

Appendix B

Drawings

PRELIMINARY
NOT FOR
CONSTRUCTION

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U.S. DEPARTMENT OF THE INTERIOR
BUREAU OF RECLAMATION
YAKIMA RIVER BASIN WATER ENHANCEMENT PROJECT - WASHINGTON

SCHAAKE PROPERTY
HABITAT IMPROVEMENT PROJECT

PRELIMINARY DESIGN DRAWINGS

CONTRACTOR
DRAWN
ACCEPTED
YAKIMA, WA 2015-10-02

COVER SHEET

SHEET G-001

SHEET 01 OF 54
457818

YAKIMA RIVER BASIN WATER ENHANCEMENT PROJECT
SCHAAKE PROPERTY HABITAT IMPROVEMENT PROJECT
KITITIAS COUNTY, WASHINGTON

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SITE SUMMARY

KITITIAS COUNTY, WASHINGTON

SEC 11, T17N, R18E
SEC 13, T17N, R18E
SEC 14, T17N, R18E
WILLAMETTE MERIDIAN

46°58'50"N, 120°33'39"W

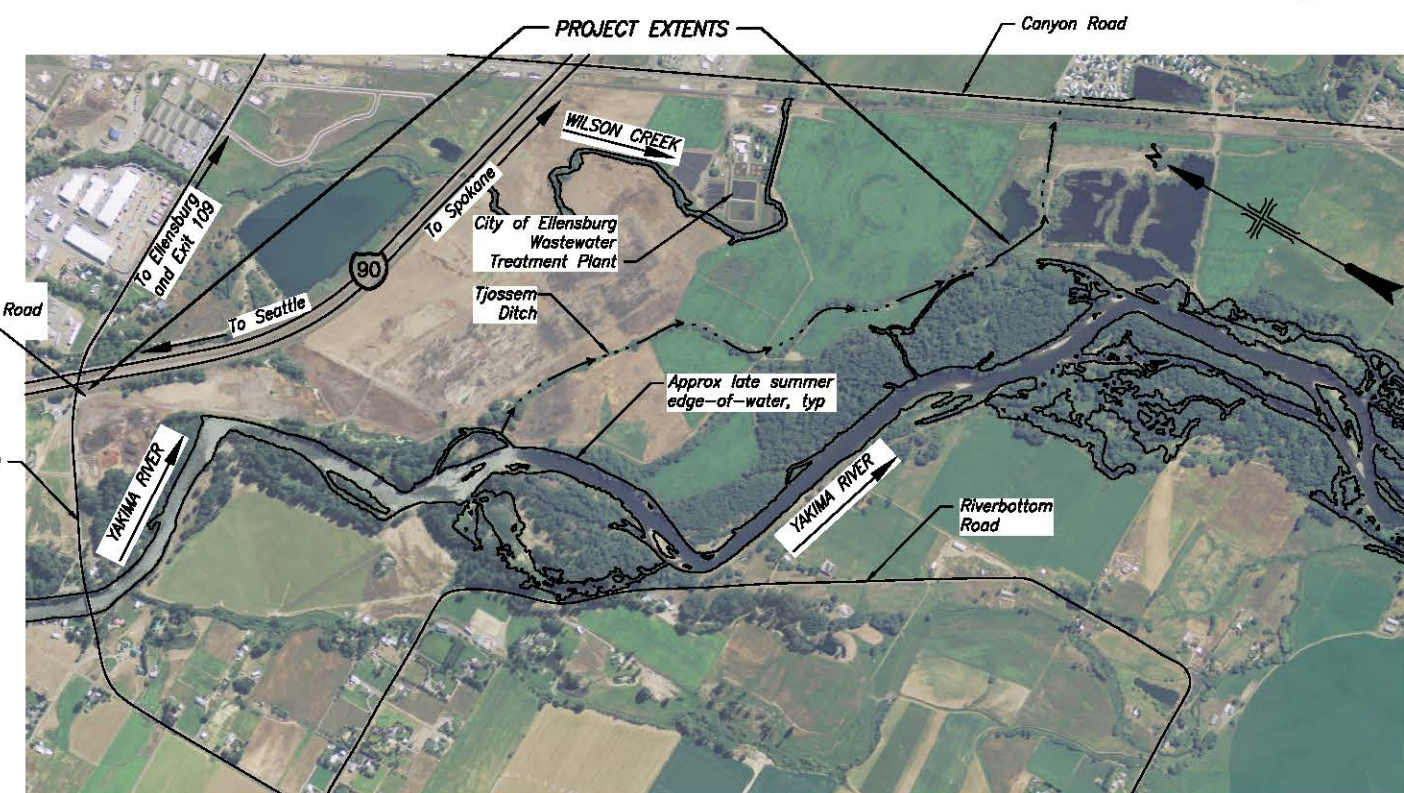
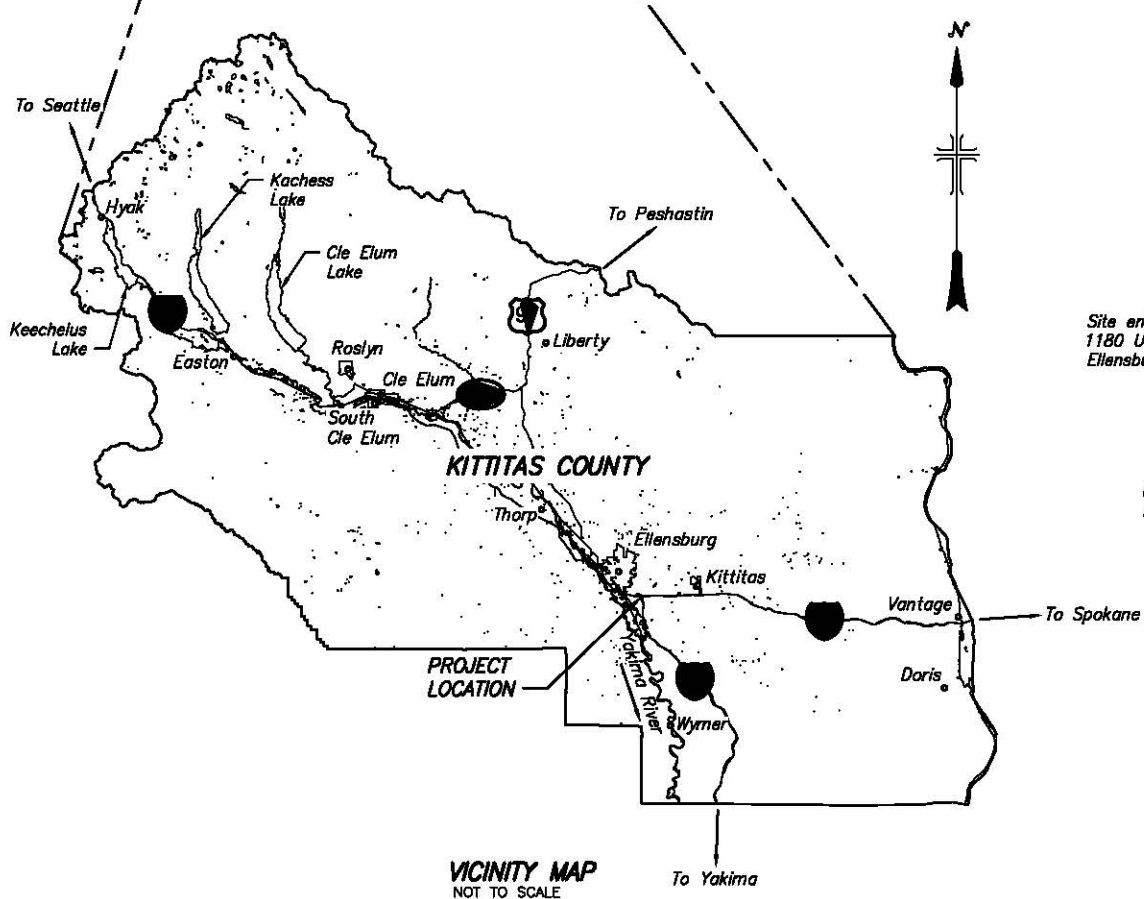
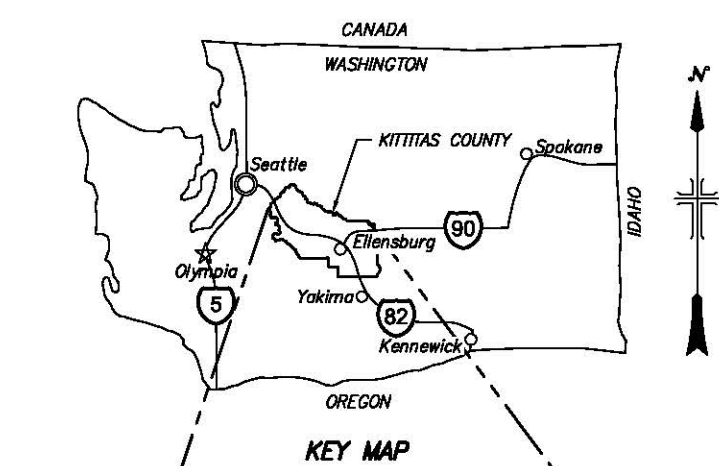
Contracting Agency:

U.S. Department of the Interior
Bureau of Reclamation
Yakima River Basin Water
Enhancement Project
Joseph Pratt
1150 North Curtis Road, Suite 100
Boise, ID 83706-1234
Phone: (208) 378-5139
Email: jpratt@usbr.com

Property Owners:

U.S. Department of the Interior
Bureau of Reclamation
Columbia-Cascades Area Office
Jeff Graham
1917 Marsh Road
Yakima, WA 98901-2058
Phone: (509) 575-2848 x287
Email: jgraham@usbr.com

City of Ellensburg
Ryan Lyyski
501 North Anderson Street
Ellensburg, WA 98926
Phone: (509) 962-7230
Email: lyyskir@ci.ellensburg.wa.us



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SECTION / DETAIL DESIGNATIONS

ABBREVIATIONS

Section (letter) or detail (numeral) designation

Drawing number (replaced with a line if taken and shown on same sheet)

On drawing where section or detail is taken:
Drawing number where shown

100-A-10010A1

SECTION
SCALE:

On drawing where section is shown:
Drawing number(s) where taken

DETAIL
SCALE:

On drawing where detail is shown:
Drawing number(s) where taken

DRAWING TITLE

On drawing where only a title is required with no reference (eg: ELEVATIONS)

Section callout where section is on the same sheet and cut extends to a fixed limit

Section callout where section is on another sheet and cut extends throughout entire sheet

Sheet note callout

AC	acre	OPUS	Online Positioning User Service
approx	approximate	OSHA	Occupational Safety and Health Administration
BMP	Best Management Practice		
BPA	Bonneville Power Administration	PLSS	Public Land Survey System
		prop	proposed
CF	cubic foot or feet	PUD	Public Utility District
cfs	cubic feet per second		
¢	centerline	R	Range or Right
conc	concrete	RM	River Mile
CP	control point		
CY	cubic yard	SEC	Section
		SF	square foot or feet
diam	diameter	SHPO	State Historic Preservation Office
		STA	station
ea	each	SWPPP	Storm Water Pollution
EL, El	elevation		Prevention Plan
exst	existing	SY	square yard or yards
ft	foot or feet	T	Township
		typ	typical
GIS	geographic information system		
		US	United States
H	Horizontal	USACE	US Army Corps of Engineers
		USEPA	US Environmental Protection Agency
IE	invert elevation	USFWS	US Fish and Wildlife Service
kV	kilovolt	V	vertical
L	left	W	west
LF	lineal foot or feet	WDOE	Washington Department of Ecology
LBS	pounds	WDFW	Washington Department of Fish and Wildlife
LIDAR	Light Detection and Ranging		
LS	lump sum	WL	wetland
		WSE	water surface elevation
min	minimum		
max	maximum	YRBWEP	Yakima River Basin Water Enhancement Project
N	north	"	inch, inches or second
N.A.	not applicable	'	foot, feet or minute
NAD	North American Datum	°	degree
NAVD	North American Vertical Datum		
NEPA	National Environmental Policy Act		
NMFS	National Marine Fisheries Service		
NO	number		
NTS	not to scale		

DESIGN DETAIL DESIGNATION

Design detail —
designation (numeral)
Shown on design
detail drawing(s)

NOTES:

1. All design details are typical and must be used if design detail designation is not shown
2. The term standard detail, or a form of it, is synonymous with design detail. The design details represent the character and nature of the work required throughout the project. All associated work shall be in accordance with the design details shown whether the details are specifically referenced or not.

CONTRACTOR
/101111/

APPENDIX

YAKIMA, WA 2015-10-0

LEGEND AND ABBREVIATIONS

SHEET G-002

SHEET 02 OF 54

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GENERAL NOTES

1. WORK shown on these drawings shall be performed by CONTRACTOR in accordance with the terms and conditions set forth in CONTRACTING DOCUMENTS. WORK shall be for for the US Bureau of Reclamation, herein referred to as "CONTRACTING AGENCY." CONTRACTING AGENCY'S representative (or other persons assigned by CONTRACTING AGENCY to act as CONTRACTING AGENCY'S representative) are herein referred to as the "CONTRACTING OFFICER." Contact information for CONTRACTING AGENCY'S representative is included on Sheet G-001. The Construction manager, engineer, and project inspector shall be _____, herein referred to as "ENGINEER".
2. CONTRACTOR shall pursue WORK in a diligent manner and provide all material, labor, and equipment required to ensure timely completion of WORK.
3. ENGINEER shall not be responsible for, or liable for, unauthorized changes to, or use of, the DRAWINGS. All changes to DRAWINGS and SPECIFICATIONS must be in writing and approved by ENGINEER responsible for the preparation of the DRAWINGS and SPECIFICATIONS.
4. CONTRACTING AGENCY shall coordinate the receipt, and provides copies to CONTRACTOR, of the Washington Department of Ecology Section 401 Water Quality Certification, Washington Department of Fish and Wildlife Hydraulic Project Approval, National Environmental Policy Act Finding of No Significant Impact Documents, National Marine Fisheries Service and US Fish and Wildlife Service Biological Opinions, Washington State Historic Preservation Office Section 106 Memorandum of Agreement, US Army Corps of Engineers Section 404 Permit, and US Environmental Protection Agency Stormwater Pollution Prevention Plan. CONTRACTOR shall be responsible for obtaining, at the CONTRACTOR's expense, all other construction permits as required by the local agencies. The CONTRACTOR shall provide all materials, labor and equipment required to comply with all applicable permit conditions and requirements.
5. For those portions of full-size drawings (22x34 inches) showing scale bars, the major scale unit equals 1 inch. On comparable portions of half-size drawings (11x17 inches), the major scale unit equals ½ inch.
6. Existing topography, structures, and site features are screened and/or light-lines with leader text provided in sentence case. New finished grade, structures, and site features are shown heavy-lined.
7. Elevations and distances shown are in feet and decimals with contour intervals at 1-foot and 5-foot increments.
8. Horizontal Datum: Washington State Plane Coordinate System, Washington South Zone, NAD83, US Survey Feet. Vertical Datum: NAVD88, US Survey Feet.
9. Topographic mapping within stream banks of Yakima River was performed by CONTRACTING AGENCY in 2012 (Contact: Rob Hildale, US Bureau of Reclamation, 303-445-3135). Topographic mapping within stream banks of Wilson Creek was performed by CH2M HILL, INC. In 2010 (Contact: James Wordt, CH2M HILL, Inc., 208-383-6154). Topographic mapping of Riverbottom Road was performed by Kittitas County in 2011 (Contact: Jeff Thorpe, Kittitas County Department of Public Works, 509-962-7523). Topographic mapping of Tjossem Ditch was performed by CONTRACTING AGENCY in 2004 and 2006 (Contact: Cory Stolsig, US Bureau of Reclamation, 509-754-0252). Topographic mapping of all other areas is based on 2008 LiDAR imaging performed by the Optimal Geomatics (Contact: Optimal Geomatics, 256-882-7788).
10. Existing conditions may vary from those shown on DRAWINGS. CONTRACTOR shall verify existing conditions and adjust work plan accordingly with approval of ENGINEER prior to construction.
11. Existing utility locations have not been identified and are not shown on drawings. The CONTRACTOR is responsible to locate utilities prior to construction and protect utilities during construction as described in section _____ of specifications. The telephone number for the northwest utility notification center for utility locates is 1-800-424-5555.
12. All equipment shall maintain a minimum of 10 feet of clearance horizontally and vertically from overhead power lines, or more as may be required by OSHA or state standards for safety.
13. CONTRACTOR shall avoid, preserve, and protect existing sensitive areas, including wetlands and Waters of the US (within the ordinary high water), and other locations shown on the DRAWINGS as "Not To Be Disturbed," or as subsequently marked in the field by CONTRACTING OFFICER, except where such conservation conflicts with WORK.
14. Unless otherwise noted, CONTRACTOR to retain and protect all existing features.
15. DRAWINGS do not show all existing vegetation or beaver dams. CONTRACTOR shall remove all beaver dams identified by CONTRACTING OFFICER.
16. CONTRACTOR shall be solely and completely responsible for the conditions of the project site, including safety of all persons and property during performance of the work (see contract documents). CONTRACTOR shall maintain PROJECT SITE in orderly manner. All materials shall be staged or stored within approved staging areas.
17. Required construction materials are shown on the DRAWINGS and described in the CONTRACT DOCUMENTS.
18. Prior to commencement of WORK, CONTRACTOR shall provide the CONTRACTING AGENCY with a detailed construction schedule and work plan for approval. The CONTRACTOR shall not begin any construction work until the project schedule and work plan is approved by the CONTRACTING OFFICER. CONTRACTOR shall provide notice to CONTRACTING OFFICER of any changes to the work plan or schedule.
19. Except for imported material and off-site disposal of spoils, CONTRACTOR shall maintain all construction activities within the PROJECT SITE. This includes, but is not limited to, vehicles and equipment, limits of excavation, and stockpiled materials.
20. CONTRACTOR shall be responsible for all construction staking and layout. CONTRACTOR shall retain a licensed Professional Land Surveyor licensed in the state of Washington to perform construction surveying and staking. Horizontal and vertical alignment data shall be available upon request.

GENERAL NOTES (CONTINUED)

21. The CONTRACTOR shall be responsible for design, permitting, and execution of any and all traffic control measures deemed necessary.
22. All work within the actively flowing Yakima River shall occur within the allowable in-water work window of July 1 through August 31.
23. CONTRACTOR shall coordinate with CONTRACTING OFFICER to ensure beaver relocation and fish salvage within the PROJECT SITE has been accomplished prior to construction activities. Beaver relocation and fish salvage will be the responsibility of the CONTRACTING AGENCY.
24. Elevations given are to finished grade unless otherwise noted. Slope uniformly between contours and spot elevations provided. Proposed contours are graphical only. Actual excavation and final grading surfaces may vary from those shown on DRAWINGS, dependent on, but not limited to, field conditions, subsurface conditions, and conformance with OSHA requirements.
25. All salvaged materials are the property of CONTRACTING AGENCY. All debris and spent construction materials shall be disposed of in accordance with applicable Federal, State, and local laws.
26. Visits to the PROJECT SITE by the ENGINEER or CONTRACTING AGENCY do not make ENGINEER nor CONTRACTING AGENCY guarantor of CONTRACTOR's work.

SUMMARY OF QUANTITIES

ITEM NUMBER	ITEM DESCRIPTION	ESTIMATED QUANTITY	UNIT
1	Site Preparation	1	LS
2	Structure Removal and Well Decommissioning	1	LS
3	Existing Culvert Removal	1	LS
4	Utility Relocation	1	LS
5	Wetland E Culvert	1	LS
6	Tjossem Ditch Culvert	1	LS
7	Site Isolation and Dewatering	1	LS
8	Side Channel 2 Crossing	1	LS
9	Site Closure	1	LS
10	Clearing and Grubbing	15	AC
11	General Excavation	46,500	CY
12	Off-site Haul	22,500	CY
13	Embankment Material – Salvaged	16,400	CY
14	Embankment Material – Borrowed	4,600	CY
15	Embankment Material – Imported	3,000	CY
16	Topsoil	3,200	CY
17	Levee Armoring – Mixed Coarse Aggregate	4,500	CY
18	Levee Armoring – Salvaged Riprap	300	CY
19	Levee Armoring – Imported Riprap	17,000	CY
20	Levee Armoring – ACB	2,550	SY
21	Constructed Riffle	3	EA
22	Tree Salvage	75	EA
23	FESL	380	LF
24	FESL Toe Rock	490	CY
25	Permanent Access Road	8,900	LF
26	Floodplain Seed Mix	24.6	AC
27	Levee Seed Mix	2.2	AC
28	Willow Live Stake	4,250	EA
29	Tree/Shrub, 1-gal	2,000	EA

PRELIMINARY
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U.S. DEPARTMENT OF THE INTERIOR
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YAKIMA RIVER BASIN WATER ENHANCEMENT PROJECT – WASHINGTON

SCHAAKE PROPERTY
HABITAT IMPROVEMENT PROJECT

PRELIMINARY DESIGN DRAWINGS

CONTRACTOR
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YAKIMA, WA

2015-10-02

GENERAL NOTES AND
SUMMARY OF QUANTITIES

SHEET G-003

SHEET 03 OF 54

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SCHAAKE PROPERTY
HABITAT IMPROVEMENT PROJECT

PRELIMINARY DESIGN DRAWINGS

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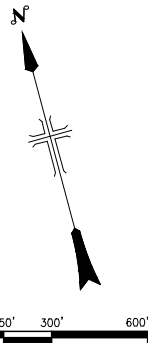
YAKIMA, WA 2015-10-02

EXISTING SITE
CONDITIONS AND SURVEY
CONTROL

SHEET G-004

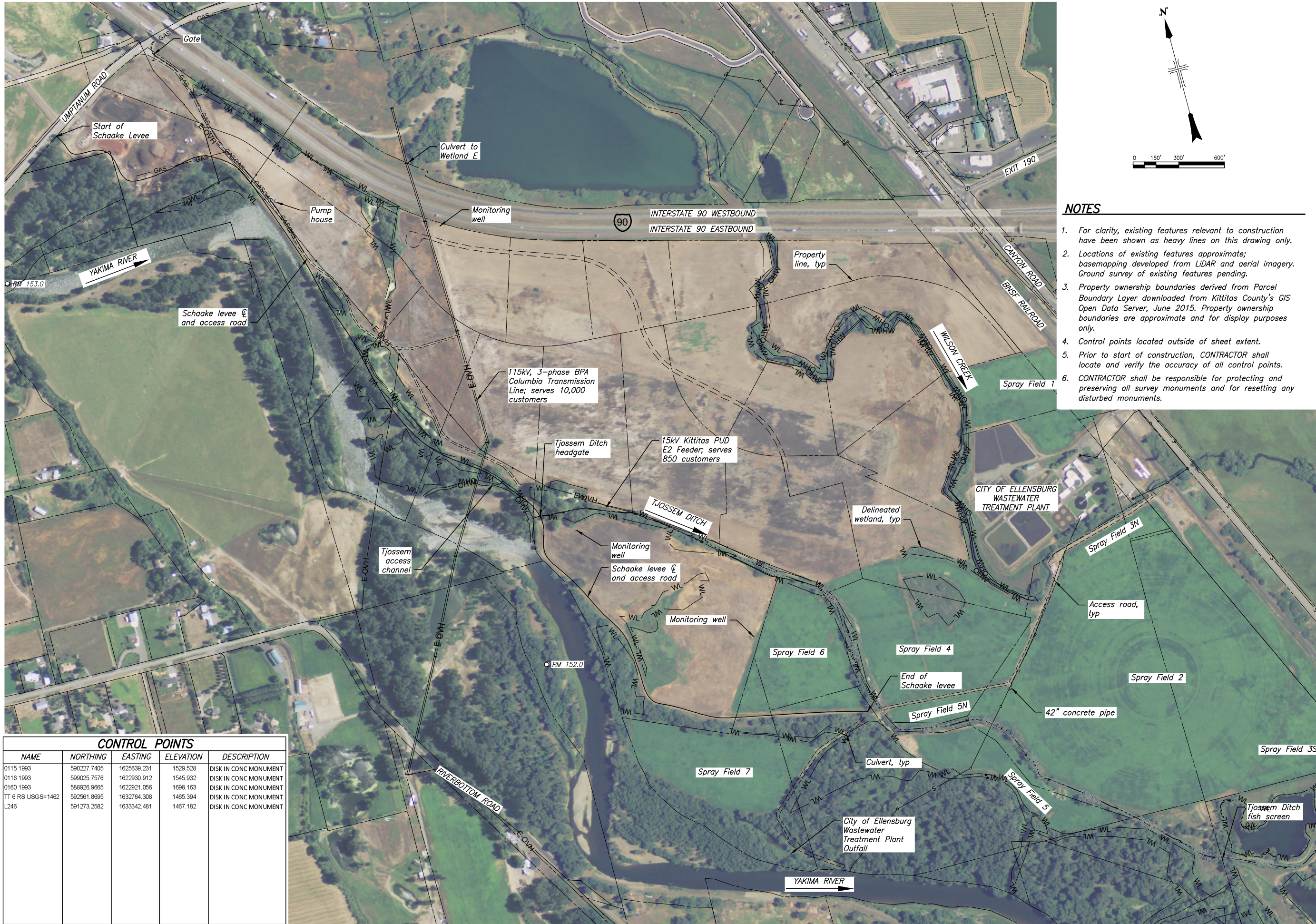
SHEET 04 OF 54

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NOTES

- For clarity, existing features relevant to construction have been shown as heavy lines on this drawing only.
- Locations of existing features approximate; basemapping developed from LIDAR and aerial imagery. Ground survey of existing features pending.
- Property ownership boundaries derived from Parcel Boundary Layer downloaded from Kittitas County's GIS Open Data Server, June 2015. Property ownership boundaries are approximate and for display purposes only.
- Control points located outside of sheet extent.
- Prior to start of construction, CONTRACTOR shall locate and verify the accuracy of all control points.
- CONTRACTOR shall be responsible for protecting and preserving all survey monuments and for resetting any disturbed monuments.



CONTROL POINTS

NAME	NORTHING	EASTING	ELEVATION	DESCRIPTION
0115 1993	590227.7405	1625639.231	1529.528	DISK IN CONC MONUMENT
0116 1993	599025.7576	1622930.912	1545.932	DISK IN CONC MONUMENT
0160 1993	588926.9665	1622921.056	1698.163	DISK IN CONC MONUMENT
TT 6 RS USGS=1462	592561.8695	1632764.308	1465.394	DISK IN CONC MONUMENT
L246	591273.2582	1633342.481	1467.182	DISK IN CONC MONUMENT

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BUREAU OF RECLAMATION
YAKIMA RIVER BASIN WATER ENHANCEMENT PROJECT - WASHINGTON

SCHAAKE PROPERTY
HABITAT IMPROVEMENT PROJECT

PRELIMINARY DESIGN DRAWINGS

REV NO

CONTRACTOR
DRAWN

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YAKIMA, WA 2015-10-02

PROJECT OVERVIEW AND
SEQUENCING

SHEET G-005

SHEET 05 OF 54

457818

NOTES

1. Remove existing Schaaque Levee and regrade floodplain, see C-131.
2. Construct Setback Levee, see C-101 for key map.
3. Excavate Side Channel 1, see C-201 for key map and site isolation plan.
4. Excavate Side Channel 2, see C-211 for key map and site isolation plan.
5. Excavate alcoves, see C-221 through C-225 for grading plan and profiles.
6. Construct riffle, see C-242 for detail.
7. Construct permanent access road, see C-001 for plan.
8. Potential borrow source, see C-107 for details.

CONSTRUCTION SEQUENCING NOTES

1. Retain and protect existing Schaaque Levee, including existing riprap, until both of the following conditions have been met:
 - a. A minimum of two-feet of compacted embankment fill has been placed from STA 157+50 to the downstream tie-in of the proposed Setback Levee, and
 - b. Spring runoff has receded to acceptable levels and written notification is provided by the ENGINEER that levee removal can begin. In most years, spring runoff has decreased to acceptable levels by July 15.
2. Construct Setback Levee, including placement of all side slope protection and erosion control measures, to finished grade prior to November 1.
3. All work within the actively flowing Yakima River shall occur within the allowable in-water work window of July 1 through August 31.
4. Excavate side channels and alcoves following "flip-flop", which historically occurs in late August, to minimize the potential for groundwater interference and sloughing of excavations.
5. Seed and plant in accordance with dates provided on Sheet L-302.

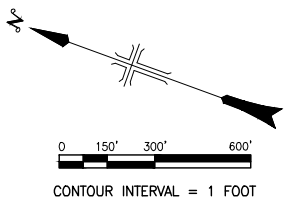


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NOTES

1. CONTRACTOR shall confirm access points, route(s), and location of staging and storage areas with ENGINEER prior to transporting materials and equipment to the project site. Locate staging and storage areas 150 feet minimum from delineated wetlands, Yakima River, and Wilson Creek.
2. CONTRACTOR to utilize existing access roads to the extent possible. Avoid, preserve and protect existing vegetation along access roads. Where impacts to existing vegetation are unavoidable, coordinate with ENGINEER prior to salvaging, disturbing, or removing vegetation.
3. Construct temporary construction access road and/or improve existing access roads as necessary to complete work.
4. Potential borrow source area may be utilized as temporary material staging area.
5. Permanent access to and along Setback Levee provided on C-102 to C-108.
6. Construct permanent access road to Tjossem Ditch headgate to remain after construction, see C-132.
7. After construction, remove imported fill material, scarify, and restore existing and temporary access roads, staging areas, and storage areas, on river side of Setback Levee to natural condition, except as noted on this sheet and C-132. Seed, see L-301.
8. Avoid impacts outside of work limits, defined by 3' buffer from existing, temporary, and permanent access roads; staging and storage areas; and earthwork limits.

RECLAMATION
Managing Water in the West

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YAKIMA, WA 2015-10-02

ACCESS AND STAGING
PLAN

SHEET C-001
SHEET 06 OF 54
457818

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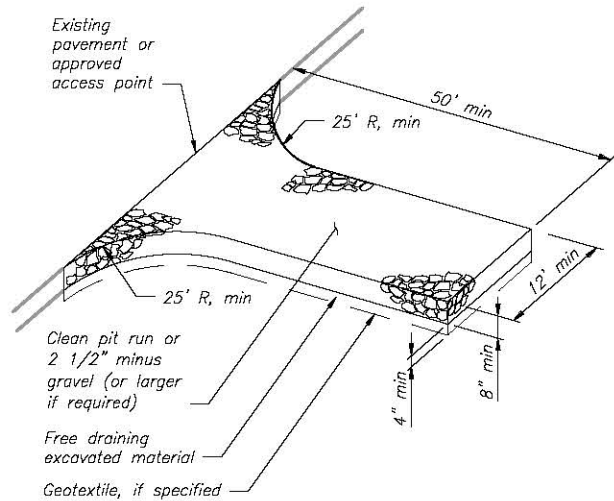
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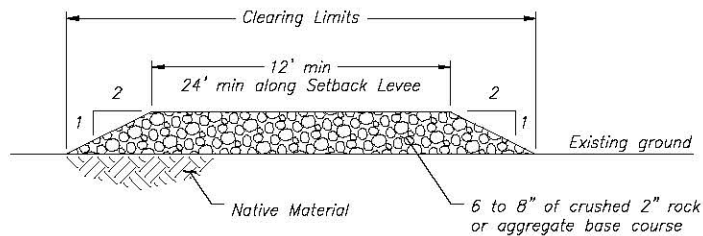
NOTES

1. Additional gravel may have to be added periodically to maintain proper function of the pad.
2. Remove gravel entrance and replace with new base course prior to completion of access road.



CONSTRUCTION ENTRANCE DETAIL

NTS



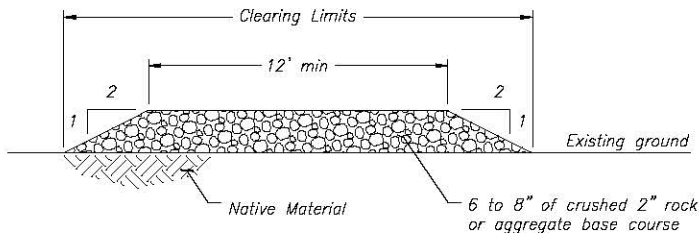
NOTES

1. Improve existing access roads and temporary access roads where necessary to convey construction traffic through duration of project.
2. Where necessary, clear vegetation by cutting to ground.



IMPROVED ACCESS ROAD CROSS SECTION

NTS



NOTES

1. Where necessary, clear vegetation by cutting to ground.
2. Compact crushed rock to provide firm driving surface.



PERMANENT ACCESS ROAD CROSS SECTION

NTS

RECLAMATION
Managing Water in the West

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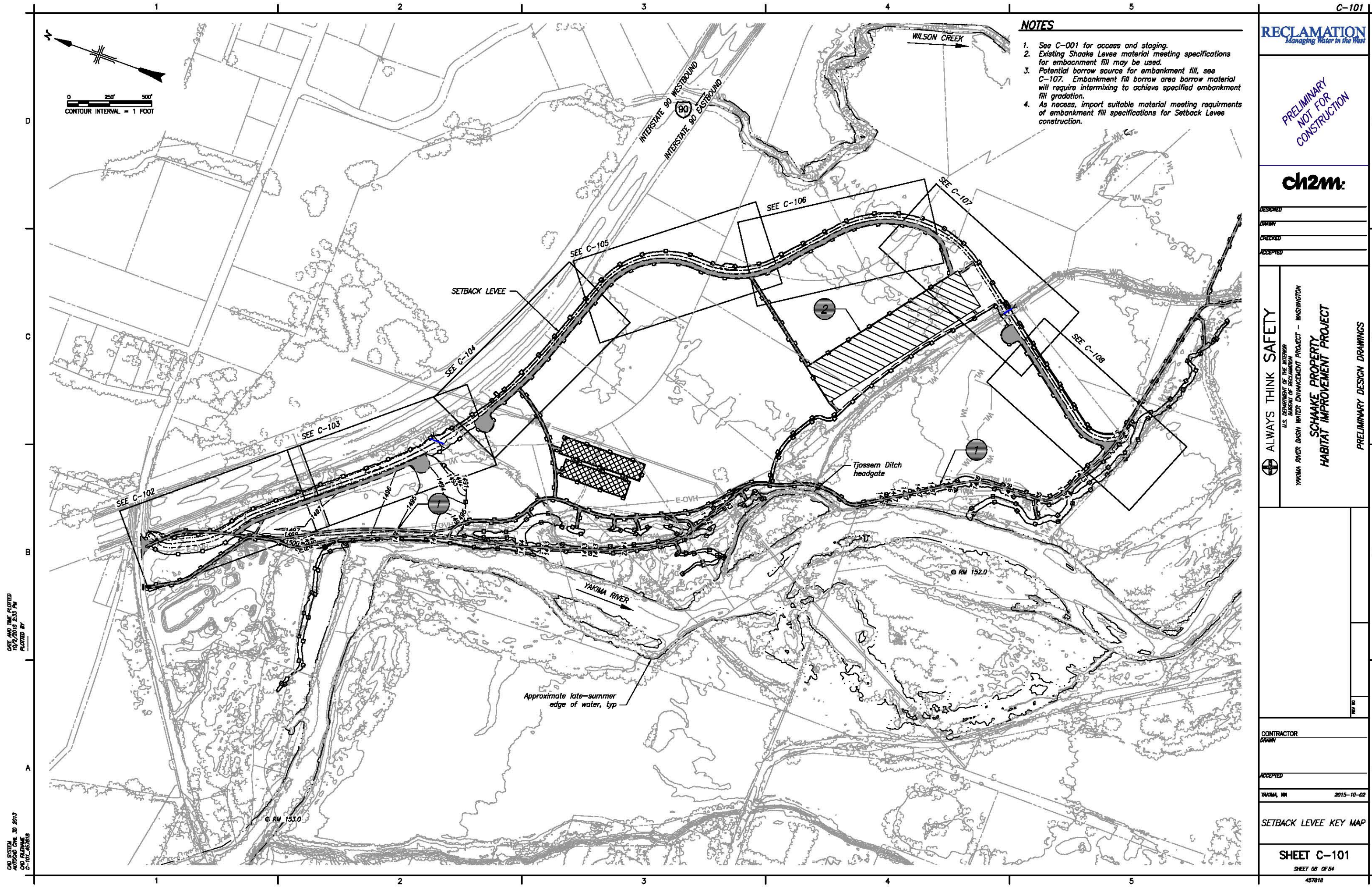
2015-10-01

ACCESS AND STAGING
DETAILS

SHEET C-002

SHEET 07 OF 54

457818



- NOTES**
1. See C-001 for access and staging.
 2. Existing Shaake Levee material meeting specifications for embankment fill may be used.
 3. Potential borrow source for embankment fill, see C-107. Embankment fill borrow area borrow material will require intermixing to achieve specified embankment fill gradation.
 4. As needed, import suitable material meeting requirements of embankment fill specifications for Setback Levee construction.

RECLAMATION
Managing Water in the West

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YAKIMA RIVER BASIN WATER ENHANCEMENT PROJECT - WASHINGTON

**SCHAKE PROPERTY
HABITAT IMPROVEMENT PROJECT**

PRELIMINARY DESIGN DRAWINGS

CONTRACTOR
DRAWN

ACCEPTED

YAKIMA, WA 2015-10-02

SETBACK LEVEE KEY MAP

SHEET C-101

SHEET 08 OF 54

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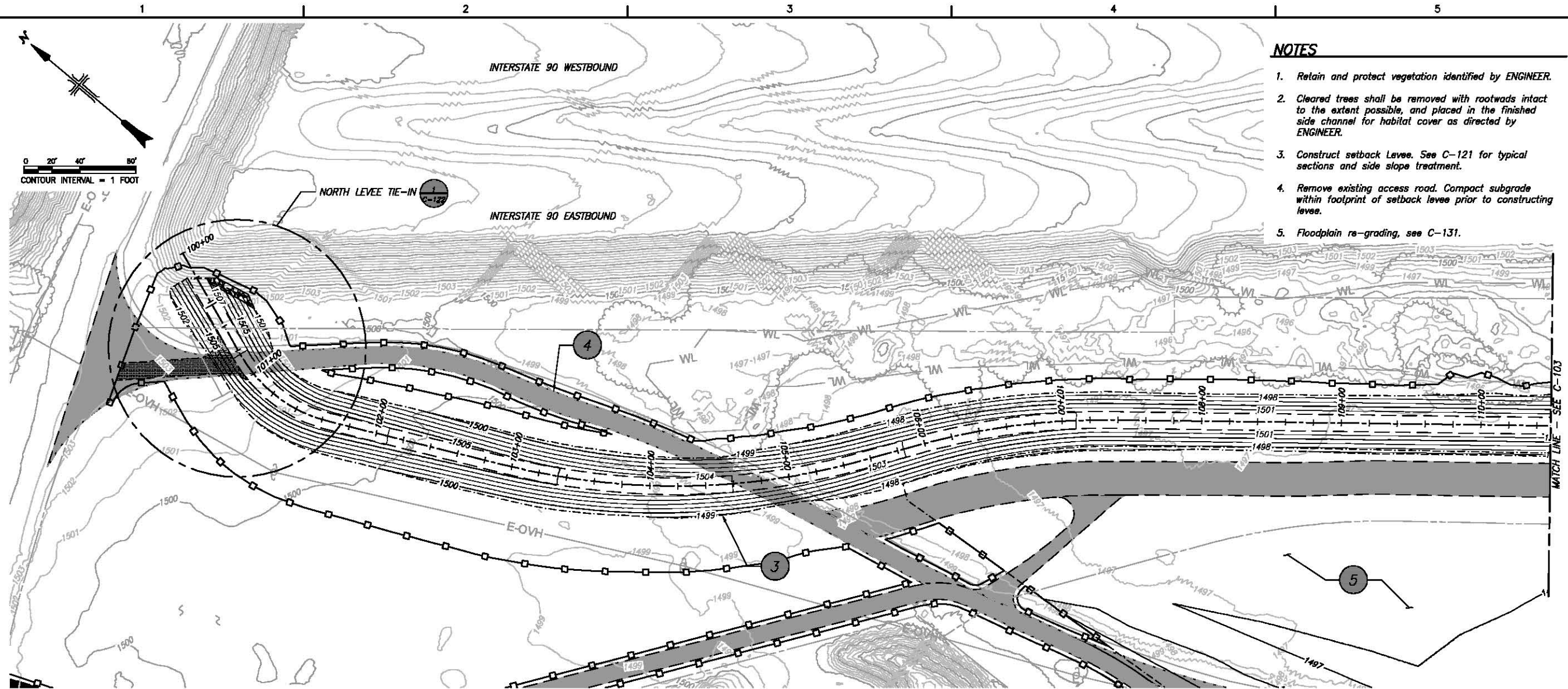
ALWAYS THINK SAFETY
U.S. DEPARTMENT OF THE INTERIOR
BUREAU OF RECLAMATION
YAKIMA RIVER BASIN WATER ENHANCEMENT PROJECT - WASHINGTON
SCHAKE PROPERTY
HABITAT IMPROVEMENT PROJECT
PRELIMINARY DESIGN DRAWINGS

CONTRACTOR
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YAKIMA, WA 2015-10-02

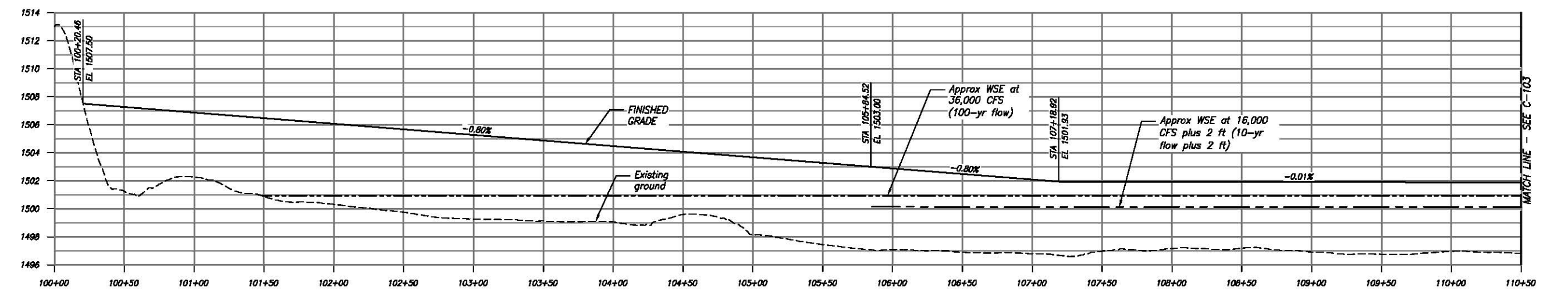
SETBACK LEVEE
PLAN AND PROFILE - 1
SHEET C-102
SHEET 08 OF 54
457818

NOTES

1. Retain and protect vegetation identified by ENGINEER.
2. Cleared trees shall be removed with rootwads intact to the extent possible, and placed in the finished side channel for habitat cover as directed by ENGINEER.
3. Construct setback Levee. See C-121 for typical sections and side slope treatment.
4. Remove existing access road. Compact subgrade within footprint of setback levee prior to constructing levee.
5. Floodplain re-grading, see C-131.



