SOLICITATION, OFFER, AND AWARD *(Construction, Alteration, or Repair)*	1. SOLICITATION NO. W912DW23B0005	2. TYPE OF SOLICITATION [X] SEALED BID (IFB) [ ] NEGOTIATED *(RFP)*	3. DATE ISSUED 29-Nov-2022	PAGE OF PAGES 1 OF 67

IMPORTANT - The "offer" section on the reverse must be fully completed by offeror.

4. CONTRACT NO.	5. REQUISITION/PURCHASE REQUEST NO.	6. PROJECT NO. 404465

7. ISSUED BY CODE W912DW	8. ADDRESS OFFER TO *(If Other Than Item 7)* CODE
USA ENGINEER DISTRICT, SEATTLE ATTN: CENWS-CT 4735 EAST MARGINAL WAY SOUTH, BLDG. 1202 SEATTLE WA 98134-2388	**See Item 7**
TEL: FAX: 206-764-6817	TEL: FAX:

9. FOR INFORMATION CALL:	A. NAME CHARLES D IDLE	B. TELEPHONE NO. *(Include area code)* *(NO COLLECT CALLS)* 206-316-3998

SOLICITATION

NOTE: In sealed bid solicitations "offer" and "offeror" mean "bid" and "bidder".

10. THE GOVERNMENT REQUIRES PERFORMANCE OF THE WORK DESCRIBED IN THESE DOCUMENTS *(Title, identifying no., date):*

Yakima 1135

Furnish all labor, materials, and equipment to perform all work for Yakima River at Union Gap Ecosystem Restoration Project CAP Section 1135, Yakima, WA

IMPORTANT NOTE: Please see Table of Contents for detailed instructions on bid submittal and bid opening procdures.

Total Small Business Set aside
NAICS Code 237990
Small Business Size Standard: $39,500,000.00

11. The Contractor shall begin performance within 14 calendar days and complete it within 893 calendar days after receiving [ ] award, [X] notice to proceed. This performance period is [X] mandatory, [ ] negotiable. *(See* 52.211-10 *.)*

12 A. THE CONTRACTOR MUST FURNISH ANY REQUIRED PERFORMANCE AND PAYMENT BONDS? *(If "YES," indicate within how many calendar days after award in Item 12B.)* [X] YES [ ] NO	12B. CALENDAR DAYS 10

13. ADDITIONAL SOLICITATION REQUIREMENTS:

A. Sealed offers in original and 1 copies to perform the work required are due at the place specified in Item 8 by 02:00 PM *(hour)* local time 29 Dec 2022 *(date).* If this is a sealed bid solicitation, offers must be publicly opened at that time. Sealed envelopes containing offers shall be marked to show the offeror's name and address, the solicitation number, and the date and time offers are due.

B. An offer guarantee [X] is, [ ] is not required.

C. All offers are subject to the (1) work requirements, and (2) other provisions and clauses incorporated in the solicitation in full text or by reference.

D. Offers providing less than 90 calendar days for Government acceptance after the date offers are due will not be considered and will be rejected.

SOLICITATION, OFFER, AND AWARD (Continued)

(Construction, Alteration, or Repair)

OFFER ***(Must be fully completed by offeror)***

14. NAME AND ADDRESS OF OFFEROR *(Include ZIP Code)*		15. TELEPHONE NO. *(Include area code)*
		16. REMITTANCE ADDRESS *(Include only if different than Item 14)* **See Item 14**
CODE	FACILITY CODE	

17. The offeror agrees to perform the work required at the prices specified below in strict accordance with the terms of this solicitation, if this offer is accepted by the Government in writing within _____ calendar days after the date offers are due. *(Insert any number equal to or greater than the minimum requirements stated in Item 13D. Failure to insert any number means the offeror accepts the minimum in Item 13D.)*

AMOUNTS	SEE SCHEDULE OF PRICES

18. The offeror agrees to furnish any required performance and payment bonds.

19. ACKNOWLEDGMENT OF AMENDMENTS

(The offeror acknowledges receipt of amendments to the solicitation -- give number and date of each)

AMENDMENT NO.										
DATE										

20A. NAME AND TITLE OF PERSON AUTHORIZED TO SIGN OFFER *(Type or print)*	20B. SIGNATURE	20C. OFFER DATE

AWARD ***(To be completed by Government)***

21. ITEMS ACCEPTED:

22. AMOUNT	23. ACCOUNTING AND APPROPRIATION DATA

24. SUBMIT INVOICES TO ADDRESS SHOWN IN *(4 copies unless otherwise specified)*	**ITEM**	25. OTHER THAN FULL AND OPEN COMPETITION PURSUANT TO ☐ 10 U.S.C. 2304(c) ☐ 41 U.S.C. 253(c)
26. ADMINISTERED BY CODE		27. PAYMENT WILL BE MADE BY: CODE

CONTRACTING OFFICER WILL COMPLETE ITEM 28 OR 29 AS APPLICABLE

☐ 28. NEGOTIATED AGREEMENT *(Contractor is required to sign this document and return _____ copies to issuing office.)* Contractor agrees to furnish and deliver all items or perform all work, requisitions identified on this form and any continuation sheets for the consideration stated in this contract. The rights and obligations of the parties to this contract shall be governed by (a) this contract award, (b) the solicitation, and (c) the clauses, representations, certifications, and specifications or incorporated by reference in or attached to this contract.

☐ 29. AWARD *(Contractor is not required to sign this document.)* Your offer on this solicitation, is hereby accepted as to the items listed. This award consummates the contract, which consists of (a) the Government solicitation and your offer, and (b) this contract award. No further contractual document is necessary.

30A. NAME AND TITLE OF CONTRACTOR OR PERSON AUTHORIZED TO SIGN *(Type or print)*		31A. NAME OF CONTRACTING OFFICER *(Type or print)* TEL: EMAIL:
30B. SIGNATURE	30C. DATE	31B. UNITED STATES OF AMERICA BY
		31C. AWARD DATE

TABLE OF CONTENTS

BID SCHEDULE

BID SCHEDULE

BASE CLINS (0001-0007) Sportsman Island Channel & Associated Structures + Newland Pond Fill Sites 1, 4, 5 and 6					
CLIN NO.	**DESCRIPTION**	**QUANTITIY**	**UNIT**	**UNIT PRICE**	**AMOUNT**
0001	Mobilization & demobilization	1	JOB	N/A	$_____
0002	Construction, deconstruction, and area restoration of staging areas and access roads	1	JOB	N/A	$_____
0003	All site work at Sportsman Park associated with large wood structures	1	JOB	N/A	$_____
0004	All site work at Sportsman Park including channels, berms, and upstream groin removals				NSP
0004AA	Excavation (all work for excavation up to and including 110,600 CY)	110,600	CY		$_____
0004AB	Excavation (all work for excavation up to and including 11,000 CY)	11,000	CY		$_____
0004AC	Berm and groin onsite fill placement and compaction (up to and including 18,400 CY)	18,400	CY		$_____
0004AD	Berm and groin onsite fill placement and compaction (up to and including 1,800 CY)	1,800	CY		$_____
0005	Hauling and all work to place material in Newland Pond Fill Sites 1,4, 5 and 6				NSP
0005AA	Onsite disposal, fill placement and compaction (up to and including 92,200 CY)	92,200	CY		$_____
0005AB	Onsite disposal, fill placement and compaction (up to and including 9,200 CY)	9,200	CY		$_____
0006	All work for O&M manuals as specified in Section 01 78 23 OPERATIONS AND MAINTENANCE MANUALS from preparation to final approval	1	JOB	N/A	$20,000
0007	All work for As-Built drawings as specified in Section 01 78 00 CLOSEOUT SUBMITTALS from preparation to final approval	1	JOB	N/A	$10,000

TOTAL ALL BASE CLINS 0001-0007 $_____

OPTIONAL ITEMS #1 CLINS (0008-0017) Blue Slough Reconfiguration & Headgate + KOA Levee & Knob Degrade + Temporary staging area placement of fill material					
CLIN NO.	**DESCRIPTION**	**QUANTITIY**	**UNIT**	**UNIT PRICE**	**AMOUNT**
0008	Mobilization & demobilization	1	JOB	N/A	$_____
0009	Construction, deconstruction, and area restoration of staging areas and access roads	1	JOB	N/A	$_____
0010	Blue Slough Headwall and Headgate design (see note 5)	1	JOB	N/A	$_____
0011	All work associated with the construction of the Blue Slough Culvert and Headgate replacement	1	JOB	N/A	$_____
0012	All site work associated with Blue Slough Channel realignments				NSP
0012AA	Excavation (up to and including 7,000 CY)	7,000	CY		$_____
0012AB	Excavation (up to and including 700 CY)	700	CY		$_____
0013	All site work associated with Blue Slough Channel plantings and drainage structures	1	JOB	N/A	$_____
0014	All site work associated with the KOA Levee and KOA Knob degrades				NSP
0014AA	Excavation (up to and including 45,000 CY)	45,000	CY		$_____
0014AB	Excavation (up to and including 4,500 CY)	4,500	CY		$_____
0015	Hauling and all work to temporarily stockpile fill material in staging area(s)				NSP
0015AA	Onsite disposal in staging area #3 (up to and including 52,000 CY)	52,000	CY		$_____
0015AB	Onsite disposal in staging area #3 (up to and including 5,200 CY)	5,200	CY		$_____
0016	All work for O&M manuals as specified in Section 01 78 23 OPERATIONS AND MAINTENANCE MANUALS from preparation to final approval	1	JOB	N/A	$20,000

0017	All work for As-Built drawings as specified in Section 01 78 00 CLOSEOUT SUBMITTALS from preparation to final approval	1	JOB	N/A	$10,000

TOTAL ALL OPTIONAL ITEMS #1 (CLINS 0008-0017) $_____

OPTIONAL ITEMS #2 (CLINS 0018-0025) – DID #1 Removal + Building Blue Slough Levee + SR-24 Cross Dike Removal + Newland Pond Cut Sites 1-14 and Fill Sites 2,3 and 7					
CLIN NO.	**DESCRIPTION**	**QUANTITIY**	**UNIT**	**UNIT PRICE**	**AMOUNT**
0018	Mobilization & demobilization	1	JOB	N/A	$_____
0019	Construction, deconstruction, and area restoration of	1	JOB	N/A	$_____
0020	All site work associate with DID #1 Levee removal, SR-24 Cross Dike degrade, and SR-24 grade control sill, including on-site borrow of riprap.				NSP
0020AA	Excavation (up to and including 145,000 CY)	145,000	CY		$_____
0020AB	Excavation(up to and including 14,500 CY)	14,500	CY		$_____
0020AC	Onsite borrowed Class V riprap placement(up to and including 10,000 CY)	10,000	CY		$_____
0020AD	Class V riprap import and placement to supplement onsite borrow (up to and including 5,000 CY)	5,000	CY		$_____
0021	All site work associate with building the Blue Slough Levee and Backwater Extension including on-site borrow and levee embankment material processing	1	JOB	N/A	$_____
0022	Floodplain grading of the Newland Pond Cut Sites 1-14				NSP
0022AA	Excavation (up to and including 76,000 CY)	76,000	CY		$_____
0022AB	Excavation (up to and including 7,600 CY)	7,600	CY		$_____
0023	Hauling and all work to place material at Fill Sites 2, 3 and 7, including placement of material stockpiled in staging area 3				NSP
0023AA	Onsite disposal, fill placement and compaction (up to and including 252,000)	252,000	CY		$_____
0023AB	Onsite disposal, fill placement and compaction (up to and including 25,000)	25,000	CY		$_____

0024	All work for O&M manuals as specified in Section 01 78 23 OPERATIONS AND MAINTENANCE MANUALS from preparation to final approval	1	JOB	N/A	$20,000
0025	All work for As-Built drawings as specified in Section 01 78 00 CLOSEOUT SUBMITTALS from preparation to final approval	1	JOB	N/A	$10,000

TOTAL ALL OPTIONAL ITEMS #2 (CLINS 0018-0025) $_____

TOTAL ALL BASE CLINS 0001-0007 $_____

TOTAL ALL OPTIONAL ITEMS #1 (CLINS 0008-0017) $_____

TOTAL ALL OPTIONAL ITEMS #2 (CLINS 0018-0025) $_____

TOTAL ALL ITEMS (CLINS 0001-0025) $_____

NOTES:

1) CY = Cubic Yards
2) Quantities are estimated except where shown as "JOB." Bids shall not be submitted for quantities less than those specified for each line item.
3) To better facilitate the receipt and proposal process, all proposals shall be submitted on copies of the latest Bid Schedule as published in the solicitation or the latest amendment thereto. In lieu of indicating additions/deductions to line items, all Bidders should state their revised prices for each item.
4) Bidders must insert a price on all entry amount lines of numbered items of the Bid Schedule. Failure to do so will result in the offer being unacceptable.
5) The dollar amount established in the O&M Manual and As-Built Drawings CLINS shall not be revised by Bidders.
6) Award of optional items will be made in accordance with clause 52.217-7 OPTION FOR INCREASED QUANTITY – SEPARATELY PRICED LINE ITEM.
7) The design of the Blue Slough headwall and headgate applies only if the Optional Items #1 CLINs are exercised. Design work can't begin until the either the full Option or CLIN 0010 is exercised.
8) Subject to DFARS 252.236-7004, Payment for Mobilzation and Demobilization.
9) Subject to FAR 52.211-18, Variation in Estimated Quantities.
10) Subject to AFARS 5152.211-9001, Variation in Estimated Quantites – Subline Items (CLINS 0004,0005,0012,0014,0015,0020,0022, and 0023)

END BID SCHEDULE

DELIVERY INFORMATION

CLIN	DELIVERY DATE	QUANTITY	SHIP TO ADDRESS	DODAAC / CAGE

Section 00 21 00 - Instructions

MAGNITUDE OF CONSTRUCTION
The magnitude of construction is estimated between $10 million and $25 million.

CLAUSES INCORPORATED BY REFERENCE

52.204-7	System for Award Management	OCT 2018
52.204-16	Commercial and Government Entity Code Reporting	AUG 2020
52.204-22	Alternative Line Item Proposal	JAN 2017
52.214-4	False Statements In Bids	APR 1984
52.214-5	Submission Of Bids	DEC 2016
52.214-6	Explanation To Prospective Bidders	APR 1984
52.214-7	Late Submissions, Modifications, and Withdrawals of Bids	NOV 1999
52.214-18	Preparation of Bids-Construction	APR 1984
52.214-19	Contract Award-Sealed Bidding-Construction	AUG 1996
52.222-5	Construction Wage Rate Requirements--Secondary Site of the Work	MAY 2014
252.215-7008	Only One Offer	JUL 2019
252.215-7013	Supplies and Services Provided by Nontraditional Defense Contractors.	JAN 2018

CLAUSES INCORPORATED BY FULL TEXT

52.216-1 TYPE OF CONTRACT (APR 1984)

The Government contemplates award of a firm fixed price contract resulting from this solicitation.

(End of provision)

52.228-1 BID GUARANTEE (SEP 1996)

(a) Failure to furnish a bid guarantee in the proper form and amount, by the time set for opening of bids, may be cause for rejection of the bid.

(b) The bidder shall furnish a bid guarantee in the form of a firm commitment, e.g., bid bond supported by good and sufficient surety or sureties acceptable to the Government, postal money order, certified check, cashier's check, irrevocable letter of credit, or, under Treasury Department regulations, certain bonds or notes of the United States. The Contracting Officer will return bid guarantees, other than bid bonds, (1) to unsuccessful bidders as soon as practicable after the opening of bids, and (2) to the successful bidder upon execution of contractual documents and bonds (including any necessary coinsurance or reinsurance agreements), as required by the bid as accepted.-

(c) The amount of the bid guarantee shall be 20 percent of the bid price or $3,000,000.00, whichever is less.-

(d) If the successful bidder, upon acceptance of its bid by the Government within the period specified for acceptance, fails to execute all contractual documents or furnish executed bond(s) within 10 days after receipt of the forms by the bidder, the Contracting Officer may terminate the contract for default.-

(e) In the event the contract is terminated for default, the bidder is liable for any cost of acquiring the work that exceeds the amount of its bid, and the bid guarantee is available to offset the difference.

(End of provision)

52.233-2 SERVICE OF PROTEST (SEP 2006)

(a) Protests, as defined in section 33.101 of the Federal Acquisition Regulation, that are filed directly with an agency, and copies of any protests that are filed with the Government Accountability Office (GAO), shall be served on the Contracting Officer (addressed as follows) by obtaining written and dated acknowledgment of receipt from

U.S. Army Corps of Engineers, Seattle District
Contracting Officer, Robert Gonzalez
Email: robert.l.gonzalez@usace.army.mil

(b) The copy of any protest shall be received in the office designated above within one day of filing a protest with the GAO.

(End of provision)

52.236-27 SITE VISIT (CONSTRUCTION) (FEB 1995) – ALTERNATE I (FEB 1995)

(a) The clauses at 52.236-2, Differing Site Conditions, and 52.236-3, Site Investigations and Conditions Affecting the Work, will be included in any contract awarded as a result of this solicitation. Accordingly, offerors or quoters are urged and expected to inspect the site where the work will be performed.

(b) An organized site visit has been scheduled for--
TBD

(c) Participants will meet at--
Walmart Supercenter at 1600 E Chestnut Ave, Yakima, WA 98901

(End of provision)

52.252-1 SOLICITATION PROVISIONS INCORPORATED BY REFERENCE (FEB 1998)

This solicitation incorporates one or more solicitation provisions by reference, with the same force and effect as if they were given in full text. Upon request, the Contracting Officer will make their full text available. The offeror is cautioned that the listed provisions may include blocks that must be completed by the offeror and submitted with its quotation or offer. In lieu of submitting the full text of those provisions, the offeror may identify the provision by paragraph identifier and provide the appropriate information with its quotation or offer. Also, the full text of a solicitation provision may be accessed electronically at this/these address(es):

http://www.acq.osd.mil/dpap/dars/dfarspgi/current/index.html
http://www.acquisition.gov

(End of provision)

52.252-5 AUTHORIZED DEVIATIONS IN PROVISIONS (NOV 2020)

(a) The use in this solicitation of any Federal Acquisition Regulation (48 CFR Chapter 1) provision with an authorized deviation is indicated by the addition of "(DEVIATION)" after the date of the provision.

(b) The use in this solicitation of any provision with an authorized deviation is indicated by the addition of "(DEVIATION)" after the name of the regulation.

(End of provision)

Section 00 21 13 - Instructions to Bidders

CAUTION AND INSTRUCTIONS

!!!CAUTION TO BIDDERS!!!

1. **BUSINESS HOURS:** For the Seattle District Corps of Engineers are from 7:30 A.M. to 4:00 P.M., Monday through Friday.

BEFORE SIGNING AND MAILING THIS OFFER, PLEASE TAKE NOTE OF THE FOLLOWING, AS FAILURE TO PERFORM ANY ONE OF THESE ACTIONS MAY CAUSE YOUR OFFER TO BE REJECTED

2. **AMENDMENTS:** Have you acknowledged receipt of **ALL** amendments? If in doubt as to the number of amendments issued, please contact the representative listed on the Information Page.

3. **AMENDED SECTIONS: If any of the amendments furnished amended sections, the amended sections must be used** in submitting your offer.

4. **MISTAKE IN OFFER:** Have you reviewed your offer price for possible errors in calculation or work left out?

5. **OFFER ACCEPTANCE PERIOD:** The minimum offer acceptance period is specified in block 13D of SF1442, Solicitation, Offer and Award. Please ensure that you allow at least the stated number of calendar days for the Government to accept your offer.

6. **SYSTEM FOR AWARD MANAGEMENT:** Contractors are required, before receipt of contract award to ensure that their firm is registered in the government web site entitled System for Award Management (SAM) and that all information required is current and up to date. https://www.sam.gov/portal/public/SAM/

7. GOVERNMENT SECURITY REQUIREMENTS:

The Offeror's bid shall be submitted electronically, as described below in Item 9, Bid Submittals. The IFB will provide the Government address and receipt date for bid submittal. The Offeror's bid shall not contain classified data. The use of hyperlinks in bids in prohibited.

8. COPIES OF SOLICITATION DOCUMENTS AND AMENDMENTS:

Copies of the solicitation and amendments are available by INTERNET ACCESS ONLY. All solicitation documents will be posted to the U.S. Government's Contract Opportunities website at: https://www.SAM.gov under Solicitation Number **W912DW23B0005**. A list of interested vendors (potential offerors and subcontractors) is available on the web site (registration required) with the solicitation announcement.

NOTE: www.SAM.gov is the new official U.S. Government website for Contract Opportunities.

It shall be the contractor's responsibility to check the websites for any amendments. The Offeror shall submit in the bid all requested information specified in this solicitation.

Additional information regarding this solicitation and potential Offerors and/or subcontractors is available at http://www.nws.usace.army.mil/BusinessWithUs/Contracting.aspx.

9. Bid Submittals

In strict compliance with guidance relating to the current situation with COVID-19 and social distancing, the only authorized transmission method for bids in response to this solicitation is electronically via email online submission. NO OTHER TRANSMISSION METHODS (E-MAIL, FACSIMILE, REGULAR MAIL, HAND CARRIED, ETC.) WILL BE ACCEPTED.

Please send bids to Contract Specialist Charles Idle charles.d.idle@usace.army.mil AND to Contracting Officer Robert Gonzalez at robert.l.gonzalez@usace.army.mil.

INSTRUCTIONS FOR SUBMITTING ELECTRONIC BIDS:

In an effort to reduce paperwork and cost, all bids shall be submitted electronically through email. Submission shall be in Adobe PDF format.

FILE DESCRIPTION: Include a "File Description" for each file(s) you upload. The "File Description" will be included in the e-mail notice to each of the recipients you choose to have access your file(s). NOTE: Do NOT enter Privacy Act Data (Personal Identifiable Information (PII) in the File Description).

FILE NAMING CONVENTION: Each file name shall begin with the solicitation number followed by the firm's name and a brief file description. Please see examples below. To ensure your submission is received and processed appropriately, it is important that interested parties CAREFULLY ensure their electronic files adhere to the following naming convention:

W912DW23B0005-FIRMNAME-Bid
W912DW23B0005-FIRMNAME-Amendments
W912DW23B0005-FIRMNAME-Bid Bonds

A completed bid includes:
- Fully executed Form 1442-with amendments acknowledged
- Bid Bond
- Fully completed Bid Schedule
- Criteria
- Completed Reps and Certs from @SAM.GOV and any fill in FAR clause incorporated by reference or by full text. Submission shall be in Adobe PDF format.

Bid bond – The amount of the bid guarantee shall be 20 percent (20%) of the bid price or $3 Million, whichever is less. Bid Bonds (SF24) MUST BE ACCOMPANIED BY A Power of Attorney containing an original or electronic signature from the surety, which must be affixed to the Power of Attorney after the Power of Attorney has been generated. Computer generated and signed Powers of Attorney will be accepted if accompanied by a certification from a current officer of the surety attesting to its authenticity and continuing validity.

Current SF24 forms are available at the following website:
http://www.gsa.gov/portal/forms/type/TOP.

NOTE: Effective immediately, to respond to the Coronavirus Disease 2019 (COVID-19) national emergency-
Electronic signatures and electronic, mechanically-applied, or printed dates may be used and shall be considered
original signatures and dates. The following FAR deviations are applicable to this procurement:

• 52.228-11, Pledges of Assets (DEVIATION 2020-O0016), which removes the requirement for the Standard
Form 28 to be sworn and notarized.

• 52.228-15, Performance and Payment Bonds—Construction (DEVIATION 2020- O0016), which removes
the requirements for seals on Standard Forms.

10. BID OPENING PROCEDURE- The virtual bid opening will occur 30 minutes after the due date and time for receipt of bids to allow for the downloading of emails. Virtual bid opening is scheduled for 29 **December 2022 at 2:30 PM Pacific Standard Time**. Please use the following information:

The link to join the meeting /view on-line is:

https://usace1.webex.com/meet/robert.l.gonzalez

NOTE: It has been reported the 'Call Me' function is the simplest way to connect audio to the meeting. Please use this function if it is provided. Instructions for the 'Call Me' function- 1) Enter your phone number. 2) The system will immediately call the number you entered. 3) Answer and follow the prompts to join the meeting.
Join by phone

1-8774029753 Call-in toll-free number (ATT Audio Conference)
1-6366513141 Call-in number (ATT Audio Conference)
594 362 5 Access Code

*** Please note the Access Code is also the Security Code so you will have to enter the Access Code twice when connecting by phone. The bid opening will begin promptly at 10:30 AM so please allow time for connecting by audio and/or resolving any technical difficulties before the beginning of proceedings.

11. BID EXPENSES AND PRE-CONTRACT COSTS
This Invitation for Bid (IFB) does not commit the Government to pay, as a direct charge, any costs incurred in the preparation and submission of a bid.

12. ACCURACY IN BIDS
Bids must set forth full, accurate, and complete information as required by this IFB, (including attachments). The penalty for making false statements is prescribed in 18 U.S.C. 1001.

13. BASIS OF AWARD

BASIS OF AWARD Bids will be evaluated without discussions. Award will be made to the responsible bidder whose bid, responsive to the invitation, will be most advantageous to the Government considering price and the price-related factors included in the invitation. In addition, the apparent low bidder must meet the Definitive Responsibility Criteria (DRC) as described in Section 00 22 00 in accordance with FAR 9.104-2. Award shall not be made until all required approvals have been obtained and the award otherwise conforms to FAR 14.103-2.

THIS PROCUREMENT IS:

100% Total Small Business Set Aside

SITE VISIT:

- BIDDERS ARE URGED and expected to inspect the site where construction is to be performed and to satisfy themselves as to all general and local conditions which may affect the cost of performance of the contract, to the extent, such information is reasonably obtainable. In no event, will a failure to inspect the site constitute grounds for withdrawal of a bid after opening or for a claim after award of the contract.
- Please email Charles Idle at charles.d.idle@usace.army.mil and copy Stephen Osgood at stephen.m.osgood@usaces.army.mil to RSVP for the site visist. We need a headcount prior to the day of, so please provided the names of up to two (2) attendees no later than TBD
- Site visit Date/Time: TBD
- LOCATION: Attendees will meet at NC Machinery located on 2100 Terrance heights Dr Yakima, WA 98901

- **Site Visit visual aid:**
- https://usace-nws.maps.arcgis.com/apps/webappviewer/index.html?id=e489f0abefb544bbaf100a8bbd83fc62
- Username: Yakima_TempUser
- Password: Yakima1135!

BIDDING DOCUMENTS: Register for solicitations at the Internet site: http://www.SAM.gov/

FOR INQUIRIES AND ADMINISTRATIVE MATTERS: Contact the following individuals Monday through Friday between the hours of 8:00 a.m. and 4:00 p.m.:

Charles Idle, 206-316-3998, charles.d.idle@usace.army.mil AND
Sonia Frees, 206-764-3516, Sonia.m.frees@usace.army.mil

TECHNICAL QUESTIONS:

All inquiries regarding this solicitation are to be submitted via ProjNet-Bid^{sm}. Telephone and email inquiries will not be accepted. ProjNet-Bid^{sm} is a web-based program that allows bidders to post questions regarding the solicitation and to view all questions by other bidders and answers by USACE. ProjNet-Bid^{sm} can be accessed through ProjNet^{sm} at https://www.projnet.org To access the ProjNet-Bid^{sm} website the first time:

1) Click the Bid tab
2) Click Bidder Inquiry. (The Agency is USACE.)
3) Enter the following information

for access:

1. The Bidder Inquiry Key: **4YPZSB-98H4C3**
2. Valid business contact information (e.g. Company name, contact person, business address, phone number and email address). (required on first project only)
3. Establish Secret Question and Answer which will be used as a password (required onfirst project only)

For subsequent access use your email address, the Bid Inquiry Key and response to the Secret Question to access the ProjNet-Bid^{sm} Module.

4) Submit technical questions. When an answer is posted to a question, the question and answer is then available for all other bidders to review.
5) For questions about the ProjNet-Bid^{sm}, please contact the Call Center help desk toll free at 1-800-428- HELP (4357), which operates from 8AM to 5PM (Central US time zone).

No response will be posted to inquiries after the Close of Business on the third business day preceding the solicitation due date. All bidders will be held to have reviewed the questions and responses in ProjNet-Bid^{sm} prior to bid submission. Nothing in the solicitation is changed unless an amendment is sent out.

DEFINTIVE RESPONSIBILITY

Definitive Responsibility Criteria

Definitive Responsibility Criteria (DRC) are specific and objective standards established to inform the Contracting Officer's responsibility determination in accordance with FAR 9.104-2. These criteria assess whether the apparent low bidder can demonstrate the expertise and specialized facilities needed for adequate contract performance. Accordingly, in addition to examining whether a prospective contractor meets the general standards of responsibility in FAR 9.104-1, the Contracting Officer will also examine whether the low bidder can meet the requirements of ALL of the following three (3) definitive responsibility criteria. The apparent low bidder will be required to furnish documentation of project experience performed within the last ten (10) years.

The documentation furnished to meet these definitive responsibility criteria shall demonstrate project experience, within the last ten (10) years, for each of the following three (3) requirements:

1. **Management of Water in a Riverine Environment.** Experience includes construction "in the wet" where care and diversion of water was required for a river or tributary stream and management of flood risk during construction was required. This experience can include: design, fabrication and/or construction of temporary water management facilities using trenches, diversion channels, berms, levees, cofferdams, sheet pilings, or dewatering systems; bridge or culvert construction or replacement; implementing temporary fish exclusion or fish passage; and incorporating any other necessary supporting features to protect fish and water quality during construction. The work must have been performed so that conditions were not worsened upstream or downstream by possible floods during construction. (Reference: Division 01 General Requirements Specification Section 01 56 00 Care and Diversion of Water and Section 35 44 00 In-Stream and Floodplain Habitat Construction.)

2. **Experience with channel stabilization and armoring**. Experience includes construction of or repair to a levee and its revetment or prism, and/or construction of or repair to a channel or stream bank. This can be the setting back of a levee and removal of a pre-existing levee, placement of armoring rock, and/or bank stabilization.

3. **Experience with earthwork – excavation, fill and grading.** The volumes of excavated, stockpiled, and placed material are quite high in this project and require an understanding of how to efficiently handle large volumes. Experience excavating at least 10,000 cubic yards (CY) of material in a single job and installation of at least 10,000 CY of material in a single job. Experience includes import or sorting of materials prior to placement as well as grading and compaction to meet specifications. Experience also includes the creation of side channels and the diversion of water to these new features. (Reference: Division 31 Earthwork Specification Section 31 00 00 for this project's earthwork requirements.)

Project experience can be demonstrated by either accomplishing all three (3) requirements discussed above under a single project or by the accomplishment of all requirements through a combination of projects.

The prime contractor and/or subcontractor identified in the submitted documentation shall be the same as the proposed prime contractor and/or subcontractor for the current solicitation.

