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**APPENDIX A  
PROJECT PLANS**

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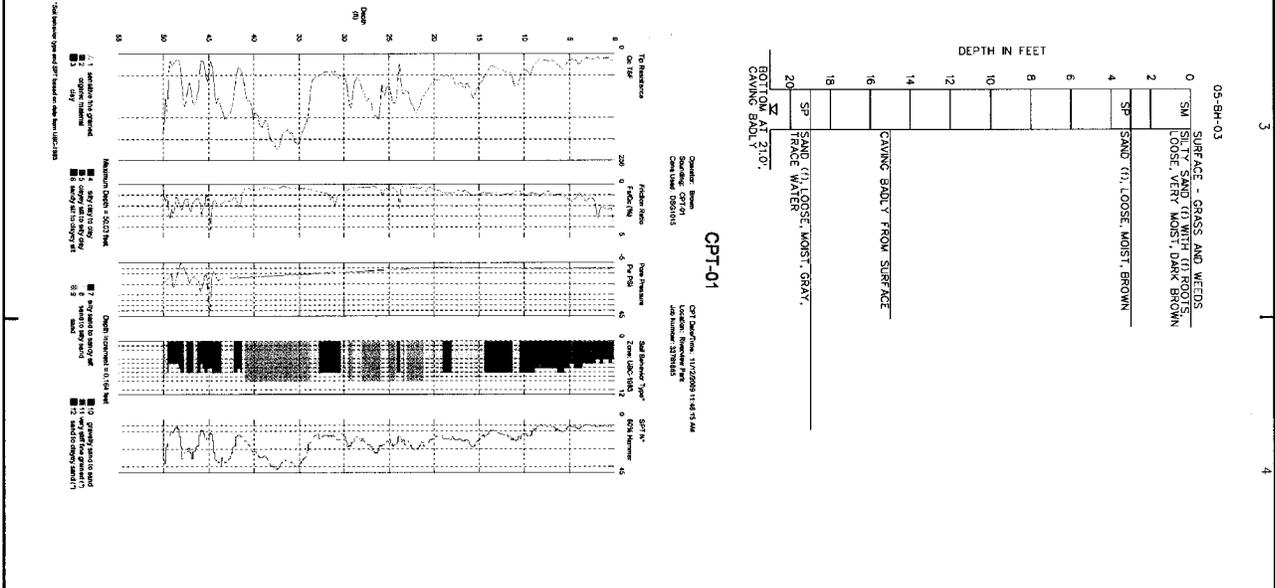
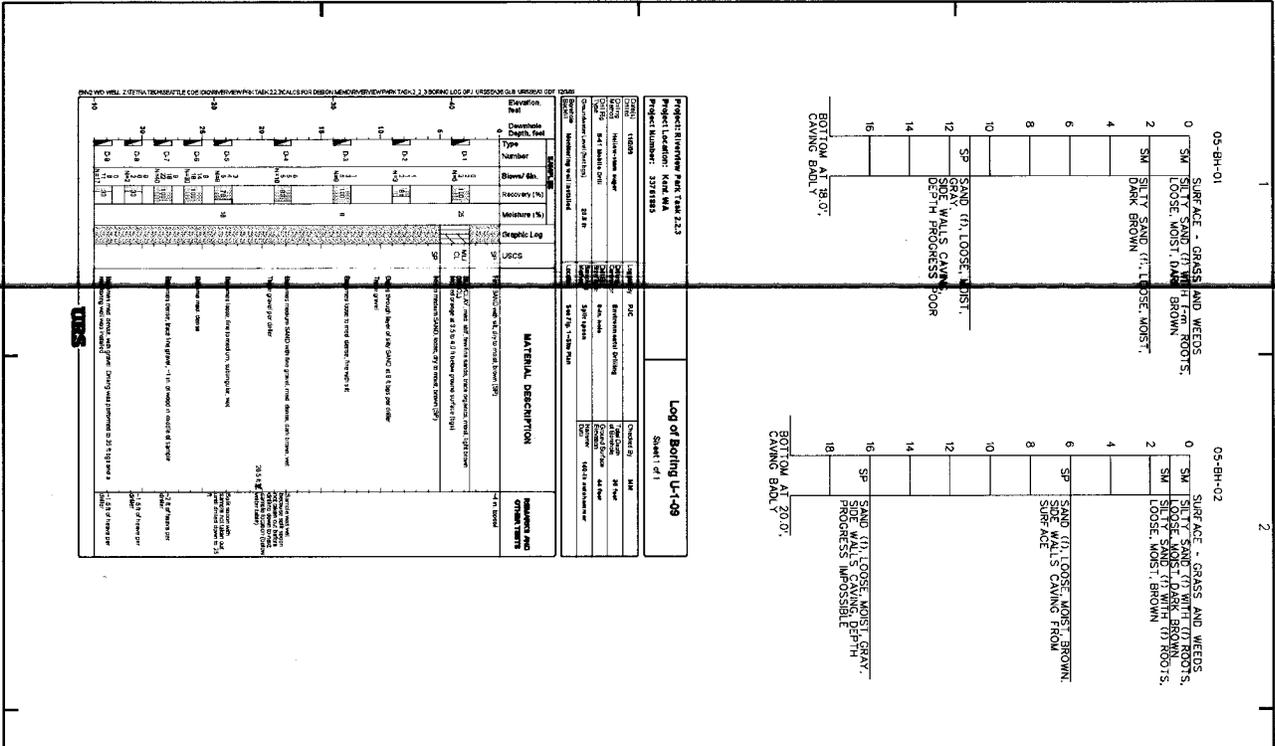




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**NOTES:**

- SEE SHEET B-01 FOR TEST PIT LOCATIONS.
- EXPLORATION PERFORMED 21 MARCH 2009, BY SEATTLE GASTERL, U.S. ARMY CORPS OF ENGINEERS AND OPERATED BY THE CITY OF KENT.
- SOILS WERE VISUALLY CLASSIFIED ACCORDING TO THE UNIFIED SOILS CLASSIFICATION SYSTEM.
- GROUNDWATER LEVELS ARE ONLY ACCURATE FOR DATE OF EXPLORATION.
- ALGER AND CONE PENETROMETER TESTS CONDUCTED FEBRUARY 2009 AND 12 NOVEMBER 2009 BY
- THE INFORMATION PRESENTED HERE IS ONLY A SUMMARY OF SUBSURFACE CONDITIONS. FOR PROJECT SITE ACTUAL SUBSURFACE CONDITIONS MAY VARY DEPENDING ON SITE OF YEAR. THE PRESENTATION OF THIS INFORMATION DOES NOT CONSTITUTE A WARRANTY OF ANY KIND EXPRESSED OR IMPLIED SITE. THE ACTUAL SUBSURFACE CONDITIONS AT THE PROJECT SITE.

**LEGEND**

- SM POORLY GRADED SILTY SAND
- SP POORLY GRADED SAND
- f FINE GRAINED
- m MEDIUM GRAINED
- Σ GROUND WATER ELEVATION
- JL BOTTOM OF TEST PIT

RIVERVIEW PARK GREEN/DUWAMISH ECOSYSTEM RESTORATION

**EXPLORATION LOGS**

KENT PN 127251 WASHINGTON

U.S. ARMY ENGINEER DISTRICT, SEATTLE CORPS OF ENGINEERS  
 SEATTLE, WASHINGTON

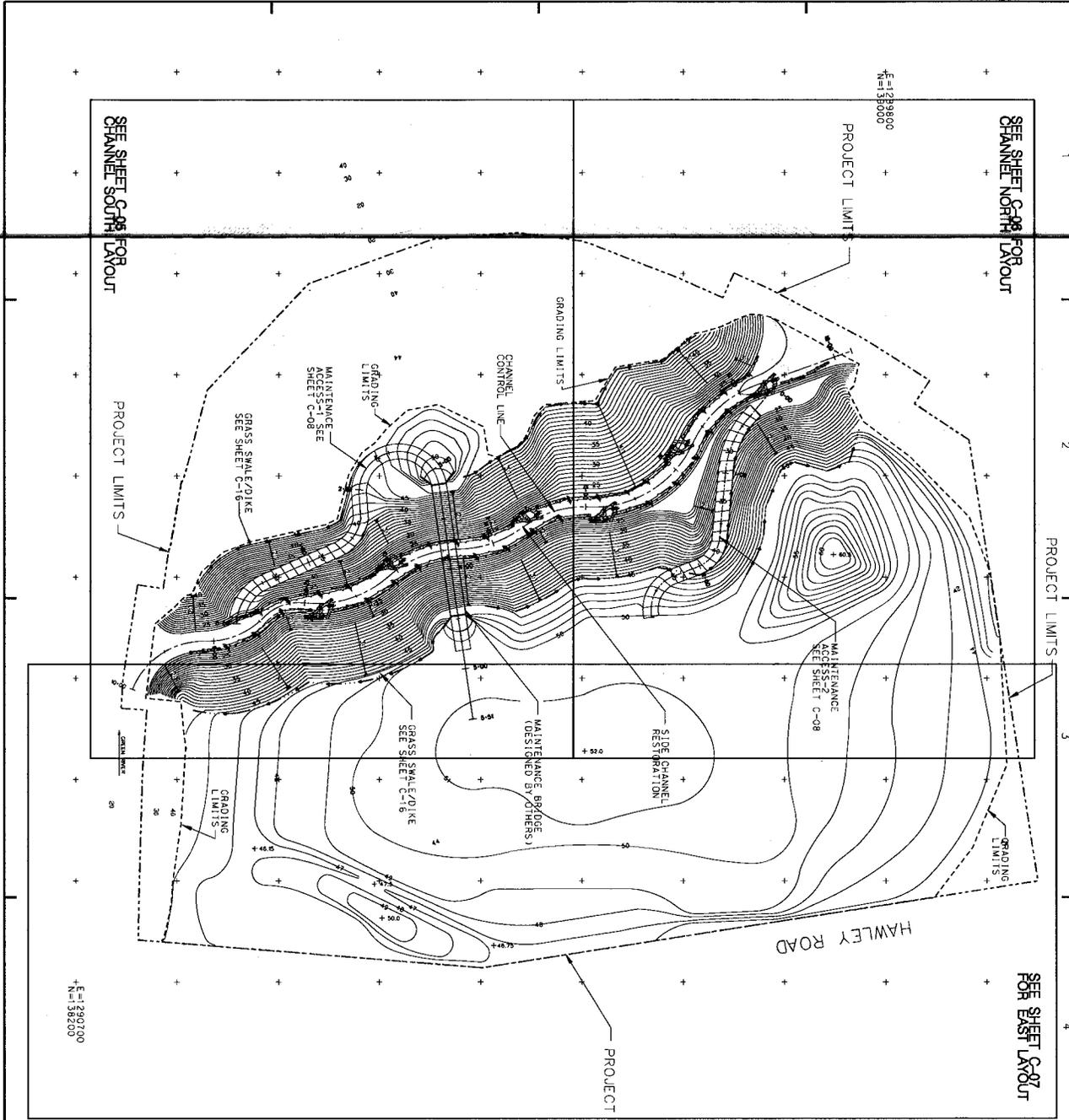
Designed by: MAS Date: 29 APR, 2011  
 Drawn by: EJ File: C:\90X\1-LB9802.dgn  
 Checked by: HHH/MM Rev:

Prepared by: **TETRA TECH**  
 1400 1st Avenue, Suite 500  
 Seattle, WA 98101  
 Tel: 206 734 9000 Fax: 206 734 9000

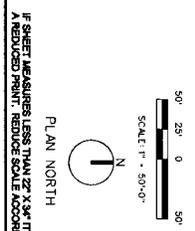
Plot Number: **B-02**  
 Sheet 4 of 39

U.S. Army Corps of Engineers  
 Seattle District

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NOTES:  
 1. SURVEY OF EXISTING TOPOGRAPHY PROVIDED BY CITY OF KENT. MAP COMPILED FROM FIELD SURVEY DATA AND AERIAL PHOTOGRAPHS. HORIZONTAL CONTROL BASED ON WASHINGTON STATE PLANE COORDINATE SYSTEM AND 83/81 NORTH ZONE. VERTICAL CONTROL BASED ON NAVD 83.



\* SHEET MEASURES LESS THAN 2" X 3" IT IS A REDUCED PRINT. REDUCE SCALE ACCORDINGLY.

RIVERVIEW PARK  
 GREEN/DUWAMISH ECOSYSTEM RESTORATION  
**GENERAL SITE PLAN**  
 KENT PN 127251 WASHINGTON

U.S. ARMY ENGINEER DISTRICT SEATTLE  
 CORPS OF ENGINEERS  
 SEATTLE, WASHINGTON

Designed by: MAS Date: 29 APR, 2011  
 Drawn by: JB File: C1951C-SP0C01.dgn  
 Checked by: HHH/MM Rev: JL

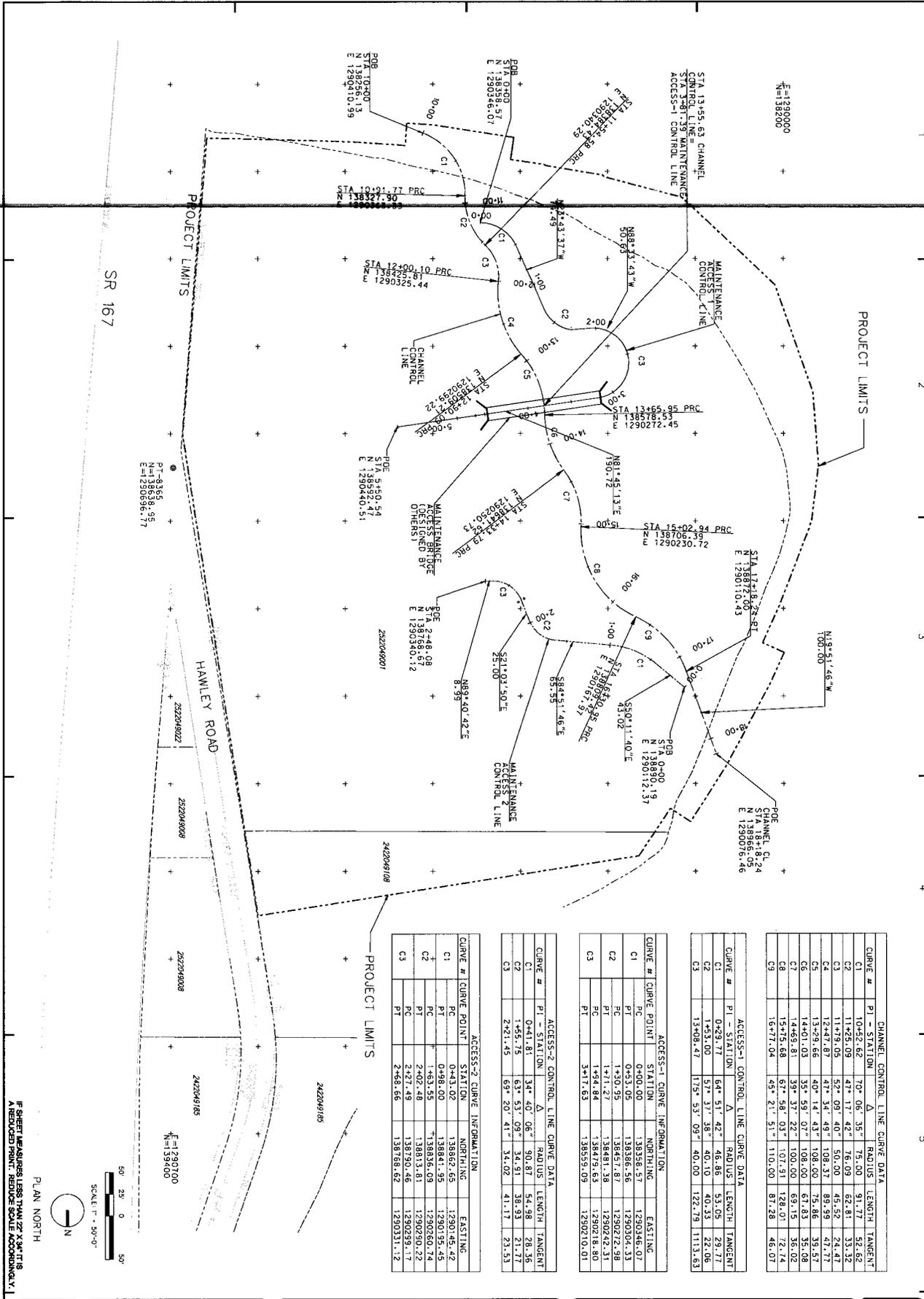
Prepared by: **TETRA TECH**  
 3220 15th Avenue, Suite 200  
 Seattle, Washington 98108  
 Tel: 206.461.4600 Fax: 206.461.4600

Symbol	Description	Date	Appr.	Symbol	Description

**U.S. Army Corps of Engineers**  
 Seattle District

Plate number: **C-01**  
 Sheet 5 of 39

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CHANNEL CONTROL LINE CURVE DATA

CURVE #	PI - STATION	Δ	RADIUS	LENGTH	TANGENT
C1	10+52.62	70° 06' 35"	75.00	91.77	52.62
C2	11+25.09	47° 17' 42"	76.09	62.81	33.32
C3	11+79.05	52° 09' 40"	50.00	45.52	24.47
C4	12+47.87	47° 34' 49"	108.37	69.59	47.77
C5	13+29.66	40° 14' 43"	108.00	75.86	39.50
C6	14+02.48	38° 59' 27"	108.00	69.82	32.02
C7	14+42.48	57° 58' 03"	107.51	128.00	72.74
C8	15+75.68	45° 21' 51"	110.00	87.28	46.07
C9	16+77.04	45° 21' 51"	110.00	87.28	46.07

ACCESS-1 CONTROL LINE CURVE DATA

CURVE #	PI - STATION	Δ	RADIUS	LENGTH	TANGENT
C1	0+29.77	64° 51' 42"	48.86	53.05	29.77
C2	1+53.00	57° 37' 38"	40.10	40.53	22.06
C3	13+08.47	175° 53' 09"	40.00	122.79	1113.63

ACCESS-1 CURVE INFORMATION

CURVE #	CURVE POINT	STATION	NORTHING	EASTING
C1	PC	0+00.00	138316.57	1290346.07
	PT	0+33.05	138316.56	1290304.33
	PC	1+30.95	138451.87	1290272.98
C2	PT	1+11.42	138451.88	1290272.98
	PC	1+44.68	138475.65	1290218.80
C3	PT	3+11.69	138539.09	1290210.01

ACCESS-2 CONTROL LINE CURVE DATA

CURVE #	PI - STATION	Δ	RADIUS	LENGTH	TANGENT
C1	0+41.81	34° 40' 06"	90.81	54.98	28.56
C2	1+45.75	63° 53' 09"	54.91	38.93	21.77
C3	2+21.45	69° 20' 41"	54.02	41.17	23.53

ACCESS-2 CURVE INFORMATION

CURVE #	CURVE POINT	STATION	NORTHING	EASTING
C1	PC	0+43.02	138862.65	1290145.42
	PT	0+98.00	138841.95	1290195.45
	PC	1+43.55	138885.09	1290260.74
C2	PT	2+40.48	138813.81	1290290.22
	PC	2+27.49	138790.46	1290299.17
C3	PT	2+46.66	138768.62	1290331.12

U.S. ARMY CORPS OF ENGINEERS  
SEATTLE DISTRICT

DESIGNED BY: MAS  
DRAWN BY: JEB  
CHECKED BY: HRS/MM

DATE: 29 APR. 2011  
FILE: C951C-KPBC02.dgn  
REV: JL

PROJECT: RIVERVIEW PARK  
GREEN/DUWAMISH ECOSYSTEM RESTORATION

SCALE: 1" = 50'-0"

50' 25' 0' 50'

PLATE NUMBER: C-02  
SHEET: 6 of 39

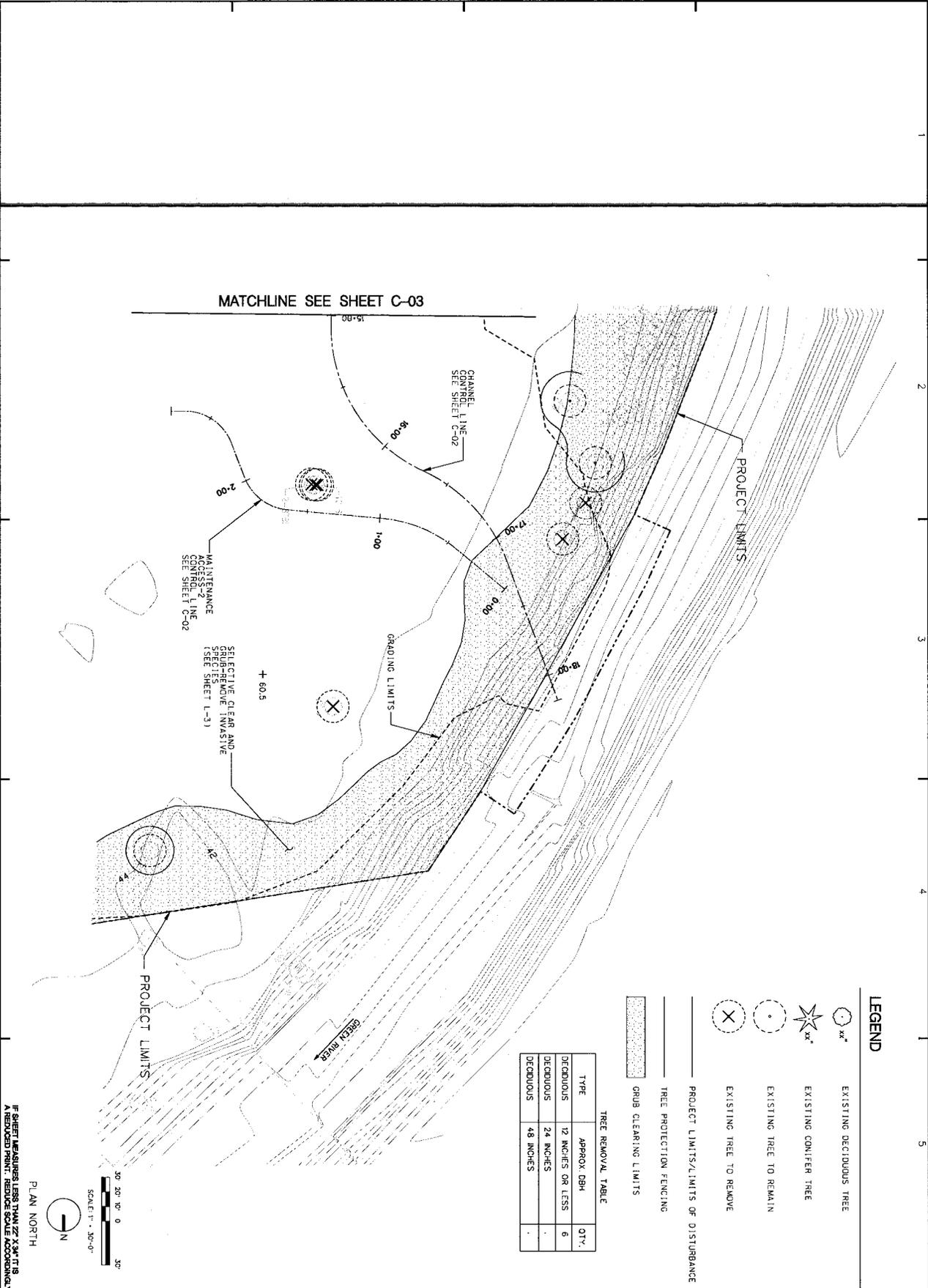
PROJECT: HORIZONTAL CONTROL

TETRA TECH  
4401 15th Avenue, Suite 200  
Seattle, WA 98148  
206.724.8000 Fax: 206.724.8001

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MATCHLINE SEE SHEET C-03

CHANNEL CONTROL LINE  
SEE SHEET C-02

MAINTENANCE CONTROL LINE  
SEE SHEET C-02

SELECTIVE CLEAR AND  
GRUBBING LIMITS  
(SEE SHEET L-3)

GRADING LIMITS

PROJECT LIMITS

PROJECT LIMITS

GREEN RIVER

**LEGEND**

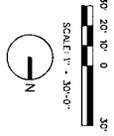
- EXISTING DECIDUOUS TREE
- EXISTING CONIFER TREE
- EXISTING TREE TO REMAIN
- EXISTING TREE TO REMOVE
- PROJECT LIMITS/LIMITS OF DISTURBANCE
- TREE PROTECTION FENCING
- GRUB CLEARING LIMITS

**TREE REMOVAL TABLE**

TYPE	APPROX. DBH	QTY.
DECIDUOUS	12 INCHES OR LESS	6
DECIDUOUS	24 INCHES	-
DECIDUOUS	48 INCHES	-

PLAN NORTH

IF SHEET MEASURES LESS THAN 27 X 34 FT 18  
A REDUCED PRINT, REDUCE SCALE ACCORDINGLY.



Sheet 8 of 39

PROJ. number: C-04

RIVERVIEW PARK  
GREEN/DUWAMISH ECOSYSTEM RESTORATION

**CLEARING, GRUBBING,  
AND TREE PROTECTION**

KENT PN 127251 WASHINGTON

U.S. ARMY ENGINEER DISTRICT, SEATTLE  
CORPS OF ENGINEERS  
SEATTLE, WASHINGTON

Prepared by: **TETRA TECH**  
1425 7th Avenue, Suite 200  
Seattle, WA 98101  
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Designed by: MAS Date: 29 APR, 2011  
Drawn by: JLB File #: C1951C-GP004.dgn  
Checked by: JHS/MM Rev. JL

Symbol	Description	Date	Appr.	Symbol	Description

U.S. Army Corps  
of Engineers  
Seattle District

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GENERAL NOTES:  
 1. THE LOCATION, SIZE, AND NUMBER OF LOGS ON THIS SHEET LOG CLUSTER INSTALLATION DETAILS FOR SHEET C-23 FOR INLET LOG JAM PILE INSTALLATION DETAILS.

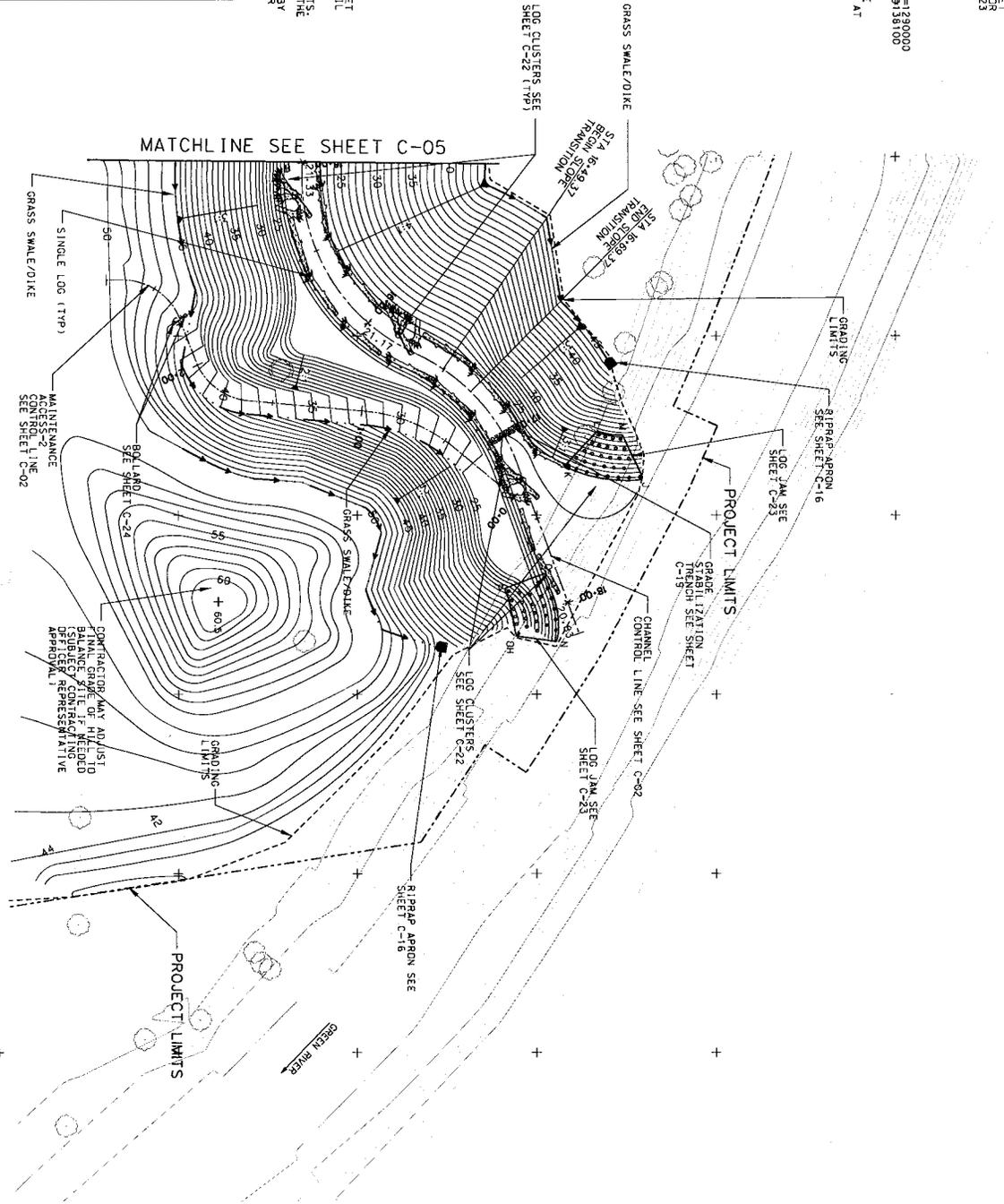
LOG CLUSTER LOCATION NOTES  
 1. THE TABLE BELOW SPECIFIES LOG CLUSTER CONTROL POINTING THE CONTROL POINTS TO BE NEARLY 5' TO 15' FROM THE APPROXIMATE CENTERLINE OF LOG CLUSTER CONTROL POINTS. THE FINAL LOCATION OF LOG CLUSTER CONTROL POINTS SHALL BE THEN APPROVED BY THE CONTRACTING OFFICER REPRESENTATIVE (COR) OR COR DESIGNATED PRIOR TO THE TOP OF RIGHT OR LEFT BANK, PERPENDICULAR TO CENTERLINE AT THE INDICATED STATION.

Right (East) Bank	Centerline	Left (West) Bank
Station	Type	Type
11+25	Single (NRB)	Single (NRB)
11+45	Single (NRB)	Single
11+65	Single (NRB)	Single (NRB)
11+85	Single (NRB)	Clusar
12+15	Single	Single (NRB)
12+45	Single	Single
12+75	Clusar	Single
13+05	Single (NRB)	Single
13+35	Single	Single
13+65	Single	Single
13+95	Clusar	Single
14+25	Single (NRB)	Single
14+55	Single (NRB)	Clusar
14+85	Single	Single (NRB)
15+15	Single	Single (NRB)
15+45	Single	Single
15+75	Clusar	Single
16+05	Single (NRB)	Single
16+35	Single	Single
16+65	Single	Single
16+95	Single	Clusar
17+25	Single	Single (NRB)
		Single (NRB)

LOG JAM LOCATION NOTES:  
 1. LOG JAM PILE LOCATIONS ILLUSTRATED ON THIS SHEET ARE APPROXIMATE LOCATIONS. SHEET C-23 FOR MORE DETAIL.

3. THE TABLE BELOW SPECIFIES LOG JAM CONTROL POINTS. THE FINAL LOCATION OF LOG JAM CONTROL POINTS SHALL BE THEN APPROVED BY THE CONTRACTING OFFICER REPRESENTATIVE (COR) OR COR DESIGNATED PRIOR TO PILE INSTALLATION.

Southwest	Eastline	Northline
A	129030.0	13830.0
B	129040.0	13845.0
C	129055.0	13850.0
D	129065.0	13851.0
E	13807.0	13857.0
F	129065.0	13859.0
G	129045.0	13872.0
H	129045.0	13877.0
I	129035.0	13878.0
J	129025.0	13878.0
K	129025.0	13877.0
L	129005.0	13885.0
M	129005.0	13887.0
Northwest		
N	129008.0	13894.0
OH	129010.0	13896.0
P	129013.0	13892.0
Q	129006.0	13893.0



SEE SHEET C-05



Scale: 1" = 30'-0"  
 PLAN NORTH  
 IF SHEET MEASURES LESS THAN 2" X 3" IT IS A REDUCED PRINT. REDUCE SCALE ACCORDINGLY.

RIVERVIEW PARK  
 GREEN/DUWAMISH ECOSYSTEM RESTORATION  
**GRADING PLAN 2**  
 KENT PN 127251 WASHINGTON

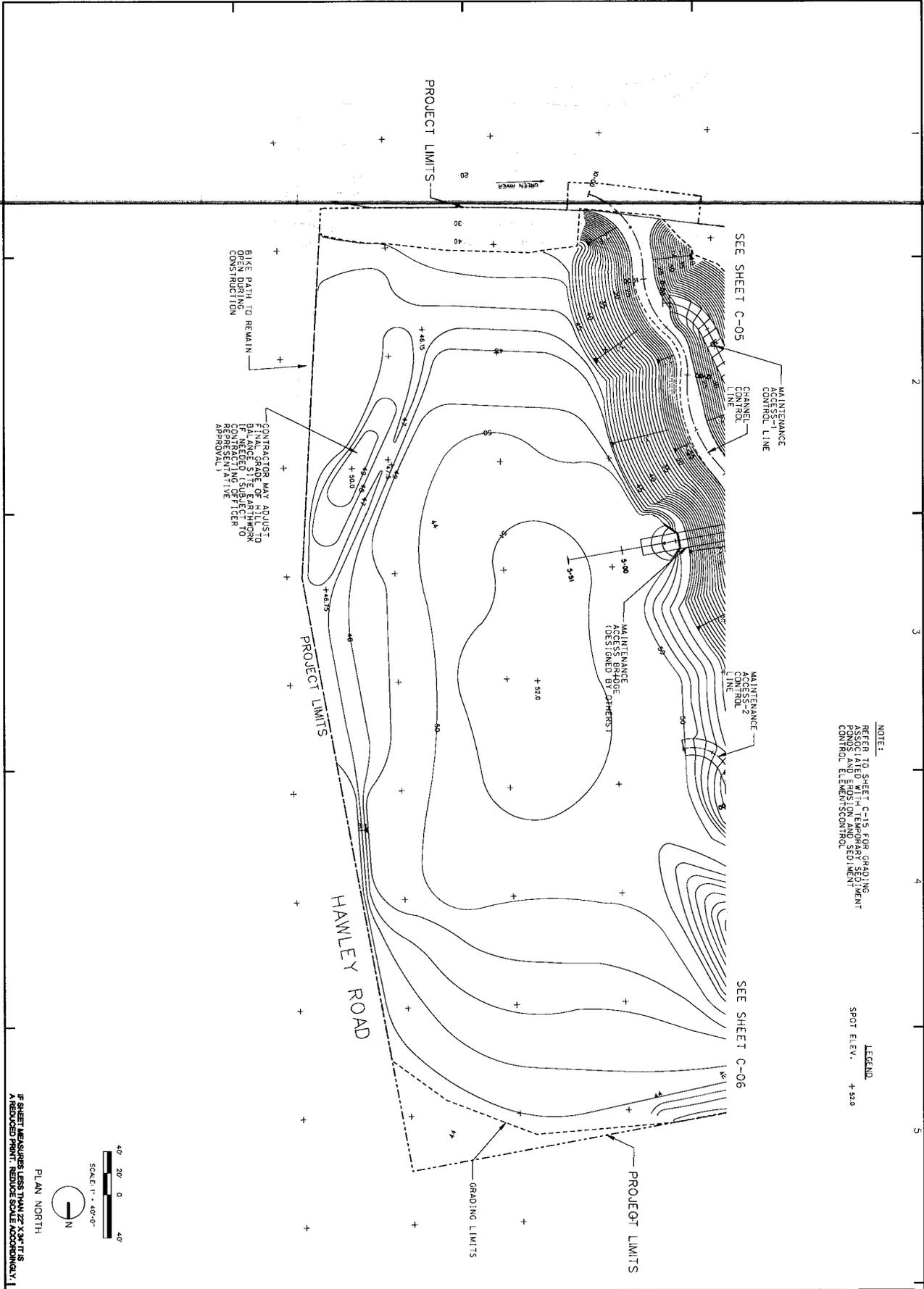
U.S. ARMY ENGINEER DISTRICT SEATTLE  
 CORPS OF ENGINEERS  
 SEATTLE, WASHINGTON  
 Prepared by: **TETRA TECH**  
 1401 Fifth Avenue, Suite 600  
 Seattle, Washington 98101  
 Tel: 206.465.4000 Fax: 206.465.4001

Designed by: MAS  
 Drawn by: JB  
 Checked by: HHH/MM  
 Date: 29 APR. 2011  
 File: C1961C-0P006.dgn  
 Rev: JL

Symbol	Description	Date	App.	Symbol	Description

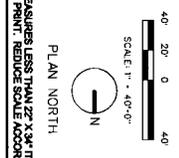
U.S. Army Corps of Engineers  
 Seattle District





NOTE:  
REFER TO SHEET C-19 FOR GRADING POND AND SEDIMENT CONTROL ELEMENTS CONTROL.

LEGEND  
SPOT ELEV. + 52.0



IF SHEET MEASURES LESS THAN 22" X 34" IT IS A REDUCED PRINT. REDUCE SCALE ACCORDINGLY.

