall provide and maintain hand washing stations for the duration of the Project.
  3. Contractor shall provide fresh drinking water for employees.
- B. Office Facilities
1. Contractor shall install and maintain necessary field office space for the duration of the Project. Office space shall be removed prior to Final Completion.
  2. Contractor's office space shall include a meeting area/room of sufficient size to hold weekly construction meetings.
  3. Contractor's office space shall include one work space for Ecology or Ecology's Representative. The work space shall include a table and chair and power supply.

### **3.03 CONSTRUCTION FENCING**

- A. Construction fencing used on the Project Site shall comply with the requirements identified in the Contract Drawings.
- B. Install construction fencing with gated entrance at the locations as shown on the Contract Drawings.

### **3.04 CONSTRUCTION BARRIERS, BARRICADES, WARNING SIGNS, AND LIGHTS**

- A. Contractor shall comply with standards and code requirements for erection of structurally adequate barriers and barricades. Paint with appropriate colors, graphics and warning signs to inform personnel and the public of the hazard being protected against. Where appropriate and needed provide lighting, including flashing red or amber lights.
- B. Contractor shall comply with the requirements of the City of Everett.

END OF SECTION

**PART 1 – GENERAL**

**1.01 DESCRIPTION OF WORK**

- A. Contractor shall provide temporary environmental controls during construction including but not limited to temporary erosion and sediment control (TESC), dust and air emissions controls, work zones, decontamination, noise controls, and oil spill prevention and control. TESC and dust and air emissions controls are presented in other Specification sections.

**1.02 WORK ZONES**

- A. Contractor shall establish a Support Zone, Exclusion Zone, and Decontamination Zone, as defined herein.
1. Contractor shall lay out the work zones and establish boundaries, barriers, facilities, and controls to ensure that all personnel and equipment exiting the Exclusion Zone shall pass through the Decontamination Zone before entering the Support Zone and before exiting the Site.
- B. Support Zone: Contractor shall establish a Support Zone for field offices, storage, sanitary facilities, hand washing facilities, and non-construction vehicle parking.
1. The Support Zone shall be an area free of physical and chemical hazards.
  2. Contractor shall maintain the Support Zone in a safe, clean, orderly, and sanitary manner at all times.
- C. Exclusion Zone: Contractor shall establish an Exclusion Zone, e.g., point repair area, using the following criteria and other criteria deemed necessary by Ecology's Representative:
1. Excavation and trenching for performing point repair and staging area for contaminated material containers shall be designated as Exclusion Zone.
  2. Consideration of meteorological conditions and the potential for contaminants or other materials to be blown or washed from the area.
  3. OSHA regulations and other applicable Laws and Regulations.
- D. Decontamination Zone and Procedures: Contractor shall establish a Decontamination Zone near the entrance/exit of the Exclusion Zone.
1. Contractor shall provide suitable facilities for personnel decontamination in the Decontamination Zone, including emergency eyewash, and hand washing facilities.

**DIVISION 01 – GENERAL REQUIREMENTS**  
**SECTION 01 57 10 – TEMPORARY ENVIRONMENTAL CONTROL**

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2. Contractor shall construct a vehicle and equipment decontamination facility, which shall allow for containment and collection of liquid and solid residuals from decontamination of construction vehicles and trucks bound for off-site transport.
3. Contractor shall inspect and document the inspection of each truck bound for landfill disposal of impacted soil and debris. Contractor shall inspect all vehicles and equipment that have been in Exclusion Zone prior to exiting the Exclusion Zone. Contractor shall remove loose mud and debris from all vehicles that have been in Exclusion Zone prior to movement of equipment between Exclusion Zone and non-Exclusion Zone areas of the Site.
4. Contractor shall provide splash protection around the vehicle decontamination facility. Splash protection shall minimize potential contamination from splatter and mist during the vehicle and equipment decontamination process. Splash protection shall be temporary, but stable, and capable of being dismantled in the event of high winds.
5. Contractor shall provide a drainage and collection system for water generated during decontamination procedures.
6. Contractor shall place Decontamination Zone near the entrance and exit of Exclusion Zones.
7. All construction equipment (earthwork equipment, construction vehicles, hand tools etc.) that has been in contact with contaminated or potentially contaminated soil or water shall be decontaminated prior to leaving/demobilizing from the Exclusion Zone and prior to using such equipment in other clean areas of the site including areas where contaminated soil removal activities are completed.
8. Conditions permitting, dry decontamination methods are encouraged. Dry decontamination methods include, but are not limited to, brushing loose materials with the use of broom and/or brushes.
9. Based on site/weather condition and/or Contractor's methodology for performing Contract Work, water decontamination methods may be necessitated to avoid tracking materials off site. The Contractor shall provide wheel washing facility on site and shall turn it on if this appears that dry decontamination methods are not sufficient. The Contractor shall provide all materials and equipment to collect, contain, store, and treat decontamination rinse water as needed, until disposal.
10. Surfactants and detergents must be approved Ecology's Representative prior to use in decontamination operations.
11. Decontamination solids and liquids shall be collected, contained, and properly disposed by Contractor in conformance with all applicable federal, state, and local waste disposal regulations.

12. Contractor shall inspect and decontaminate haul trucks after loading and before the haul trucks exit onto public streets. Contractor shall ensure that haul trucks entering public street receive proper decontamination and inspection.
13. Contractor shall maintain a Vehicle Inspection Log to document that all trucks and equipment leaving the Project Site have been properly inspected and decontaminated prior to operating on public streets to ensure that tailgates are secured and cleaned, and the tarp covers are in place and properly secured.

**1.03 NOISE CONTROL**

- A. Contractor shall be responsible for conducting all Work in accordance with Laws and Regulations concerning noise or sound levels, e.g., the City of Everett Noise Control Ordinance.
- B. Ecology's Representative will have authority to direct Contractor to stop Work or modify Work methods or activities as necessary, to comply with the City of Everett noise control requirements.
- C. Contractor shall control the Work at all times, such that sound levels measured at the Project Site active work areas (e.g. demolition, shoring installation, excavation, etc.) or 50 feet from the equipment (whichever is greater) do not exceed 60 decibels (dB), or the City's noise control ordinance requirements, whichever is more stringent.
- D. Contractor's vehicles and equipment shall be outfitted with mufflers and other sound attenuating equipment so that sound levels do not exceed 60 dB when measured at a distance of 50 feet from any vehicle or equipment, or the City's noise control ordinance requirements, whichever is more stringent.

**1.04 SITE MAINTENANCE**

- A. The Contractor shall keep the Project Site including staging areas, and Contractor's facilities clean and free from excess dirt, rubbish, and debris at all times. Materials and equipment shall be removed from the site when they are no longer necessary. Upon completion of the Contract Work and before final acceptance, the Project Site shall be cleared of equipment, unused materials, and dirt and rubbish to present a clean and neat appearance in conformance with the present condition of the Project Site.
- B. Waste material of any kind shall not be permitted to accumulate, remain at the Project Site, nor on the adjacent street areas.
- C. In the event that waste material, refuse, debris or rubbish is not removed from the Project Site or on adjacent streets by the Contractor, Ecology reserves the right to have such material removed and the expense of the removal and disposal charged to the Contractor.

**1.05 OIL SPILL PREVENTION AND CONTROL**

- A. The Contractor shall submit a Spill Prevention Control and Countermeasures (SPCC) Plan in accordance with WSDOT Standard Plans 1-07.15 and applicable permit requirements.
- B. The Contractor shall be responsible for prevention, containment, and cleanup of spills associated with oil, fuel and other petroleum products used in the Contractor's operations. All such prevention, containment and cleanup costs shall be borne by the Contractor.
- C. The Contractor shall, at a minimum, take the following measures regarding oil spill prevention, containment and cleanup:
  - 1. Fuel hoses, lubrication equipment, hydraulically operated equipment, oil drums, and other equipment and facilities shall be inspected regularly for drips, leaks, or signs of damage, and shall be maintained and stored properly to prevent spills. Proper security shall be maintained to discourage vandalism.
  - 2. All oil and products storage tanks shall be diked or located so as to prevent spills from escaping to catch basins, other underground utilities or on streets. Diking and soils shall be lined with impervious material to prevent oil from seeping through the ground and dikes.
  - 3. All visible oil spills shall be immediately contained using dikes, straw bales, or other appropriate means and removed using sand, ground clay, sawdust, or other absorbent material, which shall be properly disposed of by the Contractor. Waste materials shall be temporarily stored in drums or other leak-proof containers after cleanup and during transport to disposal. Waste materials shall be disposed off-property at an approved disposal facility.
  - 4. In the event of any oil or product discharges into public waters, or onto land with a potential for entry into public waters, the Contractor shall immediately notify the following two agencies at their listed 24-hour response numbers. The Contractor shall also notify Ecology at 1-425-649-7206.
    - Washington Emergency Management Division: 1-800-258-5990 or 1-800-OILS-911.
    - National Response Center: 1-800-424-8802

**1.06 VEHICLE INSPECTION**

- A. The Federal Motor Carrier Safety Regulation (FMCSR) § 396.13 Driver Inspection requires that each driver perform a pre-trip visual and confirmation inspection prior to starting to drive a vehicle. The driver must ensure that the vehicle is in safe operating condition. The driver should review the last driver's vehicle inspection report for that vehicle and, if necessary, take steps to correct any deficiencies as defined in the regulation.

- B. FMCSR § 396.11 Driver Vehicle Inspection Report requires every commercial motor vehicle to be inspected daily. Motor carrier shall require its drivers to submit a written report on each vehicle operated that day. In their reports, drivers must address specific parts and accessories, such as brakes, steering and lights. Each commercial motor vehicle in the fleet should carry a Driver Vehicle Inspection Report book where the drivers can record and submit this information. The vehicle must be inspected prior to being operated. This does require that the power unit and trailer be inspected. A driver must be satisfied that both the power unit and trailer are in safe operating condition before operating the combination. A pre and post trip inspection should cover at least the following parts and components on the vehicle:
- Service brakes, including trailer brake connections
  - Parking brake
  - Steering mechanism
  - Lighting devices and reflectors
  - Tires
  - Horn
  - Windshield wipers
  - Rearview mirrors
  - Coupling devices
  - Wheels and rims
  - Emergency equipment
- C. Any findings noted on the inspection report that do not meet the minimum standards established in the regulation should be repaired prior to placing the vehicle in service. All maintenance and repairs should be documented and maintained in files at the operating location. At the end of the shift, the driver shall perform a post-trip inspection.

### **1.07 SUBMITTALS**

- A. The Contractor shall submit a Spill Prevention Control and Countermeasures (SPCC) Plan in accordance with the submittal timing requirements identified in **SECTION 01 33 00 – SUBMITTAL PROCEDURES**.
- B. Refer to Specification 01 57 13 – Temporary Erosion and Sediment Controls for other submittal requirements.
- C. The Contractor shall submit Vehicle Inspection Logs as requested by Ecology.

**DIVISION 01 – GENERAL REQUIREMENTS  
SECTION 01 57 10 – TEMPORARY ENVIRONMENTAL CONTROL**

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**PART 2 – PRODUCTS (NOT USED)**

**PART 3 – EXECUTION (NOT USED)**

END OF SECTION



**PART 1 – GENERAL**

**1.01 DESCRIPTION OF WORK**

- A. The Contractor shall be responsible for implementing, maintaining, monitoring and supplementing silt control measures, stormwater runoff control measures and additional Best Management Practices (BMPs) for the implementation and maintenance of a comprehensive erosion control plan in accordance with Ecology and City of Everett requirements, the requirements of the construction storm water permit for the Project, the Surface Water Pollution Prevention Plan (SWPPP), and the requirements of a National Pollutant Discharge Elimination System (NPDES) and State Waste Discharge General Permit for Storm Water Discharges Associated With Construction Activity for the Project.
- B. The information provided in the Contract Documents shall be considered a minimum for the anticipated construction and conditions. The Contractor shall be responsible for adding additional BMPs as conditions change at no additional cost to Ecology.
- C. The Contractor shall coordinate installation and inspections of the BMP's with City of Everett and Ecology's Representative as necessary. Additional BMP supplies shall be stored and available at the Project Site as requested by the City of Everett and/or Ecology's Representative.

**1.02 PERMIT**

- A. A National Pollutant Discharge Elimination System (NPDES) and State Waste Discharge General Permit for Storm Water Discharges Associated with Construction Activity for the Project is currently maintained by Ecology.
  - 1. The NPDES permit number is WAR301681. Contractor shall conform to all requirements of this permit, unless otherwise authorized by Ecology in writing.
  - 2. The Contractor shall submit a Transfer of Coverage form as part of taking operational control of the site to transfer NPDES permit coverage.

**1.03 SUBMITTALS**

- A. The Contractor shall prepare and submit a Temporary Erosion and Sediment Control (TESC) and Environmental Controls Plan in accordance with the submittal timing requirements identified in **SECTION 01 33 00 – SUBMITTAL PROCEDURES**.
  - 1. Contractor prepared TESC and Environmental Controls Plan shall incorporate TESC/environmental controls requirements of the Contract Drawings and Specifications.
  - 2. Provide layout for implementing TESC.

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**SECTION 01 57 13 – TEMPORARY EROSION AND SEDIMENT CONTROL**

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3. Describe means, methods, and materials to be used for implementing temporary erosion and sediment control (TESC). Include manufacturer's catalog cut sheets or a sample of materials to be used for TESC.
  4. Drawings that illustrate layout of work zones (i.e. Support Zone, Exclusion Zone and Decontamination Zone). Provide layout of work zones for each point repair area.
  5. Identify number and location of personnel and vehicle decontamination stations including wheel wash stations.
  6. Describe procedures to decontaminate all construction equipment (earthwork equipment, construction vehicles, trucks/trailers used for haul out operations, hand tools, etc.) to ensure that construction soil, debris and water is not tracked outside the site. Also describe procedures to decontaminate construction equipment that has been in contact with contaminated or potentially contaminated soil or water prior to using such equipment in other clean areas of the site including areas where contaminated soil removal activities have been completed. Describe procedures for collection, treatment, and disposal or discharge of decontamination water, residuals and used PPE.
- B. The Contractor shall prepare and submit a Stormwater Pollution Prevention Plan (SWPPP) including Contractor designated CESCL and contact number to Ecology in accordance with the submittal timing requirements identified in **SECTION 01 33 00 – SUBMITTAL PROCEDURES**.
- C. The Contractor shall prepare and submit a Transfer of Coverage form to Ecology to transfer permit coverage in accordance with the submittal timing requirements identified in **SECTION 01 33 00 – SUBMITTAL PROCEDURES**.
- D. If requested by Ecology, the Contractor shall submit to Ecology Product catalog cuts for products to be used for the Work.
- E. Contractor shall be responsible for submitting monthly discharge reports in accordance with the Project's NPDES permit. These reports shall be uploaded on a monthly basis to the Department of Ecology's WebDMR system.
1. Contractor shall be responsible for all fines or penalties as a consequence of failure to submit monthly reports in a timely fashion.

**1.04 REGULATORY REQUIREMENTS**

- A. The Contractor shall comply with all applicable Ecology and City of Everett regulations and standards.
- B. Contractor shall conform to all requirements in the NPDES permit including, but not limited to, the following:
1. Prepare and maintain the SWPPP.

**DIVISION 01 – GENERAL REQUIREMENTS**  
**SECTION 01 57 13 – TEMPORARY EROSION AND SEDIMENT CONTROL**

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2. Submit monthly discharge reports to Ecology's WebDMR system as required by the Project NPDES permit.
3. Have a Certified Erosion Control Lead on-site and available.
4. All water quality testing required by the City of Everett to discharge construction storm water into the City combined sewer (if contractor chooses to discharge into City combined sewer).

**1.05 SEQUENCING AND SCHEDULING**

- A. The facilities for the comprehensive erosion control plan for the Project must be coordinated by the Contractor with all clearing and grading activities, and in such a manner as to ensure that sediment-laden water does not enter the City of Everett storm drain or combined sewer, violate applicable water standards of the City of Everett and the Washington State Department of Ecology, or adversely impact adjacent properties.
  1. Contractor shall install and verify the working condition of all erosion control measures and other BMPs in Work areas at the Project Site prior to any clearing, grubbing, demolition, general site grading or other construction.
- B. Erosion control items shall be installed and removed at various times throughout the Contract Time of the Project.
- C. Contractor shall locate existing catch basins and related storm water drainage features that may be impacted by construction activities during the Project. Protection of these catch basins and related storm water drainage features shall be coordinated with the Work by the Contractor.

**PART 2 – PRODUCTS**

**2.01 MATERIALS**

- A. Refer to Contract Drawings for requirements for products and materials to be used for erosion and sediment control.
- B. Erosion and sediment control products and materials used shall meet the most current City of Everett and Ecology's Stormwater Management Manual for Western Washington (SWMMWW) requirements.

**PART 3 – EXECUTION**

**3.01 EROSION AND SEDIMENT PREVENTION MEASURES**

- A. Where possible, maintain natural vegetation for silt control.
- B. Prevent silt-laden water from leaving Project Site or from entering off-site storm catch basins/sewer systems.
- C. All slopes, cut, or fill areas where Work has stopped for more than 30 days shall be stabilized by mulching, polyethylene sheeting or other method to prevent erosion and sediment transport.

**DIVISION 01 – GENERAL REQUIREMENTS**  
**SECTION 01 57 13 – TEMPORARY EROSION AND SEDIMENT CONTROL**

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- D. The Contractor shall establish silt fence and/or sand bags as shown on the Contract Drawings.
- E. Stabilized staging area entrance and exit shall be installed as identified in the Contract Drawings.
- F. Keep all off-site parking areas and streets clean from construction activities.
  - 1. Where soil and other Work debris on paved surfaces is not contaminated soil from the Project Site, Contractor shall keep paved surfaces clean by the use of mechanical sweeping equipment, hand shovels and brooms or other accepted methods suitable of removing dirt, rock, silt and sand.
  - 2. Where soil and other Work debris on paved surfaces is contaminated soil from the Project Site, Contractor shall keep paved surfaces clean by the use of mechanical vacuum sweeping equipment or other accepted methods suitable of removing dirt, rock, silt and sand and permitting safe and legal disposal of swept-up material.
  - 3. No street washing will be allowed, unless otherwise approved by Ecology.
- I. At project completion, all areas damaged by temporary erosion and sediment controls (trenches for silt fencing, damaged grass below straw wattles) shall be repaired to pre-construction conditions.

**3.02 MAINTENANCE OF EROSION AND SEDIMENT CONTROL MEASURES**

- A. The implementation of the comprehensive erosion control plan, and the maintenance, replacement and upgrading of these facilities shall be the responsibility of the Contractor until Substantial Completion.
  - 1. During the Contract Time, erosion control facilities installed by the Contractor may require maintenance, relocation or upgrading (e.g. additional sumps, relocation of ditches and silt fences, etc.). This Work shall be performed by the Contractor as needed.
  - 2. Contractor shall pay for all costs associated with the construction, maintenance, upgrading and removal of the erosion control facilities throughout the Contract Time.
- B. Contractor shall monitor and maintain erosion and silt control measures and other BMPs throughout the Contract Time of the Project.
  - 1. Remove accumulations of sediment when more than 50 percent of silt storage capacity is filled.
- C. Contractor shall provide continuous monitoring as required by the NPDES permit.
- D. Contractor shall inspect and repair temporary erosion control facilities as needed.

1. Inspections by the Contractor shall occur a minimum of once per week; during and after storms or other, similar weather events; and prior to weekends and holidays.
- E. Adequate temporary control of stormwater runoff will be required in order to allow site access during point repairs. The runoff control shall include, but not limited to, covering all onsite catch basins, diverting runoff to sumps, and pumping runoff to storage tanks. The Contractor shall remove any standing water resulted from runoff in the work areas immediately after each storm event.

### **3.03 WET WEATHER GUIDELINES**

- A. Site preparation and initial construction activities should be planned to minimize disturbance to the existing ground surface during extended wet weather periods when the presence of excess moisture will render the site soils more prone to excessive disturbance.
- B. During Wet Project Site Conditions:
1. Equipment traffic should not be allowed on exposed subgrade areas. Erosion of the soil will occur as exposed surfaces are disturbed due to construction activity and exposure to climatic conditions.
  2. The Contractor shall be responsible for protecting disturbed or prepared surfaces by some form of weather cover if left exposed for more than two (2) days.
  3. Contractor shall protect disturbed or prepared surfaces from surface ponding, stormwater runoff, and construction traffic.
  4. The Contractor will be solely responsible for any repairs required to these surfaces at no additional cost to Ecology.

### **3.04 STREET AND PUBLIC SIDEWALK CLEANING**

- A. Contractor shall sweep clean the following areas, as necessary, to prevent dirt from being carried onto and accumulating on public streets:
1. Truck exteriors, before trucks leave the Project Site;
  2. Truck loading areas; and
  3. Vehicle and equipment traffic areas in public rights-of-way and sidewalks not closed to the public between truck loads and construction vehicle and equipment traffic.
- B. If streets or public sidewalks not closed to the public are fouled or when directed by Ecology, Contractor shall clean them with a vacuum sweeper truck or equal in conformance with City of Everett and all governing requirements and regulations.

**3.05 TURBIDITY MONITORING**

- A. The Contractor shall be responsible for meeting turbidity and pH requirements as required by the City of Everett and the NPDES permit.
- B. Additional erosion and sediment control measures may be required to achieve discharge requirements. The Contractor shall be responsible for installing and maintaining additional measures as work progresses to meet turbidity requirements.
- C. Turbidity monitoring and reporting will be required daily during construction in the rainy season (November 1st through April 30th) and weekly between May 1 and October 31.
- D. Turbidity reports may not be necessary during extended periods of low flow or no flow conditions.
  - 1. The Contractor shall coordinate arrangements with the City of Everett during extended periods of low flow or no flow conditions and shall make available the monitoring reports to Ecology and the City of Everett upon request.
  - 2. Due to the anticipated low flow or no flow conditions during the drier summer months, stormwater flow may cease, causing an interruption in the turbidity monitoring and reporting.
- E. The benchmark for turbidity is defined as:
  - 1. 25 NTU (nephelometric turbidity units)
  - 2. The Contractor shall refer to the NPDES Permit for remedial measures when storm water discharging from the Project Site has a turbidity measurement higher than 25 NTU.
- F. If during the Contract Time the monitoring reports indicate that the threshold level of turbidity is exceeded, the monitor must report the condition to Ecology and the City of Everett immediately, or as soon as practical.
  - 1. The Contractor shall maintain additional BMP supplies as required during construction to bring the Project into compliance when the threshold level of turbidity has been exceeded.

**3.06 SILT FENCING INSTALLATION**

- A. Install silt fence as identified in the Contract Drawings.
  - 1. Perform clearing or other Work required to installing erosion control.
- B. Cast all trench excavation soils from fence installation to the Work side of fence.
- C. Overlap filter fabric fence joints minimum 1 foot prior to backfilling the trench for the fence.

**3.07 OTHER EROSION AND SEDIMENT CONTROLS INSTALLATION**

- A. For polyethylene sheeting, the Contractor shall overlap joints a minimum of 24 inches.

**DIVISION 01 – GENERAL REQUIREMENTS**  
**SECTION 01 57 13 – TEMPORARY EROSION AND SEDIMENT CONTROL**

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**DRAFT**

1. Overlap in direction of drainage and prevent water from draining onto material being protected.
2. Secure sheeting in place to prevent movement and damage.
  - a. Provide sandbags at 2.5 feet spacing.
  - b. Tie the sand bags together with rope when used on slopes greater than 3:1 (horizontal:vertical).
  - c. Minimize driving stakes through plastic.

END OF SECTION



**PART 1 – GENERAL**

**1.01 DESCRIPTION**

- A. This section specifies dust and air emissions control required for the work. Dust and air emissions control practices shall be an integral part of the work under this Contract that has a potential for generation of airborne particulate matter and for release of airborne contaminants. Additionally, sources of noxious odors shall be controlled as required by applicable laws and regulations. Potential sources of dust and air emissions include, but are not limited to:
1. Excavation and handling of contaminated soil and debris.
  2. Stockpiling of soil, debris and other construction materials.
  3. Material handling and transfer operations.
  4. Decontamination activities.
  5. Wind erosion.
  6. Vehicle traffic on access roadways.
  7. Vehicle traffic in contaminated work areas.

**1.02 CONTRACTOR RESPONSIBILITY**

- A. Hire a certified industrial hygienist (CIH) to prepare an air monitoring plan.
- B. Perform personal and perimeter air monitoring activities including sampling and analysis of air samples at the start and during excavation in point repair areas and identify action levels and determine level of personal protective equipment (PPE) that is appropriate for protection of all construction workers.
- C. The Contractor or Contractor's CIH shall perform air quality monitoring during the work to demonstrate compliance with the requirements of this section and Contractor's air monitoring plan and site-specific health and safety plan.
- D. The contractor will also be responsible for developing engineering controls necessary for protection for all construction workers and general public from exposure to air borne dust and contamination.
- E. Air quality monitoring conducted by the Contractor shall include continuous visual observations by Contractor staff of potential dust emissions in addition to field and laboratory sampling and analysis of air samples. Work methods, equipment, and procedures shall be frequently monitored, and shall be modified when observations by either the Contractor or Ecology determines that air quality compliance can be enhanced with changes to methods, equipment, or procedures.

- F. Ecology or Ecology’s Representative may conduct supplemental air quality monitoring at or near the perimeter of ongoing construction operations, the results of which will be communicated to Contractor.
- G. Air emissions control measures shall be implemented so that construction activities do not create onsite dust emissions that persist or are frequent and do not result in visible dust leaving the work area. The release of dust, odors, and airborne contaminants shall be minimized and limited to acceptable levels.
- H. If Ecology receives complaints from nearby residents or businesses regarding nuisance dust deposition onto their property, then Ecology will promptly inspect the off-site property to determine if mitigation is warranted. Ecology will immediately notify the Contractor of the findings of that inspection. If Ecology confirms that nuisance dust deposition likely occurred as a result of emissions from the Project Site, then the Contractor shall reimburse the off-site property owner for the appropriate costs of a commercial cleaning service, at no additional expense to Ecology.

**1.03 STANDARDS**

- A. Ambient air quality standards applicable to the work include, but are not necessarily limited to, the following:
  - 1. The ambient air quality standard for dust at the site is defined in WAC173-470, Ambient Air Quality Standards for Particulate Matter, and WAC 173-400, General Regulations for Air Pollution Sources.
  - 2. The ambient air quality standard for odors at the site is defined in WAC 173-400, General Regulations for Air Pollution Sources. WAC 173-400- 040 sets forth the general standards for maximum emissions, including odors. The maximum emission level for odors is:

“Odors. Any person who shall cause or allow the generation of any odor from any source which may unreasonably interfere with any other property owner's use and enjoyment of his property must use recognized good practice and procedures to reduce these odors to a reasonable minimum.”
  - 3. Puget Sound Clean Air Agency (PSCAA) regulations including Regulation 1 Section 9.11, Emissions of Air Contaminants Detrimental to Person or Property, and Section 9.15 Fugitive Dust Control Measures. Section 9.11 sets qualitative requirements to prevent odor impacts to the surrounding community, and establishes criteria for any appropriate enforcement actions by PSCAA. Section 9.15 sets a qualitative requirement to use all reasonable precautions to control fugitive dust, and provides examples of potential control measures.

**1.04 SUBMITTALS**

- A. The Contractor shall hire a certified industrial hygienist (CIH) to prepare an Air Monitoring Plan. The contractor shall review the existing site conditions including concentrations of arsenic and lead present in material that are within the point repair excavation limits while preparing an air monitoring plan. The Air Monitoring Plan shall provide details of frequency, locations, method and personnel performing air monitoring activities. The Air Monitoring Plan shall provide action levels that would trigger the use of different levels of PPE. The plan shall also describe engineering controls that will be implemented to bring dust and contaminant concentrations to acceptable levels.
- B. Submit results of air monitoring in accordance with Contractor's Air Monitoring Plan. Air monitoring results shall include field monitoring results and laboratory results.
- C. Provide submittals for Ecology review in accordance with the submittal timing requirements identified in **SECTION 01 33 00 – SUBMITTAL PROCEDURES**.

**PART 2 – PRODUCTS**

**2.01 WATER**

- A. Water used for dust and air emission control at the site shall be supplied by Contractor.

**2.02 EQUIPMENT**

- A. The Contractor shall have the following equipment for controlling dust during the project work, as necessary:
  - 1. Water truck(s) with controlled spray/mist bar, portable tanks and pumps, and hand-held hoses with fog nozzles.
  - 2. Vacuum sweeper truck for cleaning pavements.
- B. If Contractor's construction activities create onsite dust emissions that persist or are frequent, and Ecology determines that Contractor's means and methods are not adequately controlling air emissions, Contractor shall stop such dust generating activities and, at no additional cost to Ecology, provide and utilize dust suppression machines with a mister/atomizer that has the sufficient spray reach to spray a fine mist over the active work area(s) generating such dust emissions. Acceptable equipment includes those manufactured by BossTek ([www.bosstek.com](http://www.bosstek.com)), Company Wrench ([www.companywrench.com](http://www.companywrench.com)) or Ecology- approved equivalent which has a sufficient capacity to cover the Contractor's active work area generating unacceptable dust emissions.

**2.03 OTHER PRODUCTS**

- A. Submit to Ecology for review data and information on other products or equipment proposed for use to control fugitive dust or odor emissions prior to the use of the products. Indicate how the products or equipment will be applied or used.

**PART 3 – EXECUTION**

**3.01 COMMON PRACTICES**

- A. Implement dust and air emissions control measures during all phases of the work, including, but not limited to, those measures designated in Table 01 57 50-1, as necessary to limit fugitive dust emissions and minimize the generation of odors.
- B. Work methods, equipment, and procedures shall be continuously monitored by Contractor and shall be modified, at no additional cost to Ecology, when Ecology or Contractor determines that air quality compliance can be enhanced with changes to Contractor's methods, equipment, or procedures.

**TABLE 01 57 50-1**  
**DUST AND AIR EMISSIONS CONTROL MEASURES**

Activity	Control Measures
Material Excavation, Handling, Loading, Disposal	<ol style="list-style-type: none"><li>1) Apply water to work areas as needed to prevent visible dust emissions leaving the Project Site or work areas.</li><li>2) Cover exposed soil and temporary stockpiles, as necessary and appropriate, to minimize wind or stormwater erosion.</li><li>3) Move and load material for offsite disposal in a manner that limits free-fall of material and is least likely to generate dust emissions; cover and tarp loads prior to exiting the site.</li><li>4) Limit or halt dust-generating work during very windy conditions.</li><li>5) Conduct vehicle wheel wash activities (or similar) sufficient to prevent tracking dirt onto roadways.</li><li>6) Sweep and vacuum public roads near egress points as needed to remove dirt tracked out from the Project Site.</li></ol>
Movement of Equipment	<ol style="list-style-type: none"><li>1) Water traffic areas, as required, to minimize dust emissions.</li><li>2) Designate equipment traffic patterns to minimize travel distance and vehicular dust emissions.</li><li>3) Limit vehicle speed to minimize dust emissions.</li></ol>
Equipment Decontamination	<ol style="list-style-type: none"><li>1) Clean equipment with hand tools and a pressure washer to remove soil and contamination, as necessary.</li></ol>
Wind Erosion	<ol style="list-style-type: none"><li>1) Apply water, as necessary, to minimize dust emissions.</li><li>2) Cover exposed materials with properly weighted polyethylene sheeting.</li></ol>

END OF SECTION

**PART 1 – GENERAL**

**1.01 DEFINITIONS**

- A. Products are items purchased for incorporation in the Work, whether purchased for the Project or taken from previously purchased stock. The term Product includes the terms “material”, “equipment”, “system” and terms of similar intent.
  - 1. “Named Products” are items identified by manufacturer’s product name, including make or model designation, indicated in the manufacturer’s published product literature that is current as of the date of the Contract.

**1.02 SUBMITTALS**

- A. Contractor shall prepare a schedule showing Products for the Work specified in a tabular list form acceptable to the Ecology. Include generic names of products required, the manufacturer’s name and proprietary product names for each item listed.
- B. Coordinate submittal of list of Products with the submittal of the Contractor’s Preliminary Project Schedule and Contractor’s existing conditions assessment the Project Site.
  - 1. Contractor shall submit an initial list of Products with the Preliminary Project Schedule.
    - a. Provide a written explanation for omissions of data, and for known variations from Contract requirements.
  - 2. Contractor shall submit a final list of Products within ten (10) working days after receiving Ecology response to submittal of initial list.
    - a. Provide a written explanation for omissions of data, and for known variations from Contract requirements.
  - 3. Ecology will respond in writing to the Contractor within two (2) weeks of receipt of the initial and final lists of Products.
  - 4. Contractor shall supplement the final tabular list of Products as necessary based on the findings of Contractor’s existing conditions assessment of the Project Site and conditions encountered during Work.