The apparent low bidder will have two (2) working days after bid opening to submit the documentation demonstrating that it meets the above definitive responsibility criteria. If the low bidder meets these requirements, it will receive award of the contract if otherwise eligible and responsible. If the apparent low bidder cannot provide this documentation or if the documentation it submits does not show that it meets these criteria, and the Small Business Administration does not issue a Certificate of Competency (in accordance with FAR 19.6) for the contract to be awarded, the Government will request that the apparent next low bidder provide the required documentation. If the prospective contractor provides the requested documentation within two (2) working days of the Government's request, it will receive award of the contract if otherwise eligible and responsible. This process will be followed until a low bidder that meets the requirements of the solicitation can document that it meets the definitive responsibility criteria, or the Government cancels the solicitation.

Section 00 45 00 - Representations and Certifications

PRE-AWARD INFORMATION

SUBMIT THE FOLLOWING INFORMATION WITH YOUR BID
NOTICE TO BIDDERS REGARDING PRE-AWARD INFORMATION

1. Company Name and Address: _____

   _____

   _____

2. Point of Contact Name: _____

   Email address: _____

   Telephone Number: _____ Fax Number: _____

3. Electronic Transfer Payments will now be required for all new contracts. Do you currently receive Electronic Transfer Payments from this agency? (agency codes 00005524/00006482) Yes _____ No _____

4. Name of Bank and Branch: _____

   Personal Banker: _____

   Email address: _____

   Telephone Number: _____ Fax Number: _____

5. Name of Bonding Agent Company: _____

   Agents Name: _____

   Email address: _____

   Telephone Number: _____ Fax Number: _____

6. Contractors are required, before receipt of contract award to ensure that their firm is registered in the government web site entitled System for Award Management (SAM) and that all information required is current and up to date.

   https://www.sam.gov/portal/public/SAM/

   Ensure that your company's information is updated for the following areas:

   - CORE DATA: Ensure that your business types are correctly filled in:

   - What is your business type? _____

     (Examples of Business types: Small Business (SB), Small Disadvantaged Business (SDB), Woman-Owned Small Business (WOSB), Historically Underutilized Business Zone (HUBZone), Veteran-Owned Small Business (VOSB), Service-Disabled Veteran-Owned Small Business (SDVOSB), and SBA 8(a)).

- DUNS Number: _____
- CAGE Code: _____
- TAX ID: _____

- REPS & CERTS: Ensure that you have certified the FAR and DFARs provisions (clauses) listed on the Reps & Certs pages.

- CORE DATA – Business Types updated: Yes _____ Date: _____

- REPS & CERTS – Certified Yes _____ Date: _____

7. Please provide the following information; it will not be used to evaluate or rank bids. It will be used solely as a reference check for our internal files. List no more than three projects that are substantially complete or have been completed within the last ten years that are similar to this project. Projects should be listed in the following order: Federal projects, state projects, city/county projects, and then commercial projects. Use the following format:

   a) Title & Location of Project: _____

      Agency/Company: _____

      Point of Contact (Name &Title):_____

      Email address: _____

      Telephone Number:_____ Award Amount: $ _____ Yr of Completion:___

   b) Title & Location of Project: _____

      Agency/Company:_____

      Point of Contact (Name &Title):_____

      Email address: _____

      Telephone Number:_____ Award Amount: $ _____ Yr of Completion:___

   c) Title & Location of Project: _____

      Agency/Company:_____

      Point of Contact (Name &Title):_____

      Email address: _____

      Telephone Number:_____ Award Amount: $ _____ Yr of Completion:___

8. List all outstanding uncompleted projects, in the following format:

   a) Title of Project: _____

      Agency/Company:_____

Award Amount: $_____ Est. Completion Date:_____

b) Title of Project: _____

Agency/Company:_____

Award Amount: $_____ Est. Completion Date:_____

c) Title of Project: _____

Agency/Company:_____

Award Amount: $_____ Est. Completion Date:_____

CLAUSES INCORPORATED BY REFERENCE

52.203-2	Certificate Of Independent Price Determination	APR 1985
52.203-11	Certification And Disclosure Regarding Payments To Influence Certain Federal Transactions	SEP 2007
52.203-18	Prohibition on Contracting With Entities That Require Certain Internal Confidentiality Agreements or Statements--Representation	JAN 2017
52.204-8	Annual Representations and Certifications	MAR 2020
52.204-17	Ownership or Control of Offeror	AUG 2020
52.204-20	Predecessor of Offeror	AUG 2020
52.204-24	Representation Regarding Certain Telecommunications and Video Surveillance Services or Equipment.	OCT 2020
52.204-26	Covered Telecommunications Equipment or Services--Representation.	OCT 2020
52.209-2	Prohibition on Contracting with Inverted Domestic Corporations--Representation	NOV 2015
52.209-5	Certification Regarding Responsibility Matters	AUG 2020
52.209-7	Information Regarding Responsibility Matters	OCT 2018
52.209-11	Representation by Corporations Regarding Delinquent Tax Liability or a Felony Conviction under any Federal Law	FEB 2016
52.209-13	Violation of Arms Control Treaties or Agreements -- Certification.	FEB 2021
52.219-1 Alt I	Small Business Program Representations (NOV 2020) Alternate I	SEP 2015
52.219-2	Equal Low Bids	OCT 1995
52.222-22	Previous Contracts And Compliance Reports	FEB 1999
52.222-38	Compliance With Veterans' Employment Reporting Requirements	FEB 2016
52.223-22	Public Disclosure of Greenhouse Gas Emissions and Reduction Goals -- Representation.	DEC 2016
52.225-25	Prohibition on Contracting with Entities Engaging in Certain Activities or Transactions Relating to Iran-- Representation and Certifications.	JUN 2020
252.203-7005	Representation Relating to Compensation of Former DoD Officials	NOV 2011

252.204-7008	Compliance With Safeguarding Covered Defense Information Controls	OCT 2016
252.204-7016	Covered Defense Telecommunications Equipment or Services -- Representation	DEC 2019
252.204-7017	Prohibition on the Acquisition of Covered Defense Telecommunications Equipment or Services -- Representation	DEC 2019
252.225-7050	Disclosure of Ownership or Control by the Government of a Country that is a State Sponsor of Terrorism	DEC 2018
252.232-7016	Notice of Progress Payments or Performance-Based Payments	APR 2020
252.247-7022	Representation of Extent of Transportation by Sea.	JUN 2019

CORPORATE CERTIFICATE

IF THE CONTRACTOR IS A CORPORATION OR PARTNERSHIP, THE **APPLICABLE PORTION** OF THE FORM LISTED BELOW MUST BE COMPLETED. IN THE ALTERNATIVE, OTHER EVIDENCE MUST BE SUBMITTED TO SUBSTANTIATE THE AUTHORITY OF THE PERSON SIGNING THE CONTRACT. IF A CORPORATION, **THE SAME OFFICER SHALL NOT EXECUTE BOTH THE CONTRACT AND THE CERTIFICATE**.

CORPORATE CERTIFICATE

I, _____, certify that I am the _____ Secretary of the Corporation named as Contractor herein; that _____, who signed this contract on behalf of the Contractor was then _____of said corporation; that said contract was duly signed for and on behalf of said corporation by authority of its governing body and is within the scope of its corporate powers.

_____ (CORPORATE
(Secretary) SEAL)

AUTHORITY TO BIND PARTNERSHIP

This is to certify that the names and signatures of all partners are listed below and that the person signing the contract has authority actually to bind the partnership pursuant to its partnership agreements. Each of the partners individually has full authority to enter into and execute contractual instruments on behalf of said partnership with the United States of America, except as follows: (state "none" or describe limitations, if any)

_____

This authority shall remain in full force and effect until such time as the revocation of authority by any cause whatsoever has been furnished in writing to, and acknowledged by, the Contracting Officer.

(Names and Signatures of all Partners)

NAME	SIGNATURE
_____	_____
_____	_____
_____	_____
_____	_____

Section 00 70 00 - Conditions of the Contract

Section 00 72 00 - General Conditions

CLAUSES INCORPORATED BY REFERENCE

52.202-1	Definitions	JUN 2020
52.203-3	Gratuities	APR 1984
52.203-5	Covenant Against Contingent Fees	MAY 2014
52.203-6	Restrictions On Subcontractor Sales To The Government	JUN 2020
52.203-7	Anti-Kickback Procedures	JUN 2020
52.203-10	Price Or Fee Adjustment For Illegal Or Improper Activity	MAY 2014
52.203-12	Limitation On Payments To Influence Certain Federal Transactions	JUN 2020
52.203-13	Contractor Code of Business Ethics and Conduct	JUN 2020
52.203-19	Prohibition on Requiring Certain Internal Confidentiality Agreements or Statements	JAN 2017
52.204-2	Security Requirements	MAR 2021
52.204-4	Printed or Copied Double-Sided on Postconsumer Fiber Content Paper	MAY 2011
52.204-9	Personal Identity Verification of Contractor Personnel	JAN 2011
52.204-10	Reporting Executive Compensation and First-Tier Subcontract Awards	JUN 2020
52.204-13	System for Award Management Maintenance	OCT 2018
52.204-18	Commercial and Government Entity Code Maintenance	AUG 2020
52.204-19	Incorporation by Reference of Representations and Certifications.	DEC 2014
52.204-21	Basic Safeguarding of Covered Contractor Information Systems	JUN 2016
52.204-23	Prohibition on Contracting for Hardware, Software, and Services Developed or Provided by Kaspersky Lab and Other Covered Entities.	JUL 2018
52.204-25	Prohibition on Contracting for Certain Telecommunications and Video Surveillance Services or Equipment.	AUG 2020
52.209-6	Protecting the Government's Interest When Subcontracting With Contractors Debarred, Suspended, or Proposed for Debarment	JUN 2020
52.209-9	Updates of Publicly Available Information Regarding Responsibility Matters	OCT 2018
52.209-10	Prohibition on Contracting With Inverted Domestic Corporations	NOV 2015
52.210-1	Market Research	JUN 2020
52.211-13	Time Extensions	SEP 2000
52.214-26	Audit and Records--Sealed Bidding	JUN 2020
52.214-27	Price Reduction for Defective Certified Cost or Pricing Data - Modifications - Sealed Bidding	JUN 2020
52.214-28 Alt I	Subcontractor Certified Cost or Pricing Data--Modifications-- Sealed Bidding (JUN 2020) - Alternate I	AUG 2020
52.215-2	Audit and Records--Negotiation	JUN 2020
52.215-19	Notification of Ownership Changes	OCT 1997
52.217-5	Evaluation Of Options	JUL 1990
52.219-8	Utilization of Small Business Concerns	OCT 2018
52.219-9 Alt I	Small Business Subcontracting Plan (JUN 2020) Alternate I	NOV 2016
52.222-3	Convict Labor	JUN 2003
52.222-4	Contract Work Hours and Safety Standards - Overtime Compensation	MAY 2018
52.222-6	Construction Wage Rate Requirements	AUG 2018

52.222-7	Withholding of Funds	MAY 2014
52.222-8	Payrolls and Basic Records	AUG 2018
52.222-9	Apprentices and Trainees	JUL 2005
52.222-10	Compliance with Copeland Act Requirements	FEB 1988
52.222-11	Subcontracts (Labor Standards)	MAY 2014
52.222-12	Contract Termination-Debarment	MAY 2014
52.222-13	Compliance With Construction Wage Rate Requirements and Related Regulations	MAY 2014
52.222-14	Disputes Concerning Labor Standards	FEB 1988
52.222-15	Certification of Eligibility	MAY 2014
52.222-21	Prohibition Of Segregated Facilities	APR 2015
52.222-26	Equal Opportunity	SEP 2016
52.222-27	Affirmative Action Compliance Requirements for Construction	APR 2015
52.222-35	Equal Opportunity for Veterans	JUN 2020
52.222-36	Equal Opportunity for Workers with Disabilities	JUN 2020
52.222-37	Employment Reports on Veterans	JUN 2020
52.222-40	Notification of Employee Rights Under the National Labor Relations Act	DEC 2010
52.222-50	Combating Trafficking in Persons	OCT 2020
52.222-54	Employment Eligibility Verification	OCT 2015
52.222-55	Minimum Wages Under Executive Order 13658	NOV 2020
52.222-62	Paid Sick Leave Under Executive Order 13706	JAN 2017
52.223-6	Drug-Free Workplace	MAY 2001
52.223-18	Encouraging Contractor Policies To Ban Text Messaging While Driving	JUN 2020
52.225-13	Restrictions on Certain Foreign Purchases	FEB 2021
52.227-1	Authorization and Consent	JUN 2020
52.227-4	Patent Indemnity-Construction Contracts	DEC 2007
52.228-2	Additional Bond Security	OCT 1997
52.228-11 (Dev)	Individual Surety--Pledge of Assets (DEVIATION 2020-O0016)	FEB 2021
52.228-12	Prospective Subcontractor Requests for Bonds	MAY 2014
52.228-15 (Dev)	Performance and Payment Bonds-Construction. (Deviation 2020-O0016)	JUN 2020
52.229-3	Federal, State And Local Taxes	FEB 2013
52.232-17	Interest	MAY 2014
52.232-23	Assignment Of Claims	MAY 2014
52.232-27	Prompt Payment for Construction Contracts	JAN 2017
52.232-33	Payment by Electronic Funds Transfer--System for Award Management	OCT 2018
52.232-39	Unenforceability of Unauthorized Obligations	JUN 2013
52.232-40	Providing Accelerated Payments to Small Business Subcontractors	DEC 2013
52.233-1	Disputes	MAY 2014
52.233-3	Protest After Award	AUG 1996
52.233-4	Applicable Law for Breach of Contract Claim	OCT 2004
52.236-2	Differing Site Conditions	APR 1984
52.236-3	Site Investigation and Conditions Affecting the Work	APR 1984
52.236-5	Material and Workmanship	APR 1984
52.236-6	Superintendence by the Contractor	APR 1984
52.236-7	Permits and Responsibilities	NOV 1991
52.236-8	Other Contracts	APR 1984
52.236-9	Protection of Existing Vegetation, Structures, Equipment, Utilities, and Improvements	APR 1984
52.236-10	Operations and Storage Areas	APR 1984

52.236-11	Use and Possession Prior to Completion	APR 1984
52.236-12	Cleaning Up	APR 1984
52.236-13	Accident Prevention	NOV 1991
52.236-17	Layout of Work	APR 1984
52.236-21 Alt I	Specifications and Drawings for Construction (Feb 1997) - Alternate I	APR 1984
52.236-26	Preconstruction Conference	FEB 1995
52.242-5	Payments to Small Business Subcontractors	JAN 2017
52.242-13	Bankruptcy	JUL 1995
52.242-14	Suspension of Work	APR 1984
52.243-4	Changes	JUN 2007
52.244-6	Subcontracts for Commercial Items	NOV 2020
52.246-12	Inspection of Construction	AUG 1996
52.246-21	Warranty of Construction	MAR 1994
52.248-3	Value Engineering-Construction	OCT 2020
52.249-2	Termination For Convenience Of The Government (Fixed-Price)	APR 2012
52.249-10	Default (Fixed-Price Construction)	APR 1984
52.252-3	Alterations in Solicitation	APR 1984
252.201-7000	Contracting Officer's Representative	DEC 1991
252.203-7000	Requirements Relating to Compensation of Former DoD Officials	SEP 2011
252.203-7001	Prohibition On Persons Convicted of Fraud or Other Defense-Contract-Related Felonies	DEC 2008
252.203-7002	Requirement to Inform Employees of Whistleblower Rights	SEP 2013
252.203-7004	Display of Hotline Posters	AUG 2019
252.204-7003	Control Of Government Personnel Work Product	APR 1992
252.204-7012	Safeguarding Covered Defense Information and Cyber Incident Reporting	DEC 2019
252.204-7015	Notice of Authorized Disclosure of Information for Litigation Support	MAY 2016
252.204-7018	Prohibition on the Acquisition of Covered Defense Telecommunications Equipment or Services	JAN 2021
252.204-7020	NIST SP 800-171 DoD Assessment Requirements	NOV 2020
252.205-7000	Provision Of Information To Cooperative Agreement Holders	DEC 1991
252.209-7004	Subcontracting With Firms That Are Owned or Controlled By The Government of a Country that is a State Sponsor of Terrorism	MAY 2019
252.223-7001	Hazard Warning Labels	DEC 1991
252.223-7008	Prohibition of Hexavalent Chromium	JUN 2013
252.225-7012	Preference For Certain Domestic Commodities	DEC 2017
252.225-7048	Export-Controlled Items	JUN 2013
252.227-7033	Rights in Shop Drawings	APR 1966
252.232-7003	Electronic Submission of Payment Requests and Receiving Reports	DEC 2018
252.232-7004 (Dev)	DoD Progress Payment Rates (DEVIATION 2020-O0010)	MAR 2020
252.232-7010	Levies on Contract Payments	DEC 2006
252.236-7000	Modification Proposals-Price Breakdown	DEC 1991
252.243-7001	Pricing Of Contract Modifications	DEC 1991
252.243-7002	Requests for Equitable Adjustment	DEC 2012
252.244-7000	Subcontracts for Commercial Items	JAN 2021
252.247-7023	Transportation of Supplies by Sea	FEB 2019

CLAUSES INCORPORATED BY FULL TEXT

52.211-10 COMMENCEMENT, PROSECUTION, AND COMPLETION OF WORK (APR 1984)

The Contractor shall be required to (a) commence work under this contract within 14 calendar days after the date the Contractor receives the notice to proceed, (b) prosecute the work diligently, and (c) complete the entire work ready for use not later than 893 calendar days. The time stated for completion shall include final cleanup of the premises.

(End of clause)

52.211-12 LIQUIDATED DAMAGES--CONSTRUCTION (SEP 2000)

(a) If the Contractor fails to complete the work within the time specified in the contract, the Contractor shall pay liquidated damages to the Government in the amount of $2,838 for each calendar day of delay until the work is completed or accepted.

(b) If the Government terminates the Contractor's right to proceed, liquidated damages will continue to accrue until the work is completed. These liquidated damages are in addition to excess costs of repurchase under the Termination clause.

(End of clause)

52.211-18 VARIATION IN ESTIMATED QUANTITY (APR 1984)

If the quantity of a unit-priced item in this contract is an estimated quantity and the actual quantity of the unit-priced item varies more than 15 percent above or below the estimated quantity, an equitable adjustment in the contract price shall be made upon demand of either party. The equitable adjustment shall be based upon any increase or decrease in costs due solely to the variation above 115 percent or below 85 percent of the estimated quantity. If the quantity variation is such as to cause an increase in the time necessary for completion, the Contractor may request, in writing, an extension of time, to be received by the Contracting Officer within 10 days from the beginning of the delay, or within such further period as may be granted by the Contracting Officer before the date of final settlement of the contract. Upon the receipt of a written request for an extension, the Contracting Officer shall ascertain the facts and make an adjustment for extending the completion date as, in the judgement of the Contracting Officer, is justified.

52.217-7 OPTION FOR INCREASED QUANTITY--SEPARATELY PRICED LINE ITEM (MAR 1989)

The Government may require the delivery of the numbered line item, identified in the Schedule as an option item, in the quantity and at the price stated in the Schedule. The Contracting Officer may exercise the option by written notice to the Contractor within 7 days.. Delivery of added items shall continue at the same rate that like items are called for under the contract, unless the parties otherwise agree.

(End of clause)

52.217-9 OPTION TO EXTEND THE TERM OF THE CONTRACT (MAR 2000)

(a) The Government may extend the term of this contract by written notice to the Contractor within 30 provided that the Government gives the Contractor a preliminary written notice of its intent to extend at least 60 days before the contract expires. The preliminary notice does not commit the Government to an extension.

(b) If the Government exercises this option, the extended contract shall be considered to include this option clause.

(c) The total duration of this contract, including the exercise of any options under this clause, shall not exceed 893 days.
(End of clause)

52.219-28 POST-AWARD SMALL BUSINESS PROGRAM REREPRESENTATION (NOV 2020)

(a) Definitions. As used in this clause--

Long-term contract means a contract of more than five years in duration, including options. However, the term does not include contracts that exceed five years in duration because the period of performance has been extended for a cumulative period not to exceed six months under the clause at 52.217-8, Option to Extend Services, or other appropriate authority.

Small business concern--

(1) Means a concern, including its affiliates, that is independently owned and operated, not dominant in the field of operation in which it is bidding on Government contracts, and qualified as a small business under the criteria in 13 CFR part 121 and the size standard in paragraph (d) of this clause. Such a concern is "not dominant in its field of operation" when it does not exercise a controlling or major influence on a national basis in a kind of business activity in which a number of business concerns are primarily engaged. In determining whether dominance exists, consideration shall be given to all appropriate factors, including
volume of business, number of employees, financial resources, competitive status or position, ownership or control of materials, processes, patents, license agreements, facilities, sales territory, and nature of business activity.

(2) Affiliates, as used in this definition, means business concerns, one of whom directly or indirectly controls or has the power to control the others, or a third party or parties control or have the power to control the others. In determining whether affiliation exists, consideration is given to all appropriate factors including common ownership, common management, and contractual relationships. SBA determines affiliation based on the factors set forth at 13 CFR 121.103.

(b) If the Contractor represented that it was any of the small business concerns identified in 19.000(a)(3) prior to award of this contract, the Contractor shall rerepresent its size and socioeconomic status according to paragraph (f) of this clause or, if applicable, paragraph (h) of this clause, upon occurrence of any of the following:

(1) Within 30 days after execution of a novation agreement or within 30 days after modification of the contract to include this clause, if the novation agreement was executed prior to inclusion of this clause in the contract.

(2) Within 30 days after a merger or acquisition that does not require a novation or within 30 days after modification of the contract to include this clause, if the merger or acquisition occurred prior to inclusion of this clause in the contract.

(3) For long-term contracts--

(i) Within 60 to 120 days prior to the end of the fifth year of the contract; and

(ii) Within 60 to 120 days prior to the date specified in the contract for exercising any option thereafter.

(c) If the Contractor represented that it was any of the small business concerns identified in 19.000(a)(3) prior to award of this contract, the Contractor shall rerepresent its size and socioeconomic status according to paragraph (f) of this clause or, if applicable, paragraph (h) of this clause, when the Contracting Officer explicitly requires it for an order issued under a multiple-award contract.

(d) The Contractor shall rerepresent its size status in accordance with the size standard in effect at the time of this rerepresentation that corresponds to the North American Industry Classification System (NAICS) code(s) assigned to this contract. The small business size standard corresponding to this NAICS code(s) can be found at https://www.sba.gov/document/support--table-size-standards.

(e) The small business size standard for a Contractor providing a product which it does not manufacture itself, for a contract other than a construction or service contract, is 500 employees.

(f) Except as provided in paragraph (h) of this clause, the Contractor shall make the representation(s) required by paragraph (b) and (c) of this clause by validating or updating all its representations in the Representations and Certifications section of the System for Award Management (SAM) and its other data in SAM, as necessary, to ensure that they reflect the Contractor's current status. The Contractor shall notify the contracting office in writing within the timeframes specified in paragraph (b) of this clause, or with its offer for an order (see paragraph (c) of this clause), that the data have been validated or updated, and provide the date of the validation or update.

(g) If the Contractor represented that it was other than a small business concern prior to award of this contract, the Contractor may, but is not required to, take the actions required by paragraphs (f) or (h) of this clause.

(h) If the Contractor does not have representations and certifications in SAM, or does not have a representation in SAM for the NAICS code applicable to this contract, the Contractor is required to complete the following rerepresentation and submit it to the contracting office, along with the contract number and the date on which the rerepresentation was completed:

(1) The Contractor represents that it [ ] is, [ ] is not a small business concern under NAICS Code 237990 assigned to contract number TBD.

(2) [Complete only if the Contractor represented itself as a small business concern in paragraph (h)(1) of this clause.] The Contractor represents that it [ ] is, [ ] is not, a small disadvantaged business concern as defined in 13 CFR 124.1002.

(3) [Complete only if the Contractor represented itself as a small business concern in paragraph (h)(1) of this clause.] The Contractor represents that it [ ] is, [ ] is not a women-owned small business concern.

(4) Women-owned small business (WOSB) concern eligible under the WOSB Program. [Complete only if the Contractor represented itself as a women-owned small business concern in paragraph (h)(3) of this clause.] The Contractor represents that--

(i) It [ ] is, [ ] is not a WOSB concern eligible under the WOSB Program, has provided all the required documents to the WOSB Repository, and no change in circumstances or adverse decisions have been issued that affects its eligibility; and

(ii) It [ ] is, [ ] is not a joint venture that complies with the requirements of 13 CFR part 127, and the representation in paragraph (h)(4)(i) of this clause is accurate for each WOSB concern eligible under the WOSB Program participating in the joint venture.

[The Contractor shall enter the name or names of the WOSB concern eligible under the WOSB Program and other small businesses that are participating in the joint venture: .] Each WOSB concern eligible under the WOSB Program participating in the joint venture shall submit a separate signed copy of the WOSB representation.

(5) Economically disadvantaged women-owned small business (EDWOSB) concern. [Complete only if the Contractor represented itself as a women-owned small business concern eligible under the WOSB Program in (h)(4) of this clause.] The Contractor represents that--

(i) It [ ] is, [ ] is not an EDWOSB concern eligible under the WOSB Program, has provided all the required documents to the WOSB Repository, and no change in circumstances or adverse decisions have been issued that affects its eligibility; and

(ii) It [ ] is, [ ] is not a joint venture that complies with the requirements of 13 CFR part 127, and the representation in paragraph (h)(5)(i) of this clause is accurate for each EDWOSB concern participating in the joint venture. [The Contractor shall enter the name or names of the EDWOSB concern and other small businesses that are participating in the joint venture: .] Each EDWOSB concern participating in the joint venture shall submit a separate signed copy of the EDWOSB representation.

(6) [Complete only if the Contractor represented itself as a small business concern in paragraph (h)(1) of this clause.] The Contractor represents that it [ ] is, [ ] is not a veteran-owned small business concern.

(7) [Complete only if the Contractor represented itself as a veteran-owned small business concern in paragraph (h)(6) of this clause.] The Contractor represents that it [ ] is, [ ] is not a service-disabled veteran-owned small business concern.

(8) [Complete only if the Contractor represented itself as a small business concern in paragraph (h)(1) of this clause.] The Contractor represents that--

(i) It [ ] is, [ ] is not a HUBZone small business concern listed, on the date of this representation, on the List of Qualified HUBZone Small Business Concerns maintained by the Small Business Administration, and no material changes in ownership and control, principal office, or HUBZone employee percentage have occurred since it was certified in accordance with 13 CFR part 126; and

(ii) It [ ] is, [ ] is not a HUBZone joint venture that complies with the requirements of 13 CFR part 126, and the representation in paragraph (h)(8)(i) of this clause is accurate for each HUBZone small business concern participating in the HUBZone joint venture. [The Contractor shall enter the names of each of the HUBZone small business concerns participating in the HUBZone joint venture: .] Each HUBZone small business concern participating in the HUBZone joint venture shall submit a separate signed copy of the HUBZone representation.

[Contractor to sign and date and insert authorized signer's name and title.]

(End of clause)

52.222-23 NOTICE OF REQUIREMENT FOR AFFIRMATIVE ACTION TO ENSURE EQUAL EMPLOYMENT OPPORTUNITY FOR CONSTRUCTION (FEB 1999)

(a) The offeror's attention is called to the Equal Opportunity clause and the Affirmative Action Compliance Requirements for Construction clause of this solicitation.

(b) The goals for minority and female participation, expressed in percentage terms for the Contractor's aggregate workforce in each trade on all construction work in the covered area, are as follows:

Goals for minority participation for each trade	Goals for female participation for each trade
9.7%	6.9%

These goals are applicable to all the Contractor's construction work performed in the covered area. If the Contractor performs construction work in a geographical area located outside of the covered area, the Contractor shall apply the

goals established for the geographical area where the work is actually performed. Goals are published periodically in the Federal Register in notice form, and these notices may be obtained from any Office of Federal Contract Compliance Programs office.

(c) The Contractor's compliance with Executive Order 11246, as amended, and the regulations in 41 CFR 60-4 shall be based on (1) its implementation of the Equal Opportunity clause, (2) specific affirmative action obligations required by the clause entitled "Affirmative Action Compliance Requirements for Construction," and (3) its efforts to meet the goals. The hours of minority and female employment and training must be substantially uniform throughout the length of the contract, and in each trade. The Contractor shall make a good faith effort to employ minorities and women evenly on each of its projects. The transfer of minority or female employees or trainees from Contractor to Contractor, or from project to project, for the sole purpose of meeting the Contractor's goals shall be a violation of the contract, Executive Order 11246, as amended, and the regulations in 41 CFR 60-4. Compliance with the goals will be measured against the total work hours performed.

(d) The Contractor shall provide written notification to the Deputy Assistant Secretary for Federal Contract Compliance, U.S. Department of Labor, within 10 working days following award of any construction subcontract in excess of $10,000 at any tier for construction work under the contract resulting from this solicitation. The notification shall list the --

(1) Name, address, and telephone number of the subcontractor;

(2) Employer's identification number of the subcontractor;

(3) Estimated dollar amount of the subcontract;

(4) Estimated starting and completion dates of the subcontract; and

(5) Geographical area in which the subcontract is to be performed.

(e) As used in this Notice, and in any contract resulting from this solicitation, the "covered area" is Yakima, Washington.

(End of provision)

52.228-14 IRREVOCABLE LETTER OF CREDIT (NOV 2014)

(a) “Irrevocable letter of credit” (ILC), as used in this clause, means a written commitment by a federally insured financial institution to pay all or part of a stated amount of money, until the expiration date of the letter, upon presentation by the Government (the beneficiary) of a written demand therefor. Neither the financial institution nor the offeror/Contractor can revoke or condition the letter of credit.

(b) If the offeror intends to use an ILC in lieu of a bid bond, or to secure other types of bonds such as performance and payment bonds, the letter of credit and letter of confirmation formats in paragraphs (e) and (f) of this clause shall be used.

(c) The letter of credit shall be irrevocable, shall require presentation of no document other than a written demand and the ILC (including confirming letter, if any), shall be issued/confirmed by an acceptable federally insured financial institution as provided in paragraph (d) of this clause, and--

(1) If used as a bid guarantee, the ILC shall expire no earlier than 60 days after the close of the bid acceptance period;

(2) If used as an alternative to corporate or individual sureties as security for a performance or payment bond, the offeror/Contractor may submit an ILC with an initial expiration date estimated to cover the entire period for which

financial security is required or may submit an ILC with an initial expiration date that is a minimum period of one year from the date of issuance. The ILC shall provide that, unless the issuer provides the beneficiary written notice of non-renewal at least 60 days in advance of the current expiration date, the ILC is automatically extended without amendment for one year from the expiration date, or any future expiration date, until the period of required coverage is completed and the Contracting Officer provides the financial institution with a written statement waiving the right to payment. The period of required coverage shall be:

(i) For contracts subject to 40 U.S.C. chapter 31, subchapter III, Bonds, the later of--

(A) One year following the expected date of final payment;

(B) For performance bonds only, until completion of any warranty period; or

(C) For payment bonds only, until resolution of all claims filed against the payment bond during the one-year period following final payment.