RIVERVIEW PARK  
GREEN/DUWAMISH ECOSYSTEM RESTORATION

**GRADING PLAN 3**

KENT PN 127251 WASHINGTON

U.S. ARMY ENGINEER DISTRICT SEATTLE  
CORPS OF ENGINEERS  
SEATTLE, WASHINGTON

Prepared by: **TETRA TECH**  
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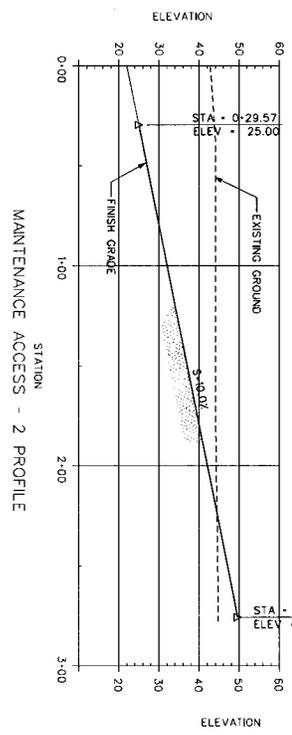
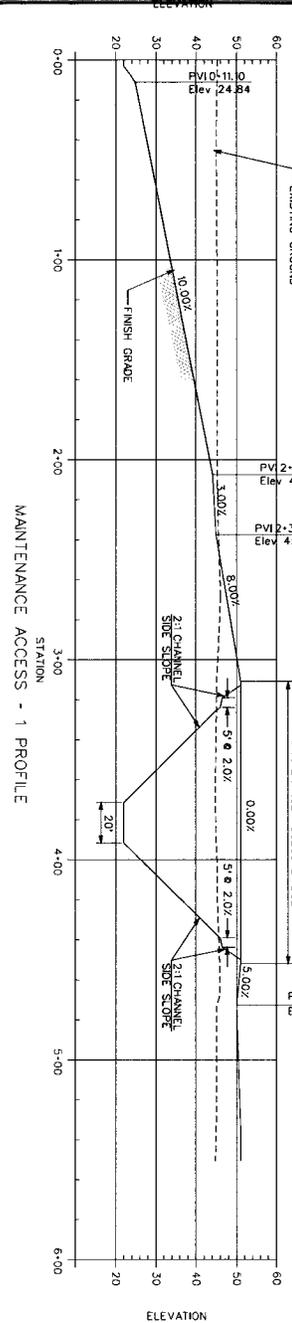
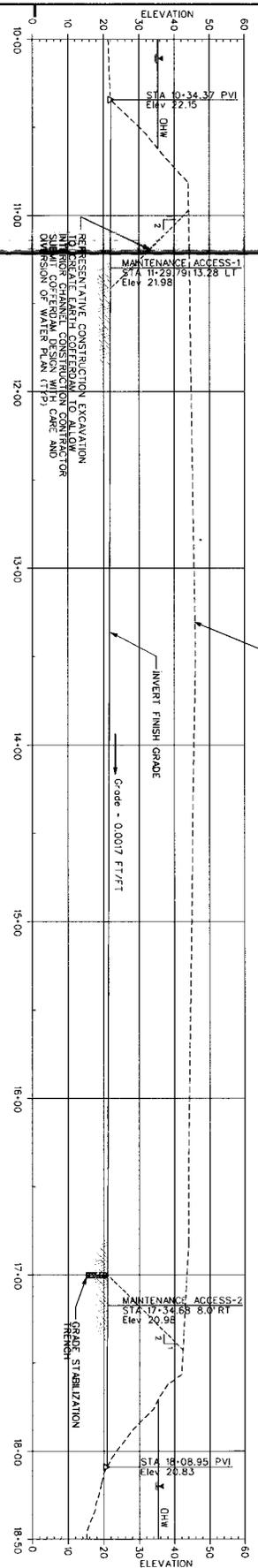
Designed by: MAS Date: 29 APR 2011  
Drawn by: JB File: C1951C-CPOCD7.dgn  
Checked by: HHH/MM Rev: JL

Symbol	Description	Date	Appr.	Symbol	Description

U.S. Army Corps of Engineers  
Seattle District

Sheet number:  
**C-07**  
Sheet 11 of 39

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IF SHEET MEASURES LESS THAN 27 X 34" IT IS A REDUCED PRINT. REDUCE SCALE ACCORDINGLY.

RIVERVIEW PARK  
 GREEN/DUWAMISH ECOSYSTEM RESTORATION  
**CHANNEL AND ALIGNMENT PROFILES**  
 KENT PN 127251 WASHINGTON

U.S. ARMY ENGINEER DISTRICT, SEATTLE  
 CORPS OF ENGINEERS  
 SEATTLE, WASHINGTON  
 Prepared by: **TETRA TECH**  
 1400 Pike Avenue, Suite 600  
 Bellevue, Washington 98005  
 206.734.4000 Fax: 206.734.4070

Designed by: MAS Date: 29 APR. 2011  
 Drawn by: JB File: C1951C-PRC08.dgn  
 Checked by: HHH/MM Rev: JL

Symbol	Description	Date	Appr.	Symbol	Description

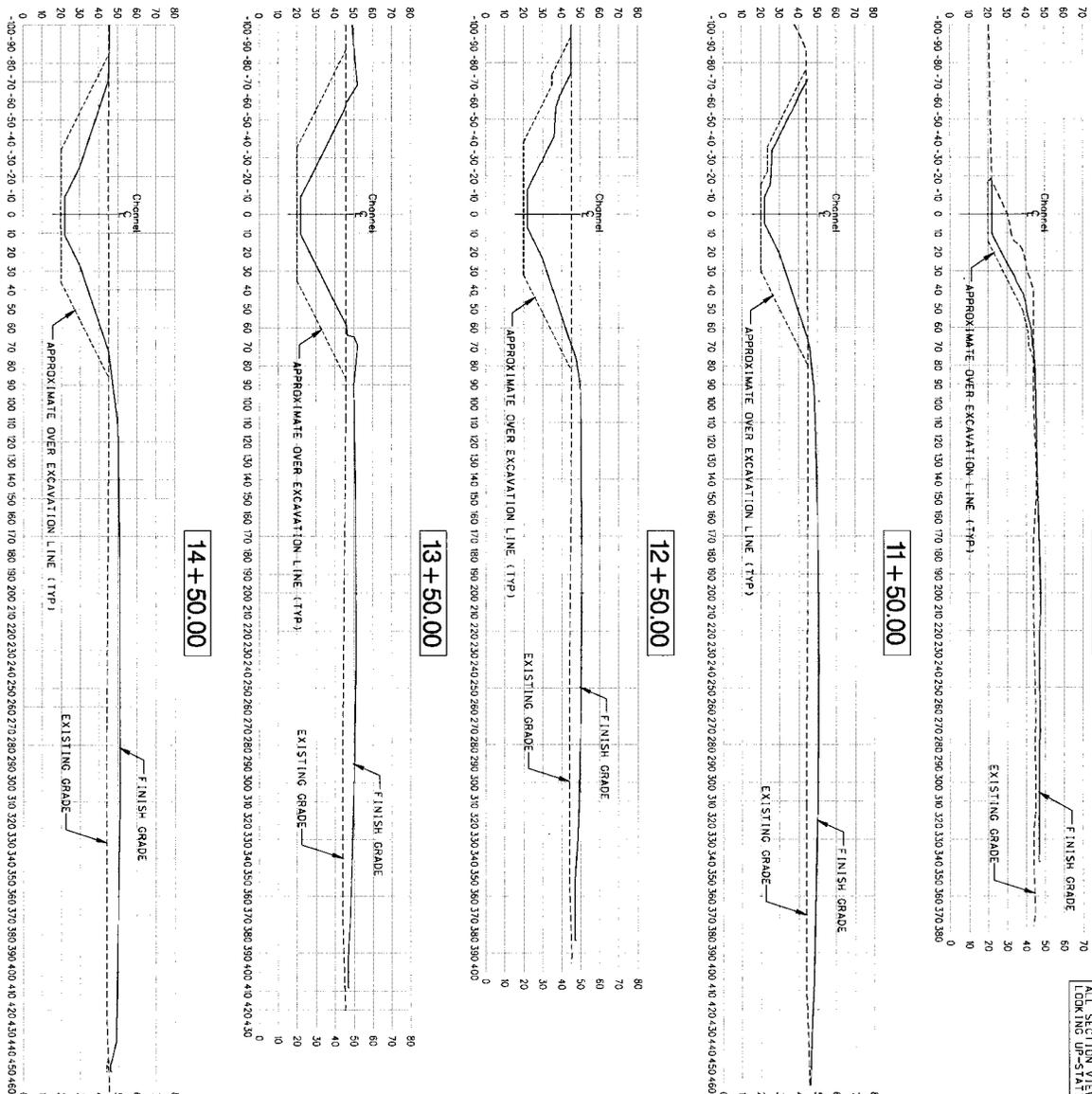
US Army Corps of Engineers  
 Seattle District  
 Seattle, WA





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NOTE:  
APPROXIMATE EXCAVATION LIMITS NOT  
INTENDED FOR USE IN OR AS A  
CONTRACTOR'S  
EXCAVATION PLAN. CONTRACTOR'S  
EXCAVATION PLAN SHOULD BE BASED  
ON GEOTECHNICAL INPUT



NOTE: RIGHT PROTECTION AND ASSURANCE OF HIGHWAY DEVICES SHALL BE PROVIDED IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS FOR IMPROVEMENTS TO STATE HIGHWAYS.

F SHEET MEASURES LESS THAN 27 X 34 FT IS REPRODUCED PRINT. REDUCE SCALE ACCORDINGLY.

RIVERVIEW PARK  
GREEN/DUWAMISH ECOSYSTEM RESTORATION  
**CUT - FILL SECTIONS-1**  
KENT PN 127251 WASHINGTON

U.S. ARMY ENGINEER DISTRICT, SEATTLE  
CORPS OF ENGINEERS  
SEATTLE, WASHINGTON

Designed by: MAS Date: 09 APR. 2011  
Drawn by: JB File: C1951C-SC0C10.dgn  
Checked by: HMM/MM Rev: JL

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Symbol	Description	Date	Appr.	By	Description

**SEA**  
U.S. Army Corps of Engineers  
Seattle District

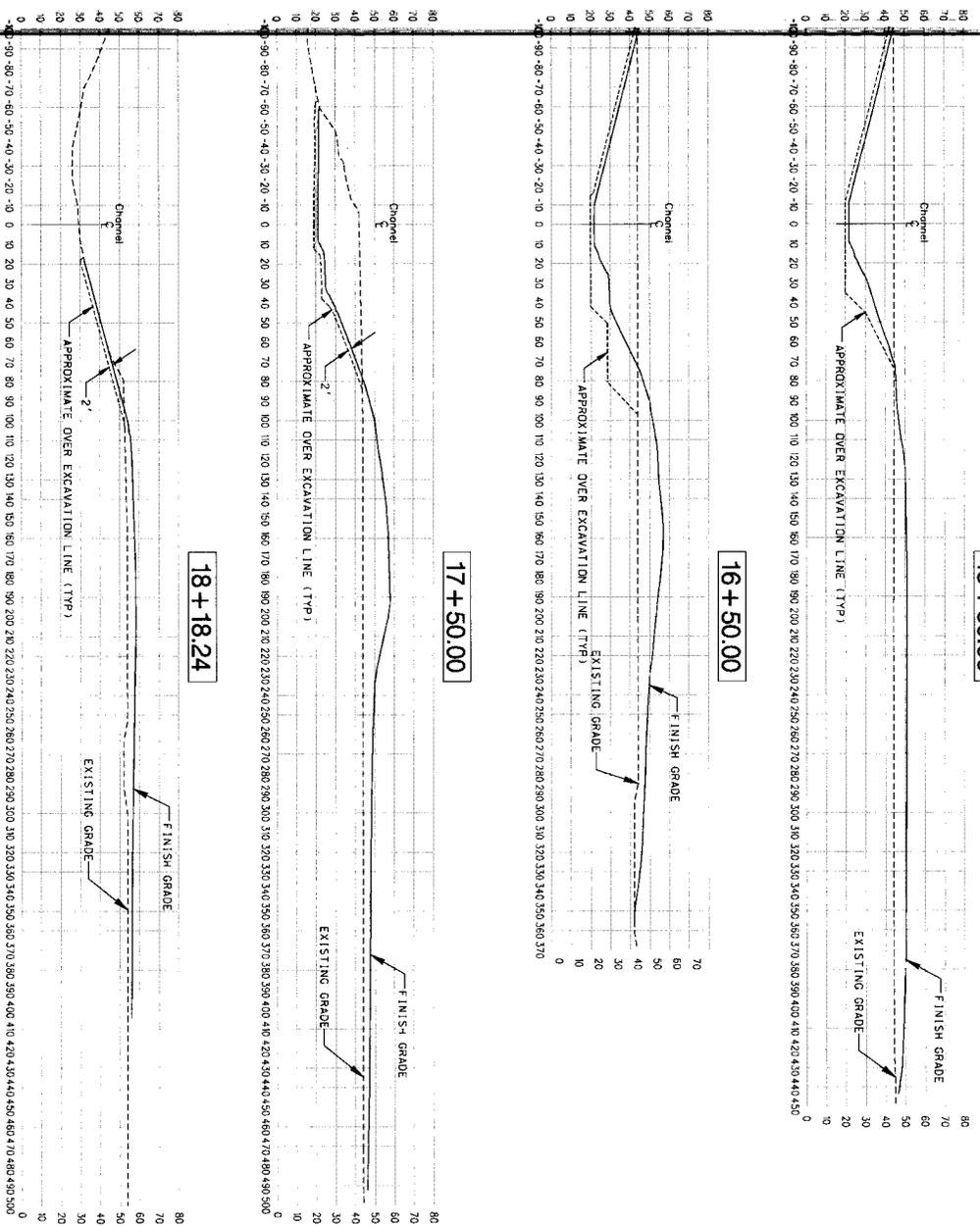
PILOT  
number  
**C-10**  
Sheet 14 of 35

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NOTE:  
 APPROXIMATE EXCAVATION LIMITS NOT  
 INTENDED FOR USE IN OR AS AN  
 EXCAVATION PLAN OR AS AN  
 RESPONSIBLE FOR GENERAL  
 EXCAVATION AND SAFETY PLAN BASED  
 ON GEOTECHNICAL INPUT

NOTE: SLOPE PROTECTION AND INSTALLATION OF HABITAT FEATURES MAY  
 BE REQUIRED TO MAINTAIN STABILIZED SOIL  
 SLOPE PROTECTION AND CIVIL DETAILS FOR MORE INFORMATION.

IF SHEET MEASURES LESS THAN 27" X 36" IT IS  
 A REDUCED PRINT. REDUCE SCALE ACCORDINGLY.



ALL SECTION VIEWS ARE  
 LOOKING UP-STATION

Sheet 5 of 29  
 Plate number:  
**C-11**

RIVERVIEW PARK  
 GREEN/DUWAMISH ECOSYSTEM RESTORATION  
**CUT - FILL SECTIONS-2**  
 KENT PN 127251 WASHINGTON

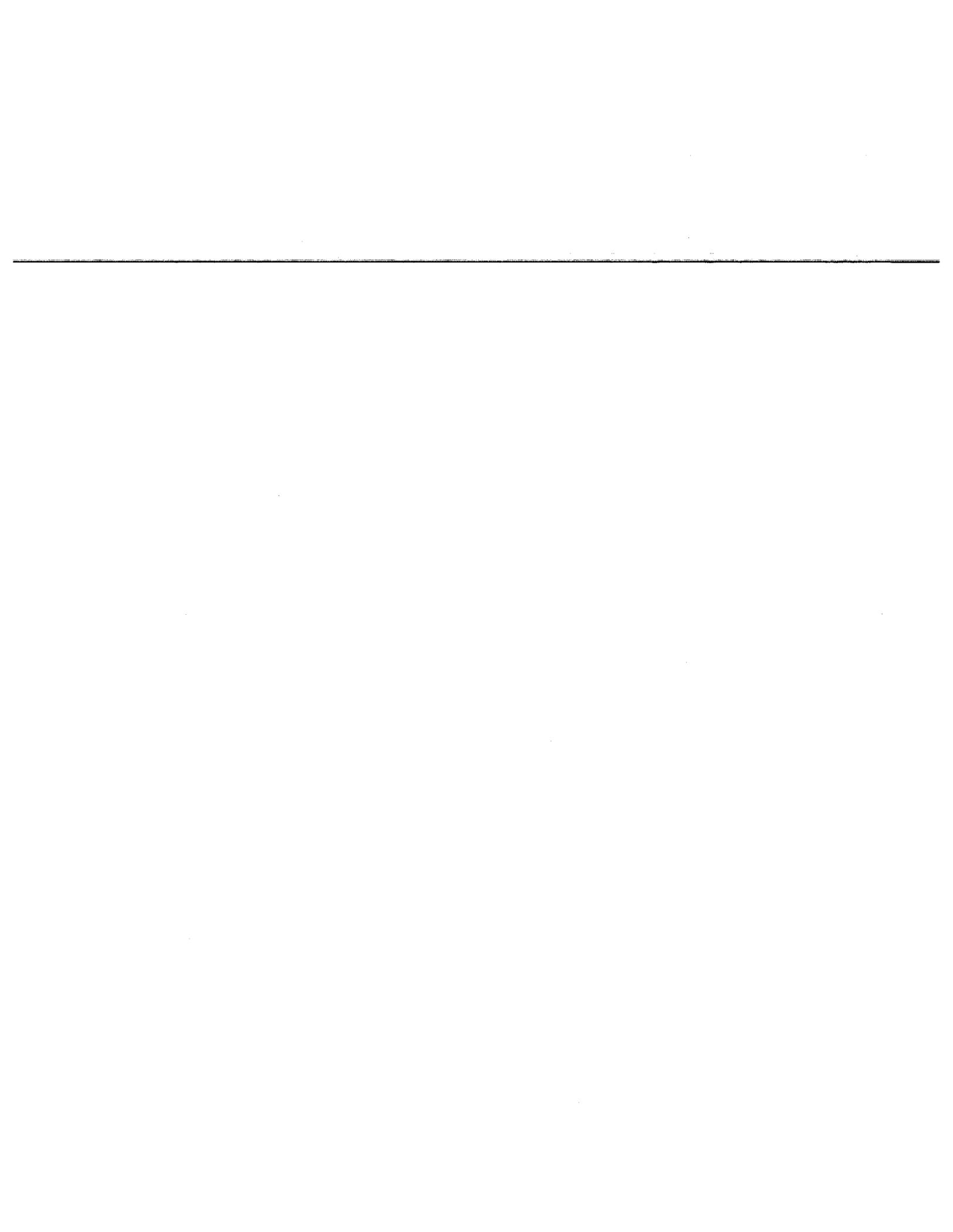
U.S. ARMY ENGINEER DISTRICT, SEATTLE  
 CORPS OF ENGINEERS  
 SEATTLE, WASHINGTON

Designed by: MAS  
 Drawn by: JB  
 Checked by: HHH/MM  
 Date: 29 APR. 2011  
 File: C1951C-S08C11.dgn  
 Rev: JL

Prepared by: **TETRA TECH**  
 400 7th Avenue, Suite 200  
 Seattle, WA 98101  
 206.724.9000 Fax: 206.724.9070

Symbol	Description	Color	Appr.	Symbol	Description

**FMA**  
 Federal  
 Corps  
 of Engineers  
 Seattle District



**EROSION AND SEDIMENT CONTROL NOTES:**

THE EROSION AND SEDIMENT CONTROL MEASURES DESCRIBED HEREIN ARE ONE OF THE BEST MANAGEMENT PRACTICES AVAILABLE TO PREVENT EROSION AND SEDIMENTATION FROM OCCURRING ON THE CONSTRUCTION SITE. THE CONTRACTOR SHALL SUBMIT A DETAILED EROSION AND SEDIMENT CONTROL PLAN (ESCP) TO THE CITY OF KENT FOR REVIEW AND APPROVAL. THE PLAN SHALL BE REVIEWED AND APPROVED BY THE CITY OF KENT AND THE WASHINGTON STATE DEPARTMENT OF ECOLOGY (DCE) PRIOR TO THE START OF CONSTRUCTION. THE PLAN SHALL BE MAINTAINED AS DESCRIBED IN THE WESTERN WASHINGTON (2005).

CONSTRUCTION SHALL BE RESPONSIBLE FOR ALL PERMIT APPLICATIONS, SUCH AS CONSTRUCTION SITE EROSION CONTROL PLAN (ESCP) AND STORMWATER POLLUTION PREVENTION PLAN (SWPPP), THAT ARE REQUIRED FOR THE PROJECT. THE CONTRACTOR SHALL BE RESPONSIBLE FOR PAYMENT OF APPLICABLE PERMIT FEES. CONSTRUCTION SHALL BE RESPONSIBLE FOR THE FOLLOWING:

1. THE APPROVED CONSTRUCTION SEQUENCE SHALL BE AS FOLLOWS:
  - A. CONDUCT PRE-CONSTRUCTION MEETING.
  - B. FENCE OFF EROSION CONTROL MEASURES.
  - C. POST SIGN WITH NAME AND PHONE NUMBER OF ESC SUPERVISOR.
  - D. GRASS AND STRAW MULCH TO PROTECT EXPOSED SOILS.
  - E. INSTALL PERIMETER FENCE (SILT FENCE, BRUSH BARRIER, ETC.).
  - F. CONSTRUCT SEDIMENT TRAP AND TRAP PITS.
  - G. CONSTRUCT SURFACE WATER CONTROL'S (INTERCEPTOR DITCHES, PIPE SLOPE DRAINAGE, ETC.).
  - H. MAINTAIN EROSION CONTROL MEASURES IN ACCORDANCE WITH WASHINGTON STATE DEPARTMENT OF ECOLOGY (DCE) REGULATIONS AND WASHINGTON STATE DEPARTMENT OF TRANSPORTATION (SDOT) REGULATIONS.
  - I. AS SITE CONDITIONS CHANGE, THE EROSION AND SEDIMENT CONTROL IS ALWAYS TO REMAIN UNCHANGED FOR MORE THAN 14 DAYS.
  - J. COVER ALL AREAS WITHIN THE SPECIFIED TIME FRAME WITH STRAW, MULCH, FIBER MULCH, GEOTEXTILE, PLASTIC SHEETING, CRUSHED ROCK OR EQUIVALENT.
  - K. SEED OR SOIL ANY AREA THAT REMAINS UNCOVERED FOR MORE THAN 14 DAYS.
  - L. STABILIZED AND BEST MANAGEMENT PRACTICES REMOVED IF APPROPRIATE.

2. APPROVAL OF THIS EROSION AND SEDIMENT CONTROL (ESCP) PLAN DOES NOT CONSTITUTE AN ENDORSEMENT OF ANY PRODUCTS, RESTRICTIONS, CHANNELS, MAINTENANCE, REPLACEMENT, AND UPGRADING OF THESE ESC FACILITIES IS THE RESPONSIBILITY OF THE CONTRACTOR UNTIL ALL CONSTRUCTION IS APPROVED.

3. THE BOUNDARIES OF THE CLEARING LIMITS SHOWN ON THIS PLAN SHALL BE SET PRIOR TO CONSTRUCTION. DURING THE CONSTRUCTION PERIOD, NO DISTURBANCE OR REMOVAL OF ANY GROUND COVER BEYOND THE TAGGED CLEARING LIMITS SHALL BE MAINTAINED BY THE CONTRACTOR FOR THE DURATION OF CONSTRUCTION.

4. THE ESC FACILITIES SHOWN ON THIS PLAN MUST BE CONSTRUCTED PRIOR TO ANY CONSTRUCTION WITHIN THE CLEARING AND GRADING ACTIVITIES. IN SUCH A CASE, THE CONTRACTOR SHALL MAINTAIN A RECORD OF THE DRAINAGE FACILITIES AND THE VEGETATION FOR SILENT MONITORING.

5. DURING THE CONSTRUCTION PERIOD, THESE ESC FACILITIES SHALL BE MAINTAINED AND OPERATED AS DESCRIBED. ADDITIONAL SWMS, RELOCATION OF DITCHES AND SILT FENCES, ETC. SHALL BE REQUIRED FOR UNEXPECTED STORM EVENTS AND AS THE ENGINEER DETERMINES. ADDITIONALLY, MORE ESC FACILITIES MAY BE REQUIRED TO ENSURE COMPLETE SILTATION CONTROL. THEREFORE, DURING THE COURSE OF CONSTRUCTION, THE CONTRACTOR SHALL MAINTAIN A RECORD OF THE ESC FACILITIES AND TO CONDUCT VISUAL INSPECTIONS OF THE FACILITIES OVER AND ABOVE THE MINIMUM REQUIREMENTS AS MAY BE REQUIRED.

6. THE ESC FACILITIES SHALL BE INSPECTED BY THE CONTRACTOR DAILY DURING CONSTRUCTION. THE CONTRACTOR SHALL MAINTAIN A RECORD OF THE ESC FACILITIES AND TO CONDUCT VISUAL INSPECTIONS OF THE FACILITIES OVER AND ABOVE THE MINIMUM REQUIREMENTS AS MAY BE REQUIRED.

7. THE ESC FACILITIES ON DRAINAGE SITES SHALL BE INSPECTED AND MAINTAINED AT LEAST ONCE A MONTH WITHIN 48 HOURS FOLLOWING A STORM EVENT.

8. A MINIMUM OF ONCE A MONTH TO BE INSTALLED PER CITY OF KENT STANDARD DETAILS.

9. ALL SILT FENCING ON SITE

10. ALL DENIED SOILS, INCLUDING ROADWAY EMBANKMENTS, MUST BE STABILIZED WITH GRASS, SEEDING ALONE WILL BE ACCEPTABLE ONLY DURING THE MONTHS OF APRIL THROUGH OCTOBER INCLUSIVE.

11. STABILIZED CONSTRUCTION EMBANKMENTS SHALL BE INSTALLED AT THE BEGINNING OF CONSTRUCTION AND MAINTAINED THROUGHOUT THE DURATION OF THE PROJECT. ALL PAVED AREAS ARE KEPT CLEAN FOR THE DURATION OF THE PROJECT.

12. ANY PERMANENT RETENTION/DETENTION FACILITY USED AS A TEMPORARY SETTLING BASIN SHALL BE MODIFIED TO THE NECESSARY EROSION CONTROL MEASURES AND SHALL BE MAINTAINED THROUGHOUT THE DURATION OF THE PROJECT. THE SYSTEM SHALL BE KEPT CLEAN FOR THE DURATION OF THE PROJECT.

13. WHERE SEEDING FOR TEMPORARY EROSION CONTROL IS REQUIRED, FAST GERMINATING GRASSES SHALL BE APPLIED AT AN APPROPRIATE RATE. (EXAMPLE: ANNUAL OR PERENNIAL GRASSES APPLIED AT APPROXIMATELY 80 POUNDS PER ACRE).

14. WHERE STRAW MULCH IS REQUIRED FOR TEMPORARY EROSION CONTROL, IT SHALL BE APPLIED AT A MINIMUM THICKNESS OF 3 IN OR 300 LBS/ACRE. EXCEEDING 6 IN MUST HAVE A PERIMETER SILT FENCE.

15. THE ESC FACILITIES SHALL BE CONSTRUCTED IN ACCORDANCE WITH THE DETAILS ON THE DRAWINGS. THE CONTRACTOR SHALL MAINTAIN A RECORD OF THE ESC FACILITIES AND TO CONDUCT VISUAL INSPECTIONS OF THE FACILITIES OVER AND ABOVE THE MINIMUM REQUIREMENTS AS MAY BE REQUIRED.

16. A COPY OF THE APPROVED EROSION CONTROL PLANS MUST BE ON THE JOB SITE WHEREVER CONSTRUCTION IS IN PROGRESS.

17. ALL LOTS ADJOINING OR SHARING ANY NATURAL PROPERTY OR EASEMENTS, SLOPE SEPARATING THE LOT FOR BUILDABLE PORTIONS OF THE LOT FROM THE AREA RESTRICTED BY THE CODE AND SHALL BE INSTALLED PRIOR TO ANY GRADING OR CLEARING AND REMAIN OPEN/UNOCCUPIED. A DWELLING IS CONSIDERED TO BE CONSTRUCTION TO THE FIRST FLOOR.

18. CLEARING LIMITS SHALL BE DELINEATED WITH A CLEARING CONTROL FENCE. THE CLEARING CONTROL FENCE SHALL CONSIST OF A 6-FT. HIGH CHAIN LINK FENCE AND BE MAINTAINED THROUGHOUT THE DURATION OF THE PROJECT. THE FENCE SHALL BE MAINTAINED THROUGHOUT THE DURATION OF THE PROJECT. THE FENCE SHALL BE MAINTAINED THROUGHOUT THE DURATION OF THE PROJECT.

19. OFF-SITE STREETS MUST BE KEPT CLEAN AT ALL TIMES. IF DIRT IS DEPOSITED ON THE PUBLIC RIGHT-OF-WAY, THE CONTRACTOR SHALL REMOVE THE DIRT FROM THE PUBLIC RIGHT-OF-WAY AND SHALL BE KEPT CLEAN OF ALL DIRT THAT WOULD BE DEPOSITED ON THE PUBLIC STREETS.

20. ANY CATCH BASINS COLLECTING RUNOFF FROM THE SITE, WHETHER THEY ARE ON OR OFF THE SITE, SHALL BE MAINTAINED THROUGHOUT THE DURATION OF THE PROJECT. THE BASIN SHALL BE MAINTAINED THROUGHOUT THE DURATION OF THE PROJECT. THE BASIN SHALL BE MAINTAINED THROUGHOUT THE DURATION OF THE PROJECT.

21. THE WASHED GRAVEL BACKFILL ADJACENT TO THE FILTER FABRIC SHALL BE REPLACED AND REPAIRED BY THE CONTRACTOR. THE CONTRACTOR SHALL MAINTAIN A RECORD OF THE ESC FACILITIES AND TO CONDUCT VISUAL INSPECTIONS OF THE FACILITIES OVER AND ABOVE THE MINIMUM REQUIREMENTS AS MAY BE REQUIRED.

22. ROCK FOR EROSION PROTECTION OF ROADWAY DITCHES, WHERE REQUIRED, MUST BE OF SOUND QUARRY ROCK, PLACED TO A DEPTH OF 1 FT AND MUST MEET THE FOLLOWING SPECIFICATIONS: 4 IN-8 IN ROCK/40% PASSING, 2 IN-4 IN ROCK/30% PASSING.

23. IF ANY PARTS OF THE CLEARING LIMIT BOUNDARY OR TEMPORARY EROSION/SEDIMENTATION CONTROL PLAN IS DAMAGED, IT SHALL BE REPAIRED IMMEDIATELY.

24. ALL PROPERTIES ADJACENT TO THE PROJECT SITE SHALL BE PROTECTED FROM EROSION AND RUNOFF.

25. DO NOT FLUSH CONCRETE BY PRODUCTS OR TRUCKS NEAR OR INTO THE STORM DRAINAGE SYSTEM. IF EXCESSIVE CONCRETE IS FLUSHED INTO THE STORM DRAINAGE SYSTEM, MEAN DECONTAMINATE THE ENTIRE DOWNSIDE STORM SYSTEM, OR POSSIBLY RE-LAYING THE STORM DRAINAGE SYSTEM.

26. IF A SEDIMENT POND IS NOT PREPARED, A BARRER TANK OR OTHER TEMPORARY GROUND PROTECTION MEASURES MAY BE REQUIRED DURING CONSTRUCTION, DEPENDING ON WEATHER CONDITIONS.

BMP ID	BMP DESCRIPTION	SYMBOL
(C103)	HIGH-VISIBILITY/CHAIN LINK FENCE	
(C105)	STABILIZED CONSTRUCTION ACCESS	
(C107)	STABILIZED ROAD/PARKING AREAS	
(C121)	STRAW MULCH	
(C132)	EROSION CONTROL NETS/BANKETS	
(C200)	GRASS-LINED SLOPE/DIKE	
(C209)	OUTLET PROTECTION	
(C233)	SILT FENCE	
(C235)	STRAW MATILES	
(N1)	CLEAR WATER DIVERSION (SEE SHEET C17)	

\* REFERENCE STORMWATER MANAGEMENT MANUAL FOR WESTERN WASHINGTON (2005)

27. THE CONTRACTOR SHALL MAINTAIN A RECORD OF THE ESC FACILITIES AND TO CONDUCT VISUAL INSPECTIONS OF THE FACILITIES OVER AND ABOVE THE MINIMUM REQUIREMENTS AS MAY BE REQUIRED.

28. THE CONTRACTOR SHALL MAINTAIN A RECORD OF THE ESC FACILITIES AND TO CONDUCT VISUAL INSPECTIONS OF THE FACILITIES OVER AND ABOVE THE MINIMUM REQUIREMENTS AS MAY BE REQUIRED.

29. THE CONTRACTOR SHALL MAINTAIN A RECORD OF THE ESC FACILITIES AND TO CONDUCT VISUAL INSPECTIONS OF THE FACILITIES OVER AND ABOVE THE MINIMUM REQUIREMENTS AS MAY BE REQUIRED.

IF SHEET MANAGERS USE THIS SHEET FOR ANY OTHER PROJECT, PLEASE PRINT REDUCE SCALE ACCORDINGLY.

RIVERVIEW PARK GREEN/DURAWASH ECOSYSTEM RESTORATION  
**EROSION AND SEDIMENT CONTROL NOTES**  
 KENT PN 127251 WASHINGTON

U.S. ARMY ENGINEER DISTRICT, SEATTLE CORPS OF ENGINEERS  
 SEATTLE, WASHINGTON

Designed by: MAS  
 Drawn by: JB  
 Checked by: HHH/MM

Date: 29 APR. 2011  
 File: C195C-EC0612.dwg  
 Rev: JL

Prepared by: **TETRA TECH**  
 1407 7th Avenue, Suite 800  
 Seattle, WA 98101  
 206.461.4000

U.S. Army Corps of Engineers  
 Seattle District

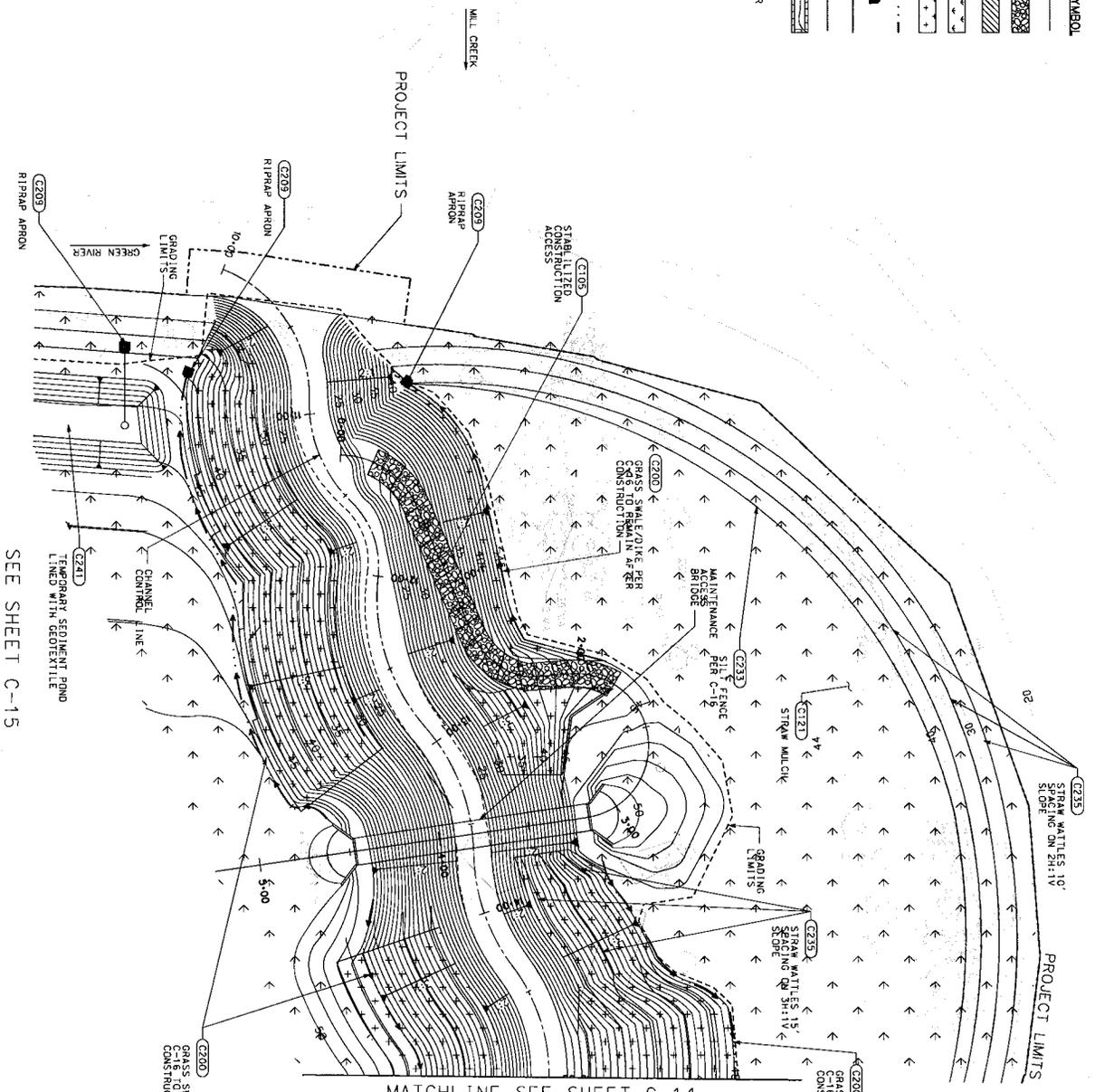
Symbol	Description	Date	App.	Symbol	Description

Sheet 16 of 39



BMP ID	BMP DESCRIPTION	SYMBOL
(C103)	HIGH-VISIBILITY/CHAIN LINK FENCE	[Symbol]
(C105)	STABILIZED CONSTRUCTION ACCESS	[Symbol]
(C107)	STABILIZED ROAD/PARKING AREAS	[Symbol]
(C121)	STRAW MULCH	[Symbol]
(C122)	EROSION CONTROL NETS/BLANKETS	[Symbol]
(C200)	GRASS-SWALE/DIKE	[Symbol]
(C209)	OUTLET PROTECTION	[Symbol]
(C233)	SILT FENCE	[Symbol]
(C235)	STRAW MATTLERS	[Symbol]
(MA)	CLEAR WATER DIVERSION (SEE SHEET C17)	[Symbol]

\* REFERENCE STORMWATER MANAGEMENT MANUAL FOR WESTERN WASHINGTON (2005)