**1.03 QUALITY ASSURANCE**

- A. To the fullest extent possible and not eliminating the requirements for Contractor to replace same or similar materials for site features that are demolished and require restoration, the Contractor shall provide Products of the same kind from a single source.

- B. When the Contractor is given the option of selecting between two or more Products for use on the Project, the Product selected shall be compatible with Products previously selected, even if previously selected Products were also options.
- C. Except for required labels and operating data, do not attach or imprint manufacturers' or producer's nameplates or trademarks on exposed surfaces of Products which will be exposed to view in occupied spaces or on the exterior.
  - 1. Locate required product labels and stamps on a concealed surface or, where required for observation after installation, on an accessible surface that is not conspicuous.
  - 2. Provide a permanent nameplate on each item of service connect or power-operated equipment, if applicable. Locate on an easily accessible surface which is inconspicuous in occupied spaces. The nameplate shall contain the following information and other essential operating data:
    - a. Name of product and manufacturer
    - b. Model and serial number
    - c. Capacity
    - d. Speed
    - e. Ratings

#### **1.04 PRODUCT SELECTION**

- A. Contractor shall provide Products that comply with the Contract Documents, that are undamaged and, unless otherwise indicated, new and unused at the time of installation.
- B. Provide Products complete with all accessories, trim, finish, safety guards and other devices and details needed for a complete installation and for the intended use and effect.
  - 1. Where available, provide standard Products of types that have been produced and used successfully in similar situations on other projects.
- C. Product selection is governed by the Contract Documents and governing regulations, not by previous project experience. Requirements governing Product selection for this Project include the following:
  - 1. Where Products or manufacturers are specified by naming one, or more, accompanied by the term "or equal" or "or approved equal" comply with **SECTION 01 25 00 – SUBSTITUTION PROCEDURES** to obtain Ecology approval for use of an unnamed product.



2. Where the Contract Documents only require compliance with an imposed code, standard or regulation, select a product that complies with the standards, codes or regulations specified.
3. Where the Contract Documents require matching an established Sample, the Ecology's decision will be final on whether a proposed product matches satisfactorily.
4. Where no available Product within the specified category matches satisfactorily and also complies with other specified requirements, comply with **SECTION 01 25 00 – SUBSTITUTION PROCEDURES** for selection of a matching Product in another Product category, or for noncompliance with specified requirements.
5. Where specified Product requirements include the phrase "...as selected from manufacturer's standard colors, patterns, textures..." or a similar phrase, select a Product and manufacturer that complies with other specified requirements. Ecology will select the color, pattern and texture from the Product line selected.

**PART 2 – PRODUCTS (NOT USED)**

**PART 3 – EXECUTION**

**3.01 DELIVERY**

- A. Contractor shall deliver Products in accordance with the manufacturer's recommendations, using means and methods that will prevent damage, deterioration and loss, including theft. At a minimum, Contractor shall do the following:
  1. Schedule delivery to minimize long-term storage at the Project Site and to prevent overcrowding of construction spaces.
  2. Coordinate delivery with installation time to ensure minimum holding time for items that are flammable, hazardous, easily damaged, or sensitive to deterioration, theft and other losses.
  3. Deliver products to the site in the manufacturer's original sealed container or other packaging system, complete with labels and instructions for handling, storing, unpacking, protecting and installing.
  4. Inspect Products upon delivery to ensure compliance with the Contract Documents, and to ensure that products are undamaged and properly protected.

**3.02 STORAGE**

- A. Contractor shall store Products in accordance with the manufacturer's recommendations, using means and methods that will prevent damage,

deterioration and loss, including theft. At a minimum, Contractor shall do the following:

1. Store Products at the Project Site in a manner that will facilitate inspection and measurement of quantity or counting of units.
2. Store heavy materials away from Work in a manner that will not endanger the supporting construction.
3. Store Products subject to damage by the elements above ground, under cover in a watertight temporary enclosure, with ventilation adequate to prevent condensation. Maintain temperature and humidity within range required by manufacturer's instructions.

**3.03 HANDLING**

A. Contractor shall handle Products in accordance with the manufacturer's recommendations, using means and methods that will prevent damage, deterioration and loss, including theft. At a minimum, Contractor shall do the following:

1. Comply with manufacturer's instructions and recommendations for installation of Products in the applications indicated. Anchor each Product securely in place, accurately located and aligned with other Work.
2. Clean exposed surfaces and protect as necessary to ensure freedom from damage and deterioration until time of Substantial Completion.

END OF SECTION

**PART 1 – GENERAL**

**1.01 DESCRIPTION OF WORK**

- A. Contractor shall conduct cleaning and waste disposal operations in full compliance with local laws and ordinances, and with federal and local environmental and anti-pollution regulations.
  - 1. Comply with governing regulations and safety standards for cleaning operations.
  - 2. Remove waste materials from the site and dispose of in a lawful manner.
  - 3. Demolished material shall be disposed of or salvaged as identified in the contract documents including Section 02 41 00 Demolition, Clearing and Grubbing.
  - 4. Cleaning activities shall include hauling routes and other areas located outside the Project Site that are used as part of the Work.
- B. The Contractor shall not dispose of volatile wastes such as mineral spirits, oil or paint thinner in combined sewer drains. The contractor shall be responsible for performing necessary analysis, obtaining disposal approval and disposing of wastes at landfills approved by Ecology.
- C. Burning of debris, rubbish or other waste material generated from the Project Site is not permitted. Burying of debris, rubbish or other waste material generated from the Project Site is not permitted unless the debris, rubbish or other waste material are managed in such a way by landfills approved by Ecology.

**1.02 SUBMITTALS**

- A. Submit Material Safety Data Sheets for cleaning materials and agents used by the Contractor and maintain a MSDS file at the Project Site during Work.

**PART 2 – PRODUCTS (NOT USED)**

**PART 3 – EXECUTION**

**3.01 CLEANING AND PROTECTION DURING CONSTRUCTION**

- A. During handling and installation, Contractor shall clean and protect construction in progress and adjoining materials in place. Apply protective covering where required to ensure protection from damage or deterioration before Substantial Completion.
- B. Use cleaning materials and agents recommended by the manufacturer or fabricator of the surface to be cleaned. Do not use cleaning agents that are potentially hazardous to health or property, or that might damage finished

surfaces. Submit Material Safety Data Sheets and maintain a MSDS file at the Project Site during Work.

- C. Contractor shall clean and maintain completed Work as frequently as necessary through the remainder of the construction period. Adjust and lubricate operable components to ensure operability without damaging effects.

### **3.02 COLLECTION AND DISPOSAL OF WASTE**

- A. Collect waste from construction areas of the Project Site daily. Do not hold waste materials more than seven (7) days during normal weather or three (3) days when the temperature is expected to rise above 80 degrees F (27 degrees C). Handle hazardous, dangerous, or unsanitary waste materials separately from other waste by containerizing properly. Dispose of material in a lawful manner.
- B. All dumpsters are to be maintained within Work areas and shall not be open or accessible to the public or be located in a public right-of-way.

### **3.03 FINAL CLEANING**

- A. Before Final Completion, final cleaning of the Project Site shall be performed by the Contractor. Contractor shall leave the Project Site, including all adjacent properties, and all adjacent City rights-of-way free of any associated debris from the project and returned to a before construction condition satisfactory to Ecology and City.
  - 1. Employ experienced workers or professional cleaners for final cleaning.
  - 2. Clean the Project Site disturbed by construction activities, of rubbish, waste materials, litter and foreign substances. Sweep paved areas broom clean. Remove petrochemical spills, stains and other foreign deposits.
  - 3. Remove tools, construction equipment, machinery and surplus material from the Project Site.
  - 4. Touch-up and otherwise repair and restore marred exposed finishes and surfaces resulting from the Work. Replace finishes and surfaces that cannot be satisfactorily repaired or restored, or that show evidence of repair or restoration.
  - 5. Wipe surfaces of mechanical and electrical equipment. Remove excess lubrication and other substances.
  - 6. Clean exterior building walls/walkways and overhangs.
- B. If Contractor fails to clean up the Project Site to the satisfaction of Ecology, after reasonable notice is provided by Ecology, Ecology may do so and the costs incurred by Ecology shall be charged to Contractor.

END OF SECTION

**PART 1 – GENERAL**

**1.01 DESCRIPTION**

- A. Contractor shall refer to **SECTION 00 72 00 – GENERAL CONDITIONS** for the definition, guidance and requirements for Substantial Completion, Final Completion, and Final Acceptance.
- B. These requirements include, but are not limited to, Contractor’s notification requirements to Ecology, specified inspections, and submittal of Project Record documents.

**1.02 SUBSTANTIAL COMPLETION DEFINITION FOR THIS PROJECT**

- A. Payment will be held to no more than 90 percent of the contract amount when the project achieves Substantial Completion.
- B. Substantial Completion shall include, but not be limited to, the following:
  - 1. All earthwork completed.
  - 2. All aboveground and underground utilities restoration completed.
  - 3. All traffic signal and street lighting restoration completed.
  - 4. All street asphalt concrete paving, concrete sidewalks, planted traffic islands restoration completed.
  - 5. All stockpile area, haul road, access road, construction entrance dismantling and restoration completed.
  - 6. Most or all landscape feature restoration completed.

**1.03 SUBSTANTIAL COMPLETION INSPECTION**

- A. Contractor shall give Ecology a minimum of ten (10) days’ notice to request a Substantial Completion inspection.
  - 1. Subject to Ecology availability, Contractor may schedule more than one (1) day of inspection.
- B. Before requesting inspection for Substantial Completion by Ecology, the Contractor shall complete the following activities.
  - 1. Unless required for continuing maintenance and finishing Work and/or permitted Work as specified in this Section, Contractor shall discontinue use and remove temporary facilities and utilities from the Project Site. Contractor shall also remove all construction tools, mock-ups, and similar elements.
  - 2. Unless required for either continuing maintenance and finishing Work and/or permitted Work as specified in this Section, Contractor shall remove all temporary protection and facilities installed for protection of the Work.

- C. On receipt of a request for an inspection for Substantial Completion by Ecology, Ecology shall proceed with the inspection with the Contractor. This inspection shall include the development of a punch list of items that either require the Contractor's attention and correction in order to achieve Substantial Completion, and, to identify work remaining to be accomplished in order for the contractor to achieve Final Completion of the Project.
  - 1. Ecology may add additional items to the punch list at any time between Substantial Completion and Final Completion.
- D. If the Project is not deemed Substantially Complete, Ecology shall conduct a repeat inspection when requested by the Contractor, provided the Contractor assures Ecology that the Work is Substantially Completed.
  - 1. Ecology shall issue a written notice of Substantial Completion following this inspection or shall advise Contractor of Work that must be corrected or completed before the notice will be issued.
- E. Results of the completed Substantial Completion inspection shall form the basis of identifying any outstanding requirements for achieving Final Completion.

#### **1.04 PROJECT RECORD REVIEW**

- A. As part of the inspection for Substantial Completion, Contractor shall provide Ecology a draft of the Project Record file for review in a binder that includes a table of contents and contents easily identifiable by the use of dividers.
  - 1. Project Record shall include all material and equipment submittals, change orders, RFIs, survey documentation, disposal facility weigh tickets or receipts, warranties, approved permits, and the record of as built construction.
- B. The Contractor shall incorporate any comments received from Ecology into the final Record Document file and deliver to Ecology prior to Final Completion.

#### **1.05 FINAL COMPLETION INSPECTION**

- A. Upon completion of all punch list items identified during the Substantial Completion inspection and the completion of all remaining Work items identified by Ecology or Contractor as the specified Maintenance and Finishing Periods are completed, Contractor and Ecology shall together perform an inspection visit to verify that Contract requirements, including corrective actions on punch list items, have been completed.
- B. Contractor shall provide Ecology a minimum of ten (10) days' notice to request a Final Completion inspection.

- C. On verification that all project work has been completed, and upon receipt of the completed Project Record file, Ecology shall issue a Notice of Final Completion to the Contractor.

**1.06 FINAL ACCEPTANCE**

- A. Ecology shall issue the Notice of Final Acceptance when all Contract requirements have been satisfied.

**1.07 WARRANTY INSPECTION**

- A. All work performed under this contract is under warranty for 12 months from the date of substantial completion.
- B. An inspection visit of the Work shall be performed by Contractor and Ecology approximately 4 weeks prior to the end of the 12 month warranty period that begins at Substantial Completion.
  - 1. Contractor shall contact Ecology to coordinate these inspection visits a minimum of two (2) calendar weeks in advance.
- C. During this inspection visit, Contractor and Ecology shall view the condition of Work since Final Completion, verify whether the Work still meets the requirements and Specifications of the Project Manual, and identify deficiencies in the Work that do not conform to the Project Manual.
  - 1. Work under warranty that does not meet the requirements and Specifications of the Project Manual shall be considered Remedy Work and scheduled for repair or replacement, as appropriate.

**1.08 REMEDY WORK**

- A. Scheduling for Remedy Work shall be submitted to Ecology by Contractor after the warranty inspection visit. All Remedy Work shall be performed and completed no later than thirty (30) calendar days after the inspection visit, unless otherwise authorized by Ecology.
- B. Work to be remedied shall be replaced or rebuilt to comply with the requirements of the Project Manual. The Contractor is responsible for the cost of correcting non complying and defective Work that is not in compliance with the Project Manual.

**PART 2 – PRODUCTS (NOT USED)**

**PART 3 – EXECUTION (NOT USED)**

END OF SECTION



**PART 1 – GENERAL**

**1.01 DESCRIPTION OF WORK**

- A. Throughout progress of the Work, the Contractor shall maintain an accurate record of all Project Record Documents/As-Built Drawings (i.e., Red-Lines).
- B. Provide one copy of the As-Built Drawings (Red-Lines) to Ecology as specified herein.

**1.02 QUALITY ASSURANCE**

- A. General: The Contractor has full responsibility for maintenance of changes to the Project Record Documents.
- B. Accuracy of Records: As-Built Drawings. Thoroughly coordinate all changes to the Contract Drawings by making red-line entries on an ongoing basis on a single set of drawings maintained at the job site. Accuracy shall be such that future uses of information showing the as-built condition of the Contract Work may reasonably rely on the information shown. The Ecology Representative's approval of the accuracy and current status of the record of changes to the As-Built Drawings will be a prerequisite to the Ecology's approval of requests for each progress payment. Appropriate payment may be withheld if Red-Lines are not up to date at the times of periodic applications for progress payments.

**1.03 AS-BUILT DRAWING REQUIREMENTS**

- A. General: Preparation of As-Built Drawings is a requirement of the Contract. The Contractor is required to revise the Drawings to document the changes during construction to produce an as-built record of the project.
- B. As-Built Drawings:
  - 1. General: The Contractor shall revise (1) set of Contract drawings by red-line process to show the as-built conditions during the course of the Project. These working, as-built drawings shall be kept accurate and current.
  - 2. Progress Submittals: Prior to submitting each request for progress payment, secure Ecology's approval of the working As-Built Drawings as currently maintained.
  - 3. Final As-Built (Redline) Drawings Submittal: After approval of the current "Redline" documents by the Ecology, and within 14 days after Substantial Completion of all or a part of the work, and prior to Final Payment request, submit (one copy) of the final As-Built Drawings to the Ecology.

**1.04 HANDLING OF AS-BUILT DRAWINGS**

- A. During execution of the Work, the Contractor shall use all means necessary to maintain a record of changes to the Contract drawings completely

protected from deterioration and from loss and damage. Such changes shall be recorded upon redlines which will be composed of Contractor markups on project drawing prints supplied by the Ecology.

## **PART 2 – PRODUCTS**

### **2.01 PROJECT DRAWINGS**

- A. Promptly following award of the Contract, secure from the Ecology one full size set of paper prints of the Contract drawings for recording As-Built conditions.

## **PART 3 – EXECUTION**

### **3.01 MAINTENANCE OF RED-LINE DRAWINGS**

- A. Identification: Upon receipt of the project drawings described in paragraph 2.01 above, identify each of the Documents with the title RED-LINES.
- B. Preservation: In consideration of the Contract completion time, frequent use of the Red-Lines for making new entries and for examination, and the conditions under which these activities will be performed, devise a suitable method for protecting the project Red-Lines to the approval of the Ecology.
- C. Do not use the Red-Lines for any purpose except entry of new data and for review by Ecology’s Representative.
- D. Maintain the Red-Lines at the site of Work as designated by Ecology.
- E. Making Entries to the Red-Lines:
  - 1. Using an erasable red-colored pencil or pen, clearly describe the change by notes and by graphic line. It is not necessary for the Contractor to redraw what is clearly shown and dimensioned on a sketch accompanying the Change Directive, however the sketch should be included on the sheet or attached to the back of the preceding sheet.
  - 2. Clearly indicate which information a sketch replaces, by “cloud” or similar device.
  - 3. Distinguish to the satisfaction of Ecology between annotations intended to be copied exactly by a future drafter creating Record Drawing files, and information that is supplemental and not meant to be copied. Examples of supplemental information would include notes to the drafter and information purely for the Contractor’s information in monitoring the change. A suggested approach is to make all markings not to be copied by the future drafter in a color other than red, reserving red for information to be copied exactly.
  - 4. The working and final As-Built Drawings (Red-Lines) shall show, as a minimum, the following information:

- a. All changes in the work generated by documents such as Change Orders, Requests for Interpretation (RFI) and Contractor-originated proposals. Identify the documents generating changes from the original Contract (As-bid) documents. These changes shall show the actual work with the same level of accuracy and completeness as the original Contract documents.
- b. Any sketches that accompanied the Change Directive attached to the drawing sheet or the back of the sheet preceding it.
- c. The actual location, identification and sizes of material, equipment, utilities and elements of the project to the same level of detail as the original Contract (As-bid) drawings.
- d. The correct scale, grade, elevations, dimensions and coordinates of changes.
- e. Changes or modifications that result from final inspection.

END OF SECTION

**PART 1 - GENERAL**

**1.01 DESCRIPTION OF WORK**

- A. Surveying shall be performed after the chain link fence installation in Areas C2 and C3 is completed.
  - 1. The surveying shall include the horizontal locations of the installed chain link fences and all gates in Areas C2 and C3.
  - 2. Surveying references and benchmarks shall be established by the Contractor in fashions that shall not be disturbed by the Work. The Contractor shall be responsible for maintaining and, if necessary, repairing all references and benchmarks established for the Work.
- B. The Contractor shall retain the services of a surveyor licensed in the State of Washington to survey the fencing location.

**1.02 SUBMITTALS**

- A. Submit survey data with the Project Record for Substantial Completion.

**PART 2 - PRODUCTS (NOT USED)**

**PART 3 - EXECUTION**

**3.01. GENERAL**

- A. Detailed survey records shall be maintained, including a description of the work performed, the methods utilized, and the control points used. The record shall be adequate to allow the survey to be reproduced.
- B. The Contractor survey procedures (positioning modes, equipment calibration, data reduction, adjustment, processing, and plotting) shall conform to industry standards. Failure to perform and process such surveys in accordance with the recognized standards will result in a rejection and nonpayment for work performed.

**3.02. AS-BUILT SURVEY**

- A. The as-built survey shall be performed to record the as-built chain link fence and gate locations at the Site. The horizontal datum shall be consistent with the datum used in the Contract Drawings.
- B. The as-built survey shall be conducted within 10 calendar days after the completion of site restoration.
- C. If Ecology's review of final as-built survey indicates non-compliance with project requirements, the Contractor shall be required to rectify identified

issues and additional final as-built survey shall be performed to represent final as-built conditions at the Project Site.

- D. The final as-built survey and the final review and acceptance by Ecology shall be completed prior to Contractor's request for final acceptance of the Contract Work.

END OF SECTION

**PART 1 – GENERAL**

**1.01. DESCRIPTION OF WORK**

- A. Prior to commencing excavation or disturbing activities, the Contractor shall perform all necessary existing conditions assessments at the Project Site, including Areas B2, C2 and C3, to facilitate and permit the Contractor to return and restore the Project Site to match or exceed its original condition or conditions as specified in the Contract Documents. Limits of existing conditions assessment shall extent at a minimum 20 feet beyond the Project Site/Contractor's site work limits.
- B. Existing conditions assessments shall include, but are not limited to:
  - 1. Photographic and/or video documentation of surface and above ground features including but not limited to asphalt and concrete paved surfaces, landscaping, above ground utilities, traffic signals, and street signs at the Project Site before commencing construction.
  - 2. Photographic and/or video documentation of the locations and conditions of underground features including foundations and utilities prior to their demolition. Documentation of underground features shall be performed as they are uncovered during excavation. The utilities shown or indicated on the Drawings are approximate and were prepared based on the information/data available from the survey. Ecology is not responsible for the accuracy or completeness of any information or data relating to the utilities. Contractor shall verify all information, data and location prior to performing the Work.

**1.02. SUBMITTALS**

- A. Photographs, video documentation and notes of existing site conditions assessments for all surface and above ground features and utilities prior commencing clearing, grubbing or demolition activities at the Project Site.
- B. Photographs, video documentation and notes of existing site conditions assessments for all underground ground features and utilities as the underground features and utilities are uncovered.

**PART 2 – PRODUCTS (NOT USED)**

**PART 3 – EXECUTION**

**3.01. UTILITY LOCATION**

- A. Contractor shall locate all existing utilities so as to avoid damage or disturbance. For aid in utility location call "Dial Dig 1-800-424-5555" a minimum of two working days prior to beginning the Work activities.
- B. Contractor is responsible for avoiding damage to all utilities.

- C. Contractor shall notify Ecology promptly if underground utilities not shown in the Contract Documents are identified through the Contractor's location efforts or are encountered.

**3.02. SITE FEATURES AND STRUCTURES INVENTORY**

- A. Contractor shall include in Contractor's existing conditions assessment and documentation of the Project Site an inventory of all site features and structures affected by the Work.
- B. The inventory of site features and structures shall include locations and, as applicable, alignment and orientation information, in order to reinstall or replace site features and structures to their pre-construction locations and configurations.
- C. Contractor's existing conditions assessment shall verify that Contractor can obtain the same features or structures in new materials during Contract Time in instances where Contractor will replace materials of site features or structures rather than reinstall site features or structures with pre-construction materials.

**3.03. UNFORESEEN PHYSICAL CONDITIONS**

- A. If Contractor encounters conditions at the Project Site which are subsurface or otherwise concealed physical conditions which differ materially from those indicated in the Project Manual, or unknown physical conditions of an unusual nature which differ materially from those ordinarily found to exist and generally recognized as inherent in construction activities of the character provided for in the Project Manual, then Contractor shall give written notice to Ecology promptly before conditions are disturbed and in no event later than one (1) calendar day after the first observance of the conditions.

END OF SECTION



**PART 1 – GENERAL**

**1.01 DESCRIPTION OF WORK**

- A. Site demolition, clearing and grubbing activities shall be performed at the point repair areas in Area B2, along new chain link fencing alignments in Areas C2 and C3 and Contractor's staging area as necessary.
- B. Demolition and associated work may include:
  - 1. Demolition of concrete sidewalks, curbs and asphalt surfaces of the right-of-way and/or parking area to facilitate excavation for storm drain point repairs.
  - 2. Partial demolition of the existing fence post concrete footings may be necessary for the new chain link fence installation.
  - 3. Clearing and grubbing shrubs and vegetation.
  - 4. Direct-load demolition debris into haul trucks or place in roll-off bins, transport to off-site disposal or recycle facility approved by Ecology.
- C. Demolished site features shall be replaced in accordance with the Project Manual after completion of point repairs and backfilling.
- D. Contractor may store existing materials that are to be reused at an off-site location provided Contractor can provide a suitable location for storage and protection of materials at no additional cost to Ecology. Ecology must approve this option in writing in advance of the removal of all such materials.

**1.02 MATERIALS OWNERSHIP**

- A. Demolished materials, except for those items or materials indicated to be reinstalled, or otherwise indicated to remain on Project Site, shall become the Contractor's property and shall be removed from the site and disposed at an off-site disposal or recycle facility approved by Ecology. Contractor is not permitted to burn demolished materials.
- B. Contractor shall promptly dispose of demolish materials, unless otherwise indicated. Contractor shall obtain all permits for transport and disposal of demolition debris and materials as required.
  - 1. Comply with hauling and disposal regulations of authorities having jurisdiction.
  - 2. Do not allow demolished materials to accumulate at the Project Site.

**1.03 SUBMITTALS**

- A. Contractor shall submit Site Demolition Plan describing the following for Ecology’s review in accordance with the submittal timing requirements identified in **SECTION 01 33 00 – SUBMITTAL PROCEDURES**:
  - 1. Sequence for removal of surface and subsurface features for demolition.
  - 2. Method and equipment used for demolition.
  - 3. Proposed disposal and recycling facilities used for demolition debris including asphalt, concrete and above ground portions of trees, shrubs and plants.
  - 4. Methods and equipment for protection of existing utilities designated to be protected.
  - 5. Copies of the disposal/recycling scale certifications that will be used for measuring weight of demolition debris prior to its disposal.
- B. Contractor shall submit recycling/disposal facility records indicating receipt and acceptance of demolition debris from the Project Site. The Contractor shall submit copies of all off-site disposal or recycle facility scale weight tickets to Ecology’s Representative. Weight tickets without the scale’s stamp will be rejected.

**PART 2 – PRODUCTS (NOT USED)**

**PART 3 – EXECUTION**

**3.01 PREPARATION**

- A. Prior to performing demolition, clearing and grubbing activities, complete utility locates and verify that utilities within the point repair areas and new chain link fence and other areas that are to be disturbed have been protected, or disconnected and rerouted as per the requirements of the Contract Documents and as approved by the utility service providers.
- B. Verify the inventory, locations and configurations, and record the conditions of items to be removed and reinstalled and items to be removed and salvaged.

**3.02 DEMOLITION GENERAL PROCEDURES**

- A. Conduct demolition operations and remove debris and materials to ensure minimum interference with roads, streets, walks, and other adjacent facilities.

- B. Have in place, before demolition begins, required protection measures, protective and regulatory devices, and personnel. Traffic and environmental controls including temporary erosion and sediment controls shall be in place prior to beginning demolition.
- C. Do not close or obstruct streets and sidewalks or other adjacent facilities except as specified in the Project Manual without permission from Ecology, City of Everett and/or WSDOT.
- D. Conduct demolition operations to prevent injury to pedestrians. Ensure safe passage of vehicles and people around demolition area.
- E. Demolish only to the extent required for the Work as indicated in the Contract Documents.
- F. Demolition work shall be coordinated with the earthwork activities specified in **SECTION 02 61 13 – EXCAVATION**.
- G. If an unforeseen obstruction or obstructions are encountered, obtain instruction from Ecology before proceeding with the work.
- H. Promptly repair, restore or replace damage, disturbance, or impairment of existing facilities to remain.

### **3.03 ASPHALT AND CONCRETE DEMOLITION**

- A. The Work includes demolishing asphalt and Portland cement concrete (concrete) surfaces of streets, curbs and sidewalks from the point repair areas.
- B. The thickness of existing pavement (street) to be demolished varies and consists of either asphalt or a layer of asphalt over concrete. Actual thickness of asphalt and concrete surfaces may vary from the estimates provided and the Contractor shall be responsible for demolition as per the requirements of the Project Manual at no additional cost to Ecology.
- C. The demolition debris shall be in acceptable size for disposal at a licensed construction and demolition debris landfill and/or recycling facility chosen by the Contractor and approved by Ecology.
- D. Wet down asphalt and concrete materials during demolition to prevent spread of dust and dirt. Do not use water in a manner that would cause damage or contaminant runoff.
- E. Saw cut asphalt and concrete pavement with saw designed for cutting pavements, prior to pavement removal. Cuts shall be straight and free of ragged edges.

**3.04 CLEARING AND GRUBBING**

- A. Clearing and grubbing shall be performed in the point repair areas in Area B2 as indicated on the Drawings.
- B. Clearing and grubbing shall be performed along the new fencing alignments in Areas C2 and C3 to remove existing trees, shrubs and vegetations to facilitate installation of the new fences.
- D. Contractor shall verify all limits of clearing, grubbing, tree removal and landscaping removal with Ecology prior to commencing work.
- E. Cleared/removed above-ground portions of trees, shrubs, bushes, and vegetation shall be considered as demolition debris and transport and dispose at an offsite disposal or recycling facility as per the requirements specified herein.
- F. Below ground portions of trees, shrubs, bushes, and vegetation shall be managed as contaminated material for offsite disposal as specified in **SECTION 02 61 15 – TRANSPORTATION AND DISPOSAL OF CONTAMINATED MATERIAL**.
- G. The Contractor may stockpile cleared and grubbed materials on site. Cleared and grubbed material shall be stockpiled separately from other demolition debris.

**3.05 POLLUTION CONTROL**

- A. Contractor shall provide services for effective air, noise and water pollution controls as required by local authorities having jurisdiction.
- B. Use water and other suitable methods to limit the spread of dust and soil.
  - 1. Comply with governing environmental protection regulations.
  - 2. Do not use water when it may damage existing construction or create hazardous or objectionable conditions, such as ice, flooding, and pollution.
- C. Remove and transport debris in a manner that will prevent spillage on adjacent surfaces and areas.
- D. Clean adjacent structures and improvements of dust, dirt, and debris caused by demolition operations, as determined by Ecology, at no additional cost to Ecology.
- E. Return adjacent areas to condition existing before start of demolition as soon as practicable.

**3.06 REPAIR OF DAMAGE FROM DEMOLITION**

- A. Contractor shall remove, replace, patch, and repair existing materials and surfaces cut, marred or damaged during demolition. Such materials and surfaces shall be repaired or restored to their condition prior to the damage. This repair or restoration work shall be done at no additional cost to Ecology, and by methods and with materials so as not to void existing warranties.
  - 1. Repair materials shall be identical to existing materials unless otherwise authorized by Ecology.
  - 2. Where identical materials are unavailable or cannot be used for exposed surfaces, use materials that visually match existing adjacent surfaces to the fullest extent possible.
  - 3. Use materials whose installed performance equals or surpasses that of existing materials.

**3.07 MATERIALS HANDLING AND DISPOSAL**

- A. The Contractor shall select an appropriate disposal facility for the disposal of debris, to be approved by Ecology, and shall coordinate arrangements for hauling such materials to the selected facility.
- B. The Contractor shall directly load the demolition debris to waste containers or dump trucks. If necessary, the Contractor may temporarily stockpile demolition debris on site. Demolition debris shall be temporarily stored within the designated Contractor's staging area.
- C. Contractor shall visually inspect each truck bound for an off-site disposal or recycling facility before it leaves the site to ensure that the tailgate and tarpaulin are secure and completely clean of debris.
- D. The load weight shall be documented by off-site disposal or recycle facility certified scale and certified scale stamp. The Contractor shall submit copies of all off-site disposal or recycle facility scale weight tickets to Ecology's Representative. Weight tickets without the scale's stamp will be rejected.
- E. The Contractor assumes full responsibility for the proper disposal of all demolition materials under this Contract in a manner that meets the requirements of federal, state and local regulations for protecting the health and safety of employees, the public, and for protecting the environment.

END OF SECTION

**PART 1 – GENERAL**

**1.01 DESCRIPTION**

- A. This section describes requirements for on-site storage of excavated contaminated materials and transportation for off-site disposal at an approved landfill facility.
- B. All excavated contaminated materials shall be placed directly into waste containers provided by the Contractor. No stockpiling of the contaminated materials will be allowed.

**1.02 REFERENCES**

- A. Washington State Department of Transportation (WSDOT) Standard Specifications for Road, Bridge, and Municipal Construction (WSDOT Standard Specifications).

**1.03 SUBMITTALS**

- A. Materials Management Plan: As part of Plan, the Contractor shall describe the following and attach figures, as necessary, to depict required details.
  - 1. Identify number and sizes of waste containers, e.g., roll-off containers, for storage of excavated contaminated materials.
  - 2. Identify locations of the waste containers on a site plan.
  - 3. If the Contractor plans to place waste containers in the staging area, identify haul routes and number of haul trucks that the Contractor plans to use for transferring material from excavation area to the waste container storage area. Identify how many cubic yards of material each haul truck can carry. Describe how the haul trucks will be covered to avoid spills of the materials during hauling.
  - 4. Identify number and locations of stabilized construction entrances/exits, if applicable.

**PART 2 – PRODUCTS**

**2.01 GENERAL**

- A. The Contractor shall coordinate with the selected waste hauler to furnish all waste containers and haul trucks required for transport and disposal of material excavated from the site.
- B. Stabilize construction entrances/exits.

- C. The Contractor shall visually inspect the containers and haul trucks prior to being used for storage and transport for offsite disposal.
- D. The Contractor shall coordinate loading operations and hours with the operating hours of the disposal facilities to minimize disruptions to the Work.