PLAN



PROFILE

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CBS SYSTEM
4/10/2010 CH4 3D 2013
C40 REDEFINE
C-102_457818

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PRELIMINARY DESIGN DRAWINGS

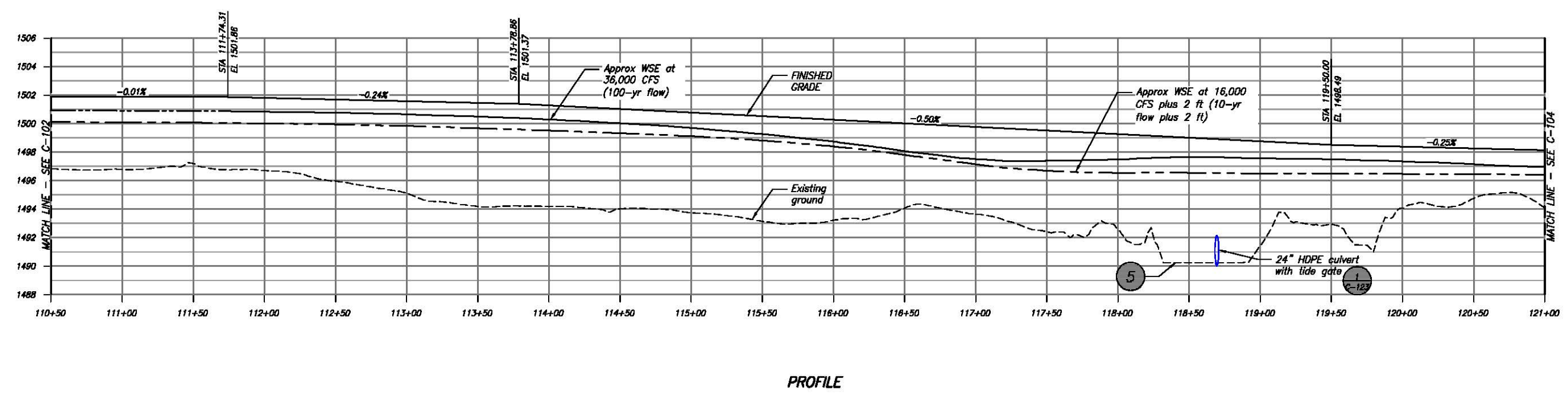
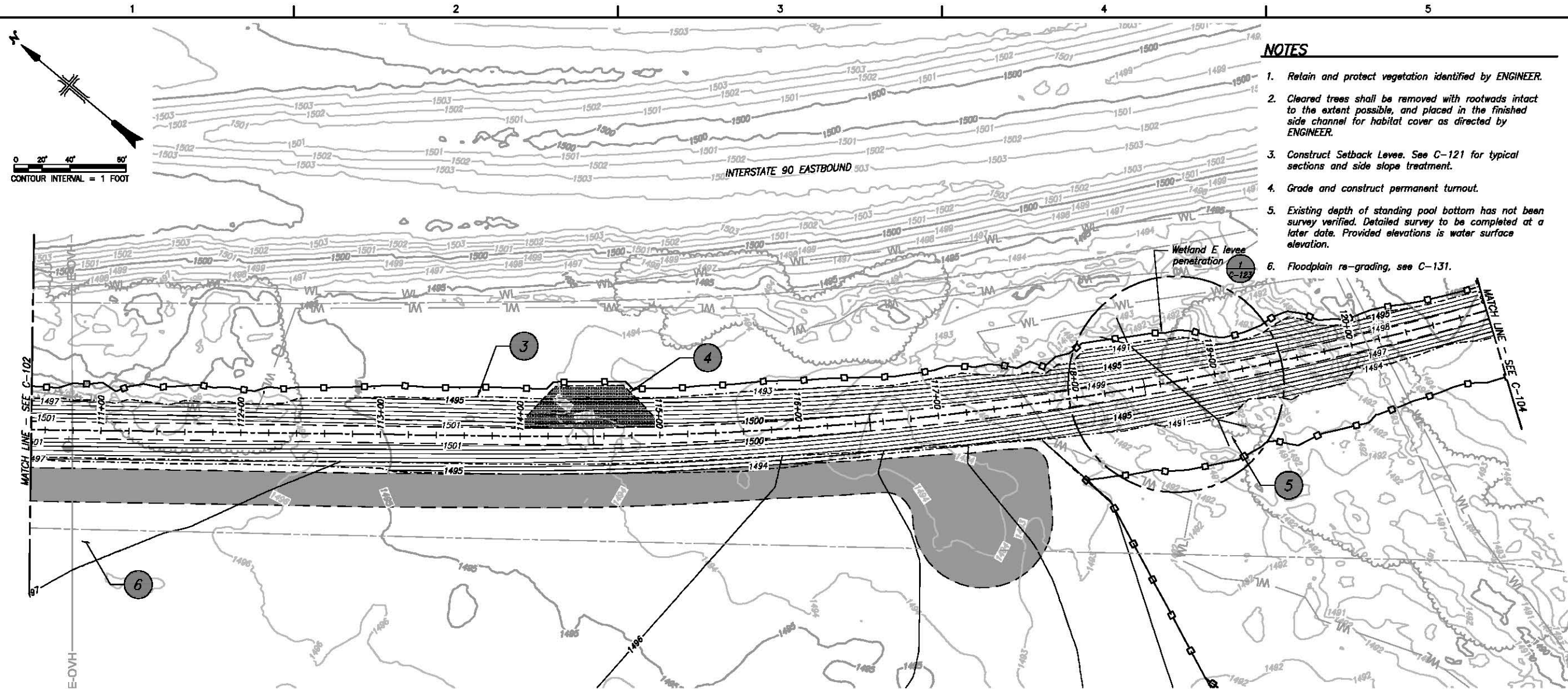
CONTRACTOR
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SETBACK LEVEE
PLAN AND PROFILE - 2

SHEET C-103
SHEET 10 OF 54
457818

NOTES

1. Retain and protect vegetation identified by ENGINEER.
2. Cleared trees shall be removed with rootwads intact to the extent possible, and placed in the finished side channel for habitat cover as directed by ENGINEER.
3. Construct Setback Levee. See C-121 for typical sections and side slope treatment.
4. Grade and construct permanent turnout.
5. Existing depth of standing pool bottom has not been survey verified. Detailed survey to be completed at a later date. Provided elevations is water surface elevation.
6. Floodplain re-grading, see C-131.



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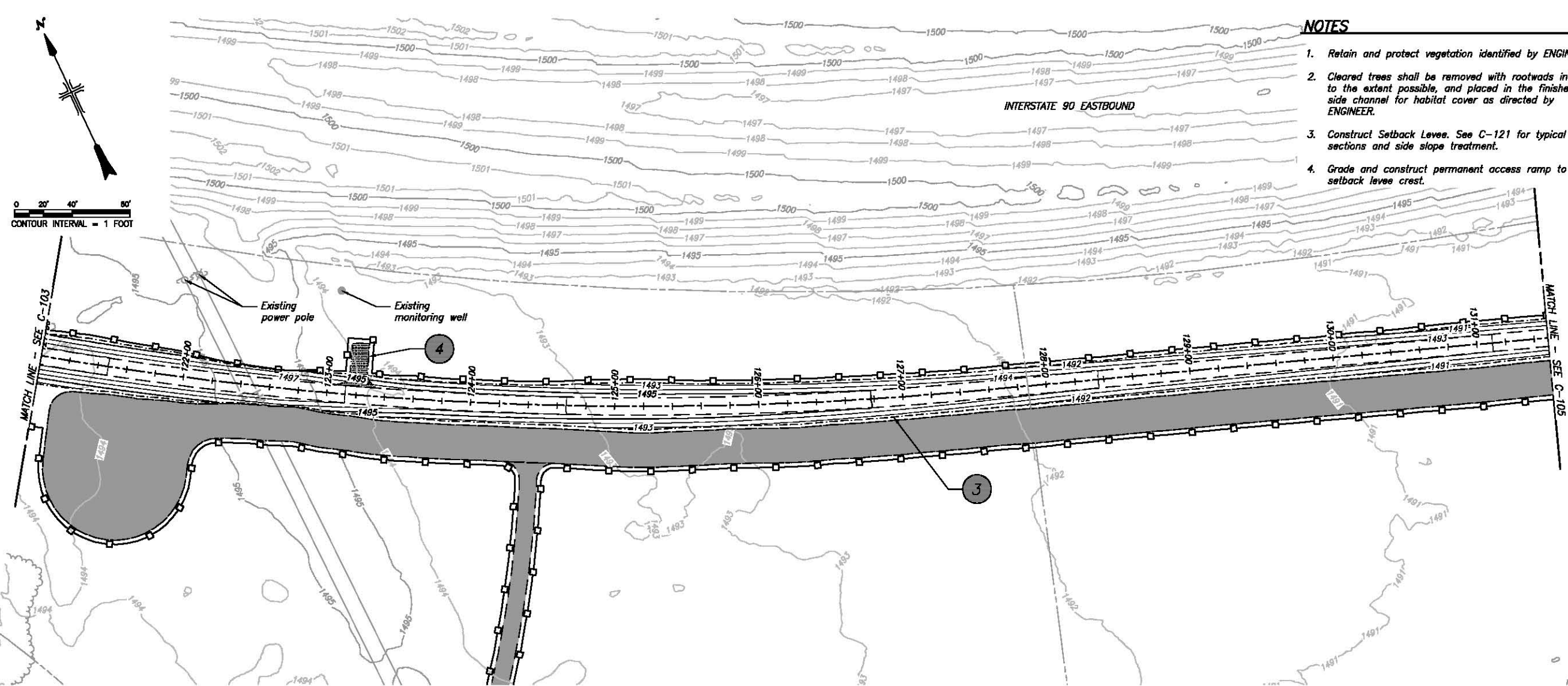
SETBACK LEVEE
PLAN AND PROFILE - 3

SHEET C-104
SHEET 11 OF 54
457818

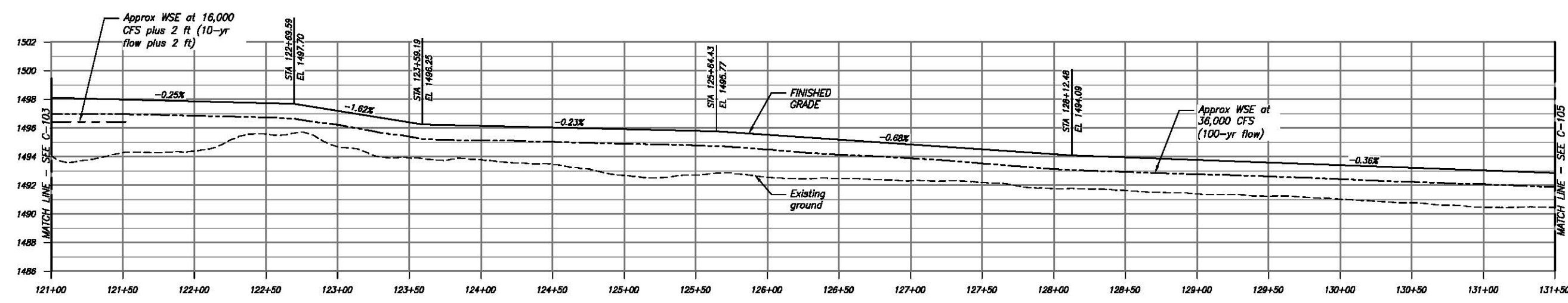
NOTES

1. Retain and protect vegetation identified by ENGINEER.
2. Cleared trees shall be removed with rootwads intact to the extent possible, and placed in the finished side channel for habitat cover as directed by ENGINEER.
3. Construct Setback Levee. See C-121 for typical sections and side slope treatment.
4. Grade and construct permanent access ramp to setback levee crest.

INTERSTATE 90 EASTBOUND



PLAN



PROFILE

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PRELIMINARY DESIGN DRAWINGS

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SETBACK LEVEE
PLAN AND PROFILE - 5

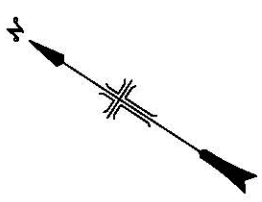
SHEET C-106

SHEET 13 OF 54

457818

NOTES

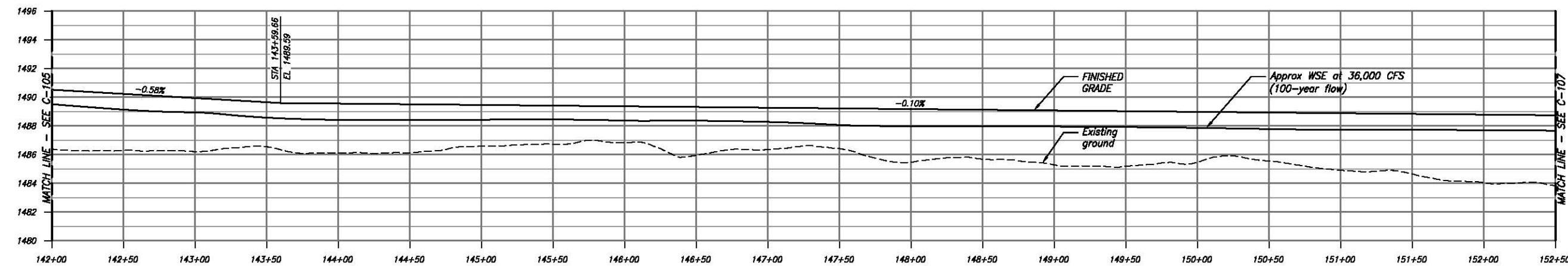
1. Retain and protect vegetation identified by ENGINEER.
2. Cleared trees shall be removed with rootwads intact to the extent possible, and placed in the finished side channel for habitat cover as directed by ENGINEER.
3. Construct Setback Levee. See C-121 for typical sections and side slope treatment.



0 20' 40' 80'
CONTOUR INTERVAL = 1 FOOT



PLAN



PROFILE

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CADD FILENAME
C-106_457818

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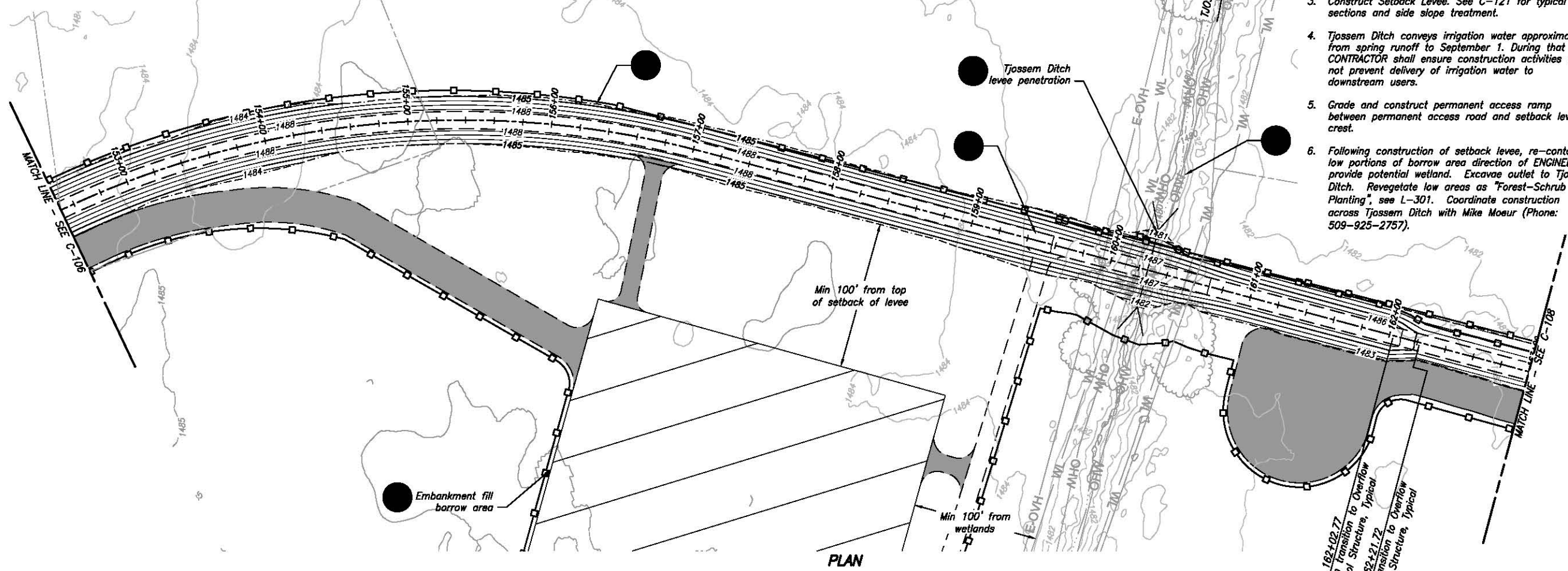
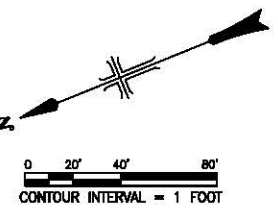
SETBACK LEVEE
PLAN AND PROFILE - 6

SHEET C-107

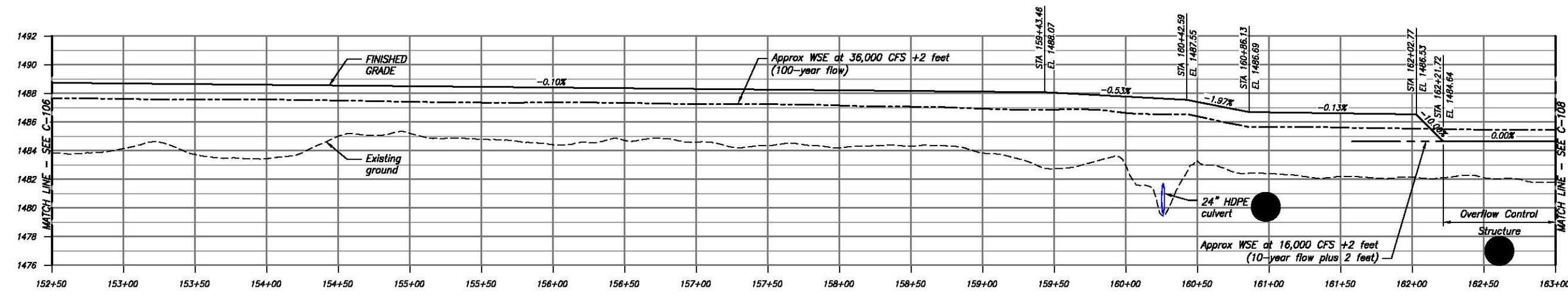
SHEET 14 OF 54
457818

NOTES

1. Retain and protect vegetation identified by ENGINEER.
2. Cleared trees shall be removed with rootwads intact to the extent possible, and placed in the finished side channel for habitat cover as directed by ENGINEER.
3. Construct Setback Levee. See C-121 for typical sections and side slope treatment.
4. Tjossem Ditch conveys irrigation water approximately from spring runoff to September 1. During that time, CONTRACTOR shall ensure construction activities do not prevent delivery of irrigation water to downstream users.
5. Grade and construct permanent access ramp between permanent access road and setback levee crest.
6. Following construction of setback levee, re-contour low portions of borrow area direction of ENGINEER to provide potential wetland. Excavate outlet to Tjossem Ditch. Revegetate low areas as "Forest-Shrub Planting", see L-301. Coordinate construction across Tjossem Ditch with Mike Moer (Phone: 509-925-2757).



PLAN



PROFILE

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PRELIMINARY DESIGN DRAWINGS

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SETBACK LEVEE
PLAN AND PROFILE - 7

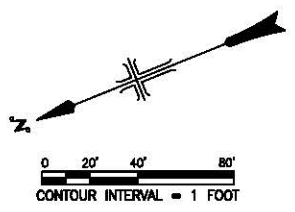
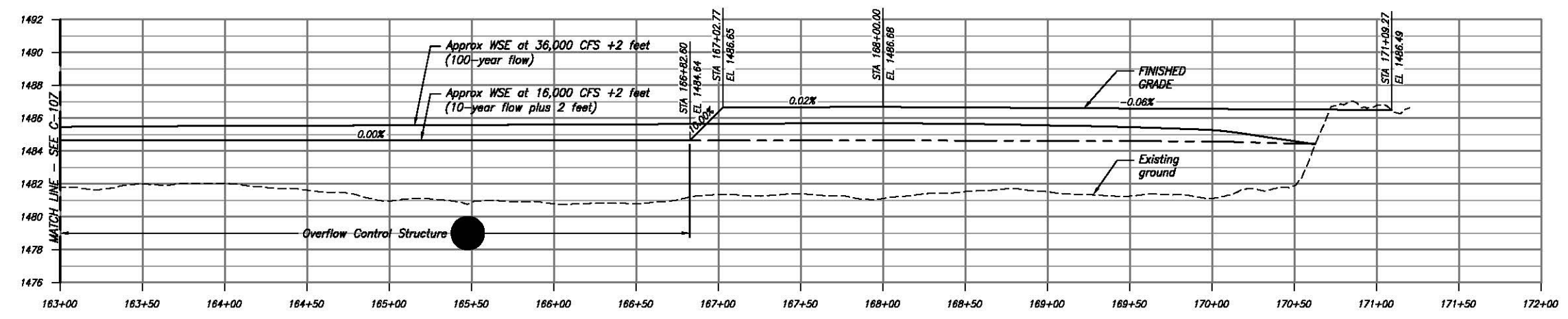
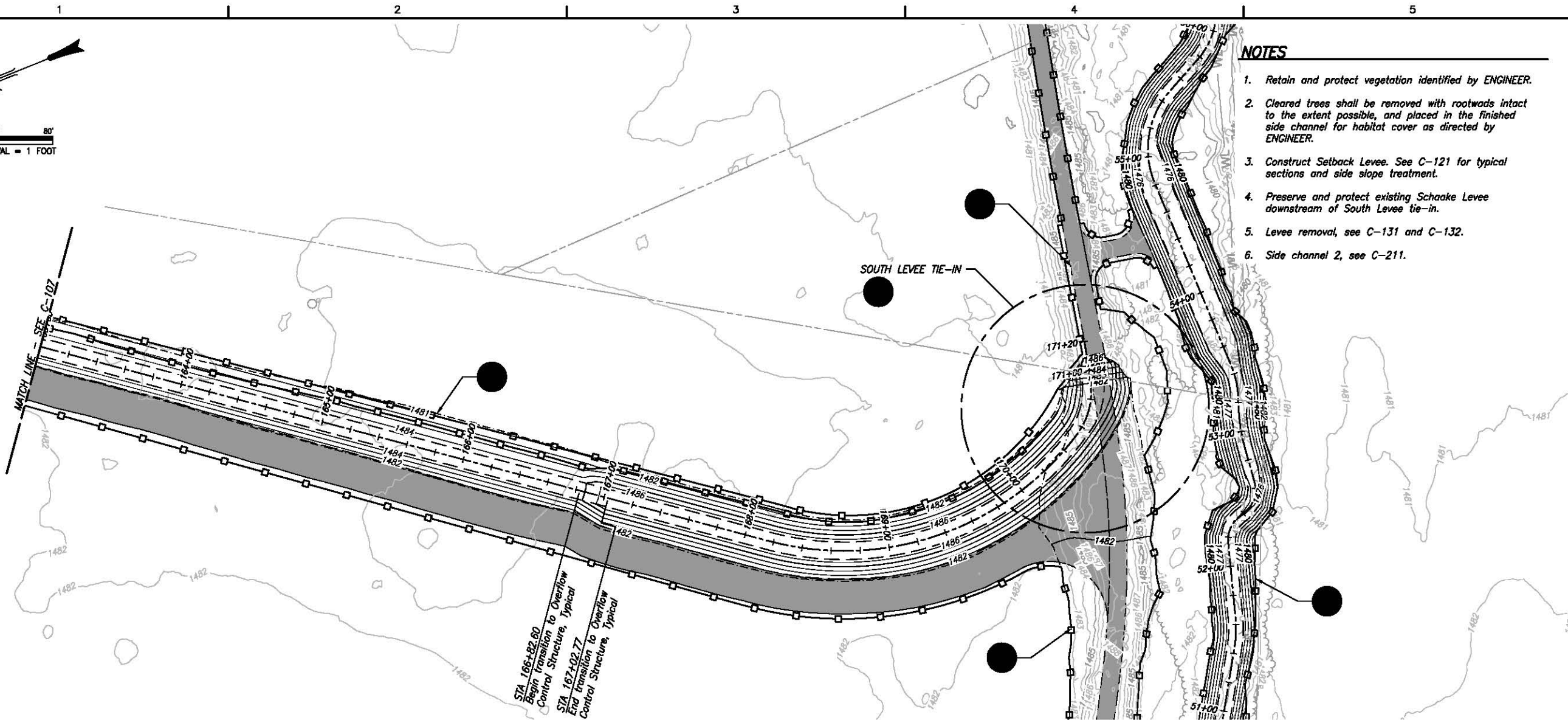
SHEET C-108

SHEET 15 OF 54

457818

NOTES

1. Retain and protect vegetation identified by ENGINEER.
2. Cleared trees shall be removed with rootwads intact to the extent possible, and placed in the finished side channel for habitat cover as directed by ENGINEER.
3. Construct Setback Levee. See C-121 for typical sections and side slope treatment.
4. Preserve and protect existing Schaafe Levee downstream of South Levee tie-in.
5. Levee removal, see C-131 and C-132.
6. Side channel 2, see C-211.



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C-108_457818

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SCHAAKE PROPERTY
HABITAT IMPROVEMENT PROJECT

PRELIMINARY DESIGN DRAWINGS

CONTRACTOR
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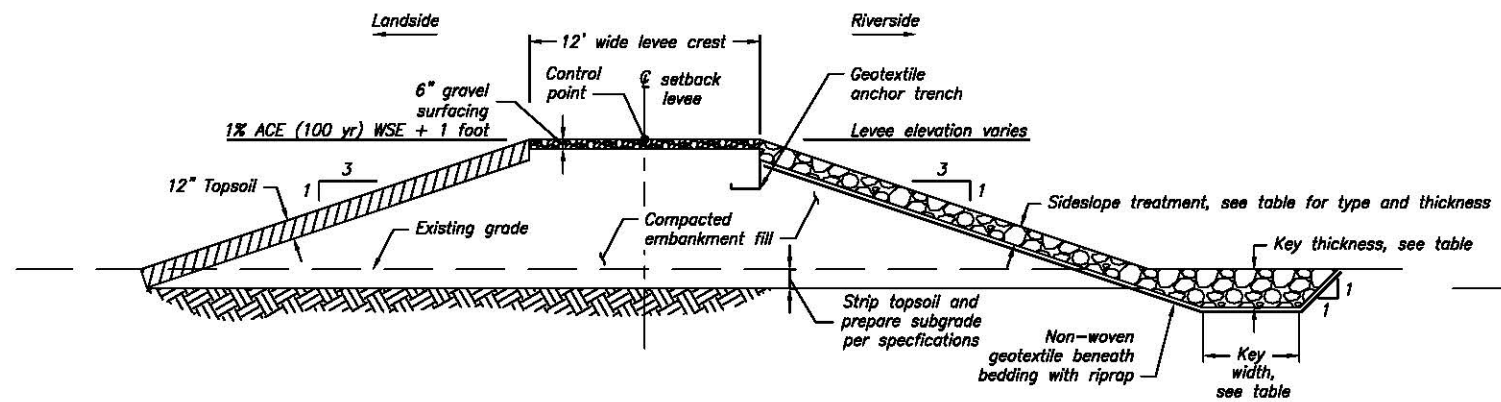
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YAKIMA, WA 2015-10-02

SETBACK LEVEE
TYPICAL SECTIONS

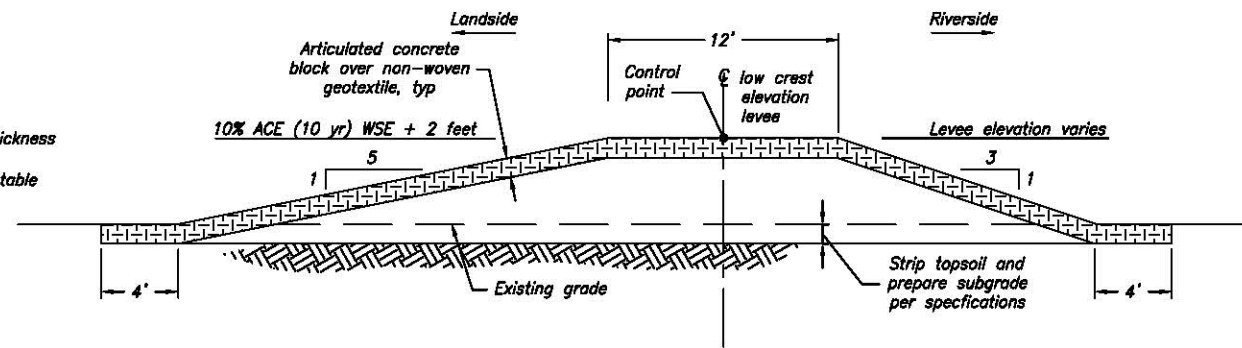
SHEET C-121

SHEET 16 OF 54
457818



SETBACK LEVEE			
START STA	END STA	LANDSIDE SLOPE (H:V)	RIVERSIDE SLOPE (H:V)
100+15	162+03	3:1	3:1
162+02	162+21	VARIES	3:1
166+82	167+02	VARIES	3:1
167+03	171+09	3:1	3:1

SETBACK LEVEE TYPICAL SECTION
SCALE: NTS



OVERFLOW CONTROL STRUCTURE TYPICAL SECTION - TYP, STA 162+21 TO STA 166+82
SCALE: NTS

RIVERSIDE SLOPE PROTECTION					
START STA	END STA	TREATMENT	THICKNESS (FT)	KEY WIDTH (FT)	KEY THICKNESS (FT)
100+15	107+00	MIXED COARSE AGGREGATE	1	3	2
107+00	121+00	RIPRAP D50=1.25'	2.5	20	6.5
121+00	162+03	MIXED COARSE AGGREGATE	1	3	2
167+03	171+09	RIPRAP D50=1.25'	2.5	20	6.5

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CAD SYSTEM
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CADD FILENAME
C-121-457818

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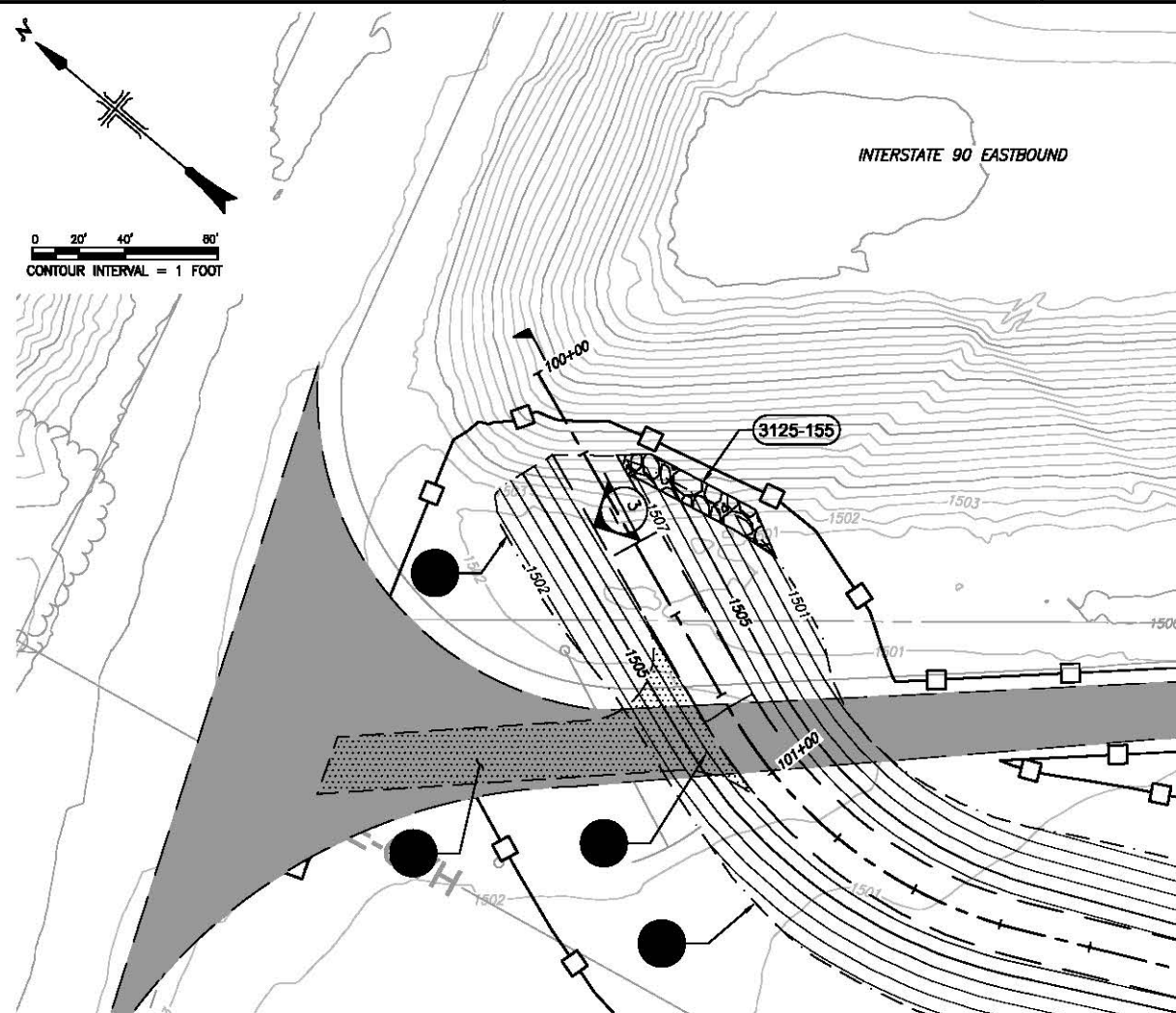
U.S. DEPARTMENT OF THE INTERIOR
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YAKIMA RIVER BASIN WATER ENHANCEMENT PROJECT - WASHINGTON

SCHAAKE PROPERTY
HABITAT IMPROVEMENT PROJECT

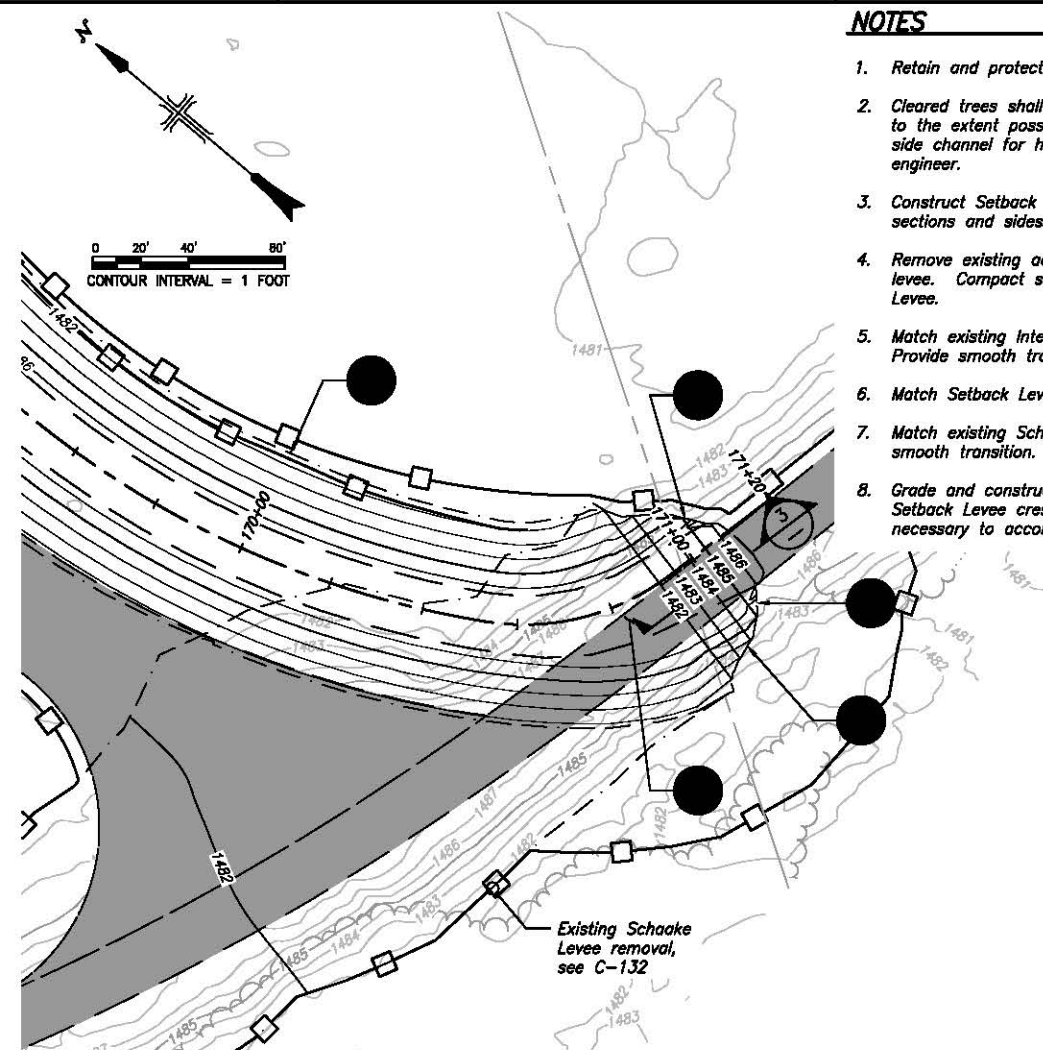
PRELIMINARY DESIGN DRAWINGS

NOTES

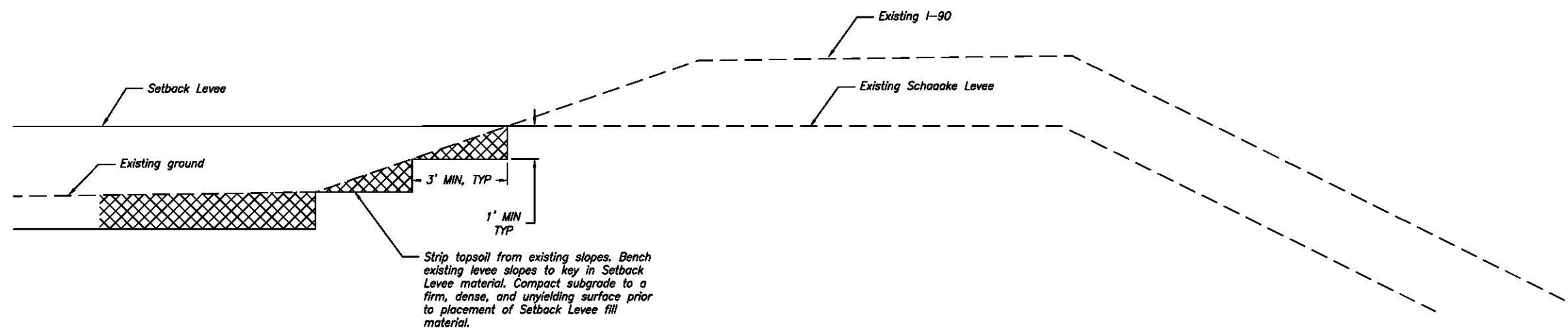
1. Retain and protect vegetation identified by engineer.
2. Cleared trees shall be removed with rootwads intact, to the extent possible, and placed in the finished side channel for habitat cover as directed by engineer.
3. Construct Setback Levee. See C-121 for typical sections and sideslope treatment.
4. Remove existing access road prior to constructing levee. Compact subgrade within footprint of Setback Levee.
5. Match existing Interstate 90 Eastbound shoulder. Provide smooth transition from existing slope.
6. Match Setback Levee crest width to existing levee.
7. Match existing Schaafe Levee banks, providing smooth transition.
8. Grade and construct permanent access ramp to Setback Levee crest. Reset existing gate as necessary to accommodate access ramp.