(ii) For contracts not subject to the Miller Act, the later of--

(A) 90 days following final payment; or

(B) For performance bonds only, until completion of any warranty period.

(d)(1) Only federally insured financial institutions rated investment grade by a commercial rating service shall issue or confirm the ILC.

(2) Unless the financial institution issuing the ILC had letter of credit business of at least $25 million in the past year, ILCs over $5 million must be confirmed by another acceptable financial institution that had letter of credit business of at least $25 million in the past year.

(3) The Offeror/Contractor shall provide the Contracting Officer a credit rating that indicates the financial institutions have the required credit rating as of the date of issuance of the ILC.

(4) The current rating for a financial institution is available through any of the following rating services registered with the U.S. Securities and Exchange Commission (SEC) as a Nationally Recognized Statistical Rating Organization (NRSRO). NRSRO's can be located at the Web site http://www.sec.gov/answers/nrsro.htm maintained by the SEC.

(e) The following format shall be used by the issuing financial institution to create an ILC:

___

[Issuing Financial Institution's Letterhead or Name and Address]

Issue Date _ ___

IRREVOCABLE LETTER OF CREDIT NO. ___

Account party's name ___ _

Account party's address ___ _

For Solicitation No. ___ _(for reference only)

TO: [___ U.S. Government agency]

[___ U.S. Government agency's address]

1. We hereby establish this irrevocable and transferable Letter of Credit in your favor for one or more drawings up to United States $ ___ . This Letter of Credit is payable at [issuing financial institution's and, if any, confirming financial institution's] office at [___ issuing financial institution's address and, if any, confirming financial institution's address] and expires with our close of business on ___ , or any automatically extended expiration date.

2. We hereby undertake to honor your or the transferee's sight draft(s) drawn on the issuing or, if any, the confirming financial institution, for all or any part of this credit if presented with this Letter of Credit and confirmation, if any, at the office specified in paragraph 1 of this Letter of Credit on or before the expiration date or any automatically extended expiration date.

3. [This paragraph is omitted if used as a bid guarantee, and subsequent paragraphs are renumbered.] It is a condition of this Letter of Credit that it is deemed to be automatically extended without amendment for one year from the expiration date hereof, or any future expiration date, unless at least 60 days prior to any expiration date, we notify you or the transferee by registered mail, or other receipted means of delivery, that we elect not to consider this Letter of Credit renewed for any such additional period. At the time we notify you, we also agree to notify the account party (and confirming financial institution, if any) by the same means of delivery.

4. This Letter of Credit is transferable. Transfers and assignments of proceeds are to be effected without charge to either the beneficiary or the transferee/assignee of proceeds. Such transfer or assignment shall be only at the written direction of the Government (the beneficiary) in a form satisfactory to the issuing financial institution and the confirming financial institution, if any.

5. This Letter of Credit is subject to the Uniform Customs and Practice (UCP) for Documentary Credits, International Chamber of Commerce Publication No. ___ -- (Insert version in effect at the time of ILC issuance, e.g., ``Publication 600, 2006 edition") and to the extent not inconsistent therewith, to the laws of ___ --[State of confirming financial institution, if any, otherwise State of issuing financial institution].

6. If this credit expires during an interruption of business of this financial institution as described in Article 17 of the UCP, the financial institution specifically agrees to effect payment if this credit is drawn against within 30 days after the resumption of our business.

Sincerely,

___

[___ Issuing financial institution]

(f) The following format shall be used by the financial institution to confirm an ILC:

___ [Confirming Financial Institution's Letterhead or Name and Address]

(Date) ___

Our Letter of Credit Advice Number ___

Beneficiary: ___ [U.S. Government agency]

Issuing Financial Institution: ___

Issuing Financial Institution's LC No.: ___

Gentlemen:

1. We hereby confirm the above indicated Letter of Credit, the original of which is attached, issued by ___ [name of issuing financial institution] for drawings of up to United States dollars ___ _/U.S. $ ___ and expiring with our close of business on ___ [the expiration date], or any automatically extended expiration date.

2. Draft(s) drawn under the Letter of Credit and this Confirmation are payable at our office located at ___ _.

3. We hereby undertake to honor sight draft(s) drawn under and presented with the Letter of Credit and this Confirmation at our offices as specified herein.

4. [This paragraph is omitted if used as a bid guarantee, and subsequent paragraphs are renumbered.] It is a condition of this confirmation that it be deemed automatically extended without amendment for one year from the expiration date hereof, or any automatically extended expiration date, unless:

(a) At least 60 days prior to any such expiration date, we shall notify the Contracting Officer, or the transferee and the issuing financial institution, by registered mail or other receipted means of delivery, that we elect not to consider this confirmation extended for any such additional period; or

(b) The issuing financial institution shall have exercised its right to notify you or the transferee, the account party, and ourselves, of its election not to extend the expiration date of the Letter of Credit.

5. This confirmation is subject to the Uniform Customs and Practice (UCP) for Documentary Credits, International Chamber of Commerce Publication No. ____ -- (Insert version in effect at the time of ILC issuance, e.g., ``Publication 600, 2006 edition") and to the extent not inconsistent therewith, to the laws of ____ --[State of confirming financial institution].

6. If this confirmation expires during an interruption of business of this financial institution as described in Article 17 of the UCP, we specifically agree to effect payment if this credit is drawn against within 30 days after the resumption of our business.

Sincerely,

___

[Confirming financial institution]

(g) The following format shall be used by the Contracting Officer for a sight draft to draw on the Letter of Credit:

SIGHT DRAFT

___

[City, State]

(Date) ___

[Name and address of financial institution]

Pay to the order of ___ [Beneficiary Agency] ___ the sum of United States ___ This draft is drawn under Irrevocable Letter of Credit No. ___

___ [Beneficiary Agency]

By: ___

(End of clause)

52.252-2 CLAUSES INCORPORATED BY REFERENCE (FEB 1998)

This contract incorporates one or more clauses by reference, with the same force and effect as if they were given in full text. Upon request, the Contracting Officer will make their full text available. Also, the full text of a clause may be accessed electronically at this/these address(es):

http://www.acq.osd.mil/dpap/dars/dfarspgi/current/index.html
http://www.acquisition.gov

(End of clause)

52.252-6 AUTHORIZED DEVIATIONS IN CLAUSES (NOV 2020)

(a) The use in this solicitation or contract of any Federal Acquisition Regulation (48 CFR Chapter 1) clause with an authorized deviation is indicated by the addition of "(DEVIATION)" after the date of the clause.

(b) The use in this solicitation or contract of any clause with an authorized deviation is indicated by the addition of "(DEVIATION)" after the name of the regulation.

(End of clause)

252.236-7001 CONTRACT DRAWINGS AND SPECIFICATIONS (AUG 2000)

(a) The Government will provide to the Contractor, without charge, one set of contract drawings and specifications, except publications incorporated into the technical provisions by reference, in electronic or paper media as chosen by the Contracting Officer.

(b) The Contractor shall--

(1) Check all drawings furnished immediately upon receipt;

(2) Compare all drawings and verify the figures before laying out the work;

(3) Promptly notify the Contracting Officer of any discrepancies;

(4) Be responsible for any errors that might have been avoided by complying with this paragraph (b); and

(5) Reproduce and print contract drawings and specifications as needed.

(c) In general--

(1) Large-scale drawings shall govern small-scale drawings; and

(2) The Contractor shall follow figures marked on drawings in preference to scale measurements.

(d) Omissions from the drawings or specifications or the misdescription of details of work that are manifestly necessary to carry out the intent of the drawings and specifications, or that are customarily performed, shall not relieve the Contractor from performing such omitted or misdescribed details of the work. The Contractor shall perform such details as if fully and correctly set forth and described in the drawings and specifications.

(e) The work shall conform to the specifications and the contract drawings identified on the following index of drawings:

See 00 73 00-A

(End of clause)

252.236-7004 PAYMENT FOR MOBILIZATION AND DEMOBILIZATION (DEC 1991)

(a) The Government will pay all costs for the mobilization and demobilization of all of the Contractor's plant and equipment at the contract lump sum price for this item.

(1) 60 percent of the lump sum price upon completion of the contractor's mobilization at the work site.

(2) The remaining 40 percent upon completion of demobilization.

(b) The Contracting Officer may require the Contractor to furnish cost data to justify this portion of the bid if the Contracting Officer believes that the percentages in paragraphs (a) (1) and (2) of this clause do not bear a reasonable relation to the cost of the work in this contract.

(1) Failure to justify such price to the satisfaction of the Contracting Officer will result in payment, as determined by the Contracting Officer, of --

(i) Actual mobilization costs at completion of mobilization;

(ii) Actual demobilization costs at completion of demobilization; and

(iii) The remainder of this item in the final payment under this contract.

(2) The Contracting Officer's determination of the actual costs in paragraph (b)(1) of this clause is not subject to appeal.

5152.211-5001 VARIATIONS IN ESTIMATED QUANTITIES — SUBDIVIDED ITEMS (MAR 1995)

This variation in estimated quantities clause is applicable only to Items Nos. 0004, 0005, 0012, 0014, 0015, 0020, 0022, 0023

(a) Variation from the estimated quantity in the actual work performed under any second or subsequent sub-item or elimination of all work under such a second or subsequent sub-item will not be the basis for an adjustment in contract unit price.

(b) Where the actual quantity of work performed for items Nos. 0004, 0005, 0012, 0014, 0015, 0020, 0022, 0023 is less than 85% of the quantity of the first sub-item listed under such item, the contractor will be paid at the contract unit price for that sub-item for the actual quantity of work performed and, in addition, an equitable adjustment shall be made in accordance with the clause FAR 52.212-11, Variation in Estimated Quantities.

(c) If the actual quantity of work performed under Items Nos. 0004, 0005, 0012, 0014, 0015, 0020, 0022, 0023 exceeds 115% or is less than 85% of the total estimated quantity of the sub-item under that item and/or if the quantity of the work performed under the second sub-item or any subsequent sub-item under Items Nos. 0004, 0005, 0012, 0014, 0015, 0020, 0022, 0023 exceeds 115% or is less than 85% of the estimated quantity of any such sub-item, and if such variation causes an increase or a decrease in the time required for performance of this contract the contract completion time will be adjusted in accordance with the clause FAR 52.211-18, Variation in Estimated Quantities.

(End of clause)

Section 00 73 00 - Supplementary Conditions

SPECIAL CLAUSES

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SECTION 00 73 00
SPECIAL CLAUSES

PART 1 GENERAL

1.1 TIME EXTENSIONS FOR UNUSUALLY SEVERE WEATHER (ER 415-1-15)

This provision specifies the procedure for determination of time extensions for unusually severe weather in accordance with the CONTRACT CLAUSE entitled "Default (Fixed Price Construction)". In order for the Contracting Officer to award a time extension under this clause, the following conditions must be satisfied:

a. The weather experienced at the project site during the Contract period must be found to be unusually severe, that is, more severe than the adverse weather anticipated for the project location during any given month.

b. The unusually severe weather must actually cause a delay to the completion of the project. The delay must be beyond the control and without the fault or negligence of the Contractor.

The following schedule of monthly anticipated adverse weather delays is based on National Oceanic and Atmospheric Administration (NOAA) or similar data for the project location and will constitute the base line for monthly weather time evaluations. The Contractor's progress schedule must reflect these anticipated adverse weather delays in all weather dependent activities.

YAKIMA MONTHLY ANTICIPATED ADVERSE WEATHER DELAYWORK DAYS
BASED ON (5) DAY WORK WEEK

JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
17	11	9	4	1	1	1	1	1	4	11	14

Upon acknowledgment of the Notice to Proceed (NTP) and continuing throughout the Contract, the Contractor shall record on the daily CQC report, the occurrence of adverse weather and resultant impact to normally scheduled work. Actual adverse weather delay days must prevent work on critical activities for 50 percent or more of the Contractors' scheduled work day.

The number of actual adverse weather delay days shall include days impacted by actual adverse weather (even if adverse weather occurred in previous month), be calculated chronologically from the first to the last day of each month, and be recorded as full days. If the number of actual adverse weather delay days exceeds the number of days anticipated, as mentioned above, the Contracting Officer will convert any qualifying delays to calendar days, giving full consideration for equivalent fair weather work days, and issue a modification in accordance with the Contract clause entitled "Default (Fixed Price Construction)".

1.2 REQUIRED INSURANCE IN ACCORDANCE WITH FAR 28.307-2

a. Workers' compensation and employer's liability: Contractors are

required to comply with applicable Federal and State workers' compensation and occupational disease statutes. If occupational diseases are not compensable under those statutes, they shall be covered under the employer's liability section of the insurance policy, except when Contract operations are so commingled with a Contractor's commercial operation that it would not be practical to require this coverage. Employer's liability coverage of at least $100,000 shall be required, except in states with exclusive or monopolistic funds that do not permit workers' compensation to be written by private carriers.

b. General Liability:

   1. The Contracting Officer shall require bodily injury liability insurance coverage written on the comprehensive form of policy of at least $500,000 per occurrence.

   2. Property damage liability insurance shall be required only in special circumstances as determined by the agency.

c. Automobile liability: The Contracting Officer shall require automobile liability insurance written on the comprehensive form of policy. The policy shall provide for bodily injury and property damage liability covering the operation of all automobiles used in connection with performing the Contract. Policies covering automobiles operated in the United States shall provide coverage of at least $200,000 per person and $500,000 per occurrence for bodily injury and $20,000 per occurrence for property damage. The amount of liability coverage on other policies shall be commensurate with any legal requirements of the locality and sufficient to meet normal and customary claims.

d. Aircraft public and passenger liability: When aircraft are used in connection with performing the Contract, the Contracting Officer shall require aircraft public and passenger liability insurance. Coverage shall be at least $200,000 per person and $500,000 per occurrence for bodily injury, other than passenger liability, and $200,000 per occurrence for property damage. Coverage for passenger liability bodily injury shall be at least $200,000 multiplied by the number of seats or passengers, whichever is greater.

e. Vessel liability: When Contract performance involves use of vessels, the Contracting Officer shall require, as determined by the agency, vessel collision liability and protection and indemnity liability insurance.

f. Environmental Liability: If this Contract includes the transport, treatment, storage, or disposal of hazardous material waste the following coverage is required.

   The Contractor shall ensure the transporter and disposal facility have liability insurance if effect for claims arising out of the death or bodily injury and property damage from hazardous material/waste transport, treatment, storage and disposal, including vehicle liability and legal defense costs in the amount of $1,000,000.00 as evidenced by a certificate of insurance for General, Automobile, and Environmental Liability Coverage. Proof of this insurance shall be provided to the Contracting Officer.

1.3 INCREMENTALLY FUNDED CONTRACTS (UAI 5152.232-5001) CONTINUING CONTRACT - SPECIAL CONTINUING CONTRACTS FOR CIVIL WORKS PROJECTS MANAGED BY THE

UNITED STATES ARMY CORPS OF ENGINEERS (DEVIATION) (UAI 5152.232-9001)

a. Funds are not available at the inception of this contract to cover the entire contract price. The liability of the Government is limited by this clause not withstanding any contrary provision of the "Payments to Contractor"' clause or any other clause of this contract, except the Termination for Convenience clause. The sum of $3,300,000.00 has been reserved for this contract and is available for payment to the Contractor during the current FY. It is expected that Congress will make appropriations for future FY from which additional funds, together with funds provided by one or more non-federal project sponsors, will be reserved for this contract.

b. Failure to make payments in excess of the amount currently reserved, or that may be reserved from time to time, shall not be considered a breach of contract and shall not entitle the Contractor to a price adjustment under the terms of this contract.

c. The Government may at any time reserve additional funds for payments under the contract if there are funds available for such purpose. The Contracting Officer will promptly notify the Contractor of any additional funds reserved for the contract by issuing an administrative modification to the contract.

d. If earnings will be such that funds reserved for the contract will be exhausted before the end of any FY, the Contractor shall give written notice to the Contracting Officer of the estimated date of exhaustion and the amount of additional funds which will be needed to meet payments due or to become due under the contract during that FY. This notice shall be given not less than 120 days prior to the estimated date of exhaustion. Unless informed in writing by the Contracting Officer that additional funds have been reserved for payments under the contract, the Contractor shall stop work upon the exhaustion of funds.

e. No payments will be made after exhaustion of funds except to the extent that additional funds are reserved for the contract.

f. Any suspension, delay, or interruption of work arising from exhaustion or anticipated exhaustion of funds shall not constitute a breach of this contract and shall not entitle the Contractor to any price adjustment under the "Suspension of Work" clause or in any other manner under this contract.

g. An equitable adjustment in performance time shall be made for any increase in the time required for performance of any part of the work arising from exhaustion of funds or the reasonable anticipation of exhaustion of funds.

h. If, upon the expiration of 100 days after the beginning of the FY following an exhaustion of funds, the Government has failed to reserve additional funds for this contract sufficient to cover the Government's estimate of funding required for the first quarter of that FY, the Contractor, by written notice delivered to the Contracting Officer at any time before such additional funds are reserved, may elect to treat his right to proceed with the work as having been terminated. Such a termination shall be considered a termination for the convenience of the Government.

i. If at any time it becomes apparent that the funds reserved for any FY are in excess of the funds required to meet all payments due or to become due the Contractor because of work performed and to be performed under the contract during the FY, the Government reserves the right, after notice to the Contractor, to reduce said reservation by the amount of such excess.

j. The term "Reservation" means monies that have been set aside and made available for payments under this contract. Reservations of funds shall be made in writing via an administrative modification issued by the Contracting Officer.

1.3 EQUIPMENT OWNERSHIP AND OPERATING EXPENSE SCHEDULE (UAI 31.105-101)

a. This special contract requirement does not apply to terminations. See 52.249-5000, Basis for Settlement of Proposals and FAR Part 49.

b. Allowable cost for construction and marine plant and equipment in sound workable condition owned or controlled and furnished by a Contractor or subcontractor at any tier shall be based on actual cost data for each piece of equipment or groups of similar serial and series for which the Government can determine both ownership and operating costs from the Contractor's accounting records. When both ownership and operating costs cannot be determined for any piece of equipment or groups of similar serial or series equipment from the Contractor's accounting records, costs for that equipment shall be based upon the applicable provisions of EP 1110-1-8, Construction Equipment Ownership and Operating Expense Schedule, Region VIII (Oregon, Washington, and Idaho. Working conditions shall be considered to be average for determining equipment rates using the schedule unless specified otherwise by the Contracting Officer. For equipment not included in the schedule, rates for comparable pieces of equipment may be used or a rate may be developed using the formula provided in the schedule. For forward pricing, the schedule in effect at the time of negotiations shall apply. For retroactive pricing, the schedule in effect at the time the work was performed shall apply.

c. Equipment rental costs are allowable, subject to the provisions of FAR 31.105(d)(ii) and FAR 31.205-36, Rental Costs. Rates for equipment rented from an organization under common control, lease-purchase arrangements, and sale-leaseback arrangements, will be determined using the schedule, except that actual rates will be used for equipment leased from an organization under common control that has an established practice of leasing the same or similar equipment to unaffiliated lessees.

d. When actual equipment costs are proposed and the total amount of the pricing action exceeds the simplified acquisition threshold (SAT), theContracting Officer shall request the Contractor to submit either certified cost or pricing data, or partial/limited data, as appropriate. The data shall be submitted on Standard Form 1411,Contract Pricing Proposal Cover Sheet.

1.4 FIELD OFFICE OVERHEAD

Notice to Offerors: You must declare below the accounting practice that

you apply to Contracts to calculate field office overhead for all change orders, modifications, and requests for equitable adjustment. Pursuant to Federal Acquisition Regulation (FAR) Parts 31.105(d)(3) and 31.203(d)(1), an accounting practice that varies from modification to modification is not allowable. Select one of the following:

a. If you use Time Distribution Base for Per Diem Rate practice, see Special Contract Requirement SC-17 "Field Office Overhead - Per Diem Rate".

b. If you use Direct Cost Distribution Base for a Percentage Mark-up practice, see Special Contract Requirement SC-18 "Field Office Overhead - Percentage Markup".

c. If you choose Other Accounting Practice That is Allowed Under the FAR and That Uses a Single Distribution Base, you must describe the accounting practice in sufficient detail below to allow the Contracting Officer to determine what accounting practice is being utilized by your company and that it complies with the criteria for acceptable accounting practices as set out in FAR Parts 31.105(d)(3) and 31.203(d)(1).

1.5 FIELD OFFICE OVERHEAD - PER DIEM RATE

The Contracting Officer shall make an equitable adjustment and modify the Contract in writing for any change to the Contract, issued pursuant to the Changes clause or otherwise, for which the Government is responsible, and which causes either an increase or decrease in the Contractor's costs as to time or performance under the Contract. Under such an equitable adjustment, the Contractor's field office overhead shall be an allowable cost, in accordance with the Contractor's accounting practice as identified by the Contractor in its Bid Schedule.

The Contractor shall declare which standard form of accounting practice it applies to field overhead costs: if a Contractor indicates that it follows a per diem basis, no overhead percentage markup rate for office overhead costs shall be allowed.

Under such an equitable adjustment, the Contractor shall be reimbursed for field office overhead on a per diem basis when the completion of the Contract is extended by reason of the change issued under any clause, except the Default clause, subject to the Contractor substantiating the variable expense by providing a detailed breakdown of its proposed increase or decrease of costs as required by the Contract Clause DFARS 252.236-7001 MODIFICATION OF PROPOSALS - PRICE BREAKDOWN. No payment of field office overhead on a per diem basis shall be allowed for any change when the completion of the Contract is not extended by reason of the change.

1.6 FIELD OFFICE OVERHEAD - PERCENTAGE MARKUP

The Contracting Officer shall make an equitable adjustment and modify the Contract in writing for any change to the Contract, issued pursuant to the Changes clause or otherwise, for which the Government is responsible, and which causes either an increase or decrease in the Contractor's costs as to time or performance under the Contract. Under such an equitable adjustment, the Contractor's field office overhead shall be an allowable cost, in accordance with the Contractor's accounting practice as identified by the Contractor in its Bid Schedule.

The Contractor shall declare which standard form of accounting practice it applies to field overhead costs: if a Contractor indicates that it follows a percentage basis, no per diem rate for office overhead costs shall be allowed.

Under such an equitable adjustment, payment of office overhead costs shall be allowed for any change on a percentage markup basis regardless of whether the completion of the Contract is, or, is not, extended by reason of the change, except for modifications issued pursuant to the Default Clause. The Contractor shall provide a detailed breakdown of its proposed increase or decrease of costs as required by Contract Clause DFARS 252.236-7001 MODIFICATION OF PROPOSALS - PRICE BREAKDOWN.

1.7 RECOVERED MATERIALS

The Corps of Engineers encourages all bidders to utilize recovered materials to the maximum extent practicable. The attached APPENDIX contains procurement guidelines for products containing recovered materials.

1.8 PROPRIETARY REFERENCES

All items specified on a brand name basis are to indicate the general type desired based on level of quality, and are not intended to restrict selection to products of any particular manufacturer.

1.9 PERFORMANCE EVALUATIONS

In accordance with the provisions of Subpart 36.201 (Evaluation of Contractor Performance) of the Federal Acquisition Regulation (FAR), construction Contractor's performance shall be evaluated throughout the performance of the Contract. The United States Army Corps of Engineers (USACE) follows the procedures outlined in Engineering Regulation 415-1-17 to fulfill this FAR requirement. For construction Contracts awarded at or above $100,000.00, the USACE will evaluate Contractor's performance and prepare a performance report using the Contractor Performance Assessment Reporting System (CPARS), which is now a web-based system. After an evaluation (interim or final) is written up by the USACE, the Contractor will have the ability to access, review and comment on the evaluation for a period of 30 days. Accessing and using CPARS requires specific software, called PKI certification, which is installed on the user's computer. The certification is a Department of Defense requirement and was implemented to provide security in electronic transactions. The certification software could cost approximately $110 - $125 per certificate per year and is purchased from an External Certificate Authorities (ECA) vendor. Current information about the PKI certification process and for Contacting vendors can be found on the web site: http://www.cpars.gov/.If the Contractor wishes to participate in the performance evaluation process, access to CPARS and PKI certification is the sole responsibility of the Contractor.

PART 2 PRODUCTS

Not used.

PART 3 EXECUTION

Not used.

APPENDIX

PART 247 - COMPREHENSIVE PROCUREMENT GUIDELINE FOR PRODUCTS CONTAINING RECOVERED MATERIALS

40 CFR Ch. 1

Subpart B-Item Designations

§ 247.10 Paper and Paper Products

Paper and paper products, excluding building and construction paper grades

§ 247.11 Vehicular Products

a. Lubricating oils containing re-refined oil, including engine lubricating oils, hydraulic fluids, and gear oils, excluding marine and aviation oils.

b. Tires, excluding airplane tires.

c. Reclaimed engine coolants, excluding coolants used in non-vehicular applications.

d. Rebuilt vehicular parts.

(60 FR 21381, May 1, 1995, as amended at 69 FR 24038, Apr. 30, 2004)

§ 247.12 Construction Products

a. Building insulation products, including the following items:

    1. Loose-fill insulation, including but not limited to cellulose fiber, mineral fibers (fiberglass and rock wool), vermiculite, and perlite;

    2. Blanket and batt insulation, including but not limited to mineral fibers (fiberglass and rock wool);

    3. Board (sheathing, roof decking, wall panel) insulation, including but not limited to structural fiberboard and laminated paperboard products, perlite composite board, polyurethane, polyisocyanurate, polystyrene, phenolics, and composites; and

    4. Spray-in-place insulation, including but not limited to foam-in-place polyurethane and polyisocyanurate, and spray-on cellulose.

b. Structural fiberboard and laminated paperboard products for applications other than building insulation, including building board, sheathing, shingle backer, sound deadening board, roof insulating board, insulating wallboard, acoustical and non-acoustical ceiling tile, acoustical and non-acoustical lay-in panels, floor underlayments, and roof overlay (coverboard).

c. Cement and concrete, including concrete products such as pipe and

block containing:

1. Coal fly ash;

2. Ground granulated blast furnace slag (GGBF);

3. Cenospheres; or

4. Silica fume from silicon and ferrosilicon metal production.

d. Carpet made from polyester fiber made from recovered materials for use in moderate-wear applications such as single-family housing and similar wear applications.

e. Floor tiles and patio blocks containing recovered rubber or plastic.

f. Shower and restroom dividers/partitions containing recovered plastic or steel.

g. Consolidated latex paint used for covering graffiti; and reprocessed latex paint used for interior and exterior architectural applications such as wallboard, ceilings, and trim; gutter boards; and concrete, stucco, masonry, wood, and metal surfaces.

h. Carpet cushion made from bonded polyurethane, jute, synthetic fibers, or rubber containing recovered materials.

i. Flowable fill containing coal fly ash and/or ferrous foundry sands.

j. Railroad grade crossing surfaces made from cement and concrete containing fly ask, recovered rubber, recovered steel, recovered wood, or recovered plastic.

k. Modular threshold ramps containing recovered steel, rubber, or aluminum.

l. Nonpressure pipe containing recovered steel, plastic, or cement.

m. Roofing materials containing recovered steel, aluminum, fiber, rubber, plastic or plastic composites, or cement.

(60 FR 21381, May 1, 1995, as amended at 62 FR 60974, Nov. 13, 1997; 65 FR 3081, Jan. 19, 2000; 69 FR 24038, Apr. 30, 2004)

§ 247.13 Transportation Products

a. Traffic barricades and traffic cones used in controlling or restricting vehicular traffic.

b. Parking stops made from concrete or containing recovered plastic or rubber.

c. Channelizers containing recovered plastic or rubber.

d. Delineators containing recovered plastic, rubber, or steel.

e. Flexible delineators containing recovered plastic.

(60 FR 21381, May 1, 1995, as amended at 62 FR 60974, Nov. 13, 1997; 65 FR 3081, Jan. 19, 2000)

§ 247.15 Landscaping Products

a. Hydraulic mulch products containing recovered paper or recovered wood used for hydroseeding and as an over-spray for straw mulch in landscaping, erosion control, and soil reclamation.

b. Compost made from yard trimmings, leaves, grass clippings, and/or food waste for use in landscaping, seeding of grass or other plants on roadsides and embankments, as a nutritious mulch under trees and shrubs, and in erosion control and soil reclamation.

c. Garden and soaker hoses containing recovered plastic or rubber.

d. Lawn and garden edging containing recovered plastic or rubber.

e. Plastic lumber landscaping timbers and posts containing recovered materials.

(60 FR 21381, May 1, 1995, as amended at 62 FR 60974, Nov. 13, 1997; 65 FR 3081, Jan. 19, 2000)

§ 247.16 Non-paper Office Product

a. Office recycling containers and office waste receptacles.

b. Plastic desktop accessories.

c. Toner cartridges.

d. Plastic-covered binders containing recovered plastic; chipboard and pressboard binders containing recovered paper; and solid plastic binders containing recovered plastic.

e. Plastic trash bags.

f. Printer ribbons.

g. Plastic envelopes.

h. Plastic clipboards containing recovered plastic.

i. Plastic file folders containing recovered plastic.

j. Plastic clip portfolios containing recovered plastic.

k. Plastic presentation folders containing recovered plastic.

l. Office furniture containing recovered steel, aluminum, wood, agricultural fiber, or plastic.

(60 FR 21381, May 1, 1995, as amended at 62 FR 60974, Nov. 13, 1997; 65 FR 3081, Jan. 19, 2000; 69 FR 24038, Apr. 30, 2004)

§ 247.17 Miscellaneous Products

a. Pallets containing recovered wood, plastic, or paperboard.

b. Sorbents containing recovered materials for use in oil and solvent clean-ups and as animal bedding.

c. Industrial drums containing recovered steel, plastic, or paper.

d. Awards and plaques containing recovered glass, wood, paper, or plastic.

e. Mats containing recovered rubber and/or plastic.

f. Non-road signs containing recovered plastic or aluminum and road signscontaining recovered aluminum, and sign supports and posts containing recovered plastic or steel.

g. Manual-grade strapping containing recovered steel or plastic.

h. Bike racks containing recovered steel or plastic.

i. Blasting grit containing recovered steel, coal and metal slag, bottomash, glass, plastic, fused alumina oxide, or walnut shells.

(62 FR 60974, Nov. 13, 1997, as amended at 65 FR 3081, Jan. 19, 2000; 69 FR 24038, Apr. 30, 2004)

-- End of Section --

WAGE DETERMINATION

"General Decision Number: WA20220079 08/05/2022

Superseded General Decision Number: WA20210079

State: Washington

Construction Type: Heavy
including water and sewer line construction

County: Yakima County in Washington.

HEAVY CONSTRUCTION PROJECTS (including sewer/water construction).

Note: Contracts subject to the Davis-Bacon Act are generally required to pay at least the applicable minimum wage rate required under Executive Order 14026 or Executive Order 13658. Please note that these Executive Orders apply to covered contracts entered into by the federal government that are subject to the Davis-Bacon Act itself, but do not apply to contracts subject only to the Davis-Bacon Related Acts, including those set forth at 29 CFR 5.1(a)(2)-(60).