SEE SHEET C-15



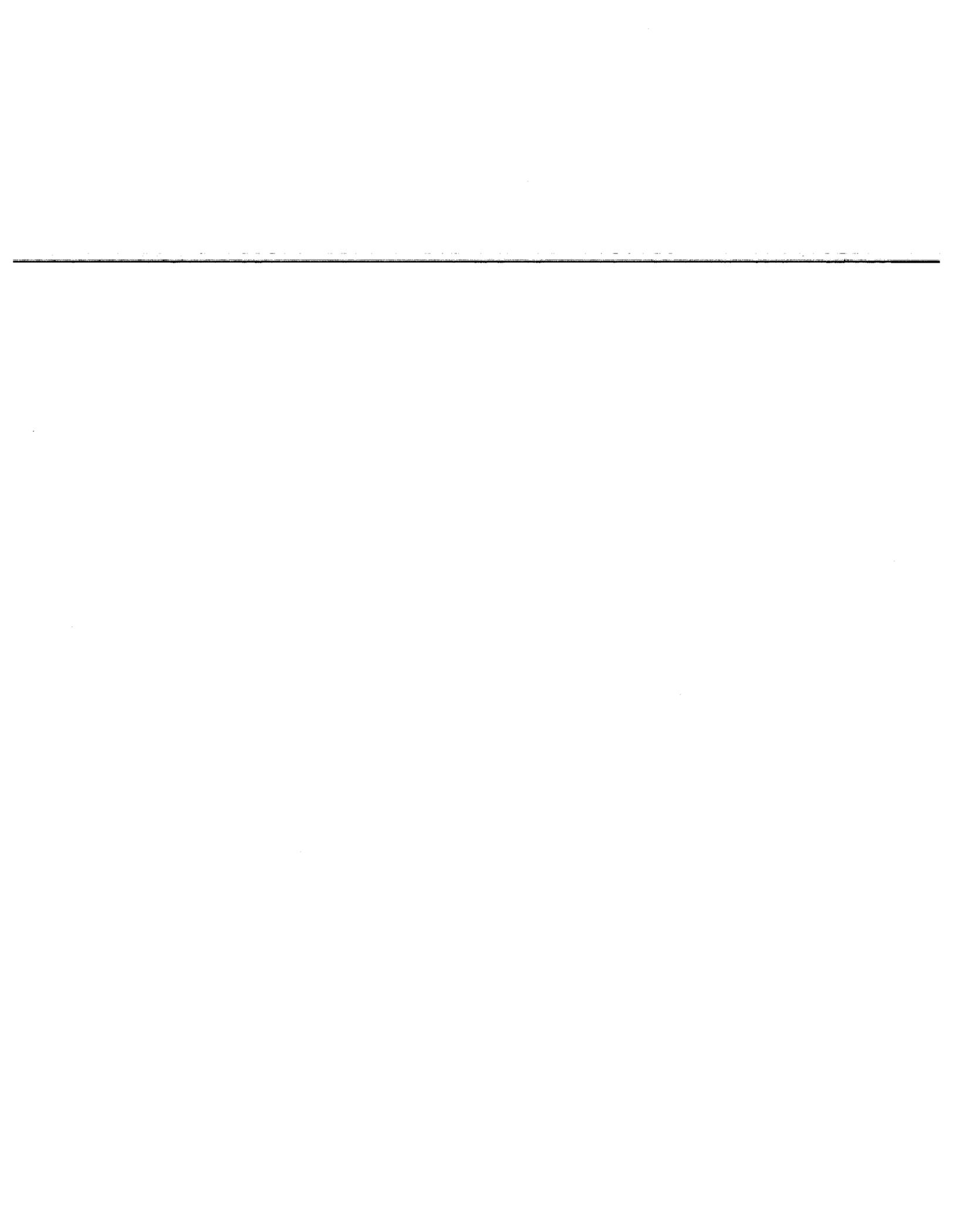
RIVERVIEW PARK  
 GREEN/DUWAMISH ECOSYSTEM RESTORATION  
**EROSION AND SEDIMENT CONTROL-1**  
 KENT PN 127251 WASHINGTON

U.S. ARMY ENGINEER DISTRICT SEATTLE  
 CORPS OF ENGINEERS  
 SEATTLE, WASHINGTON  
 Prepared by: **TETRA TECH**  
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 Tel: 206-465-1100 Fax: 206-465-1109

Designed by: MAS	Date: 29 APR. 2011
Drawn by: JB	File: C1951C-EC0C13.dgn
Checked by: HHH/MM	Rev: JL

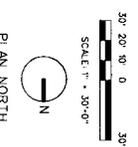
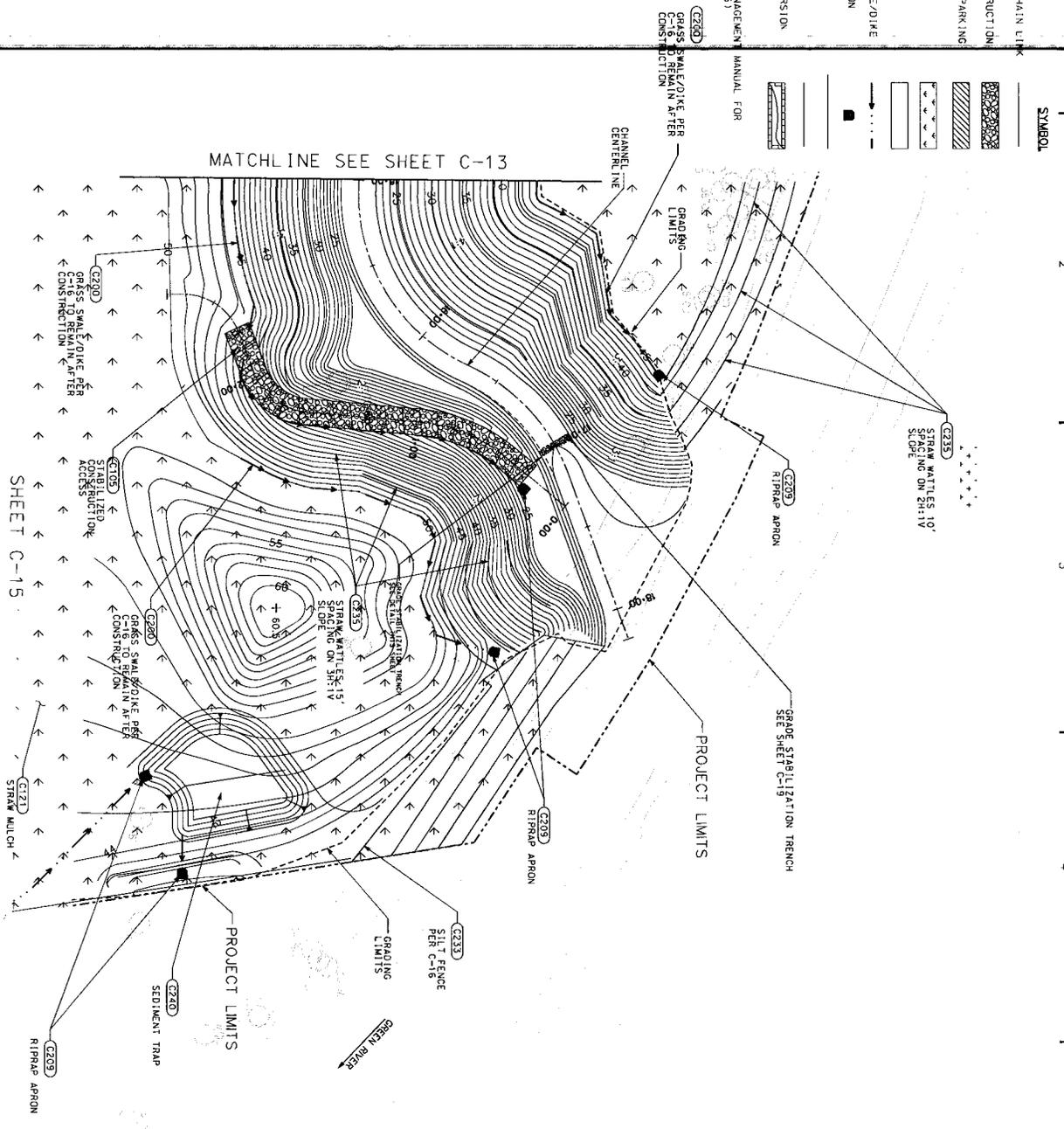
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U.S. Army Corps of Engineers  
 Seattle District  
 Sheet: 17 of 39



BMP ID	BMP DESCRIPTION
(C103)	HIGH-VISIBILITY/CHAIN LINK FENCE
(C105)	STABILIZED CONSTRUCTION ACCESS
(C107)	STABILIZED ROAD/PARKING AREAS
(C121)	STRAW MULCH
(C122)	EROSION CONTROL NETS/BLANKETS
(C200)	GRASS-LINED SWALE/DIKE
(C203)	OUTLET PROTECTION
(C233)	SILT FENCE
(C235)	STRAW MATTLIES
(M1)	CLEAR WATER DIVERSION (SEE SHEET C17)

\* REFERENCE STORMWATER MANAGEMENT MANUAL FOR WESTERN WASHINGTON (2005)



PLAN NORTH  
 F SHEET MEASURES LESS THAN 22 X 34 FT IS A REDUCED PRINT. REDUCE SCALE ACCORDINGLY.

RIVERVIEW PARK  
 GREEN/DUWAMISH ECOSYSTEM RESTORATION  
**EROSION AND SEDIMENT CONTROL-2**  
 KENT PN 127251 WASHINGTON

U.S. ARMY ENGINEER DISTRICT SEATTLE  
 CORPS OF ENGINEERS  
 SEATTLE, WASHINGTON

Designed by: MAS  
 Drawn by: JB  
 Checked by: HHH/MM

Date: 29 APR 2011  
 File: C195C-ECDC14.dgn  
 Rev: JL

Prepared by: **TETRA TECH**  
 4455 15th Avenue, Suite 900  
 Seattle, Washington 98107  
 Tel: 206-465-9000 Fax: 206-465-9070

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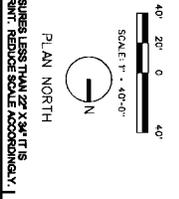
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U.S. Army Corps of Engineers  
 Seattle District

FILE NUMBER: C-14  
 SHEET 18 OF 35



- SHEET NO. SHEET DESCRIPTION**
- (C100) HIGH-VISIBILITY/CHAIN LINK FENCE
  - (C105) STABILIZED CONSTRUCTION AREAS
  - (C110) STABILIZED ROAD/PARKING AREAS
  - (C120) STRAW MULCH
  - (C125) EROSION CONTROL NETS/WRAPMENTS
  - (C130) GRASS-PLANTED SWALE/DIKE
  - (C135) SILT FENCE
  - (C140) STRAW MATILES
  - (C145) CLEAR WATER DIVERSION CLEAR SHEET CITY
  - (C150) REFERENCE STORMWATER MANAGEMENT MANUAL FOR WESTERN WASHINGTON (2003)



IF SHEET MEASURES LESS THAN 27 X 36 IN. IS A REDUCED PRINT. REDUCE SCALE ACCORDINGLY.

RIVERVIEW PARK  
GREEN/DUWAMISH ECOSYSTEM RESTORATION  
**EROSION AND SEDIMENT CONTROL-3**  
KENT PN 127251 WASHINGTON

U.S. ARMY ENGINEER DISTRICT, SEATTLE  
CORPS OF ENGINEERS  
SEATTLE, WASHINGTON

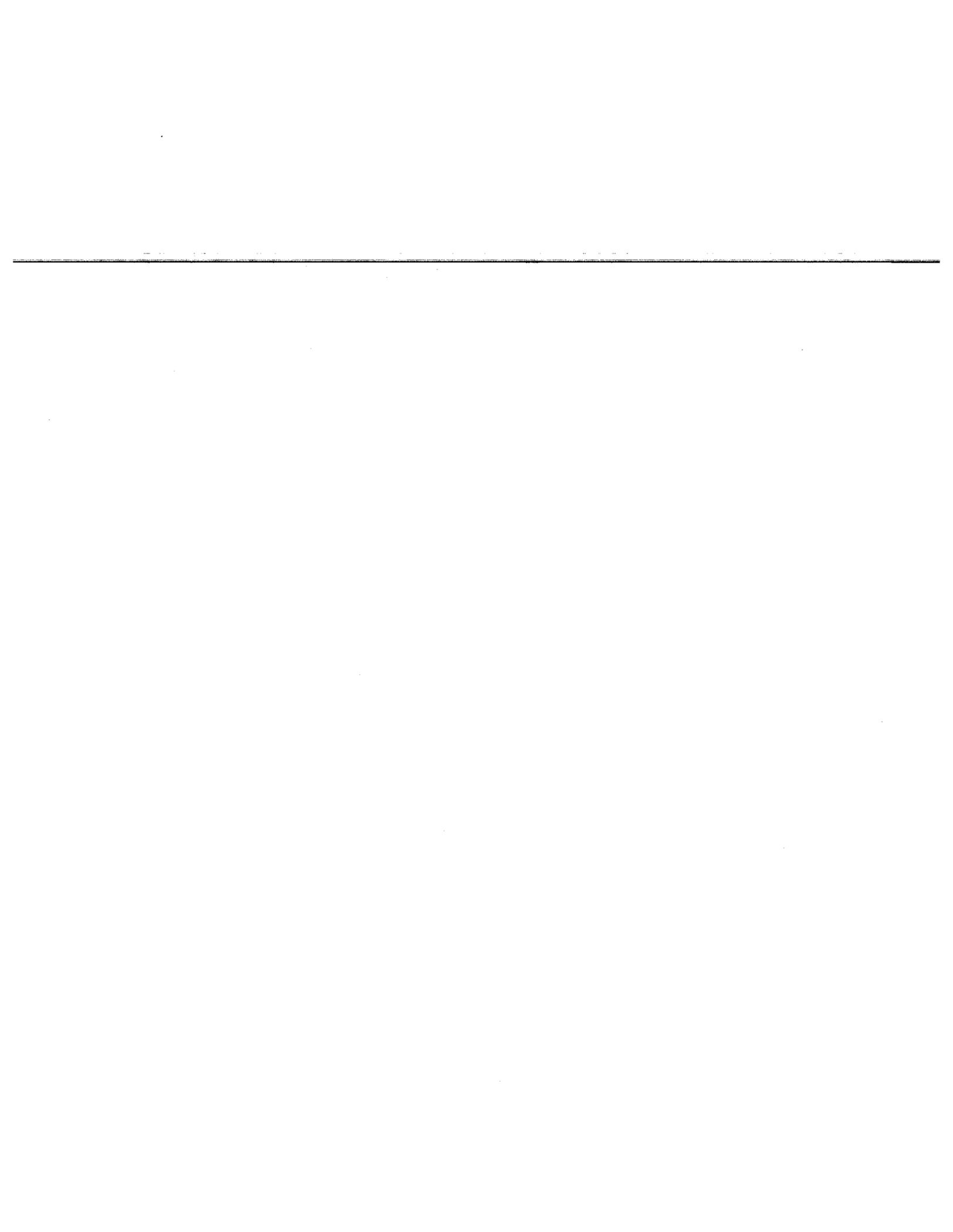
Designed by: MAS  
Checked by: HHE/MM  
Date: 29 APR. 2011  
File: C195K-EC0C15.dgn  
Rev: JL

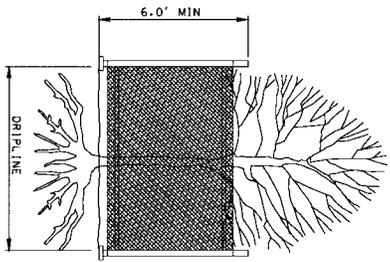
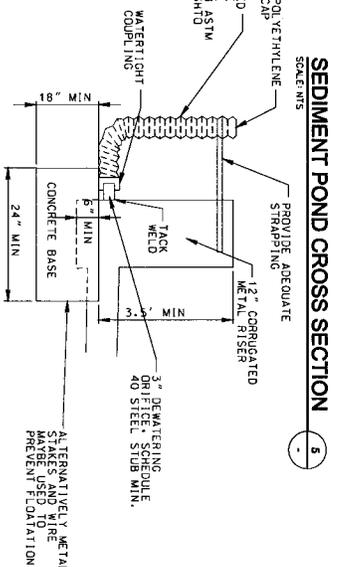
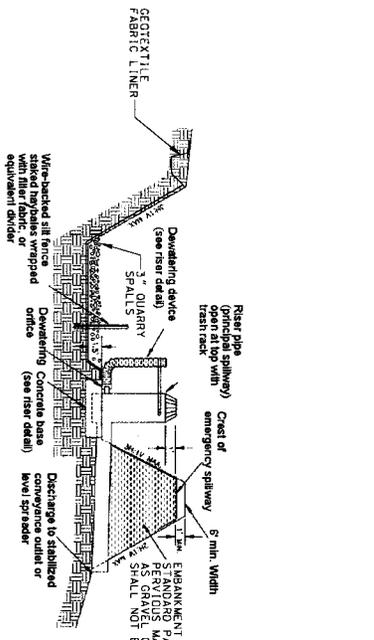
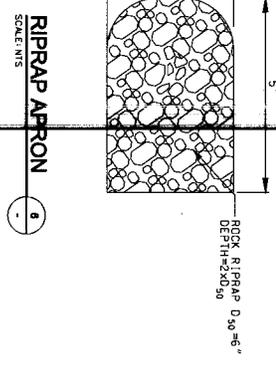
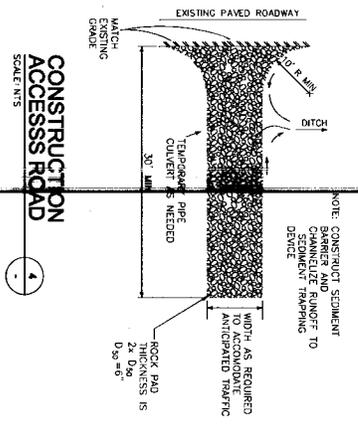
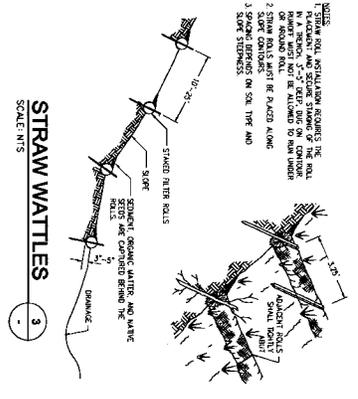
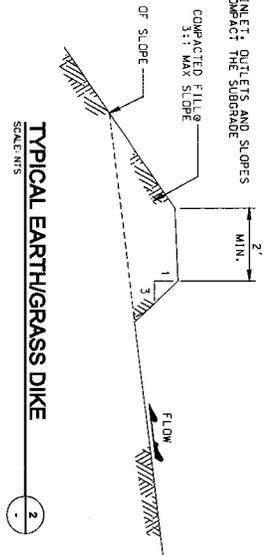
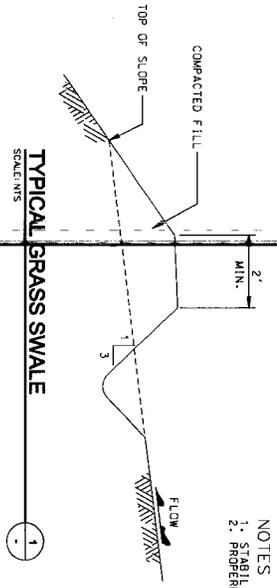
Prepared by: **TETRA TECH**  
1400 7th Avenue, Suite 600  
Seattle, Washington 98101  
206-724-8600 Fax: 206-724-8675

Symbol	Description	Date	Appr.	Symbol	Description



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C-15





**NOTES**  
1. STABILIZE INLET, OUTLETS AND SLOPES  
2. PROPERLY COMPACT THE SUBGRADE

**NOTES**  
1. STRAW ROLL APPLICATION REQUIRES THE ROLL TO BE PLACED ON A 2" DEEP BED OF SAND OR GRAVEL OR WOODEN RAIL.  
2. STRAW ROLL MUST BE PLACED ALONG SLOPE BENCHES ON SOE TIER AND SOE STRENGTHS.

**NOTES:**  
1. 18" HIGH TEMPORARY CHAIN-LINK FENCE SHALL BE PLACED AT 18" FROM TREE TRUNK. INSTALL FENCE POSTS USING PIER BLOCKS ONLY. AVOID DRIVING POSTS INTO MAJOR ROOTS.  
2. TREATMENT OF ROOTS EXPOSED DURING CONSTRUCTION: FOR ROOTS OVER 1" IN DIAMETER DAMAGED DURING CONSTRUCTION, ROOTS SHALL BE COVERED WITH TEMPORARILY COVERED SOIL. DAMP BURLAP TO PREVENT DRYING, AND COVERED WITH SILT AS SOON AS POSSIBLE.  
3. WORK WITHIN PROTECTION FENCE SHALL BE DONE MANUALLY. STORAGE OF EQUIPMENT OR MACHINERY SHALL BE ALLOWED WITHIN THE LIMIT OF THE FENCING.

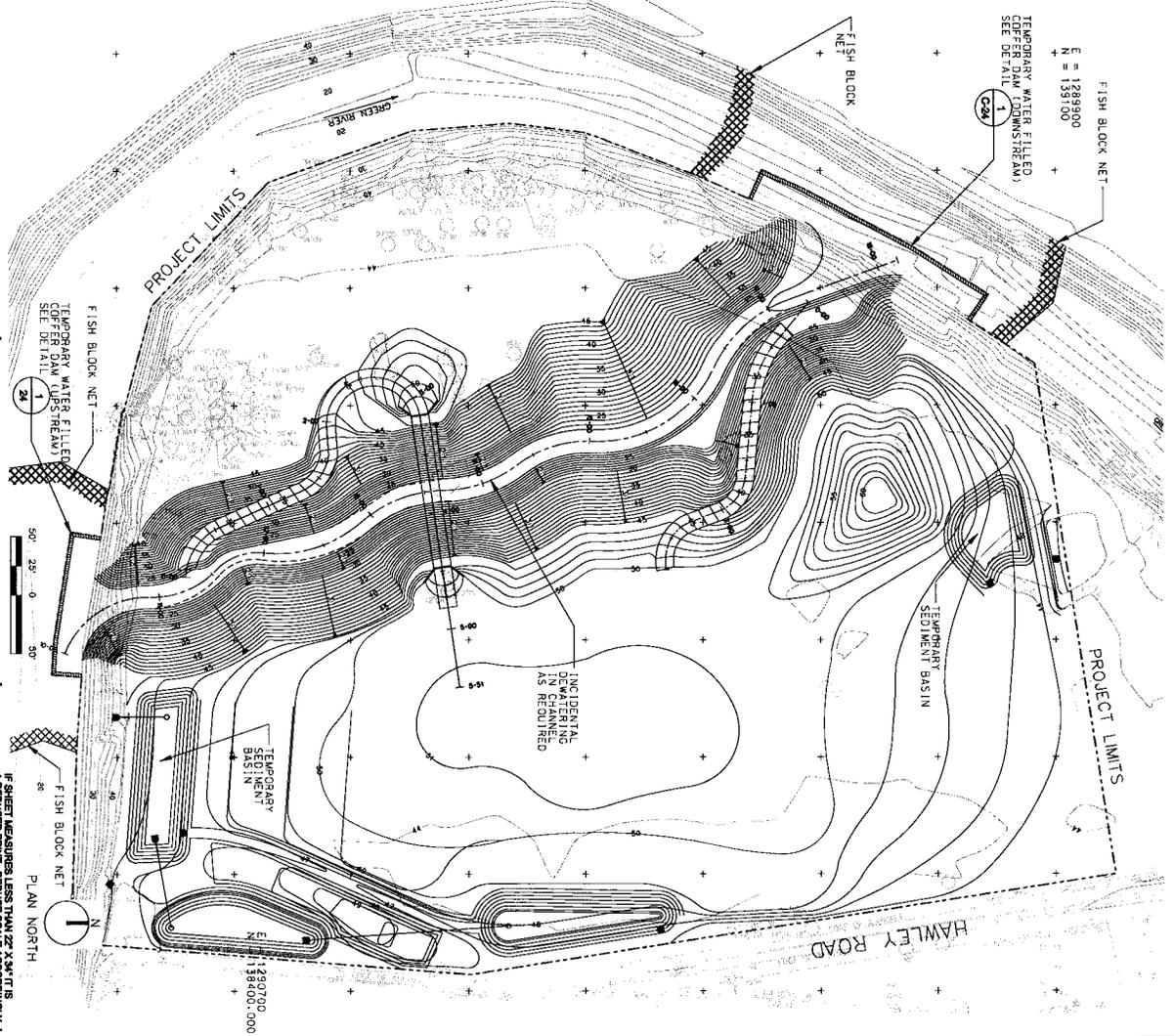
IF SHEET MEASURES LESS THAN 22" X 34" IT IS A REBUILT PRINT. REDUCE SCALE ACCORDINGLY.

	RIVERVIEW PARK GREEN/DUWAMISH ECOSYSTEM RESTORATION <b>EROSION AND SEDIMENT CONTROL DETAILS</b> KENT PN 127251 WASHINGTON	U.S. ARMY ENGINEER DISTRICT SEATTLE CORPS OF ENGINEERS SEATTLE, WASHINGTON	Designed by: MAS Drawn by: JEB Checked by: HHH/MM	Date: 29 APR. 2011 File: C191C-EC0016.dgn Rev: JL	U.S. Army Corps of Engineers Seattle District
	PAGE NUMBER: <b>C-16</b>	SHEET NUMBER: 20 of 39		TETRA TECH 4200 15th Avenue, Suite 200 Seattle, Washington 98148 Tel: 206-465-8000 Fax: 206-465-4070	Description Date App. Symbol Description



**CARE AND DIVERSION OF WATER NOTES:**

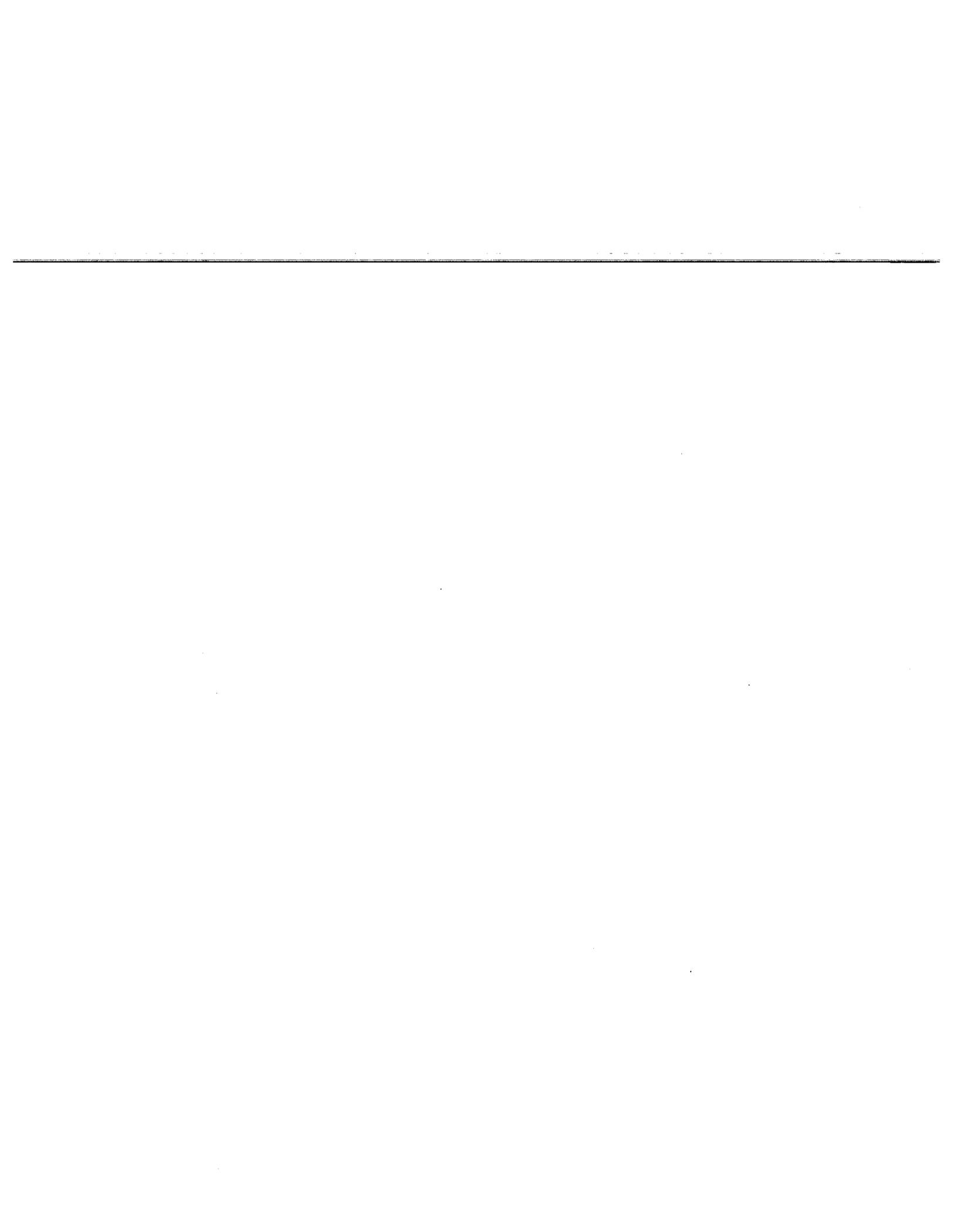
1. THE CONSTRUCTION OPERATING SCHEME SHALL BE ONE OPTION FOR DEWATERING THE PROJECT AREA DURING CONSTRUCTION. THE CONTRACTOR SHALL BE RESPONSIBLE FOR OBTAINING ALL NECESSARY PERMITS AND APPROVALS FOR THE CONSTRUCTION OPERATING SCHEME. THE CONTRACTOR SHALL BE RESPONSIBLE FOR OBTAINING ALL NECESSARY PERMITS AND APPROVALS FOR THE CONSTRUCTION OPERATING SCHEME. THE CONTRACTOR SHALL BE RESPONSIBLE FOR OBTAINING ALL NECESSARY PERMITS AND APPROVALS FOR THE CONSTRUCTION OPERATING SCHEME.
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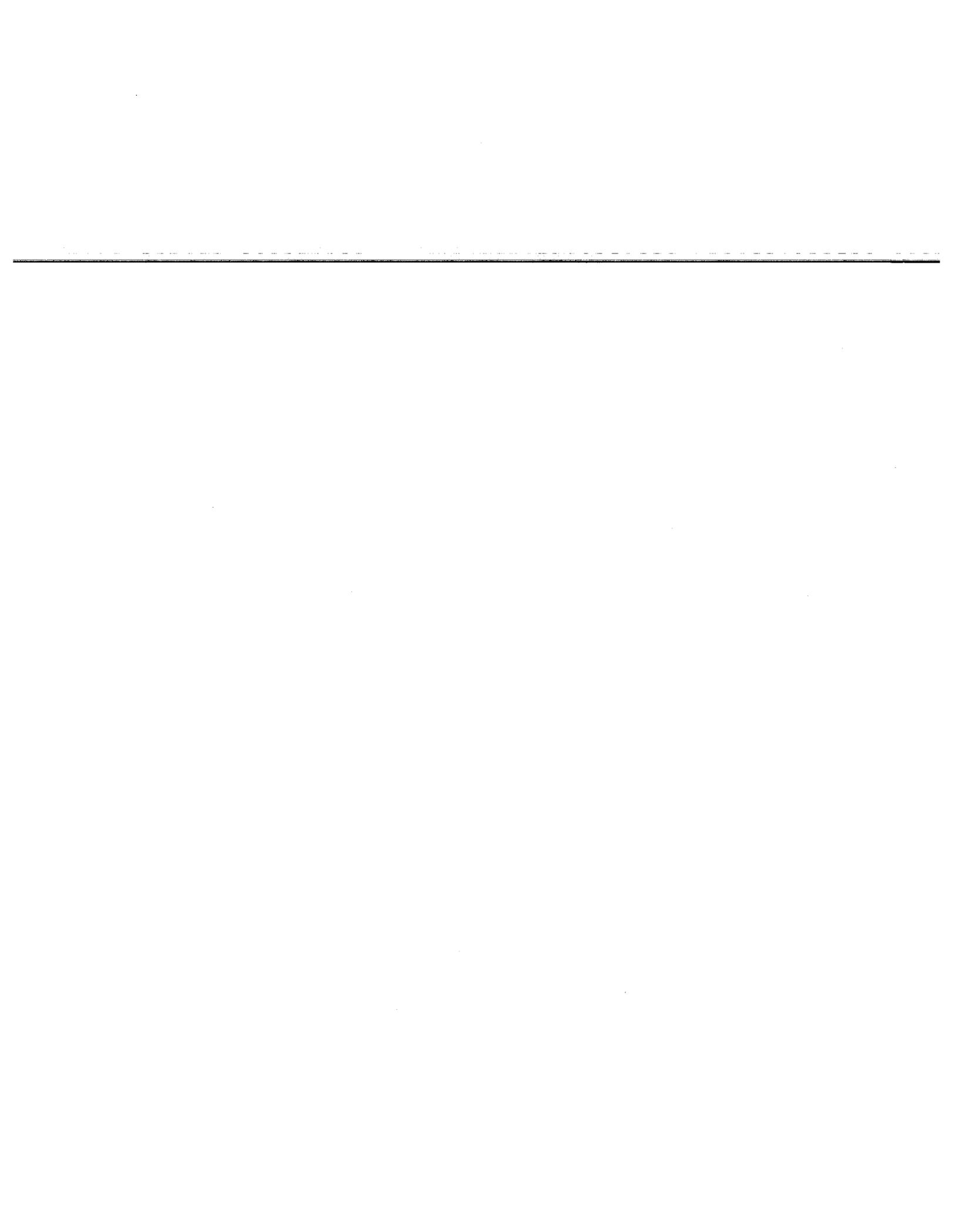
<p>U.S. ARMY CORPS OF ENGINEERS SEATTLE DISTRICT</p>	<p>DESIGNED BY: MAS DRAWN BY: JB CHECKED BY: HHH/MM</p>	<p>DATE: 29 APR. 2011 FILE: C1951C-EROC17.dwg REV: JL</p>	<p>PROJECT: RIVERVIEW PARK GREEN/DUWAMISH ECOSYSTEM RESTORATION CARE AND DIVERSION OF WATER KENT PN 127251 WASHINGTON</p>												
<p>PLATE NUMBER: C-17 SHEET 21 OF 39</p>	<p>PREPARED BY: TETRA TECH 1200 7th Avenue, Suite 900 Seattle, Washington 98101 206.461.4000 Fax: 206.461.4001</p>	<table border="1"> <thead> <tr> <th>Symbol</th> <th>Description</th> <th>Date</th> <th>Appr.</th> <th>Symbol</th> <th>Description</th> </tr> </thead> <tbody> <tr> <td> </td> <td> </td> <td> </td> <td> </td> <td> </td> <td> </td> </tr> </tbody> </table>	Symbol	Description	Date	Appr.	Symbol	Description							<p>IF SHEET MEASURES LESS THAN 28" X 34" IT IS A REDUCED PRINT. REDUCE SCALE ACCORDINGLY.</p>
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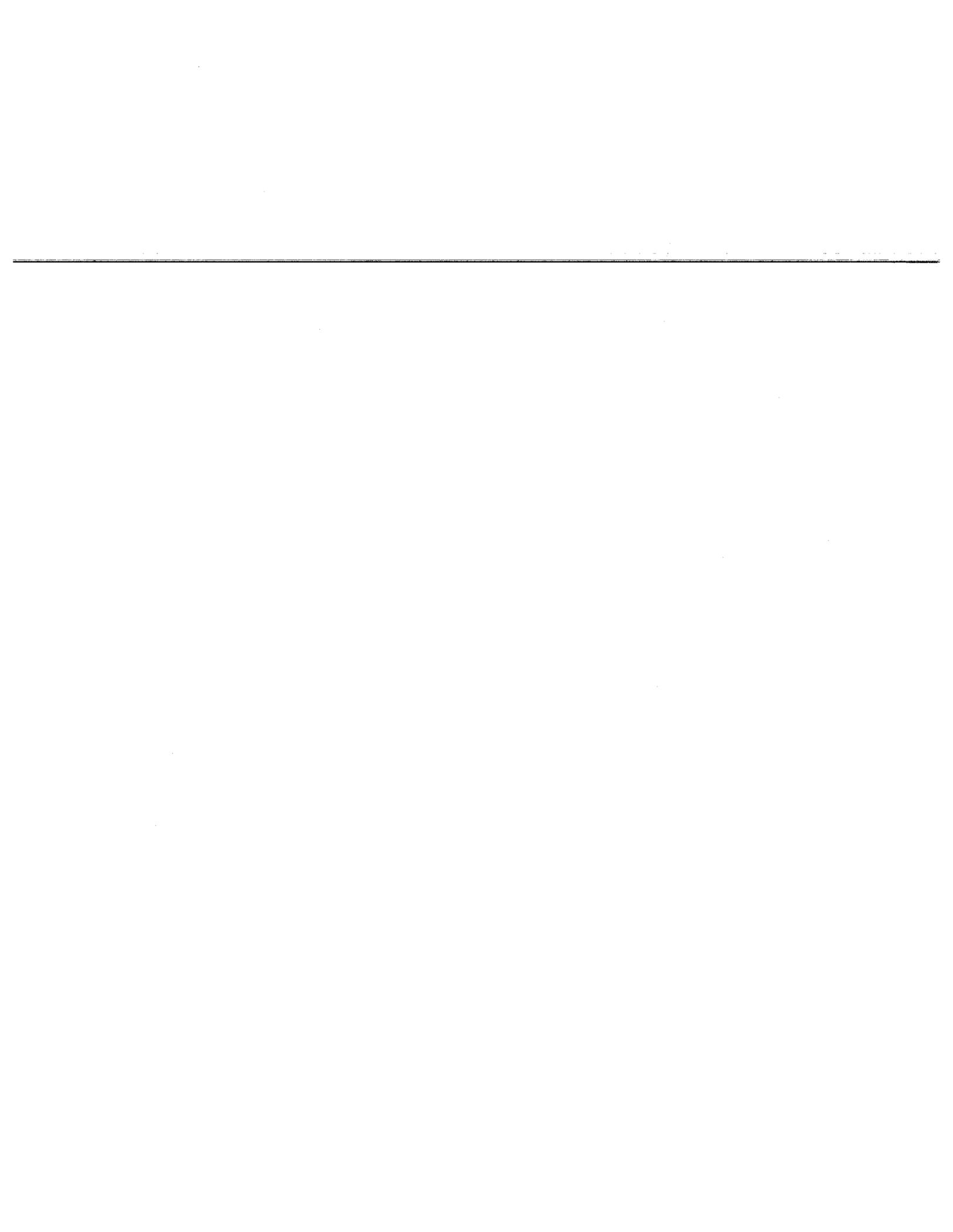