NORTH SETBACK LEVEE TIE-IN
SCALE: 1"=20'



SOUTH SETBACK LEVEE TIE-IN
SCALE: 1"=20'



TYPICAL SETBACK LEVEE TIE-IN SECTION
SCALE: 1"=2'

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CADD FILENAME
C-122_457818

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SETBACK LEVEE
TIE-IN DETAILS

SHEET C-122

SHEET 17 OF 54

457818

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PRELIMINARY DESIGN DRAWINGS

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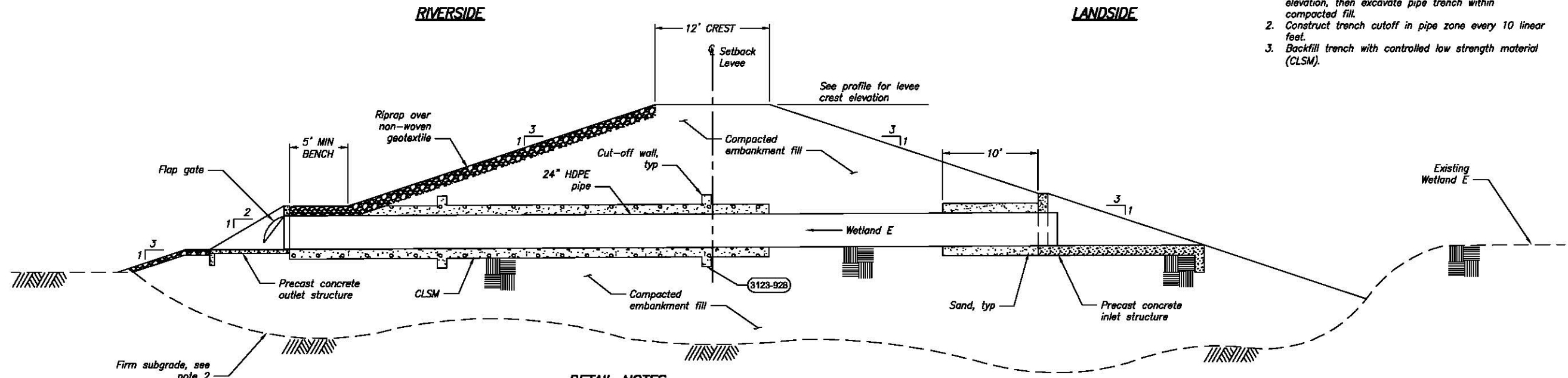
SETBACK LEVEE
PENETRATION DETAILS

SHEET C-123

SHEET 18 OF 54
457818

NOTES

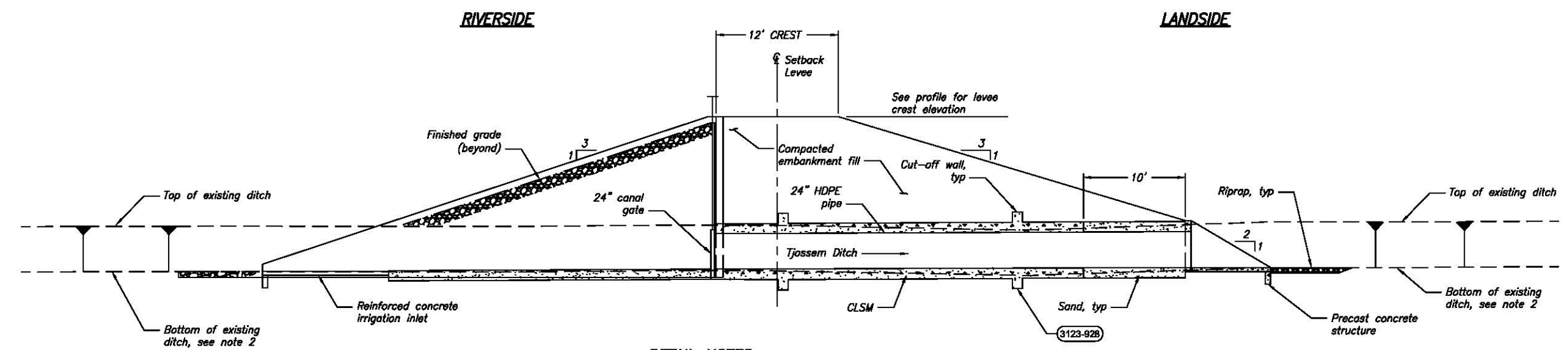
1. Construct embankment two feet above top of pipe elevation, then excavate pipe trench within compacted fill.
2. Construct trench cutoff in pipe zone every 10 linear feet.
3. Backfill trench with controlled low strength material (CLSM).



DETAIL NOTES

1. See sheet C-121 for Setback Levee typical sections.
2. Dewater and excavate to firm and unyielding subgrade before placing compacted embankment fill.

WETLAND E LEVEE PENETRATION - STA 117+80 TO 119+60
NOT TO SCALE



DETAIL NOTES

1. See sheet C-121 for Setback Levee typical sections.
2. CONTRACTOR to grade existing drainage channel to conform to invert elevation of new 24\"/>

TJOSSEM DITCH SETBACK LEVEE PENETRATION - STA 15+90 TO 16+60
NOT TO SCALE

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PRELIMINARY DESIGN DRAWINGS

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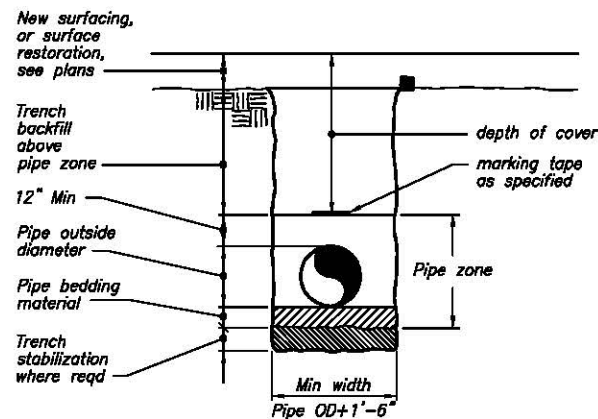
YAKIMA, WA 2015-10-02

SETBACK LEVEE
TYPICAL DETAILS

SHEET C-124

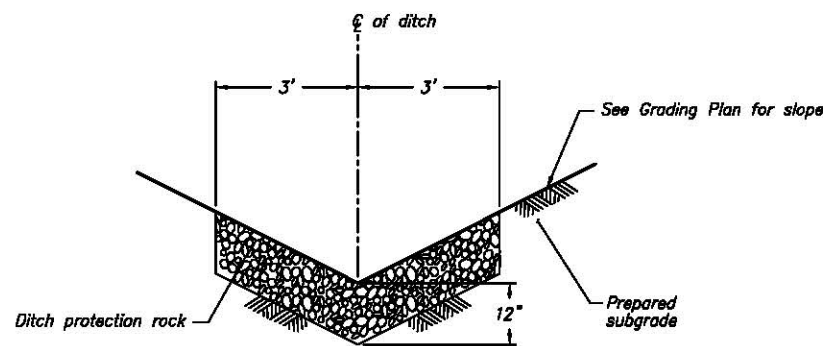
SHEET 19 OF 54

457818



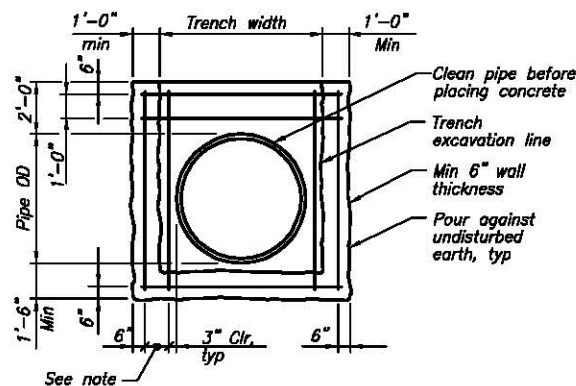
TYPICAL TRENCH
NOT TO SCALE

3123-110



DITCH PROTECTION
NOT TO SCALE

3123-155



NOTES:

1. All reinforcement #5 bar.
2. Add additional reinforcement if spacing from pipe wall to trench wall is greater than 12". place at equal spacing, maximum 12".

CUT-OFF WALL
NOT TO SCALE

3123-928

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C-124 457818

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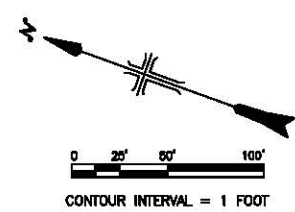
SCHAKE PROPERTY
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PRELIMINARY DESIGN DRAWINGS

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2015-10-02

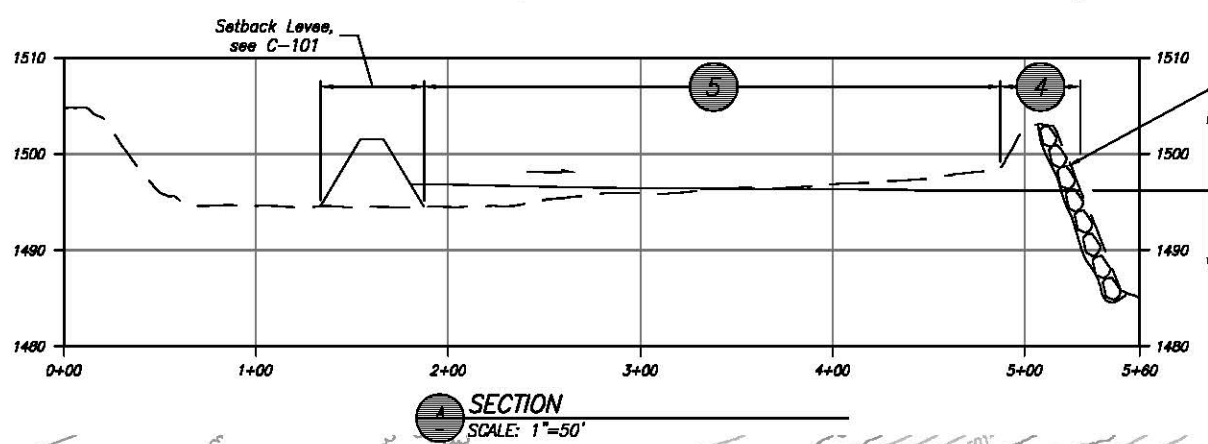
GRADING PLAN AND
EXISTING LEVEE REMOVAL

SHEET C-131
SHEET 20 OF 54
457818



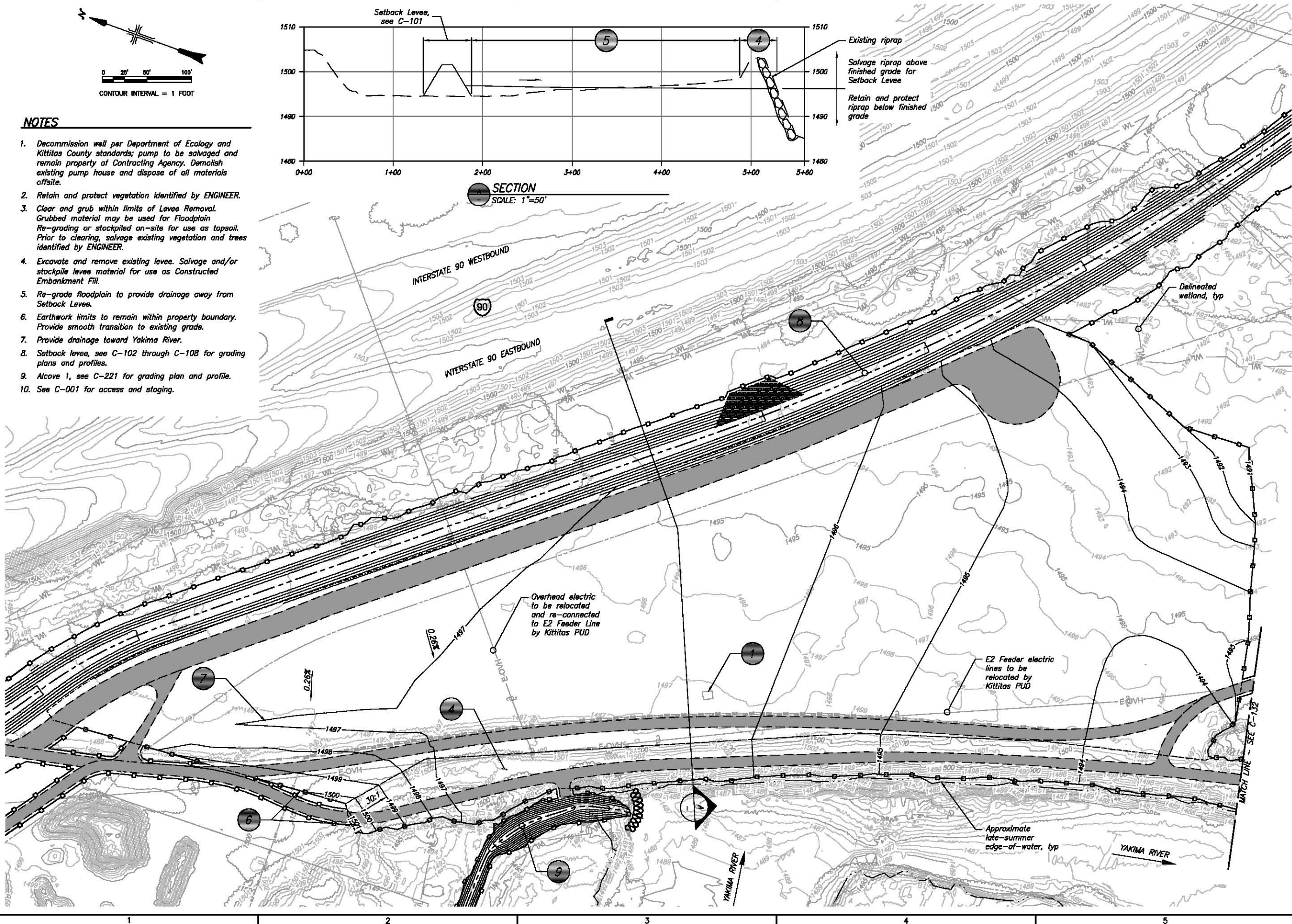
NOTES

1. Decommission well per Department of Ecology and Kittitas County standards; pump to be salvaged and remain property of Contracting Agency. Demolish existing pump house and dispose of all materials offsite.
2. Retain and protect vegetation identified by ENGINEER.
3. Clear and grub within limits of Levee Removal. Grubbed material may be used for Floodplain Re-grading or stockpiled on-site for use as topsoil. Prior to clearing, salvage existing vegetation and trees identified by ENGINEER.
4. Excavate and remove existing levee. Salvage and/or stockpile levee material for use as Constructed Embankment Fill.
5. Re-grade floodplain to provide drainage away from Setback Levee.
6. Earthwork limits to remain within property boundary. Provide smooth transition to existing grade.
7. Provide drainage toward Yakima River.
8. Setback levee, see C-102 through C-108 for grading plans and profiles.
9. Alcove 1, see C-221 for grading plan and profile.
10. See C-001 for access and staging.



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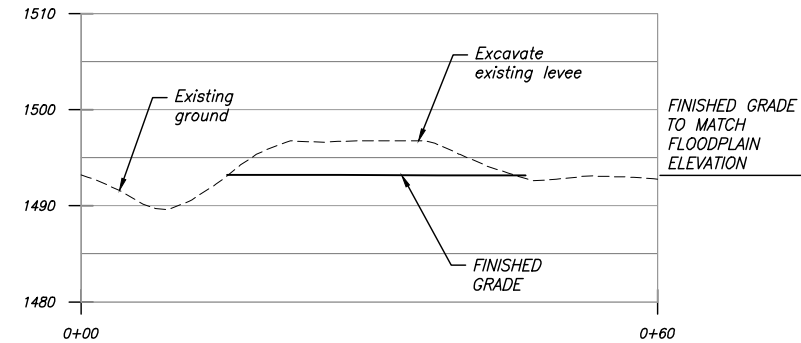
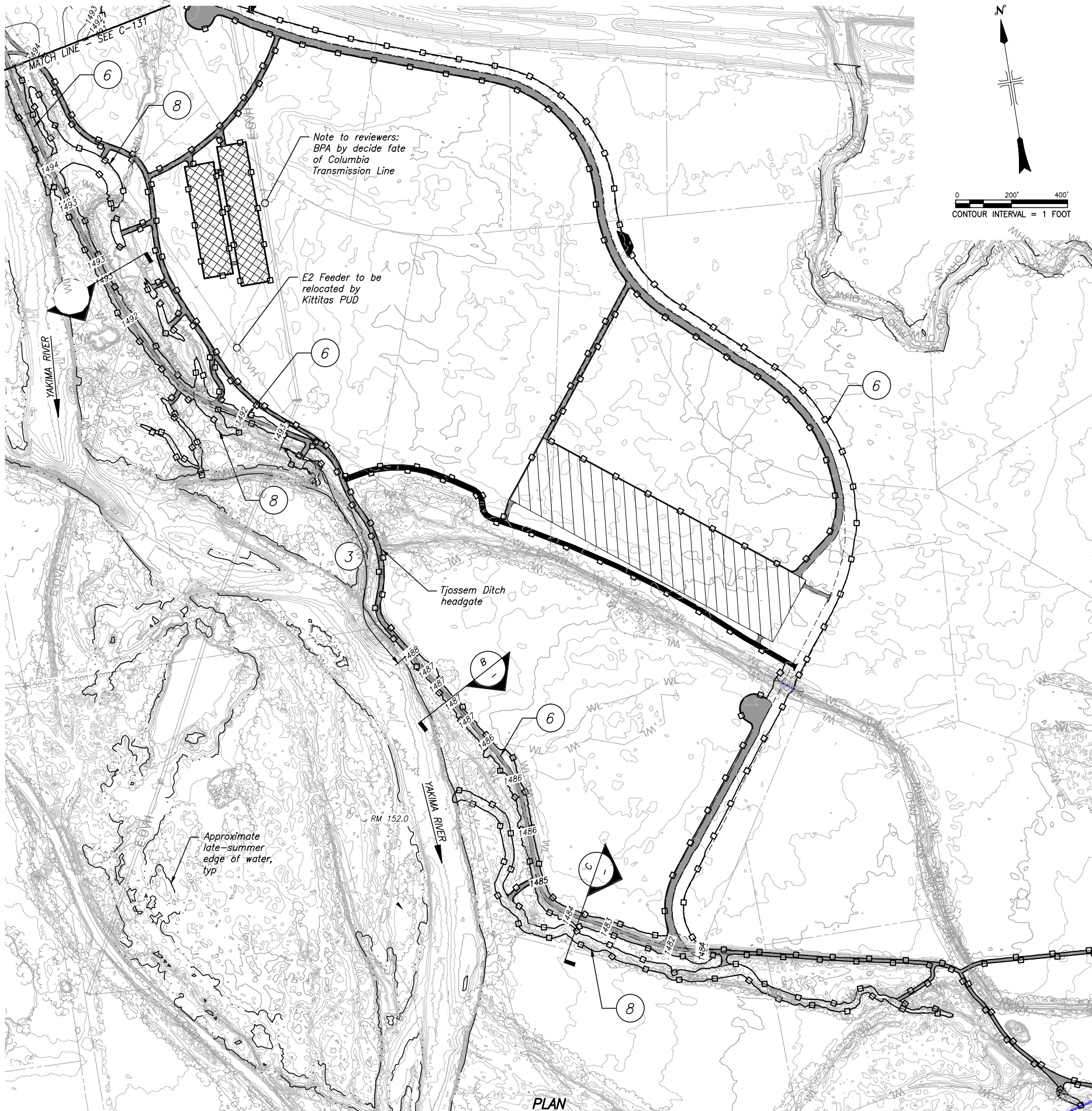
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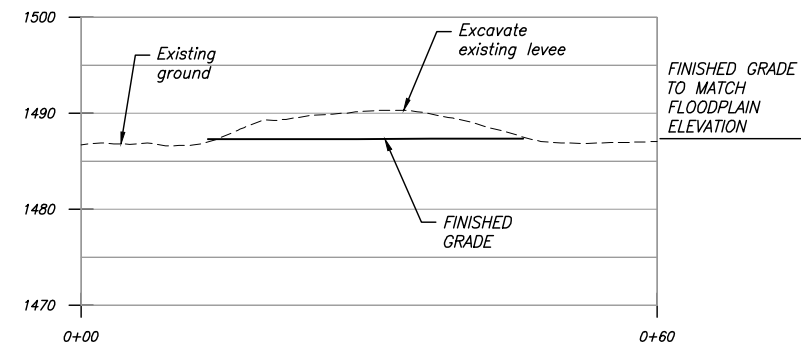
LEVEE DEMO SHEET
PLANS AND SECTIONS

SHEET C-132

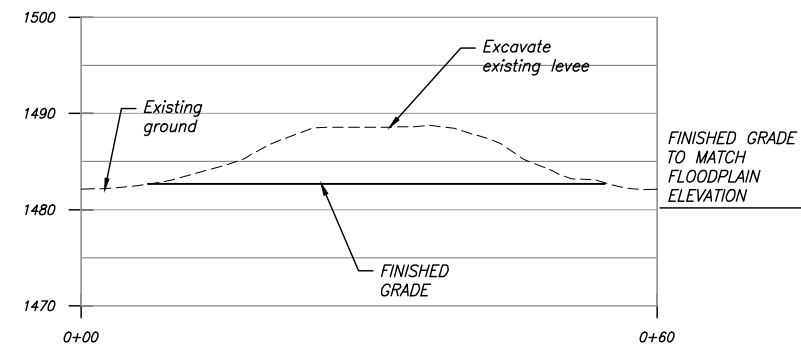
SHEET 21 OF 54
457818



A SECTION
SCALE: 1"=10'



B SECTION
SCALE: 1"=10'



C SECTION
SCALE: 1"=10'

NOTES

1. See C-001 for access and staging plan.
2. Retain and protect existing access road. Restore to present conditions at end of construction.
3. Retain and protect vegetation identified by ENGINEER.
4. Clear and grub within limits of Levee Removal. Grubbed material may be used for Floodplain Re-grading or stockpiled on-site for use as topsoil. Salvage existing vegetation and trees identified by ENGINEER prior to clearing.
5. Excavate and remove existing levee. Salvage and/or stockpile levee material for use as Constructed Embankment Fill.
6. Existing access road along Schaaque Levee to be removed as part of Levee Removal.
7. Setback Levee, see C-102 to C-108 for grading plan and profiles.
8. Side Channel, see C-201 and C-211.
9. Alcove, see C-221 and C-222.

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PRELIMINARY DESIGN DRAWINGS

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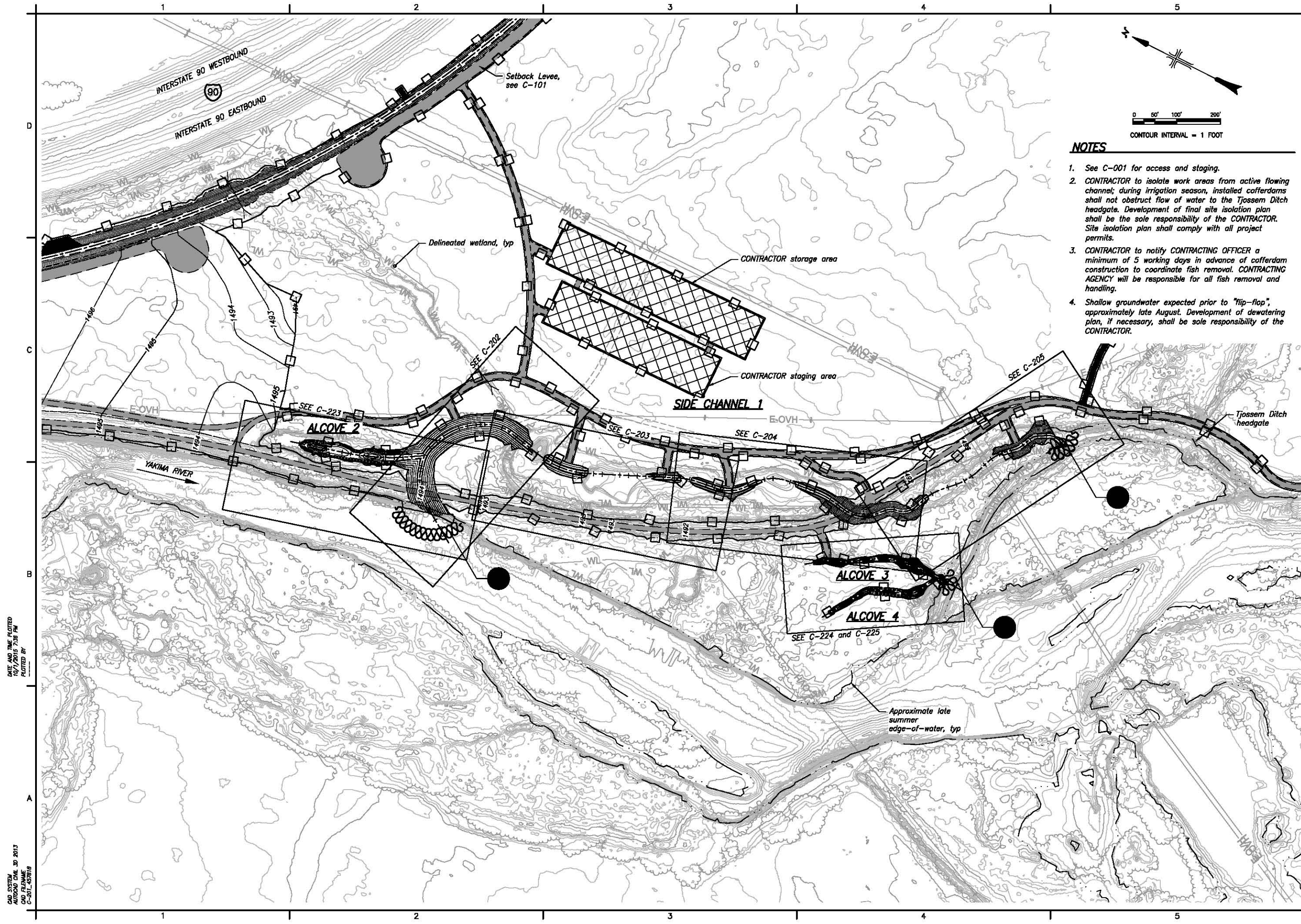
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YAKIMA, WA 2015-10-01

SIDE CHANNEL 1
KEY MAP AND SITE
ISOLATION

SHEET C-201

SHEET 22 OF 54
457818



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YAKIMA, WA 2015-10-02

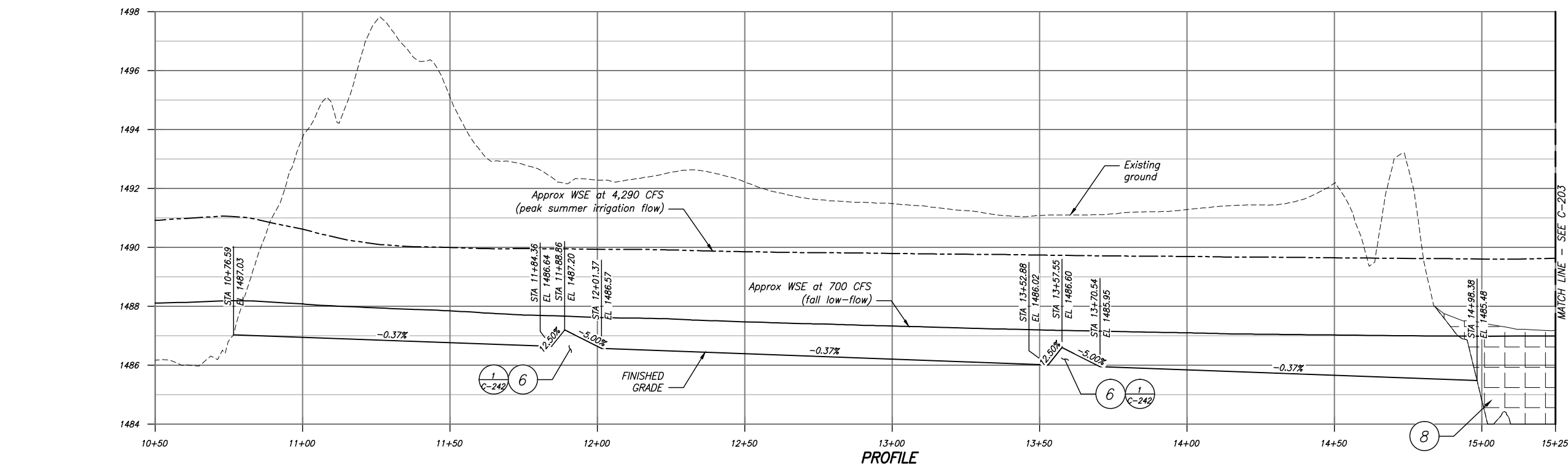
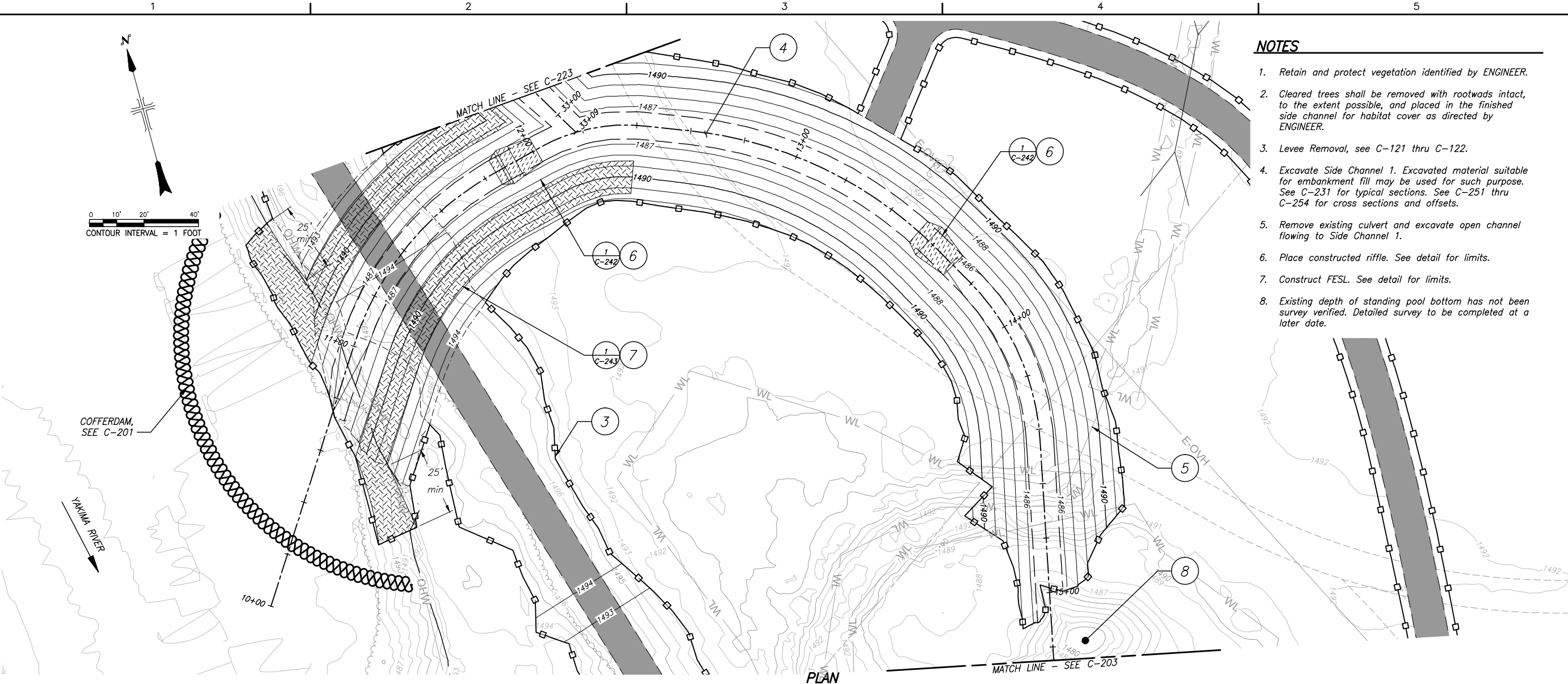
SIDE CHANNEL 1
PLAN AND PROFILE - 1

SHEET C-202

SHEET 23 OF 54
457818

NOTES

1. Retain and protect vegetation identified by ENGINEER.
2. Cleared trees shall be removed with rootwads intact, to the extent possible, and placed in the finished side channel for habitat cover as directed by ENGINEER.
3. Levee Removal, see C-121 thru C-122.
4. Excavate Side Channel 1. Excavated material suitable for embankment fill may be used for such purpose. See C-231 for typical sections. See C-251 thru C-254 for cross sections and offsets.
5. Remove existing culvert and excavate open channel flowing to Side Channel 1.
6. Place constructed riffle. See detail for limits.
7. Construct FESL. See detail for limits.
8. Existing depth of standing pool bottom has not been survey verified. Detailed survey to be completed at a later date.



DATE AND TIME PLOTTED
10/2/2015 1:54 PM
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CAD SYSTEM
AUTOCAD CIVIL 3D 2013
CAD FILENAME
C-202_457818

PRELIMINARY
NOT FOR
CONSTRUCTION

ch2m:

DESIGNED
DRAWN
CHECKED
ACCEPTED

ALWAYS THINK SAFETY

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YAKIMA RIVER BASIN WATER ENHANCEMENT PROJECT - WASHINGTON

SCHAAKE PROPERTY
HABITAT IMPROVEMENT PROJECT

PRELIMINARY DESIGN DRAWINGS

REV NO

CONTRACTOR
DRAWN

ACCEPTED

YAKIMA, WA 2015-10-02

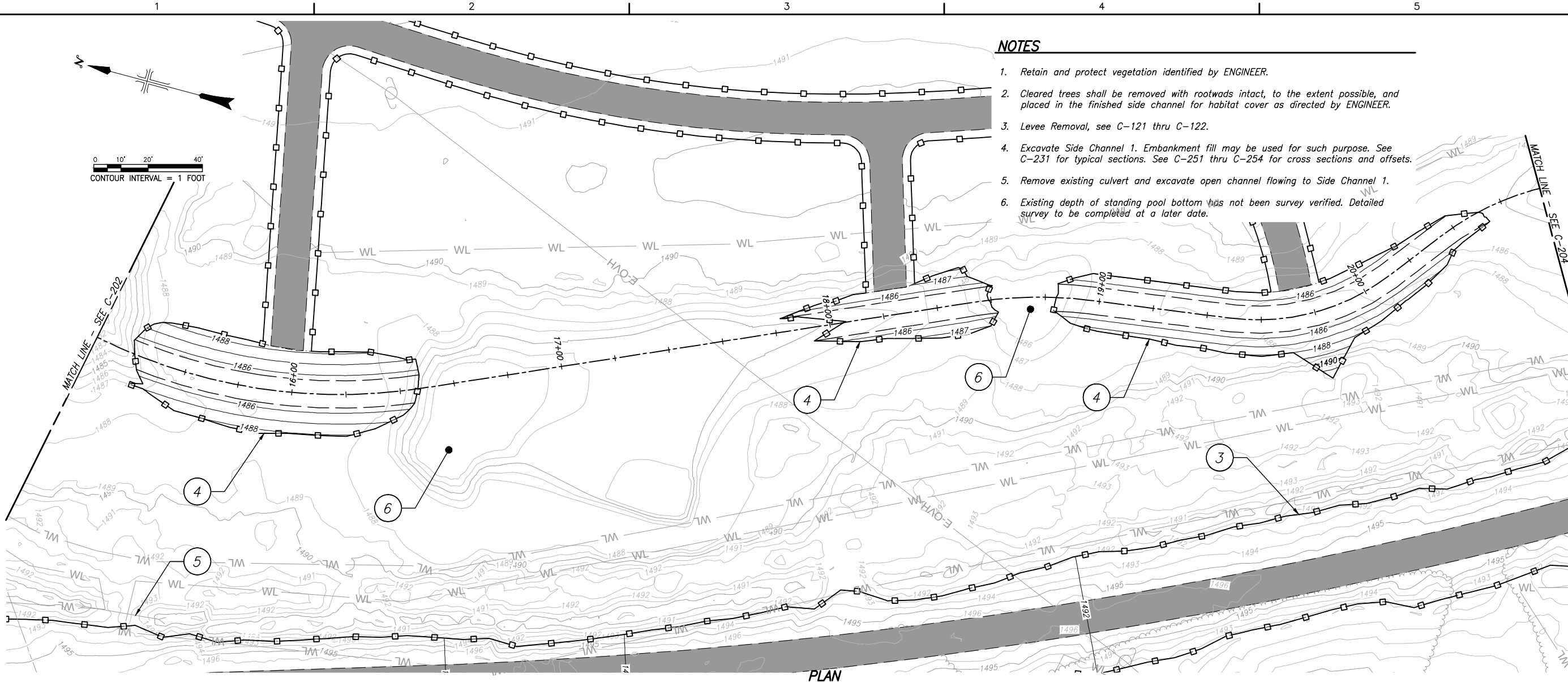
SIDE CHANNEL 1
PLAN AND PROFILE - 2

SHEET C-203

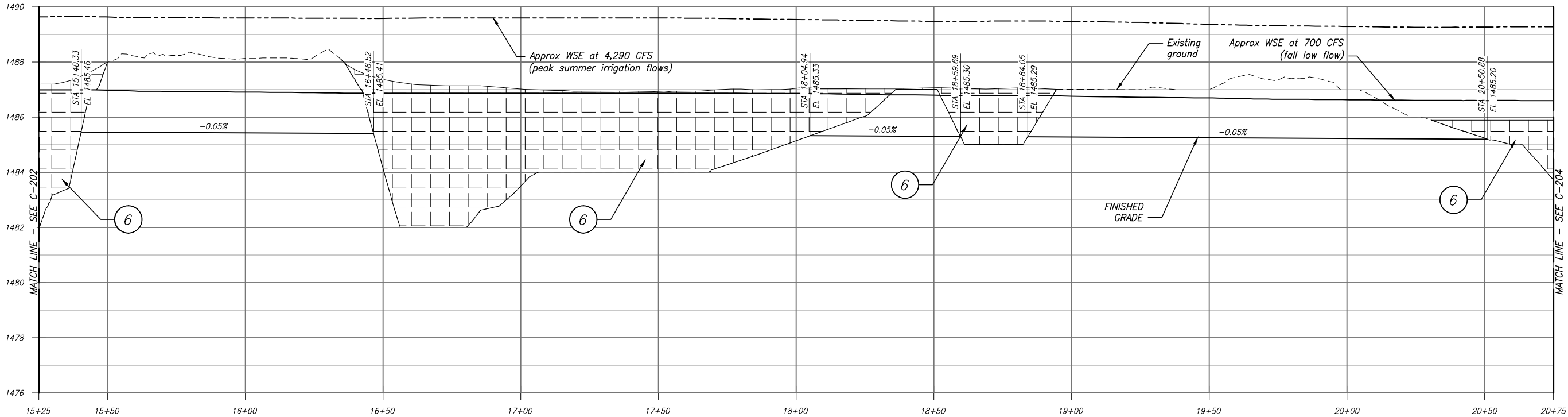
SHEET 24 OF 54
457818

NOTES

1. Retain and protect vegetation identified by ENGINEER.
2. Cleared trees shall be removed with rootwads intact, to the extent possible, and placed in the finished side channel for habitat cover as directed by ENGINEER.
3. Levee Removal, see C-121 thru C-122.
4. Excavate Side Channel 1. Embankment fill may be used for such purpose. See C-231 for typical sections. See C-251 thru C-254 for cross sections and offsets.
5. Remove existing culvert and excavate open channel flowing to Side Channel 1.
6. Existing depth of standing pool bottom has not been survey verified. Detailed survey to be completed at a later date.