**PART 3 – EXECUTION**

**3.01 GENERAL**

- A. The Contractor shall be responsible for furnishing and operation of all vehicles and containers for transportation of contaminated materials from the Project site.
- B. If the Contractor chooses to dispose of impacted decontamination water or liquids recovered during excavation at an off-site disposal facility, the impacted water shall be transported in a suitable water-tight containment system for disposal at an appropriate licensed facility (**see SECTION 31 23 20 – CONSTRUCTION WATER MANAGEMENT**).
- C. Transportation of all categories of construction debris, impacted water, and other fluids encountered during demolition shall be in compliance with all appropriate regulations.
- D. Each truck bound for an off-site landfill shall be covered with a heavy-duty tarpaulin secured to the top or sides of the container or transfer facility.
- E. The Contractor shall provide flaggers as necessary when haul trucks enter and exit the public right-of-way to protect pedestrian and motoring safety.
- F. The Contractor shall visually inspect each truck bound for an off-site landfill before it leaves the site to ensure that the tailgate and tarpaulin are secure and completely clean of debris. Decontaminate each vehicle as specified in **SECTION 01 57 10 – TEMPORARY ENVIRONMENTAL CONTROL** as needed. If directed by the Engineer, verify that covers and tarpaulin are secured to the necessary parts of the truck bed. Bed lined trucks are not required for transport of materials and shall be used only as directed by Ecology.
- G. Contractor shall promptly clean-up any spills of Project excavated material on public haul routes, should they occur, with suitable equipment at no cost to this Project.



- H. Keep and maintain public haul routes and public right-of-way free of any site materials from this Project due to the Contractor's operations. To this end, all Contractor truck loads shall be covered when operating in the public right-of-way, and all vehicles shall be carefully loaded to safely beneath the freeboard to prevent spillage and to prevent site materials from coming in contact with the exterior truck surfaces. Any material deposited on an outside truck surface shall be cleaned-off prior to leaving the Project load-out area.
- I. The load weight shall be documented by the landfill or off-site disposal facility certified scale and certified scalemaster stamp. Copies of the scale certification and the scalemaster's certification shall be submitted to the Engineer during the start-up phase of the Project. The Contractor shall submit copies of all landfill or off-site disposal facility scale weight tickets to the Engineer. Weight tickets without the scalemaster's stamp will be subject to rejection.
- J. Truck drivers shall be required to remain inside the truck cab with the windows and doors closed during the loading operation and at all times when inside the Exclusion Zone. Drivers shall be instructed to proceed after loading through a decontamination area to a designated area outside the Exclusion Zone where they shall be permitted to exit the truck cab to secure the tarpaulin over the load.
- K. The Contractor shall address vehicular accidents and the possible release of transported materials in the HASP.

### **3.02 MANIFESTS**

- A. Non-hazardous waste manifests or other tracking documents will be provided by Ecology for each individual load. Each manifest will be signed by designated authorized agent of Ecology as a shipper, the truck driver as

**DIVISION 02 – EXISTING CONDITIONS**  
**SECTION 02 61 15 – TRANSPORTATION AND DISPOSAL OF CONTAMINATED MATERIALS**

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a transporter, and by the landfill and/or other designated off-site facility operator.

- B. The Contractor will not be paid for shipments with unsigned manifests or bills of lading.

**3.03 TRANSPORTATION**

- A. Obtain all required transportation permits for shipment of non-hazardous impacted decontamination water/materials and demolition debris.
- B. Transportation of non-hazardous impacted decontamination water/materials and demolition debris shall be in accordance with applicable state, USDOT, and other applicable regulations.

END OF SECTION

**PART 1 – GENERAL**

**1.01 SUMMARY**

- A. This Section specifies requirements for design, installation, operation and maintenance of dewatering systems to:
  - 1. Lower the groundwater level in the point repair excavation and trenching areas;
  - 2. Remove stormwater runoff accumulated and pooled at the Site during storm drain rehabilitation; and
  - 3. Collect stormwater from other disturbed areas that may have come in contact with site contaminants within the Project area.
- B. Construction dewatering shall be necessary only if water is observed to collect within the excavation area, and other disturbed areas. Dewatering of excavation area is required to facilitate excavation, observation and evaluation of the excavation limits, and backfilling.
- C. Contractor shall divert off-site stormwater run-on from the excavation area. Stormwater collected within the excavation limits and area immediately adjacent to the excavation shall be considered contaminated water.
- D. Water generated from the dewatering activities shall be conveyed, stored and treated to demonstrate the treated water meets the discharge requirements specified in **SECTION 31 23 20 – CONSTRUCTION WATER MANAGEMENT** prior to disposal.

**1.02 SUBMITTALS**

- A. Contractor shall submit a Dewatering Plan that describes the methods, equipment, and operation for dewatering that includes:
  - 1. Drawings and description of location, method and equipment that will be used for dewatering in excavation areas, and other areas that may have contaminated water. Provide detailed breakdown of material and equipment (sumps, pumps, piping, valves, electrical power, meters and other significant equipment).
  - 2. Technical data on proposed pumps, and description of equipment installation, operation and maintenance, and monitoring of dewatering activities.
  - 3. Design calculations with estimated dewatering rate for each source area used for sizing dewatering equipment components.
  - 4. Method of conveyance to storage tanks for treatment and disposal.
  - 5. Decommissioning and removal of the dewatering system.

- B. Submit each of the submittals in accordance with the submittal timing requirements identified in **SECTION 01 33 00 – SUBMITTAL PROCEDURES**.

### **1.03 SITE CONDITIONS**

- A. The storm drain piping at the Site is generally located in the shallow aquifer which is comprised of fill underlain by silt. Groundwater levels in the shallow aquifer is influenced by precipitation, recharge from upland area and tidal influence of the adjacent Snohomish River. Based on the available groundwater level data, invert elevations of some of the storm drain pipes are lower than the groundwater elevations. Groundwater is expected to be encountered in some of the point repair areas depending on the depth of the storm drain pipes. Groundwater levels will fluctuate throughout the year. The estimated seasonal high and low groundwater elevations in the point repair areas are provided in the Drawings.
- B. The contractor shall dewater, temporarily store, treat and sample, and appropriately dispose of the dewatering water that has come in contact with contaminated material.
- C. Contractor shall be solely responsible for reviewing Contract Documents to verify site conditions critical to the execution of the Work under this Section, and modifying excavation dewatering and water storage, treatment, and disposal operations as required to adequately address actual site conditions encountered during the Work.

### **1.04 QUALITY ASSURANCE/QUALITY CONTROL**

- A. The dewatering system shall be designed by a professional civil engineer or certified hydrogeologist, registered in the State of Washington, with at least 5 years' experience in the design, operation and maintenance of similar systems.
- B. Contractor shall provide operation and maintenance records. Contractor shall monitor and record dewatering and water collection, handling, treatment, and disposal operations and notify Ecology's Representative immediately if any portions of the systems are not operating as intended.

## **PART 2 – PRODUCTS**

### **2.01 EQUIPMENT AND PRODUCTS**

- A. Contractor shall provide equipment and product specifications proposed to meet these performance specifications including make, model, and manufacturer in the Dewatering Plan.
- B. Provide dewatering pumps of standard manufacture and in good working order. All dewatering and water handling/storage/treatment equipment and accessories shall be properly sized and suitable for its intended use.

- C. Provide spare pumps, power supplies, and parts required to ensure continuous operation of system.

**PART 3 – EXECUTION**

**3.01 DEWATERING**

- A. Contractor shall furnish, at a minimum, all labor, materials and equipment, and perform all operations required to maintain the dewatering equipment and water storage systems as required to collect and store contaminated water from the areas where it has collected and prevent discharge of any contaminated water out of the Project Site. Contractor shall demobilize and decontaminate all dewatering equipment and materials upon completion of the Work.
- B. Contractor shall set-up site controls so as to be able to divert and collect water from disturbed areas of the Project Site, as needed, to allow for remediation activities to be conducted.
- C. Contractor shall install, operate, and remove the dewatering systems in accordance with applicable federal, state, county, and local Laws and regulations, and generally accepted industry practices.
- D. Safety of personnel and protection of designated onsite facilities during dewatering Work, shall solely be the Contractor's responsibility.
- E. Contractor is responsible for preventing contaminated stormwater from leaving the site.
- F. Contractor shall divert surface water away from the excavation.
- G. Excavations shall be dewatered to maintain a relatively dry work area during the entire period when the excavation remains open.
- H. All water from the dewatering activities shall be pumped to on-site storage tanks for treatment and disposal.
- I. If fuels, oils, or other petroleum-product like materials are encountered during excavation, Contractor shall contain and manage these materials separately as approved by Ecology's Representative.
- J. Modify excavation dewatering and water storage methods and equipment at no additional cost to Ecology if Ecology determines that the Contractor's methods and equipment are not adequate for site conditions encountered during the work. Do not cease excavation dewatering activities until the excavation is satisfactorily backfilled, unless otherwise approved by Ecology.
- K. Coordinate design and installation of excavation dewatering systems with temporary excavation shoring systems.

**3.02 INSPECTION**

- A. Contractor shall perform visual inspections daily during dewatering. Examine piping and hoses for leaks or excessive wear, and repair or replace immediately. Coordinate dewatering with water storage, treatment and disposal requirements specified in **SECTION 31 20 05 – CONSTRUCTION WATER MANAGEMENT**.

**3.03 HEALTH AND SAFETY**

- A. Contractor shall include within its site-specific health and safety plan a description of the hazards associated with the dewatering activities and the contaminants expected in groundwater (arsenic and lead).

**3.04 REMOVAL**

- A. Disassemble, decontaminate, and remove materials and equipment when no longer required for dewatering, water collection storage, treatment, handling, and disposal operation.

END OF SECTION

**PART 1 GENERAL**

**1.01 SUMMARY**

- A. This Section specifies management of impacted water collected from onsite storm drain cleaning, stormwater runoff collected in work areas and dewatering of groundwater that comes in contact with contaminated soil during the Work. Management of construction water includes storage, onsite treatment, water sampling and analysis, and discharge of treated water to the City's sanitary sewer OR alternatively, hauling of untreated (or pretreated, if required) construction water to offsite treatment and disposal facility for disposal.
- B. Sources of contaminated or potentially contaminated water (construction water) includes, but is not limited to, storm drain cleaning, excavation/trenching dewatering, onsite stormwater runoff and decontamination water.
- C. Contaminated water shall be collected, stored and treated as required to demonstrate the water meets the discharge requirements of the City's sanitary sewer (if Contractor chooses to discharge into City sewer). Contractor shall provide a construction water treatment system on site to treat the collected construction water. Contractor is solely responsible for providing design, operation, and maintenance of the construction water treatment system meeting applicable discharge requirements. Contractor shall obtain all applicable permit(s) prior to discharge to the sanitary sewer. Contractor shall contact Mark Sadler (425-257-8967) with the City of Everett Public Works Department for discharge authorization permit.
- D. If an offsite water treatment and disposal facility is selected for disposal of collected construction water, Contractor shall provide pretreatment of construction water, if necessary, to meet the discharge requirements of the off-site water treatment and disposal facility. Contractor is responsible for coordination with water treatment and disposal facility and trucking for offsite disposal.
- E. Contractor is responsible for providing sufficient storage capacity for construction water at all times during implementation of the Work. Contractor shall be solely responsible for delays of field activities due to the lack of onsite water storage capacity.

**1.02 SUBMITTALS**

- A. Contractor shall submit a Construction Water Management Plan that includes the following:
  - 1. Methods and equipment for collection and storage of construction water from excavation/trenching areas, decontamination, and other disturbed areas that requires collection and containment during



- construction. The plan shall include the proposed number of storage tanks, sizes and locations.
2. Construction water treatment system design, installation, operation and maintenance for collected water. The plan shall include the details of the water treatment train and system components.
  3. Discharge criteria of the City's sanitary sewer system or off-site water treatment and disposal facility.
  4. List of proposed offsite water treatment and disposal facilities for review and approval by Ecology.
  5. Identify Ecology-accredited laboratory that the Contractor plans to use for analysis of construction water samples for Ecology's approval.
- B. Provide a copy of the discharge authorization permit that the Contractor obtains from the City or provide disposal approval obtained by the Contractor from the off-site treatment and disposal facility.
  - C. Submit results of all sampling and analysis performed by the Contractor on construction water.
  - D. Submit detailed records (e.g. log of flow meter or off-site treatment and disposal facility receipts) showing location and quantity of water discharged or disposed.
  - E. Submit records of disposal of accumulated sediment: Provide records of disposal and weight tickets for all sediment disposed offsite.
  - F. Submit each of the submittals in accordance with the submittal timing requirements identified in **SECTION 01 33 00 – SUBMITTAL PROCEDURES**.

## **PART 2 – PRODUCTS**

### **2.01 EQUIPMENT AND PRODUCT**

- A. Provide all required water collection, handling, storage, and treatment equipment and accessories of standard manufacture and in good working order. All water handling, storage, and treatment equipment and accessories shall be properly sized and suitable for its intended use.
- B. Provide power, fittings, hoses and piping, and any other equipment and materials that may be required to collect and convey water for appropriate treatment prior to discharge, as needed.
- C. Provide suitable water storage tanks and water treatment equipment, and all ancillary materials and equipment needed to remove settleable solids from construction water and to treat extracted water to meet the discharge criteria.

- D. Provide a system to continuously meter and monitor the volume of all discharge flow to the City of Everett sanitary sewer system; the monitoring system shall have the capability to shut off the flow, or inhibit motor starter operations and divert to the emergency storage tank based on current conditions within the City of Everett sanitary sewer system (e.g., water level in the discharge manhole). Provide a totalizing flow meter to measure and record the volume of treated water discharged to the sanitary sewer or offsite water treatment and disposal facility.

### **PART 3 – EXECUTION**

#### **3.01 WATER CONVEYANCE AND STORAGE**

- A. Contractor shall furnish all labor, materials, power, and equipment and perform all operations required to convey and store contaminated construction water for onsite treatment and discharge to the authorized local sanitary sewer discharge point or offsite disposal facility.
- B. Contractor shall install sumps or other methods to intercept and collect contaminated construction water and pump to onsite storage tanks as specified in **SECTION 31 23 19 – DEWATERING**.
- C. Contractor shall provide sufficient onsite storage capacity during the entire duration of the Work. At a minimum, sufficient storage shall be provided for storm drain cleaning, excavation dewatering (as needed), stormwater runoff collection and decontamination water. Contractor shall be solely responsible for construction delays caused by the lack of storage capacity. Water storage tanks shall be located at the areas within the Project Site approved by Ecology.

#### **3.02 WATER TREATMENT, TRANSPORT AND DISPOSAL**

- A. Contractor shall provide water treatment for the collected construction water and discharge at the nearest City sanitary sewer approved by the City and Ecology. Alternatively, Contractor shall haul the construction water to an offsite water treatment and disposal facility approved by Ecology for disposal. Pre-treatment may or may not be necessary based on requirement of offsite water treatment and disposal facility.
- B. Store collected contaminated water in storage tanks on site until the water is treated and meets the discharge requirements of the City's sanitary sewer or is acceptable for offsite water treatment and disposal facility.
- C. If Contractor chooses to discharge construction water into City's sanitary sewer:
  - 1. Contractor shall submit application and obtain the temporary sanitary sewer discharge authorization permit for the treated construction water prior to commencement of the Work.

2. Contractor shall treat the stored water, as necessary, and perform sampling and analysis of the treated water until the City's sanitary sewer discharge requirements are met. Contractor shall provide the analytical results to Ecology's Representative for review prior to discharging the treated water.
  3. Coordinate with the City for the location of discharge.
  4. Install pumps, hoses, piping and fittings necessary for the discharge.
  5. Contractor shall provide analytical results to the City for approval prior to discharging the construction water to City sewer.
  6. Contractor shall use a totalizing flow meter to measure and record the volume of treated water discharged to the sanitary sewer. The discharge flow records shall be documented in the Contractor's Daily Construction Report.
- D. If Contractor chooses to haul the un-treated construction water to an offsite water treatment and disposal facility for treatment and disposal.
1. Contractor shall perform sampling and analysis of the construction water and pre-treat (if necessary) to ensure the water meets the discharge requirements at the water treatment and disposal facility.
  2. The Contractor shall coordinate with the off-site water treatment and disposal facility for disposal authorization and provide disposal authorization to Ecology.
  3. If pre-treatment of the construction water is required to meet the discharge requirements, Contractor shall provide water treatment as necessary to meet the requirements.
  4. Contractor shall provide analytical results to the treatment and disposal facility for approval prior to hauling the construction water.
- E. The construction water treatment system shall be operated by Contractor's designated operator with required certification to operate the system as required by the Washington State Department of Ecology, if necessary.

### **3.03 SAMPLING AND ANALYSIS**

- A. Contractor shall perform sampling and analysis of collected construction water prior to its discharge to confirm that the water meets the discharge criteria of the local sanitary sewer agency (City of Everett) or off-site treatment and disposal facility (as applicable).
- B. Collect sample and perform analyses at a frequency and for the list of analytes required by the local sanitary sewer agency (City of Everett) or off-site treatment and disposal facility (as applicable).
- C. The Contractor shall coordinate with the local sanitary sewer agency (City of Everett) or off-site treatment and disposal facility (as applicable) and notify Ecology's Representative of the required list of analytes prior to

performing the analysis. Samples shall be analyzed for total and dissolved arsenic, lead and mercury at a minimum.

- D. Analysis shall be performed by an Ecology-accredited laboratory.

### **3.04 INSPECTION**

- A. Contractor shall perform visual inspections daily during collection, water treatment and discharge activities. At a minimum, examine piping and hoses for leaks or excessive wear, inspect storage tanks for accumulated sheen or oil, check water treatment system components for proper functioning, replace filters or cartridges (if applicable) as necessary.
- B. Contractor shall inspect and repair or replace damaged components of the water collection, storage and treatment system as necessary.
- C. On a daily basis, record flow totalizer readings to document the volume of water conveyed to the onsite treatment system and to the City's sanitary sewer system; provide such readings to Ecology, and prepare discharge monitoring reports to the City as required. Contractor shall also examine the quantity of solids accumulated in the construction water storage and treatment tank(s) on at least a weekly basis.

### **3.05 HEALTH AND SAFETY**

- A. Contractor shall include within its site-specific health and safety plan a description of the hazards associated with the contaminants expected in the collected construction water.
- B. The plan shall include site-specific conditions of potential exposure associated with confined spaces (e.g. accessing or opening hatches on the top of the storage and treatment tanks, ascending or entering tanks or opening lids of sewer manholes).

### **3.06 REMOVAL**

- A. Properly contain all used filter bags/cartridges, spent activated carbon, and sediment removed from the storage tank. Dispose of these materials in accordance with all applicable regulations.
- B. Sediment that accumulates in the bottom of temporary storage tanks shall be disposed offsite at a solid waste landfill along with other soil removed from the site.
- C. Disassemble, clean, decontaminate and remove materials and equipment when no longer required for water collection, storage, treatment, discharge and disposal operations.

END OF SECTION

**PART 1 – GENERAL**

**1.01 DESCRIPTION**

- A. This section provides requirements for furnishing pipe bedding, pipe zone backfill, and excavation backfill materials, and performing backfilling and compaction following the completion of excavation during the storm drain point repairs.

**1.02 REFERENCES**

- A. All references to the WSDOT Standard Specifications shall refer to Road, Bridge, and Municipal Construction of the Washington State Department of Transportation.
- B. City of Everett Design and Construction Standards and Specifications for Development, June 2017.

**1.03 SUBMITTALS**

- A. Submit the name, address, contact information and certification of the material sources (quarries) and testing laboratories that the Contractor plans to use for Ecology's approval. Quarries and testing laboratories shall be independent of the Contractor. The proposed quarries shall be Washington State Department of Transportation certified. The proposed materials testing laboratory shall meet the requirements specified in ASTM D3740.
- B. Submit the name, address and qualifications of a certified, independent materials testing firm proposed to perform on-site compaction tests for the imported aggregate and backfill materials for Ecology's approval. The proposed firm shall be a certified, independent testing firm meeting the requirements specified in ASTM D3740.
- C. Submit lab testing results for material gradation as identified in **PART 2 – PRODUCTS**.
- D. Submit results of laboratory-determined maximum dry density and optimum moisture content for all materials requiring compaction.
- E. Submit results of field density testing as identified in **PART 3 – EXECUTION**.
- F. Submit certified waybills/weigh tickets for each type of material imported.
- G. Submit each of the submittals in accordance with the submittal timing requirements identified in **SECTION 01 33 00 – SUBMITTAL PROCEDURES**.

**1.04 QUALITY ASSURANCE**

- A. Contractor shall comply with applicable provisions of the following standard specifications and documents:
  - 1. Washington State Department of Transportation 2018 Standard Specifications for Road, Bridge, and Municipal Construction (WSDOT Standard Specifications).
  - 2. City of Everett Design and Construction Standards and Specifications for Development, June 2017.
  - 3. Applicable ASTM (American Society for Testing and Materials) and AASHTO (American Association of State Highway and Transportation Officials) standards.

**PART 2 – PRODUCTS**

**2.01 FOUNDATION GRAVEL – FOUNDATION MATERIAL CLASS A**

- A. Foundation Material Class A shall be used for foundation gravel beneath the pipe bedding if required by the Engineer to replace unsuitable material.
- B. Foundation Material Class A shall meet the requirements of WSDOT Section 9-03.17 and shall conform to the following gradation requirements:

<b>Sieve Size</b>	<b>Percent Passing by Weight</b>
2½"	98-100
2"	92-100
1½"	72-87
¾"	27-47
3/8"	3-14
No. 4	0-5

**2.02 PIPE BEDDING MATERIAL – CRUSHED SURFACING BASE COURSE**

- A. Pipe bedding material shall be Crushed Surfacing Base Course and subgrade for pavement shall be Crushed Surfacing Top Course and

Keystone conforming to the City of Everett Section 3-20.5 and WSDOT Section 9-03.9(3) as described below.

- B. The material shall be uniform in quality and substantially free from wood, roots, bark, and other extraneous material and shall meet the following quality requirements:
- Los Angeles Wear, 500 Rev. = 35 percent max.
  - Degradation Factor – Base Course = 15 min.
- C. The crushed surfacing base course and top course and keystone shall meet the following gradation requirements:

Sieve Size	Base Course	Top Course and Keystone
Percent Passing by Weight		
1 1/4"	99-100	-
1"	80-100	-
3/4"	-	99-100
5/8"	50-80	-
1/2"	-	80-100
No. 4	25-45	46-66
No. 40	3-18	8-24
No. 200	7.5 max.	10.0 max.
% Fracture	75 min.	75 min.
Sand Equivalent	40 min.	40 min.

**2.03 BACKFILL – IMPORTED GRAVEL BORROW**

- A. Gravel borrow for excavation backfill shall be in accordance with the City of Everett Section 3-20.2 as described below.
- B. Imported gravel borrow used for backfilling of the excavations shall be an imported, clean, granular fill material free of roots, organic material, contaminants, recycled concrete or asphalt, and all other deleterious and objectionable material.
- C. The fill shall be granular material, shall have such characteristics of size and shape that it will compact readily, and shall meet the following gradation requirements:

Sieve Size	Percent Passing by Weight
3"	100
2"	85-100



1¼"	75-100
No. 4	30-70
No. 40	0-25
No. 200	5 max.
Sand Equivalent	50 min.

- D. Submit documentation to Ecology to confirm that gravel borrow meets the requirements prior to its import in accordance with the submittal timing requirements identified in **SECTION 01 33 00 – SUBMITTAL PROCEDURES**.
- E. If the material type changes significantly as determined by Ecology or Ecology’s Representative or if Contractor elects to import material from a different source, the Contractor shall be required to resubmit submittals that represent the change in material for review and approval by Ecology.
- F. Where specified in the Contract Documents and when requested by Ecology, Contractor shall submit test reports to Ecology demonstrating that materials meet the Specifications in the Contract Documents. If tests indicate materials do not meet specified requirements, the Contractor shall change materials and retest at no additional cost to Ecology.

**2.04 SUBGRADE – CRUSHED SURFACING TOP COURSE**

- A. Refer to the requirements specified in 2.02 of this Section.

**PART 3 – EXECUTION**

**3.01 CONTRACTOR PREPARATION AND VERIFICATION OF CONDITIONS**

- A. Before commencing backfilling and compaction, Contractor shall:
  - 1. Verify temporary site controls including traffic, erosion and sediment control and other environmental control measures are in place and operating properly.
  - 2. Verify all pre-construction elevations and horizontal locations to be matched as specified in the Contract Documents.

**3.02 PREPARATION FOR BACKFILLING**

- A. The Contractor shall notify the Engineer immediately when soft, pumping soils or other unsuitable material are encountered that do not meet compaction requirements to support traffic. No over-excavation shall be performed without approval by the Engineer.
- B. As directed by the Engineer, the unsuitable material shall be removed from the trench. All unsuitable material shall be handled as specified in **SECTION 02 61 15 – TRANSPORTATION AND DISPOSAL OF CONTAMINATED MATERIALS**.

**3.03 BACKFILLING AND COMPACTION**

- A. Backfilling Over-Excavated Areas: Use Foundation Material Class A specified herein as backfill material in the over-excavated area and compact to a firm and unyielding condition.
- B. Pipe Bedding: Place and compact Crushed Surfacing Base Course pipe bedding material specified herein in six (6) inch lifts. Work the bedding beneath the pipe haunches and compact thoroughly to 95% of maximum density as determined by field density testing.
- C. Pipe Zone Backfill: Place and mechanically compact Crushed Surfacing Base Course material specified herein in six (6) inch lifts to the upper limit of pipe zone indicated on the Drawings; compact to 95% of maximum density as determined by field density testing.
- D. Excavation Backfill: Place backfill Gravel Borrow specified herein from top of the pipe zone to the bottom of subgrade (Crushed Surfacing Top Course) in six (6) inch lifts; compact to 95% of maximum density as determined by field density testing.
- E. Subgrade: Place and compact Crushed Surfacing Top Course specified herein to in six (6) inch lifts; compact to 95% of maximum density as determined by field density testing.
- F. Field density testing shall be completed in accordance with Test Methods FOP for AASHTO T 310 and WSDOT SOP 615. Field density testing shall be completed at a rate determined by the Contractor's licensed material testing firm in order to ensure that the backfill is placed in accordance with the requirements. At a minimum, the Contractor shall perform three (3) tests per lift of compacted backfill material within excavation area. Contractor shall submit the testing results to Ecology within 24 hours of taking the tests including any re-tests for areas that failed the compaction criteria.

**3.03 PROTECTION**

- A. If subgrade or fill soils become loosened, disturbed, unstable, or too saturated to perform Work, Contractor shall excavate to expose undisturbed soil.
- B. Contractor shall repair and provide the additional excavation, disposal, and import of replacement material at no additional cost to Ecology.
- C. Placement and compaction of moisture sensitive fill during periods of wet weather should be avoided by the Contractor. Fill that becomes too wet for either proper compaction or subsequent restoration Work activities shall be removed and replaced at no additional cost to Ecology.
- D. Contractor shall cover stockpiles of imported material during periods of wet weather to prevent the imported fill from becoming too wet to properly place and compact.

**3.04 CLEANING**

- A. Dispose of waste, surplus, and unsuitable materials according to laws, regulations, and ordinances offsite at no additional cost to Ecology.
- B. Contractor shall maintain hauling routes clean and free of debris at no additional cost to Ecology.

END OF SECTION

**PART 1 – GENERAL**

**1.01 DESCRIPTION**

- A. This section provides the import material chemical criteria that is applicable to all soil and aggregate (rock) material (e.g., crushed surfacing, gravel borrow used for excavation backfill, pipe and asphalt subgrade, topsoil, material used for construction of construction entrances/exits, etc.) that will be imported and used on the Project Site.

**1.02 SUBMITTALS**

- A. Submit the name, address, contact information and certification of the chemical analytical testing laboratory(s) that the Contractor plans to use for Ecology's approval. The proposed laboratory for chemical analysis shall be Ecology-accredited.
- B. Submit chemical analytical results for each type of material to be imported.
- C. Submit each of the submittals in accordance with the submittal timing requirements identified in **SECTION 01 33 00 – SUBMITTAL PROCEDURES**.

**1.03 IMPORT MATERIAL CHEMICAL CRITERIA**

- A. Imported soil or aggregate material shall not have concentrations of contaminants above the import material chemical criteria identified below.
  - 1. The import material chemical criteria identified below for all analytes, with the exception of metals, represent the laboratory practical quantitation limit (PQL) for the analysis.
  - 2. For all analytes, with the exception of metals, the results of the analysis performed by the Contractor on the import materials shall be non-detect at or below the practical quantitation limit. If the results for an import material do not meet the criteria, then the material will be rejected, and the Contractor will be required to identify a new source for the material.
  - 3. For metals, the results of the analysis shall be non-detect or detected at concentrations at or less than the identified criteria. If the results for an import material do not meet the criteria, then the material will be rejected, and the Contractor will be required to identify a new source for the material.

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**SECTION 31 23 30 - IMPORTED MATERIAL CHEMICAL CRITERIA**

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Analyte	Analytical Method	Import Material Chemical Criteria (mg/kg)
<b>Petroleum Hydrocarbons</b>		
Gasoline-Range	NW-TPH-Gx	5
Diesel-Range	NW-TPH-Dx	25
Oil-Range	NW-TPH-Dx	50
<b>Metals</b>		
Arsenic (As)	EPA 6010	7
Cadmium (Cd)	EPA 6010	1
Chromium (Cr)	EPA 6010	48
Lead (Pb)	EPA 6010	24
Mercury (Hg)	EPA 7471	0.25
<b>Volatile Organic Compounds (VOCs)</b>		
Benzene	EPA 8021 / 8260B	0.02
Ethylbenzene	EPA 8021 / 8260B	0.05
Toluene	EPA 8021 / 8260B	0.05
Xylenes	EPA 8021 / 8260B	0.10
<b>Polycyclic Aromatic Hydrocarbons (PAHs)</b>		
1-Methylnaphthalene	EPA 8270D SIM	0.0067
2-Methylnaphthalene	EPA 8270D SIM	0.0067
Naphthalene	EPA 8270D SIM	0.0067
Acenaphthene	EPA 8270D SIM	0.0067
Acenaphthylene	EPA 8270D SIM	0.0067
Anthracene	EPA 8270D SIM	0.0067
Benzo(g,h,i)perylene	EPA 8270D SIM	0.0067
Fluoranthene	EPA 8270D SIM	0.0067
Fluorene	EPA 8270D SIM	0.0067
Phenanthrene	EPA 8270D SIM	0.0067
Pyrene	EPA 8270D SIM	0.0067
Benzo(a)anthracene	EPA 8270D SIM	0.0067
Benzo(a)pyrene	EPA 8270D SIM	0.0067
Benzo(b)fluoranthene	EPA 8270D SIM	0.0067
Benzo(k)fluoranthene	EPA 8270D SIM	0.0067
Chrysene	EPA 8270D SIM	0.0067
Dibenz(a,h)anthracene	EPA 8270D SIM	0.0067
Indeno(1,2,3-cd)pyrene	EPA 8270D SIM	0.0067
Total cPAHs (TEQ)	EPA 8270D SIM	0.01
<b>Polychlorinated Biphenyls (PCBs)</b>		
Total PCBs	EPA 8082 Low Level	0.050

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Notes:

mg/kg = milligrams per kilogram                      TEQ = toxicity equivalency  
Laboratory shall perform Total cPAHs (TEQ) calculation in accordance with Ecology's guidance  
<https://fortress.wa.gov/ecy/clarc/FocusSheets/tef.pdf>

- B. Submit documentation to Ecology to confirm that import material meets the requirements prior to its import in accordance with the submittal timing requirements identified in **SECTION 01 33 00 – SUBMITTAL PROCEDURES**.
- C. One chemical analytical test of each soil and aggregate material to be used on the site is required. If more than one material to be used on site share common source material than only one chemical analytical test per source material will be required.
- D. If the material type changes significantly as determined by Ecology or Ecology's Representative, the Contractor shall be required to provide submittals representative of the change in material.
- E. Where specified in the Contract Documents and when requested by Ecology, Contractor shall submit test reports to Ecology demonstrating that materials meet the Specifications in the Contract Documents. If tests indicate materials do not meet specified requirements, the Contractor shall change materials and retest at no additional cost to Ecology.
- F. Contractor shall identify new source for import material if the results of chemical testing indicate that the import material does not meet all requirements. Contractor shall perform testing on new source and provide complete submittals indicating conformance to all requirements. Contractor shall not claim delay as a result of Contractor's import material not meeting project requirements including chemical testing requirements.