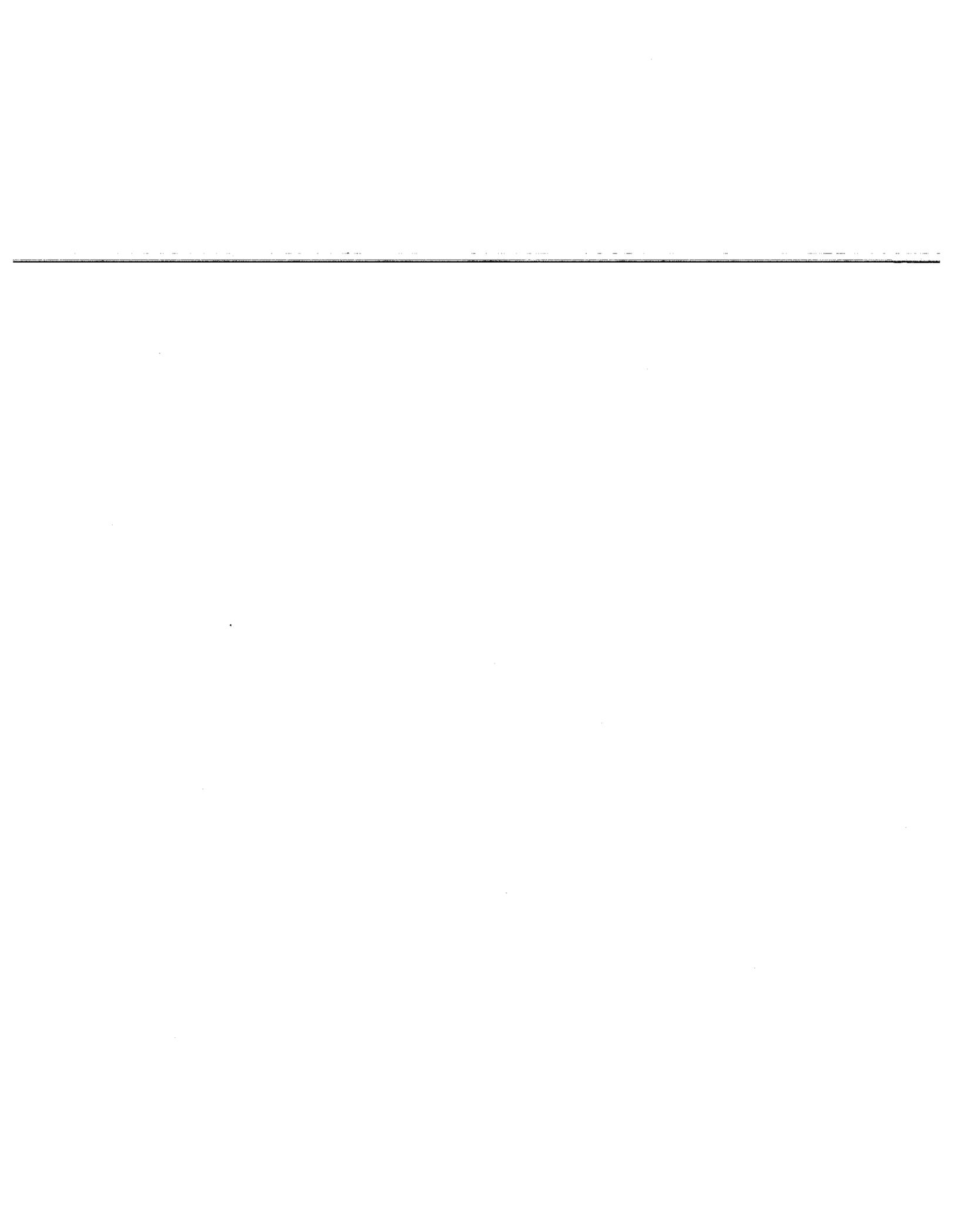


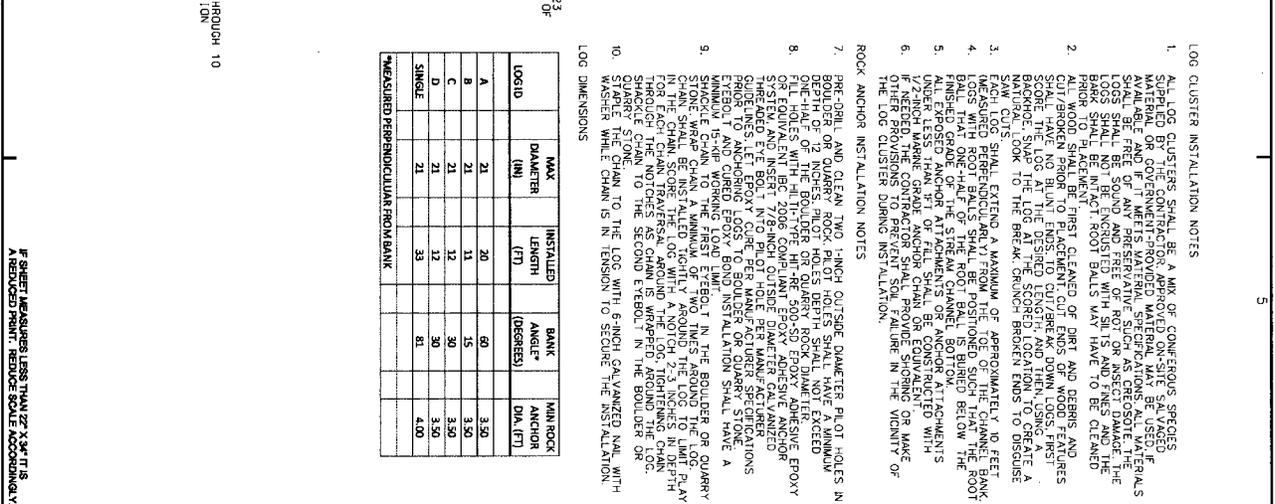
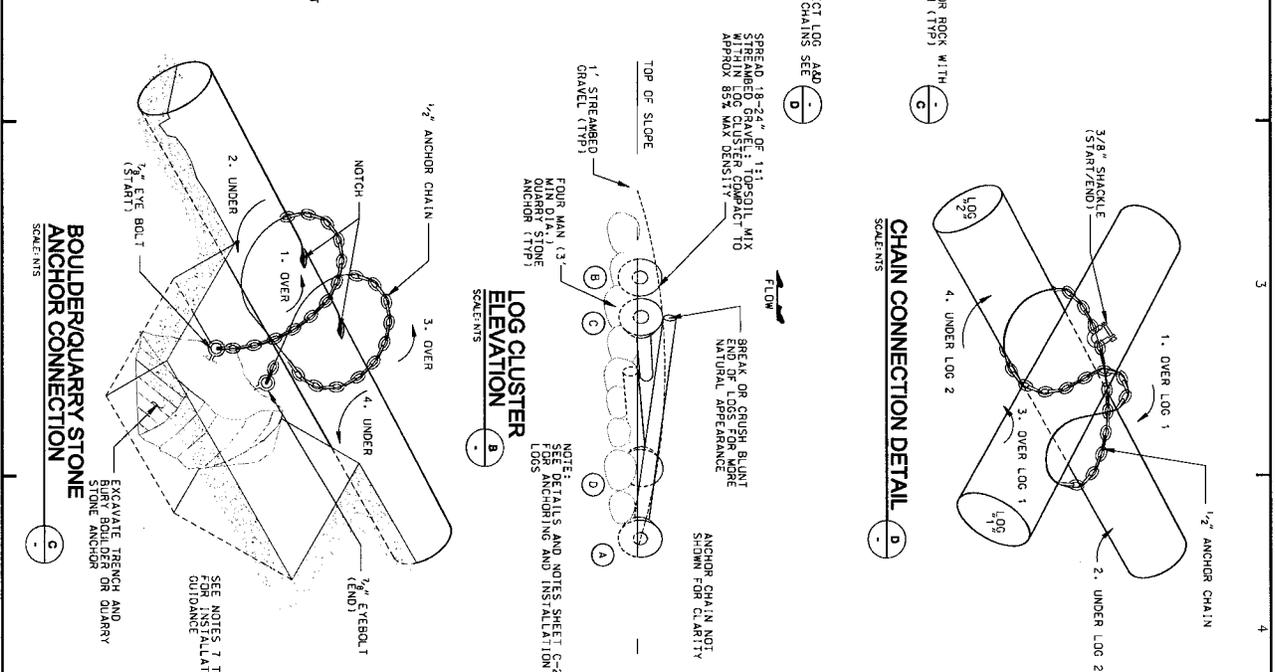
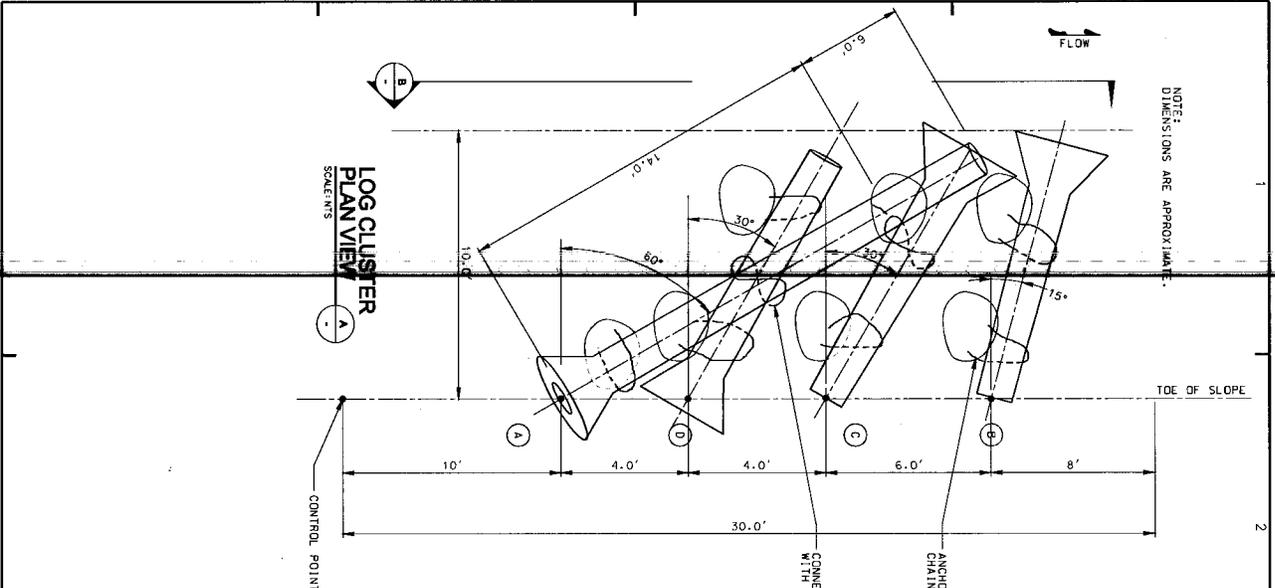












**LOG CLUSTER INSTALLATION NOTES**

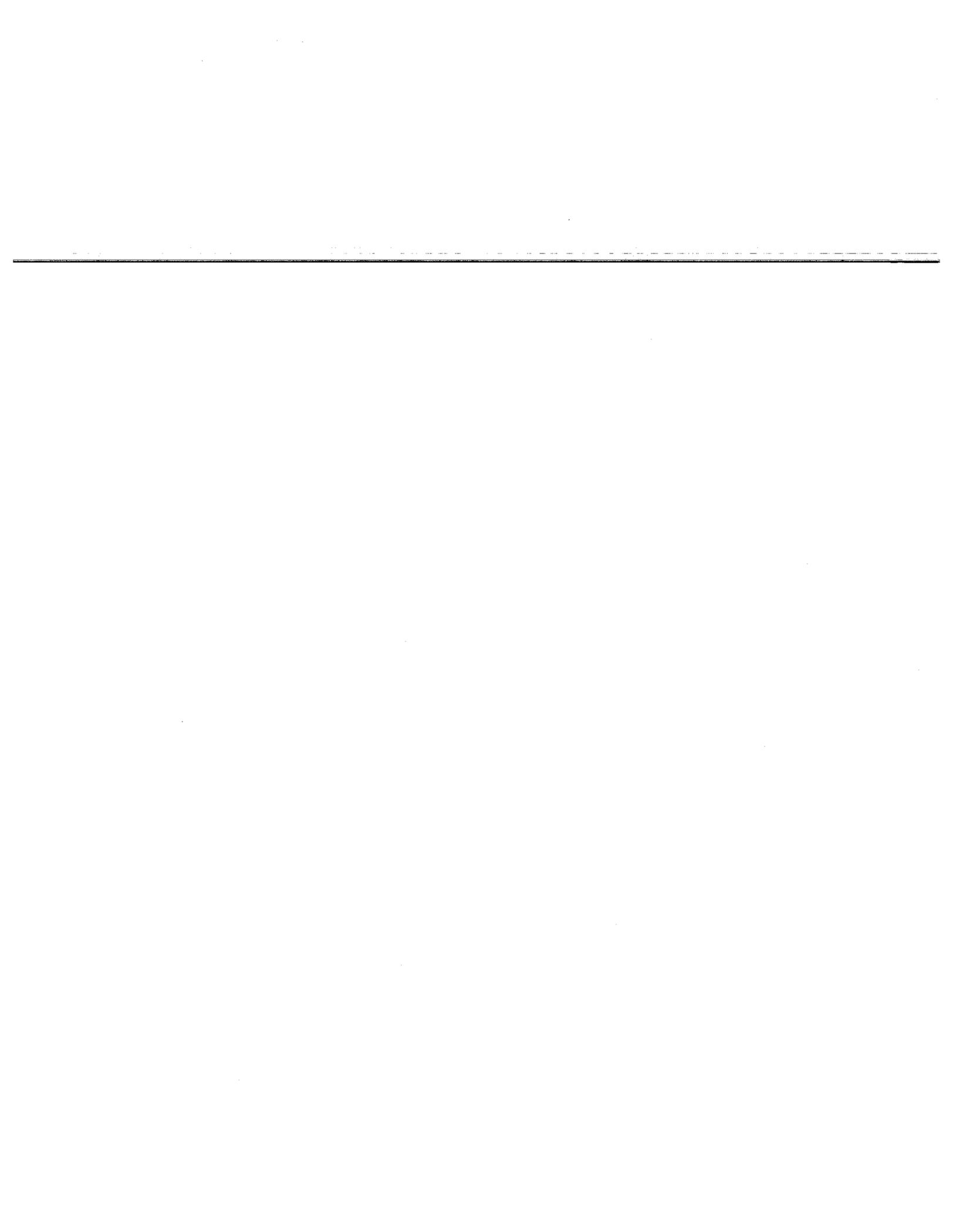
- ALL LOG CLUSTERS SHALL BE A MIX OF CONCRETE SPECIES SUPPLIED BY THE CONTRACTOR. APPROVED ON-SITE SALVAGED MATERIAL OR ON-SITE SAVED MATERIAL SHALL BE USED FOR MATERIAL AND ON-SITE SAVED MATERIAL SHALL BE USED FOR MATERIAL. ALL LOGS SHALL BE SAVED AND USED FOR MATERIAL. ALL LOGS SHALL BE SAVED AND USED FOR MATERIAL. ALL LOGS SHALL BE SAVED AND USED FOR MATERIAL.
- LOGS SHALL BE SOUND AND FREE OF ROT OR INSECT DAMAGE. THE BARK SHALL BE INTACT. ROOT BALLS MAY HAVE TO BE CLEANED PRIOR TO PLACEMENT.
- LOGS SHALL BE FIRST CLEANED OF DIRT AND DEBRIS AND CUT/BROKEN PRIOR TO PLACEMENT. CUT ENDS OF WOOD FEATURES SHALL HAVE NO BLUNT ENDS. TO CUT/BREAK DOWN LOGS, FIRST BORING SHALL BE MADE IN THE LOG. A NOTCH SHALL BE MADE IN THE LOG. A NOTCH SHALL BE MADE IN THE LOG. A NOTCH SHALL BE MADE IN THE LOG.
- LOGS WITH ROOT BALLS SHALL BE POSITIONED SUCH THAT THE ROOT BALLS ARE IN CONTACT WITH THE LOG. A NOTCH SHALL BE MADE IN THE LOG. A NOTCH SHALL BE MADE IN THE LOG. A NOTCH SHALL BE MADE IN THE LOG.
- ALL EXPOSED ANCHOR ATTACHMENTS OR ANCHOR ATTACHMENTS SHALL BE PROTECTED WITH AN ANCHOR CAP OR ANCHOR CAP.
- IF NEEDED THE CONTRACTOR SHALL PROVIDE SHORING OR MAKE OTHER PROVISIONS TO PREVENT SOIL FAILURE IN THE VICINITY OF THE LOG CLUSTER DURING INSTALLATION.

**ROCK ANCHOR INSTALLATION NOTES**

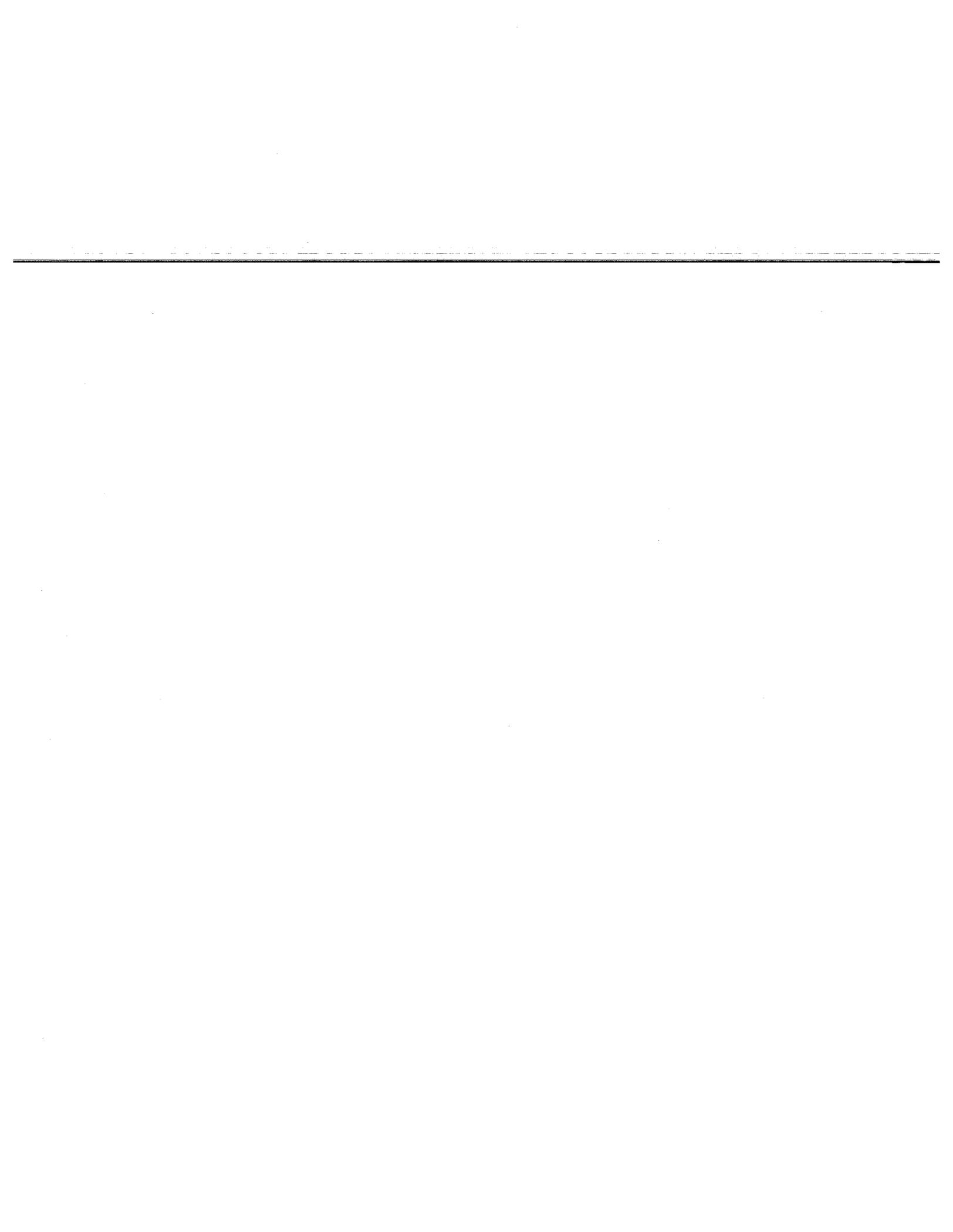
- PRE-DRILL AND CLEAN TWO 1-INCH OUTSIDE DIAMETER PILOT HOLES IN BOULDER OR QUARRY ROCK. PILOT HOLES SHALL HAVE A MINIMUM ONE-HALF OF THE BOULDER OR QUARRY ROCK DIAMETER.
- ALL HOLES SHALL BE CLEANED WITH AIR AND WATER. ALL HOLES SHALL BE CLEANED WITH AIR AND WATER. ALL HOLES SHALL BE CLEANED WITH AIR AND WATER.
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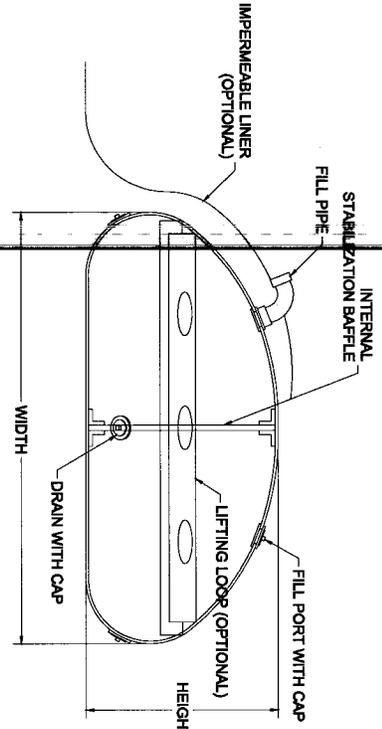
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A	21	20	60	3.30
B	21	11	15	3.30
C	21	13	30	3.30
D	21	13	30	3.30
SHACKLE	21	33	81	4.00

\*MEASURED PERPENDICULAR FROM BANK

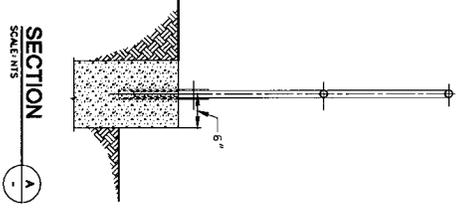
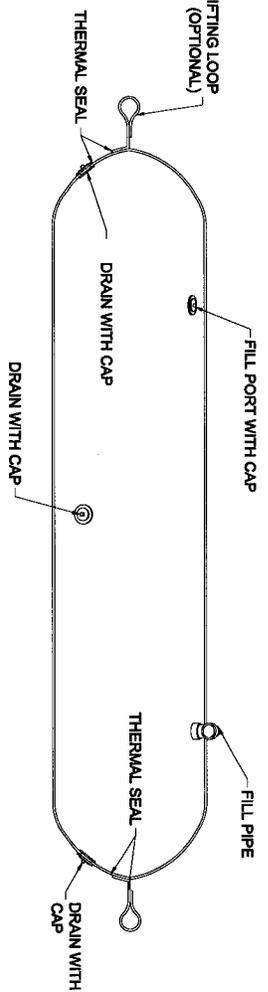




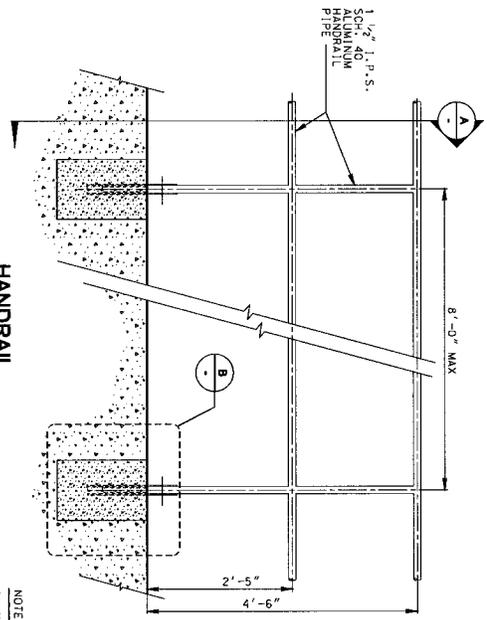




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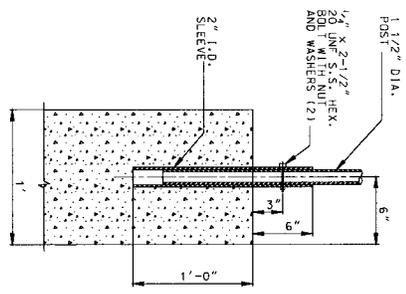


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HANDRAIL  
SCALE: 1" = 2'-0"

NOTE:  
1: HANDRAIL TO BE INSTALLED ON ABOUTMENT WALLS (SEE SHEET S-501)  
2: CONNECTIONS TO BOTH VERTICAL AND HORIZONTAL RAFTS SHALL BE APPROVED EQUAL.



DETAIL B-B  
SCALE: 1" = 2'-0"

F: SHEET MANAGER, LESS THAN 27" X 36" T.S.  
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Sheet number: **C-24**  
Sheet 28 of 39

RIVERVIEW PARK  
GREEN/DUWAMISH ECOSYSTEM RESTORATION  
**CIVIL DETAILS 5**  
KENT PN 127251 WASHINGTON

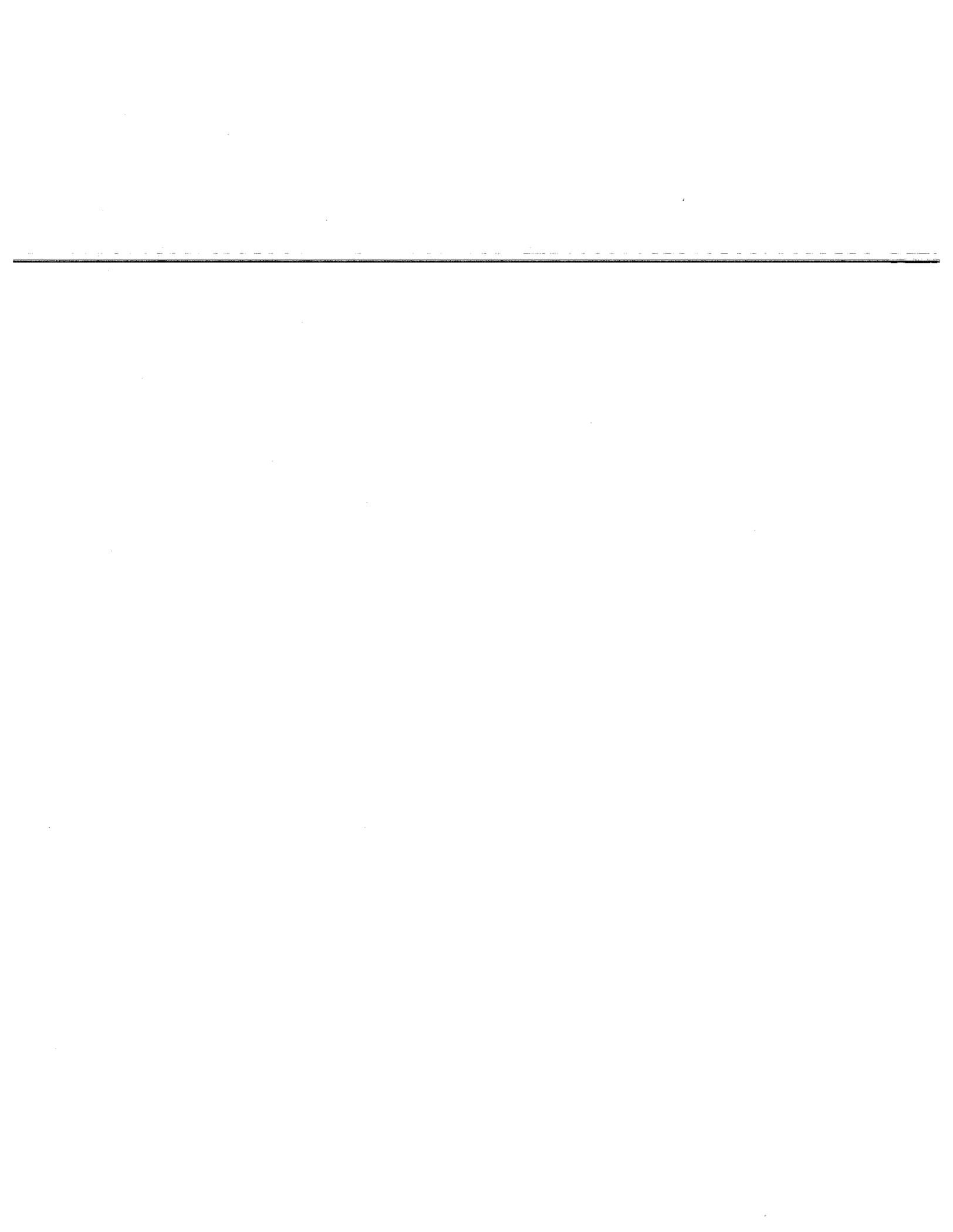
U.S. ARMY ENGINEER DISTRICT SEATTLE  
CORPS OF ENGINEERS  
SEATTLE, WASHINGTON

Designed by: MAS Date: 29 APR 2011  
Drawn by: JEB  
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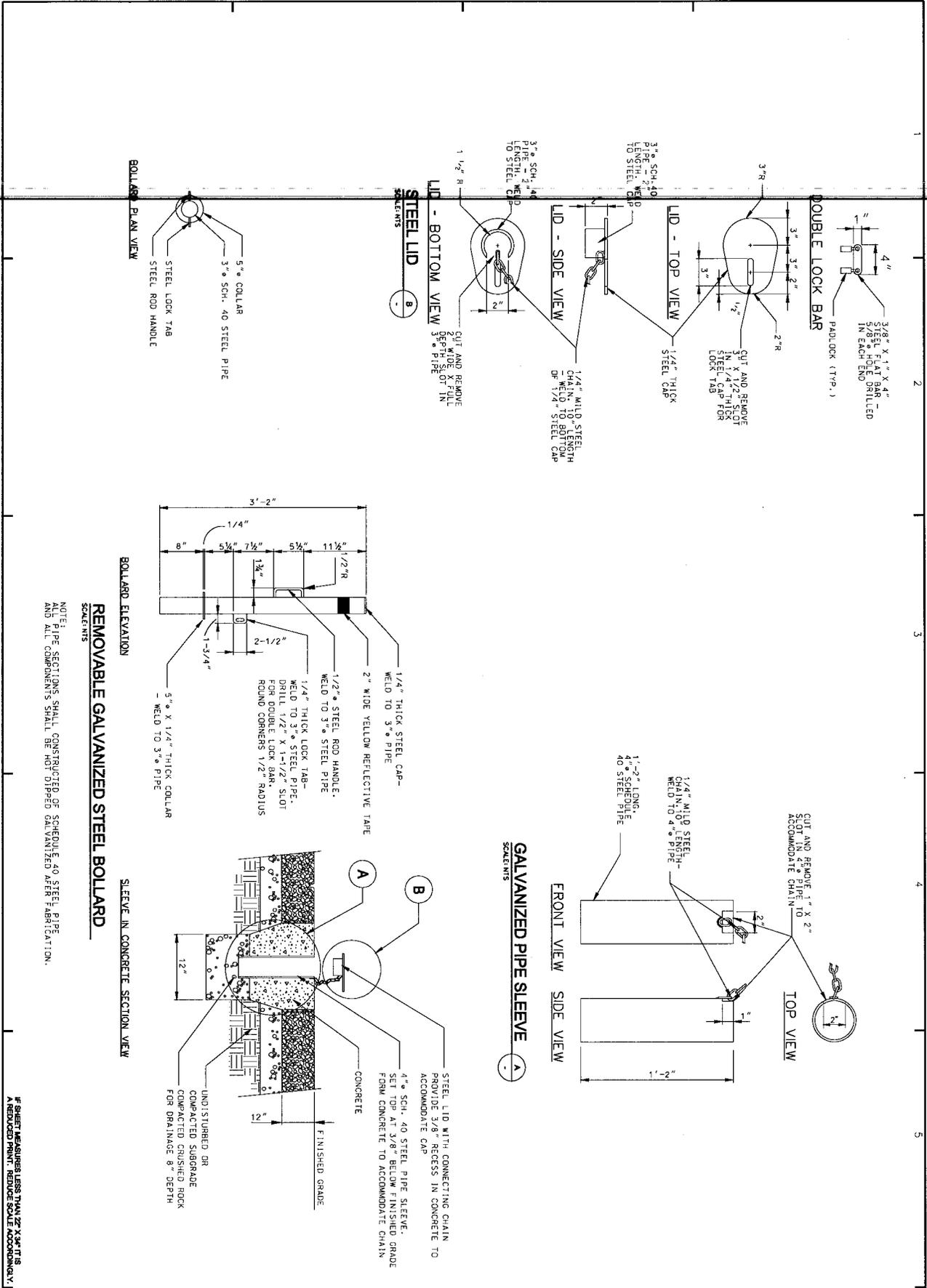
Prepared by: **TETRA TECH**  
4500 15th Avenue, Suite 400  
Seattle, Washington 98148  
206-735-4600 Fax: 206-735-4605

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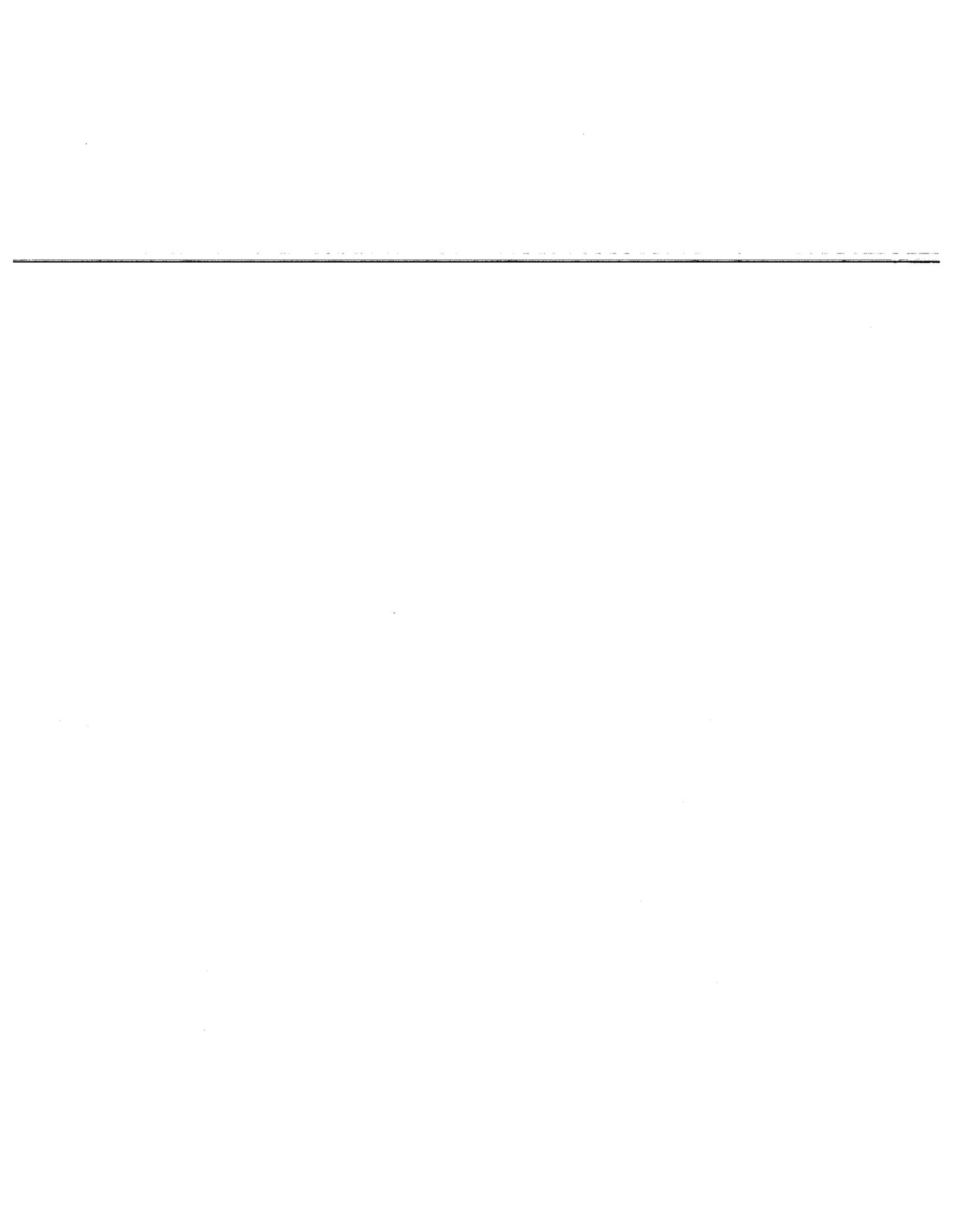
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Seattle District



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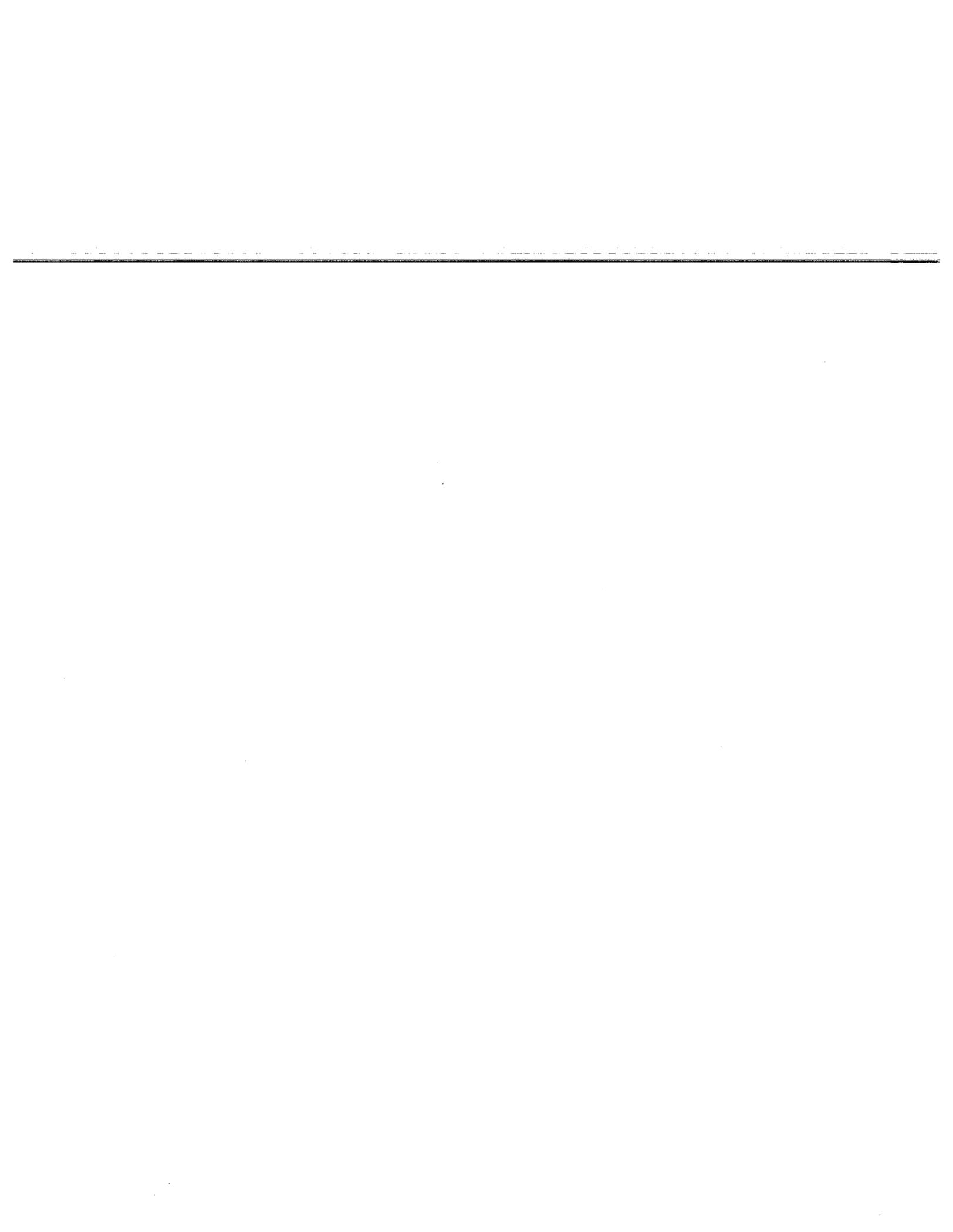
U.S. ARMY ENGINEER DISTRICT, SEATTLE CORPS OF ENGINEERS SEATTLE, WASHINGTON	Prepared by: <b>TETRA TECH</b> 5400 First Avenue, Suite 200 Seattle, Washington 98105 206.750.5000 Fax: 206.750.6000	Designed by: MAS Drawn by: JB Checked by: HHH/MM	Date: 29 APR. 2011 File: C:\9510-DT0825.dgn Rev: JL
	RIVERVIEW PARK GREEN/DUWAMISH ECOSYSTEM RESTORATION <b>CIVIL DETAILS 6</b> KENT PN 127251 WASHINGTON	Plate number: <b>C-25</b> Sheet 29 of 35	If sheet measures less than 27" x 34" it is a reduced print. Reduce scale accordingly.