If the contract is entered into on or after January 30, 2022, or the contract is renewed or extended (e.g., an	. Executive Order 14026 generally applies to the contract. . The contractor must pay

option is exercised) on or after January 30, 2022:	all covered workers at least $15.00 per hour (or the applicable wage rate listed on this wage determination, if it is higher) for all hours spent performing on the contract in 2022.
If the contract was awarded on or between January 1, 2015 and January 29, 2022, and the contract is not renewed or extended on or after January 30, 2022:	. Executive Order 13658 generally applies to the contract. . The contractor must pay all covered workers at least $11.25 per hour (or the applicable wage rate listed on this wage determination, if it is higher) for all hours spent performing on that contract in 2022.

The applicable Executive Order minimum wage rate will be adjusted annually. If this contract is covered by one of the Executive Orders and a classification considered necessary for performance of work on the contract does not appear on this wage determination, the contractor must still submit a conformance request.

Additional information on contractor requirements and worker protections under the Executive Orders is available at https://www.dol.gov/agencies/whd/government-contracts.

Modification Number	Publication Date
0	01/07/2022
1	02/25/2022
2	05/20/2022
3	06/24/2022
4	08/05/2022

BRWA0001-002 06/01/2021

	Rates	Fringes
BRICKLAYER.....	$ 33.95	19.33

CARP0059-016 06/01/2021

	Rates	Fringes
MILLWRIGHT		
EAST OF 120TH MERIDIAN.....	$ 50.68	20.14

(HOURLY ZONE PAY: WESTERN AND CENTRAL WASHINGTON - MILLWRIGHT AND PILEDRIVER ONLY)

Hourly Zone Pay shall be computed from Seattle Union Hall, Tacoma City center, and Everett City center

Zone Pay:
0 -25 radius miles Free
26-45 radius miles $ .70/hour
Over 45 radius miles $1.50/hour

CARP0770-033 06/01/2020

	Rates	Fringes
MILLWRIGHT		
WEST OF 120TH MERIDIAN.....	$ 48.42	18.02

(HOURLY ZONE PAY: WESTERN AND CENTRAL WASHINGTON - MILLWRIGHT AND PILEDRIVER ONLY)

Hourly Zone Pay shall be computed from Seattle Union Hall, Tacoma City center, and Everett City center

Zone Pay:
0 -25 radius miles Free
26-45 radius miles $ .70/hour
Over 45 radius miles $1.50/hour

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* ELEC0112-014 06/01/2022

	Rates	Fringes
ELECTRICIAN.....	$ 51.75	24.18

ENGI0302-032 06/01/2022

West of the 120th Meridian

	Rates	Fringes
Power equipment operators:		
Group 1A.....	$ 54.20	24.47
Group 1AA.....	$ 54.98	24.47
Group 1.....	$ 53.40	24.47
Group 2.....	$ 52.72	24.47
Group 3.....	$ 52.12	24.47
Group 4.....	$ 48.78	24.47

Zone Differential (Add to Zone 1 rates):

Zone 2 (26-45 radius miles) - $1.00
Zone 3 (Over 45 radius miles) - $1.30

BASEPOINTS: Aberdeen, Bellingham, Bremerton, Everett, Kent, Mount Vernon, Port Angeles, Port Townsend, Seattle, Shelton, Wenatchee, Yakima

POWER EQUIPMENT OPERATORS CLASSIFICATIONS

GROUP 1AA - Excavator/Trackhoe: Over 90 metric tons

GROUP 1A - Excavator/Trackhoe: over 50 metric tons to 90 metric tons;

GROUP 1 - Excavator/Trackhoe: over 30 metric tons to 50 metric tons; Screedman; Scrapers: 45 yards and over; Paver

GROUP 2 - Drilling machine; Excavator/Trackhoe: 15 to 30 metric tons; Horizontal/directional drill operator; Scraper: under 45 tons; Piledriver; Boring Machine

GROUP 3 - Roller-Plant Mix; Excavator/Trackhoe: under 15 metric tons; Service Oiler; Boom Truck over 10 tons

GROUP 4 - Roller-other than plant mix; Drill Assistant; Boom Truck 10 tons and under

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ENGI0370-026 07/01/2019

East of the 120th Meridian

	Rates	Fringes
POWER EQUIPMENT OPERATOR		
GROUP 1	$ 28.46	17.25
GROUP 3	$ 29.39	17.25
GROUP 4	$ 29.55	17.25
GROUP 5	$ 29.71	17.25
GROUP 6	$ 29.99	17.25
GROUP 7	$ 30.26	17.25

ZONE DIFFERENTIAL (Add to Zone 1 rate): Zone 2 - $2.00

Zone 1: Within 45 mile radius of Spokane, Pasco, Washington; Lewiston, Idaho

Zone 2: Outside 45 mile radius of Spokane, Pasco, Washington; Lewiston, Idaho

POWER EQUIPMENT OPERATORS CLASSIFICATIONS

GROUP 1: Drill Assistant; Rollers, all types on subgrade,

including seal and chip coating

GROUP 3: Boring Machine

GROUP 4: Oiler; Drill (churn, core, calyx or diamond);

GROUP 5: Trackhoe/Excavator (under 3/4 yd.); Drilling equipment (8 unch bit and over) (robbins, reverse circulation and similar); Piledriver; Boom Truck (Under 25 tons)

GROUP 6: Trackhoe/Excavator (3/4 yd. to 3 yd.), Paver; Scraper; Screed: Asphalt Roller

GROUP 7: Trackhoe/Excavator (3 yds & over)

BOOM PAY: (All Cranes, Including Tower)
180 ft to 250 ft $ .50 over scale
Over 250 ft $ .80 over scale

NOTE:
In computing the length of the boom on Tower Cranes, they shall be measured from the base of the Tower to the point of the boom.

HAZMAT:
Anyone working on HAZMAT jobs, working with supplied air shall receive $1.00 an hour above classification.

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* IRON0086-009 07/04/2022

	Rates	Fringes
IRONWORKER (Reinforcing, Structural, and Ornamental).....	$ 36.21	31.47

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* LABO0348-002 06/01/2022

	Rates	Fringes
LABORER		
GROUP 2		
YAKIMA COUNTY.....	$ 28.11	13.19
GROUP 3		
YAKIMA COUNTY.....	$ 31.94	13.80
GROUP 4		
YAKIMA COUNTY.....	$ 32.72	13.80
GROUP 5		
YAKIMA COUNTY.....	$ 33.30	13.80

ZONE DIFFERENTIAL (ADD TO ZONE 1 RATES):
ZONE 2 - $1.00

ZONE 3 - $1.30

BASE POINTS: BELLINGHAM, MT. VERNON, EVERETT, SEATTLE, KENT, TACOMA, OLYMPIA, CENTRALIA, ABERDEEN, SHELTON, PT. TOWNSEND, PT. ANGELES, AND BREMERTON

ZONE 1 - Projects within 25 radius miles of the respective city hall
ZONE 2 - More than 25 but less than 45 radius miles from the respective city hall
ZONE 3 - More than 45 radius miles from the respective city hall

LABORERS CLASSIFICATIONS

GROUP 2: Flagger

GROUP 3: General or Common Laborer; Form-Stripping

GROUP 4: Pipelayer; Handheld Drill

GROUP 5: Mason Tender-Brick; Mason Tender-Cement/Concrete; Grade Checker

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PAIN0005-010 04/15/2013

	Rates	Fringes
Painters: (Brush, Roller and Spray)	$ 15.58	10.23

SHEE0066-021 06/01/2017

	Rates	Fringes
Sheet metal worker	$ 34.75	20.68

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* SUWA2009-070 08/07/2009

	Rates	Fringes
CARPENTER, Includes Form Work	$ 27.02	6.70
CEMENT MASON/CONCRETE FINISHER	$ 24.07	0.00
LABORER: High Scaler	$ 21.08	6.61
LABORER: Landscape & Irrigation	$ 12.27 **	2.73
OPERATOR: Asphalt Plant	$ 34.14	0.68

OPERATOR: Backhoe.....$ 27.29 6.60

OPERATOR: Broom/Sweeper.....$ 27.03 4.67

OPERATOR: Bulldozer.....$ 28.17 5.97

OPERATOR: Crane, All Types.....$ 28.83 6.11

OPERATOR: Forklift.....$ 28.17 5.97

OPERATOR: Grader/Blade.....$ 29.43 3.60

OPERATOR: Mechanic.....$ 28.46 6.04

OPERATOR: Power Shovel.....$ 25.12 7.83

OPERATOR: Skid Steer.....$ 10.63 ** 0.00

OPERATOR: Loader.....$ 28.46 6.04

PIPEFITTER.....$ 32.50 6.90

TRUCK DRIVER, Includes Dump
Truck.....$ 16.40 3.60

TRUCK DRIVER: Dump (Trailer)
Truck.....$ 13.00 ** 1.24

TRUCK DRIVER: Flatbed Truck.....$ 22.74 6.29

TRUCK DRIVER: Lowboy Truck.....$ 22.89 5.72

TRUCK DRIVER: Semi-Trailer
Truck.....$ 18.32 4.91

TRUCK DRIVER: Water Truck.....$ 23.46 6.06

WELDERS - Receive rate prescribed for craft performing operation to which welding is incidental.

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** Workers in this classification may be entitled to a higher minimum wage under Executive Order 14026 ($15.00) or 13658 ($11.25). Please see the Note at the top of the wage determination for more information.

Note: Executive Order (EO) 13706, Establishing Paid Sick Leave for Federal Contractors applies to all contracts subject to the Davis-Bacon Act for which the contract is awarded (and any solicitation was issued) on or after January 1, 2017. If this contract is covered by the EO, the contractor must provide

employees with 1 hour of paid sick leave for every 30 hours they work, up to 56 hours of paid sick leave each year. Employees must be permitted to use paid sick leave for their own illness, injury or other health-related needs, including preventive care; to assist a family member (or person who is like family to the employee) who is ill, injured, or has other health-related needs, including preventive care; or for reasons resulting from, or to assist a family member (or person who is like family to the employee) who is a victim of, domestic violence, sexual assault, or stalking. Additional information on contractor requirements and worker protections under the EO is available at https://www.dol.gov/agencies/whd/government-contracts.

Unlisted classifications needed for work not included within the scope of the classifications listed may be added after award only as provided in the labor standards contract clauses (29CFR 5.5 (a) (1) (ii)).

The body of each wage determination lists the classification and wage rates that have been found to be prevailing for the cited type(s) of construction in the area covered by the wage determination. The classifications are listed in alphabetical order of ""identifiers"" that indicate whether the particular rate is a union rate (current union negotiated rate for local), a survey rate (weighted average rate) or a union average rate (weighted union average rate).

Union Rate Identifiers

A four letter classification abbreviation identifier enclosed in dotted lines beginning with characters other than ""SU"" or ""UAVG"" denotes that the union classification and rate were prevailing for that classification in the survey. Example: PLUM0198-005 07/01/2014. PLUM is an abbreviation identifier of the union which prevailed in the survey for this classification, which in this example would be Plumbers. 0198 indicates the local union number or district council number where applicable, i.e., Plumbers Local 0198. The next number, 005 in the example, is an internal number used in processing the wage determination. 07/01/2014 is the effective date of the most current negotiated rate, which in this example is July 1, 2014.

Union prevailing wage rates are updated to reflect all rate changes in the collective bargaining agreement (CBA) governing this classification and rate.

Survey Rate Identifiers

Classifications listed under the ""SU"" identifier indicate that no one rate prevailed for this classification in the survey and the published rate is derived by computing a weighted average rate based on all the rates reported in the survey for that classification. As this weighted average rate includes all rates reported in the survey, it may include both union and non-union rates. Example: SULA2012-007 5/13/2014. SU indicates the rates are survey rates based on a weighted average calculation of rates and are not majority rates. LA indicates the State of Louisiana. 2012 is the year of survey on which these classifications and rates are based. The next number, 007 in the example, is an internal number used in producing the wage determination. 5/13/2014 indicates the survey completion date for the classifications and rates under that identifier.

Survey wage rates are not updated and remain in effect until a new survey is conducted.

Union Average Rate Identifiers

Classification(s) listed under the UAVG identifier indicate that no single majority rate prevailed for those classifications; however, 100% of the data reported for the classifications was union data. EXAMPLE: UAVG-OH-0010 08/29/2014. UAVG indicates that the rate is a weighted union average rate. OH indicates the state. The next number, 0010 in the example, is an internal number used in producing the wage determination. 08/29/2014 indicates the survey completion date for the classifications and rates under that identifier.

A UAVG rate will be updated once a year, usually in January of each year, to reflect a weighted average of the current negotiated/CBA rate of the union locals from which the rate is based.

WAGE DETERMINATION APPEALS PROCESS

1.) Has there been an initial decision in the matter? This can be:

* an existing published wage determination
* a survey underlying a wage determination
* a Wage and Hour Division letter setting forth a position on a wage determination matter
* a conformance (additional classification and rate) ruling

On survey related matters, initial contact, including requests for summaries of surveys, should be with the Wage and Hour

National Office because National Office has responsibility for the Davis-Bacon survey program. If the response from this initial contact is not satisfactory, then the process described in 2.) and 3.) should be followed.

With regard to any other matter not yet ripe for the formal process described here, initial contact should be with the Branch of Construction Wage Determinations. Write to:

Branch of Construction Wage Determinations
Wage and Hour Division
U.S. Department of Labor
200 Constitution Avenue, N.W.
Washington, DC 20210

2.) If the answer to the question in 1.) is yes, then an interested party (those affected by the action) can request review and reconsideration from the Wage and Hour Administrator (See 29 CFR Part 1.8 and 29 CFR Part 7). Write to:

Wage and Hour Administrator
U.S. Department of Labor
200 Constitution Avenue, N.W.
Washington, DC 20210

The request should be accompanied by a full statement of the interested party's position and by any information (wage payment data, project description, area practice material, etc.) that the requestor considers relevant to the issue.

3.) If the decision of the Administrator is not favorable, an interested party may appeal directly to the Administrative Review Board (formerly the Wage Appeals Board). Write to:

Administrative Review Board
U.S. Department of Labor
200 Constitution Avenue, N.W.
Washington, DC 20210

4.) All decisions by the Administrative Review Board are final.

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END OF GENERAL DECISIO"

00 73 00-A INDEX OF DRAWINGS

ATTACHMENT 00 72 00-A

INDEX OF DRAWINGS

DRAWING NO. D-8-4-109, DATED 18 June 2021

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2	B-G-002	DRAWING INDEX 1		
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4	B-B-100	EXPLORATION SITE PLAN 1		
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6	B-B-102	EXPLORATION SITE LOGS 1 OF 3		
7	B-B-103	EXPLORATION SITE LOGS 2 OF 3		
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9	B-C-001	LEGEND, ABBREVIATIONS AND GENERAL NOTES		
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13	B-CS102	SPORTSMAN PARK CHANNELS - GENERAL SITE PLAN		
14	B-CS103	SPORTSMAN PARK CHANNELS - CHANNEL A SITE PLAN 1 - STA CHANNEL A 0+00 TO 13+00		
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16	B-CS105	SPORTSMAN PARK CHANNELS - CHANNEL A SITE PLAN 3 - STA CHANNEL A 23+00 TO 36+00		
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19	B-CS108	SPORTSMAN PARK CHANNELS - CHANNEL B SITE PLAN 4 - STA CHANNEL B 13+00 TO 24+00		
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33	B-C-304	SPORTSMAN PARK CHANNEL A – CROSS SECTIONS 1		
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79	2-CS102	BLUE SLOUGH LEVEE SITE PLAN 1 - STA SB 0+00 TO 5+00		
80	2-CS103	BLUE SLOUGH LEVEE SITE PLAN 2 - STA SB 5+00 TO 10+00		
81	2-CS104	BLUE SLOUGH LEVEE SITE PLAN 3 - STA SB 10+00 TO 15+00		

SHEET NUMBER	PLATE NUMBER	TITLE	REVISION NUMBER	DATE
82	2-CS105	BLUE SLOUGH LEVEE SITE PLAN 4 - STA SB 15+00 TO 20+00		
83	2-CS106	BLUE SLOUGH LEVEE SITE PLAN 5 - STA SB 20+00 TO 25+00		
84	2-CS107	BLUE SLOUGH LEVEE SITE PLAN 6 - STA SB 25+00 TO 30+00		
85	2-CS108	BLUE SLOUGH LEVEE SITE PLAN 7 - STA SB 30+00 TO 35+00		
86	2-CS109	BLUE SLOUGH LEVEE SITE PLAN 8 - STA SB 35+00 TO 40+00		
87	2-CS110	BLUE SLOUGH LEVEE SITE PLAN 9 - STA SB 40+00 TO 45+00		
88	2-CS111	BLUE SLOUGH LEVEE SITE PLAN 10 - STA SB 45+00 TO 50+00		
89	2-CS112	BLUE SLOUGH LEVEE SITE PLAN 11 - STA SB 50+00 TO 55+00		
90	2-CS113	BLUE SLOUGH LEVEE SITE PLAN 12 - STA SB 55+00 TO 60+00		
91	2-CS114	BLUE SLOUGH LEVEE SITE PLAN 13 - STA SB 60+00 TO 65+00		
92	2-CS115	BLUE SLOUGH LEVEE SITE PLAN 14 - STA SB 65+00 TO 70+00		
93	2-CS116	BLUE SLOUGH LEVEE SITE PLAN 15 - STA SB 70+00 TO 75+00		
94	2-CS117	BLUE SLOUGH LEVEE SITE PLAN 16 - STA SB 75+00 TO 78+35		
95	2-CS118	BLUE SLOUGH LEVEE BACKWATER EXTENSION SITE PLAN 1 - STA BE 0+00 TO 7+00		
96	2-CS119	BLUE SLOUGH LEVEE BACKWATER EXTENSION SITE PLAN 2 - STA BE 7+00 TO 13+47		
97	2-CS120	NEWLANDS PONDS FLOODPLAIN GRADING - SITE PLAN		
98	2-CS121	NEWLANDS PONDS FLOODPLAIN GRADING - FILL SITES #2, 3 AND 7		
99	2-CS122	NEWLANDS PONDS FLOODPLAIN GRADING - CUT SITES #1, 2 AND 3		
100	2-CS123	NEWLANDS PONDS FLOODPLAIN GRADING - CUT SITES #4, 5, 6 AND 7		
101	2-CS124	NEWLANDS PONDS FLOODPLAIN GRADING - CUT SITES #8, 9 AND 10		
102	2-CS125	NEWLANDS PONDS FLOODPLAIN GRADING - CUT SITES #11, 12 AND 15		
103	2-CS126	NEWLANDS PONDS FLOODPLAIN GRADING - CUT SITES #13 AND 14		
104	2-CS127	SR 24 GRADE CONTROL SILL - EXISTING SITE PLAN		
105	2-CS128	SR 24 GRADE CONTROL SILL - GENERAL SITE PLAN		
106	2-CS129	SR 24 GRADE CONTROL SILL - AREA 1 SITE PLAN		
107	2-CS130	SR 24 GRADE CONTROL SILL - AREA 2 SITE PLAN		

SHEET NUMBER	PLATE NUMBER	TITLE	REVISION NUMBER	DATE
108	2-CS131	SR 24 GRADE CONTROL SILL - AREA 3 SIDE CHANNEL SITE PLAN		
109	2-CS132	SR 24 GRADE CONTROL SILL - AREA 4 SITE PLAN		
110	2-CSU101	GENERAL SITE UTILITIES PLAN 1 - BLUE SLOUGH LEVEE - UN-NAMED ROAD		
111	2-CSU102	GENERAL SITE UTILITIES PLAN 2 - BLUE SLOUGH LEVEE - LESTER LANE		
112	2-CSU103	GENERAL SITE UTILITIES PLAN 3 - BLUE SLOUGH LEVEE - PAVLICK ALLEY		
113	2-CSU104	GENERAL SITE UTILITIES PLAN 5 - BLUE SLOUGH LEVEE - CHANNELS 10 & 11		
114	2-C-301	SECTION 1 - BLUE SLOUGH ARMOR AND TYPICAL SECTIONS		
115	2-C-302	SECTION 2 - BLUE SOUGH LEVEE RAMP 1		
116	2-C-303	SECTION 3 - BLUE SOUGH LEVEE RAMP 1A		
117	2-C-304	SECTION 4 - BLUE SOUGH LEVEE RAMP 2		
118	2-C-305	SECTION 5 - BLUE SOUGH LEVEE RAMP 3		
119	2-C-306	SECTION 6 - BLUE SOUGH LEVEE RAMP 4		
120	2-C-307	SECTION 7 - BLUE SOUGH LEVEE RAMP 5		
121	2-C-308	SECTION 8 - BLUE SOUGH LEVEE RAMP 6		
122	2-C-309	SECTION 9 - BLUE SOUGH LEVEE RAMP 7 AND 8		
123	2-C-310	SECTION 10 - BLUE SOUGH LEVEE - TURNAROUND 1		
124	2-C-311	SECTION 11 - BLUE SOUGH LEVEE - TURNAROUND 2		
125	2-C-312	SECTION 12 - NEWLANDS PONDS GRADING 1 - TYPICAL SECTIONS		
126	2-C-313	SECTION 13 - NEWLANDS PONDS GRADING 2 - TYPICAL SECTIONS		
127	2-C-314	SECTION 14 - SR 24 GRADE CONTROL SILL - TYPICAL SECTIONS		
128	2-C-315	SECTION 15 - DID #1 LEVEE DEGRADE - NOTCH SECTIONS		
129	2-C-316	SECTION 16 - ARTICULATED MAT ARMORING - TYPICAL SECTIONS		
130	2-C-317	DID #1 LEVEE DEGRADATION – CROSS SECTIONS 1		
131	2-C-318	DID #1 LEVEE DEGRADATION – CROSS SECTIONS 2		
132	2-C-319	DID #1 LEVEE DEGRADATION – CROSS SECTIONS 3		
133	2-C-320	DID #1 LEVEE DEGRADATION – CROSS SECTIONS 4		
134	2-C-321	DID #1 LEVEE DEGRADATION – CROSS SECTIONS 5		
135	2-C-322	DID #1 LEVEE DEGRADATION – CROSS SECTIONS 6		
136	2-C-323	DID #1 LEVEE DEGRADATION – CROSS SECTIONS 7		
137	2-C-324	DID #1 LEVEE DEGRADATION – CROSS SECTIONS 8		
138	2-C-325	DID #1 LEVEE DEGRADATION – CROSS SECTIONS 9		

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140	2-C-327	DID #1 LEVEE DEGRADATION – CROSS SECTIONS 11		
141	2-C-328	DID #1 LEVEE DEGRADATION – CROSS SECTIONS 12		
142	2-C-329	DID #1 LEVEE DEGRADATION – CROSS SECTIONS 13		
143	2-C-330	DID #1 LEVEE DEGRADATION – CROSS SECTIONS 14		
144	2-C-331	DID #1 LEVEE DEGRADATION – CROSS SECTIONS 15		
145	2-C-332	CROSS DIKE LEVEE DEGRADATION – CROSS SECTIONS 1		
146	2-C-333	CROSS DIKE LEVEE DEGRADATION – CROSS SECTIONS 2		
147	2-C-334	BLUE SLOUGH LEVEE – CROSS SECTIONS 1		
148	2-C-335	BLUE SLOUGH LEVEE – CROSS SECTIONS 2		
149	2-C-336	BLUE SLOUGH LEVEE – CROSS SECTIONS 3		
150	2-C-337	BLUE SLOUGH LEVEE – CROSS SECTIONS 4		
151	2-C-338	BLUE SLOUGH LEVEE – CROSS SECTIONS 5		
152	2-C-339	BLUE SLOUGH LEVEE – CROSS SECTIONS 6		
153	2-C-340	BLUE SLOUGH LEVEE – CROSS SECTIONS 7		
154	2-C-341	BLUE SLOUGH LEVEE – CROSS SECTIONS 8		
155	2-C-342	BLUE SLOUGH LEVEE – CROSS SECTIONS 9		
156	2-C-343	BLUE SLOUGH BACKWATER EXTENSION – CROSS SECTIONS 1		
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158	2-C-501	DETAILS 1 - ACCESS CONTROL GATE		
159	REF-001	WSDOT SR-24 ASBUILT 1		
160	REF-002	2012 YAKIMA AUTHORIZED - SPORTSMAN PARK SETBACK FINAL DESIGN		

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SECTION 01 11 00

SUMMARY OF WORK

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SECTION 01 11 00

SUMMARY OF WORK
08/15

PART 1 GENERAL

1.1 WORK COVERED BY CONTRACT DOCUMENTS

1.1.1 Project Description

The work includes restoration of ecosystem degradations that exist as a result of a past federal action (i.e. construction of the two upstream federal levees, Yakima Authorized Left Bank and Yakima Authorized Right Bank) and all incidental related work. Yakima County is the Non-Federal Sponsor who owns and maintains the project lands. Work includes excavation of channels, removal of existing levees, construction of embankments (berms and levees), installation of drainage culverts, and other features indicated on the drawings, including hauling and processing of on-site borrow materials.

1.1.2 Location

The work is located in Yakima, Washington on the left descending bank of the Yakima River, spanning between Terrace Heights and Union Gap. The primary base contract work area is west and south of the Yakima Sportsman State Park and is intersected by SR24 and the Yakima Authorized Left Bank Federal Levee. Optional work is located south of the base work area near SR 24, along existing levees which will be degraded and set back by constructing a new levee. Former active gravel pits (Newland Ponds) are within the project footprint. The Central Premix aggragate sorting and processing facility is located within the project footprint. Several private properties are in the project area. Refer to the plans for project location amd existing conditions information including access.

PART 2 PRODUCTS

Not used.

PART 3 EXECUTION

Not used.

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SECTION 01 14 00

WORK RESTRICTIONS

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SECTION 01 14 00

WORK RESTRICTIONS

PART 1 GENERAL

1.1 PROJECT SCHEDULE PHASING AND SEQUENCING

This project will occur in three phases of construction, to be completed in this order:

1. Sportsman Island - Work to be completed includes, but is not limited to: construction of side channels in Sportsman Park; removal of riprap groins from the Yakima River; construction of large woody debris habitat structures; placement of material in the Newland Pond Fill Sites 1, 4, 5 and 6. If excess materials are available they will be placed at Fill Site 3.

2. Blue Slough - Work to be completed includes, but is not limited to: design and installation of the Blue Slough headgate and culvert at the Yakima Left Bank Federal Levee; reconfiguration of Blue Slough to accommodate a new setback levee (phase 3); removal of the KOA Levee and adjacent high ground; stockpile of excavated materials in staging area(s).

3. DID #1 & Blue Slough Levees - Work to be completed includes, but is not limited to: removal of DID #1 levee; construction of the Blue Slough Levee and Backwater Extension levee, SR-24 Cross Dike removal and installation of a new riprap grade control structure; excavation of channels at Newland Pond Cut Sites 1-14; placement of excess material in the Newland Pond Fill Sites 2, 3 and 7.

1.2 PROJECT WORK RESTRICTIONS

The following work restrictions must be observed for accomplishment of this project:

1. In-water work window as defined in the Water Quality Certification (01 57 19-A) is Oct 1 thru Feb 28 for construction within lands connected to the Yakima River. There is no in-water work window for lands isolated from the Yakima River.

2. Unless BMPs are used excavation or fill, time activities to occur when the water table is at or below the working elevation to aid in adherence to requirements of the TEMPORARY ENVIRONMENTAL CONTROLS. Also refer to the CARE AND DIVERSION OF WATER specification for historical flow rates and elevations to plan construction activities. These requirements do not apply to work within the Newland Ponds site.

3. DID #1 Levee and SR 24 Cross Dike removal shall not occur in months when flooding is possible. Work will begin as soon as river conditions allow to ensure that all construction activities can be completed before the onset of flood season. If the DID#1 Levee or Cross Dike are being removed, construction of the Blue Slough Levee must be complete prior to the onset of fall flood season.

4. Outline the work day as 5 days per week, while maximizing daylight working hours and not to exceed a 10 hour day.

PART 2 PRODUCT (NOT USED)

PART 3 EXECUTION (NOT USED)

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MEASUREMENT AND PAYMENT

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MEASUREMENT AND PAYMENT

PART 1 GENERAL

1.1 GENERAL INFORMATION

Payment items for the work of this Contract for which payments will be made are listed in the bid schedule and described below. The Contract price for each item shall constitute full compensation for furnishing all plant, labor, materials, appurtenances, and incidentals and performing all operations necessary to construct and complete the items in accordance with these specifications and the applicable drawings, including surveying performed by the Contractor. The Contractor shall be responsible for transporting and disposal of all construction waste off-site.

All costs for items of work, which are not specifically mentioned to be included in a particular payment item, shall be included in the listed job item most closely associated with the work involved. Work paid for under one item will not be paid for under any other item. No separate payment will be made for the work, services, or operations required by the Contractor, as specified in DIVISION 1, GENERAL REQUIREMENTS, to complete the project in accordance with these specifications; all costs thereof shall be considered as incidental to the work. No payment will be made for repair of damage resulting from Contractor operations.

1.2 MEASUREMENT GUIDELINES

1.2.1 Job Items

Items measured as a "job" will be measured for payment as a complete job in the locations indicated. Unless the payment item paragraph makes a specific exception of any item, incidental items will not be measured under any other item even though there is another listing for the work or material.

1.3 BASE ITEMS

1.3.1 Item #0001

Payment will be made at the contract job price for Item #0001: All work for mobilization & demobilization. Payment shall constitute full compensation for this item, complete.

1.3.2 Item #0002

Payment will be made at the contract job price for Item #0002: All work for construction, deconstruction, and area restoration of staging areas and access roads. Payment shall constitute full compensation for this item, complete.

1.3.3 Item #0003

Payment will be made at the contract job price for Item #0003: All work for all site work at Sportsman Park associated with large wood structures. Payment shall constitute full compensation for this item, complete.

1.3.4 Item #0004

Payment will be made at the contract unit price per cubic yard (CY) for Item #0004: All work for all site work at Sportsman Park including channels, berms, and upstream groin removals. Payment shall constitute full compensation for this item, complete.

1.3.4.1 Item #0004AA

All work for excavation (up to and including 110,600 CY).

1.3.4.2 Item #0004AB

All work for excavation (up to and including 11,000 CY).

1.3.4.3 Item #0004AC

All work for Berm and groin onsite fill placement and compaction (up to and including 18,400 CY).

1.3.4.4 Item #0004AD

All work for Berm and groin onsite fill placement and compaction (up to and including 1,800 CY).

1.3.5 Item #0005

Payment will be made at the contract unit price per cubic yard (CY) for Item #0005: All work for Hauling and all work to place material in Newland Pond Fill Sites 1,4, 5 and 6. Payment shall constitute full compensation for this item, complete.

1.3.5.1 Item #0005AA

All work for onsite disposal, fill placement and compaction (up to and including 92,200 CY).

1.3.5.2 Item #0005AB

All work for onsite disposal, fill placement and compaction (up to and including 9,200 CY).