**PART 2 – PRODUCTS (NOT USED)**

**PART 3 – EXECUTION (NOT USED)**

END OF SECTION

**PART 1 – GENERAL**

**1.01 GENERAL**

- A. This section covers excavation support and protection systems that are Contractor designed and include:
  - 1. Excavation Safety Systems
  - 2. Excavation Shoring System
  - 3. Excavation Sloping and Benching

**1.02 DEFINITIONS**

- A. Excavation Safety Systems: A system that protects workers and equipment that are in excavations.
- B. Excavation Shoring System: A shoring system that is installed prior to excavation to facilitate point repair excavation or trenching. Shoring shall provide lateral support of soils and limit lateral movement of soils supporting improvements on the unexcavated side of the shoring such that these items are not damaged as a result of settlement or the lateral movement of soils.
- C. Excavation Sloping and Benching: A sloped and/or benched excavation sidewall to provide stable and safe transition between the top and base of the excavation.
- D. Contractor shall be responsible for obtaining all necessary permits required by the City of Everett and any other applicable regulatory agency for the excavation support and protection systems used during construction.
- E. Contractor shall design, provide materials, and install all necessary controls required for stability of the excavation and to protect adjacent roadways and structures.
- F. Contractor shall locate all utilities prior to installation of excavation support and protection systems. Contractor shall protect and/or demolish and restore utilities in accordance with the requirements of Contract Documents and as directed by Ecology.

**1.03 SEQUENCING AND SCHEDULING**

- A. Contractor shall conduct excavation in accordance with the milestones set forth in the Project Schedule.
- B. Contractor shall conduct excavation support and protection system installation activities in coordination with excavation work specified in **SECTION 31 23 00 – EXCAVATION OF CONTAMINATED MATERIAL** and the limits of excavation shown on the Contract Drawings, and **SECTION 34 41 16 – TRAFFIC CONTROL** and traffic control related Drawings.
- C. The Contractor shall notify Ecology following the installation of excavation support and protection system for each phase. Excavation work shall not



commence until Ecology acknowledges in writing the receipt of Contractor's notification.

**1.04 DESIGN REQUIREMENTS**

- A. Excavation safety systems, shoring, and excavation shall comply with federal, state, and local laws, regulations, and codes and be permitted by the City of Everett.
- B. Complete excavation, shoring, sloping, benching and trenching work in accordance with WAC 296-155 Safety Standards for Construction Work including Part N Excavation, Trenching and Shoring.
- D. Contractor shall be responsible for hiring a Professional Structural Engineer licensed in the State of Washington and designing the excavation shoring system necessary to complete excavation activities.

**1.05 EXCAVATION MONITORING**

- A. Contractor shall monitor excavation support system installation activities in accordance with the excavation monitoring requirements specified in the approved excavation designs provided in the Contractor's Excavation Support and Protection Plan.
- B. Based on the results of excavation monitoring, Ecology's Representative may direct that Contractor to stop work or provide additional excavation shoring or support, if necessary.

**1.06 SUBMITTALS**

- A. Shoring Designer Qualifications: Shoring shall be designed by a Professional Structural Engineer registered in the State of Washington. Submit engineer's current registration in the State of Washington to Ecology.
- B. Submit an Excavation Support and Protection Plan that includes:
  - 1. Design plans and specifications for a temporary shoring system that shall be prepared and stamped by a Professional Structural Engineer registered in the State of Washington.
  - 2. Construction methods and equipment for the installation of shoring system.
  - 3. Methods and equipment for removing excavation shoring system.
  - 4. Slope angle that Contractor plans to provide for sloped excavation sidewalls.
- C. Contractor's design of temporary excavation shoring system will be subject to City's review and approval. The Contractor shall make necessary revisions to the Excavation Support and Protection Plan as per City's review and submit required documents along with the plan to obtain City permit for

shoring work prior to installing shoring. The Contractor shall submit a copy of City's permit associated with shoring work to Ecology.

- D. Ecology will acknowledge the receipt of Contractor's Excavation Support and Protection Plan. The Contractor will be solely responsible for design and implementation of excavation support and protection systems.
- E. Provide each of the submittals in accordance with the submittal timing requirements identified in **SECTION 01 33 00 – SUBMITTAL PROCEDURES**.

## **PART 2 – PRODUCTS**

### **2.01 MATERIALS**

- A. Contractor shall furnish and install all materials necessary for excavation support and controls. The materials and equipment used for excavation support and controls may be new or used but must be suitable for the Work and be maintained in good condition.
- B. All temporary excavation support and controls shall remain the property of the Contractor. All temporary excavation support and controls materials shall be decontaminated and removed from the Project Site at the completion of the Work.
- C. All materials shall be as specified in Contractor's Excavation Support and Protection Plan. Substitutions must be approved in writing by the Contractor's shoring designer engineer.

## **PART 3 – EXECUTION**

### **3.01 GENERAL**

- A. The Contractor shall construct the shoring system in accordance with the approved shoring submittals, including any required construction sequence described in the plan. The Contractor is responsible for satisfactory results.
- B. All excavation and shoring shall be performed in strict compliance with WAC 296-155 as well as all other applicable local, Ecology, and Federal laws and regulations and City of Everett permit requirements.
- C. If workers enter any trench or other excavation, excavation safety measures shall be employed per state and federal laws and regulations. The Contractor alone shall be responsible for worker safety and the Contracting Agency assumes no responsibility.
- D. Upon completing the Work, the Contractor shall remove the shoring system. The Contractor may remove shoring elements incrementally as backfill progresses if such actions are consistent with the Contractor's approved shoring plan.

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**SECTION 31 50 00 – EXCAVATION SUPPORT AND PROTECTION**

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- E. Excavation slopes and benches shall conform to Chapter 296-155 WAC – Safety Standards for Construction Work, Part N – Excavation, Trenching, and Shoring at all times.
- F. Sloping or benching for excavations shall meet OSHA and City/WSDOT requirements.
- G. Contractor shall be responsible for determining proper sloping of excavation walls based on the evaluation of actual soil conditions by Contractor’s competent person. Contractor shall be responsible for stability of cut slopes, as well as the safety of the excavation.
- H. Contractor shall provide written documentation in Contractor’s Daily Report for sloping and benching, including acceptable grades and dimensions, soil types, and soil conditions.
- I. Contractor shall inspect excavations daily to verify stability of slopes, benches, and shoring system.

END OF SECTION

**PART 1 – GENERAL**

**1.01 SUMMARY**

- A. The Work includes replacement of asphalt or concrete paved surfaces over excavation or trenches excavated during storm drain point repairs.
- B. The pavement patching work shall be conducted in accordance with City of Everett Design and Construction Standards and Specifications for Development (the latest edition).

**1.02 REFERENCES**

- A. Reference the following standards:
  - AHJ AHJ is an abbreviation for public Authorities Having Jurisdiction. For this project the AHJ includes permitting agencies including but not limited to City of Everett, WSDOT, and Ecology.
  - APWA American Public Works Association.
  - COE City of Everett Design and Construction Standards and Specifications for Development (the latest edition).
  - WSDOT Washington Department of Transportation Standard Specifications and Standard Plans for Road, Bridge, and Municipal Construction (the latest edition).

**PART 2 - PRODUCTS**

**2.01 MATERIALS**

All materials shall conform to the requirements specified for material in other sections of the WSDOT/APWA Standard Specifications as follows:

- A. Asphalt concrete pavement patch shall be HMA Class ½” PG 64-22 meeting the requirements of Section 5-04.
- B. Asphalt for temporary patch shall be MC 250 meeting the requirements of Section 9-02.
- C. Cement concrete pavement patch shall be Class 4000 HES meeting the requirements of Section 6-02.
- D. Crushed Surfacing Top Course shall meet the requirements of Section 9-03.0(3).

**PART 3 - EXECUTION**

**3.01 GENERAL REQUIREMENTS**

- A. Paved areas that are removed or disturbed due to the storm drain point repairs shall be restored in accordance with the requirements specified herein and shown in the Drawings.
- B. Pavement patching shall be scheduled to accommodate the demands of traffic and shall be performed as rapidly as possible to provide maximum safety and convenience to public traffic.
- C. The placing and compaction of the trench backfill and the preparation and compaction of the subgrade shall be in accordance with the various applicable sections of the WSDOT/APWA Standard Specifications except as modified by this Specification.
- D. Before the pavement patch is to be constructed, the pavement shall be saw cut so that the marginal edges of the patch will form a rectangular shape with straight edges and vertical faces.
- E. Signs, barricades, lights and other warning devices shall be installed per the requirements of the “Manual on Uniform Traffic Control Devices” and they shall be maintained 24 hours a day until the patching work is completed and ready for traffic.
- F. Take appropriate precautions during pavement repair and replacement efforts to prevent clogging of adjacent permeable materials, if applicable.
- G. Compaction of the subgrade shall be completed prior to the required patching. Subgrade compaction shall be to 95% as determined by one of the following methods:
  - ASTM D1556 - Sand Cone Method
  - ASTM D2167 - Rubber Balloon Method
  - ASTM D2922 - Nuclear Method
- H. All excavated paved areas shall be backfilled and compacted prior to opening to vehicular traffic. Backfill shall be in accordance with the appropriate pavement patch section indicated in the Drawings except that aggregate material shall be applied up to the surface of the roadway. This Work shall occur prior to the completion of Work on any day unless otherwise approved by the Owner. At the end of each work week, but no more than 6 Days after backfilling, aggregate material shall be removed to the depth shown on the pavement patch section, the in-situ aggregate shall be recompacted, and the trench patched with asphalt concrete or cold mix.
- I. The base and sub-base materials must provide a smooth and uniform surface. Thickness of the base course shall be at the Contractor’s option unless shown otherwise on the Drawings. In no case will the minimum base and sub-base depth be less than that shown on the Drawings.

- J. The Contractor shall diligently and continuously maintain the base course prior to placement of the temporary surface course and the temporary surface course prior to the placement of the permanent surface course by grading, adding materials, removing and replacing components, or any other measures necessary to provide a smooth and passable surface free from pot holes, depressions and irregularities.

**3.02 CEMENT CONCRETE PAVEMENT**

- A. After the Crushed Surfacing Top Course subgrade for the pavement has been constructed and compacted to line and grade, the cement concrete pavement patch shall be placed and struck off to a thickness of 1 inch greater than the existing pavement or 8 inches minimum, whichever is greater. All work shall be in accordance with Section 5-05 of the WSDOT/APWA Standard Specifications, except as modified by these Specifications and Drawings.
- B. Through joints and dummy joints shall be placed to match existing or as directed by the Engineer. The surface of the concrete patch shall be finished and brushed with a fiber brush. Approved curing compound shall be placed on the finished concrete immediately after finishing.

**3.03 CEMENT CONCRETE PAVEMENT RESURFACED WITH ASPHALT CONCRETE**

- A. Streets which have cement concrete pavements surfaced with asphalt concrete shall be patched as shown on the Drawings.
- B. The cement concrete portion of the patch shall be Class 4000, HES. The thickness shall be 1 inch thicker than the existing concrete base or 6 inches, whichever is greater. The top surface of the concrete patch shall match the top surface of the existing concrete base; in no case shall the top of the concrete be higher than the top of the existing concrete base. Brush finishing will not be required. Joints shall be placed to match existing or as directed by the engineer.
- C. Asphalt concrete plant mix shall not be placed until 3 days after the cement concrete base has been placed or otherwise permitted by the engineer. The asphalt concrete plant mix shall not be placed until the concrete base has received a tack coat of CRS-2 at a rate of 0.12 to 0.20 gallons per square yard. The edges of the existing asphalt and castings shall also be painted with the tack coat. The asphalt concrete pavement shall then be placed, leveled, and compacted to conform to the surface of the existing asphalt pavement. Immediately, thereafter, all joints between the new and original asphalt pavement shall be painted with CSS-1 asphalt emulsion and covered with dry sand before the asphalt solidifies.
- D. Asphalt shall be compacted to 92% of maximum density as determined by WSDOT Test Method 705.

**3.04 ASPHALT CONCRETE ON GRANULAR BASE**

- A. After the Crushed Surfacing Top Course subgrade has been leveled and compacted, asphalt concrete pavement shall be placed to a thickness of 1 inch greater than the existing asphalt pavement depth or to a minimum of 3 inches, whichever is greater. Asphalt shall be compacted to 92% of maximum density as determined by WSDOT Test Method 705.

**3.05 UNTREATED ROAD SURFACES**

- A. Existing crushed rock, gravel, and oil mat streets shall be restored with Crushed Surfacing Top Course to a compacted depth of 4 inches within the neat lines of the trench. Crushed surfacing shall be mixed, placed, spread and shaped in accordance with the requirements of Section 4-04 of



WSDOT/APWA Standard Specifications. Compaction shall be as specified by one of the methods shown in Section 3-14.7(1) of these Specifications.

**3.06 TEMPORARY PAVEMENT PATCHING**

- A. The contractor shall furnish, place and maintain temporary pavement patching, at locations as directed by the Engineer, until such time as a permanent patch of permanent paving can be made.
- B. Temporary pavement patch shall consist of a 2-inch thick course of cold mix asphalt (MC 250) over a 4-inch course of Crushed Surfacing Top Course. The crushed surfacing shall be compacted to 96% maximum density as determined by one of the methods described in Section 3-14.7(1) of these Specifications. Asphalt shall be compacted to 90% of maximum density as determined by WSDOT Test Method 705.
- C. Temporary asphalt patching shall be required where roadway or walk is needed for vehicular or pedestrian traffic, during the construction period, until permanent pavement and sidewalks can be constructed.
- D. In the event that the temporary surface subsides after the initial placement, additional MC 250 and Crushed Surfacing shall be applied to maintain the surface.

END OF SECTION

**PART 1 – GENERAL**

**1.01 SUMMARY**

- A. Section includes, but is not limited to:
1. Painted or thermoplastic striping and symbols on asphalt surfaces.
  2. Reinstallation of existing traffic signage.

**1.02 REFERENCES**

- A. Reference Standards:
- AHJ AHJ is an abbreviation for public Authorities Having Jurisdiction. For this project the AHJ includes permitting agencies including but not limited to City of Everett, WSDOT, and Ecology.
- COE City of Everett Design and Construction Standards and Specifications for Development (the latest edition).
- WSDOT Washington State Department of Transportation Standard Specifications and Standard Plans for Road, Bridge, and Municipal Construction (the latest edition).
- MUTCD Manual on Uniform Traffic Control Devices.

**1.03 SUBMITTALS**

- A. Submit the following information in accordance with submittal procedures noted in **SECTION 01 33 00 – SUBMITTAL PROCEDURES**.
1. Manufacturer's product data, specifications and application instructions for each material with a description of its intended use at the Site.
  2. Descriptions of the proposed application methods.

**1.04 STORAGE**

- A. Store materials proposed for use in sealed and labeled containers in accordance with manufacturer's instructions.
1. Clearly identify materials by designated name, specification number, batch number, and intended use.

**PART 2 – PRODUCTS**

**2.01 PAINT**

- A. Paint for pavement marking shall conform to WSDOT Section 9-34. The paint shall be homogeneous, easily stirred to a smooth consistency, and shall show no hard settlement or other objectionable characteristics.

**2.02 THERMOPLASTIC MARKINGS**

- A. Thermoplastic markings shall be Type A and conform to WSDOT Section 9-34 and the details referenced on the Drawings.

**2.03 SIGNS**

- A. Reinstall existing traffic signs removed during construction. In the event signage materials are damaged and cannot be reinstalled, replacement signage materials shall be provided by the Contractor at no additional cost to Ecology that conform to WSDOT Section 9-28 and the details shown on the Drawings.

**PART 3 – EXECUTION**

**3.01 EXAMINATION**

- A. Verify installation conditions as satisfactory in accordance with the requirements in this Section. Do not install until unsatisfactory conditions are corrected. Beginning work constitutes acceptance of conditions as satisfactory.

**3.02 PREPARATION**

- A. Thoroughly clean pavement surfaces to be marked before application of the paint to remove dust, dirt, rubber deposits, surface laitance, and other coatings or deposits.

**3.03 APPLICATION**

- A. Apply pavement markings in accordance with WSDOT Section 8-22. Thickness of paint lines shall be per COE Standard Drawing 720.
- B. Do not allow traffic or other disturbance until markings have thoroughly dried in accordance with the manufacturer's recommended maximum drying time.
  - 1. Discontinue application of markings if drying times exceed the recommended manufacturer's drying times. Determine and correct the cause before restarting work.
  - 2. Correct deficient or disturbed markings as directed by the Ecology's Representative at no additional cost to the Ecology.

**3.04 INSTALLATION**

- A. Signage: Reinstall traffic signage per COE and WSDOT requirements and in accordance with WSDOT Section 8-21.

**3.05 CLEANING**

- A. Remove excess materials and debris and leave premises clean and free of residue in accordance with the requirements of Division 01 of this Project Manual.

END OF SECTION

**PART 1 - GENERAL**

**1.01 DESCRIPTION OF WORK**

- A. The Work includes documenting the existing conditions along East Marine View Drive, removing the existing guardrail along West Marine View Drive, demolishing the existing 4-foot high chain link fence and installing new 6-foot high chain link fence in Areas C2 and C3 as indicated on the Drawings.
- B. The new chain link fence shall be 6-foot high WSDOT Type 3 constructed in accordance with the WSDOT standard plans and specifications.

**1.02 RELATED SECTIONS**

- A. Section 02 41 00 – Demolition, Clearing and Grubbing

**PART 2 - PRODUCTS**

**2.01 MATERIALS FOR CHAIN LINK FENCE AND GATES**

- A. Chain link fence and gates shall be in accordance with WSDOT Section 9-16.1.
- B. All concrete for chain link fence shall be in accordance with WSDOT Section 6-02.3(2)B.

**PART 3 - EXECUTION**

**3.01 GENERAL REQUIREMENTS**

- A. The Contractor shall video document the pre-construction condition of West Marine View Drive immediately adjacent to Areas C2 and C3, including, but not limited to, guardrails, sidewalks, curb and gutter, pavement and vegetated area.
- B. The Contractor shall obtain all necessary permits required by the COE at the Contractor's expense.
- C. The Work activities will be limited to the designated areas as indicated on the Drawings.
- D. The Contractor shall construct the chain link fence and gates in general accordance with the materials and construction requirements provided in WSDOT Section 8-12 and Standard Plan L-20.10-03 and the Drawings and Specifications of the Project.

**3.02 GUARDRAIL REMOVAL AND RESTORATION**

- A. Prior to removal of the existing 4-foot chain link fence, the Contractor shall carefully remove the existing metal beam of the highway guardrail along West Marine View Drive as indicated on the Drawings. The wooden posts of the guardrail shall remain in place and protected during the Work activities. The removed guardrail metal beam shall be stored in a secured location within the project boundary or approved by Ecology's Representative.
- B. The Contractor shall be responsible for preserving the metal beams and other parts of the guardrail during removal and storage. Any damages to the guardrail shall be repaired or replaced at the Contractor's expense.
- C. Restore the guardrail after the new chain link fence is installed and inspected by Ecology's Representative. The guardrail shall be restored to its pre-construction location. Additional inspections may be required by the owner of the existing guardrails. The Contractor shall inform the Engineer in writing when the installation of new chain link fence and guardrail is completed.
- D. It shall be the Contractor's responsibility to provide parts and materials that may be required to restore the guardrail.

**3.05 FENCE INSTALLATION**

- A. The ground surface along the fencing shall be graded as necessary to provide a relatively even surface for fence construction.
- B. The Contractor shall provide all necessary hardware for a complete installation.
- C. Stake out or mark fence alignment based on the locations shown on the Drawings for approval by the Ecology Representative prior to digging post footings and installation.
- D. The soil removed from digging the post footing holes shall be handled as contaminated soil in accordance with **SECTION 02 61 13 – EXCAVATION OF CONTAMINATED MATERIALS**, and **SECTION 02 61 15 – STORAGE AND TRANSPORT OF CONTAMINATED MATERIAL**.
- E. Set posts uniform in horizontal and vertical alignment, equally spaced.
- F. No post holes shall be left open or unguarded during installation.

- G. The fence post spacings shall be no greater than ten (10) feet.
- H. All posts shall be set in concrete to the dimensions shown on the Drawings.
- I. After the post is set in the concrete, the hole shall be filled with Grout Type 4 per WSDOT Section 9-20.3(4).
- J. All concrete footings shall be crowned so as to shed water.
- K. Install chain link gates at the locations indicated on the Drawings or as directed by the Ecology's Representative.

**3.07 CLEANING**

- A. Excess earth resulting from post installations shall be handled as contaminated soil in accordance with **SECTION 33 42 10 – STORM DRAIN POINT REPAIR**, and **SECTION 02 61 15 – TRANSPORTATION AND DISPOSAL OF CONTAMINATED MATERIAL**.
- B. Clean up all concrete spills and splatter, as well as other debris and unused materials resulted from installation of the chain link fence.

END OF SECTION



**PART 1 – GENERAL**

**1.01 SUMMARY**

- A. The Work of this Section includes furnishing labor, materials, equipment, and supplies and performing operations required and as defined herein and as shown on the Drawings, including without limitation:
  - 1. Coordinating with other work, including soil preparation, seeding or sod lawns, and irrigation schedules
  - 2. Procurement, layout and installation of specified plants
  - 3. Applying Mulch
  - 4. Tree staking
  - 5. Landscape restoration
  - 6. Landscape maintenance until Substantial Completion
  - 7. Sweeping paved surfaces and removing debris prior to leaving the site
  - 8. Providing a warranty on Work and materials
- B. Related Sections
  - 1. Coordinate with related Work specified in other parts of the Project Manual.
  - 2. Coordinate with the General Conditions and Supplemental Conditions in the Project Manual.

**1.02 REFERENCES**

- A. Plant Names: Conform to “Report” issued by American Joint Committee on Horticultural Nomenclature Second Edition, 1942, and hereinafter called AJCHN. Names not present in this listing are to conform to accepted nomenclature in the nursery trade.
- B. Quality Standards: As described in the current edition of “American Standard for Nursery Stock” issued by the American National Standards Institute and hereinafter called ASNS.
- C. Reference the following standards:
  - AHJ                      Public Authority Having Jurisdiction AHJ is an abbreviation for public Authorities Having Jurisdiction. For this project the AHJ includes permitting agencies including but not limited to City of Everett, WSDOT and Ecology.
  - City of Everett      City of Everett Design and Construction Standards and Specifications for Development (the latest edition).

WSDOT	Washington Department of Transportation Standard Specifications and Standard Plans for Road, Bridge, and Municipal Construction (the latest edition).
ASNS	American Standard for Nursery Stock, published by American Hort. Approved National Standard, ANSI Z60.1-2014 Approved April 14, 2014.

### **1.03 QUALIFICATIONS**

- A. Landscape Installer: Landscape Installer shall be a company specializing in the Work of this Section with a minimum 5 years documented experience in commercial landscape installation of a similar nature.
- B. Lead Foreman: Landscape Installer to provide at least 1 person as the Lead Foreman who will be present onsite at all times during execution of the Work and who has a minimum 5 years documented experience in commercial landscape installation of a similar nature. The Lead Foreman is required to be thoroughly familiar with the type of materials being installed and the proper materials and methods for their installation and is to direct Work performed under this Section.

### **1.04 SUBMITTALS**

- A. Submit the following information in conformance with submittal procedures noted in **SECTION 01 33 00 – SUBMITTAL PROCEDURES**. All submittal materials listed below for work of this section shall be submitted in one complete package.
  - 1. Landscape Installer and Lead Foreman qualifications.
  - 2. Plant Materials: A complete list of plant materials proposed to be furnished and installed, demonstrating conformance with the requirements in this Section. The list is to include:
    - a. Names, addresses and phone numbers of nurseries and suppliers matched to plants;
    - b. Verification of plant quantities as shown on the Plans;
    - c. Proof of deposit or written assurance from each nursery that the plants have been secured and reserved for the project.
  - 3. Other Materials: Product literature, tear sheets and a complete list of product names and suppliers with addresses and contact information for materials proposed, including but not limited to mulch, tree-staking materials, root barrier, and other miscellaneous materials to be furnished and installed. Submittals are to demonstrate product conformance with the relevant requirements in this Section.
  - 4. Product data, including supplier name and phone number, and 1-gallon representative sample of specified mulch.

**1.05 SUBSTITUTIONS**

- A. Substitutions of plant materials will not be permitted unless authorized in advance in writing by Ecology’s Representative. If proof is submitted that any plant specified is not obtainable, submit documentation indicating that a minimum of three suppliers, who regularly grow plants, were contacted.
  - 1. A proposal will be considered for use of the nearest equivalent size or variety with corresponding adjustment of Contract price.
  - 2. Such proof shall be substantiated and submitted in writing to Ecology’s Representative a minimum of 30 days prior to start of Work under this section.
  - 3. Landscape Installer to provide a minimum of 2 options for each substitution. Options to be plants of equal character, mature height and cultural requirements.

**1.06 REVIEW BY ECOLOGY’S REPRESENTATIVE**

- A. Do not schedule review by Ecology’s Representative until Contractor has confirmed that the relevant requirements of the Drawings of this Section have been met. Provide Ecology’s Representative with a minimum 5 working days’ notice when plant materials or plant grouping layout, as applicable, will be ready for review. Do not install plant materials prior to Ecology’s Representative’s approval of plant materials and proposed layouts.
- B. Plant Materials:
  - 1. Upon Delivery: Ecology’s Representative will review plant materials on site upon delivery for conformance with the requirements of this Section, including plant specifications, storage and handling requirements. Immediately remove from the site plants which are not true to name or which do not comply with the specified requirements. Replace rejected plant materials with conforming plant material.
  - 2. Balled and burlapped and/or container trees: Ecology’s Representative may make invasive observation of the plant’s root system in the area of the root flare in order to determine that the plant meets the quality requirements for depth of the root flare, presence of roots above the root flare and stem girdling roots. If review indicates excess soil or girdling roots, Ecology’s Representative may reject plant material or direct corrective actions. This may occur prior to or following planting.
  - 3. During Construction: Ecology’s Representative reserves the right to reject plant materials for nonconformance at any time from the delivery of such plant material to the site through the end of the warranty period.

- C. Layout: Ecology’s Representative will review the layout of plant groupings, trees and other plant materials prior to installation.
- D. Failure to comply with the review and approval procedures described in this Section may require replacement and/or reinstallation of plant materials at no additional expense to the Contracting Agency.

**PART 2 – PRODUCTS**

**2.01 PLANT MATERIALS**

- A. General:
  - 1. Plants to be as specified on the Plans.
  - 2. Plants to be nursery grown in climatic conditions similar to the site. Measurements, caliper, branching, grading, quality, balling and burlapping are to be as specified unless otherwise indicated. Measurements, caliper, branching, grading, quality, balling and burlapping are to follow ASNS unless otherwise specified.
- B. Form:
  - 1. Trees and shrubs to have an overall form typical of the species, uniformly branched, with a symmetrical crown. Trees with curved or leaning trunks, damaged or cut leaders, damaged bark, sunscalds, disfiguring knots or fresh cut limbs over ¾-inch will be rejected by Ecology’s Representative. Coniferous trees to be in native form (not sheared) with a single dominant leader.
- C. Plant Size:
  - 1. Plants are to be true to species and variety and be at least equal to the size specified.
  - 2. Height and spread dimensions specified refer to main body of plant and not branch tip to tip. Plant dimensions are to be measured when branches are in normal position. Caliper measurement is to be taken at a point on the trunk 6 inches above the crown of the root ball for trees up to 4 inches in caliper.
  - 3. Plants larger than specified may be used if approved by Ecology’s Representative. Use of such plants shall not increase contract price. If larger plants are used, the ball of earth or container shall be increased in proportion of the size of the plant.
- D. Container Grown:
  - 1. Plants to have been grown and cultivated in the containers in which they are delivered for at least 6 months, but not over 2 years. Samples must prove no root-bound conditions exist.
  - 2. Root-bound plants and container plants that have cracked or broken balls of earth when container or wrappings are removed are not to

be planted except upon special approval by Ecology's Representative.

- E. Balled and Burlapped (B&B):
  - 1. Plants to have firm, natural balls of soil in sizes shown in ASNS, wrapped firmly with burlap or approved material, and bound carefully with twine, cord, or wire mesh.
  - 2. B& B material shall not have excess soil material above the root flare or stem girdling roots.
  - 3. The root flare (i.e. root collar, root crown, trunk flare, flare) is the region at the base of the trunk where the majority of the structural roots join the plant stem, usually at or near ground level.
- F. Damaged Plants: Damaged plants will be rejected. Do not prune plants before delivery.

## **2.02 MULCH**

- A. Wood Chip Mulch: Clean wood chips from tree-trimming operations; used as the standard mulch for woody plants. Size shall be ½-inch to 4 inches along the longest dimension, minimum half inch thickness on the shortest dimension. The mulch shall not contain salt, preservatives, glue, resin, tannin, or other compounds in quantities that would be detrimental to plant life. Mulch shall be free of trash, plastic, and construction materials; shall not contain material (chipped or otherwise) from lumber, pallets, or other waste manufactured wood products. Mulch shall not contain weed seed, live roots, or other propagative parts of any plants on Snohomish County Noxious weed list, or English ivy (*Hedera helix*) or horsetail (*Equisetum* spp).

## **2.03 TREE STAKING MATERIALS**

- A. Tree Tie: "Chainlock" 1-inch width, or approved equal.
- B. Wood Stakes: 2-inch diameter by 8 foot long Lodgepole pine wood stakes or approved equal.

## **2.04 ROOT BARRIER**

- A. Root Barrier: 18" depth root barrier by Deep Root, 1-415-781-9700, or approved equal.

## **2.05 STAKING FOR PLANT/TREE LAYOUT**

- A. Staking for tree layout shall be 2-inch x 2" x 36" wood stakes.
- B. Staking for plant layout, if required, shall be irrigation flags.
- C. Paint may be used to mark plant layout if weather permits.

**2.06 TREE WATERING BAGS**

- A. Tree Watering Bag: 20-gallon, slow release watering bag to supplement irrigation. Place two bags per tree (for 40 total gallons/tree) unless noted otherwise. Manufactured by Tregator (1-866-873-3428 or <http://www.tregator.com/>) or approved equal.

**PART 3 – EXECUTION**

**3.01 GENERAL**

- A. In general, proceed as rapidly as the site becomes available, consistent with seasonal limitations for planting work.  
Seasonal Limitations: Do not plant during unsuitable soil or weather conditions as determined by the Ecology's Representative. Unsuitable conditions may include frozen soil, freezing weather, saturated soil, standing water, high winds, heavy rains and high-water levels.
- B. Remove debris from other trades prior to beginning work.
- C. Verify installation conditions as satisfactory to receive work of this Section. Do not install until unsatisfactory conditions are corrected. Beginning work constitutes acceptance of conditions as satisfactory.

**3.02 PROCUREMENT, DELIVERY, STORAGE AND HANDLING**

- A. Procure all trees and plants for the project within timeframes that allows all species to be procured. Provide required offsite secure storage, care and maintenance from the date of procurement, until all tree and plant stock has been delivered, stored and planted on site.
- B. Protect plant materials from wind, drought, unusual weather, dehydration, contamination, heating, wildlife, and vandalism during delivery, storage, and handling. Prevent damage to root balls and leaf desiccation.
- C. Deliver branched plants with branches tied and covered with material that allows air circulation.
- D. Plant Material Storage and Handling:
  - 1. Protect plants from freezing or drying with protective screening and mulching material.
  - 2. Avoid drying or damaging plants being moved from the nursery or storage area to the planting site.
  - 3. Handle balled and burlapped plants carefully to avoid cracking or breaking the root ball.
  - 4. Do not handle individual plants by stem, trunk, limbs, or foliage but only by root ball or other container.
  - 5. Store bulbs in cool dry locations prior to planting.

- E. Store non-plant material products in cool dry locations away from contaminants.

**3.03 ROOT BARRIER INSTALLATION**

- A. Install root barrier at interface of pavement (edge of curb, sidewalk or driveway) and landscaping for minimum 10 feet in either direction from centerline of tree for any tree that is within six feet of a curb or pavement edge. Install per Manufacturer's instructions, except top of root barrier shall be ½-inch below finished grade.

**3.04 PLANT MATERIAL INSTALLATION**

- A. Install plant materials in accordance with the Plans.
- C. Planting Season:
  - 1. Plant only during acceptable seasonal conditions for planting, per seasonal limitations outlined above, and after major construction work has been completed unless otherwise approved by Ecology's Representative.
- D. Layout:
  - 1. Stake tree locations for review and approval by Ecology's Representative prior to digging planting pits.
  - 2. Space ground cover plants in accordance with the triangular on-center dimensions indicated on the Plans.
  - 3. Adjust spacing of ground covers and shrubs as necessary to evenly fill planting bed with indicated spacing of plants.
  - 4. Plant grouping layout review: Where Plans indicate distinct plant groupings within contiguous planting bed areas, use stakes and string or other temporary materials to clearly outline and indicate boundaries within which each grouping will be planted, as indicated on Plans.
- E. INSTALLATION:
  - 1. Schedule Ecology's Representative's review of layout for written approval before proceeding with planting.
  - 2. Install plants immediately after review and approval by Ecology's Representative. If there are unavoidable delays, cover root balls with moist soil or mulch. Install plantings within plant grouping areas where applicable.
  - 3. Orient plants as shown on the Plans or by Ecology's Representative for branching clearance and best appearance. Place trees first. Follow with major shrubs then groupings, then ground covers.