## APPENDIX B

### Clean Water Act Section 404(b)(1) Analysis

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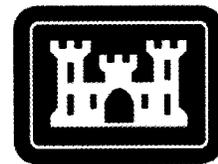
#### **Riverview Park Ecosystem Restoration Side Channel Construction Kent, King County, Washington**

#### **Clean Water Act**

**Prepared by:**

**U.S. Army Corps of Engineers  
Seattle District  
Environmental Resources Section**

**May 2010**



**US Army Corps  
of Engineers** ®  
Seattle District

## **1.0 Introduction**

The purpose of this document is to record the U.S. Army Corps of Engineers (USACE) Clean Water Act Section 404 compliance evaluation of a plan to construct an approximately 750 linear foot flow-through side channel to the Green River through Riverview Park. The primary goals for this project are to increase available off-channel rearing habitat for juvenile Chinook salmon and provide refugia during winter high flow events.

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This restoration activity is being conducted as part of the Green/Duwamish River Basin Ecosystem Restoration Project (ERP). In this program, the Corps has served as the lead in developing the restoration program for the Green/Duwamish River, working with local agencies to identify, evaluate, prioritize, and coordinate implementation of potential restoration projects to assure that the restoration programs and projects from the various agencies complement each other. The overall objective of the ERP is to restore significant ecosystem function, structure, and dynamic processes that have been degraded within the river basin. To accomplish this objective, the following basin-wide restoration goals were identified:

- Improve the physical nature of existing degraded habitat.
- Improve existing ecosystem functions and values. This includes improving riverine processes where reasonable.
- Address important factors limiting habitat productivity.

Restoration project potential at sixty-seven sites within the Green-Duwamish basin were developed and evaluated to determine the most cost effective and beneficial plan to recommend for restoration of the basin ecosystem. The recommended plan would implement a combination of 45 project-specific and programmatic restoration measures throughout the basin, and Riverview Park Restoration and Side Channel Construction (formerly called Green River Park) is one of the 45 projects.

The main body of this document summarizes the information presented in Attachment A and includes relevant information from the Environmental Assessment for the project that was collected pursuant to the National Environmental Policy Act (NEPA) of 1969 [42 USC §4321 et seq.]. Attachment A provides the specific analysis of compliance with the CWA 404(b)(1) and the General Regulatory Policy requirements.

## **2.0 Project Background**

This project is a separable element of the Duwamish/Green Ecosystem Restoration Project (ERP), authorized by Section 101(b)(26) of the Water Resources Development Act of 2000, Public Law 106-541, which lists the project as “Green River Park”. A conceptual design and cost estimate was prepared in 1998 as part of feasibility phase. The Duwamish/Green ERP gained construction New Start capability in the Water and Energy Act of 2003. The project was renamed Riverview Park in early 2006 when the period of design was initiated with the City of Kent.

The project site, near River Mile (RM) 23.7, is located within the City of Kent (the local sponsor) on the right bank of the Green River near the confluence with Mill Creek and just

west of SR167 Bridge crossing in the northwest quarter of Section 25, Township 22 North, and Range 4 East of the Willamette Meridian in Kent, King County, Washington.

The side channel construction is to occur within a City of Kent undeveloped park parcel, Riverview Park. Riverview Park is bounded to the north, west and south by the Green River and to the east by Hawley Road.

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Riverview Park is currently owned by the City of Kent Parks Department (Kent Parks). At one time, Kent Parks had proposed converting the open space of Riverview Park into a formal recreation park to include parking, picnic and restroom facilities, and a hand-carry boat ramp. The Corps' Riverview Park Side Channel Construction project was to be a part of this master plan. The lands for both pieces of the project (restoration and recreation) were purchased by the City of Kent, using non-Federal grant funds, in 2005. Kent Parks was responsible for designing and constructing the recreational park and the City of Kent Public Works was responsible for the restoration project. As of this date, Kent Parks' proposal to develop the parcel adjacent to the side channel into a formal park has been deferred due to budget and personnel constraints. In the future, if funds become available, Kent Parks may chose to develop the adjacent land as a recreational park. The local sponsor for the Side Channel Construction (the project discussed herein) is Kent Public Works.

### 3.0 Project Need

The populations of native fish, particularly anadromous fish, are declining at a rapid rate. Three anadromous salmon species, Puget Sound Chinook (*O. tshawytscha*), Puget Sound steelhead (*O. mykiss*) and Puget Sound/Coastal bull trout (*Salvelinus confluentus*) have been listed as threatened or endangered under the Endangered Species Act (ESA), and a third species, coho (*O. kisutch*), is considered a Species of Concern under the ESA. Without restorative action, many of the fish and wildlife resources of the Green/Duwamish system would continue to decline.

Deforestation, urban, industrial and residential development, and the requisite flood control facilities (Howard Hanson Dam and the nearly complete system of levees), in the Green River valley have caused considerable degradation of the river and associated habitats. This degradation takes the form of stream channelization, increased sedimentation, impaired water quality, minimal wetland and riparian buffers, and disturbed hydrological regimes. Levees and artificial control of river flow by Howard Hanson Dam (HHD) have forever altered natural ecosystem processes and directly led to the decline of salmon in the watershed. The Green River, restricted by riprap and earthen levees, is no longer able to enter its flood plain; and therefore, natural channel migration processes, riparian corridors, wetland development, off-channel habitat, and large woody debris (LWD) recruitment have been virtually eliminated in the middle and lower Green sub-watersheds. All of these elements are crucial to the formation of suitable salmonid habitat.

Construction of a side channel in Riverview Park would provide much needed off channel habitat in the middle and lower reach of the Green River. Reduction and elimination of side channel forming process in the lower and middle river has been identified as a limiting factor for salmonid spawning and rearing (Fuerstenberg et al. 1996.)

#### **4.0 Project Purpose**

The project purpose is to create side channel habitat for Chinook rearing and winter high flow refuge. The project would include native plantings and LWD, both of which are integral to the development of salmonid and other wildlife habitat.

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#### **5.0 PROPOSED ACTION AND ALTERNATIVES**

Alternatives considered under NEPA must include the proposed action (preferred alternative), and the no-action alternative. Other reasonable alternatives that meet the project purpose and need must also be considered in detail.

Five alternatives were considered for this project: 1) The No Action Alternative, 2) Construct the Dead End Side Channel Alternative, 3) Construct the Flow Through Side Channel Alternative, 4) Construct the Flow Through Side Channel - Pedestrian Bridge Alternative, and 5) Construct the Flow Through Side Channel - Vehicle Bridge Alternative.

The No Action Alternative was eliminated because it did not meet the project objectives. Alternative 2 was eliminated because flow through channels have been shown to be more beneficial to juvenile Chinook, as well as sedimentation concerns. Alternatives 3 and 4 were eliminated because the site has public safety concerns over emergency access, and the difficulty in maintaining and irrigating the riparian planting without vehicular access to the island. Alternative 5, the preferred alternative, was selected because of the emergency access requirements of the City of Kent Parks, and the ability to properly maintain and irrigate the riparian planting on the islands with a use of an irrigation truck and other larger pieces of equipment. The vehicle bridge design in alternative 5 is a wide span and no portion of the bridge would be in the channel. Therefore, impacts to habitat benefits would be minimal.

#### **6.0 POTENTIALLY ADVERSE EFFECTS (INDIVIDUALLY OR CUMULATIVELY) ON THE AQUATIC ENVIRONMENT**

##### **a. Effects on Physical, Chemical, or Biological Characteristics of the Aquatic Ecosystem**

Short term impacts from temporary increases in turbidity may result from activities associated with constructing the inlet and outlet of the channel. The largest impact may occur during the connection of the new channel with the Green River, which may cause a pulse of sedimentation as the new side channel is watered and adjusts to the new flow. In addition, there is a risk of a chemical spill (fuel, oil, or other machinery fluids) into the water whenever construction occurs near a water body. Best management practices would be implemented during construction to ensure the chances of this occurrence are minimized.

The construction of the side channel would provide important off-channel refuge from high flows and increase the amount of available salmonid rearing habitat in the lower reaches of the Green River. Both of these elements are considered limiting factors for salmon recovery in the Green River. Increased native overhanging vegetation and the

introduction of LWD into the channel would provide additional high quality habitat to a variety of fish species. It is anticipated that juvenile salmonids and other fish would utilize this new habitat during all seasons. Access to the site by the public could cause an increase in fishing and overall disturbance to adult and juvenile salmon, however educational signage put up to encourage conservation, and dense riparian planting should limit access to the channel

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**b. Effects on Recreational, Aesthetic, Historical, and Economic Values**

The installation of the side channel and bridge may result in increased interest in the site and therefore recreational use, including fishing, might increase. The City of Kent has plans to reroute the existing Green River Trail away from Hawley Road, likely through the open space of the park. This may also increase recreational use in the area.

The visual quality of the lower Green River basin varies with its diverse land use and development. Visual quality decreases downstream as development increases. At Riverview Park, large, mature trees along the river banks provide some visual quality but the predominance of invasive blackberries under the trees and along the edges of the site greatly detracts from the aesthetics of the area. The regular mowing of the majority of the site inhibits the establishment of vegetation other than grass and weedy herbaceous species. The nearby presence of SR167 also impacts the site's aesthetic qualities.

Removing invasive species and planting native vegetation along the newly created side channel and on the island would greatly improve the visual and aesthetic appeal of the site. The proposed fill added to the east side of the site to create berms and hills would serve as a visual barrier to SR167 from the park and thus increase visual value.

During excavation and construction of the site, the aesthetic quality of the general area could be reduced due to the noise and air emissions generated by the construction equipment, which may disturb recreational users of the Green River Trail. However, these impacts would be temporary and highly localized, and are not expected to result in significant impacts.

Professional cultural resources studies have been conducted for the proposed project. This archaeological investigation did not identify any cultural resources within the project area, however archaeological monitoring would be required for all ground disturbing activities, due to the potential for deeply buried artifacts.

**c. Findings**

There would be no significant adverse impacts to aquatic ecosystem functions and values. It is expected that aquatic ecosystem functions and values would increase by construction of the side channel and planting the site with native vegetation.

## **7.0 ALL APPROPRIATE AND PRACTICABLE MEASURES TO MINIMIZE POTENTIAL HARM TO THE AQUATIC ECOSYSTEM**

### **a. Impact Avoidance Measures**

Potential impacts to aquatic animals and fish would be avoided by constructing the internal 600 linear feet of the channel prior to opening the inlet/outlet of the channel to the Green River, as well as performing all in-water work within the designated fish window (August 1 to August 31).

### **b. Impact Minimization Measures**

USACE would take all practicable steps during construction of the project to minimize impacts to aquatic resources during in-water construction. Contingencies would be in place if any of the water quality protection measures fail to achieve their intended function. USACE would observe all construction windows to ensure that impacts to migratory fish would be avoided or minimized. The minimization measures would be as follows:

- Connecting the newly excavated side channel with the mainstem of the Green River during the established in-water work window (August 1 to August 31)
- During inlet/outlet construction and watering of the side channel appropriate turbidity control methods (temporary coffer dam, silt curtains, or similar) would be used to isolate construction from the Green River and minimize turbidity impacts.
- All required de-watering activities during construction would use appropriate devices (i.e. pumps, sand bags, sumps). All water removed from the site would be discharged in a vegetated upland location, a de-siltation basin, or location that would not incur damage due to water discharge.
- Water quality sampling would be conducted according to the protocol approved by the Washington Department of Ecology for the following parameters: turbidity, dissolved oxygen, and pH. Construction could be halted if deemed necessary under the water quality sampling plan in compliance with the Section 401 Water Quality Certification.
- Drive trains of equipment would not operate in the water
- All equipment would be cleaned prior to in-water construction work.
- Biodegradable hydraulic fluids would be used in machinery.
- No refueling would occur near the shoreline of the Green River or the side channel. All refueling would occur in the staging area located on the far eastern side of the site.
- Construction equipment shall be regularly checked for drips or leaks.
- At least two fuel spill kits with absorbent pads would be onsite at all times.

### **c. Compensatory Mitigation Measures**

Due to the absence of wetlands on this project, compensatory mitigation measures are not applicable.

**d. Findings**

Given the temporary, localized, necessary, and minor nature of these effects, the Corps has determined that the proposed restoration project would not result in significant adverse environmental impacts.

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**8.0 OTHER FACTORS IN THE PUBLIC INTEREST**

**a. Fish and Wildlife**

USACE has coordinated construction activities with local Native American Tribes, and state and federal resource agencies to ensure that only minimal impacts to fish and wildlife resources would occur. The in-water portions of project construction would take place during the designated fish window, established by Washington Department of Fish and Wildlife (WFDW), to avoid impacts to fish. A Corps biologist would check for perched bald eagles before construction begins to avoid and minimize disturbance due to large machinery. Work may be delayed if it appears that there would be a disturbance to eagles. USACE has received concurrence from the U.S. Fish and Wildlife Service and National Marine Fisheries Service that the proposed project “may affect, not likely to adversely affect” federally listed species and critical habitat located in the project area.

**b. Water Quality**

The Corps concluded that this project would not violate state water quality standards and, received a Section 401 water quality certification from the Washington Department of Ecology under the conditions of a Nationwide Permit 27 on 10 May 2010.

**c. Historical and Cultural Resources**

A search of the archaeological and historic site records at the Washington State Department of Archaeology and Historic Preservation (DAHP) indicated that no properties listed in the National Register of Historic Places (NRHP) or the Washington State historic site register are recorded within the project area. Although no cultural resources have been previously recorded within the project area, the project’s location at the confluence of two salmon streams represents an area likely to contain evidence of cultural resources.

Professional cultural resources studies have been conducted for the proposed project. While an archaeological investigation did not identify any cultural resources within the project area, archaeological monitoring would be required for all ground disturbing activities, due to the potential for deeply buried artifacts. If historic properties eligible for the National Register of Historic Places are found to be present in the project area, a programmatic agreement for data recovery (if necessary) would be developed in consultation with the Muckleshoot Indian Tribe Preservation/Cultural Resources Division and the DAHP that describes specific measures that would be taken to mitigate adverse effects resulting from the project. On 10 May 2010 concurrence of “No historic properties affected” was received from the Washington State Historic Preservation Officer (SHPO). A request for knowledge and concerns letter was sent to the

Muckleshoot Tribe on 12 February 2010. No response was been received from the Tribe to date.

**e. Environmental Benefits**

The project would restore significant ecosystem function, structure, and dynamic processes that have been degraded within the river basin by increasing side channel habitat, for salmonids and other fish. The addition of native riparian plants along the channel and across the site would provide shading and cover leading to localized cooler temperatures, and increase primary production in the form of insect and bird drop.

## **9.0 CONCLUSIONS**

USACE finds that this project is within the public's interest, complies with the substantive elements of Section 404 of the Clean Water Act, and meets the criteria of Nationwide Permit 27: Aquatic Habitat Restoration, Establishment, and Enhancement Activities.

## Attachment A

### Clean Water Act 404(b)(1) Evaluation [40 CFR §230] Permit Application Evaluation [33 CFR §320.4]

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#### 404(b)(1) Evaluation [40 CFR §230]

#### Potential Impacts on Physical and Chemical Characteristics [Subpart C]:

##### **17. Substrate [230.20]**

The placement of gravel suitable for benthic invertebrate colonization and juvenile salmonid habitat is expected to lead to an overall improvement in ecosystem function in this reach of the Green River.

##### **2. Suspended particulates/turbidity [230.21]**

Construction of the inlet/outlet and watering of the channel may cause short-term increases in turbidity. These increases are attributable to the excavation of the side channel inlet and outlets, placement of rock, LWD and other materials, and watering and stabilization of the new channel. Heavy equipment needed to perform in-stream work would be staged in upland areas and would not enter the river. All in-water work would be conducted during the prescribed work windows and during low flow to minimize water quality impacts. The project would use BMPs to ensure state water quality standards are maintained during construction. Daily water quality monitoring would be conducted during in-water work to ensure compliance with these standards. Should monitoring indicate that state water quality maximum standards for turbidity are exceeded; work would be halted and modified such that standards are met.

##### **3. Water [230.22]**

The project is not expected to add any nutrients to the water that could affect the clarity, color, odor, or aesthetic value of the water, or that could reduce the suitability of Riverview Park for aquatic organisms or recreation. While the groundwater table elevation may vary with season and flows of the adjacent Green River, it is anticipated that the side channel would receive groundwater flow for the majority of the year. As groundwater is of a lower temperature than that of surface water, it can be expected that temperatures within the proposed side channel, as well as those in the adjacent Green River mainstem, may exhibit minor reductions in temperature due to the project. The cooler water temperatures in the immediate vicinity of the side channel may increase dissolved oxygen in this area resulting in improved water quality.

Coniferous large woody debris, which is resistant to breakdown (and therefore has low biochemical oxygen demand), would be placed to enhance fish habitat.

##### **4. Current patterns and water circulation [230.23]**

The hydraulic effects of the project on the portion of the Green River main stem parallel to the side channel were simulated using the Corps' HEC-RAS River Analysis System computer model. The simulations found little or no change to the existing (no action) average channel flow conditions during the median annual flow event (approximately 1000cfs). During larger events (OHW events of 6000cfs and higher), the preferred

project alternative generated small reductions in the calculated water depth (on the order of 0.1 ft) and velocity (on order of 0.5 ft/sec) when compared to the no-action alternative.

It is expected there would be some hyporheic flow of groundwater into the channel. The designed elevation of the channel bottom is below the groundwater table by approximately two feet as identified by geotechnical explorations performed in November 2009. Paired with the highly permeable soils on site, this seems to indicate that some hyporheic flow would be available to supplement the surface flow in the channel. This input has not been quantified, however.

**5. Normal water fluctuations [230.24].**

Water fluctuations in the side channel would mirror those in the mainstem Green River. Water levels of the Green River are controlled by operations at Howard Hanson Dam. The only uncontrolled fluctuations in the lower and middle Green River are caused by stormwater runoff.

**6. Salinity gradients [230.25]**

Not applicable, there is no salt intrusion in this region of the Green River. .

**Potential Impacts on Biological Characteristics of the Aquatic Ecosystem [Subpart D]:**

**17. Threatened and endangered species [230.30]**

In 2000, USACE submitted a Section 7 ESA Programmatic Biological Assessment for the Green-Duwamish ERP projects to the U.S. Fish and Wildlife Service (USFWS) and National Marine Fisheries Service (NMFS). Concurrence with the Corps' determinations of **may affect, but not likely to adversely affect** for species that were federally listed at that time was received from both Services in 2001. Consultation was reinitiated for Puget Sound steelhead and Chinook salmon and bull trout critical habitat in March 2010 with NMFS and USFWS, respectively, for the current design of the side-channel at Riverview Park. The Corps determined this project **may affect, but is not likely to adversely affect** steelhead and Chinook and bull trout critical habitat; concurrence with this determination was received from NMFS on 8 April 2010 regarding Chinook critical habitat and steelhead, and from USFWS on 14 April 2010 regarding bull trout critical habitat.

**2. Fish, crustaceans, mollusks and other aquatic organisms in the food web [230.31]**

There may be temporary impacts to aquatic organisms during construction and connection of the channel due to turbidity or if the riverbed is disturbed during inlet/outlet construction and watering of the new channel. However, aquatic habitat quality conditions are expected improve greatly following construction. Streambed gravel would line the channel, providing rearing habitat and better substrate for the production of aquatic insects and other benthic organisms. Planting the stream banks with native vegetation would provide shading that functions as a thermal refuge during warm summer days as well as providing a source of organic input for the food chain and insect drop as a direct source of food.

**3. Other wildlife [230.32]**

Birds and other wildlife may be temporarily displaced during construction due to noise and presence of construction vehicles. Because these impacts would only occur during

the period of construction, and the great majority of existing trees would be retained, they are expected to be inconsequential and temporary. Planting native trees and shrubs along the stream bank would increase the extent and species diversity on the site and create additional opportunities for foraging, nesting, cover, and refuge for a wide variety of species.

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**Potential Impacts on Special Aquatic Sites [Subpart E]:**

**17. Sanctuaries and refuges [230.40]**

Not applicable. Riverview Park is not designated by local, state or federal regulations to be managed principally for the preservation and use of fish and wildlife resources.

**2. Wetlands [230.41]**

Not applicable. There are no wetlands present.

**3. Mud flats [230.42]**

Not applicable. There are no mudflats present.

**4. Vegetated shallows [230.43]**

Not applicable because there are no vegetated shallows present.

**5. Coral reefs [230.44]**

Not applicable.

**6. Riffle and pool complexes [230.45]**

Not applicable because there are no riffle/pools present.

**Potential Effects on Human Use Characteristics [Subpart F]:**

**17. Municipal and private water supplies [230.50]**

The project would not impact water supply or other public utilities.

**2. Recreational and commercial fisheries [230.51]**

There are no known commercial fisheries at or near the project area. Recreational and tribal harvest does occur in the Green River at the project site. The project is expected to increase off-channel habitat for fish in this reach, which is considered a limiting factor to salmonid recovery in the Green River. Therefore the proposed project should improve recreational and tribal fishing opportunities in the long run. The Corps will coordinate with the Muckleshoot Tribe prior to construction to ensure that construction activities are coordinated with the tribe and impacts to tribal fishing are avoided and minimized.

**3. Water-related recreation [230.53]**

The installation of the side channel and bridge may result in increased interest in the site, and therefore, recreational use, including fishing, might increase. The City of Kent has plans to reroute the existing Green River Trail away from Hawley Road, likely through the open space of the park. This may also increase recreational use in the area.

**4. Aesthetics [230.53]**

Removing invasive species and planting native vegetation along the newly created side channel and on the island would greatly improve the visual and aesthetic appeal of the site. The proposed fill added to the east side of the site to create berms and hills would serve as a visual barrier to SR167 from the park and thus increase visual value.

During excavation and construction of the site, the aesthetic quality of the general area could be reduced due to the noise and air emissions generated by the construction

equipment, which may disturb recreational users of the Green River Trail. However, these impacts would be temporary and highly localized, and are not expected to result in significant impacts.

**5. Parks, national and historic monuments, national seashores, wilderness areas, research sites and similar preserves [230.54]**

No such structures or areas are designated in the project area.

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**Evaluation and Testing [Subpart G]:**

**17. General evaluation of dredged or fill material [230.60]**

All imported material would be free from contamination.

**2. Chemical, biological, and physical evaluation and testing [230.61]**

Water quality sampling would be conducted according to the protocol approved by the Washington Department of Ecology for the following parameters: turbidity, dissolved oxygen, and pH. Construction could be halted if deemed necessary under the water quality sampling plan in compliance with the Section 401 Water Quality Certification.

**Actions to Minimize Adverse Effects [Subpart H]:**

**17. Actions concerning the location of the discharge [230.70]**

Discharge would be at channel bottom below the ordinary high-water mark. It would utilize methods that minimize the likelihood of turbidity increases in the Green River during the activity and comply with all permit protocols and restrictions.

**2. Actions concerning the material to be discharged [230.71]**

Material to be placed in the project area consists of a layer of streambed gravel within the new channel, riprap at the toe of the channel slope, and boulders placed to secure the log clusters and over the riprap toe.

**3. Actions controlling the material after discharge [230.72]**

Material to be added to the site includes streambed gravel, riprap, and boulders. There may be a pulse of sedimentation following diversion of the stream into the new channel resulting in short term turbidity increases as the streambed adjusts to the new flow. Localized shifting of sediments may continue sporadically as the new stream adjusts.

**4. Actions affecting the method of dispersion [230.73]**

See above.

**5. Actions related to technology [230.74]**

No technologies would be used to construct this site.

**6. Actions affecting plant and animal populations [230.75]**

USACE has coordinated construction activities with local Native American Tribes and state and Federal resource agencies to ensure that minimal impacts to fishery and wildlife resources would occur. The in-water portions of project construction would take place during the designated fish window to avoid impacts to fish. Providing rearing gravels, increasing off channel habitat, and planting the banks with native vegetation, is expected to lead in an increase in habitat value for aquatic biota. A Corps biologist would check for perched bald eagles before construction begins to avoid and minimize disturbance due to large machinery. Work would be delayed if it appears that there would be a disturbance to eagles. Fish rescue would take place during the installation of

the isolation devices to be used during inlet/outlet construction and watering of the channel.

**7. Actions affecting human use [230.76]**

The construction of the bridge would provide public and emergency vehicle access to the newly constructed island, ensuring continued public safety and access to the Green River at Riverview Park.

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**8. Other actions [230.77]**

Best management practices would be used to ensure that impacts are minimized during construction.

**General Policies for Evaluating Permit Applications [33 CFR §320.4]**

**17. Public Interest Review [320.4(a)]**

USACE finds this ecosystem restoration action to be in compliance with the 404(b)(1) guidelines and not contrary to public interest.

**2. Effects on wetlands [320.4(b)]**

Not applicable as there are no wetlands present on the site.

**3. Fish and wildlife [320.4@]**

USACE consulted extensively with state and federal resource agencies, tribes and other interested members of the public on this action.

**4. Water quality [320.4(d)]**

The Corps concluded that this project would not violate state water quality standards and received a Section 401 water quality certification from the Washington Department of Ecology under the conditions of a Nationwide Permit 27 on 10 May 2010. The Corps will comply with all conditions set forth in the Certification.

**5. Historic, cultural, scenic, and recreational values [320.4(e)]**

An archeological survey was conducted on site. No cultural resources were uncovered; however, due to the depth of the excavation, monitoring during ground disturbing activities is required. A concurrence with the finding of “No Historic Properties Affected” from the Washington State Historic Preservation Officer (SHPO) is anticipated.

**6. Effects on limits of the Territorial Sea [320.4(f)]**

Not applicable, since the project would not occur in coastal waters.

**7. Consideration of property ownership [320.4(g)]**

Riverview Park is an undeveloped parcel of land currently owned by the City of Kent Parks Department. Federal involvement in ecosystem restoration is supported in law and Executive Order.

**8. Activities affecting coastal zones [320.4(h)]**

The Corps has determined this project to be analogous to Nationwide Permit 27 (NWP 27), “Restoration”. Under NWP 27, if an individual Section 401 certification is not triggered, the coastal zone consistency determination is considered to be consistent. An analysis of the coastal zone consistency determination for Riverview Park has been completed.

**9. Activities in marine sanctuaries [320.4(i)]**

Not applicable, since the area is not a marine sanctuary.

**10. Other federal, state, or local requirements [320.4(j)]**

USACE received concurrence from the U.S. Fish and Wildlife Service and National Marine Fisheries Service on the findings of the Programmatic Biological Assessment for the Green Duwamish Ecosystem Restoration Project. The Corps received a Section 401 water quality certification from the Washington Department of Ecology under the conditions of a Nationwide Permit 27 on 10 May 2010. The local sponsor, the City of Kent, would obtain all locally necessary permits including a Hydraulic Approval Permit with the Washington Department of Fish and Wildlife.

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- 11. Safety of impoundment structures [320.(k)]**  
Not applicable, since an impoundment structure is not being built.
- 12. Water supply and conservation [320.4(m)]**  
No impacts to water supply are anticipated.
- 13. Energy conservation and development [320.4(n)]**  
Not applicable.
- 14. Navigation [320.4(o)]**  
Not applicable because the Green River is not considered navigable water at this river mile.
- 15. Environmental benefits [320.4(p)]**  
The project would create off-channel habitat for Chinook rearing and winter high flow refuge. It would also include native plantings and LWD, both of which are integral to the development of salmonid and other wildlife habitat.
- 16. Economics [320.4(q)]**  
No impacts to economics are anticipated.
- 17. Mitigation [320.4@]**  
No mitigation is required on this project as there would be no impact to wetlands.

## **APPENDIX B**

### **Clean Water Act Section 404(b)(1) Analysis**

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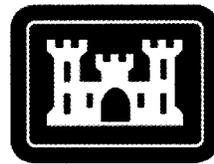
#### **Riverview Park Ecosystem Restoration Side Channel Construction Kent, King County, Washington**

#### **Clean Water Act**

**Prepared by:**

**U.S. Army Corps of Engineers  
Seattle District  
Environmental Resources Section**

**May 2010**



**US Army Corps  
of Engineers** ®  
Seattle District

## **1.0 Introduction**

The purpose of this document is to record the U.S. Army Corps of Engineers (USACE) Clean Water Act Section 404 compliance evaluation of a plan to construct an approximately 750 linear foot flow-through side channel to the Green River through Riverview Park. The primary goals for this project are to increase available off-channel rearing habitat for juvenile Chinook salmon and provide refugia during winter high flow events.

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This restoration activity is being conducted as part of the Green/Duwamish River Basin Ecosystem Restoration Project (ERP). In this program, the Corps has served as the lead in developing the restoration program for the Green/Duwamish River, working with local agencies to identify, evaluate, prioritize, and coordinate implementation of potential restoration projects to assure that the restoration programs and projects from the various agencies complement each other. The overall objective of the ERP is to restore significant ecosystem function, structure, and dynamic processes that have been degraded within the river basin. To accomplish this objective, the following basin-wide restoration goals were identified:

- Improve the physical nature of existing degraded habitat.
- Improve existing ecosystem functions and values. This includes improving riverine processes where reasonable.
- Address important factors limiting habitat productivity.

Restoration project potential at sixty-seven sites within the Green-Duwamish basin were developed and evaluated to determine the most cost effective and beneficial plan to recommend for restoration of the basin ecosystem. The recommended plan would implement a combination of 45 project-specific and programmatic restoration measures throughout the basin, and Riverview Park Restoration and Side Channel Construction (formerly called Green River Park) is one of the 45 projects.

The main body of this document summarizes the information presented in Attachment A and includes relevant information from the Environmental Assessment for the project that was collected pursuant to the National Environmental Policy Act (NEPA) of 1969 [42 USC §4321 et seq.]. Attachment A provides the specific analysis of compliance with the CWA 404(b)(1) and the General Regulatory Policy requirements.

## **2.0 Project Background**

This project is a separable element of the Duwamish/Green Ecosystem Restoration Project (ERP), authorized by Section 101(b)(26) of the Water Resources Development Act of 2000, Public Law 106-541, which lists the project as “Green River Park”. A conceptual design and cost estimate was prepared in 1998 as part of feasibility phase. The Duwamish/Green ERP gained construction New Start capability in the Water and Energy Act of 2003. The project was renamed Riverview Park in early 2006 when the period of design was initiated with the City of Kent.

The project site, near River Mile (RM) 23.7, is located within the City of Kent (the local sponsor) on the right bank of the Green River near the confluence with Mill Creek and just

west of SR167 Bridge crossing in the northwest quarter of Section 25, Township 22 North, and Range 4 East of the Willamette Meridian in Kent, King County, Washington.

The side channel construction is to occur within a City of Kent undeveloped park parcel, Riverview Park. Riverview Park is bounded to the north, west and south by the Green River and to the east by Hawley Road.

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Riverview Park is currently owned by the City of Kent Parks Department (Kent Parks). At one time, Kent Parks had proposed converting the open space of Riverview Park into a formal recreation park to include parking, picnic and restroom facilities, and a hand-carry boat ramp. The Corps' Riverview Park Side Channel Construction project was to be a part of this master plan. The lands for both pieces of the project (restoration and recreation) were purchased by the City of Kent, using non-Federal grant funds, in 2005. Kent Parks was responsible for designing and constructing the recreational park and the City of Kent Public Works was responsible for the restoration project. As of this date, Kent Parks' proposal to develop the parcel adjacent to the side channel into a formal park has been deferred due to budget and personnel constraints. In the future, if funds become available, Kent Parks may chose to develop the adjacent land as a recreational park. The local sponsor for the Side Channel Construction (the project discussed herein) is Kent Public Works.

### **3.0 Project Need**

The populations of native fish, particularly anadromous fish, are declining at a rapid rate. Three anadromous salmon species, Puget Sound Chinook (*O. tshawytscha*), Puget Sound steelhead (*O. mykiss*) and Puget Sound/Coastal bull trout (*Salvelinus confluentus*) have been listed as threatened or endangered under the Endangered Species Act (ESA), and a third species, coho (*O. kisutch*), is considered a Species of Concern under the ESA. Without restorative action, many of the fish and wildlife resources of the Green/Duwamish system would continue to decline.

Deforestation, urban, industrial and residential development, and the requisite flood control facilities (Howard Hanson Dam and the nearly complete system of levees), in the Green River valley have caused considerable degradation of the river and associated habitats. This degradation takes the form of stream channelization, increased sedimentation, impaired water quality, minimal wetland and riparian buffers, and disturbed hydrological regimes. Levees and artificial control of river flow by Howard Hanson Dam (HHD) have forever altered natural ecosystem processes and directly led to the decline of salmon in the watershed. The Green River, restricted by riprap and earthen levees, is no longer able to enter its flood plain; and therefore, natural channel migration processes, riparian corridors, wetland development, off-channel habitat, and large woody debris (LWD) recruitment have been virtually eliminated in the middle and lower Green sub-watersheds. All of these elements are crucial to the formation of suitable salmonid habitat.

Construction of a side channel in Riverview Park would provide much needed off channel habitat in the middle and lower reach of the Green River. Reduction and elimination of side channel forming process in the lower and middle river has been identified as a limiting factor for salmonid spawning and rearing (Fuerstenberg et al. 1996.)

#### **4.0 Project Purpose**

The project purpose is to create side channel habitat for Chinook rearing and winter high flow refuge. The project would include native plantings and LWD, both of which are integral to the development of salmonid and other wildlife habitat.

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#### **5.0 PROPOSED ACTION AND ALTERNATIVES**

Alternatives considered under NEPA must include the proposed action (preferred alternative), and the no-action alternative. Other reasonable alternatives that meet the project purpose and need must also be considered in detail.

Five alternatives were considered for this project: 1) The No Action Alternative, 2) Construct the Dead End Side Channel Alternative, 3) Construct the Flow Through Side Channel Alternative, 4) Construct the Flow Through Side Channel - Pedestrian Bridge Alternative, and 5) Construct the Flow Through Side Channel -Vehicle Bridge Alternative.

The No Action Alternative was eliminated because it did not meet the project objectives. Alternative 2 was eliminated because flow through channels have been shown to be more beneficial to juvenile Chinook, as well as sedimentation concerns. Alternatives 3 and 4 were eliminated because the site has public safety concerns over emergency access, and the difficulty in maintaining and irrigating the riparian planting without vehicular access to the island. Alternative 5, the preferred alternative, was selected because of the emergency access requirements of the City of Kent Parks, and the ability to properly maintain and irrigate the riparian planting on the islands with a use of an irrigation truck and other larger pieces of equipment. The vehicle bridge design in alternative 5 is a wide span and no portion of the bridge would be in the channel. Therefore, impacts to habitat benefits would be minimal.

#### **6.0 POTENTIALLY ADVERSE EFFECTS (INDIVIDUALLY OR CUMULATIVELY) ON THE AQUATIC ENVIRONMENT**

##### **a. Effects on Physical, Chemical, or Biological Characteristics of the Aquatic Ecosystem**

Short term impacts from temporary increases in turbidity may result from activities associated with constructing the inlet and outlet of the channel. The largest impact may occur during the connection of the new channel with the Green River, which may cause a pulse of sedimentation as the new side channel is watered and adjusts to the new flow. In addition, there is a risk of a chemical spill (fuel, oil, or other machinery fluids) into the water whenever construction occurs near a water body. Best management practices would be implemented during construction to ensure the chances of this occurrence are minimized.

The construction of the side channel would provide important off-channel refuge from high flows and increase the amount of available salmonid rearing habitat in the lower reaches of the Green River. Both of these elements are considered limiting factors for salmon recovery in the Green River. Increased native overhanging vegetation and the

introduction of LWD into the channel would provide additional high quality habitat to a variety of fish species. It is anticipated that juvenile salmonids and other fish would utilize this new habitat during all seasons. Access to the site by the public could cause an increase in fishing and overall disturbance to adult and juvenile salmon, however educational signage put up to encourage conservation, and dense riparian planting should limit access to the channel

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**b. Effects on Recreational, Aesthetic, Historical, and Economic Values**

The installation of the side channel and bridge may result in increased interest in the site and therefore recreational use, including fishing, might increase. The City of Kent has plans to reroute the existing Green River Trail away from Hawley Road, likely through the open space of the park. This may also increase recreational use in the area.

The visual quality of the lower Green River basin varies with its diverse land use and development. Visual quality decreases downstream as development increases. At Riverview Park, large, mature trees along the river banks provide some visual quality but the predominance of invasive blackberries under the trees and along the edges of the site greatly detracts from the aesthetics of the area. The regular mowing of the majority of the site inhibits the establishment of vegetation other than grass and weedy herbaceous species. The nearby presence of SR167 also impacts the site's aesthetic qualities.