1.3.6 Item #0006

Payment will be made at the contract job price for Item #0006: All work for O&M Manuals as specified in Section 01 78 23 OPERATIONS AND MAINTENANCE DATA from preparation to final approval. Payment shall constitute full compensation for this item, complete.

1.3.7 Item #0007

Payment will be made at the contract job price for Item #0007: All work for As-Built Drawings as specified in Section 01 78 00 CLOSEOUT SUBMITTALS from preparation to final approval. Payment shall constitute full compensation for this item, complete.

1.4 OPTIONAL ITEMS

1.4.1 OPTIONAL ITEMS #1 - Blue Slough Reconfiguration & Headgate + KOA Levee & Knob Degrade + Temporary staging area placement of fill material

1.4.1.1 Item #0008

Payment will be made at the Contract job price for Item #0008: All work for Mobilization & demobilization. Payment shall constitute full compensation for this item, complete.

1.4.1.2 Item #0009

Payment will be made at the Contract job price for Item #0009: All work for construction, deconstruction, and area restoration of staging areas and access roads. Payment shall constitute full compensation for this item, complete.

1.4.1.3 Item #0010

Payment will be made at the Contract job price for Item #0010: All work for Blue Slough Headwall and Headgate design. Payment shall constitute full compensation for this item, complete.

1.4.1.4 Item #0011

Payment will be made at the Contract job price for Item #0011: All work work for all site work associated with the construction of the Blue Slough Culvert and Headgate replacement. Payment shall constitute full compensation for this item, complete.

1.4.1.5 Item #0012

Payment will be made at the unit price per cubic yard (CY) for Item #0012: All work for all site work associated with Blue Slough Channel realignment. Payment shall constitute full compensation for this item, complete.

1.4.1.5.1 Item #0012AA

All work for excavation (up to and including 7,000 CY).

1.4.1.5.2 Item #0012AB

All work for excavation (up to and including 700 CY).

1.4.1.6 Item #0013

Payment will be made at the Contract job price for Item #0013: All work for all site work associated with Blue Slough Channel plantings and drainage structures. Payment shall constitute full compensation for this item, complete.

1.4.1.7 Item #0014

Payment will be made at the unit price per cubic yard (CY) for Item #0014: All work for all site work associated with the KOA Levee and KOA Nob degrades. Payment shall constitute full compensation for this item, complete.

1.4.1.7.1 Item #0014AA

All work for excavation (up to and including 45,000 CY).

1.4.1.7.2 Item #0014AB

All work for excavation (up to and including 4,500 CY).

1.4.1.8 Item #0015

Payment will be made at the unit price per cubic yard (CY) for Item #0015: All work hauling and all work to temporarily stockpile fill material in staging area(s). Payment shall constitute full compensation for this item, complete.

1.4.1.8.1 Item #0015AA

All work for onsite disposal in staging area #3 (up to and including 52,000 CY).

1.4.1.8.2 Item #0015AB

All work for onsite disposal in staging area #3 (up to and including 5,200 CY).

1.4.1.9 Item #0016

Payment will be made at the contract job price for Item #0016: All work for O&M Manuals as specified in Section 01 78 23 OPERATIONS AND MAINTENANCE DATA from preparation to final approval. Payment shall constitute full compensation for this item, complete.

1.4.1.10 Item #0017

Payment will be made at the contract job price for Item #0017: All work for As-Built Drawings as specified in Section 01 78 00 CLOSEOUT SUBMITTALS from preparation to final approval. Payment shall constitute full compensation for this item, complete.

1.4.2 OPTIONAL ITEMS #2 - DID #1 Removal + Building Blue Slough Levee + SR-24 Cross Dike Removal + Newland Pond Cut Sites 1-14 and Fill Sites 2,3 and 7

1.4.2.1 Item #0018

Payment will be made at the Contract job price for Item #0018: All work for Mobilization & demobilization. Payment shall constitute full compensation for this item, complete.

1.4.2.2 Item #0019

Payment will be made at the Contract job price for Item #0019: All work for construction, deconstruction, and area restoration of staging areas and access roads. Payment shall constitute full compensation for this item, complete.

1.4.2.3 Item #0020

Payment will be made at the unit price per cubic yard (CY) for Item #0020: All work for all site work associate with DID #1 Levee removal, SR-24 Cross Dike degrade, and SR-24 grade control sill, including on-site borrow of riprap. Payment shall constitute full compensation for this item, complete.

1.4.2.3.1 Item #0020AA

All work for excavation (up to and including 145,000 CY).

1.4.2.3.2 Item #0020AB

All work for excavation (up to and including 14,500 CY).

1.4.2.3.3 Item #0020AC

All work for onsite borrowed Class V riprap placement (up to and including 10,000 CY).

1.4.2.3.4 Item #0020AD

All work for class V riprap import and placement to supplement onsite borrow (up to and including 5,000 CY).

1.4.2.4 Item #0021

Payment will be made at the Contract job price for Item #0021: All work for site work associate with building the Blue Slough Levee and Backwater Extension including on-site borrow and levee embankment material processing. Payment shall constitute full compensation for this item, complete.

Item #0022

Payment will be made at the unit price per cubic yard (CY) for Item #0022: All work for floodplain grading of the Newland Pond Cut Sites 1-14. Payment shall constitute full compensation for this item, complete.

1.4.2.5 Item #0022AA

All work for excavation (up to and including 76,000 CY).

1.4.2.6 Item #0022AB

All work for excavation (up to and including 7,600 CY).

1.4.2.7 Item #0023

Payment will be made at the unit price per cubic yard (CY) for Item #0023: All work for hauling and all work to place material at Fill Sites 2, 3 and 7, including placement of material stockpiled in staging area 3. Payment shall constitute full compensation for this item, complete.

1.4.2.7.1 Item #0023AA

All work for onsite disposal, fill placement and compaction (up to and including 252,000 CY).

1.4.2.7.2 Item #0023AB

All work for onsite disposal, fill placement and compaction (up to and including 25,000 CY).

1.4.2.8 Item #0024

Payment will be made at the contract job price for Item #0024: All work for O&M Manuals as specified in Section 01 78 23 OPERATIONS AND MAINTENANCE DATA from preparation to final approval. Payment shall constitute full compensation for this item, complete.

1.4.2.9 Item #0025

Payment will be made at the contract job price for Item #0025: All work for As-Built Drawings as specified in Section 01 78 00 CLOSEOUT SUBMITTALS from preparation to final approval. Payment shall constitute full compensation for this item, complete.

1.5 PROGRESS PAYMENT INVOICE

Requests for payment shall be submitted in accordance with Federal Acquisition Regulations (FAR) Subpart 32.9, entitled "PROMPT PAYMENT", and Paragraphs 52.232-5 and 52.232-27, entitled "Payments Under Fixed-Price Construction Contracts", and "Prompt Payment for Construction Contracts", respectively. In addition each request shall be submitted in the number of copies and to the designated billing office as shown in the Contract.

When submitting payment requests, complete Blocks 1 through 12 of the "PROGRESS PAYMENT INVOICE" Form as directed by the Contracting Officer (provided in RMS). The completed form shall then become the cover document to which all other support data shall be attached.

One additional copy of the entire request for payment, to include the "PROGRESS PAYMENT INVOICE" cover document, shall be forwarded to a separate address as designated by the Contracting Officer.

Submit with each pay request, a list of subcontractors that have worked during that pay period. The listing shall be broken down into weeks, identifying each subcontractor that has worked during a particular week, and indicate the total number of employees that have worked on site for each subcontractor for each week. The prime Contractor shall also indicate the total number of employees for its on-site staff for each week.

1.6 COMPLIANCE WITH CONSTRUCTION WAGE RATE REQUIREMENTS

1.6.1 Contractor POC

Within 14 days after award of the Contract, designate a point of contact (POC) within their organization who will be responsible for the Construction Wage Rate Requirements Labor Program for the Contractor and all subcontractors under this contract as required by the Contract Clauses and FAR 52.222.

1.6.2 Responsibilities

The designated Contractor POC shall be responsible for Construction Wage Rate Requirements Labor Program activities including, but not limited to:

a. Documentation and record keeping;

b. Submittal and accuracy of certified payrolls;

c. Submittal of required labor forms including requests for additional classifications and rates, Statements and Acknowledgement, etc.;

d. Posting of the wage determination, approved additional classifications and rates, labor and EEO posters;

e. Coordination with the Contracting Officer's Labor Program POC.

Prior to submittal to the Government, payrolls shall be reviewed for compliance to all applicable labor standards, to include, but not be limited to the following items: correct wage rates, correct overtime classification and pay, misclassification of workers for work actually performed, apprentice to journeyman ratios, and registration of apprentice. Corrective actions shall be taken as necessary to ensure Contractor compliance with applicable contract and FAR clauses.

1.6.3 Certification

The Contractor POC shall provide a signed certification stating the following: "I certify that the submitted items being forwarded have been reviewed in detail and are correct and in strict conformance with the Labor Standards of the contract except as otherwise stated."

1.7 PROPOSED PROJECT MODIFICATIONS

Price proposals for contract modifications shall be submitted in accordance with the requirements of the Contract Clause MODIFICATION PROPOSALS - PRICE BREAKDOWNS. If change order work impacts or delays other unchanged contract work, the costs of such impacts or delays shall be included in the proposals and separately identified. The current threshold for requiring cost or pricing data is $700,000 but is subject to change. (See FAR 15.403 (a) (1) iii.) Any modification proposal that exceeds the cost and pricing data threshold shall meet the requirements of FAR 15.403. (See instructions for Change Orders/Modification and Claims in Table 15-2 of FAR 15.408.)

1.8 ELECTRONIC SOFTWARE SYSTEM FOR SUBMITTING CERTIFIED LABOR PAYROLLS AND RECORDS

The Contractor is required to use a commercially available software system to process and submit certified payrolls electronically to the Government. The requirements for preparing, processing, and submitting certified labor payrolls are established by the requirements as stated in FAR 52.222-8 PAYROLLS AND BASIC RECORDS, and FAR 52.222-13 COMPLIANCE WITH CONSTRUCTION WAGE RATE REQUIREMENTS AND RELATED REGULATIONS.

Provide all access, licenses, and other services required for the receipt, processing, certifying, and electronically transmitting payrolls to the Government, and storing weekly payroll and other data required to comply with Construction Wage Rate Requirements and related regulations. The payroll software system shall be capable of preserving submitted payroll documents and related records for a minimum of three years after contract completion. Provide system access to the Government for the duration of this construction contract. Government access shall include online review

by the Government's contract administration office of all electronic payroll records of the Contractor.

The payroll processing software system shall also meet the following functional criteria. It shall:

a. Be compliant with appropriate Construction Wage Rate Requirement payroll provisions in applicable Federal Acquisition Regulations,

b. Be able to accommodate the required number of employees and subcontractors employed under the contract,

c. Be capable of producing an MS Excel compatible spreadsheet to be uploaded into the Quality Control System (QCS), which in turn shall exported to the Resident Management System (RMS),

d. Provide demonstrated security of data storage, data entry, and data access rights,

e. Be able to produce Contractor certified electronic versions of weekly payroll data,

f. Be able to identify erroneous entries and track data/time of all versions of the Construction Wage Rate certified payrolls submitted to the Government over the life of the contract, and

g. Be capable of generating a durable record copy; that is, a CD or DVD of records in PDF format from the system database. This durable record copy shall be provided to the Government during contract closeout.

All incurred costs related to the provision and use of an electronic payroll processing system shall be included in the price for the work under the contract. All costs for providing and using the electronic payroll processing system and services shall not be a separately billed or reimbursed item under the contract.

PART 2 PRODUCTS

Not used.

PART 3 EXECUTION

Not used.

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SECTION 01 30 00

ADMINISTRATIVE REQUIREMENTS

08/15

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SECTION 01 30 00

ADMINISTRATIVE REQUIREMENTS
08/15

PART 1 GENERAL

1.1 REFERENCES

The publications listed below form a part of this specification to the extent referenced. The publications are referred to within the text by the basic designation only.

U.S. ARMY CORPS OF ENGINEERS (USACE)

EM 385-1-1	(2014) Safety and Health Requirements Manual
EP 1110-1-8	(2016) Construction Equipment Ownership and Operating Expense Schedule

1.2 SUBMITTALS

Government approval is required for submittals with a "G" designation; submittals not having a "G" designation are for information only. When used, a designation following the "G" designation identifies the office that will review the submittal for the Government. Submit the following in accordance with Section 01 33 00 SUBMITTAL PROCEDURES:

SD-01 Preconstruction Submittals

View Location Map; G

Progress Photographs

SD-11 Closeout Submittals

Completion Photographs

1.3 VIEW LOCATION MAP

Submit, prior to or with the first digital photograph submittals, a sketch or drawing indicating the required photographic locations. Update as required if the locations are moved.

1.4 SUPERVISION

1.4.1 Minimum Communication Requirements

Have at least one qualified superintendent, or competent alternate, capable of reading, writing, and conversing fluently in the English language, on the job-site at all times during the performance of contract work. In addition, if a Quality Control (QC) representative is required on the contract, then that individual must also have fluent English communication skills.

1.4.2 Superintendent Qualifications

The project superintendent must have a minimum of 10 years experience in construction with at least 5 of those years as a superintendent on projects similar in size and complexity. The individual must be familiar with the requirements of EM 385-1-1 and have experience in the areas of hazard identification and safety compliance. The individual must be capable of interpreting a critical path schedule and construction drawings. The qualification requirements for the alternate superintendent are the same as for the project superintendent. The Contracting Officer may request proof of the superintendent's qualifications at any point in the project if the performance of the superintendent is in question.

1.4.2.1 Duties

The project superintendent is primarily responsible for managing and coordinating day-to-day production and schedule adherence on the project. The superintendent is required to attend partnering meetings, and quality control meetings. The superintendent or qualified alternative must be on-site at all times during the performance of this contract until the work is completed and accepted.

1.4.3 Non-Compliance Actions

The Project Superintendent is subject to removal by the Contracting Officer for non-compliance with requirements specified in the contract and for failure to manage the project to insure timely completion. Furthermore, the Contracting Officer may issue an order stopping all or part of the work until satisfactory corrective action has been taken. No part of the time lost due to such stop orders is acceptable as the subject of claim for extension of time for excess costs or damages by the Contractor.

1.5 PRECONSTRUCTION CONFERENCE

After award of the contract but prior to commencement of any work at the site, meet with the Contracting Officer to discuss and develop a mutual understanding relative to the administration of the value engineering and safety program, preparation of the schedule of prices or earned value report, shop drawings, and other submittals, scheduling programming, prosecution of the work, and clear expectations of the "Interim DD Form 1354" Submittal. Major subcontractors who will engage in the work must also attend.

1.6 PARTNERING

To most effectively accomplish this contract, the Government requires the formation of a cohesive partnership within the Project Team whose members are from the Government, the Contractor and their Subcontractors. Key personnel from the Supported Command, the End User (who will occupy the facility), the Government Design and Construction team and Subject Matter Experts, the Installation, the Contractor and Subcontractors, and the Designer of Record will be invited to participate in the Partnering process. The Partnership will draw on the strength of each organization in an effort to achieve a project that is without any safety mishaps, conforms to the Contract, and stays within budget and on schedule.

The Contracting Officer will provide Information on the Partnering Process and a list of key and optional personnel who should attend the Partnering

meeting.

1.7 ELECTRONIC MAIL (E-MAIL) ADDRESS

Establish and maintain electronic mail (e-mail) capability along with the capability to open various electronic attachments as text files, pdf files, and other similar formats. Within 10 days after contract award, provide the Contracting Officer a single (only one) e-mail address for electronic communications from the Contracting Officer related to this contract including, but not limited to contract documents, invoice information, request for proposals, and other correspondence. The Contracting Officer may also use email to notify the Contractor of base access conditions when emergency conditions warrant, such as hurricanes or terrorist threats. Multiple email addresses are not allowed.

It is the Contractor's responsibility to make timely distribution of all Contracting Officer initiated e-mail with its own organization including field office(s). Promptly notify the Contracting Officer, in writing, of any changes to this email address.

1.8 EQUIPMENT OWNERSHIP AND OPERATING EXPENSE SCHEDULE (UAI 5152.231-9000)

(a) This clause does not apply to terminations. See UAI 5152.249-9000 BASIS FOR SETTLEMENT OF PROPOSALS and Federal Aquisition Regulation (FAR) part 49.

(b) Allowable cost for construction and marine plant and equipment in sound workable condition owned or controlled and furnished by a contractor or subcontractor at any tier shall be based on actual cost data for each piece of equipment or groups of similar serial and series for which the Government can determine both ownership and operating costs from the contractor's accounting records. When both ownership and operating costs cannot be determined for any piece of equipment or groups of similar serial or series equipment from the contractor's accounting records, costs for that equipment shall be based upon the applicable provisions of EP 1110-1-8, Construction Equipment Ownership and Operating Expense Schedule, Region VIII. Working conditions shall be considered to be average for determining equipment rates using the schedule unless specified otherwise by the contracting officer. For equipment not included in the schedule, rates for comparable pieces of equipment may be used or a rate may be developed using the formula provided in the schedule. For forward pricing, the schedule in effect at the time of negotiations shall apply. For retroactive pricing, the schedule in effect at the time the work was performed shall apply.

(c) Equipment rental costs are allowable, subject to the provisions of FAR 31.105(d)(ii) and FAR 31.205-36. Rates for equipment rented from an organization under common control, lease-purchase arrangements, and sale-leaseback arrangements, will be determined using the schedule, except that actual rates will be used for equipment leased from an organization under common control that has an established practice of leasing the same or similar equipment to unaffiliated lessees.

(d) When actual equipment costs are proposed and the total amount of the pricing action exceeds the small purchase threshold, the Contracting Officer shall request the contractor to submit either certified cost or pricing data, or partial/limited data, as appropriate. The data shall be submitted on Standard Form 1411, Contract Pricing Proposal

Cover Sheet.

1.9 PAYMENT FOR MATERIALS DELIVERED OFF-SITE (UAI 5152.232-9000)

(a) Pursuant to FAR clause 52.232-5, Payments Under Fixed Priced Construction Contracts, materials delivered to the contractor at locations other than the site of the work may be taken into consideration in making payments if included in payment estimates and if all the conditions of the General Provisions are fulfilled. Payment for items delivered to locations other than the work site will be limited to:

(1) Materials required by the technical provisions; or

(2) Materials that have been fabricated to the point where they are identifiable to an item of work required under this contract; or

(b) Such payment will be made only after receipt of paid or receipted invoices or invoices with canceled check showing title to the items in the prime contractor and including the value of material and labor incorporated into the item.

1.10 PERSONNEL, SUBCONTRACTORS, AND OUTSIDE ASSOCIATES OR CONSULTANTS (UAI 5152.236-9001)

In connection with this contract, any in-house personnel, subcontractors, and outside associates or consultants will be limited to individuals or firms that were specifically identified in the Contractor's accepted proposal. The Contractor shall obtain the Contracting Officer's written consent before making any substitution for these designated in-house personnel, subcontractors, associates, or consultants. If the Contractor proposes a substitution, it shall submit the same type of information that was submitted in the accepted proposal to the Contracting Officer for evaluation and approval. The level of qualifications and experience submitted in the accepted proposal or that required by the Solicitation, whichever is greater, is the minimum standard for any substitution.

1.11 PROJECT PHOTOGRAPHS

1.11.1 General

Furnish digital photographs depicting construction as specified herein. The photographs shall be in digital JPEG format, with a minimum resolution of 1600 by 1200 pixels, 24 bit true color. Submit photos in a Word document, with a caption under each photo showing date taken, project location, contract title and number, and a brief description of what the photo depicts. The photos shall be submitted on CD-ROM conforming to industry standards used in the United States.

1.11.2 Progress Photographs

Construction progress photographs shall be taken between the 1st and 15th of each month and delivered to the Contracting Officer with the payment request for the month taken. Photos shall be taken from ten positions. Location of positions shall be coordinated with or may be selected by the Contracting Officer. They shall show, inasmuch as practicable, work accomplished during the previous month. Photographic quality and composition of photos shall be such that they can be used for briefings and/or to illustrate articles on the construction progress of the project.

1.11.3 Completion Photographs

Photographs of completed work shall be taken and delivered to the Contracting Officer not later than 15 days prior to project completion. Photographs shall show the completed work and shall include overall site photos as well as photos of major features.

1.12 SUPPLEMENTAL ANTITERRORISM/OPERATIONS SECURITY REQUIREMENTS

The contractor shall be responsible for compliance with all applicable antiterrorism/operations security items as outlined below

1.12.1 E-Verify pre-screening

Contractors shall comply with the requirements set forth in FAR clause 52.222-54 Employment Eligibility Verification and FAR Subpart 22.18 in using the E-Verify Program at (https://www.e-verify.gov/) (website subject to change) to meet the contract employment eligibility requirements. Contractors are encouraged to cooperate with Federal and State agencies responsible for enforcing labor requirements to include eligibility for employment under United States immigration laws in accordance with FAR 22.102-1(i). An initial list of verified/eligible candidates shall be provided to the COR no later than three business days after the initial contract award. When contracts are with individuals, the individuals will be required to complete a Form I-9, Employment Eligibility Verification, and submit it to the Contracting Officer to become part of the official contract file.

PART 2 PRODUCTS

Not Used

PART 3 EXECUTION

Not Used

-- End of Section --

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PROJECT SCHEDULE
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PART 1 GENERAL

1.1 REFERENCES

The publications listed below form a part of this specification to the extent referenced. The publications are referred to within the text by the basic designation only.

AACE INTERNATIONAL (AACE)

AACE 29R-03	(2011) Forensic Schedule Analysis
AACE 52R-06	(2006) Time Impact Analysis - As Applied in Construction

U.S. ARMY CORPS OF ENGINEERS (USACE)

ER 1-1-11	(1995) Administration -- Progress, Schedules, and Network Analysis Systems

1.2 SUBMITTALS

Government approval is required for submittals with a "G" designation; submittals not having a "G" designation are for information only. When used, a designation following the "G" designation identifies the office that will review the submittal for the Government. Submit the following in accordance with Section 01 33 00 SUBMITTAL PROCEDURES:

SD-01 Preconstruction Submittals

Project Scheduler Qualifications; G

Preliminary Project Schedule; G

Initial Project Schedule; G

Periodic Schedule Update; G

1.3 PROJECT SCHEDULER QUALIFICATIONS

Designate an authorized representative to be responsible for the preparation of the schedule and all required updating and production of reports. The authorized representative must have a minimum of 2-years experience scheduling construction projects similar in size and nature to this project with scheduling software that meets the requirements of this specification. Representative must have a comprehensive knowledge of CPM scheduling principles and application.

1.4 TIME EXTENSIONS FOR UNUSUALLY SEVERE WEATHER (ER 415-1-15)

This provision specifies the procedure for determination of time

extensions for unusually severe weather in accordance with the CONTRACT CLAUSE entitled "Default (Fixed Price Construction)". In order for the Contracting Officer to award a time extension under this clause, the following conditions must be satisfied:

a. The weather experienced at the project site during the Contract period must be found to be unusually severe, that is, more severe than the adverse weather anticipated for the project location during any given month.

b. The unusually severe weather must actually cause a delay to the completion of the project. The delay must be beyond the control and without the fault or negligence of the Contractor.

The following schedule of monthly anticipated adverse weather delays is based on National Oceanic and Atmospheric Administration (NOAA) or similar data for the project location and will constitute the base line for monthly weather time evaluations. The Contractor's progress schedule must reflect these anticipated adverse weather delays in all weather dependent activities.

YAKIMA MONTHLY ANTICIPATED ADVERSE WEATHER DELAY
WORK DAYS BASED ON (5) DAY WORK WEEK

JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
17	11	10	5	2	1	1	1	1	4	10	14

Upon acknowledgment of the Notice to Proceed (NTP) and continuing throughout the Contract, record on the daily CQC report the occurrence of adverse weather and resultant impact to normally scheduled work. Actual adverse weather delay days must prevent work on critical activities for 50 percent or more of the Contractors' scheduled work day.

The number of actual adverse weather delay days shall include days impacted by actual adverse weather (even if adverse weather occurred in previous month), be calculated chronologically from the first to the last day of each month, and be recorded as full days. If the number of actual adverse weather delay days exceeds the number of days anticipated, as mentioned above, the Contracting Officer will convert any qualifying delays to calendar days, giving full consideration for equivalent fair weather work days, and issue a modification in accordance with the Contract clause entitled "Default (Fixed Price Construction)".

PART 2 PRODUCTS

2.1 SOFTWARE

The scheduling software utilized to produce and update the schedules required herein must be capable of meeting all requirements of this specification.

2.1.1 Government Default Software

The Government intends to use Primavera P6.

2.1.2 Contractor Software

Scheduling software used by the contractor must be commercially available from the software vendor for purchase with vendor software support

agreements available. The software routine used to create the required sdef file must be created and supported by the software manufacturer.

2.1.2.1 Primavera

If Primavera P6 is selected for use, provide the "xer" export file in a version of P6 importable by the Government system.

2.1.2.2 Other Than Primavera

If the contractor chooses software other than Primavera P6, that is compliant with this specification, provide for the Government's use two licenses, two computers, and training for two Government employees in the use of the software. These computers will be stand-alone and not connected to Government network. Computers and licenses will be returned at project completion.

PART 3 EXECUTION

3.1 GENERAL REQUIREMENTS

Prepare for approval a Project Schedule, as specified herein, pursuant to FAR Clause 52.236-15 Schedules for Construction Contracts. Show in the schedule the proposed sequence to perform the work and dates contemplated for starting and completing all schedule activities. The scheduling of the entire project is required. The scheduling of construction is the responsibility of the Contractor. Contractor management personnel must actively participate in its development. Subcontractors and suppliers working on the project must also contribute in developing and maintaining an accurate Project Schedule. Provide a schedule that is a forward planning as well as a project monitoring tool. Use the Critical Path Method (CPM) of network calculation to generate all Project Schedules. Prepare each Project Schedule using the Precedence Diagram Method (PDM).

3.2 BASIS FOR PAYMENT AND COST LOADING

The schedule is the basis for determining contract earnings during each update period and therefore the amount of each progress payment. The aggregate value of all activities coded to a contract CLIN must equal the value of the CLIN.

3.2.1 Activity Cost Loading

Activity cost loading must be reasonable and without front-end loading. Provide additional documentation to demonstrate reasonableness if requested by the Contracting Officer.

3.2.2 Withholdings / Payment Rejection

Failure to meet the requirements of this specification may result in the disapproval of the preliminary, initial or periodic schedule updates and subsequent rejection of payment requests until compliance is met.

In the event that the Contracting Officer directs schedule revisions and those revisions have not been included in subsequent Project Schedule revisions or updates, the Contracting Officer may withhold 10 percent of pay request amount from each payment period until such revisions to the project schedule have been made.

3.3 PROJECT SCHEDULE DETAILED REQUIREMENTS

3.3.1 Level of Detail Required

Develop the Project Schedule to the appropriate level of detail to address major milestones and to allow for satisfactory project planning and execution. Failure to develop the Project Schedule to an appropriate level of detail will result in its disapproval. The Contracting Officer will consider, but is not limited to, the following characteristics and requirements to determine appropriate level of detail:

3.3.2 Activity Durations

Reasonable activity durations are those that allow the progress of ongoing activities to be accurately determined between update periods. Less than 2 percent of all non-procurement activities may have Original Durations (OD) greater than 20 work days or 30 calendar days.

3.3.3 Procurement Activities

Include activities associated with the critical submittals and their approvals, procurement, fabrication, and delivery of long lead materials, equipment, fabricated assemblies, and supplies. Long lead procurement activities are those with an anticipated procurement sequence of over 90 calendar days.

3.3.4 Mandatory Tasks

Include the following activities/tasks in the initial project schedule and all updates.

a. Submission, review and acceptance of SD-01 Preconstruction Submittals (individual activity for each).

b. Submission, review and acceptance of features require design completion

c. Submission of mechanical/electrical/information systems layout drawings.

d. Long procurement activities

e. Submission and approval of O & M manuals.

f. Submission and approval of as-built drawings.

g. Submission and approval of DD1354 data and installed equipment lists.

h. Submission and approval of testing and air balance (TAB).

i. Submission of TAB specialist design review report.

j. Submission and approval of fire protection specialist.

k. Submission and approval of Building Commissioning Plan, test data, and reports: Develop the schedule logic associated with testing and commissioning of mechanical systems to a level of detail consistent with the contract commissioning requirements. All tasks associated with all building testing and commissioning will be completed prior to

submission of building commissioning report and subsequent contract completion.

l. Air and water balancing.

m. Building commissioning - Functional Performance Testing.

n. Controls testing plan submission.

o. Controls testing.

p. Performance Verification testing.

q. Other systems testing, if required.

r. Contractor's pre-final inspection.

s. Correction of punch list from Contractor's pre-final inspection.

t. Government's pre-final inspection.

u. Correction of punch list from Government's pre-final inspection.

v. Final inspection.

3.3.5 Government Activities

Show Government and other agency activities that could impact progress. These activities include, but are not limited to: approvals, environmental permit approvals by State regulators, inspections, utility tie-in, Government Furnished Equipment (GFE) and Notice to Proceed (NTP) for phasing requirements.

3.3.6 Standard Activity Coding Dictionary

Use the activity coding structure defined in the Standard Data Exchange Format (SDEF) in ER 1-1-11. This exact structure is mandatory. Develop and assign all Activity Codes to activities as detailed herein. A template SDEF compatible schedule backup file is available on the QCS web site: http://rms.usace.army.mil.

The SDEF format is as follows:

Field	Activity Code	Length	Description
1	WRKP	3	Workers per day
2	RESP	4	Responsible party
3	AREA	4	Area of work
4	MODF	6	Modification Number
5	BIDI	6	Bid Item (CLIN)

Field	Activity Code	Length	Description
6	PHAS	2	Phase of work
7	CATW	1	Category of work
8	FOW	20	Feature of work*
*Some systems require that FEATURE OF WORK values be placed in several activity code fields. The notation shown is for Primavera P6. Refer to the specific software guidelines with respect to the FEATURE OF WORK field requirements.			

3.3.6.1 Workers Per Day (WRKP)

Assign Workers per Day for all field construction or direct work activities, if directed by the Contracting Officer. Workers per day is based on the average number of workers expected each day to perform a task for the duration of that activity.

3.3.6.2 Responsible Party Coding (RESP)

Assign responsibility code for all activities to the Prime Contractor, Subcontractor(s) or Government agency(ies) responsible for performing the activity.

a. Activities coded with a Government Responsibility code include, but are not limited to: Government approvals, Government design reviews, environmental permit approvals by State regulators, Government Furnished Property/Equipment (GFP) and Notice to Proceed (NTP) for phasing requirements.

b. Activities cannot have more than one Responsibility Code. Examples of acceptable activity code values are: DOR (for the designer of record); ELEC (for the electrical subcontractor); MECH (for the mechanical subcontractor); and GOVT (for USACE).

3.3.6.3 Area of Work Coding (AREA)

Assign Work Area code to activities based upon the work area in which the activity occurs. Define work areas based on resource constraints or space constraints that would preclude a resource, such as a particular trade or craft work crew from working in more than one work area at a time due to restraints on resources or space. Examples of Work Area Coding include different areas within a floor of a building, different floors within a building, and different buildings within a complex of buildings. Activities cannot have more than one Work Area Code.