4. Completely remove wire baskets, peat pots, containers, burlap wrappings, string and other ties from root balls. Ensure root ball conforms to the minimum root ball dimensions.
5. Trees:
  - a. Cut roots that circle or mat along the sides and bottom of the root ball. Remove up to 2 inches of excess soil over root flare and cut away superficial roots that grow over the root flare of the trees.
  - b. When trees are planted within 5 feet of pavement set root flare 2 inches above pavement elevation.
  - c. Hold tree firmly in position while backfill is placed to grade. Place backfill carefully, avoiding root damage and filling voids. When hole is approximately 2/3 full, compact backfill by watering to avoid air pockets. Install root ball completely in soil.
  - d. Stake trees per details shown on Plans.
  - e. Install 2 Tree Watering Bags on each new tree, per Manufacturer's directions.
6. Plants:
  - a. Cut roots that circle or mat along the sides and bottom of the root ball.
  - b. Set plants in center of pits, on prepared subgrade or amended soils. Plants to bear same relationship with finish grade after settlement as they bore natural grade.
7. Remove temporary layout materials including stakes and string after plantings installed.

**3.05 MULCH**

- A. Provide 2-inch depth of mulch in new planting beds immediately after planting, including planting bed islands and tree wells in lawn areas. Rake mulch to provide a uniform finished surface.
- B. At proposed trees, mulch shall not be thicker than 2 inches deep and no closer than 6 inches to the trunk of the tree.
- C. At existing trees, mulch shall not be thicker than 3 inches deep and no closer than 12 inches to the trunk of the tree. Remove and dispose of excess mulch.
- D. Mulch shall be tapered back to avoid burying small plants and placing on trunks of trees and shrubs.

**3.06 PROTECTION**

- A. Protect new plantings against harm from wind, unusual weather, foot traffic or other vandalism through Substantial Completion. Special planting techniques may be required by Ecology’s Representative for unseasonal planting or prolonged periods of drought.

**3.07 PRUNING**

- A. Provide minor pruning of trees and shrubs only as directed by Ecology’s Representative to remove broken or damaged limbs or stems and to achieve proper plant branching structure, form and vertical or horizontal clearances. Prune branches at the branch collar. No stubs nor flush cuts are permitted. Prune to provide clearance as required by agency.

**3.08 CLEAN UP**

- A. Perform daily cleaning of adjacent pavements and landscape areas during installation and upon completion of Work.
- B. Remove from the site excess materials, plant containers and coverings, soil, litter, debris and equipment.

**3.09 MAINTENANCE**

- A. Provide landscape maintenance until Project Acceptance by Ecology.
- B. Landscape maintenance to include: Maintaining trees, shrubs and ground covers in a healthy, vigorous condition, free of insects and disease, by watering, weed removal and control, applying organic fertilizing (if necessary), re-mulching, restaking, straightening or loosening tree ties, removing dead plant material, resetting plants to proper grades or upright position, restoring planting saucers, and pruning (only as directed by Ecology’s Representative).
- C. Correct defective work, as soon as possible, after deficiencies become apparent and weather and seasonal limitations permit.
- D. Watering
  - 1. Water trees, plants, and ground cover planting beds within the first sixteen (16) hours of initial planting.
  - 2. Fill tree bags weekly to supply adequate water for trees.
  - 3. Deeply water trees, plants, and ground cover planting beds per requirements of the Irrigation Specification until irrigation system is winterized, if applicable.
- E. Maintenance schedule: Plant and ground cover beds are to be weed free at the end of each month during the Maintenance Period. Provide written notice to Ecology’s Representative of the completion of each weeding operation.

- F. Ecology’s Representative will periodically review landscape maintenance practices until Project Acceptance. Deficiencies will be noted and reported to the Contractor. Contractor is required to correct deficiencies to the satisfaction of Ecology’s Representative within two weeks’ notice of deficiencies.

**3.10 ACCEPTANCE OF COMPLETED LANDSCAPE WORK**

- A. Upon request by the Contractor, Ecology’s Representative will review the completed landscape work for review and conformance to the Plans. Provide written notification at least 14 working days before requested review date.
- B. Landscape areas will be accepted provided requirements, including maintenance, have been complied with and plant materials are alive and in a healthy, vigorous condition.

**3.11 ONE-YEAR WARRANTY**

- A. Warrant the Work of this Section for a period of 1 year from the date of Substantial Completion against defects of materials and workmanship (the Warranty Period).
- B. During the Warranty Period, make replacements of plant materials within 30 days of awareness of plant death or abnormal growing condition. Plants damaged by vandalism after Substantial Completion or resulting from damage by Ecology’s Representative’s occupancy of the site will not require replacement, unless improper installation is a contributing factor in the damage, including improper staking, plant pit size or protection.
- C. Plant replacement during the Warranty Period will be limited to 1 replacement per plant unless repeated failure is due to improper soil preparation, plant installation or the failure of plants to meet the specifications of this Section.
- D. Replace plants not in normal healthy growing condition at end of the Warranty Period as determined by Ecology’s Representative. Replace with plants of identical species and size.
- E. Remove tree stakes and watering bags.
- F. Year Warranty Review: Notify Ecology’s Representative 1 month prior to end of Warranty period of Warranty end date. A final review may be held if requested by Ecology’s Representative in presence of Contractor and Ecology’s Representative at the end of the Warranty Period. Ecology’s Representative will notify parties of the Warranty review a minimum of 14 days prior to the anticipated meeting date.

END OF SECTION

**PART 1 – GENERAL**

**1.01 SUMMARY**

- A. The Work of this Section includes furnishing labor, materials, equipment, and supplies and performing operations required and as defined herein and as shown on the Drawings, including without limitation:
1. Coordination with tree, shrub, and ground cover planting and seeding, sod lawn and irrigation schedules;
  2. Preparing subgrade soils;
  3. Furnishing and tilling specified topsoil mix and soil amendments into prepared subgrade soils; and
  4. Protection of completed soil preparation areas.

**1.02 QUALITY ASSURANCE**

- A. Products supplied are to comply with applicable State and Local codes.

**1.03 SUBMITTALS**

- A. Submit the following information in conformance with submittal procedures noted in **SECTION 01 33 00 – SUBMITTAL PROCEDURES**. All of the following submittal materials for this section shall be submitted in one complete package.
1. Product data, including supplier name and phone number, and 1-gallon samples of specified Topsoil and Organic Soil Amendment.
  2. Current (2 months prior to installation) test reports from an accredited soils testing laboratory for supplied Topsoil and Organic Soil Amendment describing composition and nutrient levels. Test reports to include recommendations, as necessary, for incorporation of additional soil amendments to achieve appropriate soil nutrient levels to sustain healthy plant growth.
  3. Description of equipment, methods and procedures for tilling areas specified for soil preparation.

**1.04 REVIEW BY ECOLOGY'S REPRESENTATIVE**

- A. Ecology's Representative will review soil preparation for conformance with the requirements of this Section. Promptly correct areas of soil preparation that do not conform to the requirements of this Section at no additional expense to the Ecology.
- B. Ecology's Representative will review soil testing reports and soil preparation work specified in this Section prior to commencement of fine grading and planting operations. Secure Ecology's Representative's written approval to commence the planting of trees, shrubs or ground covers or application of fine lawn seeding or sod lawn.

- C. Provide Ecology’s Representative with a minimum 3 working days notice as to when subgrade and topsoil preparation will be ready for review by Ecology’s Representative. Do not schedule review by Ecology’s Representative until Contractor has confirmed that the relevant soil preparation (subgrade or topsoil) meets the requirements of this Section.
- D. Failure to comply with the review and approval procedures described in this Section may require full re-preparation of subgrade and reincorporation of topsoil to specified depths.

**PART 2 – PRODUCTS**

**2.01 PLANTING SOIL MIX (TOPSOIL):**

- A. Soil mix to consist of 2/3 sandy loam and 1/3 Organic Soil Amendment material.
  - 1. Sandy loam or loamy sand to consist largely of sand, but with enough silt and clay present to give it a small amount of stability. Individual sand grains can be seen and felt readily. On squeezing in the hand when dry, it should form a cast that will hold its shape when pressure is released and withstand careful handling without breaking.
  - 2. The mixed soil shall meet the following gradation:

Screen Size	Percent Passing
3/8 inch	100
#4	95
#10	85
#30	70
#60	50
#100	30
#270	15
  - 3. The mixed soil to have a pH from 5.0 to 6.5 with dolomitic limestone added as necessary to attain this range.
- B. Organic Soil Amendments are to conform to the specifications described below.

**2.02 ORGANIC SOIL AMENDMENT (COMPOST)**

- A. Organic Soil Amendment to consist of composted yard debris or organic waste material of 100% recycled content. In addition, it shall have the following characteristics:
  - 1. Be screened to 7/16-inch.
  - 2. Have a pH from 5.5 to 7.5.
  - 3. Have a maximum electrical conductivity of 3.0 ohms/cm.
  - 4. Have a maximum carbon to nitrogen ratio of 40:1.

5. Be certified by the Process to Further Reduce Pathogens (PFRP) guideline for hot composting as established by the United States Environmental Protection Agency.
  6. Be fully composted, mature and stable before being acceptable.
- B. Substitutions for the Organic Soil Amendment may be accepted. Provide complete chemical and physical laboratory analysis of proposed substitutes. Substitutes will be accepted at the discretion of Ecology's Representative upon proof of their equivalent or superior performance to Organic Soil Amendments.

### **PART 3 – EXECUTION**

#### **3.01 GENERAL**

- A. In general, proceed as rapidly as the site becomes available consistent with seasonal limitations for soil preparation work.
- Seasonal Limitations: Do not work soil when moisture content is so high that homogenization or excessive compaction of soils will occur, when it is so dry that dust will form in the air, or that clods will not break readily. Do not place soil on surfaces that are soft, muddy, frozen, or containing frost, ice or loose debris or in the opinion of the Ecology's Representative in a condition detrimental to the Work.
- B. Soil preparation within an existing tree's Critical Root Zone (CRZ), to extend at a minimum to the tree's crown drip line, must comply with the requirements of WSDOT Standard Specification 1-07.16(2), including without limitation, the requirement to obtain advance written approval of work within the (CRZ).
- C. Remove debris, including without limitation, concrete spills or other spills and materials from other trades such as thinner, paint, plaster, concrete or other debris, prior to beginning Work under this Section. Notify Ecology's Representative immediately if contaminants are present.
- D. Remove any temporary paving and base materials present in planting areas.
- E. Subgrade to consist of acceptable native soils that, when amended with specified Topsoil and Soil Amendments, will provide plants with nutrients, positive drainage and appropriate particle sizes that promote long-term plant health and stability. Immediately notify Ecology's Representative of poorly draining or unacceptable drainage conditions within landscape areas that will affect the health and maturation of new plantings.
- F. Keep streets, sidewalks and site clean and free from debris.
- G. Keep affected drains open and free flowing at all times. Protect drains with filter fabric covers during construction and throughout plant establishment

periods. Implement, maintain and keep functional the specified and required erosion control measures at all times.

- H. Protect prepared soils from disruption by other Work and construction activities.

### **3.02 PRE-INSTALLATION CONFERENCE**

- A. At least 14 days prior to commencement of Work of this Section, schedule an onsite meeting with the Ecology's Representative, Contractor and Landscape Subcontractor to review the following:
  - 1. Existing condition of subgrades to be tilled and receive topsoil. Subcontractor to accept, in writing, the condition of subgrades prior to subgrade preparation, topsoil placement, irrigation installation, tilling and planting operations.
  - 2. Planting schedule and potential conflicts with work by other trades.
  - 3. Quality control and maintenance.

### **3.03 SUBGRADE ESTABLISHMENT AND PREPARATION**

- A. Inspect established subgrades to verify consistency with the Drawings. If subgrades are different than shown on the Drawings, notify the Ecology's Representative immediately.
- B. Coordinate with other project work and match the pre-existing grading to achieve subgrade depths allowing for common fill (if any), specified amendments, Topsoil and Mulch as specified in this Section.
- C. Prepare established subgrades as follows:
  - 1. Till areas and remove cobbles, rocks and debris, including any large organic debris and fill material such as glass, pipe or metal, over 2 inches in diameter.
- D. Subgrade depths:
  - 1. Medians and Restored Planting Beds - Minus 13 inches from finish grade to allow for 12 inches of topsoil, 2 inches of mulch, and approximately 1 inch of settlement.
  - 2. Tree Planting Pits – pit depth and width per detail.
  - 3. Fine Lawn Areas – Minus 5-1/2 inches from finish grade to allow 6 inches of topsoil and approximately 1/2-inch of settlement.
- E. Secure approval of subgrade preparation by Ecology's Representative prior to implementation of soil preparation procedures.

### **3.04 SOIL PREPARATION**

- A. Medians and Planting Beds:



1. Remove existing soil or fill material to specified depths and till subgrade.
  2. Place topsoil in 2 lifts of 6 inches each.
  3. Install topsoil soil to bring planting bed grade to 1 inches below finish grade as shown on plans.
  4. Rake soil smooth to finish grades and remove cobbles, rocks and debris, including any fill material such as glass, pipe or metal, over 1 inch in diameter.
  5. Lightly compact with hand equipment and provide a consistent smooth planting bed. More heavily compact the 1-foot edge adjacent to pavement to minimize settlement.
- B. Fine Lawn Areas:
1. Prepare subgrade.
  2. Place topsoil in 2 lifts of 3 inches each, tilling after first lift is placed.
  3. Rake soil smooth to finish grades and remove cobbles, rocks and debris, including any fill material such as glass, pipe or metal, over 1 inch in diameter.
  4. Lightly compact and immediately before seed installation lightly rake. Heavily compact the 1 foot edge adjacent to pavement to minimize settlement and immediately before seed installation lightly rake.
- C. Finish Grading:
1. Fine grade beds to lines and grades shown on the Plans, provide tamped 'V' along the level of adjacent walks, pavements and 1/4-inch below curbs unless otherwise noted.
  2. Fine finish Topsoil by raking smooth and even and removing extraneous matter. Work as necessary, until the surface is smooth, friable, and uniformly textured, ready for planting.

END OF SECTION

**PART 1 – GENERAL**

**1.01 DESCRIPTION OF WORK**

- A. Provide all materials, equipment and labor necessary for placement of sod in the existing lawns in areas disturbed by the storm drain system rehabilitation and fencing installation work the Project Site.

**1.02 QUALITY ASSURANCE**

- A. Sod Grass: Conform to Washington State Department of Agriculture Rules for Seed Certification.
- B. Fertilizer: Conform to Washington State Department of Agriculture Laws and Federal Specification O-F-241D pertaining to commercial fertilizers.

**1.03 SUBMITTALS**

- A. Sod: Contractor shall submit sod Product Data as recommended by supplier for the specific application and season of the year Work shall be performed.
- B. Fertilizers and Other additives: Contractor shall submit Product Data as recommended by supplier for the specific application and season of the year Work is to be performed.
- C. Maintenance Log.
- D. Provide submittals for Ecology's review in accordance with **SECTION 01 33 00 – SUBMITTAL PROCEDURES**.

**1.04 PROTECTION OF EXISTING CONDITIONS**

- A. Protect Work, adjacent property, and public areas. Contractor shall be responsible for any damage or injury arising from Contractor's actions or neglect.

**1.05 SCHEDULING AND COORDINATION**

- A. Contractor shall begin installation of sod no more than one (1) calendar week after completing final placement and grading of topsoil, unless otherwise authorized by Ecology in writing.
- B. Confine Work to areas designated. Do not disturb existing vegetation outside of Project Site. Protect all trees and shrubs within Project Site not designated to be removed. Repair or replace vegetation damaged as a result of Contractor's operation to satisfaction of Ecology at no additional cost to Ecology.
- C. All sod to be installed shall be completed by Contractor before the Maintenance and Finishing Period can begin, unless authorized by Ecology in writing.

**1.06 GUARANTEE REPLACEMENT**

- A. Contractor shall guarantee a uniform sod lawn with no bare spots whatsoever until the end of the 12-month warranty period.
  - 1. Replace with identical sod and in the manner originally specified any area which fails to vigorously establish a uniform lawn for any reason whatsoever.
  - 2. Fill to finish grade with approved topsoil and sod as specified for all sod areas with evidence of settlement or erosion before Final Completion.
  - 3. Repeat all such resodding until the end of the 12-month warranty period at no additional cost to Ecology.
- B. During Maintenance and Finishing Period, Contractor shall not be responsible for replacing lawn destroyed or damaged by vandalism or accidents caused by vehicles other than the Contractor's, or Acts of God, or severe cold as substantiated by a 25-year low temperature records (exceeding 25-year low), provided that Contractor has exercised due care to protect Work. Should replacement fall due during non-planting season, Contractor may request Ecology's permission to defer planting until proper season. If permission is granted, immediately remove and dispose of dead grass stands, including all roots. Holes shall be backfilled properly with topsoil and finish graded until proper planting season occurs. Grass used for replacement shall be of same kind originally installed and shall be as originally specified.

**PART 2 – PRODUCTS**

**2.01 SOD**

- A. Sufficient quantity of sod, in rolls, to replace lawns as specified in the Contract Documents.
  - 1. Sod shall be of a type of grass blend suitable for the area in North Everett with the sunlight conditions typical for properties in the Project Site area.
  - 2. Where sod is to be installed adjacent to existing lawn, grass species in new sod should provide similar appearance and character, including color, to existing lawn.
  - 3. All sod shall be identical in appearance and be provided by the same supplier.
  - 4. The sod shall be field grown a minimum of one (1) calendar year prior to use in Work, have a well-developed root structure, and be free of weeds, disease, and insect damage.

5. Prior to cutting, the sod shall be green, in an active and vigorous state of growth, and mowed to a height not exceeding one (1) inch. The sod shall be cut with a minimum of one (1) inch of soil adhering.

**2.02 FERTILIZERS AND OTHER ADDITIVES**

- A. Approved brands conforming to applicable State fertilizer laws. Uniform in composition, dry, free-flowing, delivered to the site in original unopened containers, each bearing the manufacturer's guaranteed analysis. All fertilizers must be EPA-approved.
- B. Installation Fertilizer:
  1. Total available Nitrogen: 16% by weight (of which 50% is derived from controlled release sources including Nutralene).
  2. Total available phosphorous: 16% by weight.
  3. Total available potassium: 16% by weight.
- C. Maintenance Fertilizer:
  1. Total available Nitrogen: No more than 18% by weight (of which 50% is derived from controlled release sources).
  2. Total available Phosphorous: 12% by weight.
  3. Total available Potassium: 12% by weight.
  4. Contractor may substitute a seasonally appropriate maintenance fertilizer, in the event sod supplier recommends a different fertilizer during the maintenance and finishing period where sod is used. Contractor shall communicate this substitution in writing to Ecology, including explanation. When authorized by Ecology, Contractor may use substitute at no additional cost to Ecology.
- D. Other amendments as recommended by suppliers:
  1. Dolomitic Limestone at minimum rate of 50 pounds per 1,000 square feet.
  2. Gypsum to counteract salinity as recommended by sod supplier.
  3. Adjust the basic quantities of the following micronutrients as recommended for:
    - a. Iron.
    - b. Manganese.
    - c. Molybdenum.
    - d. Copper.
    - e. Zinc.
    - f. Boron.

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**PART 3 – EXECUTION**

**3.01 PREPARATION**

- A. After confirmation that topsoil placement has met the required elevation and grading tolerances, apply Installation Fertilizer at the rate of 10 pounds per 1,000 square feet. Rake to incorporate.
  - 1. Contractor shall demonstrate to the Ecology Representative that finish grades have been confirmed by surveying and all surfaces have been restored to its pre-construction condition.
- B. Finish surfaces by raking smooth and even and lightly compact with roller or equal. Level out surface undulations and irregularities to tolerances specified in Contract Documents and recompact as necessary.
- C. The Ecology Representative shall observe fertilization. Contractor shall notify Ecology a minimum of two (2) working days in advance of fertilization activities.

**3.02 SOD PLACEMENT**

- A. After finish grades are verified by Contractor with the Ecology Representative and the Installation Fertilizer has been applied as specified in this Section, Contractor shall install sod in accordance with supplier's and manufacturer's requirements.
- B. Strips of sod shall be placed such that the root zone of the sod shall be within the specified final tolerances for elevation control marks and the root crown set to the grade of all adjacent final elevation control marks, sidewalks and/or curbs.
- C. Sod shall be placed without voids and have end joints staggered and tightly fitted.
- D. Where new sod is placed adjacent to pre-existing lawn, the seam shall be made flush, with a smooth and continuous grade, no gaps or ridges. Sod shall not be installed on top of pre-existing lawn under any circumstances. If the pre-existing lawn has been damaged as a result of construction activity (directly or indirectly) the pre-existing lawn shall be repaired to provide a uniform transition with the new sod.
- E. Sod strips shall be placed not later than forty-eight (48) hours after being cut.
- F. Sod shall be moistened by sprinkling or equal methods prior to being installed.
- G. On sloped areas, sod shall be laid with the long dimension oriented perpendicular to the slope surface.

- H. Following placement, sod shall be lightly rolled with a smooth, water-filled type roller, or equal, as recommended by the sod supplier. After rolling, sod shall be watered thoroughly by sprinkling.
  - 1. Contractor shall prevent traffic on sod until it has become well-established.
- I. All sod placement must be completed prior to Substantial Completion.
- J. Sod installation shall be performed during periods which are normal for such Work, as determined by season, weather conditions, and accepted practice. At the option and on the full responsibility of the Contractor, sodding operations may be conducted under unseasonable conditions without additional compensation and at no additional cost to Ecology.

**3.03 PROTECTION**

- A. Contractor shall protect sod areas from storm water and trespassing as necessary until sod is established. Contractor shall treat and resod damaged portions as required, at no additional cost to Ecology.

**3.04 MAINTENANCE FERTILIZATION**

- A. Contractor shall apply maintenance fertilizer in conformance with the season in which Work is performed and as directed by the sod supplier. At scheduled time approved by Ecology, Contractor shall apply a minimum of one (1) maintenance fertilizer before the end of the Maintenance and Finishing Period specified in this Section, unless otherwise authorized by Ecology in writing.

**3.05 RESODDING**

- A. In areas where sod coverage is observed to be weak or dead before Final Completion, repair any settlement and/or erosion channels, resod, and refertilize all areas.

**3.06 MAINTENANCE AND FINISHING PERIOD**

- A. It shall be the Contractor's responsibility to continuously and vigorously maintain all the sodded areas of this Work from time of installation for a minimum of sixty (60) calendar days.
- B. All sod areas shall be watered regularly and as necessary due to weather conditions by Contractor during the maintenance and finishing period by thorough sprinkling as needed to keep the ground moist, the sod healthy, and to prevent wilting.
- C. Contractor shall provide temporary irrigation as needed. Temporary irrigation provisions shall be sufficient to water all areas at least once daily. Watering methods shall be designed to minimize overspray on to paved surfaces or established landscape areas.

1. Contractor shall not use the private water supply as a source of water for temporary irrigation.
- D. Sod Areas:
1. Maintain by watering, weekly mowing (remove all clippings), continuous weeding, resodding, fertilizing, herbicide treatment, rolling and top dressing, and other necessary operations to establish and maintain an even, dark green, deep rooted, thick and vigorous stand of grass. Temporarily water any areas that are not irrigated, until establishment.
  2. Care shall be exercised to prevent soil erosion.
  3. During the first two (2) weeks, at a minimum all sod at Project Site shall be watered on a daily basis. During warm weather, sod may need to be lightly watered during mid- and late afternoon hours when water use and evaporation is greatest.
  4. Schedule irrigation so the lawn becomes firm enough to mow between waterings.
  5. Begin mowing the area as top growth develops, but keep the traffic level as low as possible. The recommended height for sod lawn grass is three (3) inches or more. Mow frequently enough so that no more than 1/3 of the grass blade is removed at one (1) mowing.
  6. Replace any sodded areas which fail to show vigorous growth. Fill and sod all areas which settle below the tolerances specified in the Contract Documents.
  7. At the end of the maintenance and finishing period, the sod areas shall be a flourishing, dense, vigorous, uniform, deeply rooted thick stand of specified grass with no bare spots and no weeds whatsoever.
  8. Areas not conforming to the Specifications of this Section shall remain the Contractor's responsibility, at no additional cost to Ecology, until the conditions meet the requirements of the Contract Documents.
- E. During the maintenance and finishing period specified in this Section:
1. At no time are lawns and grass stands to be yellow, lacking in vigor, or not thriving.
  2. At no time are trees and shrubs to be lacking in vigor and not thriving.
  3. Provide a high level of maintenance as required to keep lawns and grass stands in top condition.
  4. For any portions of the sod that are not in top condition at the point of acceptance, provide additional maintenance, at no additional



cost to Ecology, until such time as deficient areas are free of weeds or bare spots and in top quality condition.

5. Provide Ecology a maintenance log during the duration of the maintenance and finishing work that details exact operations performed, including dates, name of person responsible, and amount of time spent on site.
  - a. Contractor shall provide copies as requested by Ecology.
- F. Schedule all maintenance and finishing work with Ecology with a minimum of one (1) weeks' notice to avoid conflicts with other Work.
- G. Contractor shall complete all sodding and restoration during maintenance and finishing period, unless otherwise authorized by Ecology in writing. This shall include all remedy Work identified during Work activities by Contractor, Ecology and the Ecology Representatives.

### **3.07 CLEANUP**

- A. A general cleanup shall be made immediately after and as part of all Work done at the Project Site.
  1. Adjacent areas shall be cleaned to the extent that the Work may scatter litter or debris.
- B. Such cleanup shall include pick-up and removal from the Project Site all clippings, trimmings, leaves, and all other litter and debris originating from any source whatsoever.

END OF SECTION

**PART 1 - GENERAL**

**1.01 DESCRIPTION OF WORK**

- A. The Work includes cleaning all storm drain lines, catch basins and manholes at the Site prior to video inspections, point repairs and CIPP lining. The video inspections of the existing storm drain system performed by Ecology in 2016 and 2018 are provided in Appendix C.
- B. The cleaning shall remove all foreign materials, e.g., sludge, debris, etc., from the storm drain pipes, catch basins and manholes to prepare for the video inspections and point repair operations.
- C. All concrete and masonry surfaces of catch basins and manholes must be clean for inspection of any defects and for repair or rehabilitation of the structures as required.
- D. All waste materials resulted from the cleaning shall be disposed of properly in accordance with the approved Storm Drain Cleaning and Disposal Plan and all local, State and Federal regulations at no additional cost to Ecology.

**1.02 SUBMITTALS**

- A. Storm Drain Cleaning and Disposal Plan: The Contractor shall submit a Storm Drain Cleaning and Disposal Plan for review and approval by Ecology prior to performing any work that might generate waste materials. The plan shall include a complete description of equipment for cleaning and materials that are expected to be encountered and their proposed disposal sites and transportation to those sites.
- B. The Contractor shall obtain all permits related to the disposal operation and comply with all requirements of those permits. The Contractor shall submit a copy of all permits to Ecology.
- C. Submit each of the submittals in accordance with the submittal timing requirements identified in **SECTION 01 33 00 – SUBMITTAL PROCEDURES**.

**PART 2 - PRODUCTS (NOT USED)**

**PART 3 - EXECUTION**

**3.01 PREPARATION**

- A. Temporary stormwater bypass shall be installed and operational prior to storm drain cleaning.
- B. All pumping equipment, onsite water storage tanks and water treatment system shall be installed prior to storm drain cleaning.
- C. The outflow storm discharge pipe to the outfall shall be temporarily plugged prior to the storm drain cleaning to prevent water and debris from discharging into the river.

**3.02 CLEANING OPERATION**

- A. The Contractor shall protect the storm drain lines from damage that might be inflicted by the improper use of cleaning equipment. Storm drain lines, catch basins and manholes damaged as a result of the Contractor's improper operations shall be promptly repaired by the Contractor in a manner approved by Ecology, at no cost to Ecology.
- B. All equipment, devices, and tools required for this Contract shall be owned or leased and operated by the Contractor.
- C. Selection of cleaning equipment will be at the Contractor's discretion but may be subject to approval by Ecology.
- D. The storm drain lines shall be cleaned using hydraulically propelled, high-velocity jet, or mechanically powered equipment. The equipment shall be capable of removing dirt, grease, rocks, sand, and other materials and obstructions from the storm drain lines, catch basins and manholes.
- E. Cleaning shall be performed prior to point repairs and CIPP lining. The Contractor shall perform a video inspection after the cleaning is completed to confirm the storm pipes are acceptable for CIPP lining.
- F. Water and waste materials generated during cleaning shall be removed from the storm drain pipes, catch basins and manholes to onsite storage tanks.
- G. Ingress and egress to public and private properties shall not be impeded during the cleaning operation.
- H. Any roots, deposits, and other defects in the storm drain pipes shall be removed using equipment that can operate remotely, mechanical equipment and/or high-pressure jet cleaners.

**3.03 WASTE MATERIAL REMOVAL AND DISPOSAL**

- A. All waste materials, including water and solid materials, resulting from the cleaning operations shall be removed from the downstream catch basins or manholes of the segment being cleaned. Install a weir or berm in the

- downstream catch basin or manhole to trap all waste materials that spill over the top of the catch basin or manhole. Passing waste materials from upstream segment to downstream segment is not allowed.
- B. No water and waste materials from the cleaning operations is allowed to spill into onsite or offsite streets, ditches, storm drains, sanitary sewer or landscaping.
  - C. All water and waste materials resulting from the cleaning operations will be temporarily stored on site in storage tanks provided by the Contractor. Samples will be collected by Ecology's Representative for waste characterization to determine proper water treatment and waste disposal facilities or approved discharge to City's sanitary sewer. The Contractor should expect the results will be provided five (5) working days after the samples are collected and submitted to the laboratory for analysis.
  - D. Transportation and disposal of the water and waste materials shall be conducted in accordance with the approved Storm Drain Cleaning and Disposal Plan. Copies of records of all disposal shall be furnished to Ecology's Representative including disposal site, date, amount, and a brief description of material disposed.
  - E. All materials shall be removed from the work areas no less often than the end of each workday. Under no circumstances will the Contractor be allowed to accumulate debris in the work area beyond the stated time except in totally enclosed containers and as acceptable to Ecology.
  - F. Keep the haul route and work areas neat and clean and free of odor. The Contractor shall be responsible for cleaning any spills immediately that occurs during transportation of the waste materials to offsite disposal facilities. If the Contractor fails to clean up such spills immediately, Ecology may clean up the spills and the costs associated with the cleanup will be at the Contractor's expense.
  - G. It is the Contractor's responsibility to ensure vehicles used to haul the waste materials from the cleaning operations shall be the types approved by the applicable regulatory agencies.
  - H. Hauling vehicles shall be watertight and with covers preventing spills.

**3.04 ACCEPTANCE OF CLEANING OPERATION**

- A. Acceptance of the cleaning operation will be determined based on the results of video inspection after the cleaning is completed which meets the manufacturer's requirements and recommendations for CIPP lining installation.
- B. The video inspection shall be performed immediately after the storm line cleaning. The Contractor shall re-clean and re-inspect the storm lines until the cleaning is acceptable at the Contractor's expense.

END OF SECTION

**PART 1 - GENERAL**

**1.01 DESCRIPTION OF WORK**

- A. Conduct pre-installation and post-installation internal closed-circuit television (CCTV) inspection of all designated storm drain lines, manholes and catch basins.
- B. Conduct pre-installation inspections:
  - 1. After storm drain cleaning is completed to confirm point repair areas required for CIPP installation.
  - 2. After point repairs are completed and prior to CIPP lining to verify the storm drain conditions are suitable for CIPP installation.
- C. Conduct post-installation after CIPP lining is completed to verify the installation meets the requirements in the Contract Documents.

**1.02 DEFINITIONS**

- A. Pre-Installation TV Inspection is a video inspection of storm drain lines conducted by the Contractor to confirm pre-installation cleaning and constructability of line rehabilitation in accordance with the Contract Documents.
- B. Post-Installation TV Inspection is a video inspection conducted by the Contractor to determine that rehabilitation of storm drain lines has been completed in accordance with the Contract Documents.
- C. Pipeline Assessment and Certification Program (PACP) is a CCTV Inspection Standardization certification and defect coding system developed by the National Association of Sewer Service Companies (NASSCO).
- D. Manhole Assessment and Certification Program (MACP) is condition assessment protocol for coding defects within manholes developed by NASSCO.