Removing invasive species and planting native vegetation along the newly created side channel and on the island would greatly improve the visual and aesthetic appeal of the site. The proposed fill added to the east side of the site to create berms and hills would serve as a visual barrier to SR167 from the park and thus increase visual value.

During excavation and construction of the site, the aesthetic quality of the general area could be reduced due to the noise and air emissions generated by the construction equipment, which may disturb recreational users of the Green River Trail. However, these impacts would be temporary and highly localized, and are not expected to result in significant impacts.

Professional cultural resources studies have been conducted for the proposed project. This archaeological investigation did not identify any cultural resources within the project area, however archaeological monitoring would be required for all ground disturbing activities, due to the potential for deeply buried artifacts.

**c. Findings**

There would be no significant adverse impacts to aquatic ecosystem functions and values. It is expected that aquatic ecosystem functions and values would increase by construction of the side channel and planting the site with native vegetation.

## **7.0 ALL APPROPRIATE AND PRACTICABLE MEASURES TO MINIMIZE POTENTIAL HARM TO THE AQUATIC ECOSYSTEM**

### **a. Impact Avoidance Measures**

Potential impacts to aquatic animals and fish would be avoided by constructing the internal 600 linear feet of the channel prior to opening the inlet/outlet of the channel to the Green River, as well as performing all in-water work within the designated fish window (August 1 to August 31).

### **b. Impact Minimization Measures**

USACE would take all practicable steps during construction of the project to minimize impacts to aquatic resources during in-water construction. Contingencies would be in place if any of the water quality protection measures fail to achieve their intended function. USACE would observe all construction windows to ensure that impacts to migratory fish would be avoided or minimized. The minimization measures would be as follows:

- Connecting the newly excavated side channel with the mainstem of the Green River during the established in-water work window (August 1 to August 31)
- During inlet/outlet construction and watering of the side channel appropriate turbidity control methods (temporary coffer dam, silt curtains, or similar) would be used to isolate construction from the Green River and minimize turbidity impacts.
- All required de-watering activities during construction would use appropriate devices (i.e. pumps, sand bags, sumps). All water removed from the site would be discharged in a vegetated upland location, a de-siltation basin, or location that would not incur damage due to water discharge.
- Water quality sampling would be conducted according to the protocol approved by the Washington Department of Ecology for the following parameters: turbidity, dissolved oxygen, and pH. Construction could be halted if deemed necessary under the water quality sampling plan in compliance with the Section 401 Water Quality Certification.
- Drive trains of equipment would not operate in the water
- All equipment would be cleaned prior to in-water construction work.
- Biodegradable hydraulic fluids would be used in machinery.
- No refueling would occur near the shoreline of the Green River or the side channel. All refueling would occur in the staging area located on the far eastern side of the site.
- Construction equipment shall be regularly checked for drips or leaks.
- At least two fuel spill kits with absorbent pads would be onsite at all times.
- Tree removal will occur prior to April 1 in the construction year to minimize disturbance to nesting birds.

### **c. Compensatory Mitigation Measures**

Due to the absence of wetlands and the ecosystem restoration goal of this project, compensatory mitigation measures are not applicable.

**d. Findings**

Given the temporary, localized, necessary, and minor nature of these effects, the Corps has determined that the proposed restoration project would not result in significant adverse environmental impacts.

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## **8.0 OTHER FACTORS IN THE PUBLIC INTEREST**

**a. Fish and Wildlife**

USACE has coordinated construction activities with local Native American Tribes, and state and federal resource agencies to ensure that only minimal impacts to fish and wildlife resources would occur. The in-water portions of project construction would take place during the designated fish window, established by Washington Department of Fish and Wildlife (WFDW), to avoid impacts to fish. A Corps biologist would check for perched bald eagles before construction begins to avoid and minimize disturbance due to large machinery. Work may be delayed if it appears that there would be a disturbance to eagles. USACE has received concurrence from the U.S. Fish and Wildlife Service and National Marine Fisheries Service that the proposed project “may affect, not likely to adversely affect” federally listed species and critical habitat located in the project area.

**b. Water Quality**

The Corps concluded that this project would not violate state water quality standards and, received a Section 401 water quality certification from the Washington Department of Ecology under the conditions of a Nationwide Permit 27 on 10 May 2010.

**c. Historical and Cultural Resources**

A search of the archaeological and historic site records at the Washington State Department of Archaeology and Historic Preservation (DAHP) indicated that no properties listed in the National Register of Historic Places (NRHP) or the Washington State historic site register are recorded within the project area. Although no cultural resources have been previously recorded within the project area, the project’s location at the confluence of two salmon streams represents an area likely to contain evidence of cultural resources.

Professional cultural resources studies have been conducted for the proposed project. While an archaeological investigation did not identify any cultural resources within the project area, archaeological monitoring would be required for all ground disturbing activities, due to the potential for deeply buried artifacts. If historic properties eligible for the National Register of Historic Places are found to be present in the project area, a programmatic agreement for data recovery (if necessary) would be developed in consultation with the Muckleshoot Indian Tribe Preservation/Cultural Resources Division and the DAHP that describes specific measures that would be taken to mitigate adverse effects resulting from the project. On 10 May 2010 concurrence of “No historic properties affected” was received from the Washington State Historic Preservation

Officer (SHPO). A request for knowledge and concerns letter was sent to the Muckleshoot Tribe on 12 February 2010. No response was been received from the Tribe to date.

**e. Environmental Benefits**

The project would restore significant ecosystem function, structure, and dynamic ~~processes that have been degraded within the river basin by increasing side channel~~ habitat, for salmonids and other fish. The addition of native riparian plants along the channel and across the site would provide shading and cover leading to localized cooler temperatures, and increase primary production in the form of insect and bird drop.

## **9.0 CONCLUSIONS**

USACE finds that this project is within the public's interest, complies with the substantive elements of Section 404 of the Clean Water Act, and meets the criteria of Nationwide Permit 27: Aquatic Habitat Restoration, Establishment, and Enhancement Activities.

## Attachment A

### Clean Water Act 404(b)(1) Evaluation [40 CFR §230] Permit Application Evaluation [33 CFR §320.4]

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#### 404(b)(1) Evaluation [40 CFR §230]

##### **Potential Impacts on Physical and Chemical Characteristics [Subpart C]:**

##### **1. Substrate [230.20]**

The placement of gravel suitable for benthic invertebrate colonization and juvenile salmonid habitat is expected to lead to an overall improvement in ecosystem function in this reach of the Green River.

##### **2. Suspended particulates/turbidity [230.21]**

Construction of the inlet/outlet and watering of the channel may cause short-term increases in turbidity. These increases are attributable to the excavation of the side channel inlet and outlets, placement of rock, LWD and other materials, and watering and stabilization of the new channel. Heavy equipment needed to perform in-stream work would be staged in upland areas and would not enter the river. All in-water work would be conducted during the prescribed work windows and during low flow to minimize water quality impacts. The project would use BMPs to ensure state water quality standards are maintained during construction. Daily water quality monitoring would be conducted during in-water work to ensure compliance with these standards. Should monitoring indicate that state water quality maximum standards for turbidity are exceeded; work would be halted and modified such that standards are met.

##### **3. Water [230.22]**

The project is not expected to add any nutrients to the water that could affect the clarity, color, odor, or aesthetic value of the water, or that could reduce the suitability of Riverview Park or the adjacent Green River for aquatic organisms or recreation. While the groundwater table elevation may vary with season and flows of the adjacent Green River, it is anticipated that the side channel would receive groundwater flow for the majority of the year. As groundwater is of a lower temperature than that of surface water, it can be expected that temperatures within the proposed side channel, as well as those in the adjacent Green River mainstem, may exhibit minor reductions in temperature due to the project. The cooler water temperatures in the immediate vicinity of the side channel may increase dissolved oxygen in this area resulting in improved water quality.

Coniferous large woody debris, which is resistant to breakdown (and therefore has low biochemical oxygen demand), would be placed to enhance fish habitat.

##### **4. Current patterns and water circulation [230.23]**

The hydraulic effects of the project on the portion of the Green River main stem parallel to the side channel were simulated using the Corps' HEC-RAS River Analysis System computer model. The simulations found little or no change to the existing (no action) average channel flow conditions during the median annual flow event (approximately

1000cfs). During larger events (OHW events of 6000cfs and higher), the preferred project alternative generated small reductions in the calculated water depth (on the order of 0.1 ft) and velocity (on order of 0.5 ft/sec) when compared to the no-action alternative.

It is expected there would be some hyporheic flow of groundwater into the channel. The designed elevation of the channel bottom is below the groundwater table by approximately two feet as identified by geotechnical explorations performed in November 2009. Paired with the highly permeable soils on site, this seems to indicate that some hyporheic flow would be available to supplement the surface flow in the channel. This input has not been quantified, however.

**5. Normal water fluctuations [230.24].**

Water fluctuations in the side channel would mirror those in the mainstem Green River. Water levels of the Green River are controlled by operations at Howard Hanson Dam. The only uncontrolled fluctuations in the lower and middle Green River are caused by stormwater runoff.

**6. Salinity gradients [230.25]**

Not applicable, there is no salt intrusion in this region of the Green River. .

**Potential Impacts on Biological Characteristics of the Aquatic Ecosystem [Subpart D]:**

**1. Threatened and endangered species [230.30]**

In 2000, USACE submitted a Section 7 ESA Programmatic Biological Assessment for the Green-Duwamish ERP projects to the U.S. Fish and Wildlife Service (USFWS) and National Marine Fisheries Service (NMFS). Concurrence with the Corps' determinations of **may affect, but not likely to adversely affect** for species that were federally listed at that time was received from both Services in 2001. Consultation was reinitiated for Puget Sound steelhead and Chinook salmon and bull trout critical habitat in March 2010 with NMFS and USFWS, respectively, for the current design of the side-channel at Riverview Park. The Corps determined this project **may affect, but is not likely to adversely affect** steelhead and Chinook and bull trout critical habitat; concurrence with this determination was received from NMFS on 8 April 2010 regarding Chinook critical habitat and steelhead, and from USFWS on 14 April 2010 regarding bull trout critical habitat.

**2. Fish, crustaceans, mollusks and other aquatic organisms in the food web [230.31]**

There may be temporary impacts to aquatic organisms during construction and connection of the channel due to turbidity or if the riverbed is disturbed during inlet/outlet construction and watering of the new channel. However, aquatic habitat quality conditions are expected improve greatly following construction. Streambed gravel would line the channel, providing rearing habitat and better substrate for the production of aquatic insects and other benthic organisms. Planting the stream banks with native vegetation would provide shading that functions as a thermal refuge during warm summer days as well as providing a source of organic input for the food chain and insect drop as a direct source of food.

**3. Other wildlife [230.32]**

Birds and other wildlife may be temporarily displaced during construction due to noise

and presence of construction vehicles. Because these impacts would only occur during the period of construction, and the great majority of existing trees would be retained, they are expected to be inconsequential and temporary. Planting native trees and shrubs along the stream bank would increase the extent and species diversity on the site and create additional opportunities for foraging, nesting, cover, and refuge for a wide variety of species.

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**Potential Impacts on Special Aquatic Sites [Subpart E]:**

**1. Sanctuaries and refuges [230.40]**

Not applicable. Riverview Park is not designated by local, state or federal regulations to be managed principally for the preservation and use of fish and wildlife resources.

**2. Wetlands [230.41]**

Not applicable. There are no wetlands present.

**3. Mud flats [230.42]**

Not applicable. There are no mudflats present.

**4. Vegetated shallows [230.43]**

Not applicable because there are no vegetated shallows present.

**5. Coral reefs [230.44]**

Not applicable.

**6. Riffle and pool complexes [230.45]**

Not applicable because there are no riffle/pools present.

**Potential Effects on Human Use Characteristics [Subpart F]:**

**1. Municipal and private water supplies [230.50]**

The project would not impact water supply or other public utilities.

**2. Recreational and commercial fisheries [230.51]**

There are no known commercial fisheries at or near the project area. Recreational and tribal harvest does occur in the Green River at the project site. The project is expected to increase off-channel habitat for fish in this reach, which is considered a limiting factor to salmonid recovery in the Green River. Therefore the proposed project should improve recreational and tribal fishing opportunities in the long run. The Corps will coordinate with the Muckleshoot Tribe prior to construction to ensure that construction activities are coordinated with the tribe and impacts to tribal fishing are avoided and minimized.

**3. Water-related recreation [230.53]**

The installation of the side channel and bridge may result in increased interest in the site, and therefore, recreational use, including fishing, might increase. The City of Kent has plans to reroute the existing Green River Trail away from Hawley Road, likely through the open space of the park. This may also increase recreational use in the area.

**4. Aesthetics [230.53]**

Removing invasive species and planting native vegetation along the newly created side channel and on the island would greatly improve the visual and aesthetic appeal of the site. The proposed fill added to the east side of the site to create berms and hills would serve as a visual barrier to SR167 from the park and thus increase visual value.

During excavation and construction of the site, the aesthetic quality of the general area could be reduced due to the noise and air emissions generated by the construction equipment, which may disturb recreational users of the Green River Trail. However, these impacts would be temporary and highly localized, and are not expected to result in significant impacts.

**5. Parks, national and historic monuments, national seashores, wilderness areas, research sites and similar preserves [230.54]**

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No such structures or areas are designated in the project area.

**Evaluation and Testing [Subpart G]:**

**1. General evaluation of dredged or fill material [230.60]**

All imported material would be free from contamination.

**2. Chemical, biological, and physical evaluation and testing [230.61]**

Water quality sampling would be conducted according to the protocol approved by the Washington Department of Ecology for the following parameters: turbidity, dissolved oxygen, and pH. Construction could be halted if deemed necessary under the water quality sampling plan in compliance with the Section 401 Water Quality Certification.

**Actions to Minimize Adverse Effects [Subpart H]:**

**1. Actions concerning the location of the discharge [230.70]**

Discharge would be at channel bottom below the ordinary high-water mark. It would utilize methods that minimize the likelihood of turbidity increases in the Green River during the activity and comply with all permit protocols and restrictions.

**2. Actions concerning the material to be discharged [230.71]**

Material to be placed in the project area consists of a layer of streambed gravel within the new channel, riprap at the toe of the channel slope, and boulders placed to secure the log clusters and over the riprap toe.

**3. Actions controlling the material after discharge [230.72]**

Material to be added to the site includes streambed gravel, riprap, and boulders. There may be a pulse of sedimentation following diversion of the stream into the new channel resulting in short term turbidity increases as the streambed adjusts to the new flow. Localized shifting of sediments may continue sporadically as the new stream adjusts.

**4. Actions affecting the method of dispersion [230.73]**

See above.

**5. Actions related to technology [230.74]**

No technologies would be used to construct this site.

**6. Actions affecting plant and animal populations [230.75]**

USACE has coordinated construction activities with local Native American Tribes and state and Federal resource agencies to ensure that minimal impacts to fishery and wildlife resources would occur. The in-water portions of project construction would take place during the designated fish window to avoid impacts to fish. Providing rearing gravels, increasing off channel habitat, and planting the banks with native vegetation, is expected to lead in an increase in habitat value for aquatic biota. A Corps biologist would check for perched bald eagles before construction begins to avoid and minimize

disturbance due to large machinery. Work would be delayed if it appears that there would be a disturbance to eagles. Fish rescue would take place during the installation of the isolation devices to be used during inlet/outlet construction and watering of the channel.

**7. Actions affecting human use [230.76]**

The construction of the bridge would provide public and emergency vehicle access to the newly constructed island, ensuring continued public safety and access to the Green River at Riverview Park.

**8. Other actions [230.77]**

Best management practices would be used to ensure that impacts are minimized during construction.

**General Policies for Evaluating Permit Applications [33 CFR §320.4]**

**1. Public Interest Review [320.4(a)]**

USACE finds this ecosystem restoration action to be in compliance with the 404(b)(1) guidelines and not contrary to public interest.

**2. Effects on wetlands [320.4(b)]**

Not applicable as there are no wetlands present on the site.

**3. Fish and wildlife [320.4(c)]**

USACE consulted extensively with state and federal resource agencies, tribes and other interested members of the public on this action.

**4. Water quality [320.4(d)]**

The Corps concluded that this project would not violate state water quality standards and received a Section 401 water quality certification from the Washington Department of Ecology under the conditions of a Nationwide Permit 27 on 10 May 2010. The Corps will comply with all conditions set forth in the Certification.

**5. Historic, cultural, scenic, and recreational values [320.4(e)]**

An archeological survey was conducted on site. No cultural resources were uncovered; however, due to the depth of the excavation, monitoring during ground disturbing activities is required. A concurrence with the finding of "No Historic Properties Affected" from the Washington State Historic Preservation Officer (SHPO) is anticipated.

**6. Effects on limits of the Territorial Sea [320.4(f)]**

Not applicable, since the project would not occur in coastal waters.

**7. Consideration of property ownership [320.4(g)]**

Riverview Park is an undeveloped parcel of land currently owned by the City of Kent Parks Department. Federal involvement in ecosystem restoration is supported in law and Executive Order.

**8. Activities affecting coastal zones [320.4(h)]**

The Corps has determined this project to be analogous to Nationwide Permit 27 (NWP 27), "Restoration". Under NWP 27, if an individual Section 401 certification is not triggered, the coastal zone consistency determination is considered to be consistent. An analysis of the coastal zone consistency determination for Riverview Park has been completed.

**9. Activities in marine sanctuaries [320.4(i)]**

Not applicable, since the area is not a marine sanctuary.

**10. Other federal, state, or local requirements [320.4(j)]**

USACE received concurrence from the U.S. Fish and Wildlife Service and National Marine Fisheries Service on the findings of the Programmatic Biological Assessment for the Green Duwamish Ecosystem Restoration Project. The Corps received a Section 401 water quality certification from the Washington Department of Ecology under the conditions of a Nationwide Permit 27 on 10 May 2010. The local sponsor, the City of Kent, would obtain all locally necessary permits including a Hydraulic Approval Permit with the Washington Department of Fish and Wildlife.

**11. Safety of impoundment structures [320.4(k)]**

Not applicable, since an impoundment structure is not being built.

**12. Water supply and conservation [320.4(m)]**

No impacts to water supply are anticipated.

**13. Energy conservation and development [320.4(n)]**

Not applicable.

**14. Navigation [320.4(o)]**

Not applicable because the Green River is not considered navigable water at this river mile.

**15. Environmental benefits [320.4(p)]**

The project would create off-channel habitat for Chinook rearing and winter high flow refuge. It would also include native plantings and LWD, both of which are integral to the development of salmonid and other wildlife habitat.

**16. Economics [320.4(q)]**

No impacts to economics are anticipated.

**17. Mitigation [320.4(r)]**

No mitigation is required on this project as there would be no impact to wetlands.

## APPENDIX C

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### COASTAL ZONE MANAGEMENT ACT CONSISTENCY DETERMINATION

Ecology Concurrence Received – May 10, 2010

**Coastal Zone Management Act Consistency Determination  
Green-Duwamish Ecosystem Restoration Project  
Riverview Park Side Channel Construction and Restoration**

The restoration and side channel construction are activities undertaken by a Federal agency; the following constitutes a federal consistency determination with the enforceable provisions of the Washington Coastal Zone Management Program.

#### 1. INTRODUCTION

The proposed Federal action applicable to this consistency determination is the side channel construction and restoration activities at Riverview Park, as described in the Environmental Assessment. This determination of consistency with the Washington Coastal Zone Management Act is based on review of applicable sections of the State of Washington Shoreline Management Program and policies and standards of the City of Kent, Washington Shoreline Master Program.

#### 2. STATE OF WASHINGTON SHORELINE MANAGEMENT PROGRAM

The Coastal Zone Management Act of 1972, as amended, requires Federal agencies to carry out their activities in a manner which is consistent to the maximum extent practicable with the enforceable policies of the approved state Coastal Zone Management (CZM) Programs. The Shoreline Management Act of 1972 (RCW 90.58) is the core of authority of Washington's CZM Program. Primary responsibility for the implementation of the Shoreline Management Act (SMA) is assigned to local government. City of Kent, in which the proposed restoration project is located, fulfilled this requirement with the Shoreline Master Program for the City of Kent

The proposed restoration and side channel construction is located along the Green River which in an area designated Urban Conservancy - Open Space environment and classified as a "Shoreline of Statewide Significance."

#### 3. CITY OF KENT SHORELINE MANAGEMENT PROGRAM

Applicable portions of the City of Kent Shoreline Management Plan (SMP) are presented below with the Corps consistency indicated in *bold italics*.

City of Kent defines and discusses Urban Conservancy –Open Space Environment as:

**a. Purpose**

The purpose of the "Urban Conservancy-Open Space" environment is to protect and "restore", as defined in this SMP, ecological functions in urban and developed settings, while allowing public access and a variety of park and recreation uses.

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**b. Designation Criteria**

An "Urban Conservancy-Open Space" environment designation would be assigned to shorelands that are within public and private parks and natural resource areas, including golf courses, the Green River Natural Resource Area, the Green River Trail and park lands on Lake Meridian, Lake Fenwick, and Springbrook Creek. Lands planned for park uses or resource conservation areas with no other commercial or residential land uses should also be designated "Urban Conservancy-Open Space."

**c. Management Policies**

USES

1. Water-oriented recreational uses should be given priority over non-water-oriented uses. Water-dependent recreational uses should be given highest priority.
2. Commercial activities enhancing the public's enjoyment of publically accessible shorelines may be appropriate.
3. Water-dependent and water-enjoyment recreation facilities that do not deplete the resource over time, such as boating facilities, angling, wildlife viewing trails, and swimming beaches, are preferred uses, provided significant ecological impacts to the shoreline are avoided or mitigated.
4. Development that hinders natural channel movement in channel migration zones should not be allowed.

ECOLOGICAL RESTORATION AND PUBLIC ACCESS

3. During development and redevelopment, all reasonable efforts, as determined by the City, should be taken to restore ecological functions.
4. Standards should be established for shoreline stabilization measures, vegetation conservation, water quality, and shoreline modifications within the "Urban Conservancy-Open Space" designation to ensure that new development does not further degrade the shoreline and is consistent with an overall goal to improve ecological functions and habitat.
5. Public access and public recreation objectives should be implemented whenever feasible and significant ecological impacts can be mitigated.

***Consistent. The Riverview Park Side Channel Restoration project would enhance and restore the Green River environment while still allowing for public access to the river and is therefore compatible with the Urban Conservancy – Open Space determination.***

General Provisions of the City of Kent's SMP as it relates to the Riverview Park Side Channel are as follows:

UNIVERSALLY APPLICABLE POLICIES AND REGULATIONS

1. The City should periodically review conditions on the shoreline and conduct appropriate analysis to determine whether or not other actions are necessary to protect and restore the ecology to ensure no net loss of ecological functions, protect human health and safety, upgrade the visual qualities, and enhance residential and recreational uses on the City's shorelines. Specific issues to address in such evaluations include, but are not limited to:

- a. Water quality.
- b. Conservation of aquatic vegetation (control of noxious weeds and enhancement of vegetation that supports more desirable ecological and recreational conditions).
- c. Upland vegetation.
- d. Changing visual character as a result of new residential development, including additions, and individual vegetation conservation practices.
- e. Shoreline stabilization and modifications.

***Consistent. The Riverview Park Side Channel project would be reviewed periodically to ensure continued high ecological function. Adaptive management (weed management, plant replacement, etc.) would be initiated if necessary.***

2. The City should keep records of all project review actions within shoreline jurisdiction, including shoreline permits and letters of exemption.

***Consistent. The City of Kent would maintain all records related to the Riverview Park project.***

4. The City should involve affected federal, state, and tribal governments in the review process of shoreline applications.

***Consistent. Federal, state and tribal governments have been involved in the design and development of the Riverview Park project since inception.***

#### ARCHAEOLOGICAL AND HISTORIC RESOURCES

1. Due to the limited and irreplaceable nature of the resource, public or private uses, activities, and development should be prevented from destroying or damaging any site having historic, cultural, scientific or educational value as identified by the appropriate authorities and deemed worthy of protection and preservation.

***Consistent. A survey and study of the Riverview Park project area was conducted by professional archeologists in compliance with Section 106 of the National Historic Preservation Act. No archaeological deposits or historic properties were encountered during the investigation. Consultation was initiated with the Washington State Historic Preservation Officer (SHPO) and the Muckleshoot Tribe of Indians (Muckleshoot) Preservation/Cultural Resources Division for the project and concurrence with a finding of "No Historic Properties Affected" from both SHPO was received on 10 May 2010. No comments have been submitted from the Muckleshoot to date.***

#### ENVIRONMENTAL IMPACTS

1. In implementing this SMP, the City should take necessary steps to ensure compliance with Chapter 43.21C RCW, the Washington State Environmental Policy Act of 1971, and its implementing guidelines.

***Consistent. Appropriate National Environmental Policy Act (NEPA) and/or State Environmental Policy (SEPA) Act documents have been prepared. The Riverview Park project is in compliance with both NEPA and the Washington SEPA.***

## PUBLIC ACCESS

1. Public access should be considered in the review of all private and public developments with the exception of the following:
  - a. One- and two-family dwelling units; or
  - b. Where deemed inappropriate due to health, safety and environmental concerns.

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2. Developments, uses, and activities on or near the shoreline should not impair or detract from the public's access to the water or the rights of navigation.
3. Public access should be provided as close as possible to the water's edge without causing significant ecological impacts and should be designed in accordance with the Americans with Disabilities Act.
4. Opportunities for public access should be identified on publicly owned shorelines. Public access afforded by shoreline, street ends, public utilities and rights-of-way should be preserved, maintained and enhanced.
6. Public views from the shoreline upland areas should be enhanced and preserved. Enhancement of views should not be construed to mean excessive removal of existing native vegetation that partially impairs views.
7. Public access and interpretive displays should be provided as part of publicly funded restoration projects where significant ecological impacts can be avoided.
8. City parks, trails and public access facilities adjacent to shorelines should be maintained and enhanced in accordance with City and County plans.

***Consistent. Public access has been integrated into the design of the Riverview Park Side Channel by the proposed bridge. The bridge would span the new channel and grant public, pedestrian access to the newly formed island. The bridge is also designed to enable access to the island by emergency equipment if necessary.***

## SHORELINES OF STATE-WIDE SIGNIFICANCE

In implementing the objectives of RCW 90.58.020 for shorelines of statewide significance, the City would base decisions in preparing and administering this SMP on the following policies in order of priority, 1 being the highest and 6 being lowest.

1. Recognize and protect the state-wide interest over local interest.
  - a. Solicit comments and opinions from groups and individuals representing state-wide interests by circulating the SMP, and any proposed amendments affecting shorelines of state-wide significance, to state agencies, adjacent jurisdictions, citizen's advisory committees and local officials and state-wide interest groups.
  - b. Recognize and take into account state agencies' policies, programs and recommendations in developing and administering use regulations and in approving shoreline permits.
  - c. Solicit comments, opinions and advice from individuals with expertise in ecology and other scientific fields pertinent to shoreline management.

***Consistent. State-wide interests were included during the design process of the Riverview Park project. The primary goal of the project is to improve aquatic habitat in the Green River, in particular for Endangered Species Act (ESA) listed salmonid species, a resource of statewide concern.***

2. Preserve the natural character of the shoreline.

- a. Designate and administer shoreline environments and use regulations to protect and restore the ecology and environment of the shoreline as a result of man-made intrusions on shorelines.
- c. Protect and restore existing diversity of vegetation and habitat values, wetlands and riparian corridors associated with shoreline areas.
- d. Protect and restore habitats for State-listed “priority species.”

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***Consistent. The natural character of the shoreline would be enhanced by the restoration project. Existing vegetation would be retained to the extent possible and invasive species would be removed. The primary goal of the project is to restore habitat to ESA listed species, which are also State-listed “priority species”.***

3. Support actions that result in long-term benefits over short-term benefits.

***Consistent. The proposed project is expected to provide long-term benefits to aquatic species of the Green River.***

4. Protect the resources and ecology of the shoreline.
  - a. All shoreline development should be located, designed, constructed and managed to avoid disturbance of and minimize adverse impacts to wildlife resources, including spawning, nesting, rearing and habitat areas and migratory routes.
  - b. Actively promote aesthetic considerations when contemplating new development, redevelopment of existing facilities or general enhancement of shoreline areas.
  - c. Shoreline development should be managed to ensure no net loss of ecological functions.

***Consistent. The Riverview Park project would retain, to the extent possible, all existing native trees and therefore minimize impact to species which utilize these trees. In addition, the restoration site would be planted with native species which would over time greatly enhance the habitat and aesthetic conditions at the site.***

5. Increase public access to publicly owned areas of the shoreline.
  - a. Give priority to developing paths and trails to shoreline areas, linear access along the shorelines, especially to the maintenance and enhancement of the Green River Trail, which is a regional recreational and transportation resource.

***Consistent. The Riverview Park project is located on Kent Parks’ lands. Public access to the site would be maintained after project completion.***

#### VEGETATION CONSERVATION

1. Vegetation within the City shoreline areas should be enhanced over time to provide a greater level of ecological functions, human safety, and property protection.
2. This SMP in conjunction with other City development regulations should establish a coordinated and effective set of provisions and programs to protect and restore those functions provided by shoreline vegetation.
4. The removal of invasive or noxious weeds and replacement with native vegetation should be encouraged. Removal of noxious or invasive weeds should be conducted using the least-impacting method feasible, with a preference for mechanical rather than chemical means.

***Consistent. A major component of the Riverview Park project is vegetation enhancement. Most of the native trees currently existing on site would be retained and substantial additional planting would occur both along the channel and in the adjacent upland areas.***

## WATER QUALITY AND QUANTITY

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1. All shoreline uses and activities should be located, designed, constructed, and maintained to avoid significant ecological impacts that alter water quality, quantity, or hydrology.
5. All measures to treat runoff in order to maintain or improve water quality should be conducted on-site before shoreline development creates impacts to water.
6. Shoreline use and development should minimize the need for chemical fertilizers, pesticides or other similar chemical treatments to prevent contamination of surface and ground water and/or soils, and adverse effects on shoreline ecological functions and values.

***Consistent. The proposed project would not have long-term impacts to water quality or quantity of the Green River. During construction temporary impacts to water quality may result from increased turbidity. Best Management Practices (BMPs) would be implemented to minimize these impacts and prevent storm water or erosion impacts due to the construction. No chemical fertilizers, pesticides or herbicides would be used at any time on the project site.***

Shoreline Modification Provisions of the City of Kent's SMP as it relates to the Riverview Park Side Channel are as follows:

Shoreline modifications are structures or actions which permanently change the physical configuration or quality of the shoreline, particularly at the point where land and water meet. Shoreline modification activities include, but are not limited to, structures such as revetments, bulkheads, levees, breakwaters, docks, and floats. Actions such as clearing, grading, landfilling, and dredging are also considered shoreline modifications.

***The Riverview Park Side Channel Construction and Restoration Project is a shoreline modification only in the sense that it would create additional shoreline of the Green River. The approximately 750 ft long side channel would be connected at either end to the Green River. These connections would result in a modification of the existing shoreline of the Green River. This modification is consistent for construction in areas determined to be Urban Conservancy - Open Space environments.***

## SHORELINE RESTORATION AND ECOLOGICAL ENHANCEMENT

2. All shoreline enhancement projects should protect the integrity of adjacent natural resources including aquatic habitats and water quality.

***Consistent. The Riverview Park project would protect adjacent upland habitat by retaining the majority of existing native trees on site. The new channel would increase and enhance aquatic habitat in the lower Green River.***

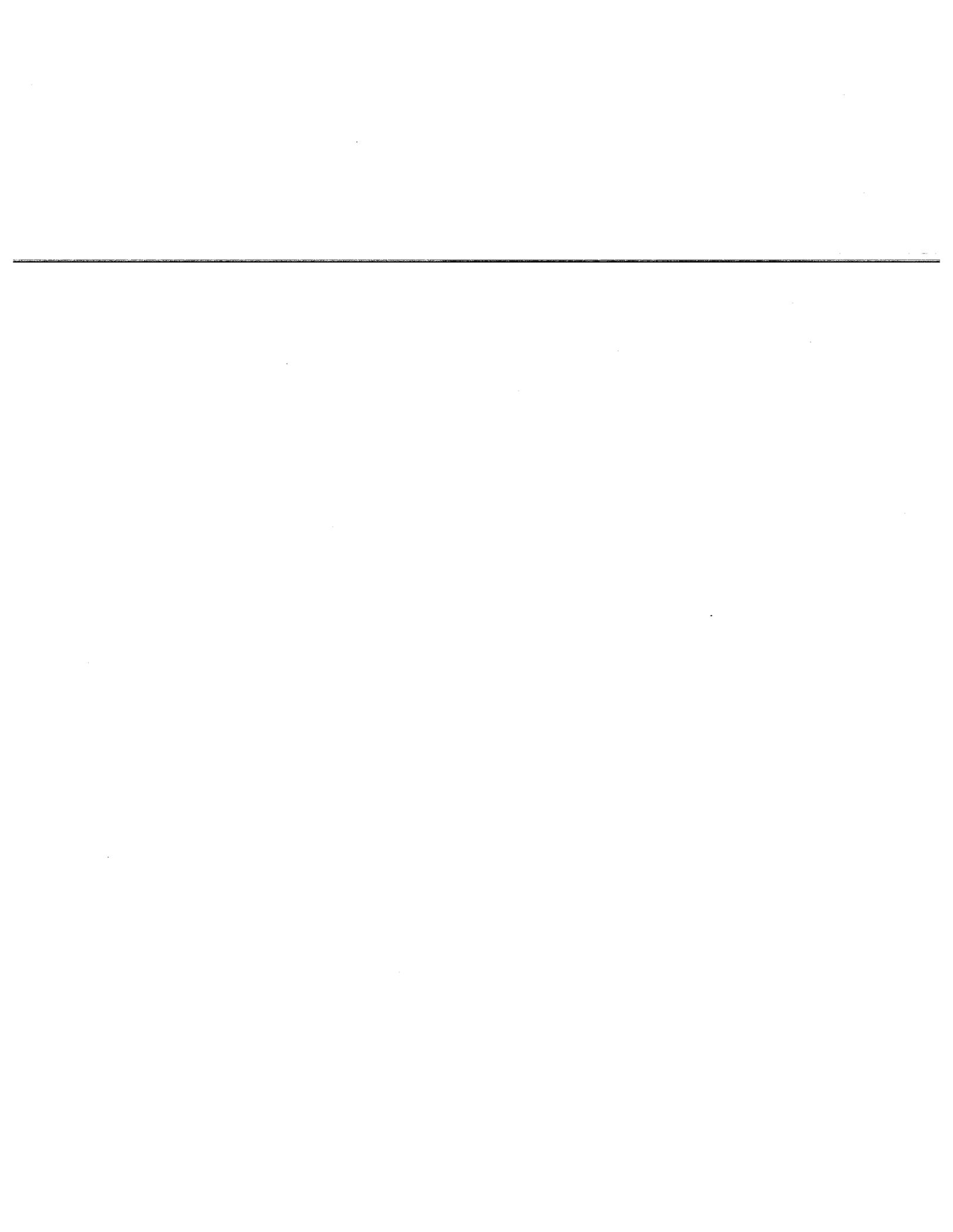
3. Where possible, shoreline restoration should use maintenance-free or low maintenance designs.

***Consistent. The side channel and associated native planting are designed to be low-maintenance after establishment.***

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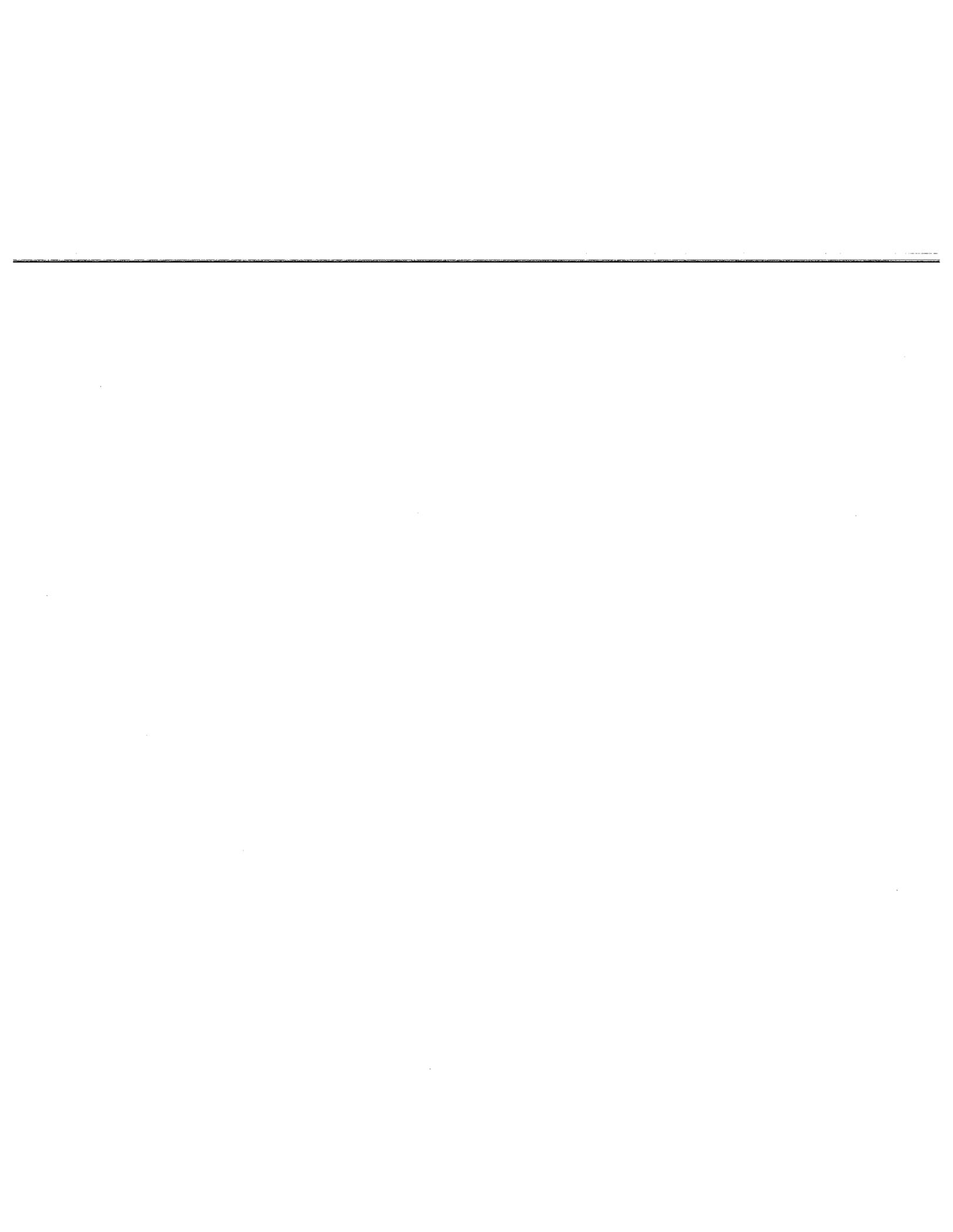
#### **4. STATEMENT OF CONSISTENCY**

Based on the above evaluation, the Corps has determined that the proposed project, Riverview Park Side Channel Construction and Restoration, complies with the policies, general conditions, and activities as specified in the City of Kent Shoreline Master Program adopted in 2010. The proposed action is thus considered to be consistent to the maximum extent practicable with the State of Washington Shoreline Management Program and policies and standards of the City of Kent Shoreline Master Program.