Not all activities are required to be Work Area coded. A lack of Work Area coding indicates the activity is not resource or space constrained.

3.3.6.4 Modification Number (MODF)

Assign a Modification Number Code to any activity or sequence of activities added to the schedule as a result of a Contract Modification,

when approved by Contracting Officer. Key all Code values to the Government's modification numbering system. An activity can have only one Modification Number Code.

3.3.6.5 Bid Item Coding (BIDI)

Assign a Bid Item Code to all activities using the Contract Line Item Schedule (CLIN) to which the activity belongs, even when an activity is not cost loaded. An activity can have only one BIDI Code.

3.3.6.6 Phase of Work Coding (PHAS)

Assign Phase of Work Code to all activities. Examples of phase of work are procurement phase and construction phase. Each activity can have only one Phase of Work code.

a. Code proposed fast track design and construction phases proposed to allow filtering and organizing the schedule by fast track design and construction packages.

b. If the contract specifies phasing with separately defined performance periods, identify a Phase Code to allow filtering and organizing the schedule accordingly.

3.3.6.7 Category of Work Coding (CATW)

Assign a Category of Work Code to all activities. Category of Work Codes include, but are not limited to construction submittal, procurement, fabrication, weather sensitive installation, non-weather sensitive installation, start-up, and testing activities. Each activity can have no more than one Category of Work Code.

3.3.6.8 Feature of Work Coding (FOW)

Assign a Feature of Work Code to appropriate activities based on the Definable Feature of Work to which the activity belongs based on the approved QC plan.

Definable Feature of Work is defined in Section 01 45 00.00 10 QUALITY CONTROL. An activity can have only one Feature of Work Code.

3.3.7 Contract Milestones and Constraints

Milestone activities are to be used for significant project events including, but not limited to, project phasing, project start and end activities, or interim completion dates. The use of artificial float constraints such as "zero free float" or "zero total float" are prohibited.

Mandatory constraints that ignore or effect network logic are prohibited. No constrained dates are allowed in the schedule other than those specified herein. Submit additional constraints to the Contracting Officer for approval on a case by case basis.

3.3.7.1 Project Start Date Milestone and Constraint

The first activity in the project schedule must be a start milestone titled "NTP Acknowledged," which must have a "Start On" constraint date equal to the date that the NTP is acknowledged.

3.3.7.2 End Project Finish Milestone and Constraint

The last activity in the schedule must be a finish milestone titled "End Project."

Constrain the project schedule to the Contract Completion Date in such a way that if the schedule calculates an early finish, then the float calculation for "End Project" milestone reflects positive float on the longest path. If the project schedule calculates a late finish, then the "End Project" milestone float calculation reflects negative float on the longest path. The Government is under no obligation to accelerate Government activities to support a Contractor's early completion.

3.3.7.3 Interim Completion Dates and Constraints

Constrain contractually specified interim completion dates to show negative float when the calculated late finish date of the last activity in that phase is later than the specified interim completion date.

3.3.7.3.1 Start Phase

Use a start milestone as the first activity for a project phase. Call the start milestone "Start Phase X" where "X" refers to the phase of work.

3.3.7.3.2 End Phase

Use a finish milestone as the last activity for a project phase. Call the finish milestone "End Phase X" where "X" refers to the phase of work.

3.3.8 Calendars

Schedule activities on a Calendar to which the activity logically belongs. Develop calendars to accommodate any contract defined work period such as a 7-day calendar for Government Acceptance activities, concrete cure times, etc. Develop the default Calendar to match the physical work plan with non-work periods identified including weekends and holidays. Develop sSeasonal Calendar(s) and assign to seasonally affected activities as applicable.

If an activity is weather sensitive it should be assigned to a calendar showing non-work days on a monthly basis, with the non-work days selected at random across the weeks of the calendar, using the anticipated adverse weather delay work days provided in the Special Contract Clauses . Assign non-work days over a seven-day week as weather records are compiled on seven-day weeks, which may cause some of the weather related non-work days to fall on weekends.

3.3.9 Open Ended Logic

Only two open ended activities are allowed: the first activity "NTP Acknowledged" may have no predecessor logic, and the last activity -"End Project" may have no successor logic.

Predecessor open ended logic may be allowed in a time impact analyses upon the Contracting Officer's approval.

3.3.10 Default Progress Data Disallowed

Actual Start and Finish dates must not automatically update with default mechanisms included in the scheduling software. Updating of the percent complete and the remaining duration of any activity must be independent functions. Disable program features that calculate one of these parameters from the other. Activity Actual Start (AS) and Actual Finish (AF) dates assigned during the updating process must match those dates provided in the Contractor Quality Control Reports. Failure to document the AS and AF dates in the Daily Quality Control report will result in disapproval of the Contractor's schedule.

3.3.11 Out-of-Sequence Progress

Activities that have progressed before all preceding logic has been satisfied (Out-of-Sequence Progress) will be allowed only on a case-by-case basis subject to approval by the Contracting Officer. Propose logic corrections to eliminate out of sequence progress or justify not changing the sequencing for approval prior to submitting an updated project schedule. Address out of sequence progress or logic changes in the Narrative Report and in the periodic schedule update meetings.

3.3.12 Added and Deleted Activities

Do not delete activities from the project schedule or add new activities to the schedule without approval from the Contracting Officer. Activity ID and description changes are considered new activities and cannot be changed without Contracting Officer approval.

3.3.13 Original Durations

Activity Original Durations (OD) must be reasonable to perform the work item. OD changes are prohibited unless justification is provided and approved by the Contracting Officer.

3.3.14 Leads, Lags, and Start to Finish Relationships

Lags must be reasonable as determined by the Government and not used in place of realistic original durations, must not be in place to artificially absorb float, or to replace proper schedule logic.

a. Leads (negative lags) are prohibited.

b. Start to Finish (SF) relationships are prohibited.

3.3.15 Retained Logic

Schedule calculations must retain the logic between predecessors and successors ("retained logic" mode) even when the successor activity(s) starts and the predecessor activity(s) has not finished (out-of-sequence progress). Software features that in effect sever the tie between predecessor and successor activities when the successor has started and the predecessor logic is not satisfied ("progress override") are not be allowed.

3.3.16 Percent Complete

Update the percent complete for each activity started, based on the realistic assessment of earned value. Activities which are complete but

for remaining minor punch list work and which do not restrain the initiation of successor activities may be declared 100 percent complete to allow for proper schedule management.

3.3.17 Remaining Duration

Update the remaining duration for each activity based on the number of estimated work days it will take to complete the activity. Remaining duration may not mathematically correlate with percentage found under paragraph entitled Percent Complete.

3.3.18 Cost Loading of Closeout Activities

Cost load the "Correction of punch list from Government pre-final inspection" activity(ies) not less than 1 percent of the present contract value. Activity(ies) may be declared 100 percent complete upon the Government's verification of completion and correction of all punch list work identified during Government pre-final inspection(s).

3.3.18.1 As-Built Drawings

If there is no separate contract line item (CLIN) for as-built drawings, cost load the "Submission and approval of as-built drawings" activity not less than $35,000 or 1 percent of the present contract value, which ever is greater, up to $200,000. Activity will be declared 100 percent complete upon the Government's approval.

3.3.18.2 O & M Manuals

Cost load the "Submission and approval of O & M manuals" activity not less than $20,000. Activity will be declared 100 percent complete upon the Government's approval of all O & M manuals.

3.3.19 Early Completion Schedule and the Right to Finish Early

An Early Completion Schedule is an Initial Project Schedule (IPS) that indicates all scope of the required contract work will be completed before the contractually required completion date.

a. No IPS indicating an Early Completion will be accepted without being fully resource-loaded (including crew sizes and manhours) and the Government agreeing that the schedule is reasonable and achievable.

b. The Government is under no obligation to accelerate work items it is responsible for to ensure that the early completion is met nor is it responsible to modify incremental funding (if applicable) for the project to meet the contractor's accelerated work.

3.4 PROJECT SCHEDULE SUBMISSIONS

Provide the submissions as described below. The data CD/DVD, reports, and network diagrams required for each submission are contained in paragraph SUBMISSION REQUIREMENTS. If the Contractor fails or refuses to furnish the information and schedule updates as set forth herein, then the Contractor will be deemed not to have provided an estimate upon which a progress payment can be made.

Review comments made by the Government on the schedule(s) do not relieve the Contractor from compliance with requirements of the Contract Documents.

3.4.1 Preliminary Project Schedule Submission

Within 15 calendar days after the NTP is acknowledged submit the Preliminary Project Schedule defining the planned operations detailed for the first 90 calendar days for approval. The approved Preliminary Project Schedule will be used for payment purposes not to exceed 90 calendar days after NTP. Completely cost load the Preliminary Project Schedule to balance the contract award CLINS shown on the Price Schedule. The Preliminary Project Schedule may be summary in nature for the remaining performance period. It must be early start and late finish constrained and logically tied as specified. The Preliminary Project Schedule forms the basis for the Initial Project Schedule specified herein and must include all of the required plan and program preparations, submissions and approvals identified in the contract (for example, Quality Control Plan, Safety Plan, and Environmental Protection Plan) as well as design activities, planned submissions of all early design packages, permitting activities, design review conference activities, and other non-construction activities intended to occur within the first 90 calendar days. Government acceptance of the associated design package(s) and all other specified Program and Plan approvals must occur prior to any planned construction activities. Activity code any activities that are summary in nature after the first 90 calendar days with Bid Item (CLIN) code (BIDI), Responsibility Code (RESP) and Feature of Work code (FOW).

3.4.2 Initial Project Schedule Submission

Submit the Initial Project Schedule for approval within 42 calendar days after notice to proceed is issued. The schedule must demonstrate a reasonable and realistic sequence of activities which represent all work through the entire contract performance period. No payment will be made for work items not fully detailed in the Project Schedule.

3.4.3 Periodic Schedule Updates

Update the Project Schedule on a regular basis, monthly at a minimum. Provide a draft Periodic Schedule Update for review at the schedule update meetings as prescribed in the paragraph PERIODIC SCHEDULE UPDATE MEETINGS. These updates will enable the Government to assess Contractor's progress.

a. Update information including Actual Start Dates (AS), Actual Finish Dates (AF), Remaining Durations (RD), and Percent Complete is subject to the approval of the Government at the meeting.

b. AS and AF dates must match the date(s) reported on the Contractor's Quality Control Report for an activity start or finish.

3.5 SUBMISSION REQUIREMENTS

Submit the following items for the Preliminary Schedule, Initial Schedule, and every Periodic Schedule Update throughout the life of the project:

3.5.1 Data CD/DVDs

Provide two sets of data CD/DVDs containing the current project schedule and all previously submitted schedules in the format of the scheduling software (e.g. .xer). Also include on the data CD/DVDs the Narrative Report and all required Schedule Reports. Label each CD/DVD indicating

the type of schedule (Preliminary, Initial, Update), full contract number, Data Date and file name. Each schedule must have a unique file name and use project specific settings.

3.5.2 Narrative Report

Provide a Narrative Report with each schedule submission. The Narrative Report is expected to communicate to the Government the thorough analysis of the schedule output and the plans to compensate for any problems, either current or potential, which are revealed through that analysis. Include the following information as minimum in the Narrative Report:

a. Identify and discuss the work scheduled to start in the next update period.

b. A description of activities along the two most critical paths where the total float is less than or equal to 20 work days.

c. A description of current and anticipated problem areas or delaying factors and their impact and an explanation of corrective actions taken or required to be taken.

d. Identify and explain why activities based on their calculated late dates should have either started or finished during the update period but did not.

e. Identify and discuss all schedule changes by activity ID and activity name including what specifically was changed and why the change was needed. Include at a minimum new and deleted activities, logic changes, duration changes, calendar changes, lag changes, resource changes, and actual start and finish date changes.

f. Identify and discuss out-of-sequence work.

3.5.3 Schedule Reports

The format, filtering, organizing and sorting for each schedule report will be as directed by the Contracting Officer. Typically, reports contain Activity Numbers, Activity Description, Original Duration, Remaining Duration, Early Start Date, Early Finish Date, Late Start Date, Late Finish Date, Total Float, Actual Start Date, Actual Finish Date, and Percent Complete. Provide the reports electronically in .pdf format. The following lists typical reports that will be requested:

3.5.3.1 Activity Report

List of all activities sorted according to activity number.

3.5.3.2 Logic Report

List of detailed predecessor and successor activities for every activity in ascending order by activity number.

3.5.3.3 Total Float Report

A list of all incomplete activities sorted in ascending order of total float. List activities which have the same amount of total float in ascending order of Early Start Dates. Do not show completed activities on this report.

3.5.3.4 Earnings Report by CLIN

A compilation of the Total Earnings on the project from the NTP to the data date, which reflects the earnings of activities based on the agreements made in the schedule update meeting defined herein. Provided a complete schedule update has been furnished, this report serves as the basis of determining progress payments. Group activities by CLIN number and sort by activity number. Provide a total CLIN percent earned value, CLIN percent complete, and project percent complete. The printed report must contain the following for each activity: the Activity Number, Activity Description, Original Budgeted Amount, Earnings to Date, Earnings this period, Total Quantity, Quantity to Date, and Percent Complete (based on cost).

3.5.3.5 Schedule Log

Provide a Scheduling/Leveling Report generated from the current project schedule being submitted.

3.5.4 Network Diagram

The Network Diagram is required for the Preliminary, Initial and Periodic Updates. Depict and display the order and interdependence of activities and the sequence in which the work is to be accomplished. The Contracting Officer will use, but is not limited to, the following conditions to review compliance with this paragraph:

3.5.4.1 Continuous Flow

Show a continuous flow from left to right with no arrows from right to left. Show the activity number, description, duration, and estimated earned value on the diagram.

3.5.4.2 Project Milestone Dates

Show dates on the diagram for start of project, any contract required interim completion dates, and contract completion dates.

3.5.4.3 Critical Path

Show all activities on the critical path. The critical path is defined as the longest path.

3.5.4.4 Banding

Organize activities using the WBS or as otherwise directed to assist in the understanding of the activity sequence. Typically, this flow will group activities by major elements of work, category of work, work area and/or responsibility.

3.5.4.5 Cash Flow / Schedule Variance Control (SVC) Diagram

With each schedule submission, provide a SVC diagram showing 1) Cash Flow S-Curves indicating planned project cost based on projected early and late activity finish dates, and 2) Earned Value to-date.

3.6 PERIODIC SCHEDULE UPDATE

3.6.1 Periodic Schedule Update Meetings

Conduct periodic schedule update meetings for the purpose of reviewing the proposed Periodic Schedule Update, Narrative Report, Schedule Reports, and progress payment. Conduct meetings at least monthly within five days of the proposed schedule data date. Provide a computer with the scheduling software loaded and a projector which allows all meeting participants to view the proposed schedule during the meeting. The Contractor's authorized scheduler must organize, group, sort, filter, perform schedule revisions as needed and review functions as requested by the Contractor and/or Government. The meeting is a working interactive exchange which allows the Government and Contractor the opportunity to review the updated schedule on a real time and interactive basis. The meeting will last no longer than 8 hours. Provide a draft of the proposed narrative report and schedule data file to the Government a minimum of two workdays in advance of the meeting. The Contractor's Project Manager and scheduler must attend the meeting with the authorized representative of the Contracting Officer. Superintendents, foremen and major subcontractors must attend the meeting as required to discuss the project schedule and work. Following the periodic schedule update meeting, make corrections to the draft submission. Include only those changes approved by the Government in the submission and invoice for payment.

3.6.2 Update Submission Following Progress Meeting

Submit the complete Periodic Schedule Update of the Project Schedule containing all approved progress, revisions, and adjustments, pursuant to paragraph SUBMISSION REQUIREMENTS not later than 4 work days after the periodic schedule update meeting.

3.7 WEEKLY PROGRESS MEETINGS

Conduct a weekly meeting with the Government (or as otherwise mutually agreed to) between the meetings described in paragraph entitled PERIODIC SCHEDULE UPDATE MEETINGS for the purpose of jointly reviewing the actual progress of the project as compared to the as planned progress and to review planned activities for the upcoming two weeks. Use the current approved schedule update for the purposes of this meeting and for the production and review of reports. At the weekly progress meeting, address the status of RFIs, RFPs and Submittals.

3.8 REQUESTS FOR TIME EXTENSIONS

Provide a justification of delay to the Contracting Officer in accordance with the contract provisions and clauses for approval within 10 days of a delay occurring. Also prepare a time impact analysis for each Government request for proposal (RFP) to justify time extensions.

3.8.1 Justification of Delay

Provide a description of the event(s) that caused the delay and/or impact to the work. As part of the description, identify all schedule activities impacted. Show that the event that caused the delay/impact was the responsibility of the Government. Provide a time impact analysis that demonstrates the effects of the delay or impact on the project completion date or interim completion date(s). Evaluate multiple impacts chronologically; each with its own justification of delay. With multiple

impacts consider any concurrency of delay. A time extension and the schedule fragnet becomes part of the project schedule and all future schedule updates upon approval by the Contracting Officer.

3.8.2 Time Impact Analysis (Prospective Analysis)

Prepare a time impact analysis for approval by the Contracting Officer based on industry standard AACE 52R-06. Utilize a copy of the last approved schedule prior to the first day of the impact or delay for the time impact analysis. If Contracting Officer determines the time frame between the last approved schedule and the first day of impact is too great, prepare an interim updated schedule to perform the time impact analysis. Unless approved by the Contracting Officer, no other changes may be incorporated into the schedule being used to justify the time impact.

3.8.3 Forensic Schedule Analysis (Retrospective Analysis)

Prepare an analysis for approval by the Contracting Officer based on industry standard AACE 29R-03.

3.8.4 Fragmentary Network (Fragnet)

Prepare a proposed fragnet for time impact analysis consisting of a sequence of new activities that are proposed to be added to the project schedule to demonstrate the influence of the delay or impact to the project's contractual dates. Clearly show how the proposed fragnet is to be tied into the project schedule including all predecessors and successors to the fragnet activities. The proposed fragnet must be approved by the Contracting Officer prior to incorporation into the project schedule.

3.8.5 Time Extension

The Contracting Officer must approve the Justification of Delay including the time impact analysis before a time extension will be granted. No time extension will be granted unless the delay consumes all available Project Float and extends the projected finish date ("End Project" milestone) beyond the Contract Completion Date. The time extension will be in calendar days.

Actual delays that are found to be caused by the Contractor's own actions, which result in a calculated schedule delay will not be a cause for an extension to the performance period, completion date, or any interim milestone date.

3.8.6 Impact to Early Completion Schedule

No extended overhead will be paid for delay prior to the original Contract Completion Date for an Early Completion IPS unless the Contractor actually performed work in accordance with that Early Completion Schedule. The Contractor must show that an early completion was achievable had it not been for the impact.

3.9 FAILURE TO ACHIEVE PROGRESS

Should the progress fall behind the approved project schedule for reasons other than those that are excusable within the terms of the contract, the Contracting Officer may require provision of a written recovery plan for

approval. The plan must detail how progress will be made-up to include which activities will be accelerated by adding additional crews, longer work hours, extra work days, etc.

3.9.1 Artificially Improving Progress

Artificially improving progress by means such as, but not limited to, revising the schedule logic, modifying or adding constraints, shortening activity durations, or changing calendars in the project schedule is prohibited. Indicate assumptions made and the basis for any logic, constraint, duration and calendar changes used in the creation of the recovery plan. Any additional resources, manpower, or daily and weekly work hour changes proposed in the recovery plan must be evident at the work site and documented in the daily report along with the Schedule Narrative Report.

3.9.2 Failure to Perform

Failure to perform work and maintain progress in accordance with the supplemental recovery plan may result in an interim and final unsatisfactory performance rating and may result in corrective action directed by the Contracting Officer pursuant to FAR 52.236-15 Schedules for Construction Contracts, FAR 52.249-10 Default (Fixed-Price Construction), and other contract provisions.

3.9.3 Recovery Schedule

Should the Contracting Officer find it necessary, submit a recovery schedule pursuant to FAR 52.236-15 Schedules for Construction Contracts.

3.10 OWNERSHIP OF FLOAT

Except for the provision given in the paragraph IMPACT TO EARLY COMPLETION SCHEDULE, float available in the schedule, at any time, may not be considered for the exclusive use of either the Government or the Contractor including activity and/or project float. Activity float is the number of work days that an activity can be delayed without causing a delay to the "End Project" finish milestone. Project float (if applicable) is the number of work days between the projected early finish and the contract completion date milestone.

3.11 TRANSFER OF SCHEDULE DATA INTO RMS/QCS

Import the schedule data into the Quality Control System (QCS) and export the QCS data to the Government. This data is considered to be additional supporting data in a form and detail required by the Contracting Officer pursuant to FAR 52.232-5 Payments under Fixed-Price Construction Contracts. The receipt of a proper payment request pursuant to FAR 52.232-27 Prompt Payment for Construction Contracts is contingent upon the Government receiving both acceptable and approvable hard copies and matching electronic export from QCS of the application for progress payment.

3.12 PRIMAVERA P6 MANDATORY REQUIREMENTS

If Primavera P6 is being used, request a backup file template (.xer) from the Government, if one is available, prior to building the schedule. The following settings are mandatory and required in all schedule submissions to the Government:

a. Activity Codes must be Project Level, not Global or EPS level.

b. Calendars must be Project Level, not Global or Resource level.

c. Activity Duration Types must be set to "Fixed Duration & Units".

d. Percent Complete Types must be set to "Physical".

e. Time Period Admin Preferences must remain the default "8.0 hr/day, 40 hr/week, 172 hr/month, 2000 hr/year". Set Calendar Work Hours/Day to 8.0 Hour days.

f. Set Schedule Option for defining Critical Activities to "Longest Path".

g. Set Schedule Option for defining progressed activities to "Retained Logic".

h. Set up cost loading using a single lump sum labor resource. The Price/Unit must be $1/hr, Default Units/Time must be "8h/d", and settings "Auto Compute Actuals" and "Calculate costs from units" selected.

i. Activity ID's must not exceed 10 characters.

j. Activity Names must have the most defining and detailed description within the first 30 characters.

-- End of Section --

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SECTION 01 33 00

SUBMITTAL PROCEDURES
08/18

PART 1 GENERAL

1.1 SUMMARY

1.1.1 Submittal Information

The Contracting Officer may request submittals in addition to those specified when deemed necessary to adequately describe the work covered in the respective sections. Each submittal is to be complete and in sufficient detail to allow ready determination of compliance with contract requirements.

Units of weights and measures used on all submittals are to be the same as those used in the contract drawings.

1.1.2 Project Type

The Contractor's Quality Control (CQC) System Manager are to check and approve all items before submittal and stamp, sign, and date indicating action taken. Proposed deviations from the contract requirements are to be clearly identified. Include within submittals items such as: Contractor's, manufacturer's, or fabricator's drawings; descriptive literature including (but not limited to) catalog cuts, diagrams, operating charts or curves; test reports; test cylinders; samples; O&M manuals (including parts list); certifications; warranties; and other such required submittals.

1.1.3 Submission of Submittals

Schedule and provide submittals requiring Government approval before acquiring the material or equipment covered thereby. Pick up and dispose of samples not incorporated into the work in accordance with manufacturer's Safety Data Sheets (SDS) and in compliance with existing laws and regulations.

1.2 DEFINITIONS

1.2.1 Submittal Descriptions (SD)

Submittal requirements are specified in the technical sections. Examples and descriptions of submittals identified by the Submittal Description (SD) numbers and titles follow:

SD-01 Preconstruction Submittals

Submittals that are required prior to or at the start of construction (work) or the next major phase of the construction on a multiphase contract.

Preconstruction Submittals include schedules and a tabular list of locations, features, and other pertinent information regarding products, materials, equipment, or components to be used in the work.

Certificates Of Insurance

Surety Bonds

List Of Proposed Subcontractors

List Of Proposed Products

Baseline Network Analysis Schedule (NAS)

Submittal Register

Schedule Of Prices Or Earned Value Report

Accident Prevention Plan

Work Plan

Quality Control (QC) plan

Environmental Protection Plan

SD-02 Shop Drawings

Drawings, diagrams and schedules specifically prepared to illustrate some portion of the work.

Diagrams and instructions from a manufacturer or fabricator for use in producing the product and as aids to the Contractor for integrating the product or system into the project.

Drawings prepared by or for the Contractor to show how multiple systems and interdisciplinary work will be coordinated.

SD-03 Product Data

Catalog cuts, illustrations, schedules, diagrams, performance charts, instructions and brochures illustrating size, physical appearance and other characteristics of materials, systems or equipment for some portion of the work.

Samples of warranty language when the contract requires extended product warranties.

SD-04 Samples

Fabricated or unfabricated physical examples of materials, equipment or workmanship that illustrate functional and aesthetic characteristics of a material or product and establish standards by which the work can be judged.

Color samples from the manufacturer's standard line (or custom color samples if specified) to be used in selecting or approving colors for the project.

Field samples and mock-ups constructed on the project site establish standards ensuring work can be judged. Includes assemblies or portions of assemblies that are to be incorporated into the project

and those that will be removed at conclusion of the work.

SD-05 Design Data

Design calculations, mix designs, analyses or other data pertaining to a part of work.

SD-06 Test Reports

Report signed by authorized official of testing laboratory that a material, product or system identical to the material, product or system to be provided has been tested in accord with specified requirements. Unless specified in another section, testing must have been within three years of date of contract award for the project.

Report that includes findings of a test required to be performed on an actual portion of the work or prototype prepared for the project before shipment to job site.

Report that includes finding of a test made at the job site or on sample taken from the job site, on portion of work during or after installation.

Investigation reports

Daily logs and checklists

Final acceptance test and operational test procedure

SD-07 Certificates

Statements printed on the manufacturer's letterhead and signed by responsible officials of manufacturer of product, system or material attesting that the product, system, or material meets specification requirements. Must be dated after award of project contract and clearly name the project.

Document required of Contractor, or of a manufacturer, supplier, installer or Subcontractor through Contractor. The document purpose is to further promote the orderly progression of a portion of the work by documenting procedures, acceptability of methods, or personnel qualifications.

Confined space entry permits

Text of posted operating instructions

SD-08 Manufacturer's Instructions

Preprinted material describing installation of a product, system or material, including special notices and (SDS)concerning impedances, hazards and safety precautions.

SD-10 Operation and Maintenance Data

Data provided by the manufacturer, or the system provider, including manufacturer's help and product line documentation, necessary to maintain and install equipment, for operating and maintenance use by

facility personnel.

Data required by operating and maintenance personnel for the safe and efficient operation, maintenance and repair of the item.

Data incorporated in an operations and maintenance manual or control system.

SD-11 Closeout Submittals

Documentation to record compliance with technical or administrative requirements or to establish an administrative mechanism.

Submittals required for Guiding Principle Validation (GPV) or Third Party Certification (TPC).

Special requirements necessary to properly close out a construction contract. For example, Record Drawings and as-built drawings. Also, submittal requirements necessary to properly close out a major phase of construction on a multi-phase contract.

1.2.2 Approving Authority

Office or designated person authorized to approve the submittal.

1.2.3 Work

As used in this section, on-site and off-site construction required by contract documents, including labor necessary to produce submittals, construction, materials, products, equipment, and systems incorporated or to be incorporated in such construction. In exception, excludes work to produce SD-01 submittals.

1.3 SUBMITTALS

Government approval is required for submittals with a "G" designation; submittals not having a "G" designation are for information only. When used, a designation following the "G" designation identifies the office that will review the submittal for the Government. Submit the following in accordance with this section.

SD-01 Preconstruction Submittals

Submittal Register; G

1.4 SUBMITTAL CLASSIFICATION

1.4.1 Government Approved (G)

Government approval is required for extensions of design, critical materials, variations, equipment whose compatibility with the entire system must be checked, and other items as designated by the Government.

Government approval is required for any variations from the Solicitation or the Accepted Proposal and for other items as designated by the Government.

Within the terms of the Contract Clause SPECIFICATIONS AND DRAWINGS FOR CONSTRUCTION, submittals are considered to be "shop drawings."

1.4.2 For Information Only

Submittals not requiring Government approval will be for information only. For Design-build construction all submittals not requiring DOR or Government approval will be for information only. Within the terms of the Contract Clause SPECIFICATIONS AND DRAWINGS FOR CONSTRUCTION, they are not considered to be "shop drawings."

1.5 PREPARATION

1.5.1 Transmittal Form

Use the ENG Form 4025-R transmittal form for submitting both Government-approved and information-only submittals. Submit in accordance with the instructions on the reverse side of the form. These forms are included in the RMS CM software that the Contractor is required to use for this contract, see section 01 45 00.15 10 RESIDENT MANAGEMENT SYSTEM CONTRACTOR MODE (RMS CM) for further information. Properly complete this form by filling out all the heading blank spaces and identifying each item submitted. Exercise special care to ensure proper listing of the specification paragraph and sheet number of the contract drawings pertinent to the data submitted for each item.

1.5.2 Submittal Format

1.5.2.1 Format of SD-01 Preconstruction Submittals

When the submittal includes a document that is to be used in the project, or is to become part of the project record, other than as a submittal, do not apply the Contractor's approval stamp to the document itself, but to a separate sheet accompanying the document.

Provide data in the unit of measure used in the contract documents.

1.5.2.2 Format for SD-02 Shop Drawings

Provide shop drawings not less than 8 1/2 by 11 inches nor more than 30 by 42 inches, except for full-size patterns or templates. Prepare drawings to accurate size, with scale indicated, unless another form is required. Ensure drawings are suitable for reproduction and of a quality to produce clear, distinct lines and letters, with dark lines on a white background.

a. Include the nameplate data, size, and capacity on drawings. Also include applicable federal, military, industry, and technical society publication references.

b. Dimension drawings, except diagrams and schematic drawings. Prepare drawings demonstrating interface with other trades to scale. Use the same unit of measure for shop drawings as indicated on the contract drawings. Identify materials and products for work shown.

Submit an electronic copy of drawings in PDF format.

1.5.2.2.1 Drawing Identification

Include on each drawing the drawing title, number, date, and revision numbers and dates, in addition to information required in paragraph IDENTIFYING SUBMITTALS.

Number drawings in a logical sequence. Each drawing is to bear the number of the submittal in a uniform location next to the title block. Place the Government contract number in the margin, immediately below the title block, for each drawing.

Reserve a blank space, no smaller than 2 inches on the right-hand side of each sheet for the Government disposition stamp.

1.5.2.3 Format of SD-03 Product Data

Present product data submittals for each section. Include a table of contents, listing the page and catalog item numbers for product data.

Indicate, by prominent notation, each product that is being submitted; indicate the specification section number and paragraph number to which it pertains.

1.5.2.3.1 Product Information

Supplement product data with material prepared for the project to satisfy the submittal requirements where product data does not exist. Identify this material as developed specifically for the project, with information and format as required for submission of SD-07 Certificates.