**1.03 SUBMITTALS**

- A. The Contractor shall provide to Ecology's Representative the following information in writing prior to the set deadline, or at the indicated frequency, whichever is applicable.
  - 1. Work Schedule
  - 2. Listing of Health and Safety and Traffic Control Measures
  - 3. Listing of CCTV Equipment

4. Listing of Backup and Standby Equipment
  5. Two (2) Copies of CCTV Inspection on Compact Disc (CD) or Digital Video Disc (DVD)
  6. Two (2) Copies of CCTV Inspection Report
- B. Each TV Inspection Log shall be submitted to Ecology accompanied by the respective video inspection.
- C. Prior to any inspections, submit a detailed description of the software to be used, a sample of the video, and a sample of the television survey log and PACP-compliant database to be used. Also, submit a detailed description of the camera equipment to be used.
- D. Submit the following qualifications for the CCTV Contractor to Ecology for review and approval:
1. Name, business address, and telephone number.
  2. Name(s) of all supervisory personnel to be directly involved with this Project.
  3. NASSCO PACP and MACP certifications of on-site operator performing inspections.
  4. Substitutions of personnel and/or methods will not be allowed without the written authorization of Ecology.
- E. Submit each of the submittals in accordance with the submittal timing requirements identified in **SECTION 01 33 00 – SUBMITTAL PROCEDURES**.

#### **1.04 GENERAL REQUIREMENTS**

- A. All CCTV operator(s) responsible for direct reporting of sewer condition shall have a minimum of three (3) years previous experience in surveying, processing, and interpretation of data associated with CCTV surveys/inspections. If requested by Ecology's Representative, the Contractor shall provide the designated representative with written documentation that all CCTV survey operators meet these experience requirements which shall include a list of projects undertaken as well as client name and telephone number for reference.
- B. Approved Contractors will be required to provide evidence acceptable to Ecology's Representative that all CCTV technicians performing work under this contract have satisfactorily completed NASSCO PACP and MACP training and possess valid PACP and MACP Certification documents. All defect coding, as well as material, shape and lining coding used throughout



the project will conform to NASSCO's PACP. Required training to meet these requirements will be carried out at the Contractor's expense.

- C. All storm drain segments rehabilitated with CIPP shall have pre- and post-CCTV inspections performed. All inspections shall be coded according to National Association of Sewer Service Companies' (NASSCO) PACP defect codes. Storm drain sections replaced by open cut excavation shall have post CCTV inspections performed.
- D. Any damages to public or private property resulting from Contractor activities shall be repaired by the Contractor at no cost to Ecology.
- E. If any Contractor equipment becomes stuck in the storm drains, the Contractor shall be responsible for all costs associated with extracting the equipment from the storm drains.
- F. All inspection videos shall be delivered to Ecology on a CD, DVD, portable hard drive (USB 2.0), or an Ecology-approved storage media accompanied with the corresponding TV logs for each televised lateral no more than seven (7) days after the inspections were completed. The video shall be direct from a live video source into a video file, MPEG-1/MPEG-2 or Windows Media File format (640x480 resolution, minimum) and, of good quality for viewing.
- G. The Contractor shall utilize a NASSCO's PACP certified software system for Work under this section, unless otherwise approved by Ecology.

### **1.05 EQUIPMENT**

- A. CCTV Equipment
  - 1. The Contractor's CCTV equipment shall include video camera, a video monitor cable, power sources, and all equipment necessary to perform a CCTV inspection as outlined in the Contract Document.
  - 2. Select and use CCTV equipment that will produce a color CD, or DVD, or an Ecology approved storage media.
  - 3. The television inspection equipment shall be a self-propelled unit capable of inspecting a length of storm pipe up to at least 500 feet, when access from the upstream or downstream of catch basins/manholes.
  - 4. The inspection equipment shall be capable of clearly televising the interior of 6-inch to 24-inch diameter storm drain pipes.
- B. CCTV Camera

1. The CCTV camera shall have pan-and-tilt capabilities that pans  $\pm 275^\circ$  and rotates  $360^\circ$ . The camera used for the inspection shall be specifically designed and constructed for such inspection.
2. The camera shall be waterproof and shall be fully operative in 100% humidity conditions and/or in any conditions that may be encountered in the inspection environment.
3. Use a camera with an accurate footage counter that displays on the monitor the exact distance of the camera (to the nearest tenth of a foot) from the centerline of the starting manhole.
4. Provide a color pan, tilt and zoom camera to facilitate the inspection of sewer line, manholes, and construction features. The television camera shall be capable of  $360^\circ$  rotational scan indicating salient defects.
5. The camera system shall be able to navigate around minor objects, roots and debris.
6. The adjustment of focus and iris shall provide a minimum focal range of 3 inches in front of the camera's lens.
7. Lighting for the camera shall be suitable to allow a clear picture of the entire periphery of the pipe. The illumination shall be such as to allow an even distribution of the light shadowing. A reflector in front of the camera may be required to enhance lighting in dark or large diameter pipe.
8. The camera shall be calibrated for accurate length measurements at least once prior to pre-installation and post-installation video inspections per the camera manufacturer's recommendations. The accuracy should be within two tenths of a foot for every 100 feet. The camera shall be kept clear of condensation and debris during the CCTV inspection.
9. The video camera shall be capable of showing on the digital inspection Ecology's name, Project name, Contractor name, date, line size and material, line identification (Ecology's catch basin and manhole numbers at both ends), camera starting location, and ongoing footage counter. The camera, television monitor, and other components of the video system shall be capable of producing picture quality to the satisfaction of Ecology; and if unsatisfactory, equipment shall be removed and replaced with adequate equipment. No payment will be made for an unsatisfactory inspection.

**PART 2 - PRODUCTS (NOT USED)**

**PART 3 - EXECUTION**

**3.01 GENERAL**

- A. The Contractor shall furnish and maintain, in good condition, all cleaning and televising equipment necessary for proper execution of the work.
- B. Retrieval of Materials and Equipment: It shall be the Contractor's responsibility to remove materials and equipment that has been lodged in the storm sewer from cleaning, television inspection, or point repair excavations.
- C. Work Schedule. This schedule shall outline the sequence in which the Contractor proposes to conduct his operations and shall be approved by Ecology before work is started. The level of detail of activities shall provide clear, concise communication of the plan of work. At a minimum, activities showing initial mobilization, start-up, cleaning and televising, and any resultant point repairs shall be included.

**3.02 STORM DRAIN TELEVISION INSPECTION**

- A. TV inspection of a storm drain segment shall be performed only when the inside pipe is free of standing water or when water depth inside the pipe is less than 10 percent of the inside pipe diameter. The Contractor shall control stormwater from entering the segment being televised during the TV inspection.
- B. The pan and tilt camera shall pause, pan, and visually inspect all service connections, pipe ends, and maintenance or structural defects.
- C. If a blockage due to structural defect cannot be removed and hampers the televising of the sewer in one direction then the Contractor shall attempt to complete the section by televising from the other catch basin or manhole to complete the section, this reversal should immediately follow the initial direction. The Contractor must immediately report the obstruction to Ecology.
- D. If the image quality is not adequate for post-inspection coding, the Contractor shall be required to repeat the survey at the Contractor's expense.
- E. The Contractor shall perform all CCTV inspections in accordance with NASSCO's Pipeline Assessment Certification Program (PACP). CCTV inspections shall be delivered entirely in electronic format. The entire survey shall be recorded in an approved electronic format submitted with electronic links between the data and the video.

- F. The Contractor shall provide a PACP certified operator on site at all times during the entire survey. If video is to be coded separately from the actual recording, both the onsite Operator and the individual performing the PACP coding shall be PACP certified. The Contractor shall provide proof of certification prior to commencement of work, prior to a change in personnel involved in data collection, and as requested by Ecology.

**3.03 CATCH BASIN AND MANHOLE CCTV INSPECTION**

- A. The Contractor shall document the exterior of each catch basin/manhole and surrounding area with still photographs.
- B. Perform catch basin/manhole TV inspection following the procedures described in MACP.
- C. Start camera at manhole rim in line with largest diameter outgoing pipe.
- D. Rotate camera clockwise until 360-degree panorama is complete. Provide still photos of defects noted, following MACP.
- E. Lower camera 2 to 3 vertical feet and repeat procedure outlined above.
- F. Repeat previous step until bench invert is reached.

**3.04 DOCUMENTATION OF TELEVISION INSPECTION**

- A. All Television Inspections shall be documented using a datalogger and reporting system as approved by Ecology. A PACP compliant datalogger and coding system must be used to perform the Work.
- B. If television inspection of an entire section cannot be successfully performed from one manhole, perform a reverse setup to obtain a complete television inspection. No additional payment will be made for a reverse setup.
- C. Television Inspection Logs:
  - 1. Computer printed location records shall be kept by the Contractor and shall clearly show the location and orientation in relation to an adjacent catch basin or manhole of each infiltration point observed during inspection.
  - 2. Other points of significance such as roots, broken pipe, presence of scale and corrosion, and other discernible features shall be recorded and a copy of such records shall be supplied to Ecology.
- D. Digital Photographs:
  - 1. Noted defects and lateral connections shall be documented as color digital files and color hard copy print-outs. Photo logs shall accompany each photo submitted.

- E. Video Recordings:
1. The video recording shall supply a visual record of problem areas of the lines that may be replayed. Video recording playback shall be at the same speed that it was recorded. Slow motion or stop-motion playback features may be supplied at the option of the Contractor. Once inspected, Ecology approved media shall be labeled and become the property of Ecology.
  2. Each media shall be labeled, at a minimum, with the following information:
    - Ecology
    - Project Name
    - Date of Creation
    - Storm Drain Segments Inspected
    - TV Inspection Firm's Name
  3. The Contractor shall have all video and necessary playback equipment readily accessible for review by Ecology during the project.
  4. The digital recording shall include video information that accurately reproduces the original picture of the video inspection. The video of the digital recording shall be free of electrical interference and shall produce a clear and stable image. Audio recording is optional and it is recommended the audio quality shall be sufficiently free of background and electrical noise so as to produce an oral report that is clear and discernible.
  5. Separate digital video recordings shall be made for each storm drain segment, and shall be properly identified, via continuous on-screen display recording, with:
    - Project name
    - Storm drain segment ID number
    - Upstream CB ID and downstream CB ID
    - Date of inspection
    - Distance along the reach from the entering catch basin/manhole
  6. The Contractor shall coordinate with Ecology prior to commencement of Work to ensure the identification is accomplished

in a manner acceptable to Ecology. If the video recording is of poor quality, Ecology retains the right to require a re-submittal of the affected sewer sections and no payment will be made until an acceptable video recording is made, submitted to, and accepted by Ecology.

### **3.04 PRE-INSTALLATION TV INSPECTION**

- A. Pre-installation TV inspections shall be performed: (1) immediately after the storm drain cleaning is completed to verify the point repairs shown on the Drawings and any additional point repairs are needed; and (2) after all point repairs have been completed to confirm the storm drain segments are suitable for CIPP lining installation.
- B. The camera shall be moved through the line in either direction at a moderate rate, stopping when necessary to permit proper documentation of the sewer's condition. In no case will the television camera be pulled at a speed greater than 30 feet per minute. Manual winches, power winches, TV cable, and powered rewinds or other devices that do not obstruct the camera view or interfere with proper documentation of the sewer conditions shall be used to move the camera through the sewer line.
- C. If, during the inspection operation, the television camera will not pass through the entire pipe section due to blockage or pipe defect, the Contractor shall set up his equipment so that the inspection can be performed from the opposite catch basin or manhole. If, again, the camera fails to pass through the entire pipe section, the Contractor shall determine the cause of the blockage or obstruction and inform Ecology immediately. The Contractor shall provide proposed method for completing the inspection to Ecology for approval. Improper cleaning will not be a reason for incomplete televising of a line section.
- D. During the internal inspection, the television camera shall be temporarily stopped at each defect along the line. The nature, location, and orientation of the defect shall be recorded by the Contractor. Where defects are also active infiltration sources, the rate of infiltration in gallons per minute shall be estimated by the Contractor and recorded.
- E. The camera operator shall slowly pan and tilt at beginning and ending manhole connections, each service connection, joints, visible defects, and at pipe material transitions.
- F. TV inspections shall be continuous for pipe segments between catch basins/manholes. Do not show a single segment on more than one media, unless specifically approved by Ecology.

### **3.05 POST-INSTALLATION TV INSPECTION**

- A. Post-installation TV inspection shall not be completed until all work, including main line and manhole visual, pressure testing, deflection and leakage testing is complete on a section of line.
- B. Post-installation TV inspection shall be completed by the Contractor in the presence of Ecology.
- C. The post-installation TV inspection shall be completed to confirm that rehabilitated lines are free of defects. Provide a color video showing the completed Work. Manhole rehabilitation should be complete prior to post-installation TV Work.
- D. Document the completion of storm drain rehabilitation and the conformance of the Work to the Contract Documents. Provide a full 360-degree view of all pipe and joints.
- E. The Contractor shall flush and clean the rehabilitated storm drain lines as necessary prior to performing the post-installation TV inspection.

**3.06 ACCEPTANCE OF TV INSPECTION RESULTS**

- A. Television inspection results will be accepted by Ecology when the videos and inspection logs meet the requirements of the Contract Documents.

END OF SECTION



**PART 1 - GENERAL**

**1.01 DESCRIPTION OF WORK**

- A. Perform repairs on defects of catch basins and manholes identified by the CCTV and visual inspection of this Project. Furnish all materials, equipment, tools, and labor as required for the rehabilitation of the catch basins and manholes in accordance with the requirements in the Drawings and Specifications.

**1.02 SUBMITTALS**

- A. Catch Basin and Manhole Rehabilitation Plan
- Work schedule.
  - List of catch basin and manhole requiring rehabilitation, including structure identification numbers, catch basin/manhole depths, elevations and locations of defects.
  - Proposed repair method (e.g., sealing, coating and/or lining, etc.) and procedures specific to each catch basin and manhole that requires repair.
  - Methods of sealing pipes at catch basins and manholes.
  - List of personnel performing the rehabilitation with a minimum of three (3) years of experience using the proposed product.
  - All Contractor's employees and/or subcontractors performing the rehabilitation work must be certified by the manhole rehabilitation system supplier if applicable.
  - Information on the products/materials to be used for repairs, including product name, manufacturer's product information, references of successful use of the materials in similar applications.
  - List of equipment to be used for performing repairs.
  - Health and safety measures.
  - Traffic control measures.

**1.03 QUALITY CONTROL**

- A. The Contractor is responsible for the workmanship and quality of the coating system installation. Inspections by Ecology's Representative or the coating system manufacturer's technical representative will not relieve or limit the Contractor's responsibilities.

- B. Only personnel who are trained by the coating system manufacturer's technical representative specifically for this contract or who are approved by the coating system manufacturer specifically for this contract shall be allowed to perform the coating system installation specified in this Section Manhole Rehabilitation.
- C. Contaminated, outdated, diluted materials, and/or materials from previously opened containers shall not be used.
- D. For repairs, the Contractor shall provide the same products, or products recommended by the coating system manufacturer, as used for the original coating.
- E. The Contractor shall identify the points of access for inspection by Ecology's Representative. The Contractor shall provide ventilation, ingress and egress, and other means necessary for Ecology's personnel to access safely the work areas.
- F. The Contractor shall conduct the work so that the coating system is installed as specified and shall inspect the work continually to ensure that the coating system is installed as specified. Coating system work that does not conform to the specifications or is otherwise not acceptable shall be corrected as specified.
- G. The Contractor shall provide written daily reports that present, in summary form, test data, work progress, surfaces covered, ambient conditions, quality control inspection test findings, and other information pertinent to the coating system installation.

**1.04 DELIVERY AND STORAGE**

- A. Materials shall be delivered to the job site in their original, unopened containers. Each container shall be properly labeled. Materials shall be handled and stored to prevent damage to or loss of label.
- B. Labels on material containers shall show the following information:
  - 1. Name or title of product.
  - 2. Product manufacturer's name and batch number.
  - 3. Application and mixing instructions.
  - 4. Hazardous material identification label.
  - 5. Shelf life expiration date.
- C. Materials shall be stored in enclosed structures and shall be protected from weather and excessive heat or cold in accordance with the coating system manufacturer's recommendations. Flammable materials shall be stored in accordance with state and local requirements.

- D. Containers shall be clearly marked indicating personnel safety hazards associated with the use of or exposure to the materials.
- E. Material Safety Data Sheets (MSDS) for each material shall be provided to Ecology. The Contractor shall store and dispose of hazardous waste according to federal, state and local requirements.

**PART 2 - PRODUCTS (NOT USED)**

**PART 3 - EXECUTION**

**3.01 GENERAL**

- A. Prior to performance of actual work, the Contractor shall locate and mark those catch basins and manholes designated to be rehabilitated.
- B. Cleaning of catch basins and manholes shall be performed as specified in **SECTION 33 42 03 – STORM DRAIN CLEANING**.
- C. The Contractor shall install temporary bypass for flow control as specified in **SECTION 33 32 09 – TEMPORARY BYPASS**.
- D. If site conditions preclude the Contractor from mobilizing the sealing, coating and/or lining equipment near the catch basin or manhole, the Contractor shall apply the coating and/or liners per the manufacturer's instructions and recommendations. Hand applications shall be completed at no additional cost to Ecology.

**3.02 REHABILITATION PROCEDURES**

- A. Place cover over invert to prevent extraneous material from entering the storm drain lines.
- B. All foreign material shall be removed from the manhole wall and bench using a high-pressure water spray (minimum 1200 psi). Loose and protruding brick, mortar, and concrete shall be removed using a mason's hammer and chisel and/or scraper. Fill any large voids with quick-setting patching mix. The surface to be repaired must be clean and free of any loose materials with walls totally saturated with water.
- C. Minor leaks shall be stopped using the quick-setting specially formulated infiltration control mix and shall be mixed and applied per manufacturer's recommendations. Some leaks may require weep holes to localize the infiltration during the application, after which the weep holes shall be plugged with the quick-setting infiltration control mix prior to the final liner application. When severe infiltration is present, drilling may be required in order to pressure grout using a cementitious or chemical grout.

Manufacturer's recommendations shall be followed when pressure grouting is required.

- D. After all preparation Work has been completed, remove all loose material and wash wall again.
- E. Any bench, invert, or service line repairs shall be made at this time using the quick-setting patching mix per manufacturer's recommendations.
- F. Invert Repair:
  - 1. Invert repair shall be performed on all inverts with visible damage or infiltration. After blocking flow through the manhole and thoroughly cleaning invert, the quick-setting patch mix shall be applied to the invert in an expeditious manner.
  - 2. The mix shall be troweled uniformly onto the damaged invert extending out onto the base of the manhole sufficiently to tie into the structural/structurally enhanced monolithic liner to be applied.
  - 3. The finished invert surfaces shall be smooth and free of ridges. Upon completion of the invert repair and lining, there shall be a smooth transition from the invert to all of the lined and unlined incoming and outgoing connections
- G. Watertight Seal between Pipe Liner and Manhole Liner:
  - 1. Where a manhole has been lined through with a pipeline liner, the Contractor shall prepare a watertight seal and smooth transition between the pipe liner and manhole liner system. No leakage or gaps will be allowed. The method of sealing and preparing a smooth transition shall be approved by Ecology.

### **3.03 REHABILITATION METHODS**

- A. Cementitious Liner Installation:
  - 1. The procedures for manhole preparation, cleaning, application and testing. The applicator, approved and trained by the manufacturer, shall furnish all labor, equipment and materials for applying a cementitious mix with machinery specially designed for the application.
  - 2. All aspects of the installation shall be in accordance with the manufacturer's recommendations and with the following specifications which include:
    - Elimination of active infiltration prior to the application.
    - Removal of loose and unsound material and cleaning surfaces in accordance with **SECTION 33 42 03 – STORM**

**DRAIN CLEANING** and per manufacturer's recommendations.

- Repair and sealing of the invert and benches.
- Spray application of a cementitious mix to form a liner.

3. Liner Application:

- a. Prior to liner application onto walls, manhole bench area shall be covered with plywood sections, which conform to the internal dimensions of the manhole, to prevent accumulation of liner material on bench.
- b. No application shall be made to frozen surfaces or if freezing is expected to occur inside the manhole within 24 hours after application. If ambient temperatures are in excess of 95° F, precautions shall be taken to keep the mix temperature at time of application below 90° F. Mix water temperature shall not exceed 85° F. Chill with ice if necessary.

4. Mixing:

- a. For each bag of product, use the amount of water specified by the manufacturer and mix for 30 seconds to 1 minute after all materials have been placed in the mixer, using equipment per manufacturer's recommendation.
- b. Empty the mixed material into the holding hopper and prepare another batch with timing such that the nozzleman can spray in a continuous manner without interruption until each application is complete.

5. Spraying:

- a. First Application: The surface prior to spraying shall be damp without noticeable free water droplets or running water, but totally saturated. Materials shall be spray applied from the bottom of the wall to the top, to a minimum uniform thickness to ensure that all cracks, crevices, and voids are filled and a relatively smooth surface remains after light troweling. The light troweling is performed to compact the material into voids and to set the bond.
- b. Second Application (as necessary per manufacturer's recommendations): A second application is to be applied after the first application has begun to take an initial set (disappearance of surface sheen which could be 15 minutes to 1 hour depending upon ambient conditions) to assure a minimum total finished thickness of ½ inch. Again application

shall be from the bottom up. The surface is then troweled to a smooth finish being careful not to over trowel so as to bring additional water to the surface and weaken it. Manufacturer's recommendations shall be followed when more than 24 hours have elapsed between applications.

- c. Bench Application: The plywood covers shall be removed and the bench sprayed such that a gradual slope is produced from the walls to the invert with the thickness at the edge of the invert being no less than ½ inch. The wall bench intersection shall be rounded to a uniform radius equal to the full circumference of the intersection.
- d. The Contractor shall take precautions to keep overspray or excess material from entering the newly installed liner pipe and any other pipes in the manhole.

6. Curing:

- a. Caution should be taken to minimize exposure of applied product to sunlight and air movement.
- b. If application of second coat is to be longer than 15 minutes after completion of application of first coat, the manhole cover shall be set back in place. At no time should the finished product be exposed to sunlight or air movement for longer than 15 minutes before replacing the manhole cover.
- c. The final application shall have a minimum of 4 hours cure time before being subjected to active flow.
- d. Traffic shall not be allowed over manholes for 6 hours after rehabilitation is complete.

B. Cured-In-Place Manhole Liner (CIPM) Installation:

- 1. Cured-in-place manhole liner systems shall be suitable for use as a monolithic surfacing in sewer manholes. The cured in place liner system shall be Perma-Liner™ CIPMH™ or pre-approved equal.
- 2. The cured in place liner shall be installed on the benches, walls, channels, and inverts of existing manholes. The cured surface shall be smooth and continuous with proper sealing connections to all unsurfaced areas. The cured in place liner shall begin below the frame and the frame/liner interface shall be sealed using an epoxy.
- 3. The cured in place liner shall be continuously bonded to all the brick, mortar, concrete, chemical sealant, grout, pipe and other surfaces inside the sewer manhole. The cured in place liner shall form a continuous, tight-fitting, hard, impermeable surfacing which is

suitable for sewer system service and chemically resistant to any chemicals or vapors normally found in domestic sewage. The liner shall effectively seal the interior surfaces of the manhole and prevent any penetration or leakage of groundwater infiltration.

4. The finished liner must be repairable at any time during the life of the structure. The liner shall be flexible, and have an elongation sufficient to bridge up to a ¼-inch settling crack, without damaged to the liner. The liner shall be able to bridge expansion cracks that may occur.
5. Field acceptance of CIPM shall be based on evaluation of the proper monolithic lining of the manhole performed by manufacturer's certified personnel. Field acceptance shall also include evaluation of the appropriate installation and curing test data along with review of the manhole inspections.
6. The CIPM shall provide a continuous monolithic lining with uniform thickness throughout the manhole interior. If the thickness of the CIPM is not uniform or is less than specified, it shall be repaired or replaced at no additional cost to Ecology.
  - a. certified manufacturer's personnel will measure the CIPM cured thickness by physically cutting through the lining (by drilling or coring) and making a direct measurement. There will be up to two thickness measurement locations in each CIPM manhole. A suitable non-destructive type of thickness measurement may also be used.
  - b. All CIPM thickness measurement locations shall be repaired by the Contractor in accordance with the manufacturer's recommendations. These repairs shall be included in the two-year guarantee.
  - c. The Contractor shall also perform in-place testing in each manhole to verify the adhesion of the CIPM to the existing manhole substrate. Adhesion strength tests shall be in accordance with ASTM D7234 and the test area shall be isolated from the remaining portion of the manhole by coring through the liner into the substrate. Two tests shall be performed in each manhole at locations directed by the manufacturer's certified personnel. Testing shall consist of a calibrated pull off test. All equipment shall be provided by the Contractor. Samples must meet a minimum pressure resistance of 400 psi.
7. There shall be no cracks, voids, pinholes, uncured spots, dry spots, lifts, delaminations or other type defects in the liner.



- C. Epoxy Manhole Monolithic Lining System (EMMLS) Installation:
1. Field acceptance of EMMLS shall be based on the manufacturer's certified personnel's evaluation of the proper monolithic lining of the manhole. Field acceptance shall also include evaluation of the appropriate installation and curing test data along with review of the manhole inspections.
  2. The EMMLS shall provide a continuous monolithic lining with uniform thickness throughout the manhole interior. If the thickness of the EMMLS is not uniform or is less than specified, it shall be repaired or replaced at no additional cost to Ecology.
    - a. The manufacturer's certified personnel will measure the EMMLS cured thickness by physically cutting through the lining (by drilling or coring) and making a direct measurement. There will be up to two thickness measurement locations in each EMMLS manhole. A suitable non-destructive type of thickness measurement may also be used.
    - b. All the EMMLS thickness measurement locations shall be repaired by the Contractor in accordance with the manufacturer's recommendations. These repairs shall be included in the two year EMMLS guarantee.
    - c. The Contractor shall also perform in-place testing in each manhole to verify the adhesion of the EMMLS to the existing manhole substrate. Adhesion strength tests shall be in accordance with ASTM D7234 and the test area shall be isolated from the remaining portion of the manhole by coring through the liner into the substrate. Two tests shall be performed in each manhole at locations directed by the manufacturer's certified personnel. Testing shall consist of a calibrated pull test. All equipment shall be provided by the contractor. Samples must meet a minimum pressure resistance of 400 psi.
  3. There shall be no cracks, voids, pinholes, uncured spots, dry spots, lifts, delaminations or other type defects in the EMMLS.
- D. Enhanced Cementitious Liner
1. The monolithic cementitious lining shall cover the complete interior of the existing sewer manhole including the benches (shelves). The lining shall effectively seal the interior surfaces of the manhole and prevent any penetration or leakage of groundwater infiltration.
  2. The lining shall be compatible with the thermal condition of the existing manhole surfaces. Surface temperatures will range from

20°F to 100°F. Provide test data on shrinkage of the cementitious lining based on ASTM C596.

3. If an internal flexible chimney seal is required per the pre-existing condition, then the lining shall be installed 1 inch below the bottom of the manhole frame.
4. The termination of and surface of the lining shall be suitable for proper installation of the manhole frame-chimney seal specified.
5. The cured system shall be continuously bonded to all brick, mortar, concrete, chemical sealant, grout, pipe and other surfaces inside the sewer manhole.
6. Chemical sealants, grouts or patching materials used to seal active manhole leaks, to patch cracks, to fill voids and to otherwise prepare the manhole surface prior to application of the system shall be fully compatible with the system.

### **3.04 LINER AND COATING ACCEPTANCE AND TESTING**

- A. The finished manhole surface shall be continuous and as free as commercially practicable from significant defects. Any defects which will affect, in the foreseeable future, or warranty period, the integrity or strength of the manhole shall be repaired at the Contractor's expense, in a manner mutually agreed upon by Ecology and the Contractor.
- B. There shall be no cracks, voids, pinholes, uncured spots, dry spots, lifts, delaminations or other type defects in the liner. If any defects are discovered after liner has been installed, it shall be repaired or replaced in a satisfactory manner within 72 hours and at no additional cost to Ecology. This requirement shall apply for the entire guarantee period.
- C. Active infiltration through the lining system shall be zero.
- D. The Contractor is responsible for coordinating testing times with the Ecology's Representative schedule as the Ecology's Representative may be involved in other tasks for scope on this project.
- E. All rehabilitated manholes shall be tested. The Contractor shall submit proposed method for testing. One or more of the following tests shall be performed by the Contractor as directed by Ecology's Representative.
  1. Cementitious and Enhanced Cementitious
    - a. Visually verify the absence of leaks or physical defects.
    - b. Cementitious manholes rehabilitation thickness shall be tested by inserting a measurement device at 8 defined

- locations in the manhole, as directed by Ecology's Representative.
- c. Four 3-inches by 6-inch test cylinders or six 2-inch cubes shall be cast each Day or from every 50 bags of product used. The test specimen shall be properly labeled and sent in for testing in accordance with the manufacturer's directions for compression strength testing as described in ASTM C 495. The frequency may be reduced by Ecology's Representative at their discretion if the samples pass the required strengths.
  - d. Pull off test in accordance with ASTM D4541 with a minimum acceptable pull strength of 250 psi. The failure point of the pull must be located within the substrate not within the coating thickness.
2. Cured in Place Manhole Liner (CIPM)
    - a. Visually verify the absence of leaks or physical defects.
    - b. Vacuum Test or Hydrostatic Test: Either a vacuum test conforming to the requirements of ASTM C1244 or the Exfiltration Test shall be performed for every lined manhole or circular structure where practical. The Exfiltration Test shall consist of plugging incoming and outgoing drain lines (or performing prior to reinstating the holes) and filling the manhole with water up to the rim. After initial absorption (15 minutes), if the water loss exceeds one inch in depth in five minutes, the manhole shall have failed the test. Each manhole which fails the test shall be carefully inspected to determine the problem and then resealed and retested until the water loss is less than one inch in 15 minutes.
  3. Epoxy Manhole Monolithic Lining System (EMMLS)
    - a. Visually verify the absence of leaks.
    - b. Holiday detection test: A holiday detection test shall be performed on all coated surfaces in the presence of Ecology's Representative.
    - c. Pull off test in accordance with ASTM D4541 with a minimum acceptable pull strength of 250 psi. The failure point of the pull must be located within the substrate not within the coating thickness.

### **3.05 MANHOLE SETP**

- A. The Contractor shall remove all steps as required by the rehabilitation method, such as coating and lining. Removal shall consist of neatly cutting steps flush with the wall prior to any lining installation. The Contractor shall be responsible for proper disposal of steps.
- B. The Contractor shall restore the steps if the conditions are suitable for reinstallation, otherwise the Contractor shall install new steps (BID ASSUMPTIONS).

**3.06 MANHOLE FRAME AND COVER**

- A. Realign manhole frame and cover as necessary.
- B. If the manhole frame and cover are damaged and require replacement, the Contractor shall remove and replace the manholes, as directed by Ecology.

END OF SECTION

**PART 1 - GENERAL**

**1.01 DESCRIPTION OF WORK**

- A. The Work includes installation, operation and maintenance of temporary stormwater bypass for the North and South Detention Ponds during the storm drain rehabilitation work. Currently the stormwater in the detention ponds discharges via the outflow network to the Snohomish River. The bypass shall be aboveground pipelines with proper protection to prevent spill and ensure the continuous bypass operation.
- B. Install temporary plugs at the overflow structures of North and South Detention Ponds to temporarily stop the overflow from flowing through the outflow network. Remove the plugs after the point repairs, CIPP liner installation and manhole/catch basin repairs have been completed.
- C. The Contractor shall provide all pumps, piping and other equipment necessary to accomplish bypass pumping and removal of the bypass system after the storm drain rehabilitation is completed.

**1.02 SUBMITTALS**

- A. Stormwater Bypass Plan: The Contractor shall submit a Stormwater Bypass Plan for review and approval by Ecology's Representative prior to installing the bypass. The plan shall include, at a minimum, the following:
  - 1. Schedule for installation and maintenance of bypass pumping system.
  - 2. Bypass pump sizes, capacity, number of pumps on site and power requirements.
  - 3. Road crossing details if applicable.
  - 4. Storm pipe and manhole plugging method.
  - 5. Size, length, material, location and method of installation for discharging piping. Show the bypass piping layout on a site plan from detention pond outflow structures to the outfall.
  - 6. Methods for protecting the bypass piping and pumps.
  - 7. Float switches, alarms, and pump controls.
  - 8. Overflow prevention, containment and cleanup plan.

- B. Submit the submittal in accordance with the submittal timing requirements identified in **SECTION 01 33 00 – SUBMITTAL PROCEDURES**.