**APPENDIX D**  
**ESA CONCURRENCE LETTERS**

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## **Electronic Approval for Use of the 2008 Fish Passage and Restoration Programmatic**

NMFS has reviewed the Fish Passage and Restoration Programmatic (FPRP) for the State of Washington Specific Project Information Form (SPIF) dated April 1, 2010 and the Memorandum for the Services (MFS) dated April 2, 2010 for the Riverview Park Side Channel Restoration project. The Corps of Engineers proposes to create an 800' flow-through side channel to create off-channel salmon rearing habitat and high flow refuge with additional riparian plantings and instream habitat features. This project is part of the Green/Duwamish River Basin Ecosystem Restoration Program (ERP) and has American Recovery and Reinvestment Act (ARRA) and Salmon Recovery Funding Board (SRFB) funding.

This project is located on the Green River at Riverview Park (RM 23.7) in Kent, King County, Washington (HUC 1711001303, Lower Green River). The SPIF and MFS requesting initiation of consultation were received in our office on April 6, 2010.

The applicant proposes a restoration project that includes elements of the *Installation of Instream Structures* and *Side Channel/Off Channel Habitat Restoration and Reconnection* categories of the FPRP. As per approval criteria set forth in this programmatic consultation, NMFS Tracking No.: 2008-03598 (formal), NMFS is responding via this electronic format to give approval to use the programmatic consultation document for the Riverview Park Side Channel Restoration project, COE # PL-10-05.

NMFS concurs with your determination that this project “*may affect, but is not likely to adversely affect*” Puget Sound (PS) steelhead and PS Chinook salmon. The Green River is designated critical habitat for PS Chinook salmon, and construction effects of this project “*may affect, but are not likely to adversely affect*” this critical habitat. In the long-term, the project will leave the action area in better than pre-construction condition. Lack of off- channel rearing habitat has been identified as a critical limiting factor in the Green River Chinook Recovery Plan.

Essential Fish Habitat (EFH) for coho and pink salmon has been designated in the action area, and NMFS concurs with the determination that this project will not adversely affect EFH for these species.

There are two project components which are identified in the FPRP as “excluded” and for which an exemption to this exclusion is sought by the project proponents. These are:

- 1) Action Category 2(a), woody debris will be anchored with meal chain which is considered the only reliable anchoring technique; and
- 2) General CM 1(5), temporary access roads will be removed and planted after construction but the slope required for access during construction will be maintained.

NMFS agrees that methods for anchoring large woody debris (LWD) with earth anchors and ballast in this side channel are adequate to keep the wood in place and maintain its function. A temporary access road and bridge will be left in place after project completion as the City of Kent is required to maintain emergency vehicle access to the entire length of the Green River at Riverview Park.

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NMFS does not expect take from construction activities in the form of turbidity effects. Following all WDFW technical guidance and BMPs as outlined in the FPRP and the Hydraulic Project Approval (HPA) will ensure that turbidity caused by the action is well within the range of natural turbidity events that occur in the Green River. NMFS expects this project to result in improved rearing, refuge and foraging habitat in the Green River for juvenile salmonids and other species. Post-construction monitoring is part of the project.

The NMFS tracking number for this project is 2010/01436 and the Corps reference number is PL-10-05.

Hi Andrea,

I have reviewed the Specific Project Information Form (SPIF) for the proposed Riverview Park Side Channel Construction in and adjacent to the Green River at approximately River Mile 23.7 near Kent, in King County, Washington. ~~The Corps is proposing to construct an 800-ft-long~~ side channel to create off-rearing habitat and high flow refuge for salmonids. The work would include excavation of a new channel and placement of 12 instream log clusters, streambed gravel, cobble and other armoring in the new channel.

A pedestrian and emergency vehicle access bridge will be constructed over the new channel. Riparian vegetation will also be planted along the new channel. A coffer dam would be constructed at either end of the proposed new channel with most of the excavation and other work conducted in the dry. The in-water work window for the proposed action is August 1 to 31, 2011.

The project would deviate slightly from the programmatic in the following manner:

- 1) The proposed log clusters would be anchored with metal chains to ensure they are retained.
- 2) The temporary access roads would be removed and planted after construction is completed, but will not be regraded to their original elevations.

These deviations prevent the project from fully meeting the requirements of the programmatic. However, BMPs and conservation measures will be implemented and are considered sufficient to address potential effects.

The project meets all other applicable requirements outlined in the Fish Passage/Habitat Restoration Programmatic for the following Activity Types:

Activity 2, Installation of Instream Structures (Placement of Woody Debris, Placement of Boulders, Gravel Placement Associated with Structure Placement); Activity 4, Side Channel/Off Channel Habitat Restoration and Reconnection.

Informal consultation under section 7 of the Endangered Species Act was completed on March 27, 2001, but consultation on this uncompleted action was reinitiated with our office to address bull trout critical habitat, which was designated in 2005. The SPIF, Memorandum to the Services, and addenda requesting approval of the project under the Programmatic were received in our office on April 5, 2010; The Corps has determined that the proposed action "may affect, but is not likely to adversely affect" the bull trout (*Salvelinus confluentus*) and critical habitat for the bull trout.

The Corps has met their obligations under Section 7 of the Endangered Species Act and no further consultation on this action is required. The U.S. Fish and Wildlife Service tracking number for this project is 13410-2010-I-0259 (x. Ref. 13410-2008-F-0209). If you have any questions, please contact me at the number below. Thanks,

Karen Myers  
Fish and Wildlife Biologist

US Fish and Wildlife Service,  
Consultation and Technical Assistance Division 510 Desmond Drive SE  
Lacey, Washington  
(360)753-9098

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**UNITED STATES DEPARTMENT OF COMMERCE**  
**National Oceanic and Atmospheric Administration**  
 NATIONAL MARINE FISHERIES SERVICE  
 Northwest Region  
 7600 Sand Point Way N.E., Bldg. 1  
 Seattle, WA 98115

April 10, 2001

Colonel Ralph H. Graves  
 District Engineer  
 Corps of Engineers, Seattle District  
 Post Office Box 37551  
 Seattle, Washington 98124-3755

Attention: Patrick T. Cagney

Re: Section 7 Informal Consultation on the U.S. Army Corps of Engineers' Green Duwamish Ecosystem Restoration Program, King County, Washington (NMFS No. WSB-00-423) and Essential Fish Habitat Consultation.

Dear Colonel Graves:

This correspondence is in response to your request for consultation under the Endangered Species Act (ESA). Additionally, this letter serves to meet the requirements for consultation under the Magnuson-Stevens Fishery Conservation and Management Act (Magnuson-Stevens Act).

#### Endangered Species Act

The National Marine Fisheries Service (NMFS) has reviewed the August 31, 2000 request for concurrence with your findings of "may affect, not likely to adversely affect (NLAA)" for the above referenced program, based on the Programmatic Biological Assessment (PBA, June 2000), Final Feasibility Report (October 2000), and Supplemental Letter (March 27, 2001). Your findings in regard to the listing of Puget Sound chinook salmon (*Oncorhynchus tshawytscha*) as Threatened under the ESA. This consultation with the United States Army Corps of Engineers (ACOE) is conducted under section 7(a)(2) of the ESA, and its implementing regulations, 50 CFR Part 402.

The NMFS has evaluated the 50 projects in this ten-year program directed at ecosystem habitat restoration and enhancement, largely for salmonids and especially Chinook salmon, and concurs with your findings of "may affect, not likely to adversely affect," to either the species or the designated critical habitat for most of the projects (See Table 1). Based on the ACOE's Supplemental Letter of March 27, 2001 to the PBA, NMFS agrees with the assignment of the projects into four groups: early action (Calendar Year 2001), Phase 1 projects (Years 2002-2003), Phase 2 (Years 2004-2009), and those that require an individual consultation or reinitiation under this consultation, based on requiring more detailed construction plans. Five projects during Phase 1 are considered Demonstration Projects which will provide information on how to better implement larger scale projects planned for Phase 2 which ultimately occur at



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multiple sites or units.

Table 1 Green Duwamish Ecosystem Restoration Program Projects

Project No	Project Name	Phase	ESA Status
<u>Marine Projects</u>			
1	Elliott Bay Nearshore	1	Concur
<u>Tidally-Influenced Estuarine Projects</u>			
2	Site 1, Duwamish	1	Concur
3	Riverton Side Channel	1	Concur
4	Codiga Farms	Early Action	Concur
<u>Free-Flowing Riverine Projects</u>			
5	Black River Marsh	2	Concur
6	Gilliam Creek	2	Concur
7	Lower Springbrook Creek	1	Concur
8	Upper Springbrook Creek	1	Concur
9	Mill Creek East	2	Concur
10	Garrison Creek	2	Concur
11	Mullen Slough, Prentice Nursery Reach	2	Concur
12	Mullen Slough Reach	2	Concur
13	Mill Creek, Schuler Brothers Reach	2	Concur
14	Mill Creek, Merlino Reach	2	Concur
15	Mill Creek, Wetland 5 K Reach	2	Concur
16	Mill Creek, Goedeke Reach	2	Concur
17	Green River Park	1	Concur
18	Horsehead Bend Side Channel	1	Concur
19	NE Auburn Creek	1	Concur
20	Meridian Valley Creek	1	Concur
21	Lake Meridian-Outlet Relocation	1	Concur
22	Olson Creek	1	Concur
23	Riverside Estates Side Channel	2	Concur
24	Mainstem Maintenance	1	Concur for Demo <sup>1</sup>
25	Porter Levee	2	Concur
26	Kaech Levee Pond	2	Concur
27	Ray Creek Trib Corridor	2	Concur
28	Hamikami Levee Modification	2	Concur
29	Turley Levee Setback	2	Concur
30	Loans Levee Setback	1	Concur
31	Burns Creek Restoration	1	Concur
32	Middle Green River Large Woody Debris	1	Concur for Demo

33	Middle Green River Gravel Replacement	1	Concur for Demo
34	Flaming Geyser Landslide	2	Individual <sup>3</sup>
35	Flaming Geyser Side Channel	2	Concur
36	Newaukum Creek	1	Concur for Demo
37	Big Spring Creek	2	Concur
38	Brunner Slough	1	Concur
39	Upper Green R. Side Channel Enhancement	2	Individual
40	Upper Green River Gravel Replacement	1	Concur for Demo

Above Howard Hansen Dam

41	Gale Creek	1	Concur <sup>3</sup>
42	Boundary Creek	2	Concur <sup>3</sup>
43	Sweeney Creek	Early Action	Concur <sup>3</sup>
44	Olsen Creek	2	Concur <sup>3</sup>
45	May Creek	2	Concur <sup>3</sup>
46	Maywood Creek	2	Concur <sup>3</sup>
47	Gold Creek	2	Concur <sup>3</sup>
48	Sunday Creek Riparian Planting	1	Concur
49	North East Creek	2	Concur <sup>3</sup>
50	Volunteer Revegetation	1	Concur

<sup>1</sup> Concurrence as NLAA for one demonstration unit in each project.

<sup>2</sup> Either reinstate this consultation or initiate a new consultation, based on further Project designs.

<sup>3</sup> Culvert replacement projects will use NMFS' Guidelines for Salmonid Passage at Stream Crossings, Final Draft, March 28, 2000 (Appended).

Those restoration projects in which NMFS concurs provide an increase in quantity of critical and essential fish habitat through the removal of upland fill and the removing of fish passage impediments and an increase in quality of the critical and essential fish habitat because of the reasons provided in your Biological Assessment and Supplemental Letter: 1) the work will be done during a time of the year when chinook salmon are not present; 2) most of the upland construction will take place "in the dry" with final connection to the aquatic environment during permissible periods, 3) the implementation employs a landscape ecological approach for the entire watershed from the headwaters of the Green River through the Duwamish estuary to marine habitats in Elliott Bay shallow subtidal substrates; 4) these projects will complement other ongoing Green-Duwamish River Basin restoration and mitigation efforts; and 5) the project will meet all of the Washington Department of Fish and Wildlife Hydraulic Project Approval conditions.

This concludes informal consultation on these actions in accordance with 50 CFR 402.14(b)(1). The ACOE must reinstate this ESA consultation if: 1) new information reveals effects of the action that may affect listed species in a way not previously considered; 2) the action is modified

in a manner that causes an effect to the listed species that was not previously considered; or 3) a new species is listed, or critical habitat designated, that may be affected by the identified action.

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### Essential Fish Habitat

Federal agencies are obligated, under Section 305 of the Magnuson-Stevens Fishery Conservation and Management Act (MSA) (16 USC 1855(b)) and its implementing regulations (50CFR600), to consult with NMFS regarding actions that are authorized, funded, or undertaken by that agency, that may adversely affect Essential Fish Habitat (EFH). The MSA (§3) defines EFH as "those waters and substrate necessary to fish for spawning, breeding, feeding, or growth to maturity." Furthermore, NMFS is required to provide the Federal agency with conservation recommendations which minimize the adverse effects of the project and conserve EFH. This consultation is based, in part, on information provided by the Federal agency and descriptions of EFH for Pacific coast groundfish, coastal pelagic species, and Pacific salmon contained in the Fishery Management Plans produced by the Pacific Fisheries Management Council.

The proposed actions and action areas are described in the Biological Assessment. The action area covers four different types of habitats: marine, tidally-influenced estuarine, and riverine. The marine habitats contain designated EFH for various life-history stages of 46 species of groundfish, 4 coastal pelagic species, and three species of Pacific salmon; the estuarine habitats contain designated EFH for various life-history stages of 17 species of groundfish, four coastal pelagic species, and three species of Pacific salmon; and the riverine habitats include designated EFH for various life-history stages of three species of Pacific salmon (Table 2). Information submitted by the ACOE in the Programmatic Biological Assessment is sufficient for NMFS to conclude that the proposed action may adversely impact EFH in the short term by:

1. Increased siltation during in-water construction operations; and
2. Release of previously unknown chemical contamination during construction.

*EFH Conservation Recommendations:* The conservation measures that the ACOE included as part of the proposed action are adequate to minimize the long-term adverse impacts from this project to designated EFH for the species in Table 2. It is NMFS' understanding that the ACOE intends to implement the proposed activity with these built-in conservation measures that minimize potential adverse effect to the maximum extent practicable. While NMFS is satisfied with the nineteen General Best Management Practices (BMPs, in Section 2.5) in the PBA, short-term impacts should be minimized with the following recommendations.

1. Where gravel/cobble material is to be used in gravel replacement projects, it will be sieved (screen) to remove fine-grained materials smaller than 1/4" in diameter (BMP #15). It is assumed projects will require some level of maintenance over time; this should not include in-water dredging of sediments.

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2. Construction activities will cease if chemical contamination found at any site exceeds the State of Washington sediment standards or Model Toxics Control Act, where applicable (BMP #16), until the contamination is either removed or the project abandoned.
- 

Please note that the MSA (§305(b)(4)(B)) requires the Federal agency to provide a written response to NMFS' EFH conservation recommendations within 30 days of its receipt of this letter.

This concludes EFH consultation in accordance with the MSA and 50CFR600. The ACOE must reinitiate EFH consultation with NMFS if the proposed action is substantially revised in a manner that may adversely affect EFH, or if new information becomes available that affects the basis for NMFS' EFH conservation recommendations (50 CFR 600.920(k)).

This concludes ESA and EFH consultations. If you have questions regarding either of these consultations, please contact Robert Clark at 206-526-4338.

Sincerely,



Donna Darm  
Acting Regional Administrator

Table 2. Species of fishes with designated EFH in the proposed action areas (M = Marine, E = Estuarine, R = Riverine).

Groundfish Species	redstripe rockfish (M) <i>S. proriger</i>	Dover sole (M, E) <i>Microstomus pacificus</i>
spiny dogfish (M, E) <i>Squalus acanthias</i>	rosethorn rockfish (M) <i>S. helvomaculatus</i>	English sole (M) <i>Parophrys vetulus</i>
big skate (M) <i>Raja binoculata</i>	rosy rockfish (M) <i>S. rosaceus</i>	flathead sole (M, E) <i>Hippoglossoides elassodon</i>
California skate (M, E) <i>Raja inornata</i>	rougheye rockfish (M) <i>S. aleuticus</i>	petrale sole (M, E) <i>Eopsetta jordani</i>
longnose skate (M) <i>Raja rhina</i>	sharpchin rockfish (M) <i>S. zacentrus</i>	rex sole (M) <i>Glyptocephalus zachirus</i>
rattfish (M, E) <i>Hydrolagus colliet</i>	splitnose rockfish (M) <i>S. diploproa</i>	rock sole (M, E) <i>Lepidopsetta bilineata</i>
Pacific cod (M, E) <i>Gadus macrocephalus</i>	striptail rockfish (M) <i>S. saxicola</i>	sand sole (M, E) <i>Psettichthys melanostictus</i>
hake (M, E) <i>Merluccius productus</i>	tiger rockfish (M) <i>S. nigrocinctus</i>	starry flounder (M) <i>Platichthys stellatus</i>
black rockfish (M) <i>Sebastes melanops</i>	vermilion rockfish (M) <i>S. miniatus</i>	arrowtooth flounder (M, E) <i>Atheresthes stomias</i>
bocaccio (M, E) <i>S. paucispinis</i>	yelloweye rockfish (M) <i>S. ruberrimus</i>	
brown rockfish (M, E) <i>S. auricularis</i>	yellowtail rockfish (M) <i>S. flavidus</i>	Coastal Pelagic Species
canary rockfish (M) <i>S. pinniger</i>	shortspine thornyhead (M) <i>Sebastolobus alascanus</i>	anchovy (M, E) <i>Engraulis mordax</i>
China rockfish (M) <i>S. nebulosus</i>	cabezon (M, E) <i>Scorpaenichthys marmoratus</i>	Pacific sardine (M, E) <i>Sardinops sagax</i>
copper rockfish (M, E) <i>S. caurinus</i>	lingcod (M, E) <i>Ophiodon elongatus</i>	Pacific mackerel (M, E) <i>Scomber japonicus</i>
darkblotch rockfish (M) <i>S. crameri</i>	kelp greenling (M, E) <i>Hexagrammos decagrammus</i>	market squid (M, E) <i>Loligo opalescens</i>
greenstriped rockfish (M) <i>S. elongatus</i>	sablefish (M, E) <i>Anoplopoma fimbria</i>	Pacific salmon Species
Pacific ocean perch (M) <i>S. alutus</i>	Pacific sanddab (M, E) <i>Citharichthys sordidus</i>	chinook (M, E, R) <i>Oncorhynchus tshawytscha</i>
quillback rockfish (M, E) <i>S. maliger</i>	butter sole (M, E) <i>Isopsetta isolepis</i>	coho (M, E, R) <i>O. kisutch</i>
redbanded rockfish (M) <i>S. babcocki</i>	curlfin sole (M, E) <i>Pleuronichthys decurrens</i>	Puget Sound pink (M, E, R) <i>O. gorbuscha</i>



## United States Department of the Interior

### FISH AND WILDLIFE SERVICE

Western Washington Office  
510 Desmond Drive SE, Suite 102  
Lacey, Washington 98503

Phone: (360) 753-9440 Fax: (360) 753-9008

MAR 27 2001

Colonel Ralph H. Graves  
District Engineer  
Seattle District, Corps of Engineers  
P.O. Box 3755  
Seattle, Washington 98124-3755

Attention: Mr. Pat Cagney

(FWS Reference: 1-3-01-I-0906)

Dear Colonel Graves:

This letter responds to your August 31, 2000 transmittal letter and Programmatic Biological Assessment (PBA) for the Green/Duwamish Ecosystem Restoration Program which we received on September 5, 2000. We are able to provide partial concurrence.

The PBA covers forty-nine restoration projects within the Green/Duwamish River Basin that the Corps of Engineers (Corps) is proposing for implementation over a ten year period. Fish and Wildlife Service (Service) and Corps staff have discussed on a number of occasions the need for more detailed project information to complete the Section 7 consultation. The Service proposed that the Corps meet annually with the Service, prior to the construction season, to review any refinements in project details that could have an impact on federally listed species, but especially the Coastal/Puget Sound bull trout. The Corps informed us in January 2001, that they were uncomfortable with the requirement for future reviews because of the uncertainties that could potentially affect project implementation. Instead, the Corps requested that the Service treat the PBA as a batch consultation. You further asked that we separate out any of the projects that we considered to be lacking in sufficient detail to complete the consultation, as well as projects for which we could not concur with the Corps' effect determination. For the purposes of this consultation, we are treating the forty-nine projects described in the PBA as a batch consultation.

The Corps of Engineers has determined that the actions, as described in its PBA, are not likely to adversely affect the bald eagle (*Haliaeetus leucocephalus*), marbled murrelet (*Brachyramphus marmoratus*), northern spotted owl (*Strix occidentalis caurina*), gray wolf (*Canis lupus*), Canada lynx (*Lynx canadensis*) and Coastal/Puget Sound bull trout (*Salvelinus confluentus*).

Based on the information provided in the PBA and the Corps' final feasibility report for the Green/Duwamish River Basin ecosystem restoration study, we concur with the Corps' determination of effects for the bald eagle, marbled murrelet, northern spotted owl, gray wolf, and Canada lynx. With regard to the Coastal/Puget Sound bull trout, we concur with the Corps' effect determination for forty-three of the forty-nine projects described in the PBA and listed in the attachment to this letter. These projects are covered under this consultation for a period of ten years.

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MAR 30 2001

USACE  
REGULATORY BRANCH

We do not concur with the Corps' "not likely to adversely effect" determination for the bull trout for the following six projects: (1) mainstem maintenance (Auburn to Elliott Bay); (2) middle Green River large woody debris placement; (3) middle Green River gravel replacement; (4) Flaming Geyser landslide control; (5) Newaukum Creek restoration; and (6) upper Green River gravel replacement. We recommend that the Corps consult individually on these projects.

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Although these six projects are expected to benefit bull trout in the long term, we believe they have the potential to adversely affect bull trout in the short term. These projects are larger and more complex than the others, involve significant in-water work, and have not been developed in enough detail at this time for us to conclude that the adverse impacts to bull trout would be insignificant. As project details become more refined, our concern for these projects and their potential impact to bull trout may lessen. In the absence of detailed project information, we need to be more cautious and therefore conclude that bull trout foraging could be adversely affected in the short term as a result of fine sediment releases during the modification of streambanks, the construction of engineered log jams, the addition of spawning gravels and the construction of other habitat improvements. Elevated levels of sediment can reduce the abundance of bull trout prey resources as well as make it more difficult for bull trout to locate their prey.

This concludes informal consultation pursuant to 50 CFR 402.13. This project should be re-analyzed if new information reveals effects of the action that may affect listed species or critical habitat in a manner or to an extent not considered in this consultation; if the action is subsequently modified in a manner that causes an effect to the listed species or critical habitat that was not considered in this consultation; and/or, if a new species is listed or critical habitat is designated that may be affected by this project.

If you have further questions about this letter or your responsibilities under the Act, please contact Gwill Ging at (360) 753-6041 or John Grettenberger at (360) 753-6044.

Sincerely,



*for* Carol Schuler, Manager  
Western Washington Office

**Attachment A.** The U.S. Fish and Wildlife Service concurs with Corps of Engineers' not likely to adversely affect determination for the following projects:

Lower Green/Duwamish River Sites

Elliott Bay Nearshore

Site 1, Duwamish  
Riverton Side Channel  
Codiga Farms

Middle Basin Restoration Sites

Black River Marsh  
Gilliam Creek  
Lower Springbrook Creek  
Upper Springbrook Creek  
Mill Creek East  
Garrison Creek  
Mullen Slough, Prentice Nursery Reach  
Mullen Slough Reach  
Mill Creek, Schuler Brothers Reach  
Mill Creek, Merlino Reach  
Mill Creek, Wetland 5K Reach  
Mill Creek, Goedeke Reach  
Green River Park  
Horsehead Bend Side Channel  
NE Auburn Creek  
Meridian Valley Creek  
Lake Meridian Outlet Relocation  
Olson Creek  
Riverside Estates Side Channel  
Porter Levee Setback  
Kaech Levee Pond  
Ray Creek Trib Corridor  
Hamikami Levee Modification  
Turley Levee Setback  
Loans Levee Setback  
Burns Creek Restoration  
Flaming Geysers Side Channel  
Big Spring Creek  
Brunner Slough  
Upper Green River Side Channel Enhancement

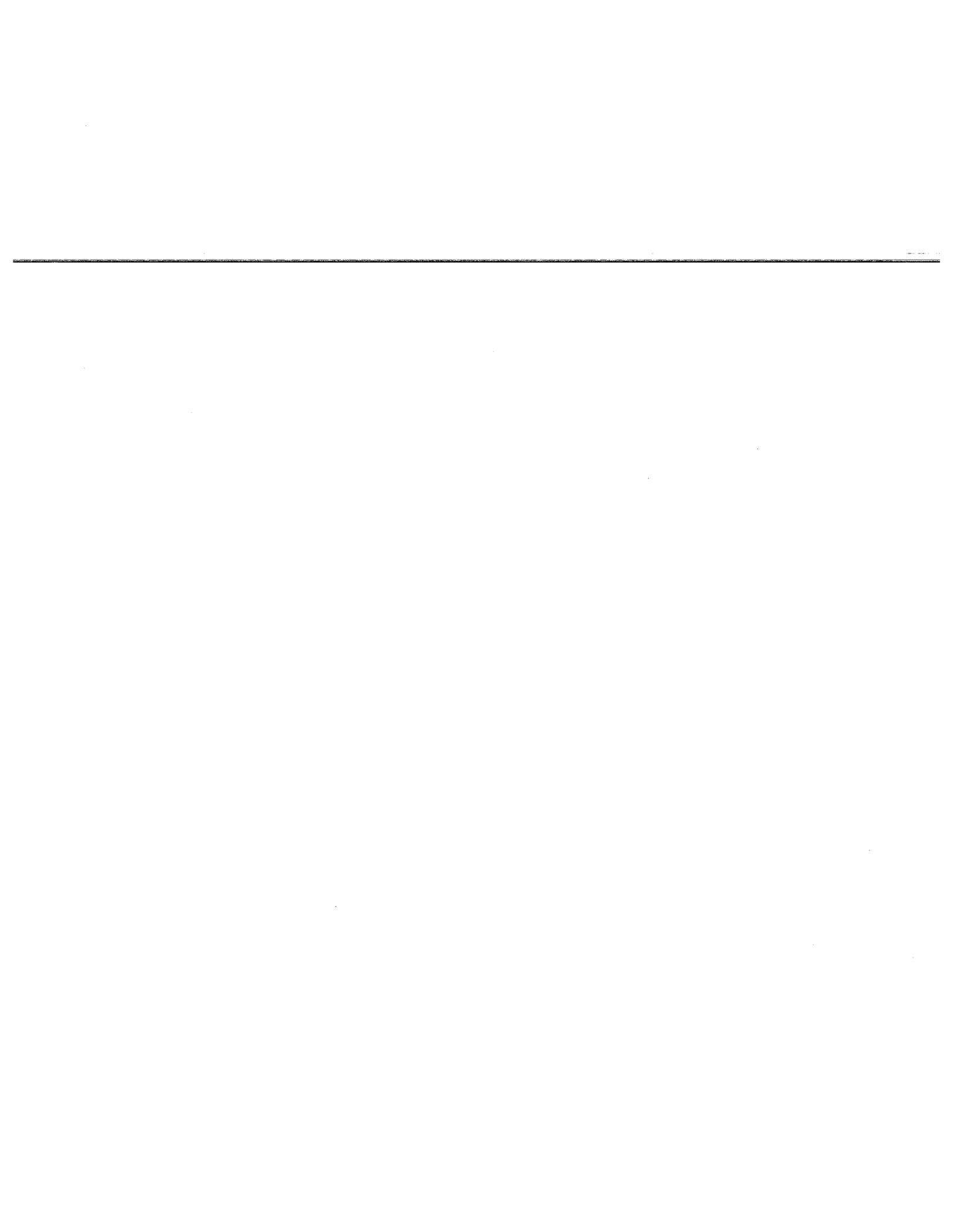
Upper Basin Restoration Sites:

Gale Creek  
Boundary Creek  
Sweeney Creek  
Olson Creek  
May Creek  
Maywood Creek  
Gold Creek  
Sunday Creek Riparian Planting  
North East Creek

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**APPENDIX E**  
**401 WATER QUALITY CERTIFICATION**

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STATE OF WASHINGTON  
DEPARTMENT OF ECOLOGY

Northwest Regional Office • 3190 160th Avenue SE • Bellevue, Washington 98008-5452 • (425) 649-7000

May 10, 2010

United States Army Corps of Engineers  
Attn: Chemine Jackels  
PO Box 3755  
Seattle, WA 98124

**RE: U.S. Army Corps of Engineers Reference #PL-10-05  
Riverview Park Side Channel Restoration Project, Kent, King County, Washington**

Dear Ms. Jackels:

Ecology has determined that the above project meets the requirements for Washington State 401 Water Quality Certification and Coastal Zone Management Act Consistency under NWP #27. Therefore, an individual 401 certification will not be required for this project.

Any changes to your project that would impact water quality should be submitted in writing to Ecology before work begins for additional review.

This letter does not exempt you from other requirements of federal, state, and local agencies.

Please contact me if you have any questions regarding this letter at (425) 649-7129 or e-mail [rp461@ecy.wa.gov](mailto:rp461@ecy.wa.gov).

Sincerely,

Rebekah R. Padgett  
Federal Permit Manager  
Shorelands and Environmental Assistance Program

RRP:cja

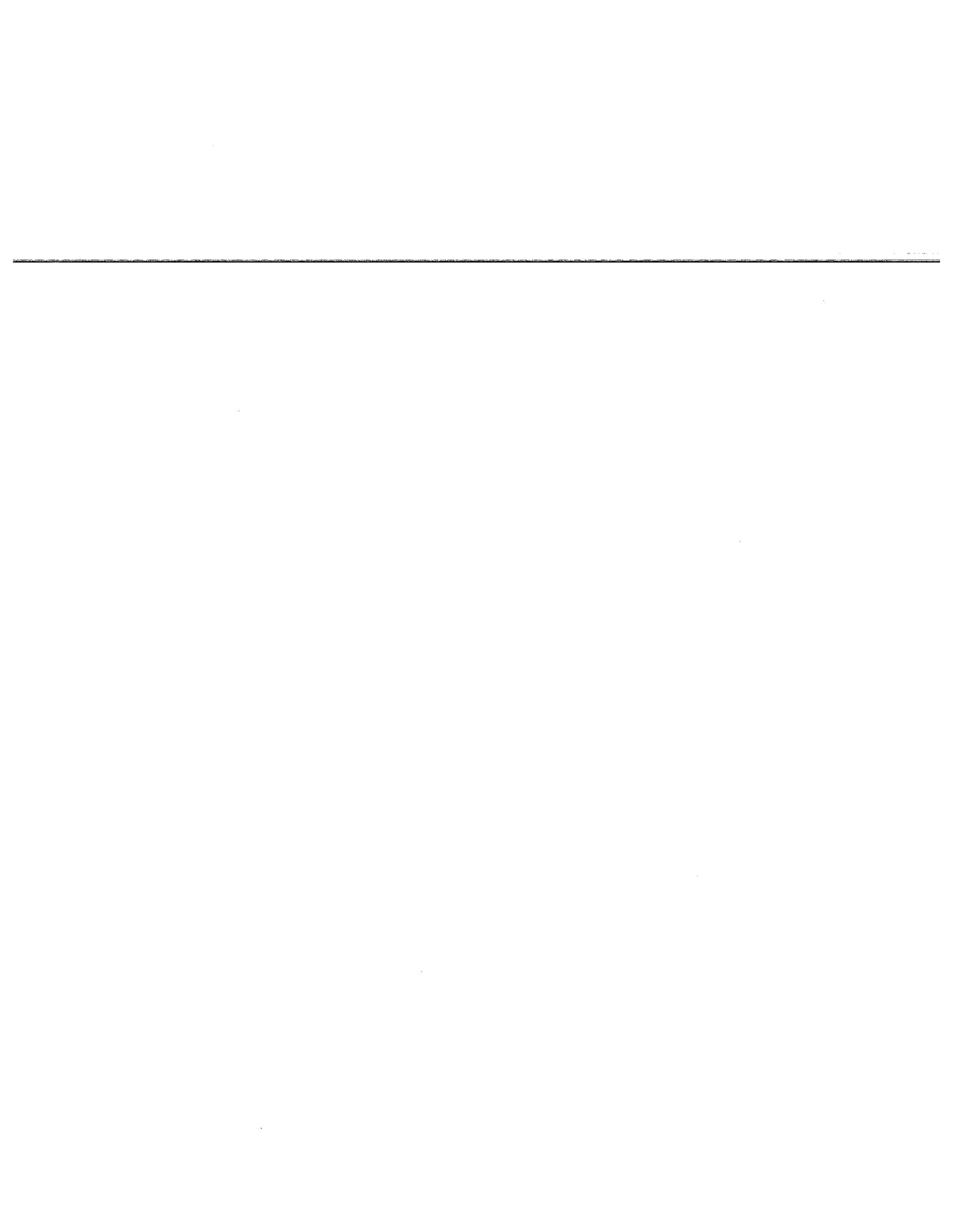
e-cc: Larry Fisher, Washington Department of Fish and Wildlife  
Karen Walter, Muckleshoot Indian Tribe





**APPENDIX F**  
**SHPO CONCURRENCE AND LETTER TO THE TRIBE**

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STATE OF WASHINGTON

**DEPARTMENT OF ARCHAEOLOGY & HISTORIC PRESERVATION**

1063 S. Capitol Way, Suite 106 • Olympia, Washington 98501

Mailing address: PO Box 48343 • Olympia, Washington 98504-8343

(360) 586-3065 • Fax Number (360) 586-3067 • Website: [www.dahp.wa.gov](http://www.dahp.wa.gov)

May 10, 2010

Mr. Evan Lewis  
Environmental Resources Section  
Seattle District, Corps of Engineers  
PO Box 3755  
Seattle, Washington 98124-3755

Re: Riverview Park Green/ Duwamish Restoration Project  
Log No: 022410-06-COE-S

Dear Mr. Lewis:

Thank you for contacting our department. We have reviewed the professional archaeological survey report you provided for the proposed Riverview Park Green/ Duwamish Restoration Project in Kent, King County, Washington.

We concur with your Determination of No Historic Properties Affected.

We would appreciate receiving any correspondence or comments from concerned tribes or other parties that you receive as you consult under the requirements of 36CFR800.4(a)(4).

In the event that archaeological or historic materials are discovered during project activities, work in the immediate vicinity must stop, the area secured, and the concerned tribes and this department notified.

These comments are based on the information available at the time of this review and on the behalf of the State Historic Preservation Officer in conformance with Section 106 of the National Historic Preservation Act and its implementing regulations 36CFR800. Should additional information become available, our assessment may be revised. Thank you for the opportunity to comment and a copy of these comments should be included in subsequent environmental documents.

Sincerely,

Robert G. Whitlam, Ph.D.  
State Archaeologist  
(360) 586-3080  
email: [rob.whitlam@dahp.wa.gov](mailto:rob.whitlam@dahp.wa.gov)



REPLY TO  
ATTENTION OF

**DEPARTMENT OF THE ARMY**  
**SEATTLE DISTRICT, CORPS OF ENGINEERS**  
P.O. BOX 3755  
SEATTLE, WASHINGTON 98124-3755

Environmental Resources Section

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Melissa Calvert  
The Muckleshoot Tribe  
39015 172<sup>nd</sup> Ave SE  
Auburn, Washington 98092-9763

**SUBJECT:** Request for knowledge of, or concerns with, Historic Properties for the proposed Riverview Park Green/Duwamish Ecosystem Restoration Project, King County, Washington.

Dear Ms. Calvert:

As a part of the Green-Duwamish General Investigation Study and under the authorization of Section 101 of the Water Resources Development Act (WRDA) of 2000, the U.S. Army Corps of Engineers, Seattle District (Corps) in cooperation with the City of Kent, is proposing the creation of a side channel on the east side of the Green River to provide benefits for fish and other species. This side channel is intended to provide low-velocity refuge and habitat during periods of high flow on the Green River. It will have an upstream and downstream connection to the Green River, and the side channel will provide near full-time fish access.

Specific ground disturbing activities will include the excavation of approximately 60,000 cubic yards of soil, along with soil transfers and fill grading. Construction will also involve bioengineered banks and in-stream habitat features, installing a pre-fabricated bridge, and invasive riparian species removal and native plant landscaping. Geotechnical trenching has shown that approximately 35 feet of river silt and alluvial gravel exists on site, but the Corps has determined that the proposed work has the potential to affect historic properties eligible for listing in the National Register of Historic Places (NRHP) if they exist within the project's area of potential effects or APE.

The Corps has defined the APE per the enclosed draft Design Evaluation Report (DAR), including all staging and planting areas. When the final DAR is approved and the project is approved for construction, the APE will be subjected to intensive level survey and evaluative testing to identify and record all historic properties in the APE, determine their NRHP eligibility, and determine project effects. A National Historic Preservation Act (NHPA) Section 106 compliance report will be prepared. The report will include the findings of the investigation, recommendations for archaeological monitoring during construction (if any), and a recommended determination of effects to historic properties. If archaeological monitoring is recommended, the report will include a monitoring plan and protocols to be followed. The protocols will include an inadvertent discovery clause that will apply when an archaeological monitor is not present.

To further identify historic properties, Section 106 of the National Historic Preservation Act (NHPA or the Act) of 1966, as amended (36 CFR 800.4[a] [3]), requires Federal agencies to seek information from tribes likely to have knowledge of, or concerns with, historic properties within the project's APE. We are specifically seeking assistance in identifying properties that may be of religious or cultural significance and may be eligible for listing in the National Register of Historic Places (NRHP), including Traditional Cultural Properties (TCP). Specific guidance concerning the Corps' obligation to contact your tribe regarding this issue is found at 36 CFR 800.4(a) (4), which states that the agency official shall:

(4) Gather information from any Indian tribe or Native Hawaiian organization identified pursuant to Sec. 800.3(f) to assist in identifying properties, including those located off tribal lands, which may be of religious and cultural significance to them and may be eligible for the National Register, recognizing that an Indian tribe or Native Hawaiian organization may be reluctant to divulge specific information regarding the location, nature, and activities associated with such sites. The agency official should address concerns raised about confidentiality pursuant to Sec. 800.11(c).