PLAN



PROFILE

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AUTOCAD CIVIL
C-203L 457818

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SCHAAKE PROPERTY
HABITAT IMPROVEMENT PROJECT

PRELIMINARY DESIGN DRAWINGS

REV NO

CONTRACTOR
DRAWN

ACCEPTED

YAKIMA, WA 2015-10-02

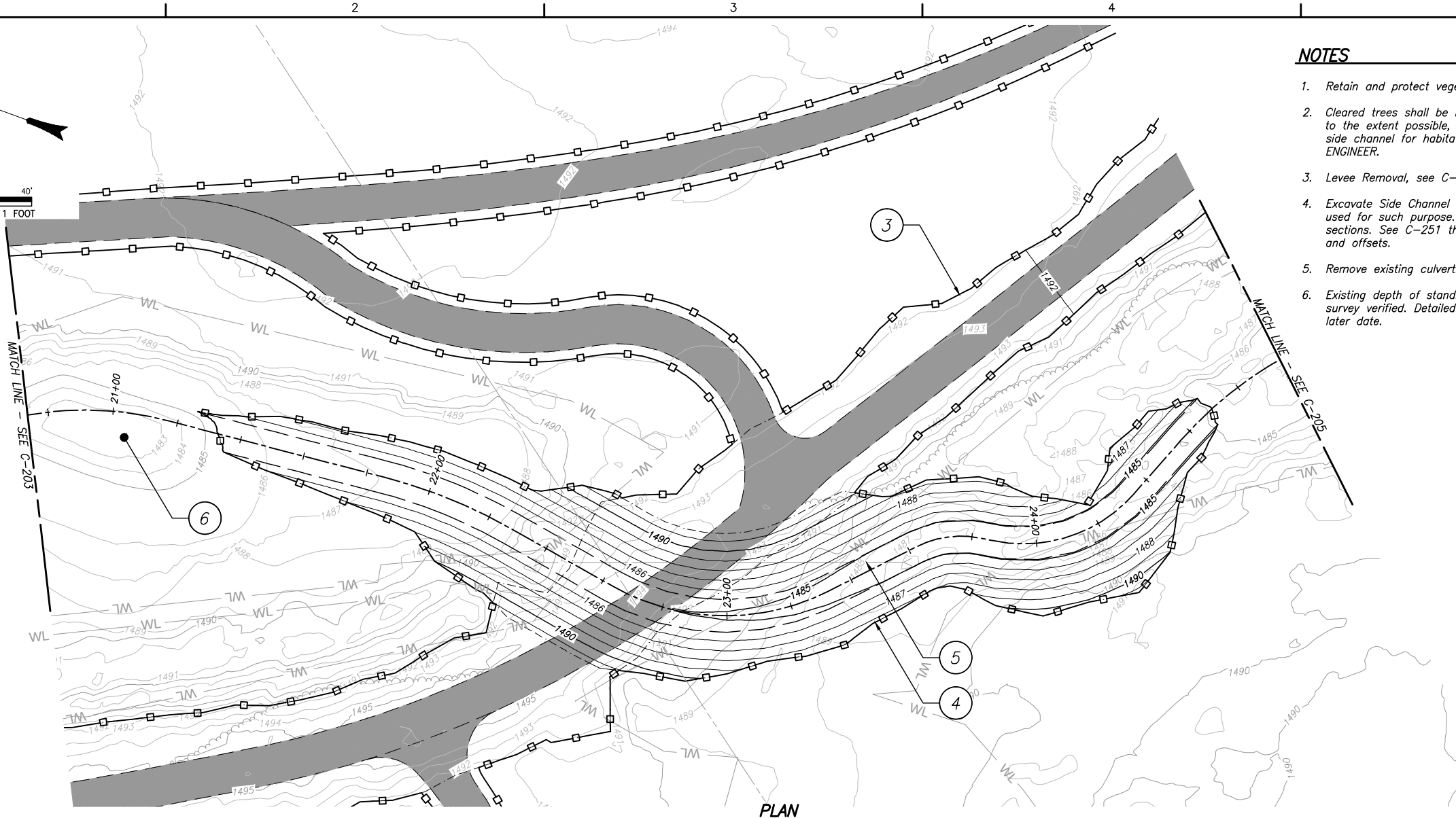
SIDE CHANNEL 1
PLAN AND PROFILE - 3

SHEET C-204

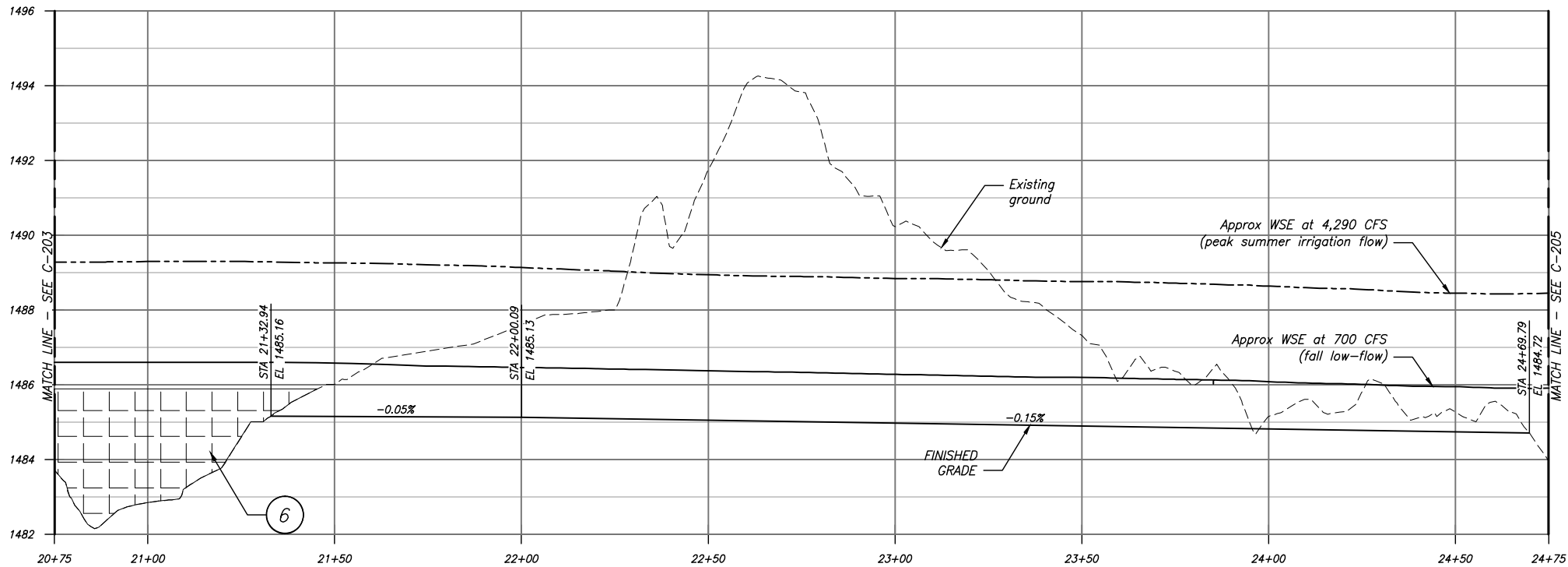
SHEET 25 OF 54
457818

NOTES

1. Retain and protect vegetation identified by ENGINEER.
2. Cleared trees shall be removed with rootwads intact, to the extent possible, and placed in the finished side channel for habitat cover as directed by ENGINEER.
3. Levee Removal, see C-121 thru C-122.
4. Excavate Side Channel 1. Embankment fill may be used for such purpose. See C-231 for typical sections. See C-251 thru C-254 for cross sections and offsets.
5. Remove existing culvert.
6. Existing depth of standing pool bottom has not been survey verified. Detailed survey to be completed at a later date.



PLAN



PROFILE

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CAD SYSTEM
AUTOCAD CIVIL 3D 2013
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C-204L 457818

PRELIMINARY
NOT FOR
CONSTRUCTION

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SCHAKE PROPERTY
HABITAT IMPROVEMENT PROJECT

PRELIMINARY DESIGN DRAWINGS

CONTRACTOR
DRAWN

ACCEPTED

YAKIMA, WA 2015-10-01

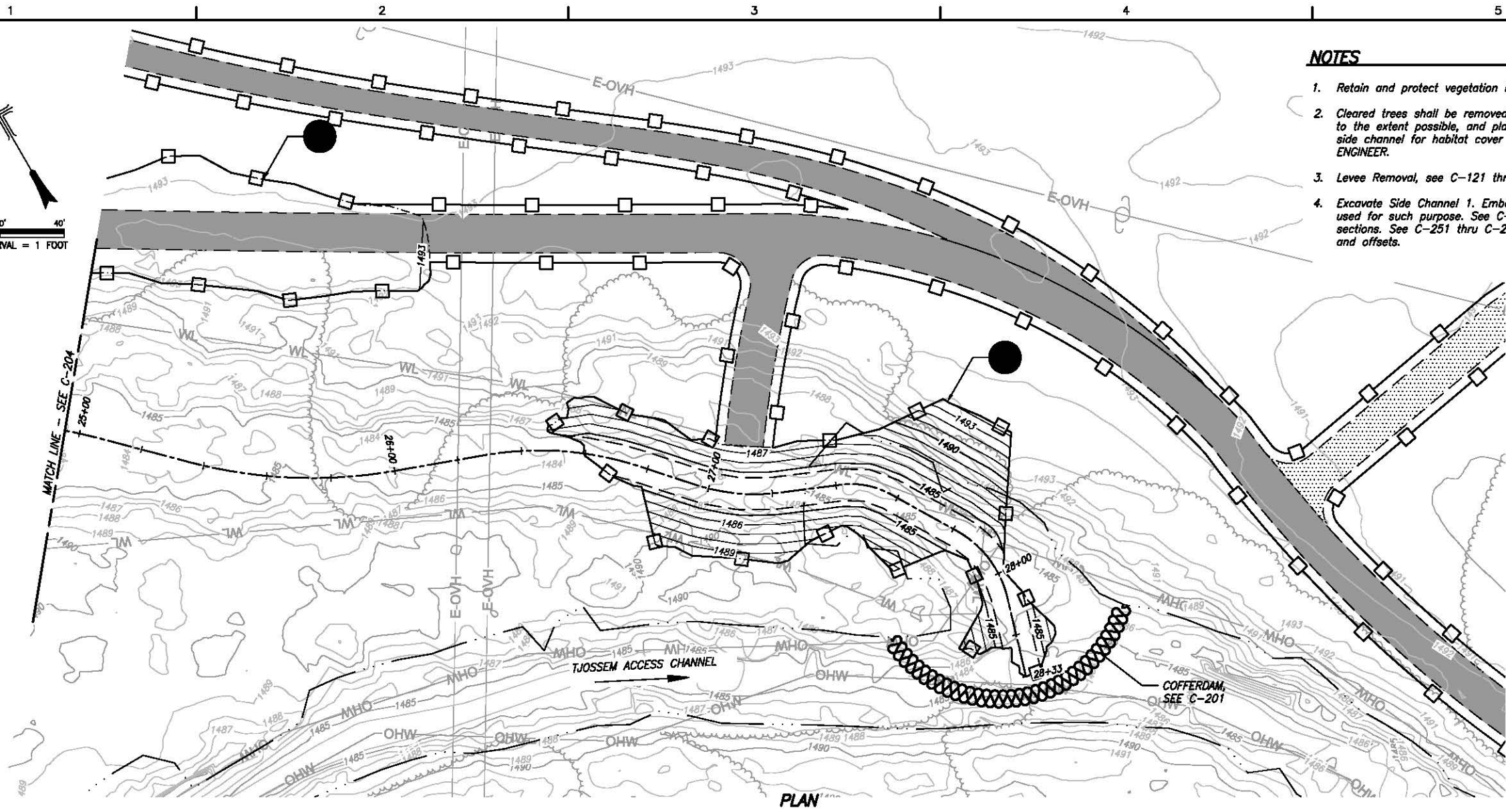
SIDE CHANNEL 1
PLAN AND PROFILE - 4

SHEET C-205

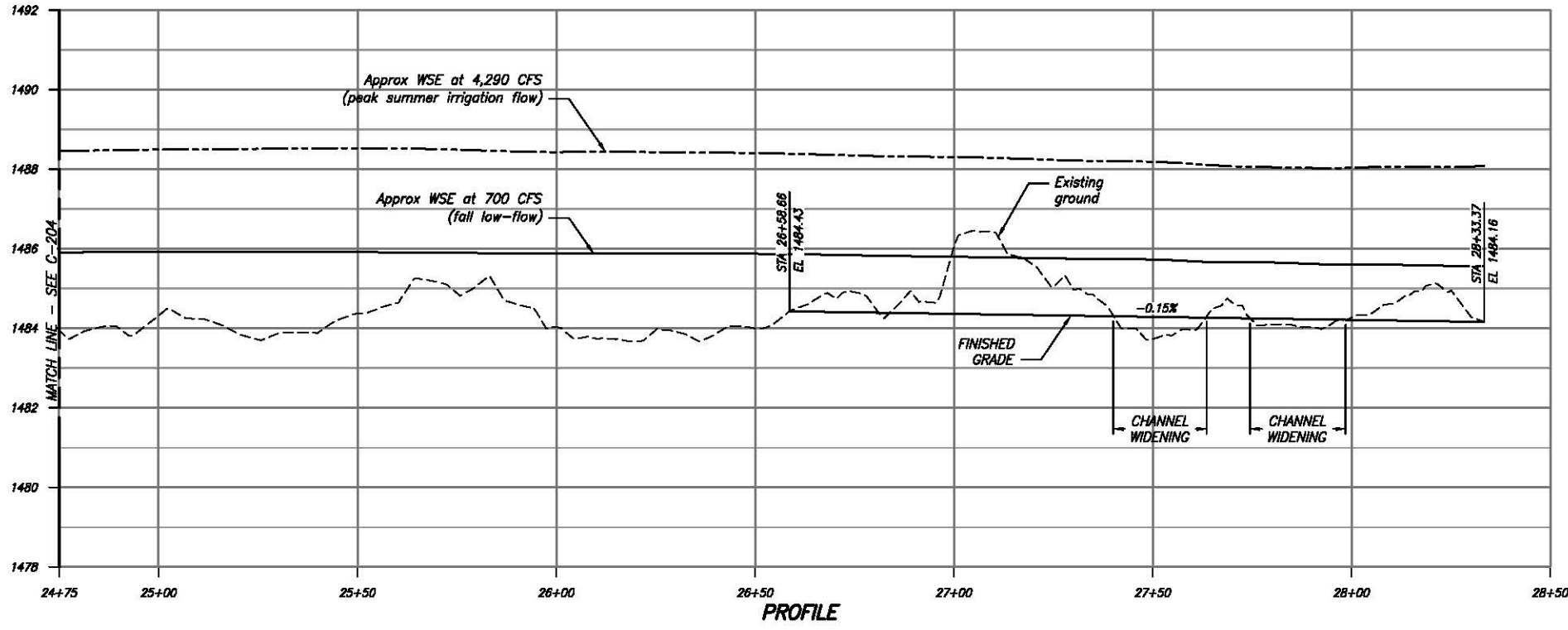
SHEET 28 OF 54
457818

NOTES

1. Retain and protect vegetation identified by ENGINEER.
2. Cleared trees shall be removed with rootwads intact, to the extent possible, and placed in the finished side channel for habitat cover as directed by ENGINEER.
3. Levee Removal, see C-121 thru C-122.
4. Excavate Side Channel 1. Embankment fill may be used for such purpose. See C-231 for typical sections. See C-251 thru C-254 for cross sections and offsets.



PLAN



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CONSTRUCTION

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YAKIMA RIVER BASIN WATER ENHANCEMENT PROJECT - WASHINGTON

SCHAKE PROPERTY
HABITAT IMPROVEMENT PROJECT

PRELIMINARY DESIGN DRAWINGS

CONTRACTOR
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YAKIMA, WA 2015-10-02

SIDE CHANNEL 2
KEY MAP AND SITE
ISOLATION

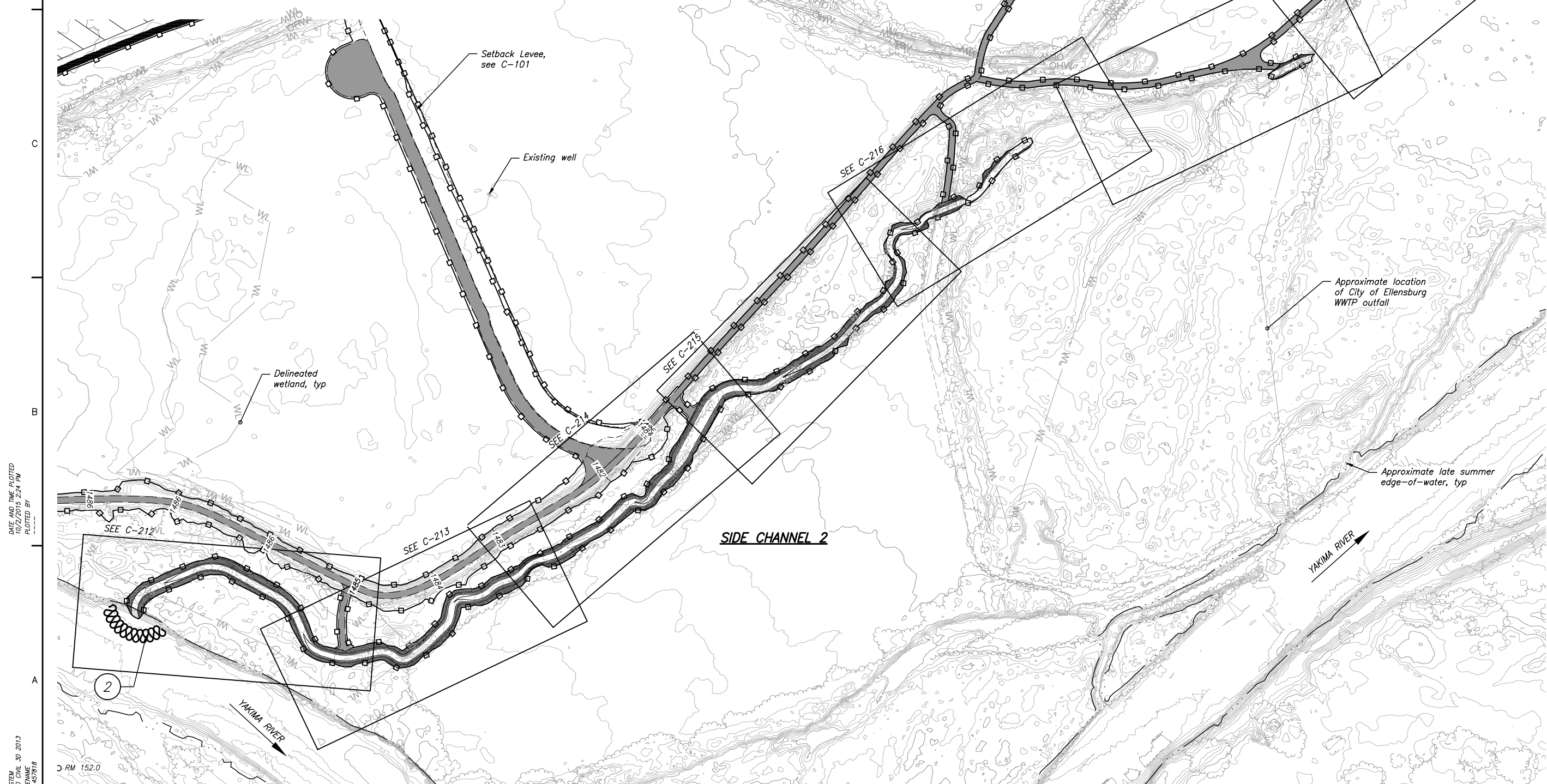
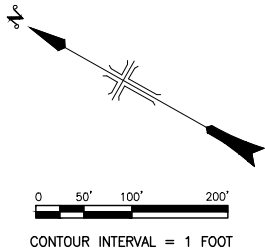
SHEET C-211

SHEET 27 OF 54

457818

NOTES

1. See C-001 for access and staging.
2. CONTRACTOR to isolate work areas from active flowing channel; during irrigation season, installed cofferdams shall not obstruct flow of water to the Tjoseem Ditch headgate. Development of final site isolation plan shall be the sole responsibility of the CONTRACTOR. Site isolation plan shall comply with all project permits.
3. CONTRACTOR to notify CONTRACTING OFFICER a minimum of 5 working days in advance of cofferdam construction to coordinate fish removal. CONTRACTING AGENCY will be responsible for all fish removal and handling.
4. Shallow groundwater expected prior to "flip-flop", approximately late August. Development of dewatering plan, if necessary, shall be sole responsibility of the Contractor.



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YAKIMA RIVER BASIN WATER ENHANCEMENT PROJECT - WASHINGTON

SCHAAKE PROPERTY
HABITAT IMPROVEMENT PROJECT

PRELIMINARY DESIGN DRAWINGS

REV NO

CONTRACTOR
DRAWN

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YAKIMA, WA 2015-10-02

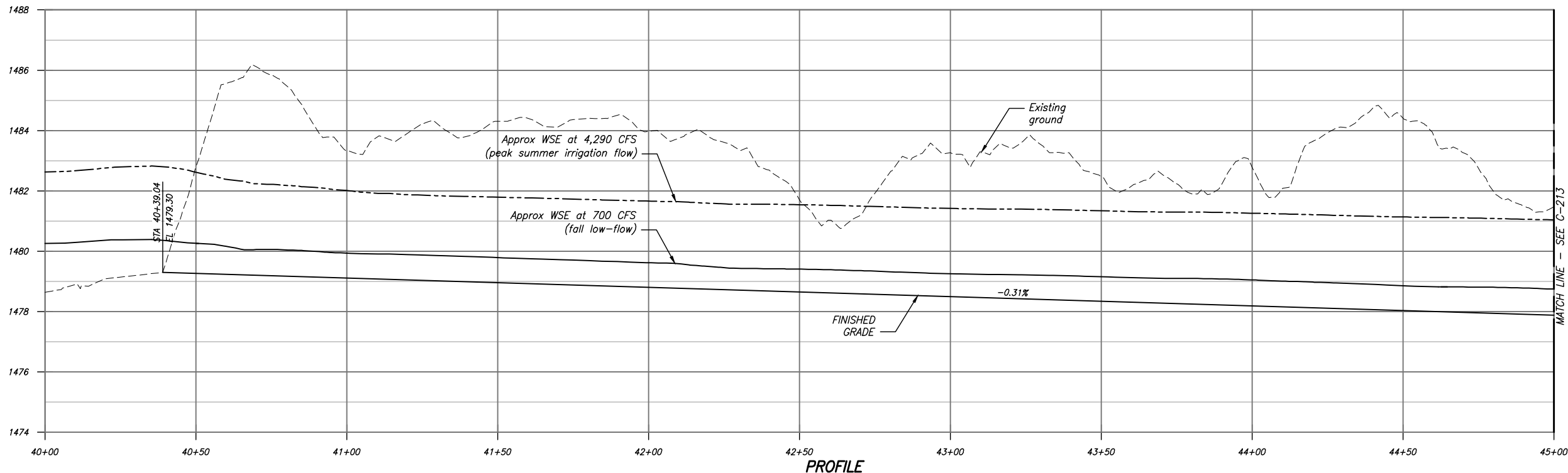
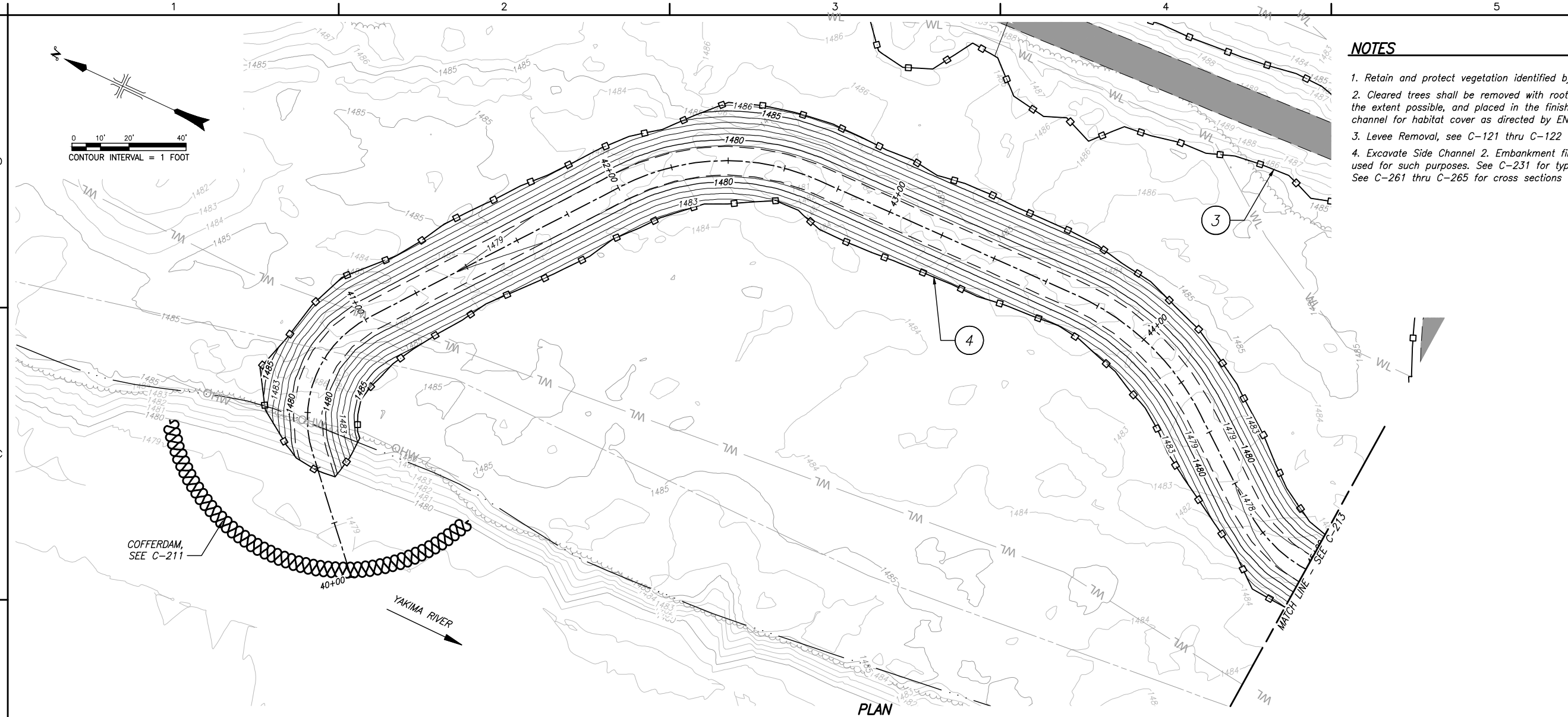
SIDE CHANNEL 2
PLAN AND PROFILE - 1

SHEET C-212

SHEET 28 OF 54
457818

NOTES

1. Retain and protect vegetation identified by ENGINEER.
2. Cleared trees shall be removed with rootwads intact, to the extent possible, and placed in the finished side channel for habitat cover as directed by ENGINEER.
3. Levee Removal, see C-121 thru C-122
4. Excavate Side Channel 2. Embankment fill may be used for such purposes. See C-231 for typical sections. See C-261 thru C-265 for cross sections and offsets.



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CAD SYSTEM
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PRELIMINARY
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CONSTRUCTION

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SCHAAKE PROPERTY
HABITAT IMPROVEMENT PROJECT

PRELIMINARY DESIGN DRAWINGS

REV NO

CONTRACTOR
DRAWN

ACCEPTED

YAKIMA, WA 2015-10-02

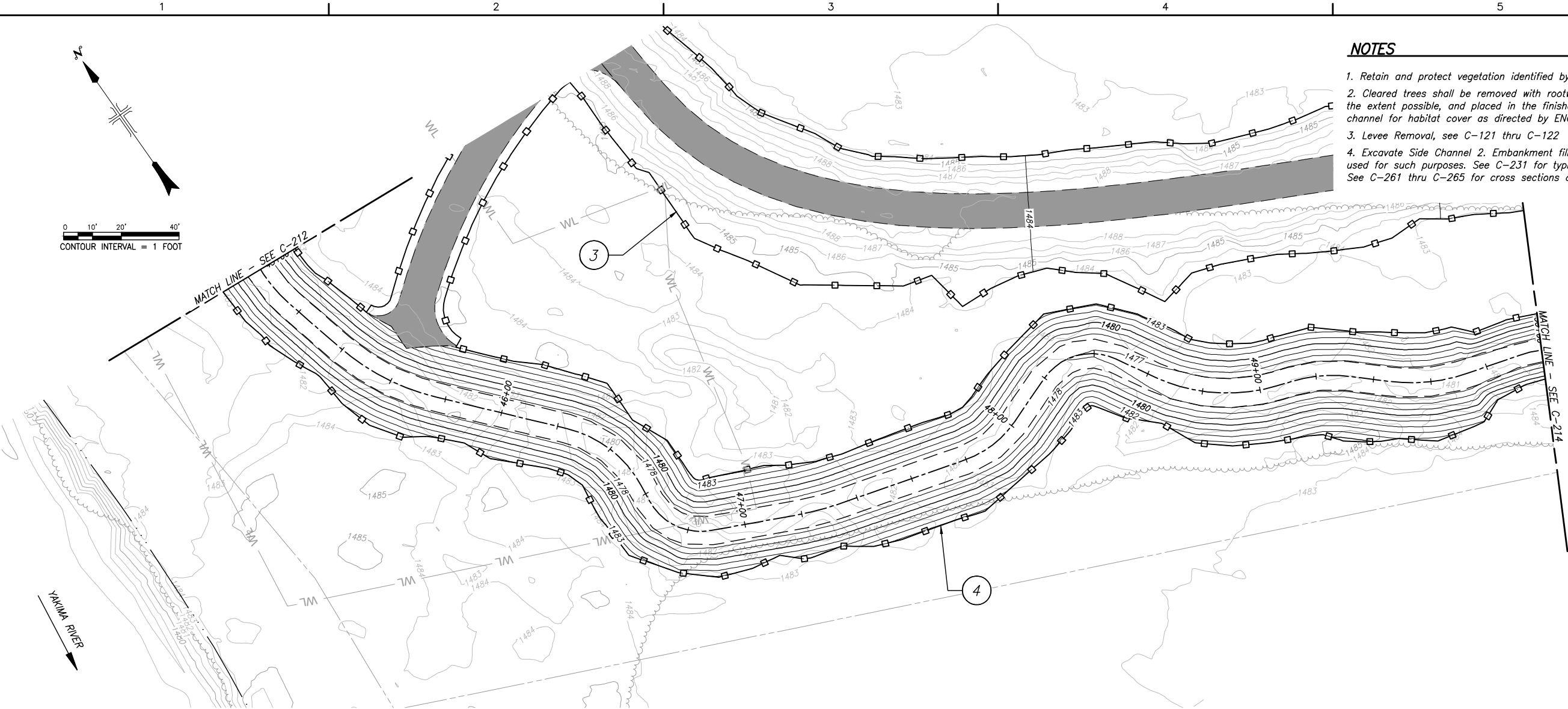
SIDE CHANNEL 2
PLAN AND PROFILE - 2

SHEET C-213

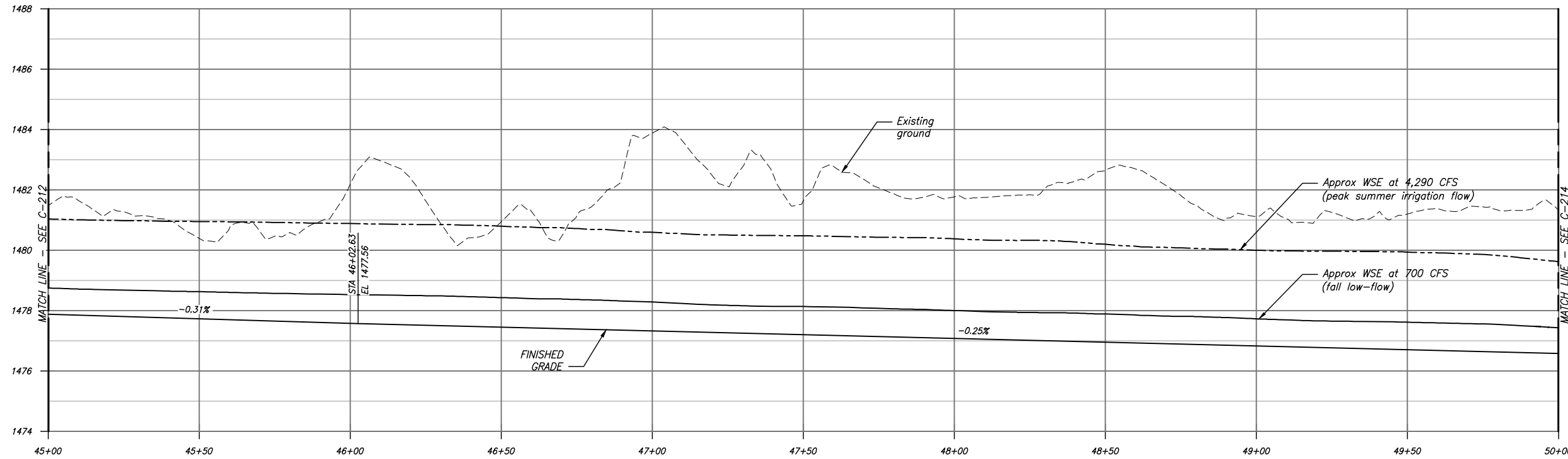
SHEET 29 OF 54
457818

NOTES

1. Retain and protect vegetation identified by ENGINEER.
2. Cleared trees shall be removed with rootwads intact, to the extent possible, and placed in the finished side channel for habitat cover as directed by ENGINEER.
3. Levee Removal, see C-121 thru C-122
4. Excavate Side Channel 2. Embankment fill may be used for such purposes. See C-231 for typical sections. See C-261 thru C-265 for cross sections and offsets.



PLAN



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CAD SYSTEM
AUTOCAD CIVIL 2013
CAD FILENAME
C-213_457818

PRELIMINARY
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CONSTRUCTION

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SCHAAKE PROPERTY
HABITAT IMPROVEMENT PROJECT

PRELIMINARY DESIGN DRAWINGS

REV NO

CONTRACTOR
DRAWN

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YAKIMA, WA 2015-10-02

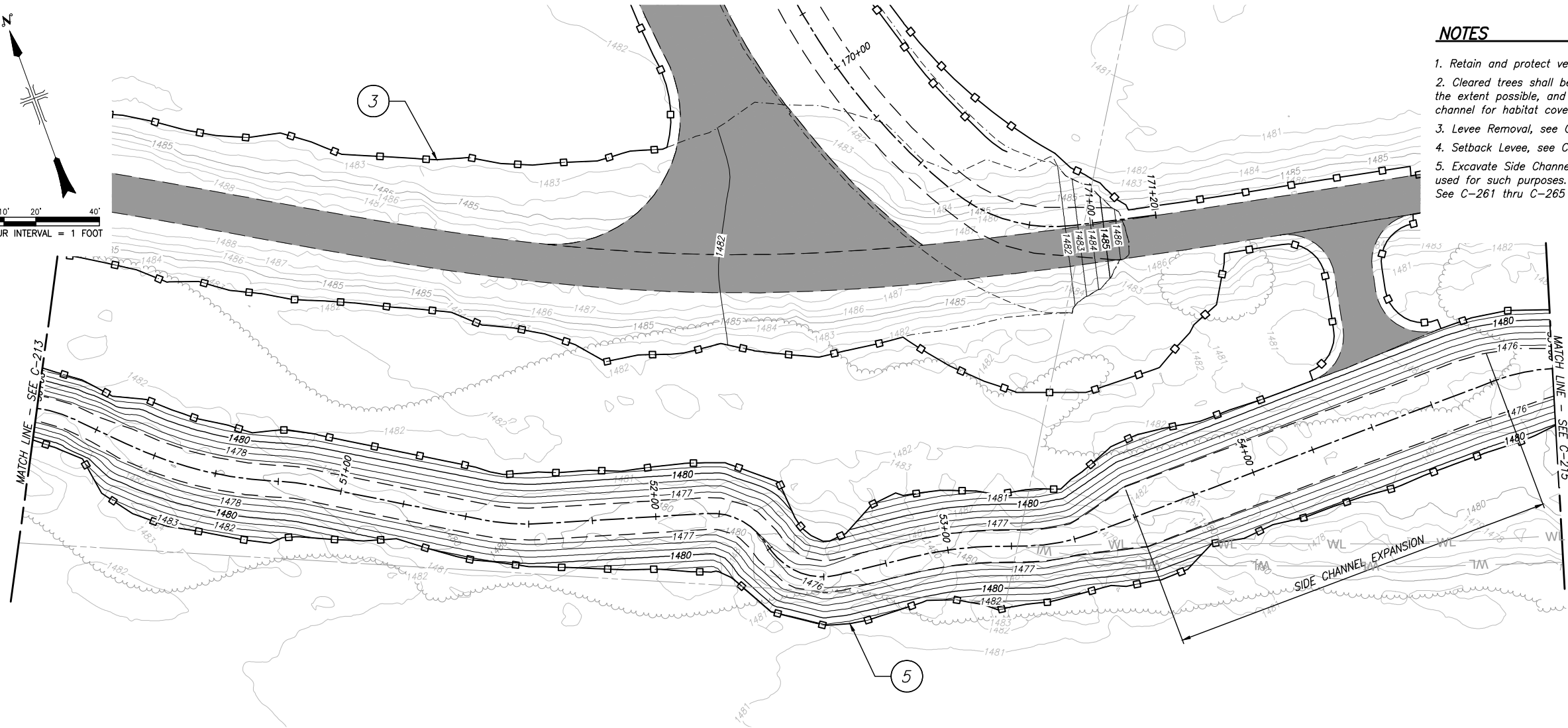
SIDE CHANNEL 2
PLAN AND PROFILE - 3

SHEET C-214

SHEET 30 OF 54
457818

NOTES

1. Retain and protect vegetation identified by ENGINEER.
2. Cleared trees shall be removed with rootwads intact, to the extent possible, and placed in the finished side channel for habitat cover as directed by ENGINEER.
3. Levee Removal, see C-121 thru C-122
4. Setback Levee, see C-102 thru C-108
5. Excavate Side Channel 2. Embankment fill may be used for such purposes. See C-231 for typical sections. See C-261 thru C-265 for cross sections and offsets.



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CONSTRUCTION

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SCHAKE PROPERTY
HABITAT IMPROVEMENT PROJECT

PRELIMINARY DESIGN DRAWINGS

REV NO

CONTRACTOR
DRAWN

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YAKIMA, WA 2015-10-02

SIDE CHANNEL 2
PLAN AND PROFILE - 4

SHEET C-215

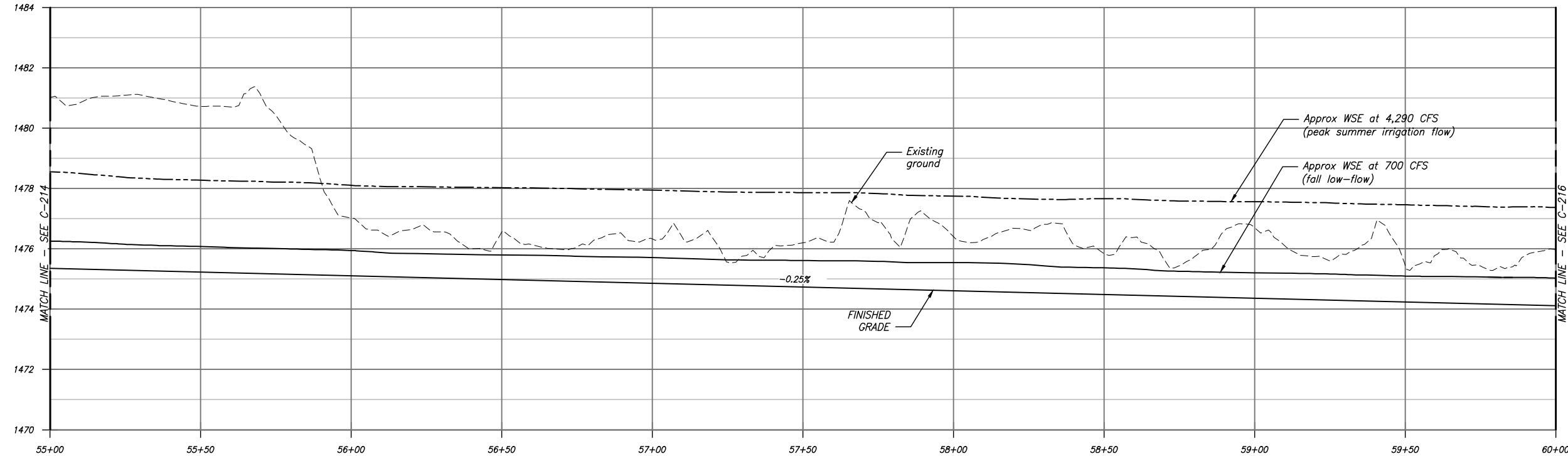
SHEET 31 OF 54
457818

NOTES

1. Retain and protect vegetation identified by ENGINEER.
2. Cleared trees shall be removed with rootwads intact, to the extent possible, and placed in the finished side channel for habitat cover as directed by ENGINEER.
3. Excavate Side Channel 2. Embankment fill may be used for such purposes. See C-231 for typical sections. See C-261 thru C-265 for cross sections and offsets.