Provide product data in units used in the Contract documents. Where product data are included in preprinted catalogs with another unit, submit the dimensions in contract document units, on a separate sheet.

1.5.2.3.2 Standards

Where equipment or materials are specified to conform to industry or technical-society reference standards of such organizations as the American National Standards Institute (ANSI), ASTM International (ASTM), National Electrical Manufacturer's Association (NEMA), Underwriters Laboratories (UL), or Association of Edison Illuminating Companies (AEIC), submit proof of such compliance. The label or listing by the specified organization will be acceptable evidence of compliance. In lieu of the label or listing, submit a certificate from an independent testing organization, competent to perform testing, and approved by the Contracting Officer. State on the certificate that the item has been tested in accordance with the specified organization's test methods and that the item complies with the specified organization's reference standard.

1.5.2.3.3 Data Submission

Collect required data submittals for each specific material, product, unit of work, or system into a single submittal that is marked for choices, options, and portions applicable to the submittal. Mark each copy of the product data identically. Partial submittals will not be accepted for expedition of the construction effort.

Submit the manufacturer's instructions before installation.

1.5.2.4 Format of SD-04 Samples

1.5.2.4.1 Sample Characteristics

Furnish samples in the following sizes, unless otherwise specified or unless the manufacturer has prepackaged samples of approximately the same size as specified:

a. Sample of Equipment or Device: Full size.

b. Sample of Materials Less Than 2 by 3 inches: Built up to 8 1/2 by 11 inches.

c. Sample of Materials Exceeding 8 1/2 by 11 inches: Cut down to 8 1/2 by 11 inches and adequate to indicate color, texture, and material variations.

d. Sample of Linear Devices or Materials: 10 inch length or length to be supplied, if less than 10 inches. Examples of linear devices or materials are conduit and handrails.

e. Sample Volume of Nonsolid Materials: Pint. Examples of nonsolid materials are sand and paint.

f. Color Selection Samples: 2 by 4 inches. Where samples are specified for selection of color, finish, pattern, or texture, submit the full set of available choices for the material or product specified. Sizes and quantities of samples are to represent their respective standard unit.

g. Sample Panel: 4 by 4 feet.

h. Sample Installation: 100 square feet.

1.5.2.4.2 Sample Incorporation

Reusable Samples: Incorporate returned samples into work only if so specified or indicated. Incorporated samples are to be in undamaged condition at the time of use.

Recording of Sample Installation: Note and preserve the notation of any area constituting a sample installation, but remove the notation at the final clean-up of the project.

1.5.2.4.3 Comparison Sample

Samples Showing Range of Variation: Where variations in color, finish, pattern, or texture are unavoidable due to nature of the materials, submit sets of samples of not less than three units showing extremes and middle of range. Mark each unit to describe its relation to the range of the variation.

When color, texture, or pattern is specified by naming a particular manufacturer and style, include one sample of that manufacturer and style, for comparison.

1.5.2.5 Format of SD-05 Design Data

Provide design data and certificates on 8 1/2 by 11 inch paper.

1.5.2.6 Format of SD-06 Test Reports

By prominent notation, indicate each report in the submittal. Indicate the specification number and paragraph number to which each report pertains.

1.5.2.7 Format of SD-07 Certificates

Provide design data and certificates on 8 1/2 by 11 inch paper.

1.5.2.8 Format of SD-08 Manufacturer's Instructions

Present manufacturer's instructions submittals for each section. Include the manufacturer's name, trade name, place of manufacture, and catalog model or number on product data. Also include applicable federal, military, industry, and technical-society publication references. If supplemental information is needed to clarify the manufacturer's data, submit it as specified for SD-07 Certificates.

Submit the manufacturer's instructions before installation.

1.5.2.8.1 Standards

Where equipment or materials are specified to conform to industry or technical-society reference standards of such organizations as the American National Standards Institute (ANSI), ASTM International (ASTM), National Electrical Manufacturer's Association (NEMA), Underwriters Laboratories (UL), or Association of Edison Illuminating Companies (AEIC), submit proof of such compliance. The label or listing by the specified organization will be acceptable evidence of compliance. In lieu of the label or listing, submit a certificate from an independent testing organization, competent to perform testing, and approved by the Contracting Officer. State on the certificate that the item has been tested in accordance with the specified organization's test methods and that the item complies with the specified organization's reference standard.

1.5.2.9 Format of SD-09 Manufacturer's Field Reports

By prominent notation, indicate each report in the submittal. Indicate the specification number and paragraph number to which each report pertains.

1.5.2.10 Format of SD-10 Operation and Maintenance Data (O&M)

Comply with the requirements specified in Section 01 78 23 OPERATION AND MAINTENANCE DATA for O&M Data format.

1.5.2.11 Format of SD-11 Closeout Submittals

When the submittal includes a document that is to be used in the project or is to become part of the project record, other than as a submittal, do not apply the Contractor's approval stamp to the document itself, but to a separate sheet accompanying the document.

Provide data in the unit of measure used in the contract documents.

1.5.3 Source Drawings for Shop Drawings

1.5.3.1 Source Drawings

The entire set of source drawing files (DWG) will not be provided to the Contractor. Request the specific Drawing Number for the preparation of shop drawings. Only those drawings requested to prepare shop drawings will be provided. These drawings are provided only after award.

1.5.3.2 Terms and Conditions

Data contained on these electronic files must not be used for any purpose other than as a convenience in the preparation of construction data for the referenced project. Any other use or reuse is at the sole risk of the Contractor and without liability or legal exposure to the Government. The Contractor must make no claim, and waives to the fullest extent permitted by law any claim or cause of action of any nature against the Government, its agents, or its subconsultants that may arise out of or in connection with the use of these electronic files. The Contractor must, to the fullest extent permitted by law, indemnify and hold the Government harmless against all damages, liabilities, or costs, including reasonable attorney's fees and defense costs, arising out of or resulting from the use of these electronic files.

These electronic source drawing files are not construction documents. Differences may exist between the source drawing files and the corresponding construction documents. The Government makes no representation regarding the accuracy or completeness of the electronic source drawing files, nor does it make representation to the compatibility of these files with the Contractor hardware or software. The Contractor is responsible for determining if any conflict exists. In the event that a conflict arises between the signed and sealed construction documents prepared by the Government and the furnished source drawing files, the signed and sealed construction documents govern. Use of these source drawing files does not relieve the Contractor of the duty to fully comply with the contract documents, including and without limitation the need to check, confirm and coordinate the work of all contractors for the project. If the Contractor uses, duplicates or modifies these electronic source drawing files for use in producing construction data related to this contract, remove all previous indication of ownership (seals, logos, signatures, initials and dates).

1.5.4 Electronic File Format

Provide submittals in electronic format, with the exception of material samples required for SD-04 Samples items. Name the electronic submittal file specifically according to its contents, and coordinate the file naming convention with the Contracting Officer. Electronic files must be of sufficient quality that all information is legible. Use PDF as the electronic format, unless otherwise specified or directed by the Contracting Officer. Generate PDF files from original documents with bookmarks so that the text included in the PDF file is searchable and can be copied. If documents are scanned, optical character resolution (OCR) routines are required. Index and bookmark files exceeding 30 pages to allow efficient navigation of the file. When required, the electronic file must include a valid electronic signature or a scan of a signature.

1.6 QUANTITY OF SUBMITTALS

1.6.1 Number of SD-01 Preconstruction Submittal Copies

Unless otherwise specified, submit two sets of administrative submittals.

1.6.2 Number of SD-04 Samples

a. Submit two samples, or two sets of samples showing the range of variation, of each required item. One approved sample or set of samples will be retained by the approving authority and one will be returned to the Contractor.

b. Submit one sample panel or provide one sample installation where directed. Include components listed in the technical section or as directed.

c. Submit one sample installation, where directed.

d. Submit one sample of nonsolid materials.

1.7 INFORMATION ONLY SUBMITTALS

Submittals without a "G" designation must be certified by the QC manager and submitted to the Contracting Officer for information-only. Approval of the Contracting Officer is not required on information only submittals. The Contracting Officer will mark "receipt acknowledged" on submittals for information and will return only the transmittal cover sheet to the Contractor. Normally, submittals for information only will not be returned. However, the Government reserves the right to return unsatisfactory submittals and require the Contractor to resubmit any item found not to comply with the contract. This does not relieve the Contractor from the obligation to furnish material conforming to the plans and specifications; will not prevent the Contracting Officer from requiring removal and replacement of nonconforming material incorporated in the work; and does not relieve the Contractor of the requirement to furnish samples for testing by the Government laboratory or for check testing by the Government in those instances where the technical specifications so prescribe.

1.8 PROJECT SUBMITTAL REGISTER

A sample Project Submittal Register showing items of equipment and materials for when submittals are required by the specifications is provided as "Appendix A - Submittal Register."

1.8.1 Submittal Management

Prepare and maintain a submittal register, as the work progresses. Do not change data that is output in columns (c), (d), (e), and (f) as delivered by Government; retain data that is output in columns (a), (g), (h), and (i) as approved. As an attachment, provide a submittal register showing items of equipment and materials for which submittals are required by the specifications. This list may not be all-inclusive and additional submittals may be required. Maintain a submittal register for the project in accordance with Section 01 45 00.15 10 RESIDENT MANAGEMENT SYSTEM CONTRACTOR MODE(RMS CM). The Government will provide the initial submittal register in electronic format

Column (c): Lists specification section in which submittal is required.

Column (d): Lists each submittal description (SD Number. and type, e.g., SD-02 Shop Drawings) required in each specification section.

Column (e): Lists one principal paragraph in each specification section where a material or product is specified. This listing is only to facilitate locating submitted requirements. Do not consider entries in column (e) as limiting the project requirements.

Thereafter, the Contractor is to track all submittals by maintaining a complete list, including completion of all data columns and all dates on which submittals are received by and returned by the Government.

1.8.2 Preconstruction Use of Submittal Register

Submit the submittal register. Include the QC plan and the project schedule. Verify that all submittals required for the project are listed and add missing submittals. Coordinate and complete the following fields on the register submitted with the QC plan and the project schedule:

Column (a) Activity Number: Activity number from the project schedule.

Column (g) Contractor Submit Date: Scheduled date for the approving authority to receive submittals.

Column (h) Contractor Approval Date: Date that Contractor needs approval of submittal.

Column (i) Contractor Material: Date that Contractor needs material delivered to Contractor control.

1.8.3 Contractor Use of Submittal Register

Update the following fields in the Government-furnished submittal register program or equivalent fields in the program used by the Contractor with each submittal throughout the contract.

Column (b) Transmittal Number: List of consecutive, Contractor-assigned numbers.

Column (j) Action Code (k): Date of action used to record Contractor's review when forwarding submittals to QC.

Column (l) Date submittal transmitted.

Column (q) Date approval was received.

1.8.4 Approving Authority Use of Submittal Register

Update the following fields:

Column (b) Transmittal Number: List of consecutive, Contractor-assigned numbers.

Column (l) Date submittal was received.

Column (m) through (p) Dates of review actions.

Column (q) Date of return to Contractor.

1.8.5 Action Codes

1.8.5.1 Contractor Action Codes

DESIGN BID BUILD SUBMITTALS			
Submittal Classifications shown in UFGS Sections	Submittal Classification	Corresponding SpecsIntact Submittal Register Code which is populated in the SI Submittal Register. Software Limitations: (The software shows one character delineation in the SpecsIntact Submittal Register)	RMS – The following Submittal Classifications are populated in RMS when the SpecsIntact Submittal Data File is pulled into RMS)
G	Submittal requires Government Approval	G	GA
BLANK	Submittal is For Information Only (FIO)	BLANK	FIO
S	Submittal is for documentation of Sustainable requirements	S	S/FIO

1.8.6 Delivery of Copies

Submit an updated electronic copy of the submittal register to the Contracting Officer with each invoice request. Provide an updated Submittal Register monthly regardless of whether an invoice is submitted.

1.9 VARIATIONS

Variations from contract requirements require Contracting Officer approval pursuant to contract Clause FAR 52.236-21 Specifications and Drawings for Construction, and will be considered where advantageous to the Government.

1.9.1 Considering Variations

Discussion of variations with the Contracting Officer before submission will help ensure that functional and quality requirements are met and minimize rejections and resubmittals. When contemplating a variation that results in lower cost, consider submission of the variation as a Value

Engineering Change Proposal (VECP).

Specifically point out variations from contract requirements in transmittal letters. Failure to point out variations may cause the Government to require rejection and removal of such work at no additional cost to the Government.

1.9.2 Proposing Variations

When proposing variation, deliver a written request to the Contracting Officer, with documentation of the nature and features of the variation and why the variation is desirable and beneficial to Government. Include the DOR's written analysis and approval. If lower cost is a benefit, also include an estimate of the cost savings. In addition to documentation required for variation, include the submittals required for the item. Clearly mark the proposed variation in all documentation.

Check the column "variation" of ENG Form 4025 for submittals that include variations proposed by the Contractor. Set forth in writing the reason for any variations and note such variations on the submittal. The Government reserves the right to rescind inadvertent approval of submittals containing unnoted variations.

1.9.3 Warranting that Variations are Compatible

When delivering a variation for approval, the Contractor warrants that this contract has been reviewed to establish that the variation, if incorporated, will be compatible with other elements of work.

1.9.4 Review Schedule Extension

In addition to the normal submittal review period, a period of 14 calendar days will be allowed for the Government to consider submittals with variations.

1.10 SCHEDULING

Schedule and submit concurrently product data and shop drawings covering component items forming a system or items that are interrelated. Submit pertinent certifications at the same time. No delay damages or time extensions will be allowed for time lost in late submittals. .

a. Coordinate scheduling, sequencing, preparing, and processing of submittals with performance of work so that work will not be delayed by submittal processing. The Contractor is responsible for additional time required for Government reviews resulting from required resubmittals. The review period for each resubmittal is the same as for the initial submittal.

b. Submittals required by the contract documents are listed on the submittal register. If a submittal is listed in the submittal register but does not pertain to the contract work, the Contractor is to include the submittal in the register and annotate it "N/A" with a brief explanation. Approval by the Contracting Officer does not relieve the Contractor of supplying submittals required by the contract documents but that have been omitted from the register or marked "N/A."

c. Resubmit the submittal register and annotate it monthly with actual

submission and approval dates. When all items on the register have been fully approved, no further resubmittal is required.

Contracting Officer review will be completed within 30 calendar days after the date of submission.

1.11 GOVERNMENT APPROVING AUTHORITY

When the approving authority is the Contracting Officer, the Government will:

a. Note the date on which the submittal was received.

b. Review submittals for approval within the scheduling period specified and only for conformance with project design concepts and compliance with contract documents.

c. Identify returned submittals with one of the actions defined in paragraph REVIEW NOTATIONS and with comments and markings appropriate for the action indicated.

Upon completion of review of submittals requiring Government approval, stamp and date submittals. One copy of the submittal will be retained by the Contracting Officer and one copy of the submittal will be returned to the Contractor.

1.11.1 Review Notations

Submittals will be returned to the Contractor with the following notations:

a. Submittals marked "approved" or "accepted" authorize proceeding with the work covered.

b. Submittals marked "approved as noted" or "approved, except as noted, resubmittal not required," authorize proceeding with the work covered provided that the Contractor takes no exception to the corrections.

c. Submittals marked "not approved," "disapproved," or "revise and resubmit" indicate incomplete submittal or noncompliance with the contract requirements or design concept. Resubmit with appropriate changes. Do not proceed with work for this item until the resubmittal is approved.

d. Submittals marked "not reviewed" indicate that the submittal has been previously reviewed and approved, is not required, does not have evidence of being reviewed and approved by Contractor, or is not complete. A submittal marked "not reviewed" will be returned with an explanation of the reason it is not reviewed. Resubmit submittals returned for lack of review by Contractor or for being incomplete, with appropriate action, coordination, or change.

e. Submittals marked "receipt acknowledged" indicate that submittals have been received by the Government. This applies only to "information-only submittals" as previously defined.

1.12 DISAPPROVED SUBMITTALS

Make corrections required by the Contracting Officer. If the Contractor considers any correction or notation on the returned submittals to constitute a change to the contract drawings or specifications, give

notice to the Contracting Officer as required under the FAR clause titled CHANGES. The Contractor is responsible for the dimensions and design of connection details and the construction of work. Failure to point out variations may cause the Government to require rejection and removal of such work at the Contractor's expense.

If changes are necessary to submittals, make such revisions and resubmit in accordance with the procedures above. No item of work requiring a submittal change is to be accomplished until the changed submittals are approved.

1.13 APPROVED SUBMITTALS

The Contracting Officer's approval of submittals is not to be construed as a complete check, and indicates only that the general method of construction, materials, detailing, and other information are satisfactory. The design, general method of construction, materials, detailing, and other information appear to meet the Solicitation and Accepted Proposal.

Approval or acceptance by the Government for a submittal does not relieve the Contractor of the responsibility for meeting the contract requirements or for any error that may exist, because under the Quality Control (QC) requirements of this contract, the Contractor is responsible for ensuring information contained with in each submittal accurately conforms with the requirements of the contract documents.

After submittals have been approved or accepted by the Contracting Officer, no resubmittal for the purpose of substituting materials or equipment will be considered unless accompanied by an explanation of why a substitution is necessary.

1.14 APPROVED SAMPLES

Approval of a sample is only for the characteristics or use named in such approval and is not be construed to change or modify any contract requirements. Before submitting samples, provide assurance that the materials or equipment will be available in quantities required in the project. No change or substitution will be permitted after a sample has been approved.

Match the approved samples for materials and equipment incorporated in the work. If requested, approved samples, including those that may be damaged in testing, will be returned to the Contractor, at its expense, upon completion of the contract. Unapproved samples will also be returned to the Contractor at its expense, if so requested.

Failure of any materials to pass the specified tests will be sufficient cause for refusal to consider, under this contract, any further samples of the same brand or make as that material. The Government reserves the right to disapprove any material or equipment that has previously proved unsatisfactory in service.

Samples of various materials or equipment delivered on the site or in place may be taken by the Contracting Officer for testing. Samples failing to meet contract requirements will automatically void previous approvals. Replace such materials or equipment to meet contract requirements.

1.15 WITHHOLDING OF PAYMENT

Payment for materials incorporated in the work will not be made if required approvals have not been obtained. No payment for materials incorporated in the work will be made unless all required DOR approvals or required Government approvals have been obtained. No payment will be made for any materials incorporated into the work for any conformance review submittals or information-only submittals found to contain errors or deviations from the Solicitation or Accepted Proposal.

1.16 STAMPS

Certify the submittal data as follows on Form ENG 4025: "I certify that the above submitted items had been reviewed in detail and are correct and in strict conformance with the contract drawings and specifications except as otherwise stated.

_____NAME OF CONTRACTOR _____ SIGNATURE OF CONTRACTOR

PART 2 PRODUCTS

Not Used

PART 3 EXECUTION

Not Used

-- End of Section --

SUBMITTAL REGISTER

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Yakima 1135

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		01 30 00	SD-01 Preconstruction Submittals															
			View Location Map	1.3	G													
			Progress Photographs	1.11.2														
			SD-11 Closeout Submittals															
			Completion Photographs	1.11.3														
		01 32 01.00 10	SD-01 Preconstruction Submittals															
			Project Scheduler Qualifications	1.3	G													
			Preliminary Project Schedule	3.4.1	G													
			Initial Project Schedule	3.4.2	G													
			Periodic Schedule Update	3.6.2	G													
		01 33 00	SD-01 Preconstruction Submittals															
			Submittal Register	1.8	G													
		01 35 26	SD-01 Preconstruction Submittals															
			Accident Prevention Plan (APP)	1.7	G													
			SD-06 Test Reports															
			Monthly Exposure Reports	1.4														
			Notifications and Reports	1.12														
			Accident Reports	1.12.2	G													
			LHE Inspection Reports	1.12.3														
			Dive Operations Plan	1.15	G													
			SD-07 Certificates															
			Crane Operators/Riggers	1.6.1.4														
			Standard Lift Plan	1.7.2.2	G													
			Critical Lift Plan	1.7.2.3	G													
			Naval Architecture Analysis	1.7.2.4	G													
			Activity Hazard Analysis (AHA)	1.8														

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		01 35 26	Confined Space Entry Permit	1.9.1														
			Hot Work Permit	1.9.1														
			Certificate of Compliance	1.12.4														
		01 45 00.00 10	SD-01 Preconstruction Submittals															
			Contractor Quality Control (CQC)	3.2	G													
			Plan															
			SD-06 Test Reports															
			Verification Statement	3.8.2														
		01 50 00	SD-01 Preconstruction Submittals															
			Construction Site Plan	1.3	G													
			Traffic Control Plan	3.4.1	G													
			Haul Road Plan	2.2.1	G													
			SD-07 Certificates															
			Backflow Tester	1.4.1														
			Backflow Preventers	1.4														
		01 56 00	SD-01 Preconstruction Submittals															
			Care and Diversion Work Plan	1.5	G	DO												
			Evacuation Plan	1.6	G	DO												
			In-Water Safety Plan	1.7														
			SD-02 Shop Drawings															
			Shop Drawings	1.8	G	DO												
			SD-05 Design Data															
			Design Calculations	1.9	G	DO												
		01 57 19	SD-01 Preconstruction Submittals															
			Preconstruction Survey	1.7.2														
			Solid Waste Management Permit	1.13	G													

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		01 57 19	Regulatory Notifications	1.7.3	G													
			Environmental Protection Plan	1.8	G													
			Stormwater Pollution Prevention	3.3.1.1	G													
			Plan															
			Stormwater Notice of Intent	3.3.1.2	G													
			Dirt and Dust Control Plan	1.8.9.1	G													
			Employee Training Records	1.7.8	G													
			Environmental Manager	1.7.5	G													
			Qualifications															
			Fish Exclusion And Rescue Plan	1.10	G DO													
			Lighting Plan	1.9	G													
			SD-06 Test Reports															
			Inspection Reports	3.3.1.3														
			Monthly Solid Waste Disposal	1.13.1	G													
			Report															
			SD-07 Certificates															
			Employee Training Records	1.7.8	G													
			Erosion and Sediment Control	1.7.8														
			Inspector															
			Environmental Manager	1.7.5	G DO													
			Contractor's Biologist	1.7.6	G DO													
			Fish Biologist	1.7.7	G DO													
			SD-11 Closeout Submittals															
			Stormwater Pollution Prevention	3.3.1.4	G													
			Plan Compliance Notebook															
			Stormwater Notice of Termination	3.3.1.5	G													

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		01 57 19	Waste Determination	3.8.1	G													
			Documentation															
			Assembled Employee Training	1.7.8	G													
			Records															
			Solid Waste Management Permit	1.13	G													
			Project Solid Waste Disposal	3.8.2.1	G													
			Documentation Report															
			Hazardous Waste/Debris	3.8.3.1	G													
			Management															
			Regulatory Notifications	1.7.3	G													
			Sales Documentation	3.8.2.1	G													
			As-Built Topographic Survey	3.3.1.5														
		01 74 19	SD-01 Preconstruction Submittals															
			Construction Waste Management	1.6	G													
			Plan															
			SD-06 Test Reports															
			Quarterly Reports	1.8.2														
			Annual Report	1.8.3														
			SD-11 Closeout Submittals															
			Final Construction Waste	1.9														
			Diversion Report															
		01 78 00	SD-03 Product Data															
			Warranty Management Plan	1.7.1														
			Warranty Tags	1.7.5														
			Spare Parts Data	1.5														
			SD-11 Closeout Submittals															

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		01 78 00	As-Built Drawings	3.1	G													
			Record Drawings	3.3	G													
			As-Built Record of Equipment	3.6														
			and Materials															
			Final Approved Shop Drawings	3.4														
			Construction Contract	3.5														
			Specifications															
		03 30 53	SD-02 Shop Drawings															
			Installation Drawings	1.4	G DO													
			SD-03 Product Data															
			Air-Entraining Admixture	2.2.3.1														
			Accelerating Admixture	2.2.3.2														
			Water-Reducing or Retarding	2.2.3.3														
			Admixture															
			Curing Materials	2.2.10														
			Expansion Joint Filler Strips,	2.2.6														
			Premolded															
			Joint Sealants - Field Molded	2.2.7														
			Sealants															
			Waterstops	2.4.1														
			Conveying and Placing Concrete	3.2														
			Formwork	2.2.8														
			Mix Design Data	2.3	G DO													
			Ready-Mix Concrete	2.3														
			Curing Compound	2.4.2														
			SD-06 Test Reports															

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		03 30 53	Aggregates	2.2.2														
			Concrete Mixture Proportions	2.1.3	G	DO												
			Compressive Strength Testing	3.8.3	G	DO												
			Slump	3.8.3	G	DO												
			Air Content	3.8.3														
			Water	2.2.4														
			SD-07 Certificates															
			Cementitious Materials	2.2.1														
			Pozzolan	2.2.1.2														
			CPG for recycled materials or	1.4.1														
			appropriate Waiver Form															
			Aggregates	2.2.2														
			Delivery Tickets	2.3														
			SD-08 Manufacturer's Instructions															
			Curing Compound	2.4.2														
		03 42 13.00 10	SD-01 Preconstruction Submittals															
			Quality Control Procedures	1.3.2.2														
			SD-02 Shop Drawings															
			Standard Precast Units	2.1.1	G													
			Custom-Made Precast Units	2.1.2	G													
			Special Finishes	3.2.4.3														
			SD-03 Product Data															
			Standard Precast Units	2.1.1														
			Proprietary Precast Units	2.1.3														
			Embedded Items	3.1.3														
			Accessories	2.2.4														

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(a)	(b)	(c)	(d)	(e)	(f)		(g)	(h)	(i)	(j)	(k)	(l)	(m)	(n)	(o)	(p)	(q)	(r)
		03 42 13.00 10	SD-05 Design Data															
			Design Calculations	2.1.2	G													
			Concrete Mix Proportions	2.1.5.1														
			SD-06 Test Reports															
			Test Reports	1.3.2.4														
			SD-07 Certificates															
			Quality Control Procedures	1.3.2.2														
		05 50 13	SD-02 Shop Drawings															
			Angles and Plates	2.3	G	DO												
			SD-03 Product Data															
			Certified Mill	2.1	G													
		31 00 00	SD-01 Preconstruction Submittals															
			Dewatering Work Plan	1.4.6	G	DO												
			Dewatering Work Plan	1.6.1	G	DO												
			Newland Ponds Berms Work	2.3.2.1	G	DO												
			Plan															
			Newland Ponds Berms Work	3.11	G	DO												
			Plan															
			Embankment And Backfill	1.4.1	G	DO												
			Materials															
			Haul Road Site Plan	1.4.2	G													
			Opening Of Any Excavation Or	3.4	G													
			Borrow Pit															
			Rock Fill Construction Plan	3.11.1	G	DO												
			SD-03 Product Data															
			Utilization of Excavated Materials	3.7	G	DO												

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		31 00 00	Quarry Spalls	2.2.3														
			Running Course	2.3.3	G	DO												
			Shoulder Ballast	2.2.2														
			SD-06 Test Reports															
			Testing	3.13	G	DO												
			SD-07 Certificates															
			Testing	3.13	G	DO												
		31 05 19	SD-03 Product Data															
			Thread	2.1.2														
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			Quality Assurance Samples and	3.1														
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			SD-07 Certificates															
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		31 11 00	SD-01 Preconstruction Submittals															
			Vegetation Management Plan	3.2.1	D	DO												
			SD-03 Product Data															
			Tree Wound Paint	2.1.1														
		32 93 00	SD-01 Preconstruction Submittals															
			State Landscape Contractor's	1.5.2	G													
			License															
			Time Restrictions and Planting	1.7	G													
			Conditions															
			SD-03 Product Data															

SUBMITTAL REGISTER

CONTRACT NO.
W912DW23B0005

TITLE AND LOCATION
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CONTRACTOR

ACTIVITY NO	TRANSMITTAL NO	SPEC SECT	DESCRIPTION ITEM SUBMITTED	PARAGRAPH #	CLASSIFICATION	GOVT OR A/E REVWR	CONTRACTOR: SCHEDULE DATES			CONTRACTOR ACTION			APPROVING AUTHORITY					
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		32 93 00	Mulch	2.3														
			Nursery Certifications	1.5.1	G													
			SD-07 Certificates															
			Inspection Certificates	1.3	G													
			SD-11 Closeout Submittals															
			As-Built Report	3.5.6														
			Year 1 Monitoring Report	3.5.6														
		33 40 00	SD-04 Samples															
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			Drains															
			SD-07 Certificates															
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			Placing Pipe	3.3														
		33 40 00.10	SD-01 Preconstruction Submittals															
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			Automated Headgate and															
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			Construction Plan															
			Dewatering Plan	1.4.5	G	DO												

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		33 40 00.10	Design Engineer's Professional	1.4.1	G	DO												
			Credentials															
			SD-02 Shop Drawings															
			Blue Slough Culvert, Headwall,	1.4.3	G	DO												
			Wingwalls, Slab, and Foundations															
			Blue Slough Culvert, Headwall,	2.2	G	DO												
			Wingwalls, Slab, and Foundations															
			Trashrack	1.4.3	G	DO												
			Trashrack	2.3	G	DO												
			Automated Headgate	1.4.2	G	DO												
			SD-03 Product Data															
			Double Wall HDPE Corrugated	2.1	G	DO												
			Plastic Pipe															
			Automated Headgate	1.4.2	G	DO												
			SD-05 Design Data															
			Blue Slough Culvert, Headwall,	1.4	G	DO												
			Wingwalls, Slab, Foundations,															
			Automated Headgate and															
			Trashrack Design Calculations															
			Blue slough culvert, headwall,	1.4.3	G	DO												
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			design calculations															
			Concrete Mix Design	1.4	G	DO												
			System Performance Curves	1.4.2	G	DO												
			SD-06 Test Reports															
			Low Pressure Air Testing	1.4.5	G													

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		33 40 00.10	Television Inspection	1.4.5	G	DO												
			Concrete Aggregates	1.4	G	DO												
			Concrete Mix Proportions	1.4	G	DO												
			Concrete Compressive Strength	1.4	G	DO												
			Testings															
			Blue Slough Automatic Head	3.2.1	G	DO												
			Gate Startup Testing															
			SD-10 Operation and Maintenance															
			Data															
			Operations and Maintenance	3.3	G	DO												
			Manual															
		35 31 19	SD-01 Preconstruction Submittals															
			Placement Plan	3.3	G	DO												
			SD-03 Product Data															
			Riprap	2.2.3	G	DO												
			Quarry Spalls;	2.2.2														
			River Cobble	1.3.5	G	DO												
			Anchor Boulders	1.3.6	G	DO												
			SD-04 Samples															
			Stone	1.5.1	G													
			SD-06 Test Reports															
			Bulk Specific Gravity;	3.4.1.1														
			Gradation Test at Quarry	2.2.1.3	G	DO												
			Drop test record	1.5.1.5	G	DO												
			Quarry Inspection Report	2.2.1.1	G	DO												
			SD-07 Certificates															

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		35 31 19	Stone	1.5.1	G													
			Laboratory	2.1	G													
			Laboratory	2.2.1.1	G													
			Certification	3.4.1.1														
			Certified Weight Scale Ticket	3.4.1.1														
		35 44 00	SD-01 Preconstruction Submittals															
			Anchor Boulders	1.2.8	G													
			SD-02 Shop Drawings															
			Dewatering	3.1.2	G	DO												
			LWD Placements	1.2.6	G	DO												
			LWD Placements	3.4	G	DO												
			LWD Cabling	1.2.7	G	DO												

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GOVERNMENTAL SAFETY REQUIREMENTS
11/15

PART 1 GENERAL

1.1 REFERENCES

The publications listed below form a part of this specification to the extent referenced. The publications are referred to within the text by the basic designation only.