We appreciate any assistance you can provide us in our efforts to comply with Section 106 of the National Historic Preservation Act. Please be assured that the Corps will treat any information you decide to share with us with the degree of confidentiality that is required in Section 800.11(c) of the Act, or with any other special restrictions you may require. In order to fulfill these obligations we request that you provide comments at your earliest convenience.

If you have any questions, please feel free to contact me at 206-764-6942 or by e-mail. My e-mail address is ashley.m.dailide@usace.army.mil.

Sincerely,



Ashley M. Dailide, Archaeologist  
Environmental Resources Section

Enclosures

cc: (with enclosures)  
Laura Murphy  
The Muckleshoot Tribe  
39015 172<sup>nd</sup> Ave SE  
Auburn, Washington 98092-9763

Cc: (without enclosures)  
PM-PL-ER (Dailide)  
PM-PL-PF (Nguyen)  
CENWS-PM (Lake)

12 February 2010

Dailide/6942

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MFR: This initiates consultation with the Muckleshoot Tribe and requests knowledge and concerns for the proposed Riverview Park Green/Duwamish Ecosystem Restoration Project, King County, Washington. (DAILIDE)

DAILIDE/PM-PL-ER ~~AND~~ 2/12/10  
PM-PL files

APPENDIX G

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# Riverview Park

## Draft Maintenance and Monitoring Plan

May, 2011

## 1. INTRODUCTION

Deforestation, urban, industrial, agricultural, and residential development, and the requisite flood control facilities (Howard Hanson Dam and the nearly complete system of levees), in the Green River valley have caused considerable degradation of the river and associated habitats. This degradation takes the form of stream channelization, increased sedimentation, impaired water quality, minimal wetland and riparian buffers, and disturbed hydrological regimes. ~~Levees and artificial control of river flow by Howard Hanson Dam (HHD) have~~ forever altered natural ecosystem processes and directly led to the decline of salmon in the watershed. The Green River, restricted by riprap and earthen levees, is no longer able to enter its floodplain; and therefore natural channel migration processes, riparian corridors, wetland development, off-channel habitat, and large woody debris (LWD) recruitment have been virtually eliminated in the middle and lower Green sub-watersheds. All of these elements are crucial to the formation of suitable salmonid habitat.

The Corps of Engineers and the City of Kent are proposing to construct an approximately 800 linear foot flow-through side channel to the Green River through Riverview Park. Additional elements of this restoration project will include several grouping of woody debris placed throughout the side channel and riparian planting along the channel, as well as other areas on the island.

### 1.1 Goals and Objectives

#### 1.1.1 Program Objectives

The overall goal of the Green-Duwamish Ecosystem Restoration Project is to restore significant ecosystem function, structure, and dynamic processes that have been degraded within the river basin. To accomplish this goal, the following basin-wide restoration objectives were identified:

- Improve the physical nature of existing degraded habitat.
- Improve existing ecosystem functions and values. This includes improving riverine processes where reasonable.
- Address important factors limiting habitat productivity.

#### 1.1.2 Project Objectives

Construction of a side channel in Riverview Park will provide much needed off channel habitat in the middle and lower reach of the Green River. Reduction and elimination of side channel forming process in the lower and middle river has been identified as a limiting factor for salmonid spawning and rearing (Fuerstenberg et al. 1996.)

The objectives of Riverview Park Ecosystem Restoration are to:

- Create high quality off-channel habitat for fish to provide summer rearing and winter refuge for fish during high flows in the mainstem
- Improve the quality of riparian habitat, thereby increasing habitat quality for terrestrial and aquatic biota.

## **1.2 Location**

The project site, near River Mile (RM) 23.7, is located within the City of Kent (the local sponsor) on the right bank of the Green River near the confluence with Mill Creek and just west of SR167 Bridge crossing in the northwest quarter of Section 25, Township 22 North, and Range 4 East of the Willamette Meridian in Kent, King County, Washington (Figure 1).

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The side channel construction is to occur within a City of Kent undeveloped park parcel, Riverview Park. Riverview Park is bounded to the north, west and south by the Green River and to the east by Hawley Road and Green River trail.

## **2. MAINTENANCE AND PROTECTION**

The restored habitats are designed to be ultimately self-sustaining. However, to ensure success of the plantings and the eventual development of the targeted plant communities and habitats, certain maintenance and protection activities will be conducted. The city of Kent (as the local sponsor) will be responsible for the long-term maintenance of the site. Maintenance and protection activities will include:

- Replacement of dead plants during the first year post-construction will be done by the planting contractor, including substitution of unsuccessful species to obtain targeted percent cover performance criteria for the site. Established trees and shrubs that die over time will not be removed unless they pose a direct threat to safety of people or property.
- Spring and fall inventories and removal of invasive species for the first five years post-construction. Invasive species such as Himalayan and cut leaf blackberry, reed canary grass, purple loosestrife, English ivy, butterfly bush, Scot's broom, and Japanese knotweed would be diligently controlled using manual methods to the greatest extent possible. Other control methods, including limited spot application of approved herbicide, could be employed if necessary if manual removal is not effective. The City of Kent will be responsible for the removal of invasive vegetation for 5 years following the completion of construction.
- Weed control matting, protective tree collars, chemical browse-repellants, and/or other measures will be implemented, as necessary to limit competitive pressures or browse damage to plantings.
- Irrigation of riparian plantings from the end of May through the end of October as warranted by regional weather or on-site soil conditions. The City of Kent will be responsible for irrigation of the riparian planting for 5 years post construction.
- City of Kent Sensitive Area signage will be placed along the outer perimeter of the site to identify the area a sensitive landscape feature and limit vegetation trampling/pedestrian traffic.

## **3. MONITORING**

### 3.1 PRE-CONSTRUCTION AND CONSTRUCTION MONITORING

Because the success rate of restoration efforts is increased through the coordination and communication between all parties before and during construction, monitoring by the project biologist from the Corps will take place during construction. A pre-construction meeting of the personnel responsible for the design and those responsible for implementation of the restoration site will take place prior to the onset of construction. The ~~purpose of the meeting would be to review the intent of the restoration plan, establish a~~ pathway of communication during construction, agree upon the construction sequence and address and resolve any questions.

As this is a habitat restoration project, the biological elements are critical to the design and ultimate success of the project. Therefore, the project biologist from the Corps will play a significant role in all decisions regarding project construction. The project biologists will be present on-site during all stages of the restoration process, including but not limited to, (1) Excavation of the channel, (2) Installation of the fish exclusion nets, cofferdams, and fish rescue (3) Final grading and approval of materials such as logs, (4) Placement of habitat structures, (5) Inspection of the plant materials and recommendation for their final placement before planting, (6) Making adjustments in planting plans, as needed, in response to as-built field conditions, (7) Ensuring that construction activities are conducted per the approved plan, and (8) Resolving problems that arise during implementation, thus lessening problems that might occur later during the post-construction monitoring phase. The project biologists will also review the ‘as-built’ site conditions (including elevations, number and species of installed plants, and photo points) immediately following construction to create a baseline condition against which the future evolution of the site will be measured.

### 3.2 Post-Construction Monitoring

As a restoration project, it is expected that this site will be dynamic and evolve in accordance with river flow and sediment movement following the opening of the side channel. Thus, strict achievement of predetermined “performance standards” will not necessarily predict the success or reveal the failure of the restoration effort. The monitoring and evaluation will be flexible and will focus on determining whether the overall goals and objectives of the restoration are being met. Two types of monitoring are proposed:

- 1) *Compliance Monitoring*- to demonstrate if the habitat that was proposed to be built is present and if the habitat evolving as expected, and
- 2) *Effectiveness Monitoring*- to demonstrate how well the habitat being utilized by targeted biota.

Monitoring efforts will be performed by using “monitoring metrics” listed in section 3.2.1 (Evaluation of Specific Objectives); some have specific performance targets associated with them and others measure the more unpredictable aspects of the development and use of the site. Many of these methods were identified in the Green Duwamish Ecosystem Restoration Project Feasibility Report, that was approved in 2000. However, each Green/Duwamish

ERP project will need to have an individual monitoring plan developed that is tailored to its project specific objectives. Methods listed in the Feasibility Report include:

- Standard methods for assessing in-stream fish such as electroshocking and seining
- ~~Percent cover of vegetation and species~~
- Birds and wildlife presence/absence
- Assessment of biotic integrity for invertebrate analysis
- Estuarine Habitat Assessment Protocol
- Physical data such as water quality and sedimentation

Evaluating the evolution of restored habitats will be based on the establishment of the targeted habitat within the restoration site and on the ecologic function and use of those habitats. All post-construction monitoring (Performance Targets and Adaptive Management), will be conducted in years 1, 3, and 5 following construction.

The Corps and the City of Kent will use the knowledge gained through this restoration project to adaptively manage the project site and to improve the design and implementation of future restoration efforts in the area (USACE, 1996). In addition, data collection will be useful to further the understanding of riverine restoration in an urban setting, with the focus on the development of in-stream and riparian habitats and their use by fish, invertebrates, and wildlife. Data collected will also be integrated into the larger volume of fish-use data that has been gathered in the Green River basin as part of the Green-Duwamish Ecosystem Restoration General Investigation.

### 3.2.1 Evaluation of Specific Objectives

***Objective 1: Create high quality off-channel habitat for fish to provide summer rearing and winter refuge during high flows in the mainstem.***

#### **Compliance Monitoring**

##### **Monitoring Metric 1, Percent Coverage of Herbaceous Plants:**

Percent coverage would be measured within using appropriate method. See section 4, Performance Targets and Adaptive Management, for specific targets regarding herbaceous plants.

#### **Effectiveness Monitoring**

##### **Monitoring Metric 2, Fish Presence/Absence and Stomach Contents Analysis:**

The purpose of monitoring this parameter is to evaluate whether the site is being utilized as intended since one of the primary project objectives is to “create high quality off-channel habitat for fish to provide summer rearing and winter refuge for fish during high flows in the mainstem”. There are no specific performance standards other than presence/absence.

Expected species that would utilize the site include Chinook (in the winter and early spring), coho, and chum salmon, sculpin species, three-spine stickleback, and rainbow trout.

Quantifying usage of the site by fish will be done using the following methods:

- If the channel is not wadable, the inlet will be blocked with a blocknet and a ~~trap net, such as an Oncida or fyke net, will be set at the outlet, or both the~~ inlet and outlet will be blocked with blocknets and purse seining within the channel will be conducted likely using a motorized boat. Sampling methods will may need to be improvised based on conditions such as channel depth and velocity.
- If the channel is wadable, both the inlet and outlet will be blocked with blocknets and beach seining within the channel will be conducted.

All fish will be identified to species and measured. If proper permits are obtained a small sub-sample of fish will be collected for diet analysis. The purpose of obtaining a sub-sample of stomach contents is for comparison with the benthic invertebrate and insect drop data (discussed below) to indicate if fish are obtaining their prey from onsite or offsite. If stomach contents are similar in composition to the benthic invertebrates and insect found on the site, it would indicate that the site is functioning well at providing a forage base for juvenile fish rearing, as intended by objective 1. All ESA listed species sampled for diet will be lavaged onsite and released alive, if possible. Sampling will be done in the spring between March 1 and July 15 or as directed by the Washington Department of Fish and Wildlife. All fish sampling will be performed by a qualified fish biologist.

#### **Monitoring Metric 3, Benthic Invertebrate Diversity and Abundance:**

The purpose of monitoring this metric is to indicate if the site is functioning as rearing habitat for fish by providing a forage base. Benthic invertebrates will be sampled using Hess sampler methodology or equivalent in shallow littoral habitat along the margins of the channel. All benthic invertebrates will be identified to family and enumerated.

No performance targets or adaptive management will be established for benthic invertebrate diversity and abundance, as it is largely dependent on how the substrate composition evolves in the channel and water quality (which is beyond the scope of this project). Substrate in the channel is expected to transition over time to coarse and fine sand, as that is the typical substrate found in this reach of the Green River. Benthic invertebrates such as chironomid and other dipteran larvae are common in sandy substrates. There may patchy areas of gravelly substrate in the channel that contain mayfly, stonefly, and caddisfly larvae.

#### **Monitoring Metric 4, Large Woody Debris Recruitment of Smaller Debris:**

The large wood placed in the channel is intended to function as cover and to create slower water area creating pools. In addition, the large wood is expected to act as “key” pieces to recruit smaller woody debris to further enhance cover. There are no specific performance standards for this metric since recruitment of small debris is dependent on offsite conditions. However, it is still useful to monitor this metric to evaluate if the channel is evolving into the rearing habitat that is expected.

The number of large woody debris structures in the channel should remain as it is immediately following construction since they will be anchored down. However, these large or “key” pieces will likely recruit smaller pieces of woody debris. Methodology will consist of counting the number of pieces and randomly sampling for an average diameter of woody pieces. Estimates of woody debris recruitment in these structures will be done in the summer.

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***Objective 2: Improve the quality of riparian vegetation therefore increasing habitat quality for terrestrial and aquatic biota***

**Compliance Monitoring:**

**Monitoring Metric 1, Riparian Plant Survival:**

Because the channel will likely make adjustments as it evolves, changes will influence the number, species, and distribution of plants on the site. Plant survival would be assessed by counting (and marking for replacement) all dead trees and shrubs and subtracting that number from the plant quantities listed on the As-Built planting plan. See section 4, Performance Targets and Adaptive Management, for specific targets regarding riparian plant survival.

**Monitoring Metric 2, Percent Coverage of Riparian Plants**

Percent coverage will be measured using appropriate method. Plants should be healthy, un-suppressed by invasive species, and expanding at a rate acceptable to the project team. See section 4, Performance Targets and Adaptive Management, for specific targets regarding riparian plant cover.

**Effectiveness Monitoring:**

**Monitoring Metric 3, Percent Overhanging Cover and Shading along the Channel**

There are no specific performance standards for this metric since it is dependent upon riparian plant survival and cover, which do have performance targets. It is useful to monitor this metric to indicate that riparian habitat is providing aquatic habitat, as stated in the objective 2. Methodology will include using a densiometer and visual estimates of how much of the riparian vegetation overhangs the wetted channel. Information will be collected in the summer.

**Monitoring Metric 4, Insect Drop**

There are no specific performance standards for this metric since it is dependent on vegetative cover, which has a performance target. However, it is still useful to monitor to indicate if there is sufficient prey from riparian sources to provide habitat (by way of a forage base) for aquatic species, as stated in objective 2. Insect drop will be estimated using fall-out trap methodology. Information will be collected in the summer.

#### **Monitoring Metric 5, Wildlife Habitat Functions**

There are no specific performance standards for this metric. However it is still useful to monitor to indicate if the riparian habitat is being utilized by wildlife species, as stated in objective 2. Increases in wildlife habitat functions would be documented primarily by seasonal bird and mammal surveys conducted at the site at least three times per year, ~~generally timed in the early spring, summer, and winter to document the greatest diversity of~~ bird species using the restoration site. Incidental observations of reptiles and amphibians made during any site visit would also be recorded.

#### **4. PERFORMANCE TARGETS AND ADAPTIVE MANAGEMENT**

Potential scenarios that would require adaptive management of the site, along with conceptual approaches to correct problems, are presented below. Specific corrective actions would be based on the performance targets.

**Potential Scenario 1:** Less than the targeted percent survival of planted riparian vegetation species.

**Performance target:** Planted and desirable volunteer trees and shrubs should be healthy and have:

- 100% survival after year one (per one year guarantee on plant materials)
- 80% of original planting density after year three and year 5

**Corrective actions:** Replanting to maintain targeted plant survival, substitution of failing species with different species more appropriate for site conditions. Plant mortality in excess of the standards would be replaced with the same species or a substitute species (depending on the extent and cause of the mortality) in quantities appropriate to maintain the survival and percent cover standards desired for this project.

**Potential Scenario 2:** Percent coverage of emergent plantings not steadily increasing and/or does not meet targeted percent cover.

**Performance target:** Desirable herbaceous plants will achieve the following aerial cover thresholds in areas where emergent plants are intended:

- Year 1; 30%
- Year 3: 50%
- Year 3: 70%

**Corrective actions:** replanting, more aggressive invasive species control, substitution of species, fertilizer, soil amendment, irrigation, browse control measures, or other remedial actions to correct potential causes of poor growth.

**Potential Scenario 3:** Percent coverage of woody riparian plantings not steadily increasing and/or does not meet targeted percent cover.

**Performance Target:** Native tree and shrub species will achieve the following aerial cover thresholds in areas where riparian woody species are intended:

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- Year 3: 30%
- Year 5: 70%

**Corrective actions:** replanting, more aggressive invasive species control, substitution of species, fertilizer, soil amendment, irrigation, browse control measures, or other remedial actions to correct potential causes of poor growth.

**Potential Scenario 4:** Blackberry, knotweed, loosestrife, reed canary grass, Scot's broom, English ivy, butterfly bush or other non-native, invasive plants constitute greater than 10% coverage of the restoration site.

**Corrective actions:** manual removal, herbicide application, or mechanical grubbing of plants, off-site disposal required.

**Potential Scenario 5:** Site is not being utilize by a variety of fish species

**Performance Target:** Presence of fish

It is difficult to set specific numerical targets for fish, particularly juvenile salmonids, as a variety of extraneous variables could have an influence that have little or nothing to do with how the site is functioning. Some of these variables include:

1. Low spawning success from the previous year, which could be influenced by:
  - a. Ocean conditions such as el nino/la nina years or pacific decadal oscillation
  - b. Overharvest and/or increased predation
  - c. Drought
  - d. Catastrophic events including oil spills or landslides
2. Low Recruitment of juveniles, which could be influenced by:
  - a. Flooding during incubation of eggs and alevin
  - b. Flooding during outmigration
  - c. Dam actives
  - d. Increased predation

The may be variables specific to the site that influence its utilization by fish. If it is determined that none of the extraneous variables that are affecting fish use at the site then the following site parameters will be investigated:

1. Is there sufficient cover from large woody debris and vegetation?
  2. Is there no suitable channel depth within the channel? (*Depth profiles will be measured at evenly spaced channel cross sections with a meter stick and measuring tape pulled taught across the channel*)
    - a. **Target:** depths for young of the year Chinook rearing is approximately 15-100cm (Everest and Chapman, 1972; Stuehrenberg, 1975 Thompson, 1972)
- 
3. Is the velocity too fast? (*velocities will be measured at evenly spaced channel cross sections with a velocity meter and a measuring tape pulled taught across the channel*)
    - a. **Target:** velocities for young of the year Chinook rearing is approximately 6-24 cm/s (Everest and Chapman, 1972; Stuehrenberg, 1975 Thompson, 1972)
  4. Is the substrate composition inadequate? (grain size too silty)
  5. Prey availability- dependent on other variables such as vegetation

**Corrective actions:** See vegetation corrective actions above, install additional wood to slow down velocity and create pools (if deemed safe by hydraulic engineer), install deflection device at inlet to prevent siltation, augment substrate.

#### 4.1 Contingency Planning and Implementation

Contingency measures will be implemented if the monitoring program (or any other documented observations by qualified personnel) indicates performance targets are not being met. The Corps and the City of Kent, in coordination with regulatory and funding agencies, would then assess monitoring metric parameters and initiate the implementation of corrective actions to address the identified issue.

#### 4.2 Responsible Parties

The contingency plan may require extension of the monitoring phase of the project, especially if major changes in the plan are required. As applicable, Corps project biologists and engineers, in consultation with agency personnel, will make adaptive management recommendations. The parties responsible for implementation of the restoration plan and any associated contingencies are as follows:

Project Manager City of Kent: Beth Tan  
City of Kent  
253-856-5552

Project Manager Corps: Lan Nguyen  
U.S. Army, Corps of Engineers, Seattle District  
206-764-6675

Project Biologists Corps: Chemine Jackels  
U.S. Army, Corps of Engineers, Seattle District  
206-764-3646

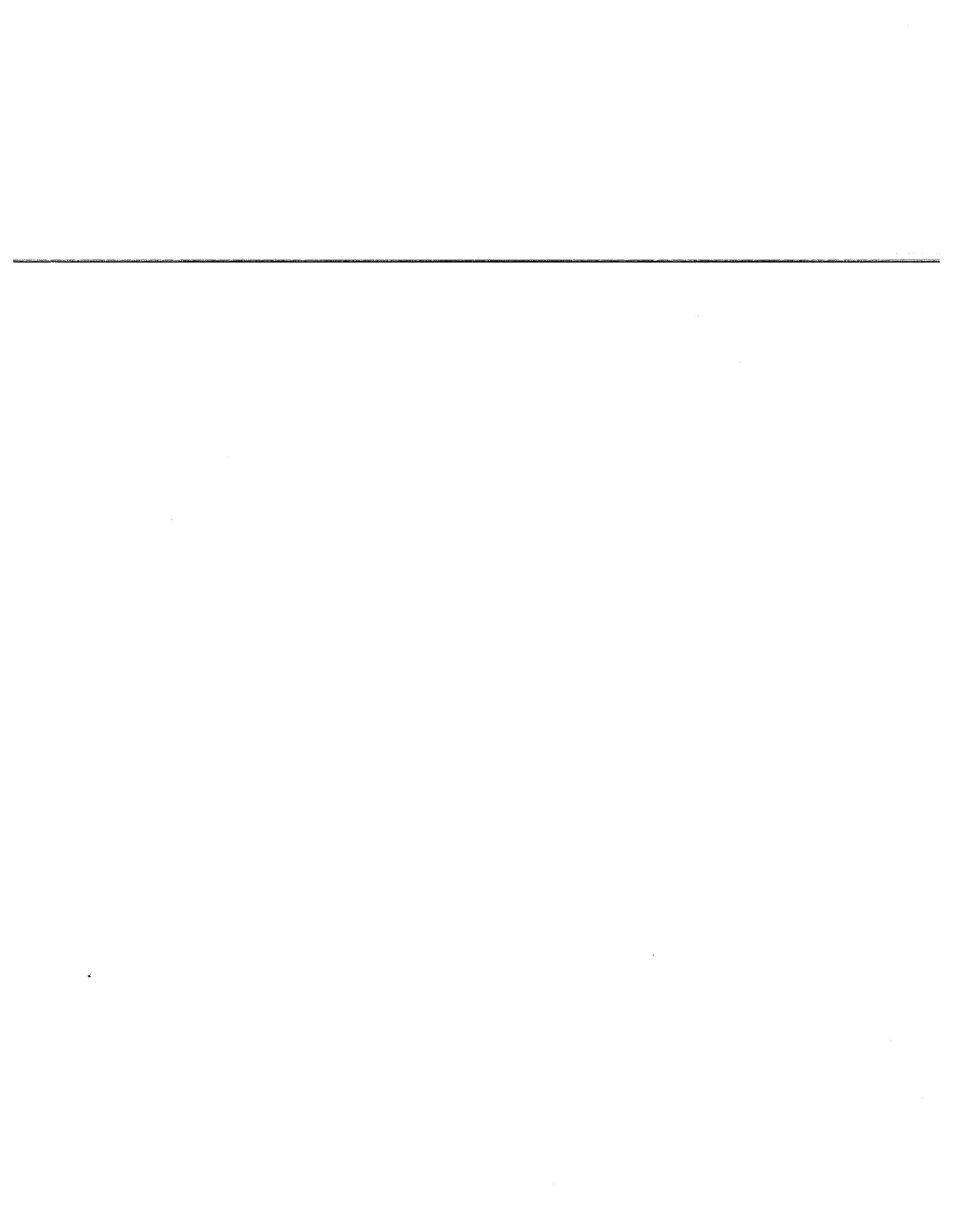
Michael Scuderi  
U.S Army Corps of Engineers, Seattle District  
206-764-7205

**References**

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USACE, 1996. Planning and Evaluating Restoration of Aquatic Habitats from an Ecological Perspective

USACE, 2000. Green Duwamish Ecosystem Restoration Project Feasibility Report



## APPENDIX H PUBLIC COMMENTS RECEIVED

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### Received on 5/19/10 from the Muckleshoot Indian Tribe Fisheries Division:

#### Section 2.0 Alternatives Analysis

**Comment:** If a bridge crossing is needed, then the project should use the pedestrian bridge crossing instead of the preferred alternative vehicle bridge crossing. The pedestrian bridge would result in less permanent impact to the constructed side channel and riparian area than the vehicle bridge alternative. Further, since the developed park proposal is on hold for sometime into the future, a vehicle bridge crossing is not needed for the project at this time. There are many existing public trails and parks in King County that do not provide vehicle access to all areas of these sites yet they remain open to the public without public safety issues. The "island" created by the project would be accessible to emergency personnel on foot that could access the site with a gurney or backboard as needed to provide service to anyone injured on the island. Finally, King County DNRP staff has found ways to develop irrigation systems for their restoration projects that do not require vehicles. The Corps and Kent staff should contact them for additional information. A revised EA should be completed that analyzes this alternative fully compared to the preferred alternative.

**Response:** *The main purpose of the vehicle bridge is to allow a water truck to fill the cisterns on the island used for the drip irrigation system, and well as bring in equipment to maintain the plantings and control invasive species. Installing a waterline is far too expensive, and therefore not feasible. The City of Kent also needs a vehicle bridge for emergency access if someone got hurt on the island. There are currently homeless encampments on the site, which poses the risk of violence. This is City of Kent Parks Department land and the Corps has to meet their needs, regardless of how King County manages their parks.*

*Please note that impacts to habitat benefits from a pedestrian bridge versus a vehicle bridge are minimal. The vehicle bridge is wide span: therefore no portion of it would be located in the channel. Also, bollards would be placed on the vehicle bridge only allowing access for City of Kent maintenance crews and emergency vehicles.*

**Comment:** Toe rock should be minimized and replaced with wood as much as possible to create a more natural channel and to allow some bank scour to provide lower velocity habitats necessary for juvenile rearing. The toe rock will limit this function severely.

**Response:** *It is vital to maintain the integrity of the toe with rock to avoid slope failure above. We do have six log clusters and 4 log jams of various size and configuration along*



*the toe. In addition, both sides of the remaining channel are lined with single pieces of wood. We anticipate that the local scour patterns that will evolve around these log clusters that will provide a diversity of habitat.*

**Comment:** Please clarify how the remaining 200 feet of the 750 foot side channel will be constructed (see page 14 for a description of construction sequencing).

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**Response:** *Additional information was added to the EA describing the sequencing of events to make the connection of the inlet and outlet of the channel. Events will be as follows:*

- 1. Isolate the area around the outlet and the inlet where the Cofferdam, or equivalent, would be installed using a blocknet in an arced configuration.*
- 2. Drag beach seine through the area to remove any fish from the area.*
- 3. Remove all collected fish from the area by seining, dip nets, or electrofishing only when all other methods have been exhausted. Immediately transfer the collected fish to free flowing water downstream of the project area, or upstream of project reach if directed by the biologist. Any transfer of ESA (Endangered Species Act) listed fish would be conducted using a sanctuary net that holds water during the transfer. All fish rescue would be performed by a qualified biologist with experience sampling and handling fish. All staff working with rescue must have necessary skills in knowledge, skills, and abilities to ensure safe handling of fish. If electroshocking, protocols shall adhere to National Marine Fisheries Service electroshocking guidelines (NMFS, 2008).*
- 4. Install stream flow diversion (Cofferdam or equivalent). If a bypass pipe would be installed, leave an opening to continue to allow flow through the cofferdam until the pipe is installed. Pipes would be secured with pipe anchors if necessary. Close off openings through cofferdam and seal cofferdams with plastic sheeting.*
- 5. Dewater project area using pump system with appropriate screening on the intake. Water pumped from the project area shall be pumped to well vegetated upland location or location that would not incur damage due to stream diversion discharge.*
- 6. As the project area is dewatered, monitor project reach and rescue any fish from remaining pools. Transfer the collected fish to free flowing water downstream of the project reach or upstream of project reach.*
- 7. Perform remaining excavation to targeted elevations to make connection with the river.*
- 8. Install remaining bioengineered bank stabilization and in-stream habitat features.*

**Comment:** Since the 10,000 cubic yards of fill will be located on site and the entire park site is within 100 year flood plain of Green River, please describe what mitigation measures

will be implemented to offset this fill. As part of this discussion, please explain why the fill is needed to berm the side channel from SR 167, particularly if the side channel will result in only a very small (0.14 foot) localized increase in water elevation. In other words, more information is needed to assess the extent to which the extent and volume of floodplain fill is being avoided, minimized, and mitigated. An explanation is also needed to describe the purpose of the temporary sediment ponds if the side channel is being constructed in the dry.

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**Response:** *The project provides its own mitigation. It increases the total volume available for flood waters by excavating soil from below the 100-year floodplain elevation and placing it above the 100-year floodplain elevation. Our hydraulic analysis indicates little to no change in calculated floodplain elevations. Fill is placed on site to reduce the negative environmental effects of disposing excavation materials off-site. This approach reduces emissions, cost, and construction time significantly.*

*Temporary sediment ponds are standard temporary erosion and sediment control (TESC) practice that remove sediment from surface runoff. During construction and before establishment of vegetative controls, one should expect that there will be increased sediment generation from the site that will need management, especially on the large graded area on the east side of the site. The TESC recommends the ponds to provide effective temporary stormwater control at this location. These ponds have been sized such that they meet TESC requirements of the Ecology Stormwater Management Manual for Western Washington. In addition, the temporary sediment ponds might be used to safely remove sediment from dewatering discharge during excavation of the channel, which will be below the water table, without causing surface erosion.*

#### Section 4.0 Existing Environment

**Comment:** It should be noted that the majority of the available spawning habitat is above River Mile (RM) 25 in the mainstem Green River, as well as, the tributaries above this point. The EA states that "some spawning habitat exists in the upper portions of the mainstem above RM 25" when in reality most spawning habitat is upstream of RM 25.

**Response:** *Noted, change made to the EA.*

#### Section 4.2 Hydrology

**Comment:** Stormwater runoff has affected the lower Green River in addition to the Middle Green.

**Response:** *Noted, change made to the EA.*

#### Sections 4.3.2 and 4.3.3, Temperature and Dissolved Oxygen

**Comment:** The section of the Green River above and below the project site is listed on the State's 303(d) for temperature and dissolved oxygen based on Ecology's 2008 Clean Water

Act 303(d) list and map. The EA uses the 2004 data, which has been replaced with the 2008 data. The most recent available 303(d) information should be used.

**Response:** *Noted, updated information in the EA to reflect Ecology's 2008 303d list.*

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## Section 5.0 Environmental Effects of the Proposed Action

### Section 5.4.2

**Comment:** Any tree that is 4 inches in diameter or greater should be placed back into the constructed side channel as partial mitigation for the temporal loss of future wood recruitment due to the removal of these trees. Planting trees is not sufficient mitigation to address this impact.

**Response:** *Much more wood will be added to the channel than trees will be removed to construct the channel. If trees meet the specs of >12 inches they will be used as key pieces, if they are smaller they will be placed as brush.*

### Sections Fish Use and Endangered Species 5.5 and 5.7

**Comment:** The project should include monitoring of use by juvenile coho, steelhead, and Chinook salmon to determine if the channel is successful in providing juvenile high flow refuge and rearing habitat, the principal objective of the side channel project.

**Response:** *See attached Draft, Maintenance, and Monitoring Plan (Appendix G of the EA)*

### Section 5.11.2

**Comment:** We would like to know the exact construction schedule proposed for the project and work with the Corps in order to resolve any treaty fishing access concerns that the Tribe may have prior to the initiation of construction.

**Response:** *All in-water work will be done during the fish window (August 1-31). The Corps will coordinate with the Muckleshoot Tribe as in-water work approaches to ensure that construction work is managed to avoid and minimize impacts to tribal fishing in 2011.*

### Section 5.13

**Comment:** Increased recreation at the site may increase the incidence of illegal fishing, too. Increased recreation on the island and in or near the side channel, including access by dogs, will increase the potential disturbance and harm adult and juvenile salmon.

**Response:** *Added these concerns to the section.*

## Section 8.0 Cumulative Impacts

**Comment:** Please clarify the local sponsor's proposal for the Riverview Park site. The project plan sheets C-01, L6, and L5 show both access roads and a trail to be constructed throughout the island created by the side channel and in the mainland portions. A discussion about the trail is needed in the project description along with an analysis about the permanent lost restoration opportunity for proposed developed or constructed areas. These project elements represent a lost opportunity to restore a larger, more functional and ~~continuous natural riparian habitat for the side channel and the Green River floodplain.~~ In addition, these constructed features enhance the ability of users to disturb, harass, and/or poach salmon. These features should not be constructed as they will limit the restoration objectives of the project.

The EA should discuss the adjacent Mill Creek confluence restoration project and the potential to affect mainstem Green River flow and/or modify surface water elevations in the side channel.

***Response:** Kent's potential future plans for the site are included in this section. There are no formal plans to date. The access road and trails are for maintenance of the plantings. The trails are not paved or gravel, but planted with native shrubby vegetation, just not trees, again for maintenance reasons (see plan sheets L5 and L6). Once the plant maintenance period is over (about five years), trails should be unrecognizable due to native plant growth*

*The contractor's professional judgment, along with the City of Kent, is that the Mill Creek restoration project will not impact the Riverview Park Site. The Mill Creek project should cause water to back water and then flow into the Green River*

#### Section 9.0

**Comment:** The coordination section should note that the coordination has been with the Muckleshoot Indian Tribe Fisheries Division and Preservation/Cultural Resources Division staff where it is appropriate to indicate so.

***Response:** Noted, distinction noted in the EA where appropriate.*

#### Project Plans Comments

These comments are organized by specific project pages where we have comments.

**Comment:** Sheet CO 1 does not show the proposed 4 sediment ponds shown on Sheet C-15. Sheet CO 1 also does not show the trails shown on Sheets L3-L6.

***Response:** Sheet CO1 is what the project will look like post construction, the sediment pond are temporary. Trails are shown on sheet C01.*

**Comment:** Sheet C05 and C06 show 17 log clusters and 5 single logs; an improvement over the February 2010 plan sheet. There is a discrepancy in the EA because it states that

there will be 12 log clusters and does not mention the single logs shown on these plan sheets (see page 13). The plan sheets should be implemented using logs with rootwads in the channel on all of the individual pieces in the log clusters. Logs with rootwads should be used on the single pieces, too. Finally, as we have commented previously, the log cluster at the inlet should be moved to the west bank. There is no issue for removing trees if the cluster is moved to this side based on the location of trees shown on Sheet C05. The log cluster on this side of the inlet is needed to function properly and divert flows into the channel. As WDFW staff have suggested, pilings can be used to stabilize the jam.

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**Response:** *EA updated to reflect the correct amount of log clusters. Rootwads added on all the logs in the plans. The log cluster has been moved to the west bank and will be stabilized with pilings to avoid impacts to the trees.*

**Comment:** Sheet C07 should show the proposed berms.

**Response:** *Noted, berm added to the plans.*

**Comment:** Sheet C09, the proposed I-and 2-man single boulders should be removed from the design. If these features are needed to stabilize the streambed, wood should be used instead.

**Response:** *Boulders eliminated from the plans.*

**Comment:** Sheets C-13 and C-14, please explain the purpose and need for the grass swale dikes that will remain after construction and how much water is anticipated to be intercepted by these swales instead of going to the side channel.

**Response:** *Geotechnical reports from the Corps recommended that surface runoff not be allowed to run down the side slopes of the channel. Approximately 2 cfs (relative to approximately 3020cfs total in side channel) of surface runoff might be intercepted from entering the side channel during a 10-year event from the east side.*

**Comment:** Sheet C-15 as noted previously, an explanation is needed to demonstrate why the project needs four temporary sediment ponds that will outlet into the Green River upslope from the side channel site. There is nothing on Sheet C-17 to indicate that the temporary ponds will be used when dewatering the constructed side channel.

**Response:** *Temporary sediment ponds are standard temporary erosion and sediment control (TESC) practice that remove sediment from surface runoff. During construction and before establishment of vegetative controls, one should expect that there will be increased sediment generation from the site that will need management, especially on the large graded area on*

*the east side of the site. The TESC recommends the ponds to provide effective temporary stormwater control at this location. These ponds have been sized such that they meet TESC requirements of the Ecology Stormwater Management Manual for Western Washington. In addition, the temporary sediment ponds might be used to safely remove sediment from dewatering discharge during excavation of the channel, which will be below the water table, without causing surface erosion.*

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**Comment:** Sheet C-22, all of the wood shown on this sheet should have rootwads.

**Response:** *Rootwads added on all logs in the plans.*

**Comment:** Sheet C-23, the rootwad ends of the logs with rootwads should not be buried 1/3 below the streambed grade as shown on this sheet. They should be exposed to flows to provide cover and low velocity habitat for juvenile salmon.

**Response:** *We prefer to allow scour to develop naturally around the rootwads. Please recognize that the suggested embedment of the rootwad is an initial condition; we anticipate that natural local scour patterns will evolve around these log clusters and will provide the diversity of habitat that is desired. Other logs in clusters will have varying elevations that will provide cover and low-velocity habitat for juveniles as well.*

#### Appendix B Clean Water Act Section 404 Analysis

**Comment:** See our previous comments regarding the full consideration and evaluation of a "no bridge" and "pedestrian bridge" options.

**Response:** *The main purpose of the vehicle bridge is to allow a water truck to fill the cisterns on the island used for the drip irrigation system, and well as bring in equipment to maintain the plantings and control invasive species. Installing a waterline is far too expensive, and therefore not feasible. The City of Kent also needs a vehicle bridge for emergency access if someone got hurt on the island. There are currently homeless encampments on the site, which poses the risk of violence. This is City of Kent Parks Department land and the Corps has to meet their needs, regardless of how King County manages their parks.*

*Please note that impacts to habitat benefits from a pedestrian bridge versus a vehicle bridge are minimal. The vehicle bridge is wide span; therefore no portion of it would be located in the channel. Also, bollards would be place on the vehicle bridge only allowing access for City of Kent maintenance crews and emergency vehicles.*

**Comment:** The 404 analysis should discuss the potential impacts of the bridge (and trails shown in the plan sheet) to create illegal fishing opportunities and recreation uses that disturb adult and juvenile salmon using the project area. Ways to avoid these impacts is

eliminate these features or to have seasonal closures on the bridge that would allow adult and juvenile salmon use (the primary purpose of the project) to occur unhindered.

***Response:*** *Added these concerns to the recreation section, but signage will be placed to encourage conservation. Trails are actually heavily planted with shrubs and will likely inhibit access to the channel.*

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