PLAN



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CONSTRUCTION

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SCHAAKE PROPERTY
HABITAT IMPROVEMENT PROJECT

PRELIMINARY DESIGN DRAWINGS

CONTRACTOR
DRAWN

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YAKIMA, WA 2015-10-02

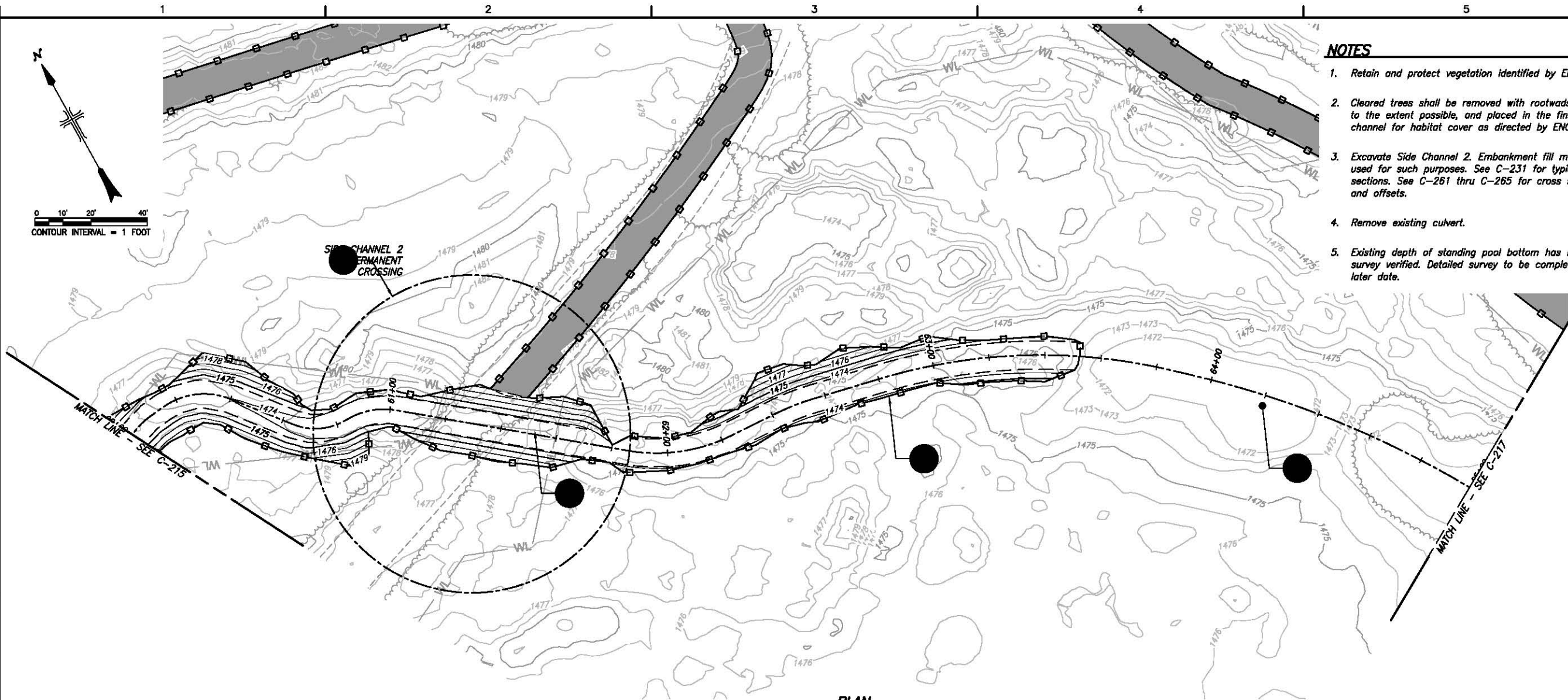
SIDE CHANNEL 2
PLAN AND PROFILE - 5

SHEET C-216

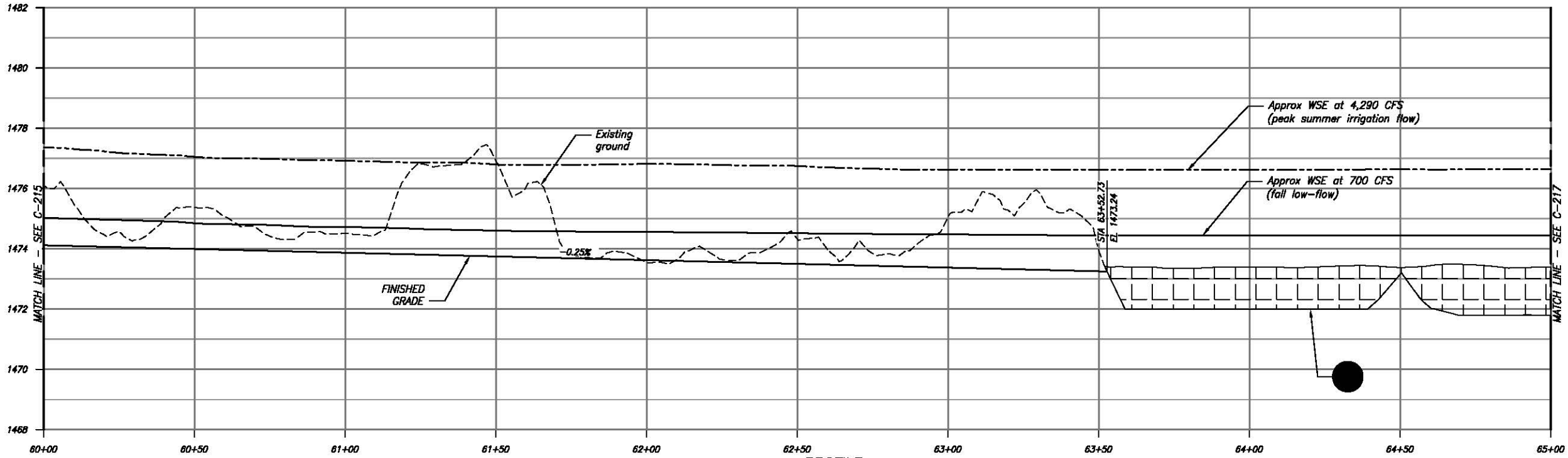
SHEET 32 OF 54
457818

NOTES

1. Retain and protect vegetation identified by ENGINEER.
2. Cleared trees shall be removed with rootwads intact, to the extent possible, and placed in the finished side channel for habitat cover as directed by ENGINEER.
3. Excavate Side Channel 2. Embankment fill may be used for such purposes. See C-231 for typical sections. See C-261 thru C-265 for cross sections and offsets.
4. Remove existing culvert.
5. Existing depth of standing pool bottom has not been survey verified. Detailed survey to be completed at a later date.



PLAN



PROFILE

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PRELIMINARY
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CONSTRUCTION

ch2m:

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DRAWN
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YAKIMA RIVER BASIN WATER ENHANCEMENT PROJECT - WASHINGTON

SCHAAKE PROPERTY
HABITAT IMPROVEMENT PROJECT

PRELIMINARY DESIGN DRAWINGS

CONTRACTOR
DRAWN

ACCEPTED

YAKIMA, WA 2015-10-02

SIDE CHANNEL 2
PLAN AND PROFILE - 6

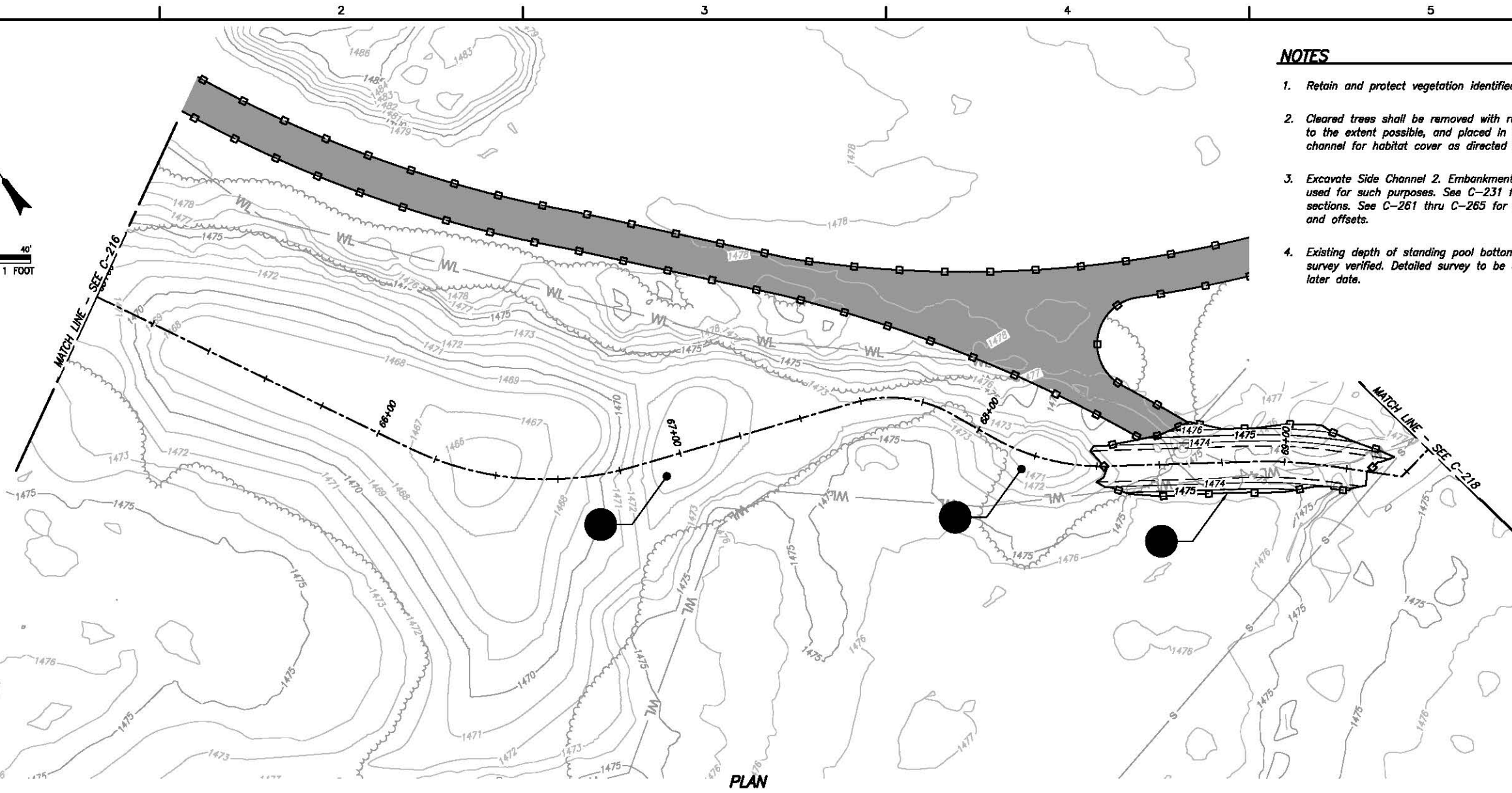
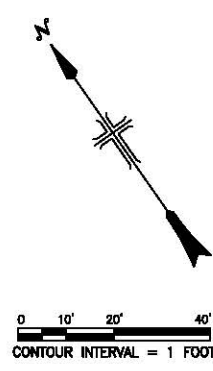
SHEET C-217

SHEET 33 OF 54

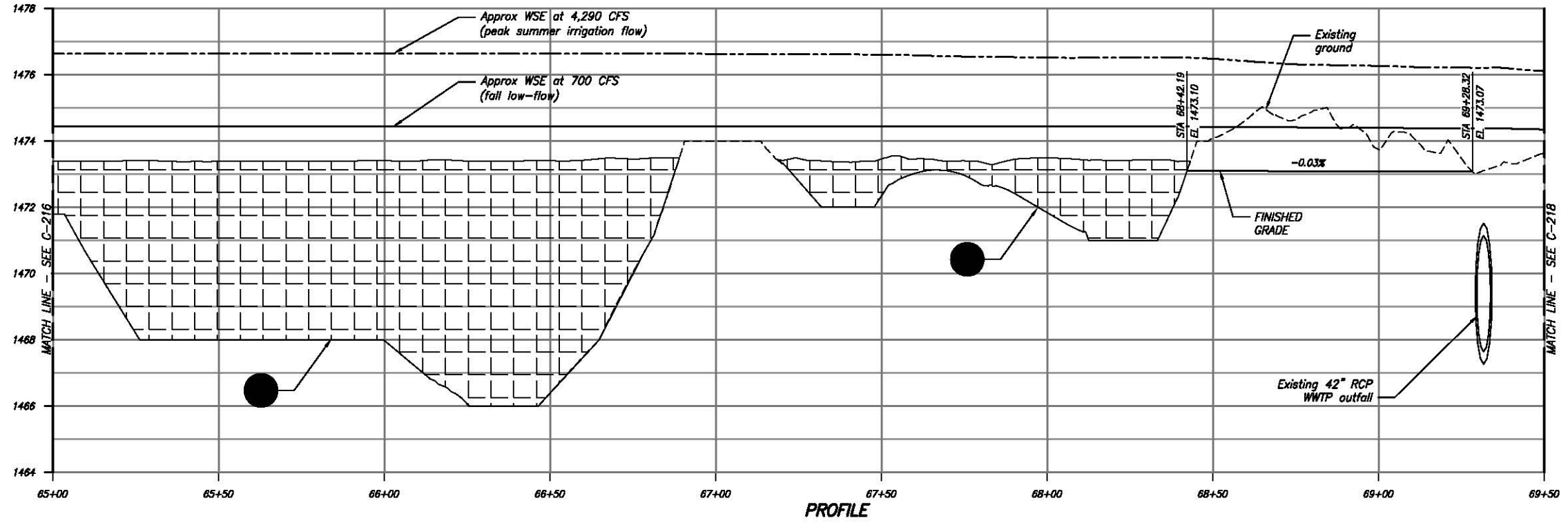
457818

NOTES

1. Retain and protect vegetation identified by ENGINEER.
2. Cleared trees shall be removed with rootwads intact, to the extent possible, and placed in the finished side channel for habitat cover as directed by ENGINEER.
3. Excavate Side Channel 2. Embankment fill may be used for such purposes. See C-231 for typical sections. See C-261 thru C-265 for cross sections and offsets.
4. Existing depth of standing pool bottom has not been survey verified. Detailed survey to be completed at a later date.



PLAN



PROFILE

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PRELIMINARY
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CONSTRUCTION

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وَأَمَّا الْفُلُ فَأُرْسِلَتْ بِرَحْمَةٍ مِنَّا لِيُبَيِّنَ مَا بَيْنَ أَيْمَانِهِ هَذِهِ وَأَيْمَانِ ذُو الْأُنْثَىٰ هَذِهِ ۚ

CRIMINAL

CREATED

ACCEPTED

 ALWAYS THINK SAFETY

**U.S. DEPARTMENT OF THE INTERIOR
BUREAU OF RECLAMATION**

**SCHAAKE PROPERTY
HABITAT IMPROVEMENT PROJECT**

PRELIMINARY DESIGN DRAWINGS

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CONTRACTOR
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YAKIMA, WA 2015-10-02

SIDE CHANNEL 2
PLAN AND PROFILE - 7

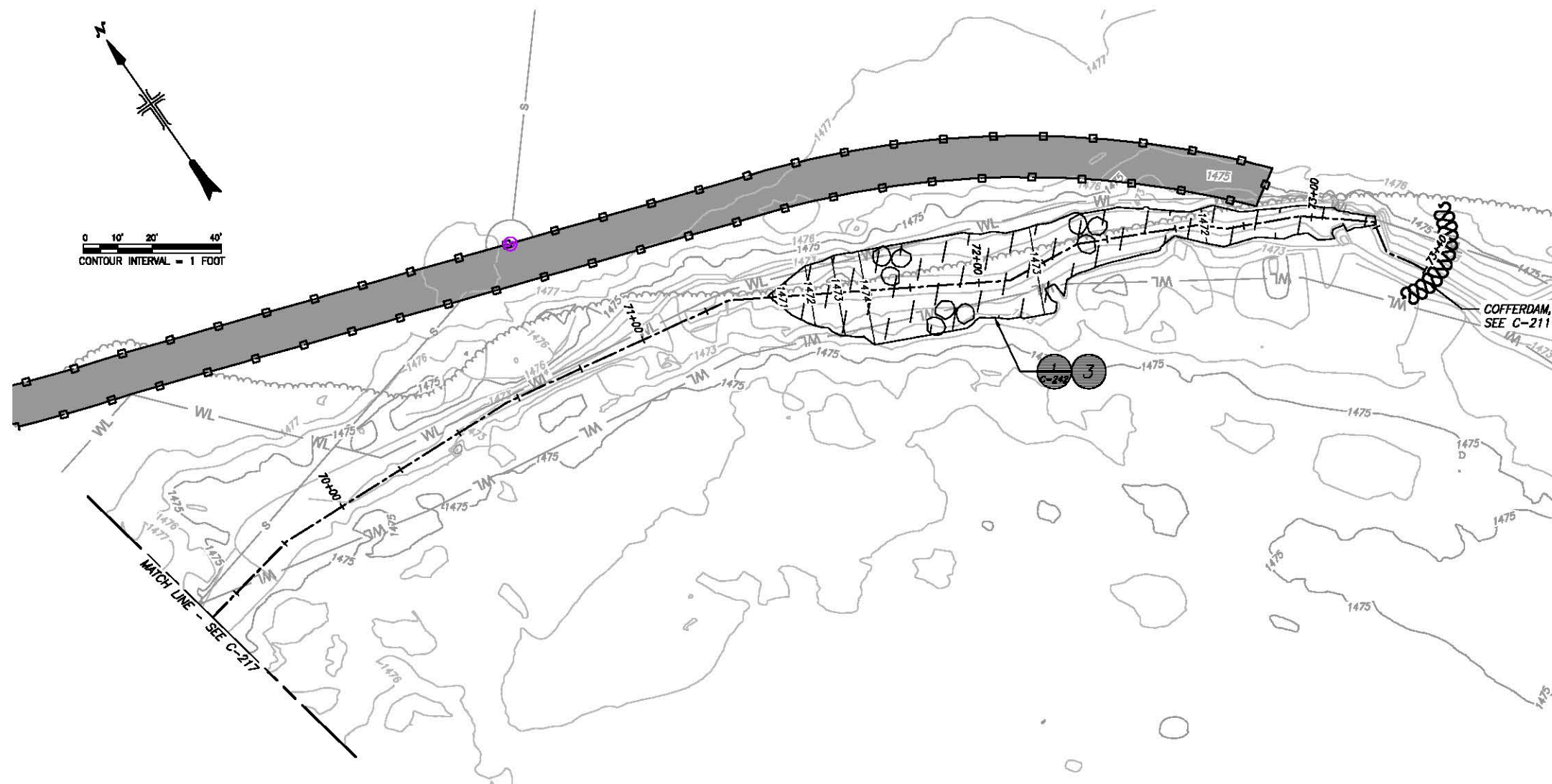
SHEET C-218

SHEET 34 OF 54

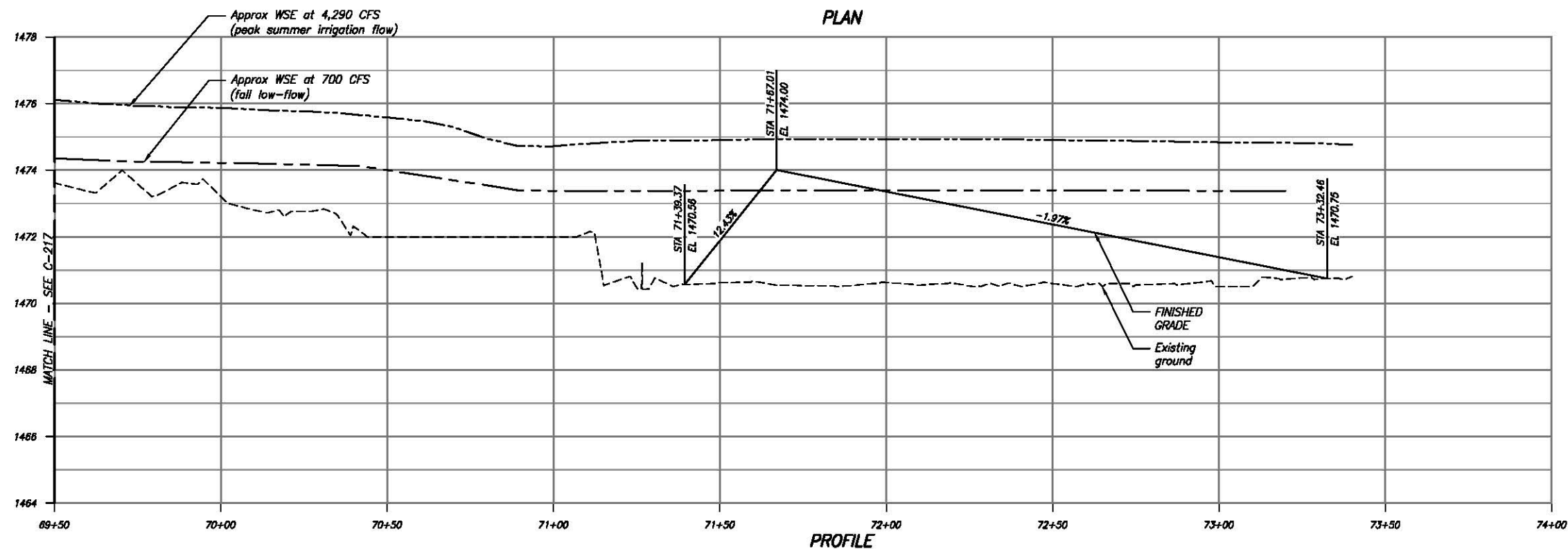
45781

NOTES

1. Retain and protect vegetation identified by ENGINEER.
2. Cleared trees shall be removed with rootwads intact, to the extent possible, and placed in the finished side channel for habitat cover as directed by ENGINEER.
3. Place constructed riffle. See detail for limits.



PLAN



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YAKIMA RIVER BASIN WATER ENHANCEMENT PROJECT - WASHINGTON

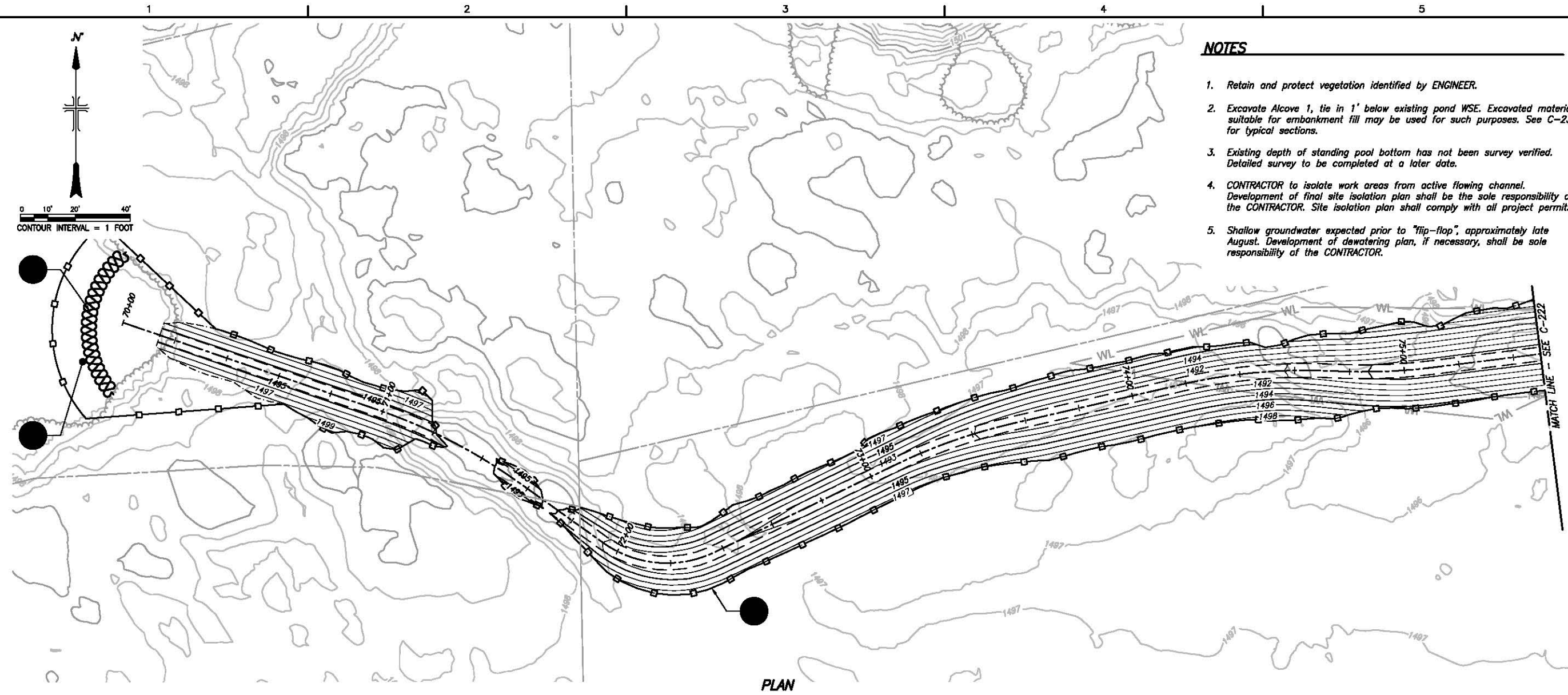
SCHAAKE PROPERTY
HABITAT IMPROVEMENT PROJECT

PRELIMINARY DESIGN DRAWINGS

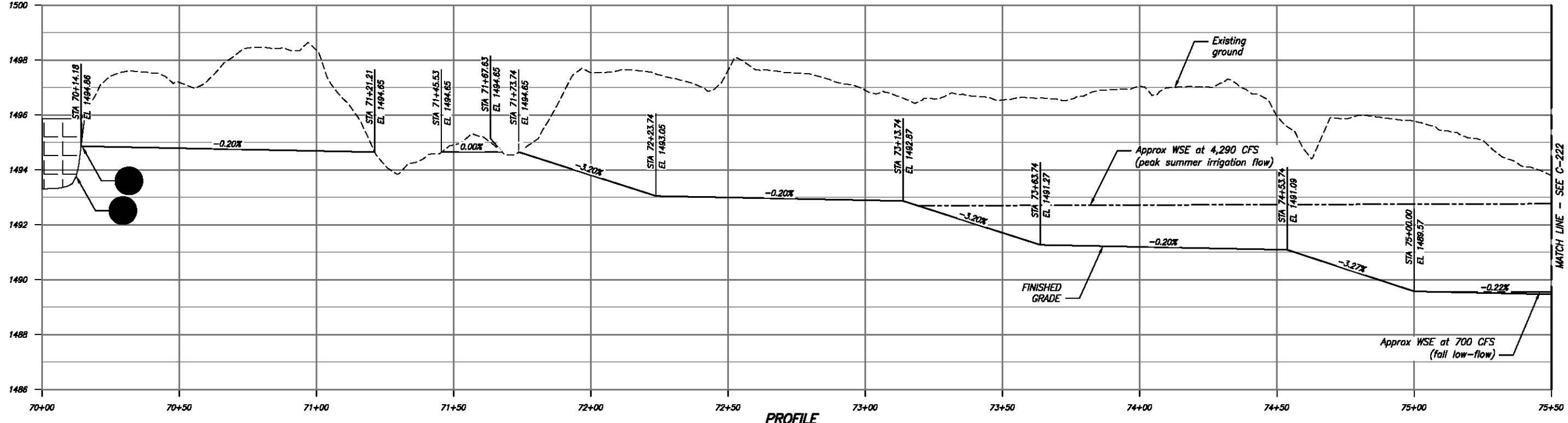
CONTRACTOR DRAWN
ACCEPTED
YAKIMA, WA 2015-10-19

NOTES

1. Retain and protect vegetation identified by ENGINEER.
2. Excavate Alcove 1, tie in 1' below existing pond WSE. Excavated material suitable for embankment fill may be used for such purposes. See C-231 for typical sections.
3. Existing depth of standing pool bottom has not been survey verified. Detailed survey to be completed at a later date.
4. CONTRACTOR to isolate work areas from active flowing channel. Development of final site isolation plan shall be the sole responsibility of the CONTRACTOR. Site isolation plan shall comply with all project permits.
5. Shallow groundwater expected prior to "flip-flop", approximately late August. Development of dewatering plan, if necessary, shall be sole responsibility of the CONTRACTOR.



PLAN



PROFILE

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10/19/2015 6:50 AM
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CAD SYSTEM
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CADD FILENAME
C-221_457818

PRELIMINARY
NOT FOR
CONSTRUCTION

ch2m:

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YAKIMA RIVER BASIN WATER ENHANCEMENT PROJECT - WASHINGTON

SCHAAKE PROPERTY
HABITAT IMPROVEMENT PROJECT

PRELIMINARY DESIGN DRAWINGS

CONTRACTOR
DRAWN

ACCEPTED

YAKIMA, WA 2015-10-19

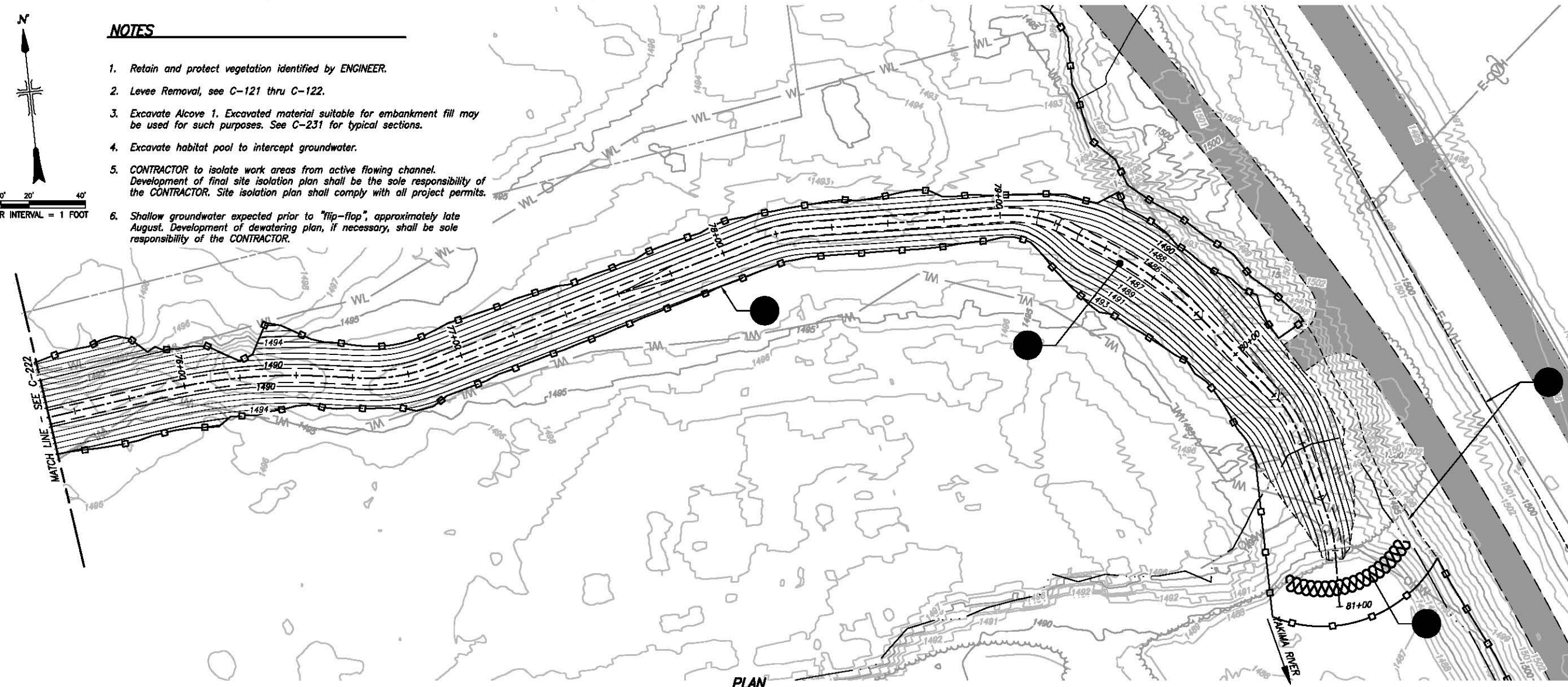
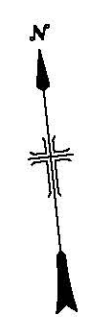
ALCOVE 1
PLAN AND PROFILE - 2

SHEET C-222
SHEET 38 OF 54
457818

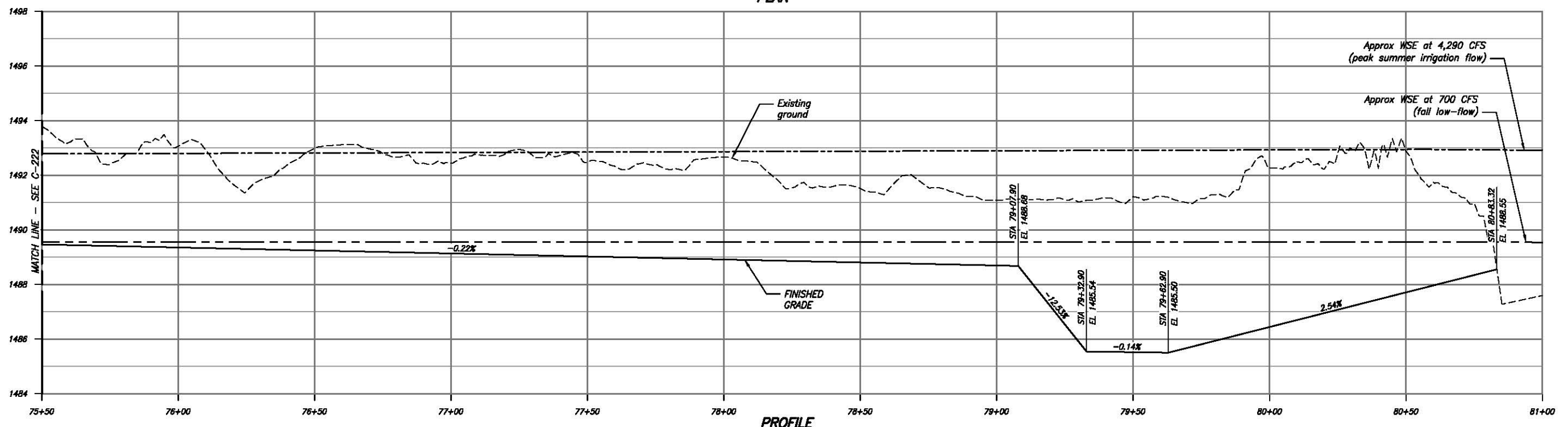
NOTES

1. Retain and protect vegetation identified by ENGINEER.
2. Levee Removal, see C-121 thru C-122.
3. Excavate Alcove 1. Excavated material suitable for embankment fill may be used for such purposes. See C-231 for typical sections.
4. Excavate habitat pool to intercept groundwater.
5. CONTRACTOR to isolate work areas from active flowing channel. Development of final site isolation plan shall be the sole responsibility of the CONTRACTOR. Site isolation plan shall comply with all project permits.
6. Shallow groundwater expected prior to "flip-flop", approximately late August. Development of dewatering plan, if necessary, shall be sole responsibility of the CONTRACTOR.

0 10' 20' 40'
CONTOUR INTERVAL = 1 FOOT



PLAN



PROFILE

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10/19/2015 1:07 PM
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CAD SYSTEM
AUTOCAD 2013
CADD FILENAME
C-222_457818

PRELIMINARY
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SCHAAKE PROPERTY
HABITAT IMPROVEMENT PROJECT

PRELIMINARY DESIGN DRAWINGS

CONTRACTOR
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ACCEPTED

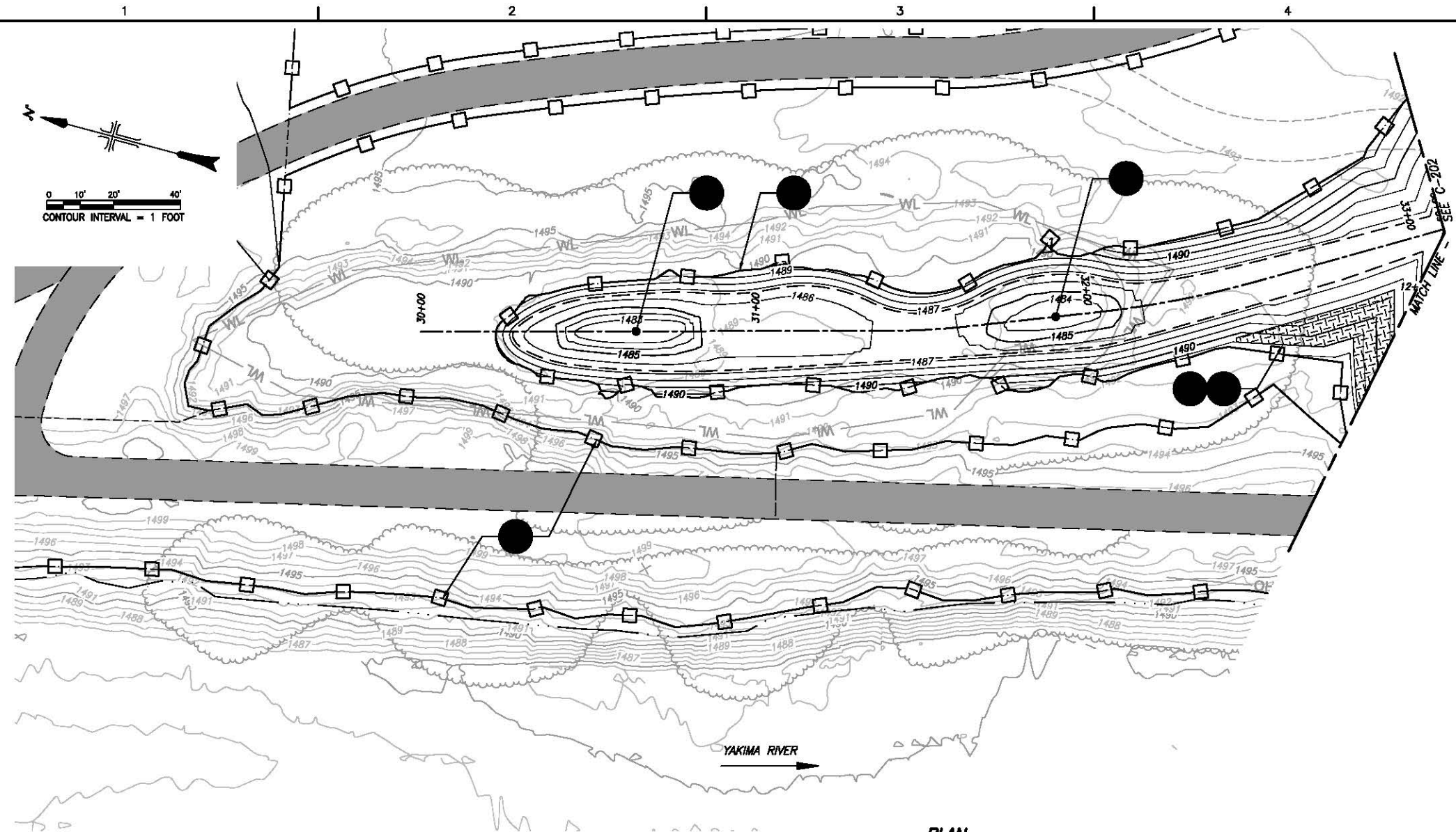
YAKIMA, WA 2015-10-02

ALCOVE 2
PLAN AND PROFILE

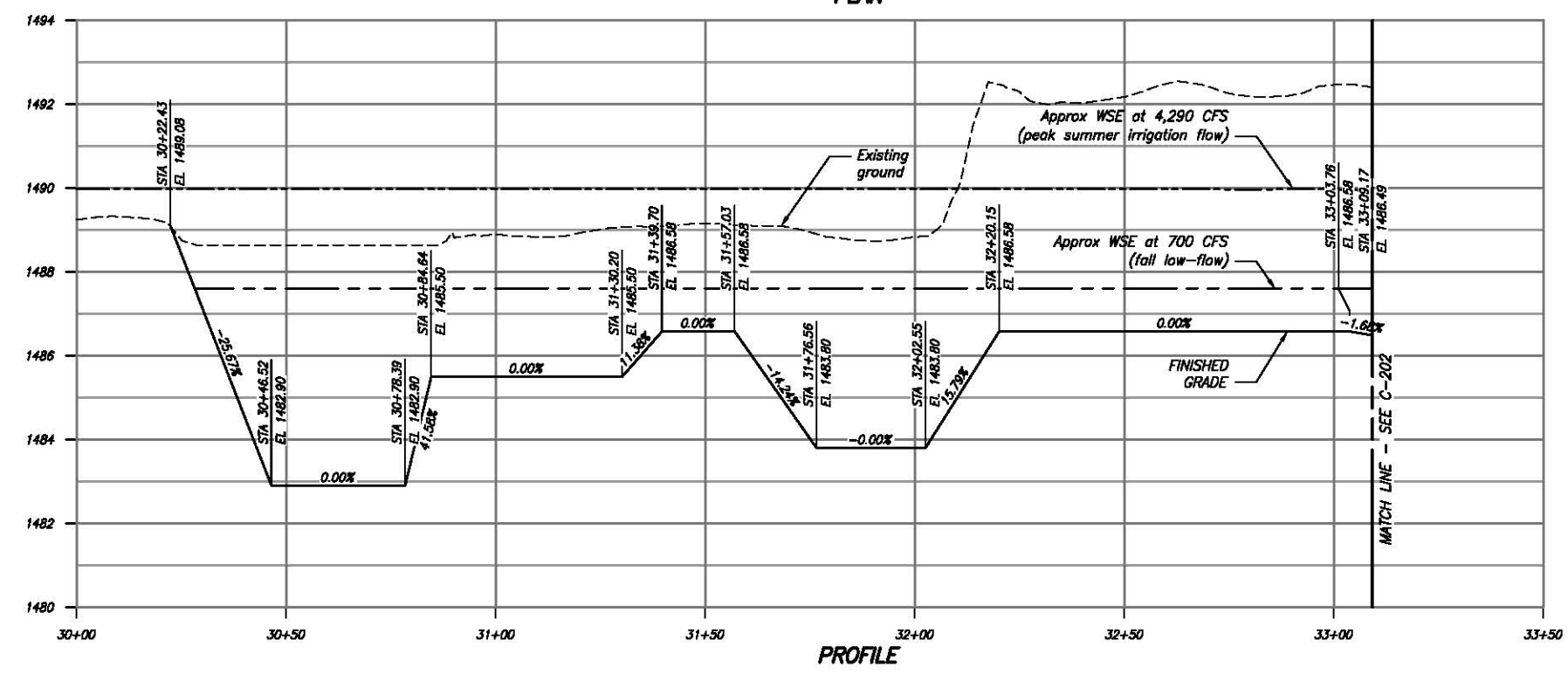
SHEET C-223
SHEET 37 OF 54
457818

NOTES

1. Retain and protect vegetation, identified by ENGINEER.
2. Cleared trees shall be removed with rootwads intact, to the extent possible, and placed in the finished side channel for habitat cover as directed by ENGINEER.
3. Levee Removal, see C-121 thru C-122.
4. Excavate Alcove 2. See C-231 for typical sections.
5. Excavate habitat pool to intercept groundwater.
6. Construct FESL. See detail for limits.