**PART 2 - PRODUCTS (NOT USED)**

**PART 3 - EXECUTION**

**3.01 GENERAL**

- A. The temporary stormwater bypass shall be installed prior to the storm drain cleaning operation and remain operational until point repairs, installation of the CIPP liner and manhole/catch basin repairs have been completed and accepted by Ecology.
- B. The stormwater bypass shall be constructed of pipes that are durable, withstanding anticipated fluid pressure from pumping, weather resistant (e.g., UV protection and frozen condition) and durable (e.g., fatigue and surges). No glued PVC piping is allowed. Discharge hose will only be allowed in short sections per site conditions and shall be approved by Ecology. The bypass system shall be fully (100%) watertight with no exceptions.
- C. A temporary stormwater bypass layout is shown on the Drawings. The Contractor shall verify the layout in the field with any proposed modifications in the Temporary Bypass Plan for review and approval by Ecology. The bypass routes shall minimize any disturbance to the existing utilities, uses of public and private properties.
- D. The Contractor shall comply with OSHA requirements when working inside confined space such as a manhole.

**3.01 CONSTRUCTION REQUIREMENTS**

- A. Plug the upstream outflow pipes at the overflow structures at the North and South Detention Ponds and the outflow pipe at CB24 that discharges to the outfall with plugs in the approved Stormwater Bypass Plan.
- B. Install bypass pipelines from the detention pond overflow structures to the outfall as shown on the Drawings.
- C. The bypass system shall have sufficient capacity to handle the stormwater flows at the overflow structures during both dry- and wet-seasons. The Contractor shall monitor the pumps and pipelines continuously when the bypass pumping is necessary.
- D. The pumping equipment shall not have excessive noise levels exceeding the maximum permissible noise levels specified in the City of Everett Noise Ordinance.
- E. The Contractor shall protect all pumps, pipelines and other equipment used for bypass from traffic or other possible sources of damage. The Contractor is solely responsible for repair or replacement of damaged bypass equipment and pipes.
- F. Should any stormwater overflow from the detention ponds be spilled, discharged, leaked to the open environment as a result of the Contractor's bypass operation, the Contractor shall be responsible for costs associated with any damages that may require repair or corrective actions.

END OF SECTION



**PART 1 - GENERAL**

**1.01 DESCRIPTION OF WORK**

- A. Contractor shall perform point repairs for the defective storm pipe sections prior to CIPP liner installation. Storm drain defects and point repair locations are shown on the Drawings. The Contractor shall be responsible for verifying the defects and identifying any additional defects that require point repairs. It is the Contractor's sole responsibility to perform repairs on the storm pipes to a condition acceptable for the CIPP installation.
- B. The Work includes removal of pavement and disposal, excavation support, dewatering, excavation, removal and disposal of existing defective pipe, furnishing and installing replacement pipe, fittings and couplings, connections to existing pipe and/or catch basins or manholes, restoration of pavement and landscaping.
- C. The Work described in this Section shall incorporate and conform to the requirements in:
- **SECTION 02 41 00 – DEMOLITION, CLEARING AND GRUBBING**
  - **SECTION 02 61 15 – TRANSPORTATION AND DISPOSAL OF CONTAMINATED MATERIALS**
  - **SECTION 31 50 00 – EXCAVATION SUPPORT AND PROTECTION**
  - **SECTION 31 23 19 – DEWATERING**
  - **SECTION 31 23 23 – BACKFILL**
  - **SECTION 32 01 16 – PAVEMENT PATCHING**
  - **SECTION 32 17 00 – PAVEMENT MARKINGS AND SIGNAGE**
  - **SECTION 32 90 00 – PLANTING**
  - **SECTION 33 92 23 – SODDING**

**1.02 SUBMITTALS**

- A. Storm Drain Repair Plan: The Contractor shall submit a storm drain repair plan describing equipment, materials, methods and procedures that the Contractor proposes to use for the repairs. The plan shall also describe construction sequencing, traffic control, excavation support, construction materials management (e.g., demolition debris, cleared and grubbed vegetation, excavated soil, etc.), dewatering, decontamination, and other activities associated with the Work.

- B. Submit the submittals in accordance with the submittal timing requirements identified in **SECTION 01 33 00 – SUBMITTAL PROCEDURES**.

**1.03 QUALIFICATIONS**

- A. Personnel engaged in contaminated/hazardous materials work must have received all applicable health and safety training to meet the requirements of Chapter 296-62/-843 Washington Administrative Code (WAC), Occupational Safety and Health Administration (OSHA), Washington Industrial Safety and Health Act (WISHA), and federal, state and local regulations. Personnel engaged in contaminated/hazardous materials work must have received 40-hour Hazardous Waste Operations and Emergency Response (HAZWOPER) training and shall be current with their 8-hour refresher.

**1.04 QUALITY ASSURANCE**

- A. Contractor shall comply with applicable provisions of the following standard specifications and documents:
  - 1. WSDOT Standard Specifications Washington State Department of Transportation 2018 Standard Specifications for Road, Bridge, and Municipal Construction (WSDOT Standard Specifications).
  - 2. City of Everett Construction Standards.

**1.05 DIMENSIONS AND LAYOUTS**

- A. The Contractor shall be responsible for furnishing, setting and marking all line and location stakes, including offsets and general construction staking. When Work requiring control is being performed, all necessary related equipment, supplies and instruments shall be on site and in use by Contractor. A qualified layout engineer, surveyor, or technical specialist must be assigned to the Contractor's crew for this Work. The equipment and personnel must be available, at no additional cost to Ecology, for the purpose of verifying layout, conformance of grading, and certifying the accuracy of Work on the Project Site.
- B. The Contractor shall be responsible for preserving all benchmarks and stakes and the replacement of any that are displaced or missing.
- C. The Contractor shall be responsible for review of all utility purveyor, and City, County or State records relative to the existing underground utilities. The Contractor shall be responsible for avoiding damage to these facilities and shall restore all utilities at no additional cost to Ecology.
- D. Contractor shall identify all utilities encountered during clearing, excavation, and all other Work performed for the Project.

1. Document utility conditions, layout, and configuration, identifying any damage experienced prior to and/or during the Work.
2. Identification should include the materials and the location and alignment of those utilities.
3. The Contractor shall notify the Ecology Representative immediately if underground utilities not shown in Contract Documents, or not located by the utility locate service, are encountered.

## **PART 2 - PRODUCTS**

### **2.01 CORRUGATED POLYETHYLENE DRAIN PIPE**

- A. Polyethylene (PE) Drain Pipe: Conform to WSDOT Section 9-05.1(7).
  1. Fittings shall be same material as the drain pipe.
  2. Provide connections to catch basins with A.C. x PVC Brant, Ko-N-Seal Connector or GPK manhole adapter or an approved equivalent product. Portland cement joints on pipe are prohibited.

### **2.02 POLYVINYL CHLORIDE (PVC) DRAIN PIPE**

- A. Polyvinyl Chloride (PVC) Drain Pipe: Conform to WSDOT Section 9-05.12 with rubber gasket joints.
  1. Fittings shall be same material as pipe.
  2. Provide connections to catch basins with AC or GPK manhole adapter or an approved equivalent product. Portland cement joints on pipe are prohibited.

### **2.03 FITTINGS, COUPLINGS AND JOINTS**

- A. Fittings shall be the same material as the pipe.
- B. Jointing new pipe to existing pipe for storm drain mains shall be in accordance with WSDOT Section 7-04.3.
- C. Connections between pipes of differing material shall be made with a flexible gasketed coupling, adaptor or coupling-adaptor to make a watertight joint. Couplings shall be those manufactured by Romac, Caulder, or Fernco or approved equivalent product. Jointing of dissimilar pipe shall be in accordance with WSDOT Section 7-08.3(2)G.

### **2.04 DETECTABLE MARKING TAPE**

- A. Detectable marking tape shall conform to WSDOT Section 9-15.18.

**2.05 FOUNDATION GRAVEL, PIPE BEDDING AND BACKFILL MATERIAL**

- A. Foundation gravel, pipe bedding and backfill materials for excavation and trench shall conform to the requirements specified in **SECTION 31 23 23 BACKFILL**.

**2.06 CATCH BASINS AND MANHOLES**

- A. Catch basins and manholes replacement, as necessary, shall be performed in accordance with City of Everett Standard Plans and WSDOT Section 7-05. Catch basins shall have outlet traps.

**PART 3 - EXECUTION**

**3.01 EXAMINATION**

- A. Locate all point repair locations as indicated on the Drawings and additional point repairs that are identified during the preconstruction video survey as approved by Ecology's Representative.
- B. Information pertains to the storm drain lines and pipes, and point repair locations are provided in the Drawings.

**3.02 PREPARATION**

- A. Coordinate with Ecology and property owner or tenant within the Project Area to limit adverse effects of the work on their operations.
- B. The Contractor shall ensure adequate protection for all personnel during construction and comply with all health and safety requirements of Contractor's site-specific health and safety plan.
- C. Provide all temporary controls including site security, traffic control, environmental, temporary erosion and sediment controls (TESC), dust and air emissions control during excavation in accordance with the requirement of the Contract Documents.
- D. Contractor shall contact utility location service and have all underground utilities on the Project Site and adjacent rights of way clearly marked. For aid in utility location call "Dial Dig 1-800-424-5555" a minimum of two working days prior to beginning demolition, clearing, grubbing, and excavation activities.
  - 1. The Contractor shall inform Ecology of any new utilities that are identified as a result of utility locate that are not shown or shown in a different location on the Contract Drawings.

2. If undocumented utilities are uncovered during excavation, the Contractor shall inform Ecology of such occurrence and shall obtain Ecology's direction for protection or demolition of such undocumented utilities. The Contractor shall be responsible for all costs associated with the decommissioning and demolition of undocumented utilities unless it is determined by Ecology that the undocumented utility represents a change condition.
  3. Damage to any utilities or utility structures that are not designated for demolition shall be repaired by the Contractor to the satisfaction of Ecology, at no additional cost to Ecology.
- E. Before commencing excavation, Contractor shall verify location of site features, utilities and vegetation that are specified to be protected in place and ensure they are protected and prominently marked. Contractor shall also verify location of site features, utilities and vegetation that are specified to be demolished, cleared and grubbed.

### **3.03 EXCAVATION**

- A. Excavate the storm drain point repair area carefully to not damage the existing storm drain pipes not designated to be repaired or replaced. The trench shall be dewatered, as necessary, to maintain a dry working condition during the point repair work.
- B. Excavation slopes and benches shall conform to OSHA requirements at all times. Provide excavation support (e.g., trench boxes), as necessary.
- C. Contractor shall inspect excavations daily to verify stability of slopes and benches, including excavation support system (i.e., trench boxes, shoring, etc.).
- D. The excavated soils shall be directly loaded to waste containers (e.g., roll-off boxes) located adjacent to the excavation, provided by the Contractor.
- E. The Contractor shall provide sufficient waste containers for the Work. Allow Ecology's Representative reasonable access to sample the waste containers as required for waste disposal profiling purposes.

### **3.04 STORM PIPE REPAIR**

- A. After the defective pipe section is exposed, uncover additional pipe length and space around the pipe to the extent necessary to allow for performance of the repair work.
- B. Saw-cut the defective pipe section so that the ends of the pipe section are straight and smooth and free of cracks or chips. Remove the defective pipe section from the trench.

- C. Remove the bedding material of the removed pipe section to 6 inches below the pipe grade. Over-excavate and remove the foundation soil below the pipe bedding material, as determined by Ecology's Representative, and backfill with WSDOT Section 9-03.17 Foundation Material Class A or Class B.
- D. Backfill the bottom of the excavation/trench with WSDOT Section 9-03.12(3) Gravel Backfill for Pipe Zone Bedding material in accordance with detail shown on the Drawings.
- E. Saw-cut the new replacement pipe, as necessary, to a flat vertical surface. Place the new pipe section to the same line and grade of the existing pipe. Inspect the replacement pipe section and fittings for any defects prior to laying the pipe into the trench.
- F. Connect the new pipe section to the existing pipe with an approved coupling to provide a watertight connection. The coupler shall be selected and installed per the manufacturer's recommendations.
- G. Pipe material used in the point repair sections shall be the same as the existing storm drain pipe.
- H. If replacement of an entire storm drain pipe segment is required, as approved by Ecology, install storm drain pipe in accordance with City of Everett Construction Standards and WSDOT Section 7-04.
- I. Protect the existing storm drain pipe, nearby underground and aboveground utilities and surface improvements from damage during the point repair activities. Any repair of damages resulting from the point repairs will be at the Contractor's expense.
- J. The finished pipe installation shall be free from visual defects and damage, and no visual infiltration.

### **3.05 BEDDING AND BACKFILLING**

- A. Pipe bedding and backfilling shall be performed in accordance with **SECTION 31 23 23 – BACKFILL.**

### **3.06 FIELD QUALITY CONTROL**

- A. Perform trench and roadway compaction density testing on compacted fill and on roadway bases in accordance with the WSDOT Standard Specifications and the WSDOT Construction Manual.

### **3.07 CLEANING AND TESTING**

- A. Clean and test the repaired pipe in conformance with WSDOT Section 7-04.3.
  - 1. The repaired storm drain pipes shall be tested as specified in WSDOT Section 7-04.3(1). Infiltration test will be acceptable for the pipes below groundwater table.

**DIVISION 33 – UTILITIES**  
**SECTION 33 42 10 – STORM DRAIN POINT REPAIR**

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**DRAFT**

2. Replace or repair section that fails testing as directed by Ecology Representative and at no additional cost to Ecology.
- B. Remove debris and leave premises clean and free of residue in accordance with the requirements of this Project Manual.

END OF SECTION



**PART 1 – GENERAL**

**1.01 DESCRIPTION**

- A. This section provides requirements for reconstruction of the existing storm drain lines at the Site by installation of cured-in-place pipe (CIPP) consisting of a resin-impregnated flexible tube, which is tightly formed to the original conduits. The resin is cured using either hot water under hydrostatic pressure or steam pressure within the tube. The CIPP shall be continuous and tight fitting.

**1.02 REFERENCES**

- A. ASTM F1216 -- “Rehabilitation of Existing Pipelines and Conduits by the Inversion and Curing of a Resin-Impregnated Tube”.
- B. ASTM F1743 -- “Rehabilitation of Existing Pipelines and Conduits by Pulled-in-Place Installation of Cured-in-Place Thermosetting Resin Pipe (CIPP)”.
- C. ASTM D5813 -- “Cured-in-Place Thermosetting Resin Sewer Pipe”
- D. ASTM D790 -- “Test Methods for Flexural Properties of Un-reinforced and Reinforced Plastics and Electrical Insulating Materials”
- E. ASTM D2990 -- “Tensile, Compressive, and Flexural Creep and Creep-Rupture of Plastics”.

**1.03 QUALIFICATIONS**

- A. Only proven products with substantial successful installations and experience will be approved.
- B. In order for the CIPP product and Installation to be deemed commercially acceptable and approved for this project, the following CIPP product criteria must be met:
  - 1. The CIPP product must have been installed in a minimum of 5,000,000 linear feet or 4,000 manhole to manhole line sections of successful storm sewer systems in North America and must be documented to the satisfaction of Ecology.
  - 2. The CIPP product shall comply with the latest versions of ASTM F1216 or ASTM F1743, including appendices.
  - 3. For the CIPP to be considered Commercially Proven, it shall have been successfully in service in an application similar to this project for a minimum of 10 years and documented to the satisfaction of Ecology.
  - 4. The lining tube manufacturer shall operate under a quality management system that is third party certified to ISO 9001 or other internationally recognized organization standards. Proof of

- certification shall be submitted with the Contractor's bid and required for approval.
5. Third-party test results supporting the structural properties and long-term performance of the CIPP product shall be submitted for approval, and such data shall be satisfactory to Ecology. No CIPP product will be approved without independent third-party testing verification.
- C. Installation Contractor:
1. The Installation Contractor shall be certified by the CIPP product manufacturer to have had at least 5 years active experience in the installation of the proposed CIPP product.
  2. The Installation Contractor shall satisfy all insurance, financial and bonding requirements of Ecology, and shall have installed within the United States a minimum of 1,000,000 lineal feet of the same CIPP product being represented by the bidder.
  3. The Installation Contractor superintendent(s) designated for the project shall have installed a minimum of 100,000 lineal feet and shall have 5 years of installation experience of the same CIPP product being represented by the bidder. This shall be documented to Ecology's satisfaction in the form of a resume of work experience detailing scope of work (linear footage and pipe diameters), location of work, and reference contact information for each project listed.
  4. The Installation Contractor shall operate under a quality management system that is third party certified to ISO 9001 or equivalent standards. Proof of certification or quality management system shall be submitted with the Installation Contractor's bid and required for approval.

### **1.03 SUBMITTALS**

- A. Submit certification of lining tube manufacturer quality management system issued by ISO9001 or other internationally recognized organization standards.
- B. Submit third-party test results of the CIPP product as identified in **PART 2 – PRODUCTS**.
- C. Submit results of laboratory-determined thickness of the CIPP signed by a professional engineer registered in the state of Washington prior to CIPP installation.
- D. Submit a temporary stormwater bypass plan to Ecology's Representative.
- E. Submit pre-installation and post-installation video inspections to Ecology's Representative for review.
- F. Submit results of the testing required in this section.

**1.04 QUALITY ASSURANCE**

- A. Contractor shall comply with applicable provisions of the following standard specifications and documents:
  - 1. Applicable ASTM (American Society for Testing and Materials) standards.

**PART 2 – PRODUCTS**

**2.01 CIPP TUBE**

- A. The sewn tube shall consist of one or more layers of absorbent non-woven felt and fabric and meet the requirements of ASTM F1216, Section 5.1 or ASTM F1743, Section 5.2.1 or ASTM D 5813, Sections 5 and 6. The tube shall be constructed to withstand installation pressures, have sufficient strength to bridge missing pipe, and stretch to fit irregular pipe sections. The tube may also contain felt layers reinforced with glass or carbon fibers.
- B. The wet out tube shall have a relatively uniform thickness that when compressed at installation pressures will equal or exceed the calculated minimum design CIPP wall thickness.
- C. The tube shall be manufactured to a size that when installed will tightly fit the internal circumference and length of the original pipe. Allowance should be made for circumferential stretching during installation.
- D. The outside layer of the tube shall be coated with an impermeable, flexible membrane that will contain the resin and allow the resin impregnation (wet out) procedure to be monitored.
- E. The tube shall contain no intermediate or encapsulated elastomeric layers. No material shall be included in the Tube that may cause de-lamination in the cured CIPP. No dry or unsaturated layers shall be evident.
- F. The wall color of the interior pipe surface of CIPP after installation shall be a relatively light reflective color so that a clear detailed examination with closed circuit television inspection equipment may be made.
- G. Seams in the tube shall be stronger than the non-seamed felt material.
- H. The tube shall be marked for distance at regular intervals along its entire length, not to exceed 5 ft. Such markings shall include the Manufacturers name or identifying symbol. The tubes must be manufactured in the USA.

**2.02 RESIN**

- A. The resin system shall be a corrosion resistant polyester or vinyl ester system including all required catalysts, initiators that when cured within the tube create a composite that satisfies the requirements of ASTM F1216, ASTM D5813 and ASTM F1743, the physical properties herein, and those which are to be utilized in the submitted and approved design of the CIPP

for this project. The resin shall produce a CIPP that will comply with the structural and chemical resistance requirements of this section.

**2.03 STRUCTURAL REQUIREMENTS**

- A. The CIPP shall be designed as per ASTM F1216, Appendix X.1. The CIPP design shall assume no bonding to the original pipe wall. The CIPP shall have design life of fifty (50) years and shall be designed for H20 Highway live loads.
- B. The Contractor must have performed long-term testing for flexural creep of the CIPP pipe material. Such testing results are to be used to determine the long-term, time dependent flexural modulus to be utilized in the product design. This is a performance test of the materials (Tube and Resin) and general workmanship of the installation and curing as defined within the relevant ASTM standard. A percentage of the instantaneous flexural modulus value (as measured by ASTM D790 testing) shall be used in design calculations for external buckling. The percentage, or the long-term creep retention value utilized, shall be verified by this testing. Retention values exceeding 50 percent (%) of the short-term test results shall not be applied unless substantiated by qualified third party test data to Ecology's satisfaction. The materials utilized for the contracted project shall be of a quality equal to or better than the materials used in the long-term test with respect to the initial flexural modulus used in the CIPP design.
- C. The Enhancement Factor 'K' to be used in 'Partially Deteriorated' Design conditions shall be assigned a value of 7.
- D. The layers of the cured CIPP shall be uniformly bonded. It shall not be possible to separate any two layers with a probe or point of a knife blade so that the layers separate cleanly or the probe or knife blade moves freely between the layers. If the layers separate during field sample testing, new samples will be required to be obtained from the installed pipe. Any reoccurrence may cause rejection of the work.
- E. The cured pipe material (CIPP) shall conform to the structural properties, as listed below.

<b>MINIMUM PHYSICAL PROPERTIES</b>				
Property	ASTM Test Method	Polyester System	Filled Polyester System	Vinyl Ester System
Flexural Strength	ASTM D790	4,500 psi	4,500 psi	5,000 psi
Flexural Modulus (initial)	ASTM D790	250,000 psi	400,000 psi	300,000 psi
Flexural Modulus (50-year)	ASTM D790	125,000 psi	200,000 psi	150,000 psi

F. The required CIPP wall thickness shall be based as a minimum on the physical properties in Section 2.03-E above, and in accordance with the design equations in the Appendix X1 of ASTM F1216, and the following design parameters:

• Design Safety Factor (typically used value) =	2.0
• Retention Factor for Long-Term Flexural Modulus to be used in Design (As determined by long-term tests described in Section 1.3.D and approved by Ecology) =	50% - 75%
• Ovality* (calculated from (X1.1 of ASTM F1216) =	% <sup>(1)</sup>
• Enhancement Factor, K =	7
• Groundwater Depth (above invert of existing pipe) * =	Feet
• Soil Depth (above crown of existing pipe) * =	Feet <sup>(1)</sup>
• Soil Modulus (only required for fully deteriorated design conditions) =	Psi <sup>(1)</sup>
• Soil Density (only required for fully deteriorated design conditions) =	lb/ft <sup>3</sup> <sup>(1)</sup>
• Live Load (only required for fully deteriorated design conditions) =	H20 Highway
• Design Condition (partially or fully deteriorated) ** =	**
* Denotes information provided in the storm drain details shown on the Drawings.	
** Based on review of video logs, design conditions of pipeline can be fully or partially deteriorated (See ASTM F1216, Appendix X1). Ecology will determine as to pipe conditions and parameters utilized in design.	

<sup>(1)</sup> In the absence of other information and to ensure uniformity in bidding, the following assumptions shall be used: Ovality = 2%; Groundwater Depth at one half soil depth to invert; Soil Modulus = 1000 psi; Soil Density = 120 lb/ ft<sup>3</sup>.

### **PART 3 – EXECUTION**

#### **3.01 GENERAL**

- A. The Installation Contractor shall deliver the resin impregnated CIPP tube to the site and provide all equipment required to insert and cure the CIPP within the host pipe. The Installation Contractor shall designate a location where the tube will be vacuum impregnated with the resin prior to installation. If requested by Ecology, the Installation Contractor shall notify Ecology's Representative at least 48 hours prior to wet out to allow Ecology's representative to observe the materials and wet out procedure. All procedures to prepare the CIPP for installation shall be in strict accordance with the Manufacturer's recommendations.
- B. The CIPP shall be vacuum impregnated with resin not more than 120 hours before the time of installation and stored out of direct sunlight at a temperature of less than 70° F.

#### **3.02 NOTIFICATION AND PREPARATION**

- A. The Contractor shall install temporary stormwater bypass prior to the storm drain rehabilitation work.
- B. The Installation Contractor shall perform cleaning, video, and inspection prior to installation of the CIPP as specified in Contract Documents. The Installation Contractor shall remove all debris from within the pipe that will interfere with the installation of the CIPP.
- C. It shall be the responsibility of the Contractor to notify Ecology of line obstructions, offset joints or collapsed pipe that will prevent the insertion of the tube or significantly reduce the capacity of the sewer. Contractor shall determine the method of pipe repair required and shall address these concerns on a case-by-case basis.

#### **3.03 VIDEO INSPECTIONS**

- A. The Installation Contractor shall perform pre-installation and post-installation in accordance with the requirements in **SECTION 33 42 05 – TELEVISION INSPECTION**.

#### **3.04 TESTING REQUIREMENTS**

- A. Chemical Resistance – The CIPP shall meet the chemical resistance requirements of ASTM F1216, Appendix X2. CIPP samples for testing shall be of tube and resin system similar to that proposed for actual construction.

It is required that CIPP samples with and without plastic coating meet these chemical-testing requirements.

- B. Hydraulic Capacity – Overall, the hydraulic cross-section shall be maintained as large as possible. The CIPP shall have a minimum of the full flow capacity of the original pipe before rehabilitation. Calculated capacities may be derived using a commonly accepted roughness coefficient for the existing pipe material taking into consideration its age and condition.
- C. CIPP Field Samples – When requested by Ecology, the Contractor shall submit test results from field installations of the same resin system and tube materials as proposed for the actual installation. These test results must verify that the CIPP physical properties specified in this section have been achieved in previous field applications. Samples for this project shall be made and tested as described in this section.

### **3.05 INSTALLATION**

- A. CIPP installation shall be in accordance with ASTM F1216, Section 7, or ASTM F1743, Section 6, with the following modifications:
  - 1. Resin Impregnation – The quantity of resin used for tube impregnation shall be sufficient to fill the volume of air voids in the tube with additional allowances for polymerization shrinkage and the potential loss of resin during installation through cracks and irregularities in the original pipe wall, as applicable.
  - 2. Tube Insertion – The wet out tube shall be positioned in the pipeline using either inversion or a pull-in method as defined within relevant ASTM standards previously stipulated. If pulled into place, a power winch or its equivalent should be utilized and care should be exercised not to damage the tube as a result of pull-in friction. The tube should be pulled-in or inverted through an existing manhole or approved access point and fully extend to the next designated manhole or termination point.
  - 3. Temperature gauges shall be placed between the tube and the host pipe's invert position to monitor temperatures during the cure cycle.
  - 4. Curing shall be accomplished by utilizing hot water under hydrostatic pressure or steam pressure in accordance with the manufacturer's recommended cure schedule. A cool-down process shall be conducted that complies with the resin manufacturer's specification.

### **3.06 CURING**

- A. After the CIPP tube installation is completed, the Installation Contractor shall supply a suitable heat source and recirculation equipment (if required). The equipment shall be capable of delivering hot water or steam throughout the section to uniformly raise the temperature above the temperature required to affect a cure of the resin.



- B. The heat source shall be fitted with suitable monitors to gauge the temperature of the incoming and outgoing heat supply (for water cure) and outgoing heat supply (for steam cure). Water or air temperature in the pipe during the cure period shall be as recommended by the resin Manufacturer.
- C. Initial cure shall be deemed to be completed when inspection of the exposed portions of the CIPP appears to be hard and sound and the remote temperature sensor(s) indicates that the temperature is of a magnitude to realize an exotherm. The cure period shall be of a duration recommended by the resin Manufacturer, as modified for the installation process, during which time the recirculation of the heat and/or cycling of the heat exchanger to maintain the temperature is continued.

### **3.07 COOL DOWN**

- A. Cool down may be accomplished by the introduction of cool water or air to replace water or pressurized air being relieved. Care shall be taken in the release of the hydrostatic head so that a vacuum will not be developed.

### **3.08 INSPECTION**

- A. CIPP samples shall be prepared for each installation designated by Ecology/Engineer or approximately 20 percent (%) of the project's installations. Pipe physical properties will be tested in accordance with ASTM F1216 or ASTM F1743, Section 8, using either method proposed. The flexural properties must meet or exceed the values listed in this section, Table 1 of ASTM F1216 or the values submitted to Ecology/Engineer by the Contractor for this project's CIPP wall design, whichever is greater.
- B. Wall thickness of samples shall be determined as described in paragraph 8.1.6 of ASTM F1743. The minimum wall thickness at any point shall not be less than 87½ percent (%) of the submitted minimum design wall thickness as calculated in this section.
- C. Visual inspection of the CIPP shall be in accordance with ASTM F1743, Section 8.6.
- D. CIPP installation shall be inspected by post-lining video inspection. Variations from true line and grade may be inherent because of the conditions of the original piping. No infiltration of groundwater should be observed. All service entrances should be unobstructed and accounted for.

### **3.09 FINISH**

- A. The finished CIPP shall be continuous over the entire length of an insertion run and be as free as commercially practical from visual defects such as foreign inclusions, dry spots, pinholes, and delamination. The CIPP shall be homogeneous, and free of any leakage from the surrounding ground to the inside of the CIPP.

- B. Where the CIPP is installed through a manhole uninterrupted, the invert shall be maintained smooth within the manhole, with approximately the bottom half of the CIPP continuous through the length of the manhole. The invert of the manhole shall be shaped and grouted as necessary to support the liner. The cost of this work shall be included in the CIPP unit price.
- C. During the warranty period, any defects which will affect the integrity or strength of the CIPP, collect solids, or reduce hydraulic flow capabilities of the product shall be repaired at the Installation Contractor's expense in a manner mutually agreed upon by Ecology and the Installation Contractor.

**3.10 CLEAN-UP**

- A. Upon acceptance of the installation work and testing, the Contractor shall restore the project area affected by the operations to a condition at least equal to that existing prior to the work.

END OF SECTION

**APPENDIX H**  
**Quality Assurance Project Plan (QAPP)**

**Quality Assurance Project Plan (QAPP)**

Area B2 Storm Drain Repairs  
and Areas C2 and C3 Fencing  
Everett Smelter Site, Lowland Area  
Everett, Washington

*for*

**Washington State Department of Ecology**

June 29, 2018



Plaza 600 Building  
600 Stewart Street, Suite 1700  
Seattle, Washington 98101  
206.728.2674

## Quality Assurance Project Plan (QAPP)

### Area B2 Storm Drain Repairs and Areas C2 and C3 Fencing Everett Smelter Site, Lowland Area Everett, Washington

File No. 0504-068-02

June 29, 2018

Approved By:

Signature:

Date: June 29, 2018

Iain H. Wingard, Project Manager/Associate, GeoEngineers, Inc.

Signature:

Date: June 29, 2018

Abhijit R. Joshi, PE, Project Engineer/Field Coordinator, GeoEngineers, Inc.

Signature:

Date: June 29, 2018

Mark J. Lybeer, Laboratory Data Quality Assurance Leader, GeoEngineers, Inc.

AJ:IHW:leh

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**DISTRIBUTION LIST**

**Sandra Matthews**

**Washington State Department of Ecology**

Northwest Regional Office

Toxics Cleanup Program

3190 160<sup>th</sup> Avenue SE

Bellevue, Washington 98008-5452

[smat461@ecy.wa.gov](mailto:smat461@ecy.wa.gov)

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## 1.0 INTRODUCTION

This Quality Assurance Project Plan (QAPP) has been prepared for field and laboratory activities planned as part of storm drain repair work planned at Remedial Action Area B2 (Area B2) and fencing work at Remedial Action Areas C2 and C3 (Areas C2 and C3) at the Everett Smelter Site Lowland Area (i.e., Lowland Area) located in Everett, Washington. This QAPP serves as the primary guide to integrate quality assurance (QA) and quality control (QC) functions in sampling and analyses activities. The field activities including sampling and analyses planned as part of the storm drain repair and fencing work are described in the Engineering Design Report (EDR), Area B2 Storm Drain Repairs, and Areas C2 and C3 Fencing, Everett Smelter Site Lowland Area. Sampling and analysis activities to be completed by Ecology's representative include collection of soil samples from the stockpiled material for disposal characterization purposes.

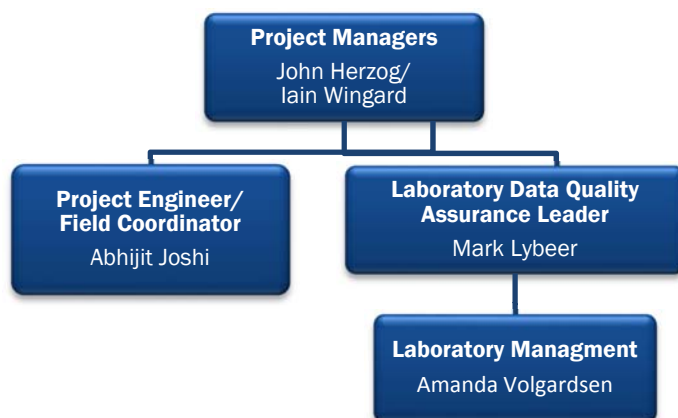
The QAPP presents the objectives, procedures, organization, and specific QA and QC activities designed to achieve chemical analytical data quality goals established for the project. Environmental measurements will be conducted to produce data that are scientifically valid, of known and acceptable quality and that meet established objectives. QA/QC procedures will be implemented so that the precision, accuracy, representativeness, completeness and comparability (PARCC) of the data generated meet the specified data quality objectives.

## 2.0 PROJECT MANAGEMENT

### 2.1. Project Organization and Responsibilities

Descriptions of the responsibilities, lines of authority and communication for the key positions providing QA/QC are shown in the Project Organization Chart provided below. The project organization facilitates the efficient production of project work, allows for an independent quality review, and permits resolution of any QA issues.