PLAN



PROFILE

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CONSTRUCTION

ch2m:

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DRAWN
CHECKED
ACCEPTED

ALWAYS THINK SAFETY

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BUREAU OF RECLAMATION
YAKIMA RIVER BASIN WATER ENHANCEMENT PROJECT - WASHINGTON

SCHAAKE PROPERTY
HABITAT IMPROVEMENT PROJECT

PRELIMINARY DESIGN DRAWINGS

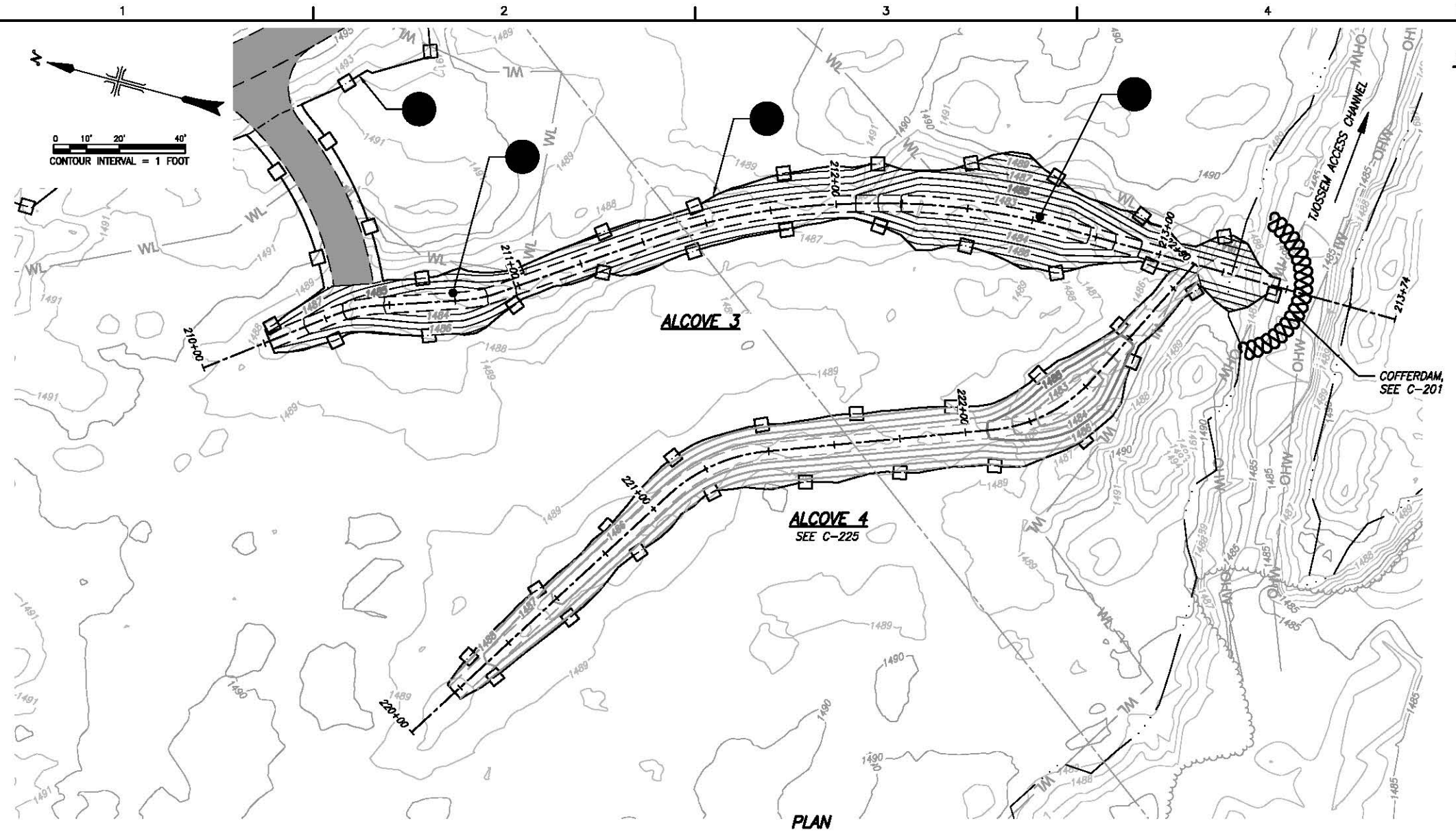
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ACCEPTED
YAKIMA, WA 2015-10-02

ALCOVE 3
PLAN AND PROFILE

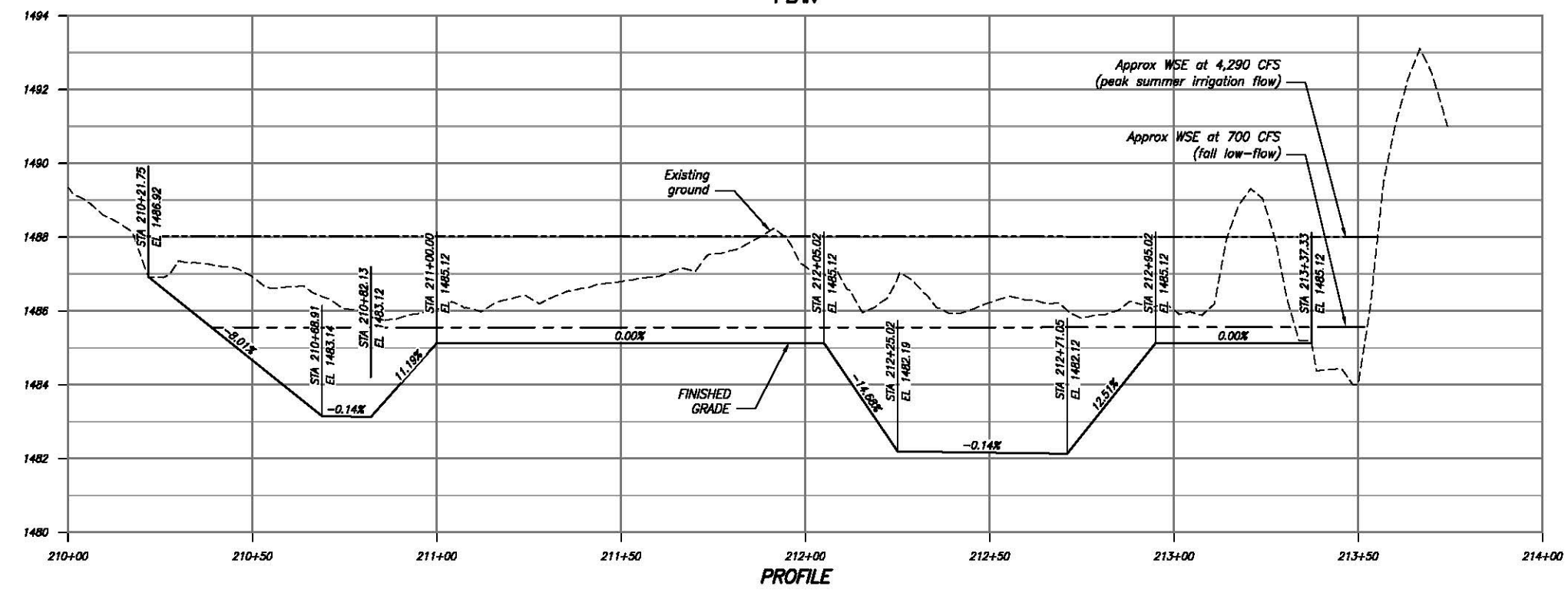
SHEET C-224
SHEET 38 OF 54
457818

NOTES

1. Retain and protect vegetation, identified by ENGINEER.
2. Cleared trees shall be removed with rootwads intact, to the extent possible, and placed in the finished side channel for habitat cover as directed by ENGINEER.
3. Levee Removal, see C-121 thru C-122.
4. Excavate Alcove 3. See C-231 for typical sections.
5. Excavate habitat pool to intercept groundwater.



PLAN



PROFILE

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CAD FILENAME
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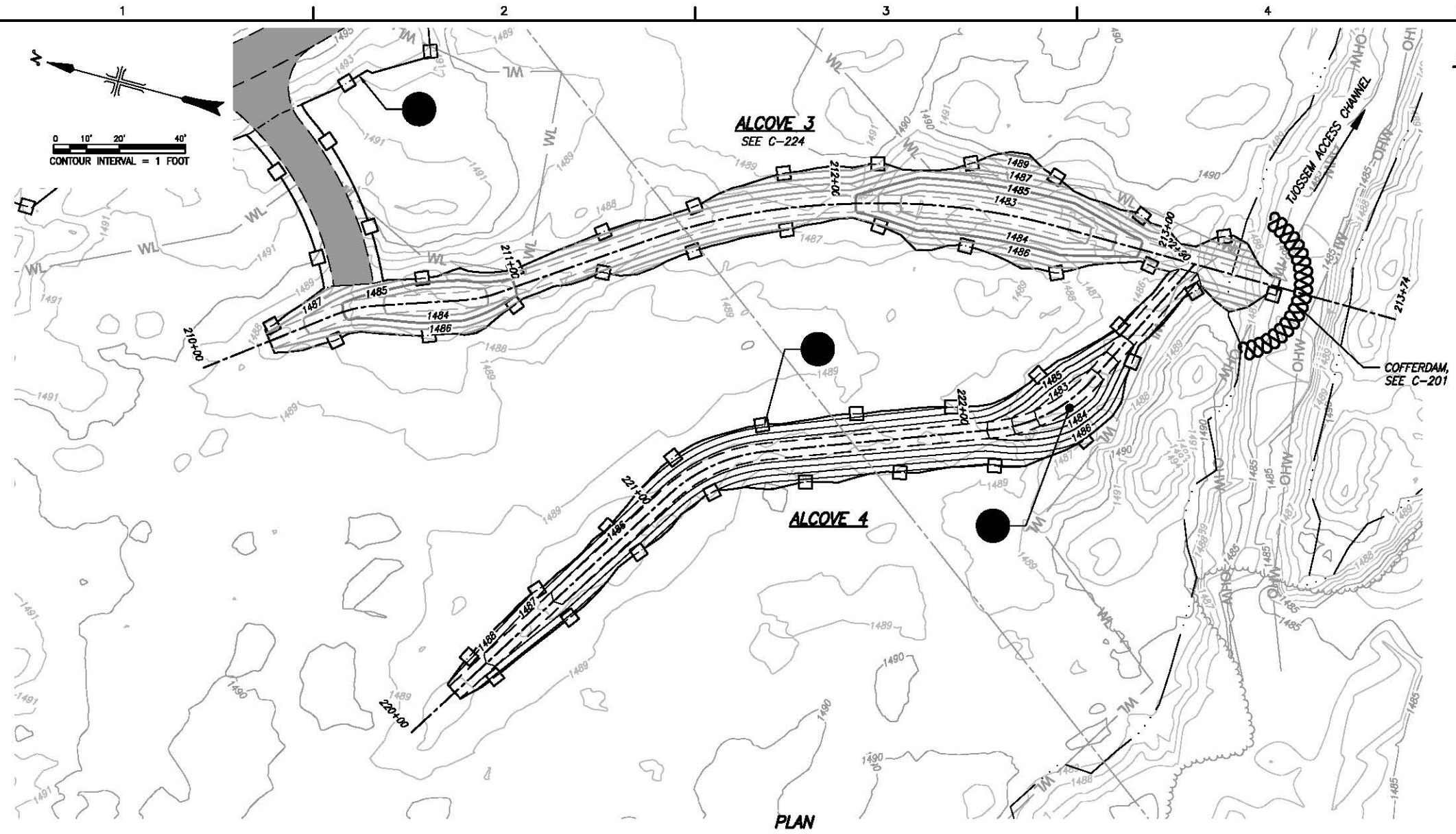
U.S. DEPARTMENT OF THE INTERIOR
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YAKIMA RIVER BASIN WATER ENHANCEMENT PROJECT - WASHINGTON

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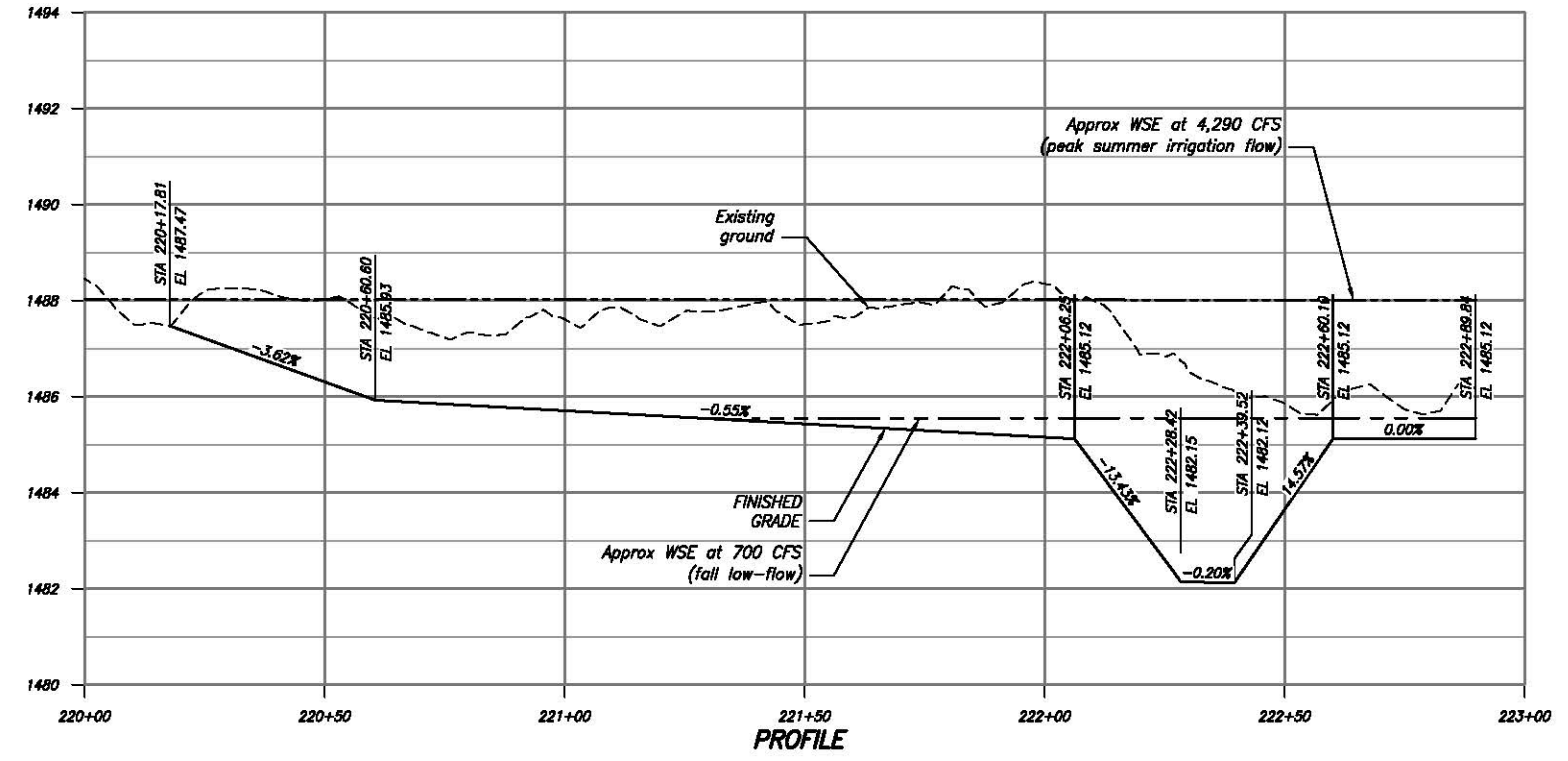
PRELIMINARY DESIGN DRAWINGS

NOTES

1. Retain and protect vegetation, identified by ENGINEER.
2. Cleared trees shall be removed with rootwads intact, to the extent possible, and placed in the finished side channel for habitat cover as directed by ENGINEER.
3. Levee Removal, see C-121 thru C-122.
4. Excavate Alcove 4. See C-231 for typical sections.
5. Excavate habitat pool to intercept groundwater.



PLAN



PROFILE

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10/2/2015 8:21 PM
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AUTOCAD 2013
CAD FILENAME
C-225_457818

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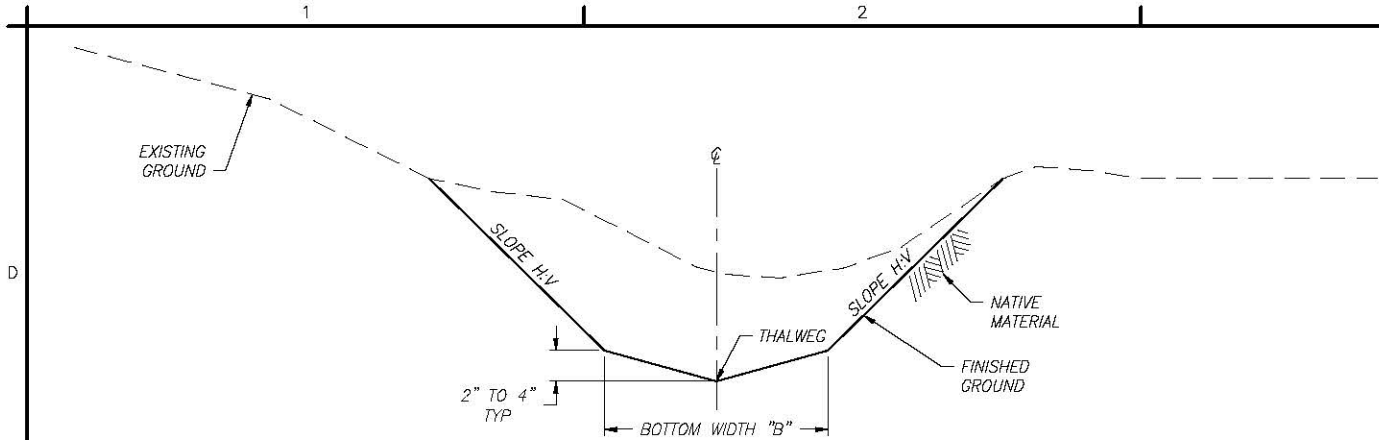
ALCOVE 4
PLAN AND PROFILE

SHEET C-225

SHEET 39 OF 54
457818

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C-231_457818

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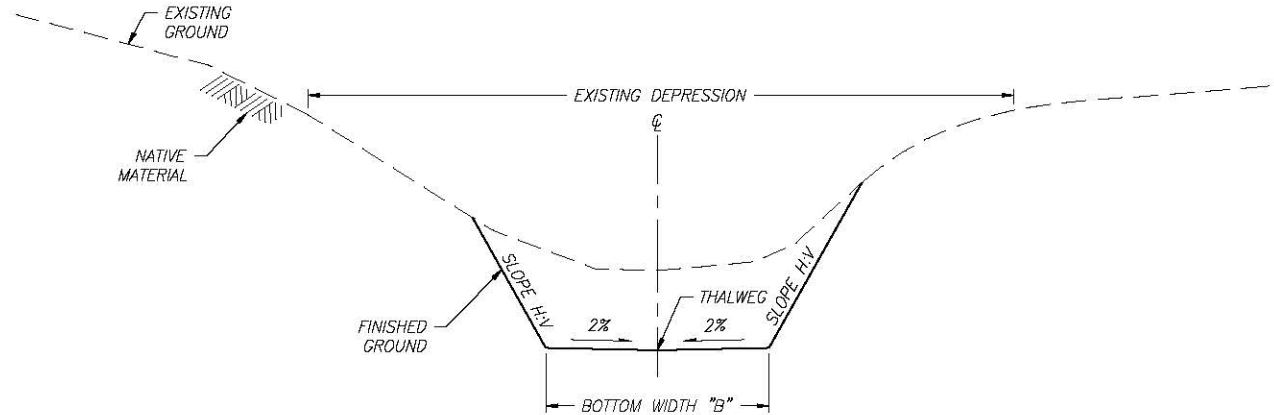


RIFFLE/RUN SECTIONS				
ALCOVE/SIDE CHANNEL ID	UPSTREAM STATION	DOWNSTREAM STATION	BOTTOM WIDTH "B"	SLOPE (H:V)
SC2	40+39	49+73	10	2:1
SC2	49+73	49+80	Varies	Varies
SC2	49+80	50+20	8	1.5:1
SC2	50+20	50+30	Varies	Varies
SC2	50+30	53+40	10	2:1
SC2	53+40	53+60	Varies	2:1
SC2	53+60	54+70	20	2:1
SC2	54+70	55+10	Varies	2:1
SC2	55+10	63+52	10	2:1
SC2	68+42	69+28	10	2:1

NOTES

1. Typical cross section horizontal control and vertical control shall be about the thalweg point.
2. Stabilize slope and re-vegetate per 1) grading plan and profiles and 2) planting plan.

TYPICAL SECTION – RIFFLE/RUN
SCALE: NTS



ALCOVES				
ALCOVE/SIDE CHANNEL ID	UPSTREAM STATION	DOWNSTREAM STATION	BOTTOM WIDTH "B"	SLOPE (H:V)
AL1	70+14	71+21	5	2:1
AL1	71+45	71+67	5	2:1
AL1	71+73	80+83	5	2:1
AL2	30+22	33+09	VARIES	VARIES
AL3	210+21	213+37	5	2:1
AL4	220+17	222+89	5	2:1

NOTES

1. Typical cross section horizontal control and vertical control shall be about the thalweg point.
2. Stabilize slope and re-vegetate per planting plan.

TYPICAL SECTION – ALCOVES
SCALE: NTS

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Managing Water in the West

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PRELIMINARY DESIGN DRAWINGS

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GRADING DETAILS
TYPICAL CROSS SECTIONS

SHEET C-231
SHEET 40 OF 54
457818

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PRELIMINARY DESIGN DRAWINGS

REV NO

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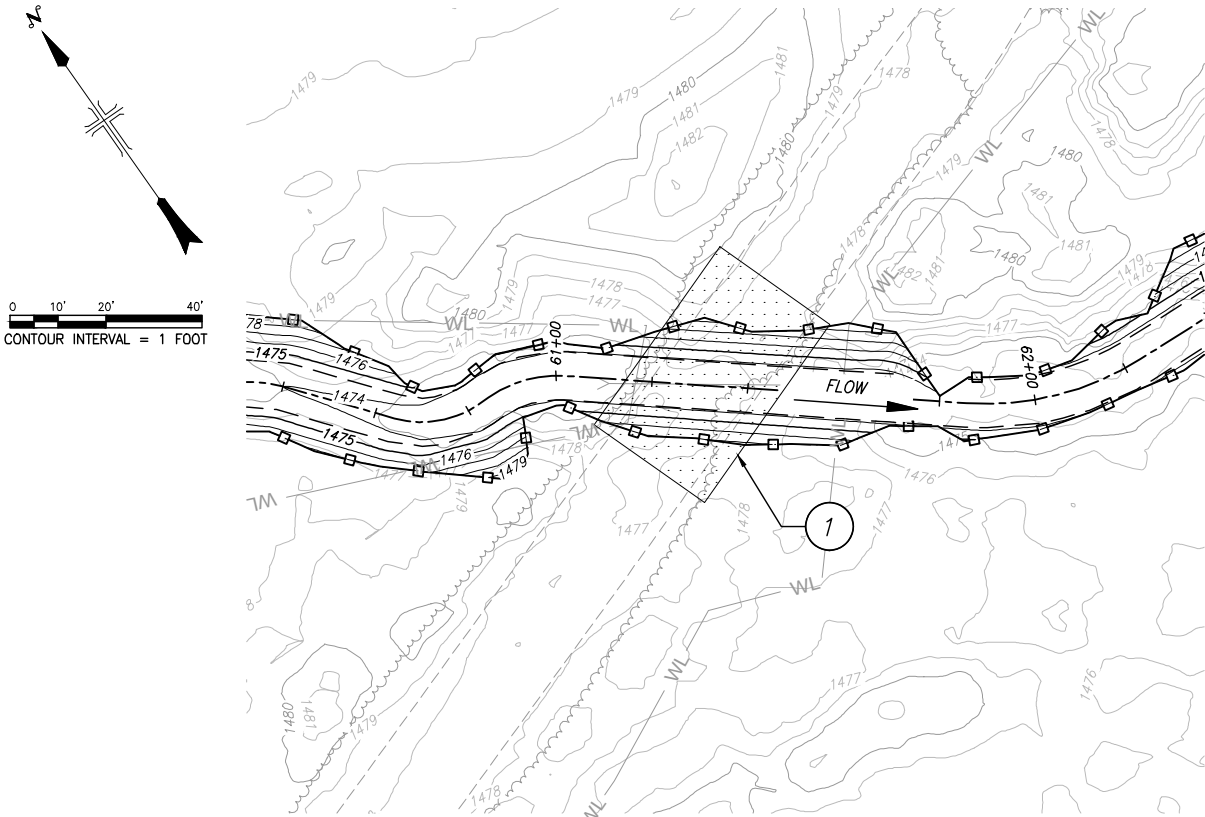
ACCEPTED

YAKIMA, WA 2015-09-30

SIDE CHANNEL 2
CROSSING DETAILS

SHEET C-241

SHEET Value OF 52
457818



1 SIDE CHANNEL 2 - PERMANENT CROSSING
NTS

NOTE

1. Side channel 2 crossing to provide permanent access to City of Ellensburg WWTP outfall.
2. Three potential options for the permanent stream crossing are provided for stakeholder review, discussion and selection. Detailed design of selected alternative will be provided as part of the 60% design package.



Option 2: Open-bottom steel plate arch culvert
(Photo Reference: HDS-5 [USDOT, 2012])



Option 1: Precast concrete box culvert with placed streambed material bottom
(Photo Reference: NOAA celebrates Recovery Act project restoring salt marsh and fish passage on Cape Cod [NOAA, 2011])



Option 3: Pre-cast concrete bridge supported on pre-cast concrete blocks (Chumstick Creek Driveway and Bridges Project, Chelan County)

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HABITAT IMPROVEMENT PROJECT

PRELIMINARY DESIGN DRAWINGS

REV NO

CONTRACTOR
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YAKIMA, WA 2015-10-02

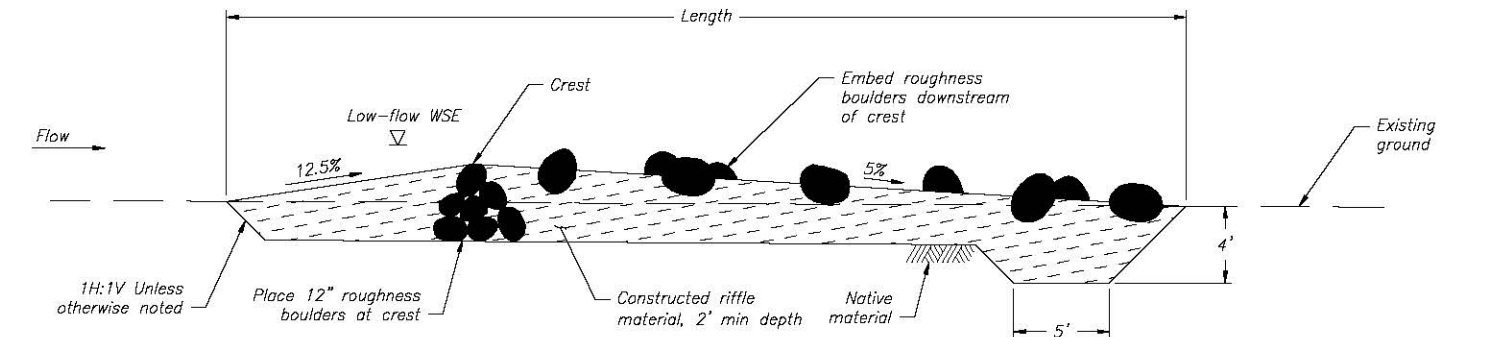
CONSTRUCTED RIFFLE
DETAILS

SHEET C-242

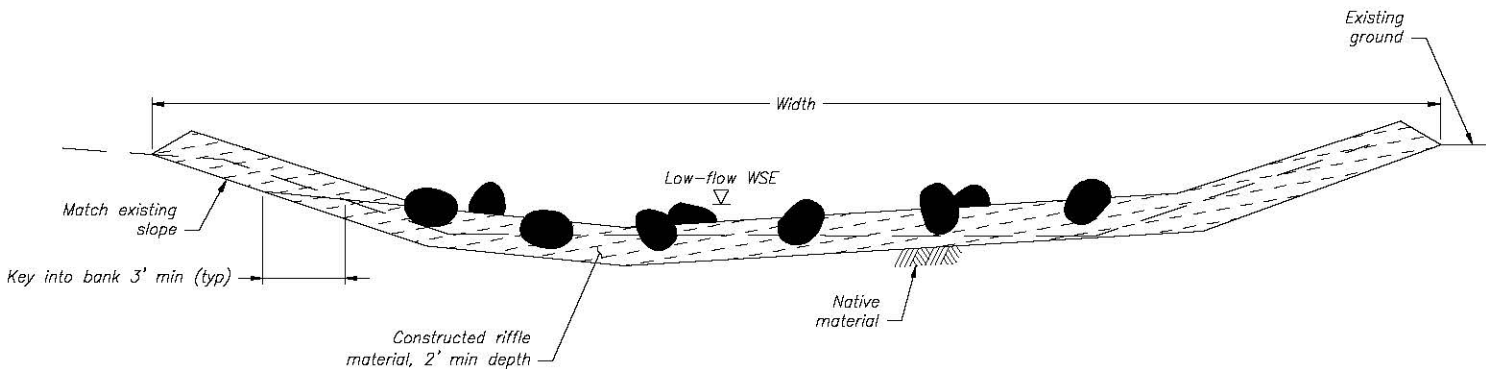
SHEET 42 OF 54
457818

NOTES

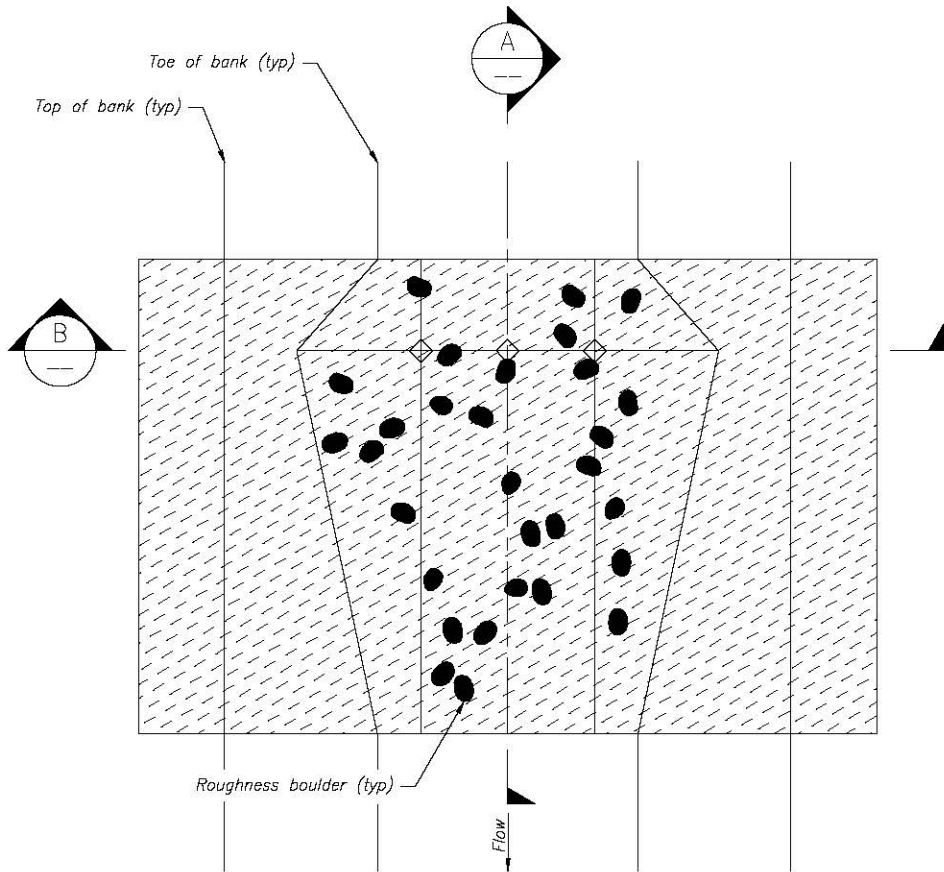
1. Preserve or salvage existing vegetation and logs as identified by Contracting Officer prior to construction.
2. See cross sections.
3. Embed 1/2 diameter of roughness boulder within constructed riffle.



PROFILE
NTS



SECTION
NTS



CONSTRUCTED RIFFLES				
SIDE CHANNEL ID	UPSTREAM STATION	CREST STATION	DOWNSTEAM STATION	WIDTH
SC1	11+84	11+88	12+01	14'
SC1	13+52	13+57	13+70	14'
SC2	71+38	71+66	73+08	28'

CONSTRUCTED RIFFLE
NTS

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CAD FILENAME
C-242-457818

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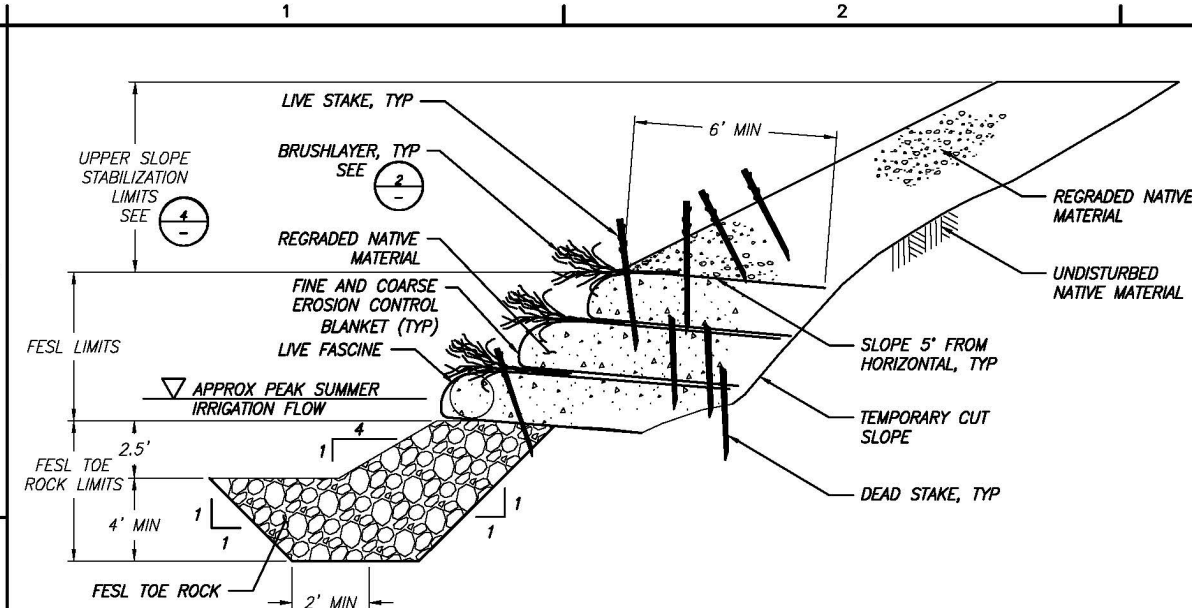
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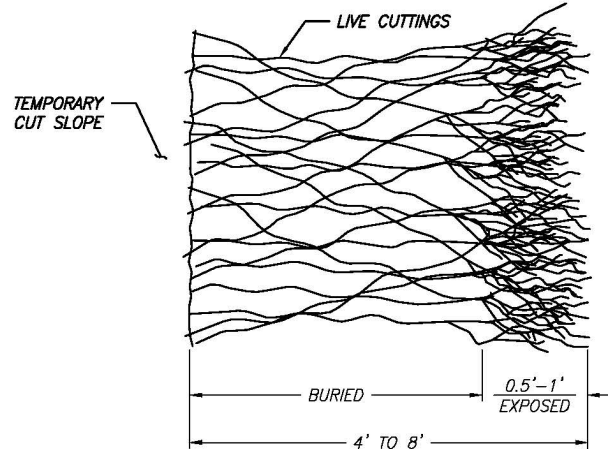
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SCHAAKE PROPERTY
HABITAT IMPROVEMENT PROJECT

PRELIMINARY DESIGN DRAWINGS



- NOTES
1. CONSTRUCT FESL IN ACCORDANCE WITH SPECIFICATIONS.
 2. INSTALL LIVE WOOD STAKES IN ACCORDANCE WITH SPECIFICATIONS.
 3. EXTEND FESL TOE ROCK 2.5' ABOVE TOE OF BANK, TOE OF FESL SHALL BE CONSTRUCTED AT TOP OF TOE ROCK. SEE GRADING PLANS, PROFILES AND TYPICAL SECTIONS FOR BANK SLOPE.
 4. PREPARE LIVE FASCINE IN ACCORDANCE WITH THE SPECIFICATIONS AND PLACE AT LEADING EDGE OF LOWEST LIFT.

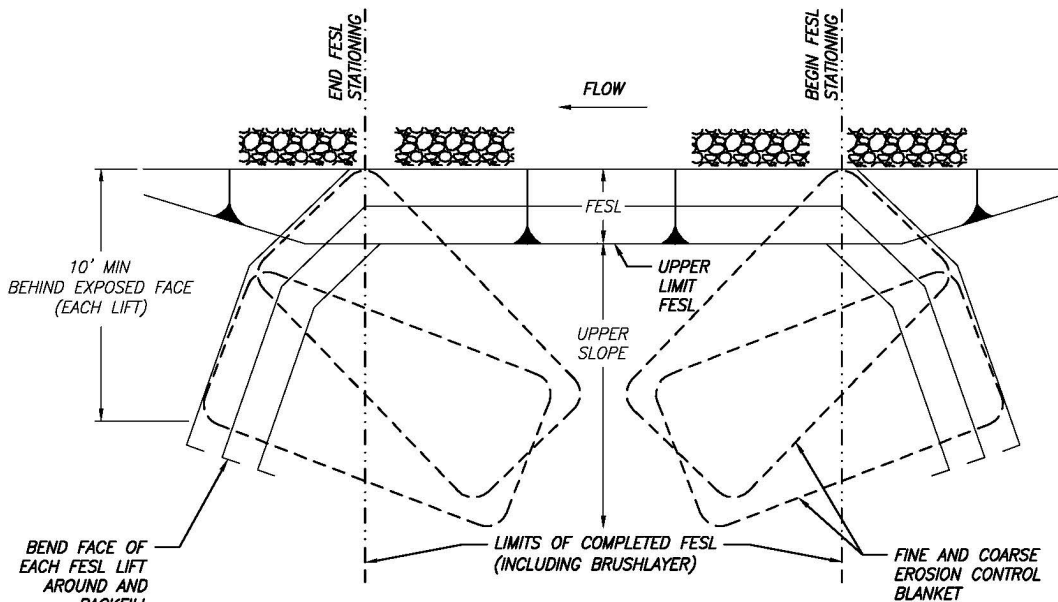


- NOTES
1. SEE LIVE CUTTING TABLE IN SPECIFICATIONS FOR SPECIES SELECTION.
 2. ORIENT LIVE CUTTINGS WITH GROWING TIPS EXTENDING OUT OF SLOPE FACE.

FESL LAYOUT					
ALCOVE/SIDE CHANNEL ID	BANK (FACING DOWNSTREAM)	FESL START STA	APPROX NUMBER OF LIFTS	FESL END STA	TOTAL LENGTH
SC1	RIGHT	10+57	3	12+40	183 LF
SC1	LEFT	10+80	3	12+10	130 LF
AL1	RIGHT	32+41	3	33+01	60 LF

1 FABRIC ENCAPSULATED SOIL LIFT (FESL), UPPER SLOPE STABILIZATION, AND BRUSHLAYER DETAIL
SCALE: NTS

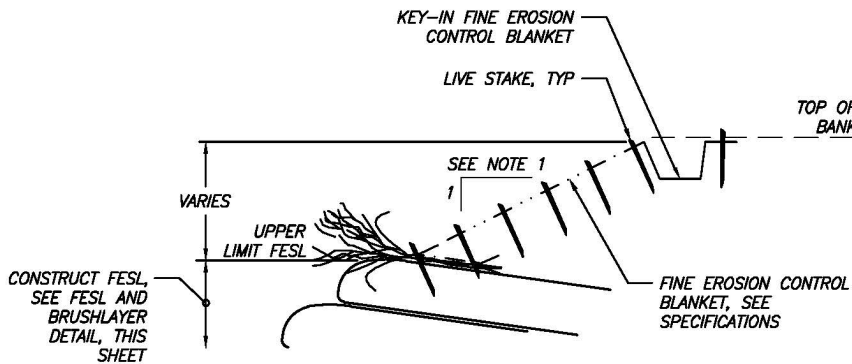
2 BRUSHLAYER PLAN VIEW
SCALE: NTS



- NOTES
1. KEY IN FESL ENDS (UPSTREAM AND DOWNSTREAM) AS SHOWN AT ALL LIMITS WHERE IT IS CONSTRUCTED.
 2. FESL CONSTRUCTION IS SYMMETRIC FOR INSTALLATION ON THE RIGHT BANK.

3 FESL END DETAIL
SCALE: NTS

UPPER SLOPE STABILIZATION LAYOUT				
ALCOVE/SIDE CHANNEL ID	BANK (FACING DOWNSTREAM)	UPPER SLOPE START STA	UPPER SLOPE END STA	TOTAL LENGTH
SC1	RIGHT	10+57	12+40	183 LF
SC1	LEFT	11+19	11+78	59 LF
AL1	RIGHT	32+41	32+69	28 LF



- NOTES
1. SEE C-231 FOR SIDE SLOPE.

4 UPPER SLOPE STABILIZATION DETAIL
SCALE: NTS

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CADD FILENAME
C-243_457818

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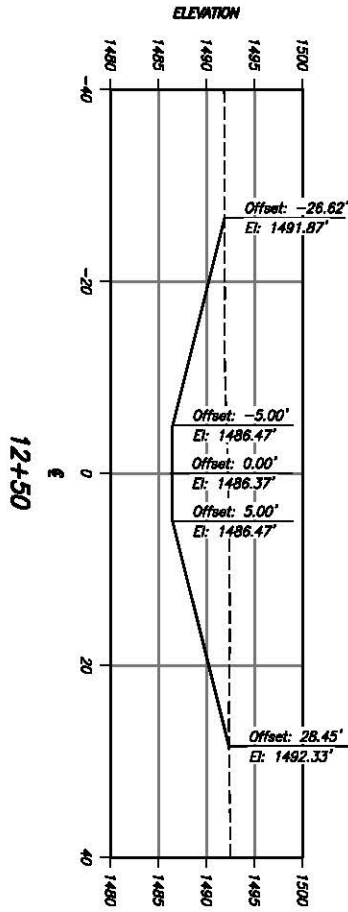
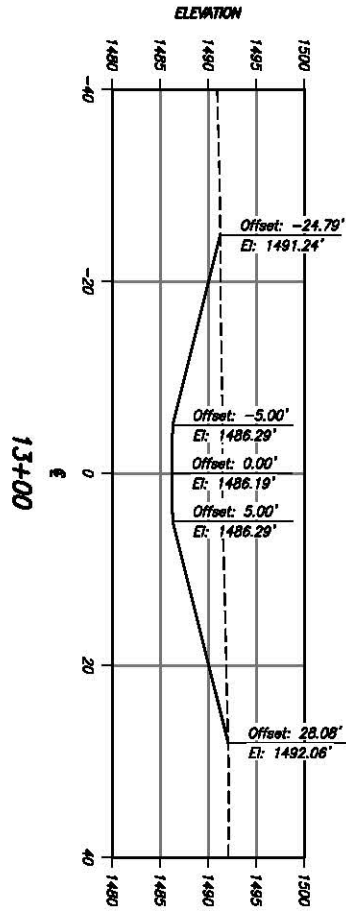
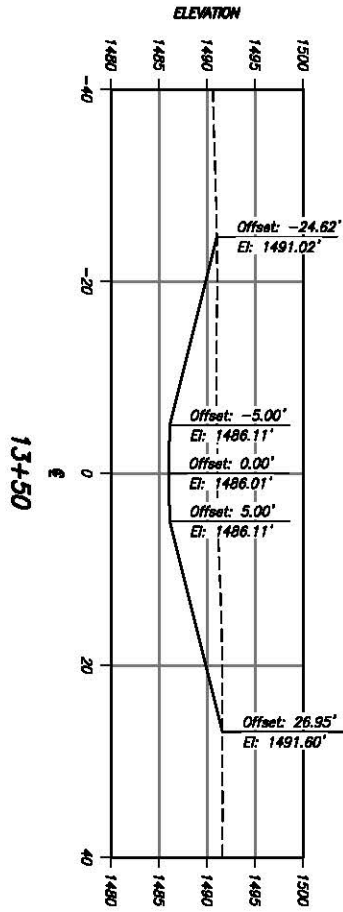
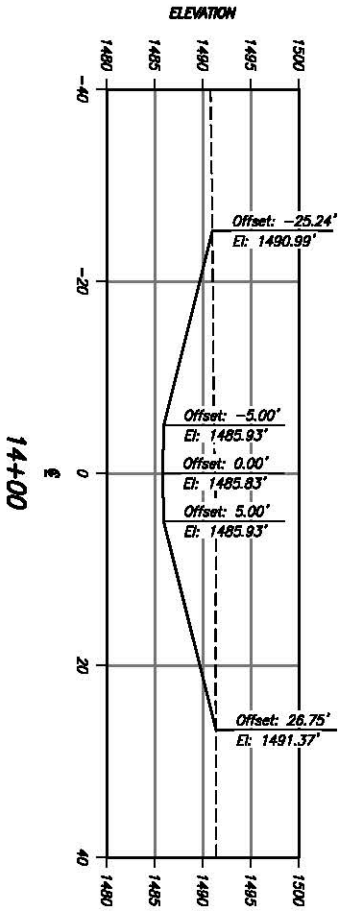
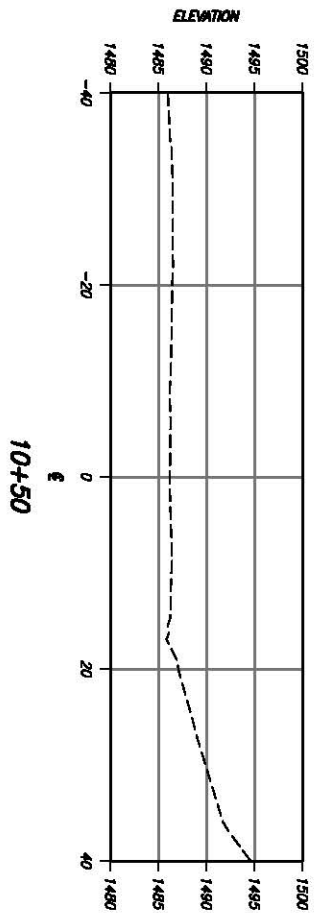
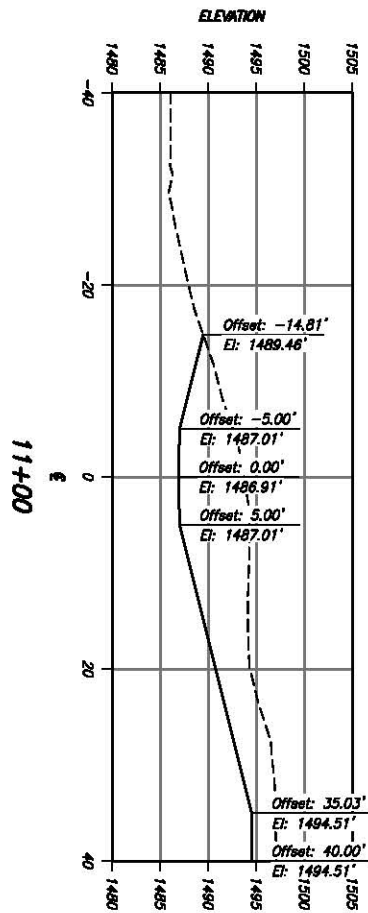
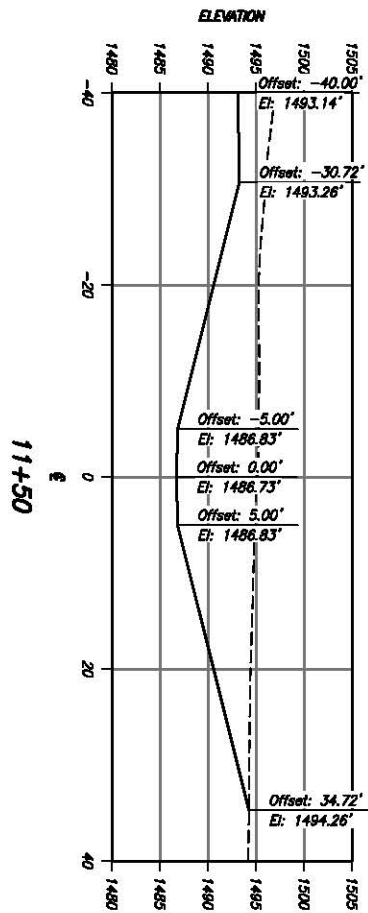
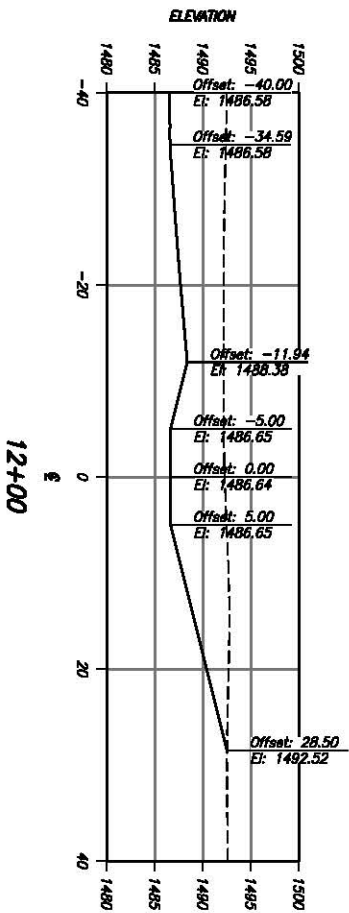
ACCEPTED

YAKIMA, WA 2015-10-02

GRADING DETAILS
FESL

SHEET C-243

SHEET 43 OF 54
457818



SIDE CHANNEL 1

NOTES

1. All cross sections perpendicular to Side Channel 1 centerline and facing downstream.

LEGEND

Existing ground
Finished grade

ch2m

PRELIMINARY
NOT FOR
CONSTRUCTION

RECLAMATION
Managing Water in the West



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PRELIMINARY DESIGN DRAWINGS

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2015-10-08

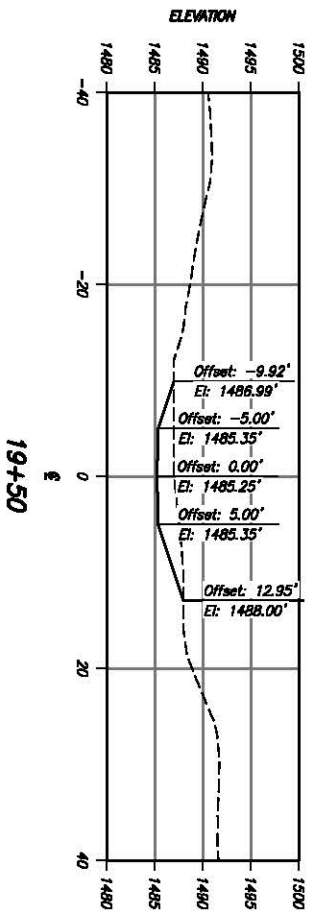
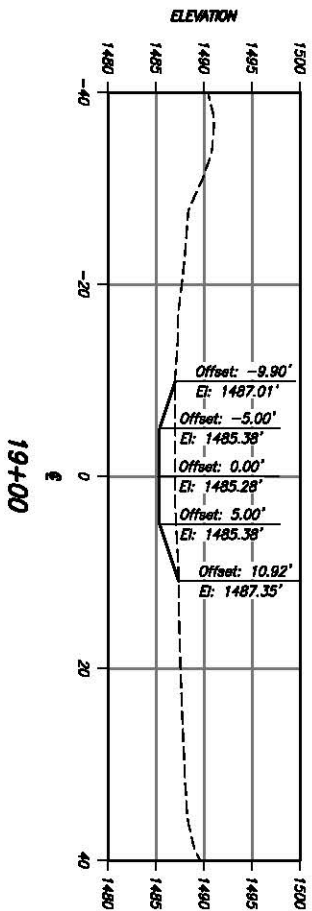
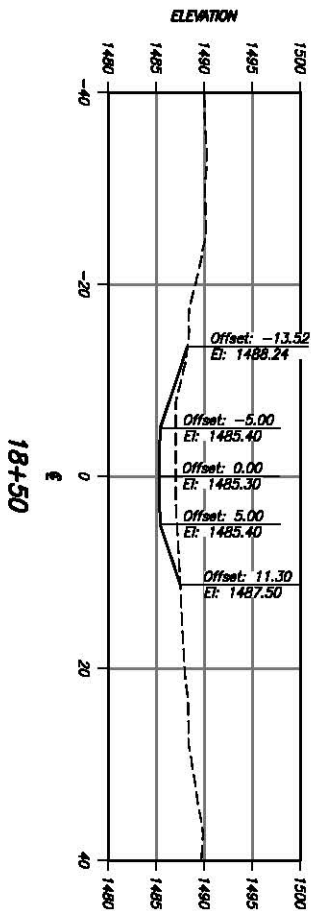
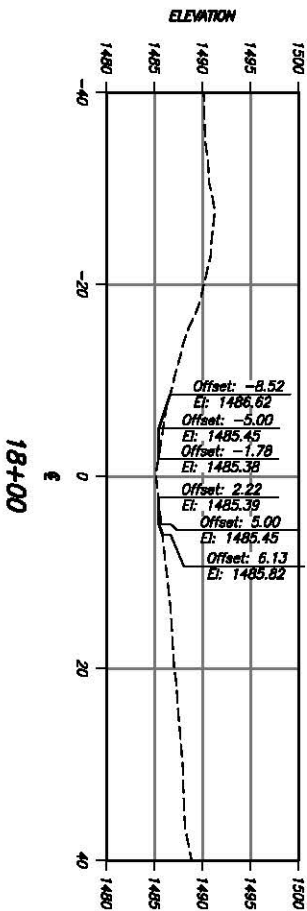
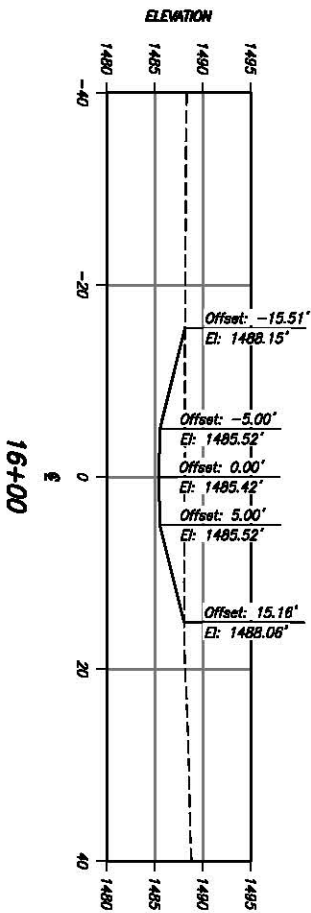
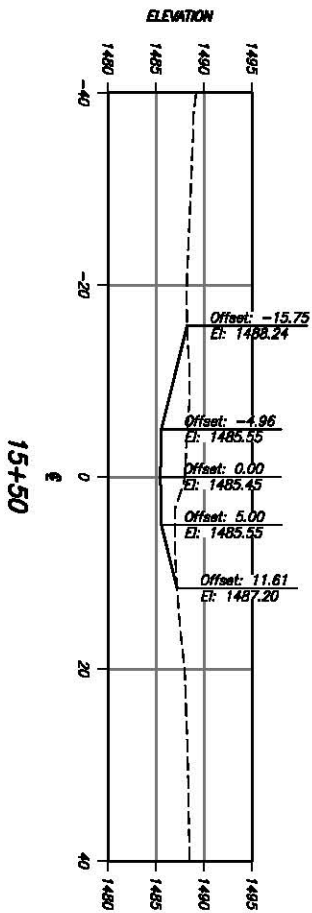
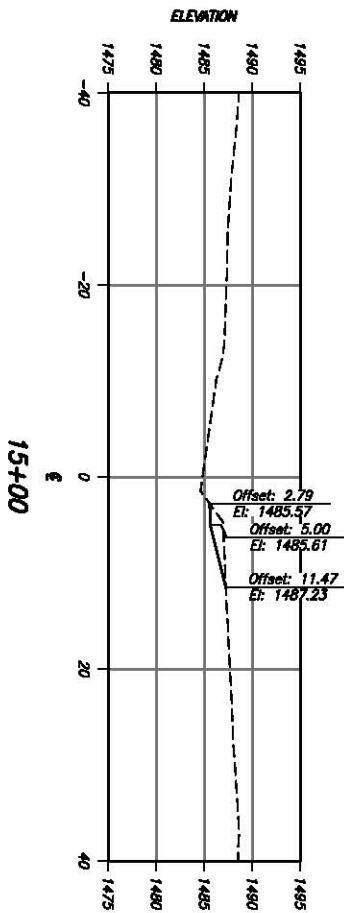
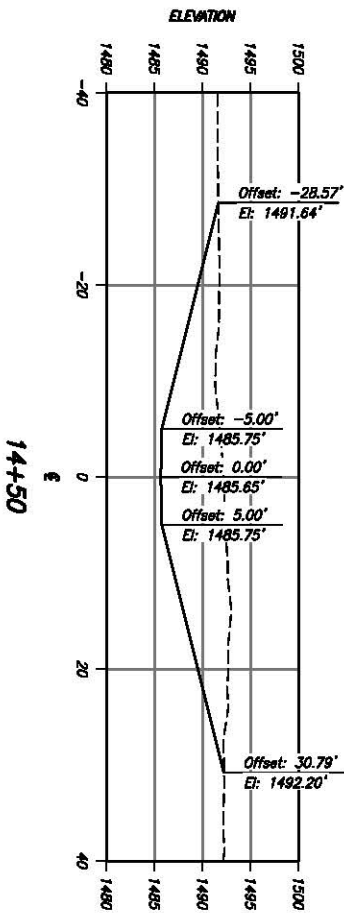
SIDE CHANNEL 1
CROSS SECTIONS - 1

SHEET C-251

SHEET 44 OF 54

457818

SIDE CHANNEL 1



NOTES

1. All cross sections perpendicular to Side Channel 1 centerline and facing downstream.

LEGEND

----- Existing ground
----- Finished grade

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DATE

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2015-10-08

SIDE CHANNEL 1
CROSS SECTIONS - 2

SHEET C-252

SHEET 45 OF 54

457818

C-252

1

2

3

4

5

SIDE CHANNEL 1

NOTES

1. All cross sections perpendicular to Side Channel 1 centerline and facing downstream.

RECLAMATION
Managing Water in the West

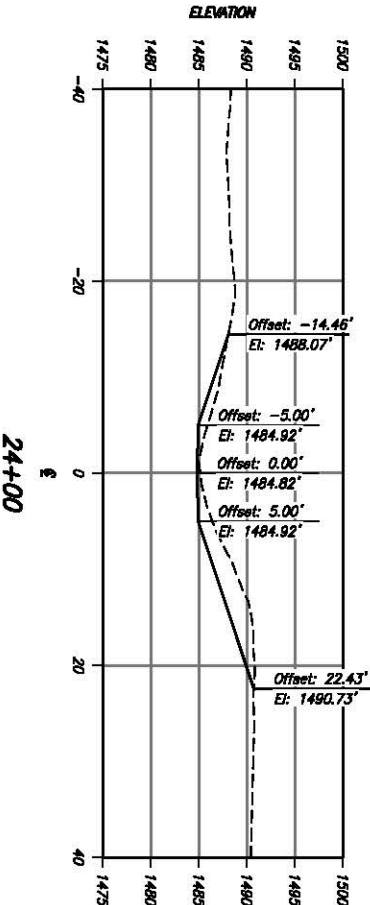
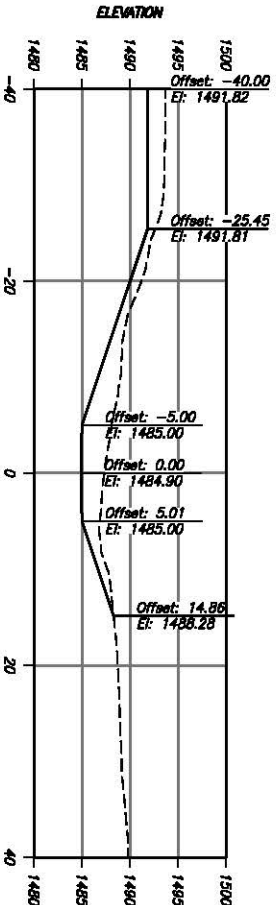
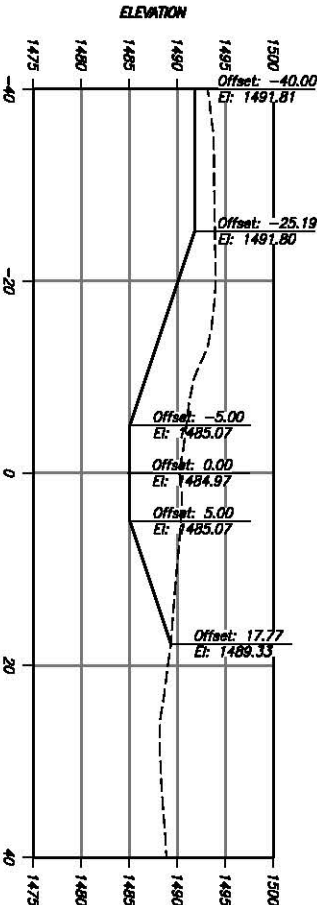
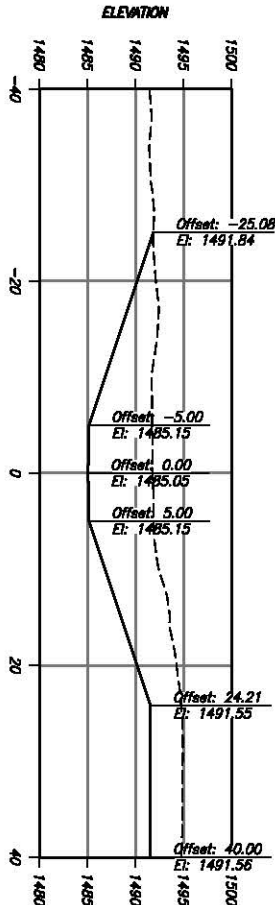
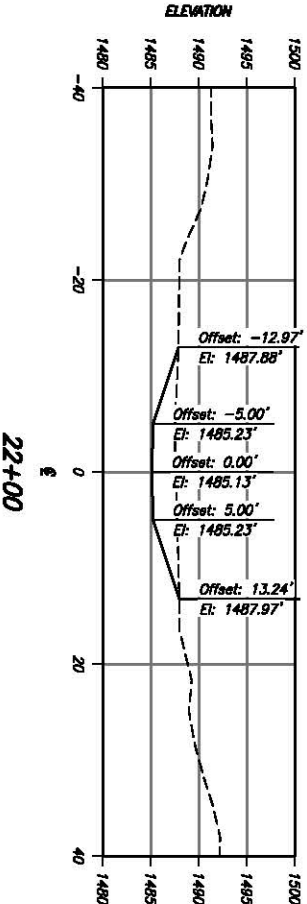
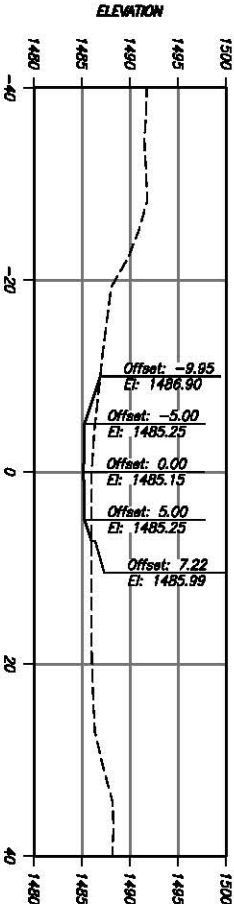
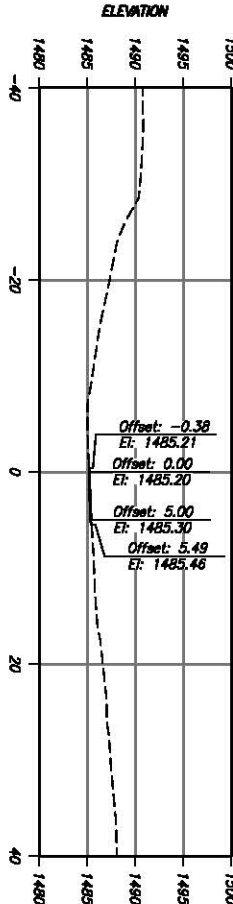
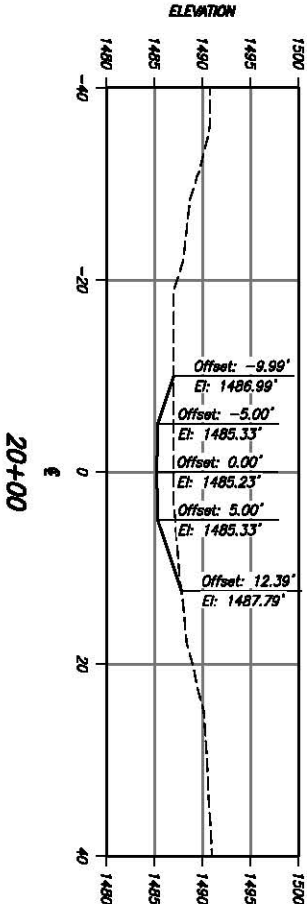
C-253

LEGEND

Existing ground
Finished grade

ch2m

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HABITAT IMPROVEMENT PROJECT

PRELIMINARY DESIGN DRAWINGS

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CONTRACTOR
APPROVED
YAKIMA, WA
2015-10-08

REV NO

SIDE CHANNEL 1
CROSS SECTIONS - 3

SHEET C-253

SHEET 48 OF 54

457818

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C-253_457818

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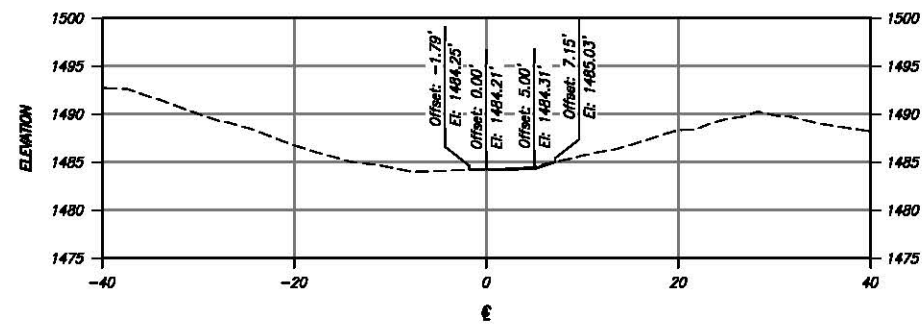
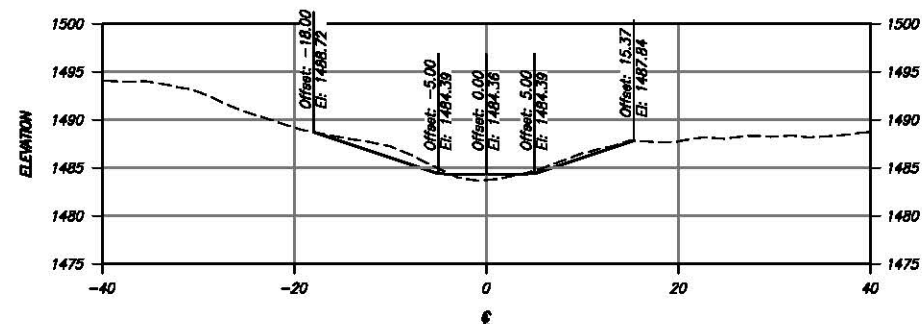
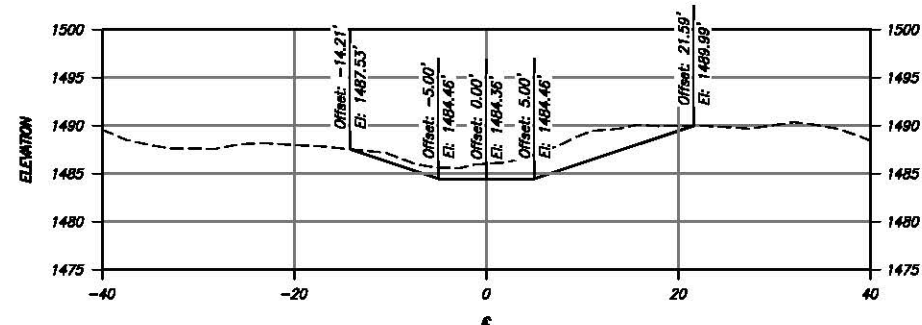
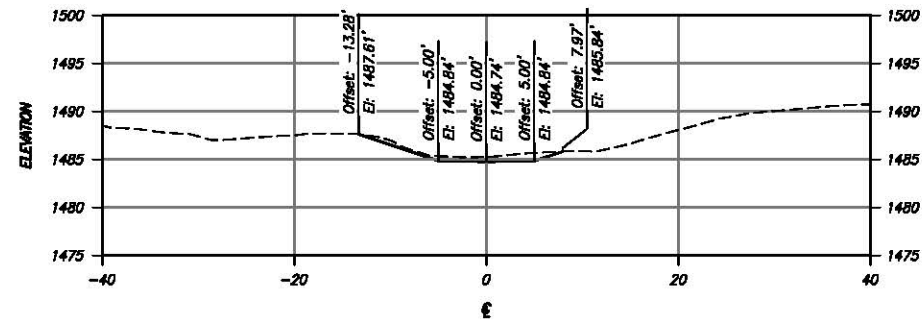
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C

B

A

SIDE CHANNEL 1



NOTES

1. All cross sections perpendicular to Side Channel 1 centerline and facing downstream.

LEGEND

--- Existing ground
— Finished grade

RECLAMATION
Managing Water in the West

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HABITAT IMPROVEMENT PROJECT

PRELIMINARY DESIGN DRAWINGS

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YAKIMA, WA

2015-10-02

SIDE CHANNEL 1
CROSS SECTIONS - 4

SHEET C-254

SHEET 47 OF 54

457818

D

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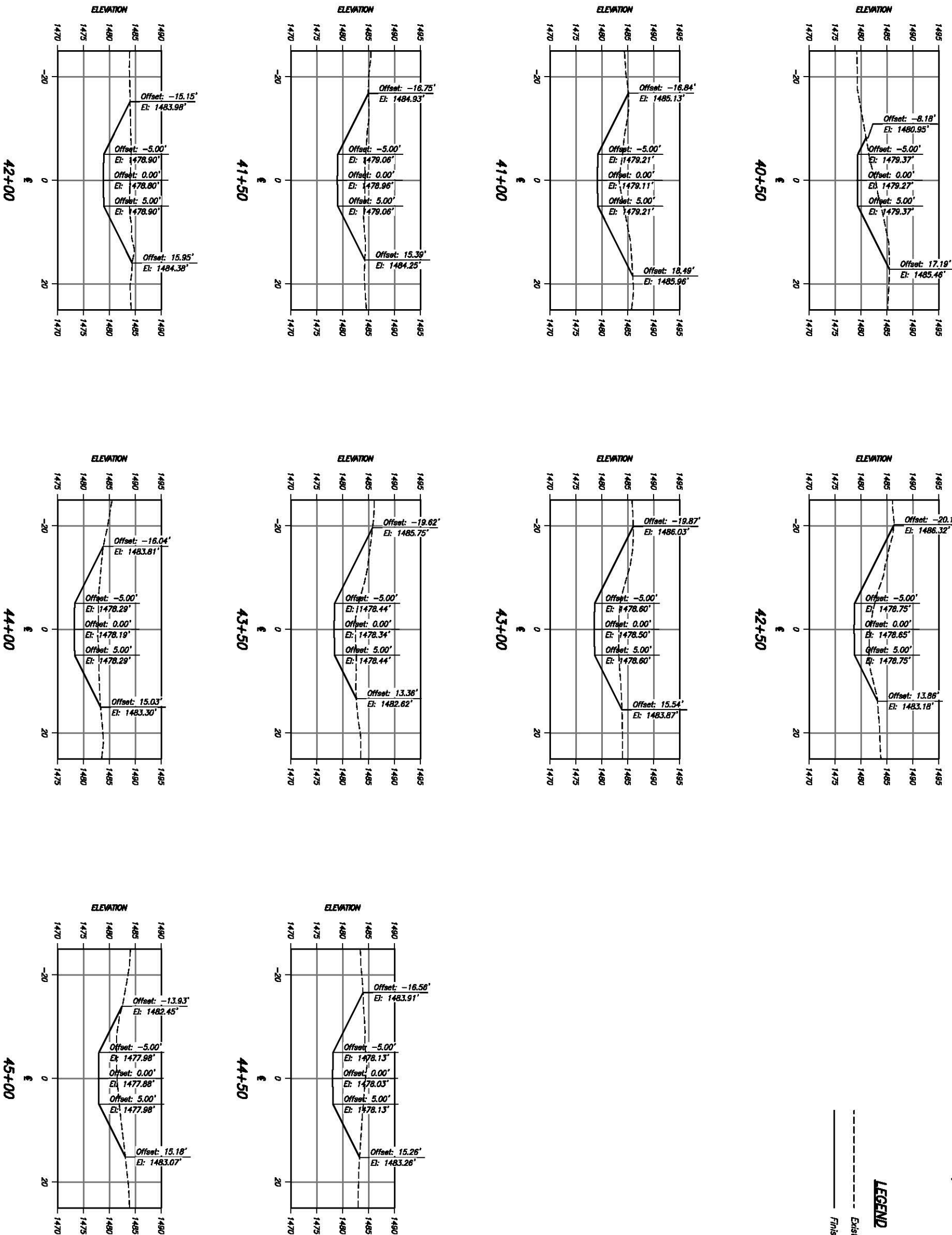
SIDE CHANNEL 2

NOTES

1. All cross sections perpendicular to Side Channel 2 centerline and facing downstream.

LEGEND

Existing ground
Finished grade



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HABITAT IMPROVEMENT PROJECT

PRELIMINARY DESIGN DRAWINGS

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DRAWN
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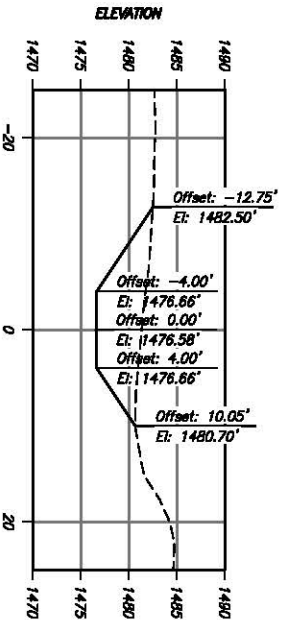
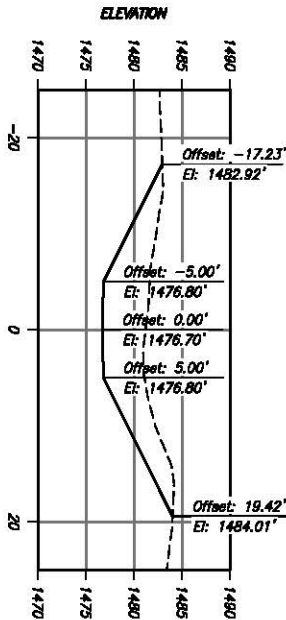
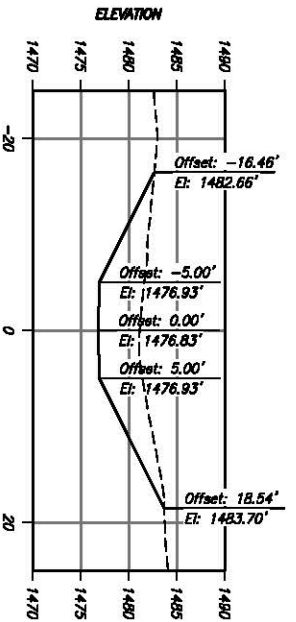
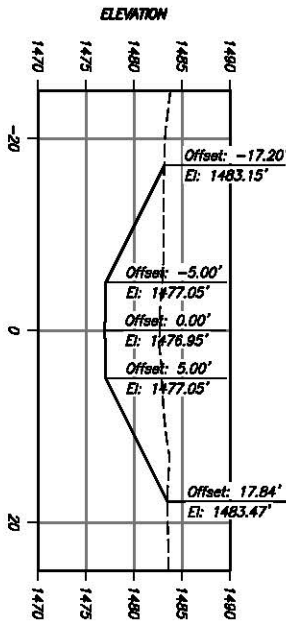
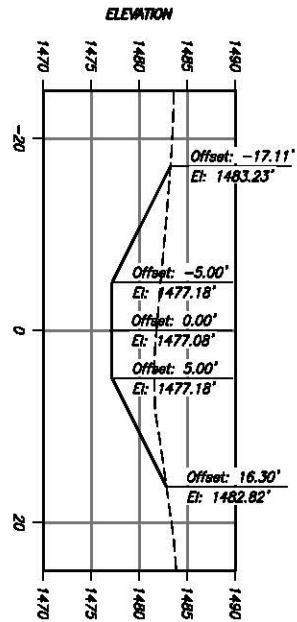
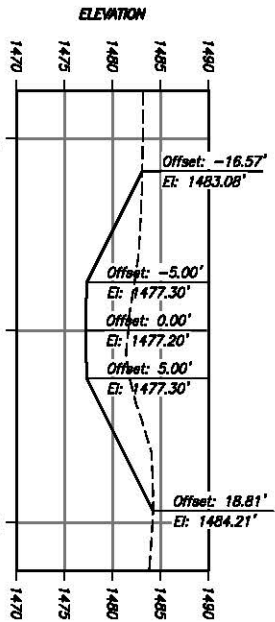
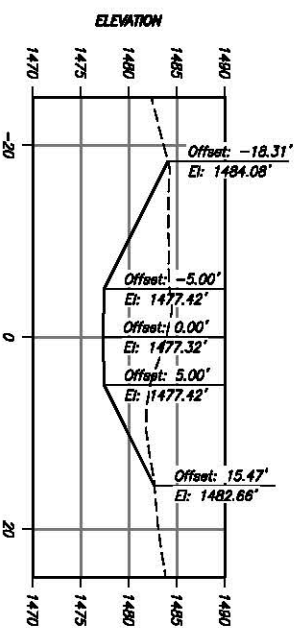
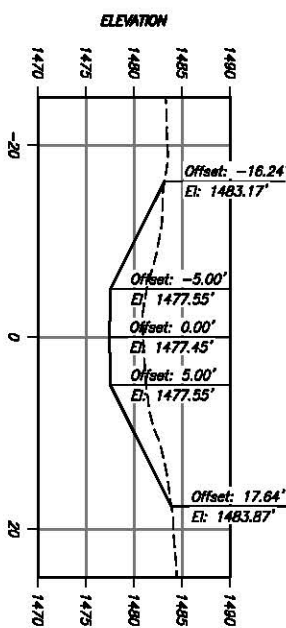
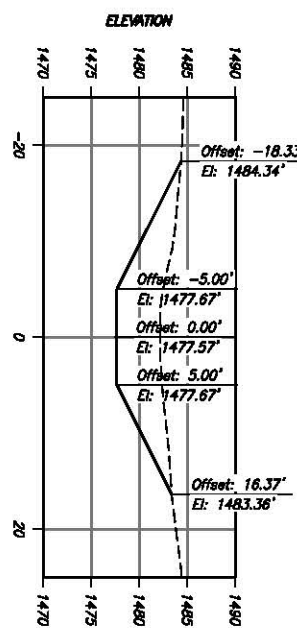
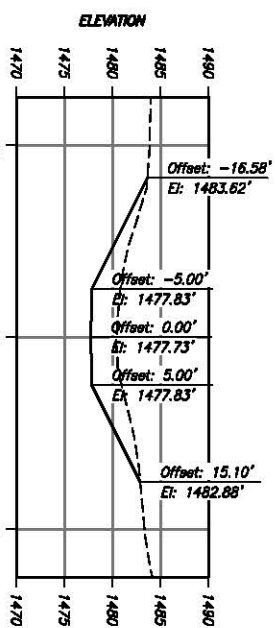
ch2m

RECLAMATION
Managing Water in the West

PRELIMINARY
NOT FOR
CONSTRUCTION

CONTRACTOR
DRAWN
APPROVED
YAKIMA, WA
2015-10-08

SHEET C-261
SHEET 48 OF 54
457818



SIDE CHANNEL 2

NOTES

1. All cross sections perpendicular to Side Channel 2 centerline and facing downstream.

LEGEND

----- Existing ground
————— Finished grade

PRELIMINARY
NOT FOR
CONSTRUCTION

ch2m

DESIGNED	_____
DRAWN	_____
CHECKED	_____
APPROVED	_____



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U.S. DEPARTMENT OF THE INTERIOR
BUREAU OF RECLAMATION
YAKIMA RIVER BASIN WATER ENHANCEMENT PROJECT - WASHINGTON

**SCHAAKE PROPERTY
HABITAT IMPROVEMENT PROJECT**

PRELIMINARY DESIGN DRAWINGS

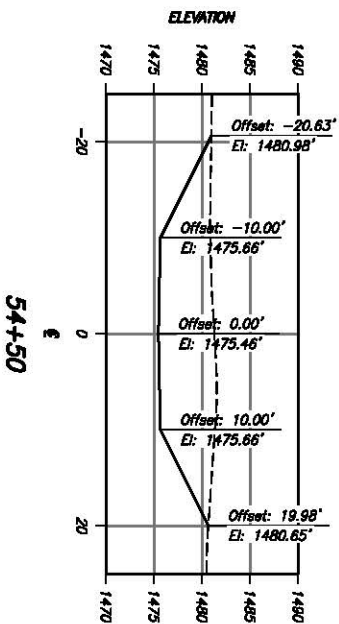
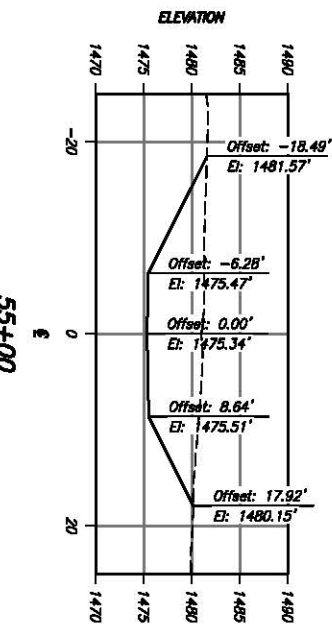
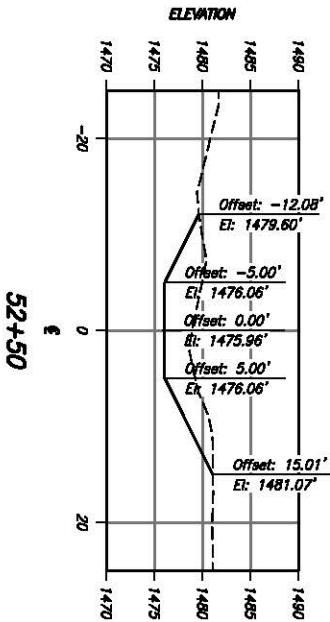
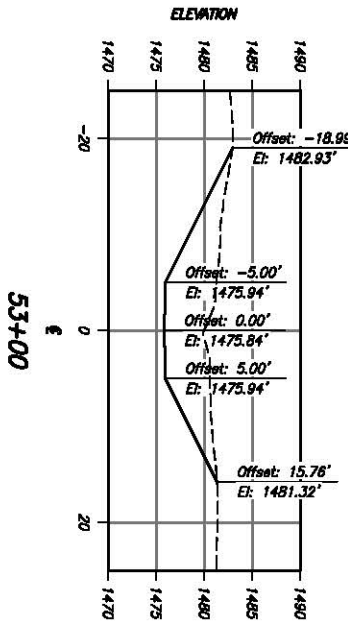
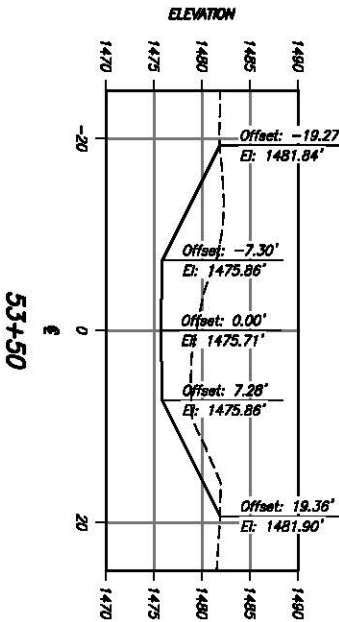
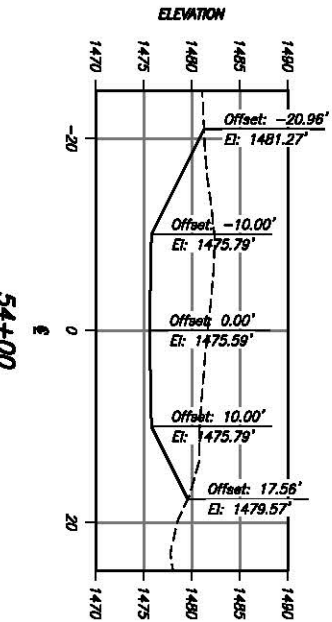
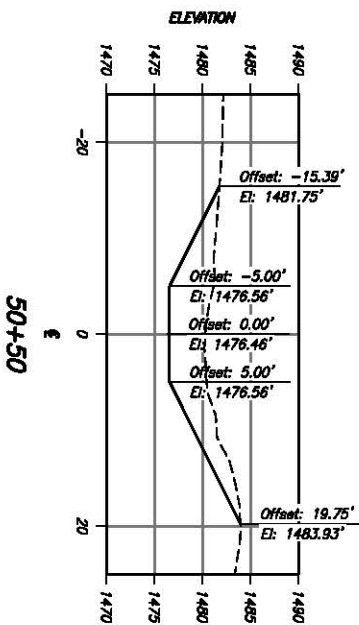
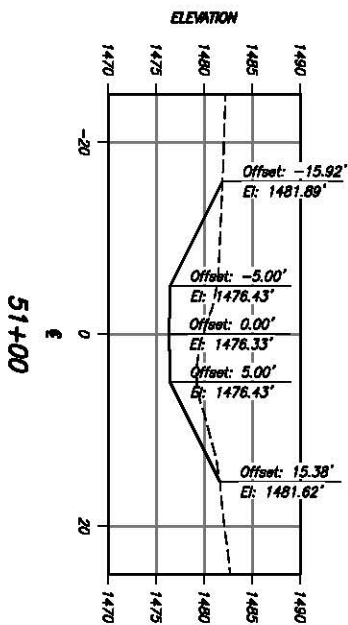
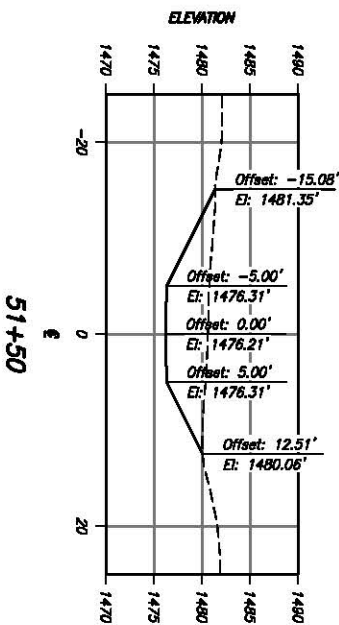
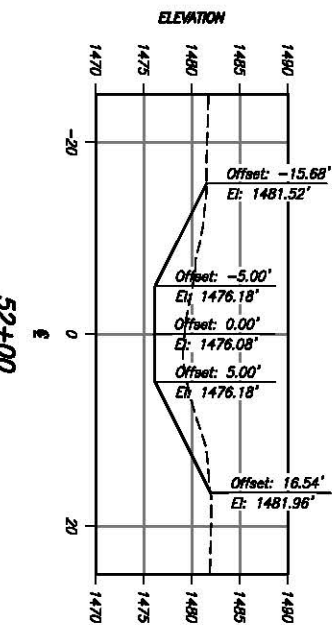
CONTRACTOR	_____
APPROVED	_____
YAKIMA, WA	2015-10-08
REV NO	_____

SIDE CHANNEL 2
CROSS SECTIONS - 2

SHEET C-262

SHEET 49 OF 54

457818



SIDE CHANNEL 2

- NOTES
- All cross sections perpendicular to Side Channel 2 centerline and facing downstream.