Project Organization Chart



### 2.1.1. Project Managers

John Herzog and Iain Wingard are the Project Managers and can be reached at 206.406.6431 and 206.595.7402, respectively. The Project Manager has overall responsibility for executing the project in accordance with contractual requirements. The Project Manager is also responsible for selecting project team members, assigning and coordinating project tasks, determining subcontractor participation, establishing and adhering to budgets and schedules, providing technical oversight, and coordinating production and review of project deliverables.

### 2.1.2. Project Engineer/Field Coordinator

Abhijit Joshi is the Project Engineer/Field Coordinator and can be reached at 425.223.9028. The Project Engineer/Field Coordinator responsibilities include the following:

- Provides technical direction to the field staff.
- Develops schedules and allocates resources for field tasks.
- Coordinates data collection activities to be consistent with information requirements.
- Supervises the compilation of field data and laboratory analytical results.
- Assures that data are correctly and completely reported.
- Implements and oversees field sampling in accordance with project plans.
- Supervises field personnel.
- Coordinates work with on-site subcontractors.
- Schedules sample shipment with the analytical laboratory.
- Monitors that appropriate sampling, testing, and measurement procedures are followed.
- Coordinates the transfer of field data to the Project Manager for data reduction and validation.
- Participates in QA corrective actions as required.

### 2.1.3. Laboratory Data Quality Assurance (QA) Leader

Mark Lybeer is the Laboratory Data QA Leader and can be reached at 206.239.3227. The Laboratory Data QA Leader responsibilities include the following:

- Serves as the official contact for laboratory data QA concerns.
- Reviews and approves the laboratory QA Plan.
- Responds to laboratory data QA needs, answers laboratory requests for guidance and assistance, and resolves issues.
- Monitors laboratory compliance with data quality requirements.
- Ensures that appropriate sampling, testing, and analysis procedures are followed and that proper QC checks are implemented.
- Reviews the implementation of the QAPP and the overall quality of the analytical data generated.
- Maintains the authority to implement corrective actions as necessary.

#### 2.1.4. Laboratory Management

Amanda Volgardsen at Analytical Resources, Inc. (ARI) will provide laboratory analytical services for the project and can be reached at 206.695.6220. Sue Dunnihoo is the Laboratory's QA Coordinator for the project and can be reached at 206.695.6207.

The subcontracted laboratory conducting sample analyses for this project are required to obtain approval from the QA Leader before the initiation of sample analysis to assure that the laboratory QA plan complies with the project QA objectives. The Laboratory's QA Coordinator administers the Laboratory QA Plan and is responsible for QC. Specific responsibilities of this position include:

- Ensure implementation of the QA Plan.
- Serve as the laboratory point of contact.
- Activate corrective action for out-of-control events.
- Issue the final QA/QC report.
- Administer QA sample analysis.
- Comply with the specifications established in the project plans as related to laboratory services.
- Participate in QA audits and compliance inspections.

#### 2.2. Health and Safety

A Site-specific Health and Safety Plan (HASP) will be used for field activities. The Field Coordinator will be responsible for implementing the HASP during sampling activities. The Project Manager will discuss health and safety issues with the Field Coordinator on a routine basis during the completion of field activities.

The Field Coordinator will terminate any work activities that do not comply with the HASP. Companies providing services for this project on a subcontracted basis will be responsible for developing and implementing their own HASP.

### 3.0 DATA QUALITY OBJECTIVES

The quality assurance objective for technical data is to collect environmental monitoring data of known, acceptable, and documentable quality. The QA objectives established for the project are:

- Implement the procedures outlined herein for field sampling, sample custody, equipment operation and calibration, laboratory analysis, and data reporting that will facilitate consistency and thoroughness of data generated.
- Achieve the acceptable level of confidence and quality required so that data generated are scientifically valid and of known and documented quality. This will be performed by establishing criteria for precision, accuracy, representativeness, completeness, and comparability, and by testing data against these criteria.

The sampling design, field procedures, laboratory procedures, and QC procedures are set up to provide high-quality data for use in this project. Specific data quality factors that may affect data usability include

quantitative factors (bias, detection limits, precision, accuracy and completeness) and qualitative factors (representativeness and comparability). The measurement quality objectives (MQO) associated with the data quality factors are summarized in Table 1 and are discussed below.

### 3.1. Detection Limits

Analytical methods have quantitative limitations at a given statistical level of confidence that are often expressed as the method detection limit (MDL). Although results reported near the MDL provide insight to site conditions, quality assurance dictates that analytical methods achieve a consistently reliable level of detection known as the practical quantitation limit (PQL), which is typically demonstrated with the lowest point of a linear calibration. The contract laboratory will provide numerical results for all analytes and report them as detected above the PQL or undetected at the PQL.

The target reporting limits (TRLs) for metals are presented in Table 2 for soil. These TRLs were obtained from a Washington State Department of Ecology (Ecology)-certified laboratory (ARI). The reporting limits presented in Table 2 are the laboratory PQLs that are considered target reporting limits because several factors may influence final reporting limits. First, moisture and other physical conditions of soil affect detection limits. Second, analytical procedures may require sample dilutions or other practices to accurately quantify a particular analyte at concentrations above the range of the instrument. The effect is that other analytes could be reported as undetected but at a value higher than a specified TRL. Data users must be aware that high non-detect values, although correctly reported, can bias statistical summaries and careful interpretation is required to correctly characterize Site conditions.

### 3.2. Precision

Precision is the measure of mutual agreement among replicate or duplicate measurements of an analyte from the same sample and applies to field duplicate or split samples, replicate analyses, and duplicate spiked environmental samples (matrix spike duplicates). The closer the measured values are to each other, the more precise the measurement process. Precision error may affect data usefulness. Good precision is indicative of relative consistency and comparability between different samples. Precision will be expressed as the relative percent difference (RPD) for spike sample comparisons of various matrices and field duplicate comparisons.

This value is calculated by:

$$\text{Where: } RPD(\%) = \frac{|D_1 - D_2|}{(D_1 + D_2)/2} \times 100,$$

D<sub>1</sub> = Concentration of analyte in sample.  
D<sub>2</sub> = Concentration of analyte in duplicate sample.

The calculation applies to split samples, replicate analyses, duplicate spiked environmental samples (matrix spike duplicates), and laboratory control duplicates. The RPD will be calculated for samples and compared to the applicable criteria. Precision can also be expressed as the percent difference (%D) between replicate analyses. Persons performing the evaluation must review the pertinent document (EPA 2004) that addresses criteria exceedances and courses of action. Project field duplicate RPD goals for all analyses is 50 percent for soil samples, unless the primary and duplicate sample results are less than five times the MRL, in which case RPD goals will not apply for data quality assessment purposes.

### 3.3. Accuracy

Accuracy is a measure of bias in the analytic process. The closer the measurement value is to the true value, the greater the accuracy. This measure is defined as the difference between the reported values versus the actual value and is often measured with the addition of a known compound to a sample. The amount of known compound reported in the sample, or percent recovery, assists in determining the performance of the analytical system in correctly quantifying the compounds of interest. Since most environmental data collected represent one point spatially and temporally rather than an average of values, accuracy plays a greater role than precision in assessing the results. In general, if the percent recovery is low, non-detect results may indicate that compounds of interest are not present when in fact these compounds are present. Detected compounds may be biased low or reported at a value less than actual environmental conditions. The reverse is true when recoveries are high. Non-detect values are considered accurate while detected results may be higher than the true value.

For this project, accuracy will be expressed as the percent recovery of a known surrogate spike, matrix spike, or laboratory control sample (blank spike), concentration:

$$\text{Recovery (\%)} = \frac{\text{Spiked Result} - \text{Unspiked Result}}{\text{Known Spike Concentration}} \times 100$$

Persons performing the evaluation must review the pertinent document (EPA 2004) that addresses criteria exceedances and courses of action. Accuracy criteria for surrogate spikes, matrix spikes, and laboratory control spikes are found in Table 1 of this QAPP.

### 3.4. Representativeness

Representativeness expresses the degree to which data accurately and precisely represent the actual Site conditions. The determination of the representativeness of the data will be performed by completing the following:

- Comparing actual sampling procedures to those delineated within the EDR and this QAPP.
- Comparing analytical results of field duplicates to determine the variations in the analytical results.
- Invalidating non-representative data or identifying data to be classified as questionable.

Only representative data will be used in subsequent data reduction, validation, and reporting activities.

### 3.5. Completeness

Completeness establishes whether a sufficient amount of valid measurements were obtained to meet project objectives. The number of samples and results expected establishes the comparative basis for completeness. Completeness goals are 90 percent useable data for samples/analyses planned. If the completeness goal is not achieved an evaluation will be made to determine if the data are adequate to meet study objectives.

$$\text{Completeness} = \frac{\text{number of valid measurements}}{\text{total number of data points planned}} \times 100$$

### 3.6. Comparability

Comparability expresses the confidence with which one set of data can be compared to another. Although numeric goals do not exist for comparability, a statement on comparability will be prepared to determine overall usefulness of data sets, following the determination of both precision and accuracy.

### 3.7. Holding Times

Holding times are defined as the time between sample collection and extraction, sample collection and analysis, or sample extraction and analysis. Some analytical methods specify a holding time for analysis only. For many methods, holding times may be extended by sample preservation techniques in the field. If a sample exceeds a holding time, then the results may be biased low. Holding times are presented in Table 3.

### 3.8. Field Blanks

As metals are the only analysis to be performed, field blanks will not be analyzed. Laboratory blanks are discussed below.

### 3.9. Special Training Requirements/Certification

The Superfund Amendments and Reauthorization Act of 1986 required the Secretary of Labor to issue regulations providing health and safety standards and guidelines for workers engaged in hazardous waste operations. Occupational Safety and Health Administration (OSHA) regulations (29 Code of Federal Regulations [CFR] 1910.120) require training to provide employees with the knowledge and skills necessary to enable them to perform their jobs safely and with minimum risk to their personal health. All sampling personnel will have completed the 40-hour Hazardous Waste Operations and Emergency Response (HAZWOPER) training course and 8-hour refresher courses, as necessary, to meet OSHA regulations.

## 4.0 DOCUMENTATION AND RECORDS

### 4.1. Field Observations

Field documentation provides important information about potential problems or special circumstances surrounding sample collection. Field personnel will record information for each boring on field logs and will record a daily field report. Entries in the field logs will be made on water-resistant paper, and corrections will consist of line-out deletions.

At a minimum, the following information will be recorded during the collection of each sample:

- Sample location and description
- Sampler's name(s)
- Date and time of sample collection
- Sample matrix (soil)
- Type of sampling equipment used
- Field instrument (e.g., hand tools) readings



- Field observations and details that are pertinent to the integrity/condition of the samples (e.g., weather conditions, performance of the sampling equipment, sample depth control, sample disturbance, etc.)
- Preliminary sample descriptions (e.g., lithology, field screening results)
- Sample preservation
- Sample transport/shipping arrangements
- Name of recipient laboratory

In addition to the sampling information, the following specific information will also be recorded in the field log for each investigation location or in a daily field report:

- Sampling team members
- Time of arrival/entry on Site and time of Site departure
- Other personnel present at the Site
- Summary of pertinent meetings or discussions with contractor personnel
- Deviations from sampling plans, QAPP procedures, and HASP
- Changes in field personnel and responsibilities with reasons for the changes
- Levels of safety protection

The handling, use, and maintenance of field logs and reports are the Field Coordinator's responsibility.

#### 4.2. Analytical Chemistry Records

Laboratories will be responsible for internal checks on data reporting and will correct errors identified during the QA review. All laboratories must be accredited by Ecology for the required analytical methods. Close contact will be maintained with the laboratories to resolve any quality control problems in a timely manner. The laboratories will be required to provide the following:

- **Project Narrative**—This summary, in the form of a cover letter, will present any problems encountered during any aspect of analysis. The summary will include, but not be limited to, a discussion of QC, sample shipment, sample storage, and analytical difficulties. Any problems encountered by the laboratory, and their resolutions, will be documented in the project narrative.
- **Records**—Legible copies of the chain-of-custody (COC) forms will be provided as part of the data package. This documentation will include the time of receipt and the condition of each sample received by the laboratory. Additional internal tracking of sample custody by the laboratory will also be documented.
- **Sample Results**—The data package will summarize the results for each sample analyzed. The summary will include the following information, as applicable:
  - Field sample identification code and the corresponding laboratory identification code
  - Sample matrix
  - Date of sample extraction/digestion

- Date and time of analysis
  - Weight and/or volume used for analysis
  - Final dilution volumes or concentration factor for the sample
  - Total solids in the samples
  - Identification of the instruments used for analysis
  - MDLs and RLs
  - All data qualifiers and their definitions
- **QA/QC Summaries**—These summaries will contain the results of all QA/QC procedures. Each QA/QC sample analysis will be documented with the same information as that required for the sample results (see above). The laboratory will make no recovery or blank corrections. The required summaries are listed below.
- The calibration data summary will contain the concentrations of the initial calibration and daily calibration standards and the date and time of analysis. The response factor, percent standard deviation (%RSD), RPDs, and retention time for each analyte will be listed, as appropriate. Results for standards analyzed at the RL to determine instrument sensitivity will be reported.
  - The internal standard area summary will report the internal standard areas, as appropriate.
  - The method blank analysis summary will report the method blank analysis associated with each sample and the concentrations of all compounds of interest identified in these blanks.
  - The surrogate spike recovery summary will report all surrogate spike recovery data for organic analyses. The names and concentrations of all compounds added, percent recoveries, and QC limits will be listed.
  - The laboratory replicate summary will report the RPD for all laboratory replicate analyses. The QC limits for each compound or analyte will be listed.
  - The laboratory control sample (LCS) analysis summary will report the results of the analyses of the LCS. The QC limits for each compound or analyte will be included in the data package.
  - The relative retention time summary will report the relative retention times for the primary and confirmational columns of each analyte detected in the samples, as appropriate.

EQulS four-file format electronic data deliverables will be obtained from the laboratory and data will be submitted into Ecology's Environmental Information Management (EIM) system after data quality assessments are completed.

### 4.3. Data Reduction

Data reduction is the process by which original data are converted or reduced to a specified format or unit to facilitate the analysis of the data. For example, a final analytical concentration may need to be calculated from a diluted sample result. Data reduction requires that all aspects of sample preparation that could affect the test result, such as sample volume analyzed or dilutions required, be taken into account in the final result. The laboratory personnel will reduce the analytical data for review by the Quality Assurance Leader and Project Manager.

During chemical analysis, samples are occasionally diluted after the initial analysis if the estimated concentration curve for one or more of the target analytes is above the calibration curve. In these

instances, concentrations from the initial analysis will be identified as the “best result” for all target analytes other than the chemical(s) that was originally above the calibration range. The “best result” for this qualified analyte(s) will be taken from the diluted sample.

## 5.0 DATA GENERATION AND ACQUISITION

### 5.1. Sample Process Design

Soil sampling will be conducted by GeoEngineers’ field personnel. Soil samples are to be analyzed for arsenic, lead, and mercury. Sample procedures and sample frequencies are described in the EDR.

### 5.2. Sample Methods

#### 5.2.1. Sampling Equipment and Decontamination Procedures

Excavation soil samples will be collected by field personnel either directly from the excavation sidewall and base or with an assistance of construction equipment (e.g. excavator bucket) if entering the excavation area is not possible. Each soil sample will be collected directly with hands using a fresh pair of nitrile gloves and the sample will be transferred into laboratory prepared containers. While collecting sample from excavator bucket it will be ensured that the portion of soil that is not in direct contact with the walls of excavator bucket will be used. Decontaminated hand tools such as hand auger, shovel or similar may be used for collecting stockpile soil samples (if necessary).

Reusable sampling equipment (if used) that comes in contact with soil will be decontaminated before each use. Decontamination procedures for this equipment will consist of the following:

1. Washing with a brush and non-phosphate detergent solution (e.g., Liqui-Nox® and distilled water),
2. Rinsing with distilled water, and
3. Wrapping or covering the decontaminated equipment with aluminum foil. Field personnel will limit cross-contamination by changing gloves between sampling locations.

#### 5.2.2. Field Screening Procedures

The potential presence of contamination in samples collected from soil will be evaluated using field screening techniques. Field screening results will be recorded on the field logs. Visual screening methods consisting of observations for the presence of slag, unusual color and/or staining indicative of possible contamination will be used during investigation activities.

#### 5.2.3. Sample Containers and Labeling

The Field Coordinator will establish field protocol to manage field sample collection, handling, and documentation. All samples will be placed in appropriate laboratory-prepared containers. Sample containers and preservatives are listed in Table 3.

Sample containers will be labeled with the following information at the time of sample collection:

- Project number
- Sample name

- Sampling depth interval (if applicable)
- Date and time of collection

The sample collection activities will be noted on the field logs. The Field Coordinator will monitor consistency between sample containers/labels, field logs, and COC forms.

### **5.3. Sample Handling and Custody**

#### **5.3.1. Sample Storage**

Samples will be placed in a cooler with ice after they are collected. The objective of the cold storage will be to attain a sample temperature of 2 to 6 degrees Celsius. Holding times (Table 3) will be observed during sample storage.

#### **5.3.2. Sample Shipment**

Samples will be transported and delivered to the analytical laboratory in the sample coolers. The samples will either be transported by field personnel, laboratory personnel, or by courier service. The Field Coordinator will ensure that the cooler has been properly secured using clear plastic tape and custody seals.

#### **5.3.3. Chain-of-custody Records**

Field personnel are responsible for the security of samples from the time the samples are collected until the samples have been received by the courier service or laboratory personnel. A COC form will be completed for each group of samples being shipped to the laboratory. Information to be included on the COC form includes:

- Project name and number;
- Sample identification numbers;
- Date and time of sampling;
- Sample matrix (soil), preservative, and number of containers for each sample;
- Analyses to be performed;
- Names of sampling personnel;
- Project manager name and contact information including phone number; and
- Shipping information including shipping container number, if applicable.

The original COC form will be signed by a member of the field team. Field personnel will retain copies and provide the original and remaining copies to the laboratory or courier.

#### **5.3.4. Laboratory Custody Procedures**

The laboratory will follow their standard operating procedures (SOPs) to document sample handling from time of receipt (sample log-in) to reporting. Documentation will include, at a minimum, the analyst's name or initials, time, and date.

#### 5.4. Analytical Methods

The methods of chemical analysis are identified in Table 2. All methods selected represent standard methods used for the analysis of these analytes in soil. The laboratory project manager will determine the remedy to be used if the project RLS cannot be attained, in consultation with GeoEngineers Quality Assurance Leader.

#### 5.5. Quality Control

Table 4 summarizes the types and frequency of QC samples to be analyzed, including both field QC and laboratory QC samples.

##### 5.5.1. Field Duplicates

Field duplicates serve as a measure for precision. Under ideal field conditions, field duplicates (sometimes referred to as splits), are created by thoroughly mixing a volume of the sample matrix, placing aliquots of the mixed sample in separate containers, and identifying one of the aliquots as the primary sample and the other as the duplicate sample. Field duplicates measure the precision and consistency of laboratory analytical procedures and methods, as well as the consistency of the sampling techniques used by field personnel.

Field duplicates will not be collected as part of this project since only stockpile soil samples are planned to be collected and analyzed for disposal characterization purposes. Field duplicates are not considered applicable for samples collected for waste disposal characterization.

##### 5.5.2. Trip Blanks

Trip blanks accompany samples for volatile organic compound (VOC) analysis during field sampling and delivery to the laboratory. Trip blanks will not be analyzed during this investigation because VOC analyses are not part of the sampling and analysis plan.

##### 5.5.3. Equipment Rinse Blanks

Rinse blanks will not be analyzed during this investigation as rinsates are not expected to be generated.

#### 5.6. Laboratory Quality Control

Laboratory QC procedures will be evaluated through a formal data quality assessment process. The analytical laboratory will follow standard analytical method procedures that include specified QC monitoring requirements. These requirements will vary by method, but generally include:

- Method blanks
- Internal standards
- Instrument calibrations
- Laboratory control samples/laboratory control sample duplicates (LCS/LCSD)
- Laboratory replicates or duplicates
- Surrogate/Labeled compounds

### 5.6.1. Laboratory Blanks

Laboratory procedures utilize several types of blanks, but the most commonly used blanks for QC monitoring are method blanks. Method blanks are laboratory QC samples that consist of either a soil-like material having undergone a contaminant destruction process, or reagent (contaminant-free) water. Method blanks are extracted and analyzed with each batch of environmental samples undergoing analysis. If a substance is detected in a method blank, then one (or more) of the following occurred:

- Sample containers, measurement equipment, and/or analytical instruments were not properly cleaned and contained contaminants.
- Reagents used in the process were contaminated with a substance(s) of interest.

It is difficult to determine which of the above scenarios took place if blank contamination occurs. However, it is assumed that the conditions that affected the blanks also likely affected the project samples. If target analytes are detected in method blanks, data validation guidelines assist in determining which substances in project samples are considered “real,” and which ones are attributable to the analytical process. Furthermore, the guidelines state, “there may be instances where little or no contamination was present in the associated blank, but qualification of the sample is deemed necessary. Contamination introduced through dilution water is one example.”

### 5.6.2. Calibrations

Several types of instrument calibrations are used, depending on the analytical method, to assess the linearity of the calibration curve and assure that the sample results reflect accurate and precise measurements. The main calibrations used are initial calibrations, daily calibrations, and continuing calibration verification.

### 5.6.3. Laboratory Control Sample/ Laboratory Control Sample Duplicates (LCS/LCSD)

Also known as blanks spikes, LCS use a contaminant-free sample medium, are spiked with a known amount of one or more of the target analytes, and a percent recovery of the spiked substances is calculated. The purpose of an LCS is to help assess the overall accuracy and precision of the analytical process including sample preparation, instrument performance, and analyst performance.

### 5.6.4. Laboratory Replicates/Duplicates

Laboratories utilize LCS/LCSDs, and/or replicates to assess precision. Replicates are a second analysis of a field-collected environmental sample. Replicates can be split at varying stages of the sample preparation and analysis process and most commonly consist of a second analysis on the extracted media.

### 5.6.5. Surrogates/Labeled Compounds

Surrogate spikes are used to verify proper extraction procedures and the accuracy of the analytical instrument. Surrogates are substances with characteristics similar to the target analytes. A known concentration of surrogate is added to the project sample and passed through the instrument and the percent recovery is calculated. Each surrogate used has acceptance limits (i.e., an acceptable range) for percent recovery. If a surrogate recovery is low, sample results may be biased low and depending on the recovery value, a possibility of false negatives may exist. Conversely, when recoveries are above the specified acceptance limits, a possibility of false positives exist, although non-detect results are considered accurate.

## 5.7. Instrument Testing, Inspection and Maintenance

The field coordinator will be responsible for overseeing the testing, inspection, and maintenance of all field equipment. The laboratory project manager will be responsible for laboratory equipment testing, inspection, and maintenance requirements. The calibration methods used in calibrating the analytical instrumentation are described in the following section.

## 5.8. Instrument Calibration and Frequency

### 5.8.1. Field Instrumentation

The calibration and calibration checks facilitate accurate and reliable field measurements. The calibration of field instruments used on the project will be checked and adjusted as necessary in general accordance with the manufacturer's recommendations. Methods and intervals of calibration checks and instrument maintenance will be based on the type of instrument, stability characteristics, required accuracy, intended use, and environmental conditions. The basic calibration check frequencies are described below.

### 5.8.2. Laboratory Instrumentation

For chemical analytical testing, calibration procedures will be performed in general accordance with the analytical methods used and the laboratory's SOPs. Calibration documentation will be retained at the laboratory.

All instrument calibrations and their appropriate chemical standards are to comply with the specific methods within United States Environmental Protection Agency (EPA) SW-846, Test Methods for Evaluating Solid Waste, Physical and Chemical Methods, 3<sup>rd</sup> Edition, December 1996 and the Laboratory SOPs. Calibration documentation, initial (ICALs) and continuing (CCALs), will be retained at the Laboratory.

## 5.9. Inspection of Supplies and Consumables

Supplies and consumables for the field sampling effort will be inspected upon delivery and accepted if the condition of the supplies is satisfactory. For example, jars will be inspected to ensure that they are the correct size and quantity and were not damaged in shipment.

## 5.10. Data Management

Laboratories will report data in formatted hardcopy and digital formats. Analytical laboratory measurements will be recorded in standard formats that display, at a minimum, the field sample identification, the laboratory identification, reporting units, data qualifiers, analytical method, analyte tested, analytical result, extraction and analysis dates, and quantitation limits. Each sample delivery group will be accompanied by sample receipt forms and a case narrative identifying data quality issues. Laboratory electronic data deliverable (EDD) requirements will be established by GeoEngineers, Inc. with the contract laboratory. The laboratory will send final analytical testing results to the Project Manager.

Following completion of the soil sampling, the relevant data generated as part of the project will be reported to Ecology.



## 6.0 ASSESSMENT AND OVERSIGHT

### 6.1. Assessment and Response Actions

#### 6.1.1. Review of Field Documentation and Laboratory Receipt Information

Documentation of field sampling data will be reviewed periodically for conformance with project QC requirements described in this QAPP. At a minimum, field documentation will be checked for proper documentation of the following:

- Sample collection information (date, time, location, matrices, etc.);
- Field instruments used and calibration data;
- Sample collection protocol;
- Sample containers, preservation, and volume;
- Field QC samples collected at the frequency specified;
- COC protocols; and
- Sample shipment information.

Sample receipt forms provided by the laboratory will be reviewed for QC exceptions. The final laboratory data package will describe (in the case narrative) the effects that any identified QC exceptions have on data quality. The laboratory will review transcribed sample collection and receipt information for correctness prior to delivering the final data package.

#### 6.1.2. Response Actions for Field Sampling

The Field Coordinator, or a designee, will be responsible for correcting equipment malfunctions throughout the field sampling effort and resolving situations in the field that may result in nonconformance or noncompliance with the QAPP. Corrective measures will be documented in the field report.

#### 6.1.3. Corrective Action for Laboratory Analyses

Laboratories are required to comply with their current written SOPs. The laboratory project manager will be responsible for ensuring that appropriate corrective actions are initiated as required for conformance with this QAPP. All laboratory personnel will be responsible for reporting problems that may compromise the quality of the data to the laboratory project manager. A narrative describing the anomaly, the steps taken to identify and correct it, and the treatment of the relevant sample batch (i.e., recalculation, reanalysis and re-extraction) will be submitted with the data package.

## 7.0 DATA VALIDATION AND USABILITY

### 7.1. Data Review, Verification and Validation

The data validation and usability elements of the QAPP as detailed below address the QA/QC activities that occur after data collection and/or data generation is complete. Implementation of these elements ensures that the data conform to the specified criteria and will achieve the project objectives.

The data are not considered final until validated. All data, including laboratory and field QC sample results, will be summarized in a data validation report. The data validation report will focus on data that did not meet the MQOs specified in Table 1. The data validation reports will be included as an appendix to the final report. The data report will also describe any deviations from this QAPP and actions taken to address those deviations.

Level III laboratory data packages will be obtained for all soil samples. These data will be reviewed for the following QC parameters:

- Holding times and sample preservation
- Method blanks
- LCS/LCSD analyses
- Surrogate spikes
- Duplicates/replicates
- Lab duplicates
- Calibrations (initial and continuing)
- Internal standards
- Instrument tunes

In addition to these QC parameters, other documentation such as sample receipt forms and case narratives will be reviewed to evaluate laboratory QA/QC.

## 7.2. Verification and Validation Methods

Hard-copy laboratory reports will be generated providing the analysis-specific information including final sample analytical results, reportable field and laboratory QA/QC analytical results, MDLs and MRLs. The laboratory data will also be reported via electronic media using the tabular outputting capabilities of standard software formats.

The term “reporting limit” will be used interchangeably with “quantitation limit” to mean the lowest concentration at which an analyte can be quantified subject to the quality control criteria of the analytical method. These terms are different from “MDL,” which refers to the lowest concentration that the analytical method can ideally detect.

Data validation qualifiers including “U,” “J,” and “R” will be used following the reported laboratory results to explain data quality issues affecting the laboratory data to the data user. These qualifiers are explained as follows:

- “U” indicates that a compound was analyzed for but not detected. The associated numerical value is the estimated sample quantitation limit, which is corrected for dilution and percent moisture.
- “J” indicates that a compound was detected below the reporting limit and the value is estimated or the value was estimated by the validator because of instrument bias reasons.

- If any target analytes are found in a laboratory method blank, it will be regarded as blank contamination. In these cases, the result of a given analyte in the method blank will be compared to any positive result of the same analyte in the associated field samples. If a field sample result is less than five times (ten times for common laboratory contaminants like acetone, phthalates, etc.) the result that is reported in the method blank, the result will be considered blank contamination. Accordingly, the result will be qualified as not-detected “U” at the elevated reporting limit. Otherwise the positive result in the field sample will be considered real.
- “R” indicates results should not be used. If there are two analyses reported by the laboratory for one sample (as in the case of dilutions), the validator will use the method described in Section 4.3 of this QAPP to make the final assessment. As there should be only one reported result per analyte for a given sample, any extraneous results will be qualified as not-reportable, “R”, and will not be used.

### 7.3. Reconciliation with User Requirements

A data quality assessment will be conducted by the project Quality Assessment Leader to identify cases where the projects MQOs were not met.

## 8.0 REFERENCES

United States Environmental Protection Agency. 2004. “Contract Laboratory Program National Functional Guidelines for Inorganic Data Review, OSWER 9240.1-45, EPA 540-R-04-004.” October 2004.

**Table 1**  
**Measurement Quality Objectives**  
**Remedial Action Areas B2, C2 and C3, Everett Smelter Site Lowland Area**  
**Everett, Washington**

Laboratory Analysis	Analytical Method	Quality Control Check Standards (Laboratory Control Samples & Matrix Spike Samples) Limits		Field Duplicate <sup>2</sup> Samples RPD Limits
		Soil %R <sup>1</sup>	RPD	Soil
			Soil	
Metals (Arsenic, Lead and Mercury)	EPA 6000/7000	75%-125%	≤20%	NA

**Notes:**

<sup>1</sup> Percent recovery limits are compound-specific and based on laboratory studies. The surrogate %R and laboratory control/matrix spike sample %R control limits presented are the ranges for all of the individual analytes in the identified analysis. The individual control limits will be provided with the laboratory report for each analysis.

<sup>2</sup> Field duplicates will not be collected as part of this project since only stockpile soil samples are planned to be collected and analyzed for disposal characterization purposes. Field duplicates are not considered applicable for samples collected for waste disposal characterization.

%R = Percent recovery

RPD = Relative Percent Difference

EPA = United States Environmental Protection Agency

**Table 2**  
**Methods of Analysis and Target Reporting Limits for Soil Samples**  
Remedial Action Areas B2, C2 and C3, Everett Smelter Site Lowland Area  
Everett, Washington

Analyte	Analytical Method	Cleanup Level <sup>1</sup> (mg/kg)	Target Reporting Limit (mg/kg)
Arsenic	EPA 6010B	20	7
Lead	EPA 6010B	118	24
Mercury	EPA 7471A	5.5	0.25

**Notes:**

<sup>1</sup> Lowest applicable cleanup levels are provided for the purposes of identifying laboratory target reporting limits. Cleanup levels are detailed in the Engineering Design Report.

mg/kg = Milligram per kilogram

EPA = United States Environmental Protection Agency

**Table 3**  
**Test Methods, Sample Containers, Preservation and Hold Times**  
**Remedial Action Areas B2, C2 and C3, Everett Smelter Site Lowland Area**  
**Everett, Washington**

Analysis	Method	Soil			
		Minimum Sample Size	Sample Containers	Sample Preservation	Holding Times
Metals	EPA 6000/7000	8 oz	8 oz glass wide mouth with Teflon-lined lid	Cool 4°C	180 days/ 28 days for Mercury

**Notes:**

Extraction Holding Time is based on elapsed time from date of sample collection.

oz = ounce

mL = milliliter

°C = degrees Celsius

EPA = United States Environmental Protection Agency

**Table 4**  
**Quality Control Samples - Type and Frequency**  
**Remedial Action Areas B2, C2 and C3, Everett Smelter Site Lowland Area**  
**Everett, Washington**

Samples Collected for Chemical Analytical Testing	Field QC		Laboratory QC		
	Field Duplicates <sup>1</sup>	Trip Blanks	Method Blanks	LCS	Lab Duplicates
Soil	NA	NA	1/batch	1/batch	1/batch

**Notes:**

<sup>1</sup> Field duplicates will not be collected as part of this project since only stockpile soil samples are planned to be collected and analyzed for disposal characterization purposes. Field duplicates are not considered applicable for samples collected for waste disposal characterization.

An analytical batch is defined as a group of samples taken through a preparation procedure and sharing a method blank, LCS, and MS/MSD (or MS and lab duplicate).

No more than 20 field samples can be contained in one batch.

LCS = Laboratory control sample

NA = Not Applicable