LEGEND

----- Existing ground

----- Finished grade



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BUREAU OF RECLAMATION

YAKIMA RIVER BASIN WATER ENHANCEMENT PROJECT - WASHINGTON

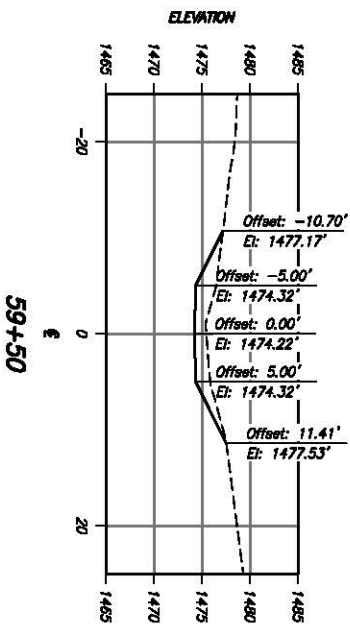
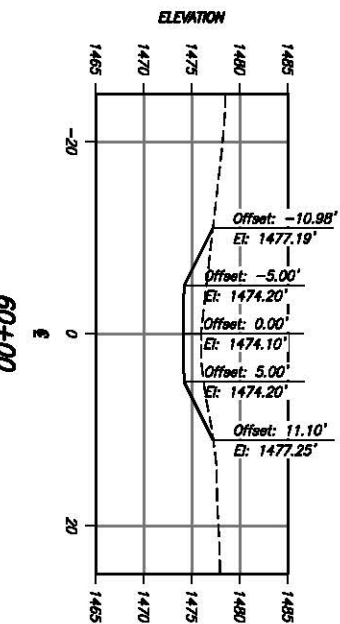
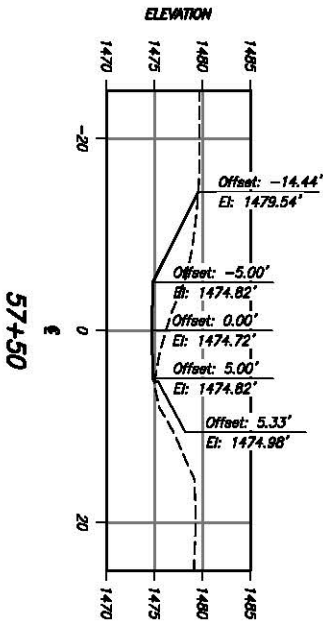
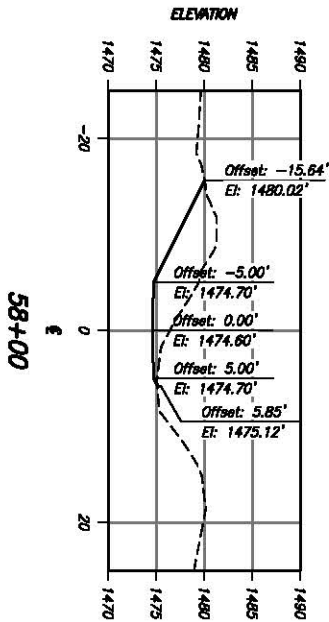
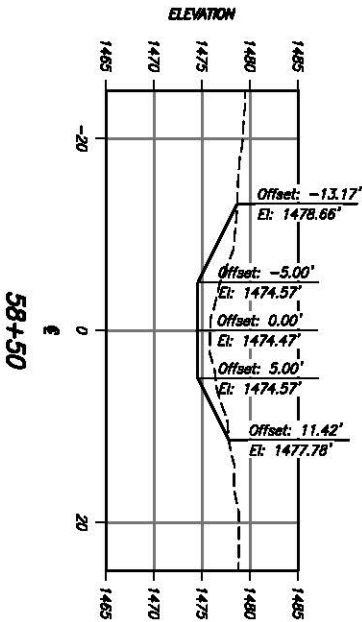
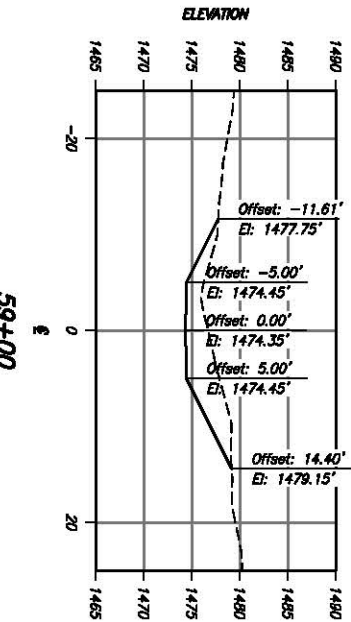
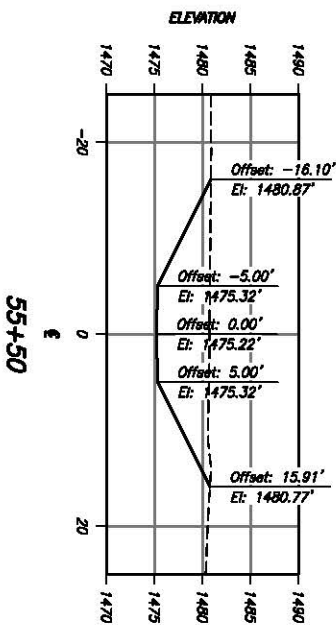
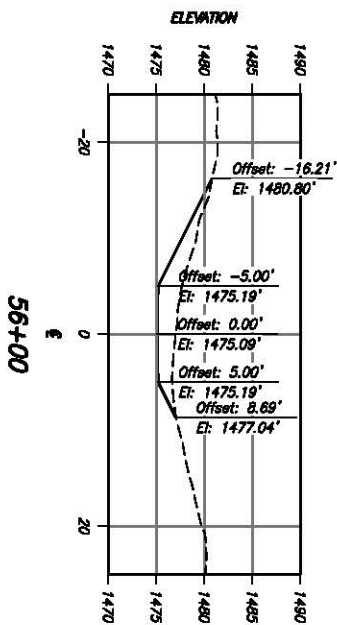
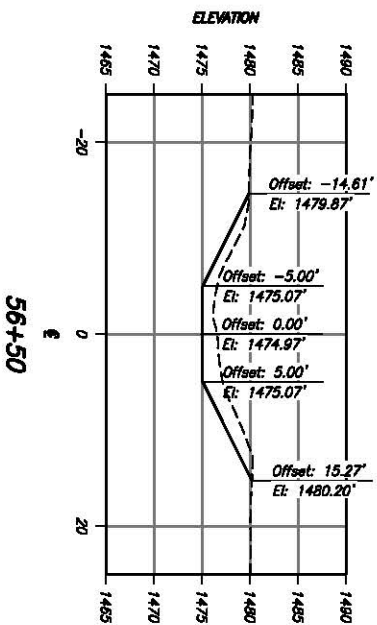
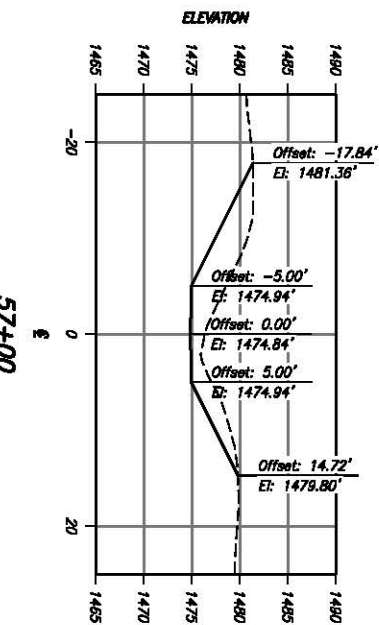
SCHAAKE PROPERTY
HABITAT IMPROVEMENT PROJECT

PRELIMINARY DESIGN DRAWINGS

ch2m

PRELIMINARY
NOT FOR
CONSTRUCTION

RECLAMATION
Managing Water in the West



SIDE CHANNEL 2

- NOTES
- All cross sections perpendicular to Side Channel 2 centerline and facing downstream.

LEGEND

--- Existing ground

— Finished grade



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YAKIMA RIVER BASIN WATER ENHANCEMENT PROJECT - WASHINGTON

SCHAAKE PROPERTY
HABITAT IMPROVEMENT PROJECT

PRELIMINARY DESIGN DRAWINGS

RECLAMATION
Managing Water in the West

PRELIMINARY
NOT FOR
CONSTRUCTION

ch2m

DESIGNED
DRAWN
CHECKED
APPROVED

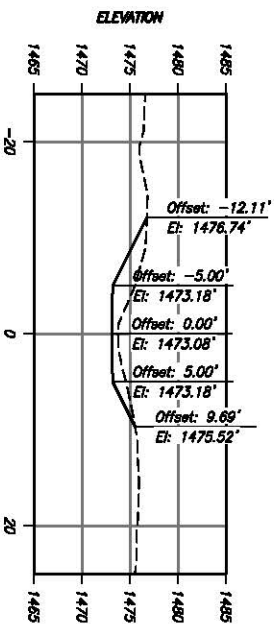
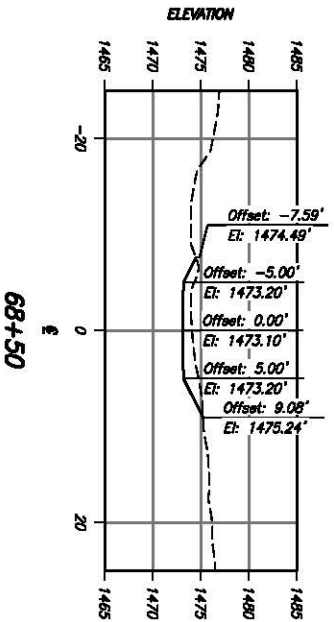
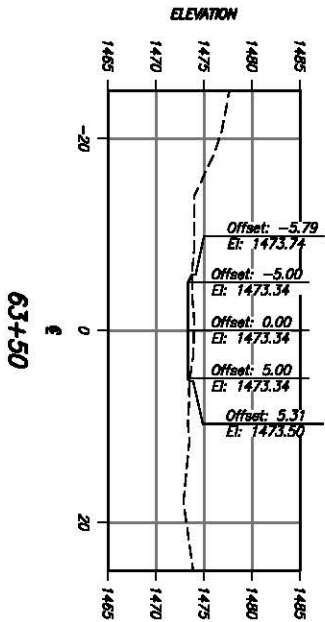
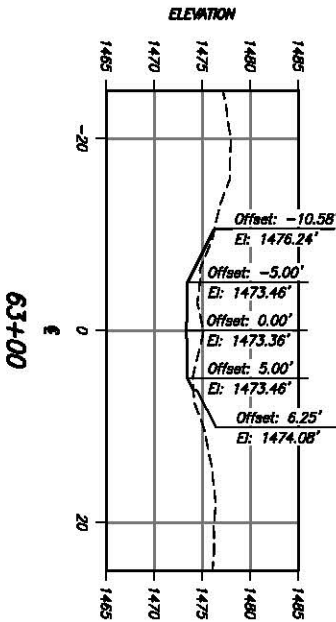
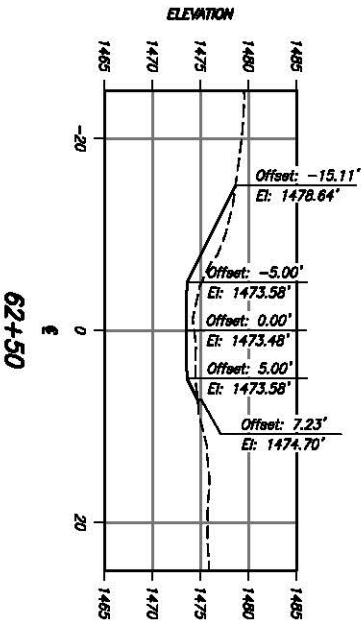
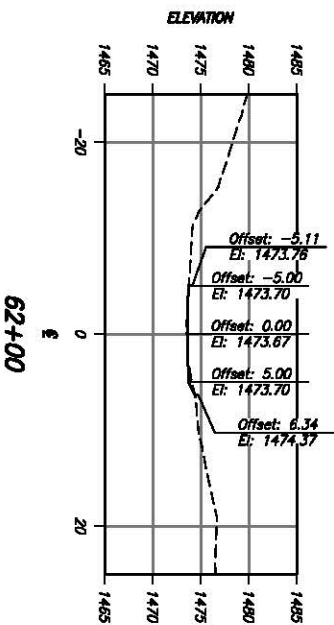
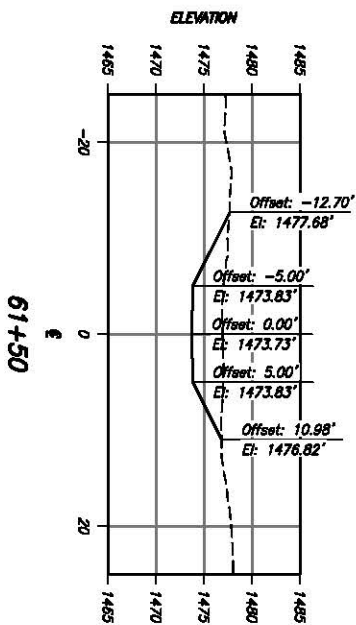
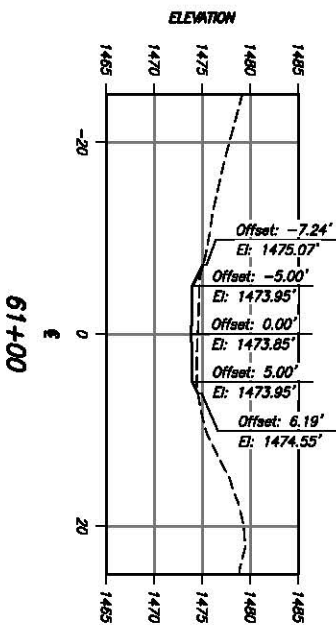
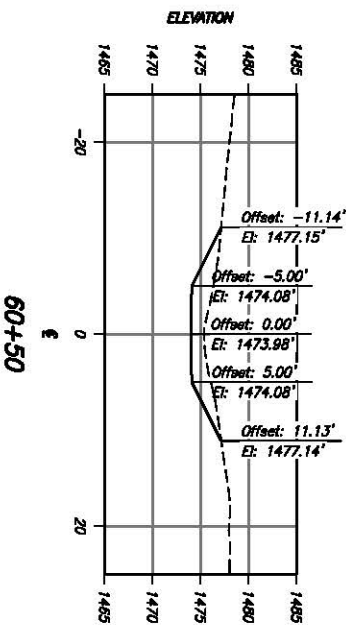
CONTRACTOR
DRAWN
APPROVED
YAKIMA, WA
2015-10-08

SIDE CHANNEL 2
CROSS SECTIONS - 4

SHEET C-264

SHEET 51 OF 54

457818



SIDE CHANNEL 2

- NOTES
- All cross sections perpendicular to Side Channel 2 centerline and facing downstream.

LEGEND

--- Existing ground

— Finished grade

PRELIMINARY
NOT FOR
CONSTRUCTION

ch2m

DESIGNED
DRAWN
CHECKED
ACCEPTED



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U.S. DEPARTMENT OF THE INTERIOR
BUREAU OF RECLAMATION
YAKIMA RIVER BASIN WATER ENHANCEMENT PROJECT - WASHINGTON

SCHAAKE PROPERTY
HABITAT IMPROVEMENT PROJECT

PRELIMINARY DESIGN DRAWINGS

REV NO	DESCRIPTION

CONTRACTOR

DRAWN

ACCEPTED

YAKIMA, WA

2015-10-08

SIDE CHANNEL 2
CROSS SECTIONS - 5

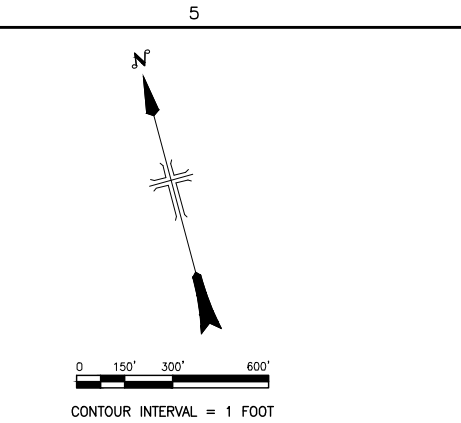
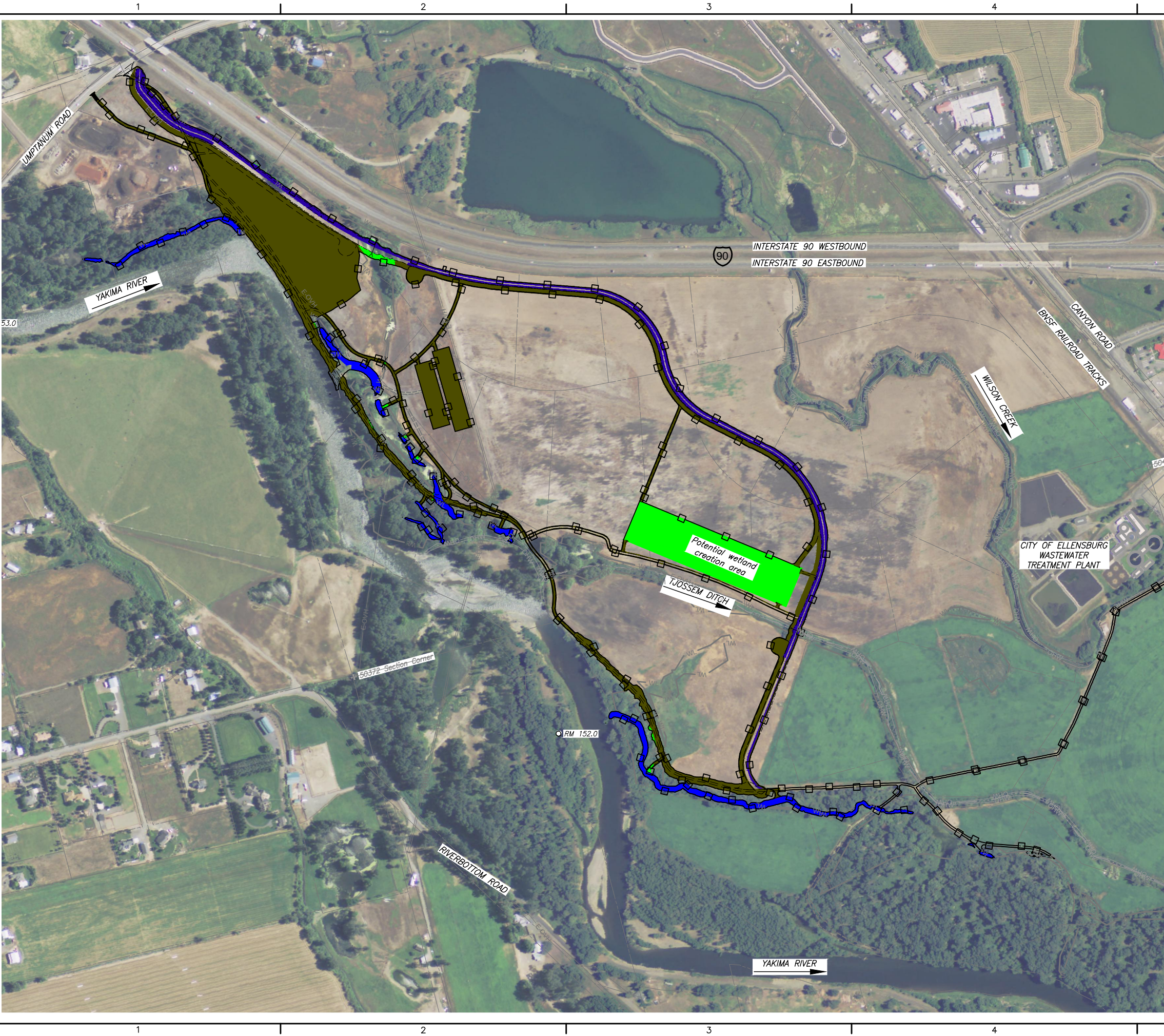
SHEET C-265

SHEET 32 OF 54

457818

CAD SYSTEM
AUTOCAD CIVIL
CAD FILENAME
L-301_457818

DATE AND TIME PLOTTED
10/2/2015 8:51 AM
PLOTTED BY



NOTES

1. Revegetate disturbed areas. See plant materials list on L-302 for species, quantities, spacing, materials, and sizes.

LEGEND	
	Floodplain Seed Mix
	Levee Seed Mix
	Bank Planting
	Forest-Shrub Planting

RECLAMATION
Managing Water in the West

PRELIMINARY
NOT FOR
CONSTRUCTION

ch2m:

DESIGNED _____

DRAWN _____

CHECKED _____

ACCEPTED _____

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BUREAU OF RECLAMATION
YAKIMA RIVER BASIN WATER ENHANCEMENT PROJECT - WASHINGTON

**SCHAAKE PROPERTY
HABITAT IMPROVEMENT PROJECT**

PRELIMINARY DESIGN DRAWINGS

CONTRACTOR
DRAWN _____

ACCEPTED _____

YAKIMA, WA 2015-10-02

REVEGETATION PLAN

SHEET L-301
SHEET 53 OF 54
457818

PRELIMINARY
NOT FOR
CONSTRUCTION

ch2m:

DESIGNED
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BUREAU OF RECLAMATION
YAKIMA RIVER BASIN WATER ENHANCEMENT PROJECT - WASHINGTON

SCHAAKE PROPERTY
HABITAT IMPROVEMENT PROJECT

PRELIMINARY DESIGN DRAWINGS

REV NO

CONTRACTOR
DRAWN

ACCEPTED

YAKIMA, WA 2015-10-01

REVEGETATION DETAILS

SHEET L-302

SHEET 54 OF 54

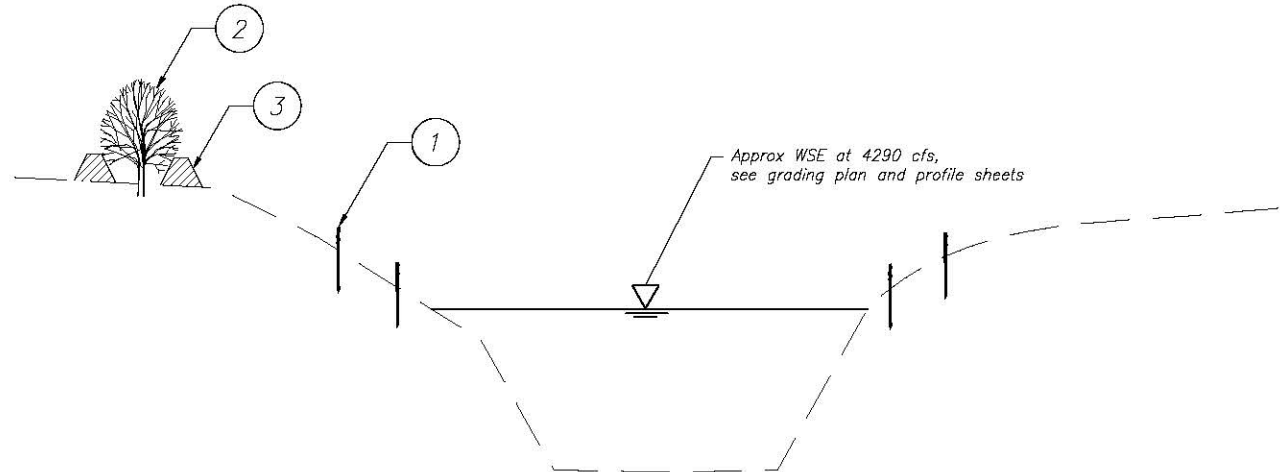
457818

NOTES

1. All revegetation work shall be performed by a LANDSCAPE CONTRACTOR holding a valid current SPECIALTY CONTRACTOR'S license from the State of Washington to supervise and direct CONTRACTOR'S seeding, and planting layout and installation in accordance with approved landscaping industry standards and practices.
2. At least three months prior to planting, the CONTRACTOR shall submit documentation of the source of plant materials. Trees and shrubs shall be obtained from sources in central Washington, and preferably from local sources in the Yakima Basin.
3. No substitution of plant material, species or variety, will be permitted unless evidence is submitted in writing to the ENGINEER that a specified plant cannot be obtained and has been unobtainable since the award of the contract.
4. At least one month prior to seeding and planting, notify ENGINEER for a pre-installation conference to review and discuss requirements for seeding and planting.
5. In all areas disturbed during construction, rip, disk, or till to a minimum depth of 12 inches. Notify ENGINEER for approval after soil is scarified as specified.
6. Any disturbance to vegetation beyond the disturbance limits shown on the plans shall be restored to existing conditions by the CONTRACTOR at no cost to the OWNER.
7. See specifications for requirements for seed bed preparation and installation. Roller compact soil for seeding. Notify ENGINEER for approval after soil is prepared for seeding as specified. After ENGINEER approves areas for seeding, apply seed mixes indicated to areas shown using drill seeder on floodplain and hydroseeder on levee. Seed shall be applied as a dormant seeding on or after November 1.
8. See specifications for requirements for plant layout and installation. Notify ENGINEER when planting layout is staked for ENGINEER approval. After ENGINEER approves the CONTRACTOR'S plant layout, install plants identified on the plant materials list according to the spacing and groupings indicated, per planting details, or as directed by the ENGINEER. Plant wetter species in lower elevations of designated areas and distribute plants at various micro-elevations using wetland indicator status as a guide.
9. Planting shall occur between October 1 and March 1. Source plants for live stake cuttings shall be dormant when live stake cuttings are taken (which does not typically occur until November or December), and all cuts shall be made with a sharp instrument.
10. Notify ENGINEER at least 1 week prior to when plants are scheduled to be delivered and inspected, and when planting will occur.
11. Plant according to WSDOT standard plans (<http://www.Wsdot.Wa.Gov/design/standards/plans.htm>):
 - a. H-10.10-00 TREE AND SHRUB PLANTING DETAILS
 - b. H-10.15-00 LIVE STAKE INSTALLATIONS
12. Prepare planting areas:
 - a. Completely remove all noxious weed plants (tops and roots) including, but not limited to, reed canarygrass, cheatgrass, kochia, mustard, and thistle.
 - b. Remove all existing vegetation within a 3-foot-diameter circle around each planting hole by scalping or other method approved by the ENGINEER. Notify ENGINEER for approval when vegetation has been removed and is prepared as specified and ready for planting and bark/wood chip placement.
13. Plant trees and shrubs:
 - a. During planting remove containers and/or biodegradable pots. Loosen roots and spread or cut circling roots.
 - b. Add one fertilizer packet (Reforest Technologies International - RTI Forest Pak 20_11-9, or similar) to each planting hole as recommended by the manufacturer.
14. Firm soil around the root ball.
15. Immediately after planting each plant, water plant slowly and thoroughly.
16. Notify ENGINEER for approval of bark or wood chip placement in tree and shrub planting areas. After ENGINEER approves areas for bark or wood chip placement, apply minimum 5-inch depth of bark or wood chips in entire planting area. Ensure that bark or wood chips do not touch plant stems and keep back 2 inches from tree trunks.
17. Install specified conifer plants at locations identified by engineer. Due to high wind conditions onsite, stake all conifer plants as specified. Use two 2x2 inch by 4 feet long wood stakes. Do not drive stake through rootball. Secure tree with web fabric in a figure eight formation at 2/3 of tree height, or as approved by ENGINEER. Apply minimum 6-inch depth of bark or wood chips in a 3-foot-diameter circle around each conifer.
18. Notify ENGINEER to schedule inspections and acceptance of seeding and planting. Remove all tags after final plant inspection.
19. Remove all non-biodegradable debris (such as: plastic tags, synthetic twine, and containers).

PLANT MATERIALS LIST

			Total Planting/Seeding Area (Acres):		-	-	-	0.13	0.10	0.22	2.10	2.30	8.90	9.20	2.20	1.50	-	26.65	Acres				
			Total Planting/Seeding Area (Linear Feet):		1261	2480	1913	-	-	-	-	-	-	-	-	-	-	5654	Linear Feet				
Type	BOTANICAL NAME	COMMON NAME	Wetland Indicator Status	Side Channel 1 Bank Planting	Side Channel 2 Bank Planting	Alcoves Bank Planting	Replant Temp Access in Misc Wetlands	Replant Temp Access in Shrub-Forest Uplands	Wetlands E and F Replanting	New Levee Seeding	Levee Removal Area Seeding	NW Regraded Floodplain Seeding	Temporary Access Road Seeding	Staging Areas Seeding	Potential Wetland Creation Planting	Conifer Planting	TOTAL QUANT	SPACING (O.C.)	SIZE	ROOT CONDITION	REMARKS		
PLANTS																							
tree	<i>Alnus incana</i>	Gray alder	FACW	-	-	-	13	-	22	-	-	-	-	-	65	-	100	12'	18-36" Height	1 Gal Container	Plant in groups of 5		
tree	<i>Populus balsamifera</i>	Black cottonwood	FAC	-	-	-	13	6	22	-	-	-	-	-	65	-	106	12'	18-36" Height	1 Gal Container	Plant in groups of 5		
tree	<i>Salix lucida</i> var. <i>lasianдра</i>	Pacific willow	FACW	-	-	-	13	-	-	-	-	-	-	-	65	-	78	12'	18-36" Height	1 Gal Container	Plant in groups of 5		
tree	<i>Populus tremuloides</i>	Quaking aspen	FACU	-	-	-	-	6	-	-	-	-	-	-	-	-	6	12'	18-36" Height	1 Gal Container	Plant in groups of 3-5 at locations directed in field		
tree	<i>Picea pungens</i>	Blue spruce	FAC	-	-	-	-	6	-	-	-	-	-	-	-	25	31	20'	18" Height Min	1 Gal Container	Plant in groups of 3 at locations directed in field		
tree	<i>Pinus ponderosa</i>	Ponderosa pine	FACU	-	-	-	-	6	-	-	-	-	-	-	-	50	56	20'	18" Height Min	1 Gal Container	Plant in groups of 3 at locations directed in field		
tree	<i>Pseudotsuga menziesii</i>	Douglas-fir	FACU	-	-	-	-	6	-	-	-	-	-	-	-	50	56	20'	18" Height Min	1 Gal Container	Plant in groups of 3 at locations directed in field		
Tree Subtotal				0	0	0	39	30	44	0	0	0	0	0	194	125	433						
shrub	<i>Cornus sericea</i>	Red-osier dogwood	FACW	-	-	-	15	-	20	-	-	-	-	-	203	-	237	6'	12-18" Height	1 Gal Container	Plant in groups of 5		
shrub	<i>Crataegus douglasii</i>	Black hawthorn	FAC	-	-	-	15	13	20	-	-	-	-	-	203	-	250	6'	12-18" Height	1 Gal Container	Plant in groups of 5		
shrub	<i>Lonicera involucrata</i>	Black twinberry	FAC	-	-	-	15	13	20	-	-	-	-	-	203	-	250	6'	12-18" Height	1 Gal Container	Plant in groups of 5		
shrub	<i>Ribes aureum</i>	Golden current	FAC	-	-	-	15	13	20	-	-	-	-	-	203	-	250	6'	12-18" Height	1 Gal Container	Plant in groups of 5		
shrub	<i>Rosa woodsii</i>	Woods' rose	FACU	-	-	-	-	13	20	-	-	-	-	-	-	-	33	6'	12-18" Height	1 Gal Container	Plant in groups of 5		
shrub	<i>Symphoricarpos albus</i>	Snowberry	FACU	-	-	-	-	13	20	-	-	-	-	-	-	-	33	6'	12-18" Height	1 Gal Container	Plant in groups of 5		
shrub	<i>Prunus virginiana</i>	Choke cherry	FAC	-	-	-	15	13	20	-	-	-	-	-	203	-	250	6'	12-18" Height	1 Gal Container	Plant in groups of 5		
shrub	<i>Amelanchier alnifolia</i>	Servicberry	FACU	-	-	-	-	13	20	-	-	-	-	-	-	-	33	6'	12-18" Height	1 Gal Container	Plant in groups of 5		
shrub	<i>Spiraea douglasii</i>	Hardhack spirea	FACW	-	-	-	15	-	20	-	-	-	-	-	203	-	237	6'	12-18" Height	1 Gal Container	Plant in groups of 5		
Shrub Subtotal				0	0	0	88	91	182	0	0	0	0	0	1215	0	1576						
Live stake	<i>Salix lucida</i> var. <i>lasianдра</i>	Pacific willow	FACW	420	827	638	15	-	20	-	-	-	-	-	203	-	2122	6'	3' Length	Live Stake	0.5" Top Diameter Min.		
Live stake	<i>Salix exigua</i>	Coyote willow	FACW	420	827	638	15	-	20	-	-	-	-	-	203	-	2122	6'	3' Length	Live Stake	0.5" Top Diameter Min.		
Live Stake Subtotal				841	1653	1275	29	0	40	0	0	0	0	0	405	0	4244						
GRAND TOTAL PLANTS				841	1653	1275	157	121	266	0	0	0	0	0	1815	125	7186						
																		TOTAL					
LEVEE SEED MIX																							
seed	<i>Pseudoroegneria spicata</i>	Bluebunch Wheatgrass	-	-	-	-	-	-	-	16.8	-	-	-	-	-	-	16.8	Pounds PLS					
seed	<i>Oryzopsis hymenoides</i>	Indian Ricegrass	-	-	-	-	-	-	-	10.5	-	-	-	-	-	-	10.5	Pounds PLS					
seed	<i>Elymus elymoides</i>	Bottlebrush Squirreltail	-	-	-	-	-	-	-	8.4	-	-	-	-	-	-	8.4	Pounds PLS					
seed	<i>Elymus lanceolatus</i> ssp. <i>Lanceolatus</i>	Thickspike Wheatgrass	-	-	-	-	-	-	-	8.4	-	-	-	-	-	-	8.4	Pounds PLS					
seed	<i>Poa secunda</i>	Sandberg Bluegrass	-	-	-	-	-	-	-	8.4	-	-	-	-	-	-	8.4	Pounds PLS					
subtotal				0.0	0.0	0.0	0.0	0.0	0.0	52.5	0.0	0.0	0.0	0.0	0.0	0.0	52.5	Pounds PLS					
FLOODPLAIN SEED MIX																							
seed	<i>Leymus cinereus</i>	Basin Wildrye	-	-	-	-	-	-	-	-	9.20	35.60	36.80	8.80	-	-	90.4	Pounds PLS					
seed	<i>Elymus glaucus</i>	Blue Wildrye	-	-	-	-	-	-	-	-	4.60	17.80	18.40	4.40	-	-	45.2	Pounds PLS					
seed	<i>Elymus elymoides</i>	Bottlebrush Squirreltail	-	-	-	-	-	-	-	-	3.45	13.35	13.80	3.30	-	-	33.9	Pounds PLS					
seed	<i>Pseudoroegneria spicata</i>	Bluebunch Wheatgrass	-	-	-	-	-	-	-	-	6.90	28.70	27.60	6.60	-	-	67.8	Pounds PLS					
seed	<i>Poa secunda</i>	Sandberg Bluegrass	-	-	-	-	-	-	-	-	5.75	22.25	23.00	5.50	-	-	56.5	Pounds PLS					
seed	<i>Elymus trachycaulis</i> ssp. <i>trachycaulis</i>	Slender Wheatgrass	-	-	-	-	-	-	-	-	2.30	8.90	9.20	2.20	-	-	22.6	Pounds PLS					
subtotal				0.0	0.0	0.0	0.0	0.0	0.0	0.0	32.2	124.6	128.8	30.8	0.0	0.0	316.4	Pounds PLS					
GRAND TOTAL POUNDS OF SEED				0.0	0.0	0.0	0.0	0.0	0.0	52.5	32.2	124.6	128.8	30.8	0.0	0.0	368.9	Pounds PLS					



NOTES

1. Install willow live stakes above approximate water surface elevation at 4290 cfs as shown on grading plan and profiles.
2. Install container plants on top of bank where temporary construction access has been provided.
3. Create well around container planting for water retention.

TYPICAL BANK PLANTING

SCALE: NTS

DATE AND TIME PLOTTED
10/1/2015 2:41 PM
PLOTTED BY

CAD SYSTEM
AUTOCAD CHAL 3D 2013
CWD FILENAME
L-302_457818