AMERICAN SOCIETY OF MECHANICAL ENGINEERS (ASME)

ASME B30.3	(2016) Tower Cranes
ASME B30.5	(2018) Mobile and Locomotive Cranes
ASME B30.7	(2011) Winches
ASME B30.8	(2015) Floating Cranes and Floating Derricks
ASME B30.9	(2018) Slings
ASME B30.20	(2018) Below-the-Hook Lifting Devices
ASME B30.22	(2016) Articulating Boom Cranes
ASME B30.23	(2011) Personnel Lifting Systems Safety Standard for Cableways, Cranes, Derricks, Hoists, Hooks, Jacks, and Slings
ASME B30.26	(2015; INT Jun 2010 - Jun 2014) Rigging Hardware

AMERICAN SOCIETY OF SAFETY PROFESSIONALS (ASSP)

ASSP A10.22	(2007; R 2017) Safety Requirements for Rope-Guided and Non-Guided Workers' Hoists
ASSP A10.34	(2001; R 2012) Protection of the Public on or Adjacent to Construction Sites
ASSP A10.44	(2014) Control of Energy Sources (Lockout/Tagout) for Construction and Demolition Operations
ASSP Z244.1	(2016) The Control of Hazardous Energy Lockout, Tagout and Alternative Methods
ASSP Z359.0	(2012) Definitions and Nomenclature Used for Fall Protection and Fall Arrest
ASSP Z359.1	(2016) The Fall Protection Code

ASSP Z359.2	(2017) Minimum Requirements for a Comprehensive Managed Fall Protection Program
ASSP Z359.3	(2017) Safety Requirements for Lanyards and Positioning Lanyards
ASSP Z359.4	(2013) Safety Requirements for Assisted-Rescue and Self-Rescue Systems, Subsystems and Components
ASSP Z359.6	(2016) Specifications and Design Requirements for Active Fall Protection Systems
ASSP Z359.7	(2011) Qualification and Verification Testing of Fall Protection Products
ASSP Z359.11	(2014) Safety Requirements for Full Body Harnesses
ASSP Z359.12	(2009) Connecting Components for Personal Fall Arrest Systems
ASSP Z359.13	(2013) Personal Energy Absorbers and Energy Absorbing Lanyards
ASSP Z359.14	(2014) Safety Requirements for Self-Retracting Devices for Personal Fall Arrest and Rescue Systems
ASSP Z359.15	(2014) Safety Requirements for Single Anchor Lifelines and Fall Arresters for Personal Fall Arrest Systems

ASTM INTERNATIONAL (ASTM)

ASTM F855	(2015) Standard Specifications for Temporary Protective Grounds to Be Used on De-energized Electric Power Lines and Equipment

INSTITUTE OF ELECTRICAL AND ELECTRONICS ENGINEERS (IEEE)

IEEE 1048	(2003) Guide for Protective Grounding of Power Lines
IEEE C2	(2017; Errata 1-2 2017; INT 1 2017) National Electrical Safety Code

NATIONAL FIRE PROTECTION ASSOCIATION (NFPA)

NFPA 10	(2018; TIA 18-1) Standard for Portable Fire Extinguishers
NFPA 51B	(2014) Standard for Fire Prevention During Welding, Cutting, and Other Hot Work
NFPA 70	(2017; ERTA 1-2 2017; TIA 17-1; TIA 17-2;

	TIA 17-3; TIA 17-4; TIA 17-5; TIA 17-6; TIA 17-7; TIA 17-8; TIA 17-9; TIA 17-10; TIA 17-11; TIA 17-12; TIA 17-13; TIA 17-14; TIA 17-15; TIA 17-16; TIA 17-17) National Electrical Code
NFPA 70E	(2018; TIA 18-1; TIA 81-2) Standard for Electrical Safety in the Workplace
NFPA 241	(2019) Standard for Safeguarding Construction, Alteration, and Demolition Operations

TELECOMMUNICATIONS INDUSTRY ASSOCIATION (TIA)

TIA-222	(2005G; Add 1 2007; Add 2 2009; Add 3 2014; Add 4 2014; R 2014; R 2016) Structural Standards for Steel Antenna Towers and Antenna Supporting Structures
TIA-1019	(2012; R 2016) Standard for Installation, Alteration and Maintenance of Antenna Supporting Structures and Antennas

U.S. ARMY CORPS OF ENGINEERS (USACE)

EM 385-1-1	(2014) Safety and Health Requirements Manual

U.S. NATIONAL ARCHIVES AND RECORDS ADMINISTRATION (NARA)

29 CFR 1910	Occupational Safety and Health Standards
29 CFR 1910.146	Permit-required Confined Spaces
29 CFR 1910.147	The Control of Hazardous Energy (Lock Out/Tag Out)
29 CFR 1910.333	Selection and Use of Work Practices
29 CFR 1915	Confined and Enclosed Spaces and Other Dangerous Atmospheres in Shipyard Employment
29 CFR 1915.89	Control of Hazardous Energy (Lockout/Tags-Plus)
29 CFR 1926	Safety and Health Regulations for Construction
29 CFR 1926.16	Rules of Construction
29 CFR 1926.450	Scaffolds
29 CFR 1926.500	Fall Protection
29 CFR 1926.552	Material Hoists, Personal Hoists, and Elevators

29 CFR 1926.553	Base-Mounted Drum Hoists
29 CFR 1926.1400	Cranes and Derricks in Construction
CPL 02-01-056	(2014) Inspection Procedures for Accessing Communication Towers by Hoist
CPL 2.100	(1995) Application of the Permit-Required Confined Spaces (PRCS) Standards, 29 CFR 1910.146

1.2 DEFINITIONS

1.2.1 Competent Person (CP)

The CP is a person designated in writing, who, through training, knowledge and experience, is capable of identifying, evaluating, and addressing existing and predictable hazards in the working environment or working conditions that are dangerous to personnel, and who has authorization to take prompt corrective measures with regards to such hazards.

1.2.2 Competent Person, Confined Space

The CP, Confined Space, is a person meeting the competent person requirements as defined EM 385-1-1 Appendix Q, with thorough knowledge of OSHA’s Confined Space Standard, 29 CFR 1910.146, and designated in writing to be responsible for the immediate supervision, implementation and monitoring of the confined space program, who through training, knowledge and experience in confined space entry is capable of identifying, evaluating and addressing existing and potential confined space hazards and, who has the authority to take prompt corrective measures with regard to such hazards.

1.2.3 Competent Person, Cranes and Rigging

The CP, Cranes and Rigging, as defined in EM 385-1-1 Appendix Q, is a person meeting the competent person, who has been designated in writing to be responsible for the immediate supervision, implementation and monitoring of the Crane and Rigging Program, who through training, knowledge and experience in crane and rigging is capable of identifying, evaluating and addressing existing and potential hazards and, who has the authority to take prompt corrective measures with regard to such hazards.

1.2.4 Competent Person, Excavation/Trenching

A CP, Excavation/Trenching, is a person meeting the competent person requirements as defined in EM 385-1-1 Appendix Q and 29 CFR 1926, who has been designated in writing to be responsible for the immediate supervision, implementation and monitoring of the excavation/trenching program, who through training, knowledge and experience in excavation/trenching is capable of identifying, evaluating and addressing existing and potential hazards and, who has the authority to take prompt corrective measures with regard to such hazards.

1.2.5 Competent Person, Fall Protection

The CP, Fall Protection, is a person meeting the competent person requirements as defined in EM 385-1-1 Appendix Q and in accordance with ASSP Z359.0, who has been designated in writing by the employer to be

responsible for immediate supervising, implementing and monitoring of the fall protection program, who through training, knowledge and experience in fall protection and rescue systems and equipment, is capable of identifying, evaluating and addressing existing and potential fall hazards and, who has the authority to take prompt corrective measures with regard to such hazards.

1.2.6 Competent Person, Scaffolding

The CP, Scaffolding is a person meeting the competent person requirements in EM 385-1-1 Appendix Q, and designated in writing by the employer to be responsible for immediate supervising, implementing and monitoring of the scaffolding program. The CP for Scaffolding has enough training, knowledge and experience in scaffolding to correctly identify, evaluate and address existing and potential hazards and also has the authority to take prompt corrective measures with regard to these hazards. CP qualifications must be documented and include experience on the specific scaffolding systems/types being used, assessment of the base material that the scaffold will be erected upon, load calculations for materials and personnel, and erection and dismantling. The CP for scaffolding must have a documented, minimum of 8-hours of scaffold training to include training on the specific type of scaffold being used (e.g. mast-climbing, adjustable, tubular frame), in accordance with EM 385-1-1 Section 22.B.02.

1.2.7 Competent Person (CP) Trainer

A competent person trainer as defined in EM 385-1-1 Appendix Q, who is qualified in the material presented, and who possesses a working knowledge of applicable technical regulations, standards, equipment and systems related to the subject matter on which they are training Competent Persons. A competent person trainer must be familiar with the typical hazards and the equipment used in the industry they are instructing. The training provided by the competent person trainer must be appropriate to that specific industry. The competent person trainer must evaluate the knowledge and skills of the competent persons as part of the training process.

1.2.8 High Risk Activities

High Risk Activities are activities that involve work at heights, crane and rigging, excavations and trenching, scaffolding, electrical work, and confined space entry.

1.2.9 High Visibility Accident

A High Visibility Accident is any mishap which may generate publicity or high visibility.

1.2.10 Load Handling Equipment (LHE)

LHE is a term used to describe cranes, hoists and all other hoisting equipment (hoisting equipment means equipment, including crane, derricks, hoists and power operated equipment used with rigging to raise, lower or horizontally move a load).

1.2.11 Medical Treatment

Medical Treatment is treatment administered by a physician or by registered professional personnel under the standing orders of a

physician. Medical treatment does not include first aid treatment even when provided by a physician or registered personnel.

1.2.12 Near Miss

A Near Miss is a mishap resulting in no personal injury and zero property damage, but given a shift in time or position, damage or injury may have occurred (e.g., a worker falls off a scaffold and is not injured; a crane swings around to move the load and narrowly misses a parked vehicle).

1.2.13 Operating Envelope

The Operating Envelope is the area surrounding any crane or load handling equipment. Inside this "envelope" is the crane, the operator, riggers and crane walkers, other personnel involved in the operation, rigging gear between the hook, the load, the crane's supporting structure (i.e. ground or rail), the load's rigging path, the lift and rigging procedure.

1.2.14 Qualified Person (QP)

The QP is a person designated in writing, who, by possession of a recognized degree, certificate, or professional standing, or extensive knowledge, training, and experience, has successfully demonstrated their ability to solve or resolve problems related to the subject matter, the work, or the project.

1.2.15 Qualified Person, Fall Protection (QP for FP)

A QP for FP is a person meeting the requirements of EM 385-1-1 Appendix Q, and ASSP Z359.0, with a recognized degree or professional certificate and with extensive knowledge, training and experience in the fall protection and rescue field who is capable of designing, analyzing, and evaluating and specifying fall protection and rescue systems.

1.2.16 USACE Property and Equipment

Interpret "USACE" property and equipment specified in USACE EM 385-1-1 as Government property and equipment.

1.2.17 Load Handling Equipment (LHE) Accident or Load Handling Equipment Mishap

A LHE accident occurs when any one or more of the eight elements in the operating envelope fails to perform correctly during operation, including operation during maintenance or testing resulting in personnel injury or death; material or equipment damage; dropped load; derailment; two-blocking; overload; or collision, including unplanned contact between the load, crane, or other objects. A dropped load, derailment, two-blocking, overload and collision are considered accidents, even though no material damage or injury occurs. A component failure (e.g., motor burnout, gear tooth failure, bearing failure) is not considered an accident solely due to material or equipment damage unless the component failure results in damage to other components (e.g., dropped boom, dropped load, or roll over). Document an LHE mishap using the Crane High Hazard working group mishap reporting form.

1.3 SUBMITTALS

Government approval is required for submittals with a "G" designation;

submittals not having a "G" designation are for information only. When used, a designation following the "G" designation identifies the office that will review the submittal for the Government. Submit the following in accordance with Section 01 33 00 SUBMITTAL PROCEDURES:

SD-01 Preconstruction Submittals

Accident Prevention Plan (APP); G

SD-06 Test Reports

Monthly Exposure Reports

Notifications and Reports

Accident Reports; G

LHE Inspection Reports

Dive Operations Plan; G

SD-07 Certificates

Crane Operators/Riggers

Standard Lift Plan; G

Critical Lift Plan; G

Naval Architecture Analysis; G

Activity Hazard Analysis (AHA)

Confined Space Entry Permit

Hot Work Permit

Certificate of Compliance

1.4 MONTHLY EXPOSURE REPORTS

Provide a Monthly Exposure Report and attach to the monthly billing request. This report is a compilation of employee-hours worked each month for all site workers, both Prime and subcontractor. Failure to submit the report may result in retention of up to 10 percent of the voucher.

1.5 REGULATORY REQUIREMENTS

In addition to the detailed requirements included in the provisions of this contract, comply with the most recent edition of USACE EM 385-1-1, and the following federal, state, and local laws, ordinances, criteria, rules and regulations. Submit matters of interpretation of standards to the appropriate administrative agency for resolution before starting work. Where the requirements of this specification, applicable laws, criteria, ordinances, regulations, and referenced documents vary, the most stringent requirements govern.

1.6 SITE QUALIFICATIONS, DUTIES, AND MEETINGS

1.6.1 Personnel Qualifications

1.6.1.1 Site Safety and Health Officer (SSHO)

Provide an SSHO that meets the requirements of EM 385-1-1 Section 1. The SSHO must ensure that the requirements of 29 CFR 1926.16 are met for the project. Provide a Safety oversight team that includes a minimum of one (1) person at each project site to function as the Site Safety and Health Officer (SSHO). The SSHO or an equally-qualified Alternate SSHO must be at the work site at all times to implement and administer the Contractor's safety program and government-accepted Accident Prevention Plan. The SSHO and Alternate SSHO must have the required training, experience, and qualifications in accordance with EM 385-1-1 Section 01.A.17, and all associated sub-paragraphs.

If the SSHO is off-site for a period longer than 24 hours, an equally-qualified alternate SSHO must be provided and must fulfill the same roles and responsibilities as the primary SSHO. When the SSHO is temporarily (up to 24 hours) off-site, a Designated Representative (DR), as identified in the AHA may be used in lieu of an Alternate SSHO, and must be on the project site at all times when work is being performed. Note that the DR is a collateral duty safety position, with safety duties in addition to their full time occupation.

1.6.1.1.1 Additional Site Safety and Health Officer (SSHO) Requirements and Duties

The SSHO may not serve as the Quality Control Manager. The SSHO may not serve as the Superintendent. The SSHO may not have any other duties.

1.6.1.2 Competent Person Qualifications

Provide Competent Persons in accordance with EM 385-1-1, Appendix Q and herein. Competent Persons for high risk activities include confined space, cranes and rigging, excavation/trenching, fall protection, and electrical work. The CP for these activities must be designated in writing, and meet the requirements for the specific activity (i.e. competent person, fall protection).

The Competent Person identified in the Contractor's Safety and Health Program and accepted Accident Prevention Plan, must be on-site at all times when the work that presents the hazards associated with their professional expertise is being performed. Provide the credentials of the Competent Persons(s) to the the Contracting Officer for information in consultation with the Safety Office.

1.6.1.2.1 Competent Person for Confined Space Entry

Provide a Confined Space (CP) Competent Person who meets the requirements of EM 385-1-1, Appendix Q, and herein. The CP for Confined Space Entry must supervise the entry into each confined space in accordance with EM 385-1-1, Section 34.

1.6.1.2.2 Competent Person for Scaffolding

Provide a Competent Person for Scaffolding who meets the requirements of EM 385-1-1, Section 22.B.02 and herein.

1.6.1.2.3 Competent Person for Fall Protection

Provide a Competent Person for Fall Protection who meets the requirements of EM 385-1-1, Section 21.C.04, 21.B.03, and herein.

1.6.1.3 Qualified Trainer Requirements

Individuals qualified to instruct the 40 hour contract safety awareness course, or portions thereof, must meet the definition of a Competent Person Trainer, and, at a minimum, possess a working knowledge of the following subject areas: EM 385-1-1, Electrical Standards,Lockout/Tagout, Fall Protection, Confined Space Entry for Construction; Excavation, Trenching and Soil Mechanics, and Scaffolds in accordance with 29 CFR 1926.450, Subpart L.

Instructors are required to:

a. Prepare class presentations that cover construction-related safety requirements.

b. Ensure that all attendees attend all sessions by using a class roster signed daily by each attendee. Maintain copies of the roster for at least five (5) years. This is a certification class and must be attended 100 percent. In cases of emergency where an attendee cannot make it to a session, the attendee can make it up in another class session for the same subject.

c. Update training course materials whenever an update of the EM 385-1-1 becomes available.

d. Provide a written exam of at least 50 questions. Students are required to answer 80 percent correctly to pass.

e. Request, review and incorporate student feedback into a continuous course improvement program.

1.6.1.4 Crane Operators/Riggers

Provide Operators, Signal Persons, and Riggers meeting the requirements in EM 385-1-1, Section 15.B for Riggers and Section 16.B for Crane Operators and Signal Persons. Provide proof of current qualification.

1.6.2 Personnel Duties

1.6.2.1 Duties of the Site Safety and Health Officer (SSHO)

The SSHO must:

a. Conduct daily safety and health inspections and maintain a written log which includes area/operation inspected, date of inspection, identified hazards, recommended corrective actions, estimated and actual dates of corrections. Attach safety inspection logs to the Contractors' daily production report.

b. Conduct mishap investigations and complete required accident reports. Report mishaps and near misses.

c. Use and maintain OSHA's Form 300 to log work-related injuries and

illnesses occurring on the project site for Prime Contractors and subcontractors, and make available to the Contracting Officer upon request. Post and maintain the Form 300A on the site Safety Bulletin Board.

d. Maintain applicable safety reference material on the job site.

e. Attend the pre-construction conference, pre-work meetings including preparatory meetings, and periodic in-progress meetings.

f. Review the APP and AHAs for compliance with EM 385-1-1, and approve, sign, implement and enforce them.

g. Establish a Safety and Occupational Health (SOH) Deficiency Tracking System that lists and monitors outstanding deficiencies until resolution.

h. Ensure subcontractor compliance with safety and health requirements.

i. Maintain a list of hazardous chemicals on site and their material Safety Data Sheets (SDS).

j. Maintain a weekly list of high hazard activities involving energy, equipment, excavation, entry into confined space, and elevation, and be prepared to discuss details during QC Meetings.

k. Provide and keep a record of site safety orientation and indoctrination for Contractor employees, subcontractor employees, and site visitors.

Superintendent, QC Manager, and SSHO are subject to dismissal if the above duties are not being effectively carried out. If Superintendent, QC Manager, or SSHO are dismissed, project work will be stopped and will not be allowed to resume until a suitable replacement is approved and the above duties are again being effectively carried out.

1.6.3 Meetings

1.6.3.1 Preconstruction Conference

a. Contractor representatives who have a responsibility or significant role in accident prevention on the project must attend the preconstruction conference. This includes the project superintendent, Site Safety and Occupational Health officer, quality control manager, or any other assigned safety and health professionals who participated in the development of the APP (including the Activity Hazard Analyses (AHAs) and special plans, program and procedures associated with it).

b. Discuss the details of the submitted APP to include incorporated plans, programs, procedures and a listing of anticipated AHAs that will be developed and implemented during the performance of the contract. This list of proposed AHAs will be reviewed at the conference and an agreement will be reached between the Contractor and the Contracting Officer as to which phases will require an analysis. In addition, establish a schedule for the preparation, submittal, and Government review of AHAs to preclude project delays.

c. Deficiencies in the submitted APP, identified during the Contracting Officer's review, must be corrected, and the APP re-submitted for

review prior to the start of construction. Work is not permitted to begin until an APP is established that is acceptable to the Contracting Officer.

1.6.3.2 Safety Meetings

Conduct safety meetings to review past activities, plan for new or changed operations, review pertinent aspects of appropriate AHA (by trade), establish safe working procedures for anticipated hazards, and provide pertinent Safety and Occupational Health (SOH) training and motivation. Conduct meetings at least once a month for all supervisors on the project location. The SSHO, supervisors, foremen, or CDSOs must conduct meetings at least once a week for the trade workers. Document meeting minutes to include the date, persons in attendance, subjects discussed, and names of individual(s) who conducted the meeting. Maintain documentation on-site and furnish copies to the Contracting Officer on request. Notify the Contracting Officer of all scheduled meetings 7 calendar days in advance.

1.7 ACCIDENT PREVENTION PLAN (APP)

A qualified person must prepare the written site-specific APP. Prepare the APP in accordance with the format and requirements of EM 385-1-1, Appendix A, and as supplemented herein. Cover all paragraph and subparagraph elements in EM 385-1-1, Appendix A. The APP must be job-specific and address any unusual or unique aspects of the project or activity for which it is written. The APP must interface with the Contractor's overall safety and health program referenced in the APP in the applicable APP element, and made site-specific. Describe the methods to evaluate past safety performance of potential subcontractors in the selection process. Also, describe innovative methods used to ensure and monitor safe work practices of subcontractors. The Government considers the Prime Contractor to be the "controlling authority" for all work site safety and health of the subcontractors. Contractors are responsible for informing their subcontractors of the safety provisions under the terms of the contract and the penalties for noncompliance, coordinating the work to prevent one craft from interfering with or creating hazardous working conditions for other crafts, and inspecting subcontractor operations to ensure that accident prevention responsibilities are being carried out. The APP must be signed by an officer of the firm (Prime Contractor senior person), the individual preparing the APP, the on-site superintendent, the designated SSHO, the Contractor Quality Control Manager, and any designated Certified Safety Professional (CSP) or Certified Health Physicist (CIH). The SSHO must provide and maintain the APP and a log of signatures by each subcontractor foreman, attesting that they have read and understand the APP, and make the APP and log available on-site to the Contracting Officer. If English is not the foreman's primary language, the Prime Contractor must provide an interpreter.

Submit the APP to the Contracting Officer 15 calendar days prior to the date of the preconstruction conference for acceptance. Work cannot proceed without an accepted APP. Once reviewed and accepted by the Contracting Officer, the APP and attachments will be enforced as part of the contract. Disregarding the provisions of this contract or the accepted APP is cause for stopping of work, at the discretion of the Contracting Officer, until the matter has been rectified. Continuously review and amend the APP, as necessary, throughout the life of the contract. Changes to the accepted APP must be made with the knowledge and concurrence of the Contracting Officer, project superintendent, SSHO and Quality Control Manager. Incorporate unusual or high-hazard activities

not identified in the original APP as they are discovered. Should any severe hazard exposure (i.e. imminent danger) become evident, stop work in the area, secure the area, and develop a plan to remove the exposure and control the hazard. Notify the Contracting Officer within 24 hours of discovery. Eliminate and remove the hazard. In the interim, take all necessary action to restore and maintain safe working conditions in order to safeguard onsite personnel, visitors, the public (as defined by ASSP A10.34), and the environment.

1.7.1 Names and Qualifications

Provide plans in accordance with the requirements outlined in Appendix A of EM 385-1-1, including the following:

a. Names and qualifications (resumes including education, training, experience and certifications) of site safety and health personnel designated to perform work on this project to include the designated Site Safety and Health Officer and other competent and qualified personnel to be used. Specify the duties of each position.

b. Qualifications of competent and of qualified persons. As a minimum, designate and submit qualifications of competent persons for each of the following major areas: excavation; scaffolding; fall protection; hazardous energy; confined space; health hazard recognition, evaluation and control of chemical, physical and biological agents; and personal protective equipment and clothing to include selection, use and maintenance.

1.7.2 Plans

Provide plans in the APP in accordance with the requirements outlined in Appendix A of EM 385-1-1, including the following:

1.7.2.1 Confined Space Entry Plan

Develop a confined or enclosed space entry plan in accordance with EM 385-1-1, applicable OSHA standards 29 CFR 1910, 29 CFR 1915, and 29 CFR 1926, OSHA Directive CPL 2.100, and any other federal, state and local regulatory requirements identified in this contract. Identify the qualified person's name and qualifications, training, and experience. Delineate the qualified person's authority to direct work stoppage in the event of hazardous conditions. Include procedure for rescue by contractor personnel and the coordination with emergency responders. (If there is no confined space work, include a statement that no confined space work exists and none will be created.)

1.7.2.2 Standard Lift Plan (SLP)

Plan lifts to avoid situations where the operator cannot maintain safe control of the lift. Prepare a written SLP in accordance with EM 385-1-1, Section 16.A.03, using Form 16-2 for every lift or series of lifts (if duty cycle or routine lifts are being performed). The SLP must be developed, reviewed and accepted by all personnel involved in the lift in conjunction with the associated AHA. Signature on the AHA constitutes acceptance of the plan. Maintain the SLP on the LHE for the current lift(s) being made. Maintain historical SLPs for a minimum of 3 months.

1.7.2.3 Critical Lift Plan - Crane or Load Handling Equipment

Provide a Critical Lift Plan as required by EM 385-1-1, Section 16.H.01, using Form 16-3. In addition, Critical Lift Plans are required for the following:

a. Lifts over 50 percent of the capacity of barge mounted mobile crane's hoist.

b. When working around energized power lines where the work will get closer than the minimum clearance distance in EM 385-1-1 Table 16-1.

c. For lifts with anticipated binding conditions.

d. When erecting cranes.

1.7.2.3.1 Critical Lift Plan Planning and Schedule

Critical lifts require detailed planning and additional or unusual safety precautions. Develop and submit a critical lift plan to the Contracting Officer 30 calendar days prior to critical lift. Comply with load testing requirements in accordance with EM 385-1-1, Section 16.F.03.

1.7.2.3.2 Lifts of Personnel

In addition to the requirements of EM 385-1-1, Section 16.H.02, for lifts of personnel, demonstrate compliance with the requirements of 29 CFR 1926.1400 and EM 385-1-1, Section 16.T.

1.7.2.4 Barge Mounted Mobile Crane Lift Plan

Provide a Naval Architecture Analysis and include an LHE Manufacturer's Floating Service Load Chart in accordance with EM 385-1-1, Section 16.L.03.

1.7.2.5 Multi-Purpose Machines, Material Handling Equipment, and Construction Equipment Lift Plan

Multi-purpose machines, material handling equipment, and construction equipment used to lift loads that are suspended by rigging gear, require proof of authorization from the machine OEM that the machine is capable of making lifts of loads suspended by rigging equipment. Written approval from a qualified registered professional engineer, after a safety analysis is performed, is allowed in lieu of the OEM's approval. Demonstrate that the operator is properly trained and that the equipment is properly configured to make such lifts and is equipped with a load chart.

1.7.2.6 Fall Protection and Prevention (FP&P) Plan

The plan must comply with the requirements of EM 385-1-1, Section 21.D and ASSP Z359.2, be site specific, and address all fall hazards in the work place and during different phases of construction. Address how to protect and prevent workers from falling to lower levels when they are exposed to fall hazards above 6 feet. A competent person or qualified person for fall protection must prepare and sign the plan documentation. Include fall protection and prevention systems, equipment and methods employed for every phase of work, roles and responsibilities, assisted rescue, self-rescue and evacuation procedures, training requirements, and monitoring methods. Review and revise, as necessary, the Fall Protection and Prevention Plan documentation as conditions change, but at a minimum

every six months, for lengthy projects, reflecting any changes during the course of construction due to changes in personnel, equipment, systems or work habits. Keep and maintain the accepted Fall Protection and Prevention Plan documentation at the job site for the duration of the project. Include the Fall Protection and Prevention Plan documentation in the Accident Prevention Plan (APP).

1.7.2.7 Rescue and Evacuation Plan

Provide a Rescue and Evacuation Plan in accordance with EM 385-1-1 Section 21.N and ASSP Z359.2, and include in the FP&P Plan and as part of the APP. Include a detailed discussion of the following: methods of rescue; methods of self-rescue; equipment used; training requirement; specialized training for the rescuers; procedures for requesting rescue and medical assistance; and transportation routes to a medical facility.

1.7.2.8 Hazardous Energy Control Program (HECP)

Develop a HECP in accordance with EM 385-1-1 Section 12, 29 CFR 1910.147, 29 CFR 1910.333, 29 CFR 1915.89, ASSP Z244.1, and ASSP A10.44. Submit this HECP as part of the Accident Prevention Plan (APP). Conduct a preparatory meeting and inspection with all effected personnel to coordinate all HECP activities. Document this meeting and inspection in accordance with EM 385-1-1, Section 12.A.02. Ensure that each employee is familiar with and complies with these procedures.

1.7.2.9 Excavation Plan

Identify the safety and health aspects of excavation, and provide and prepare the plan in accordance with EM 385-1-1, Section 25.A and Section 31 00 00 EARTHWORK.

1.8 ACTIVITY HAZARD ANALYSIS (AHA)

Before beginning each activity, task or Definable Feature of Work (DFOW) involving a type of work presenting hazards not experienced in previous project operations, or where a new work crew or subcontractor is to perform the work, the Contractor(s) performing that work activity must prepare an AHA. AHAs must be developed by the Prime Contractor, subcontractor, or supplier performing the work, and provided for Prime Contractor review and approval before submitting to the Contracting Officer. AHAs must be signed by the SSHO, Superintendent, QC Manager and the subcontractor Foreman performing the work. Format the AHA in accordance with EM 385-1-1, Section 1 or as directed by the Contracting Officer. Submit the AHA for review at least 15 working days prior to the start of each activity task, or DFOW. The Government reserves the right to require the Contractor to revise and resubmit the AHA if it fails to effectively identify the work sequences, specific anticipated hazards, site conditions, equipment, materials, personnel and the control measures to be implemented.

AHAs must identify competent persons required for phases involving high risk activities, including confined entry, crane and rigging, excavations, trenching, electrical work, fall protection, and scaffolding.

1.8.1 AHA Management

Review the AHA list periodically (at least monthly) at the Contractor supervisory safety meeting, and update as necessary when procedures,

scheduling, or hazards change. Use the AHA during daily inspections by the SSHO to ensure the implementation and effectiveness of the required safety and health controls for that work activity.

1.8.2 AHA Signature Log

Each employee performing work as part of an activity, task or DFOW must review the AHA for that work and sign a signature log specifically maintained for that AHA prior to starting work on that activity. The SSHO must maintain a signature log on site for every AHA. Provide employees whose primary language is other than English, with an interpreter to ensure a clear understanding of the AHA and its contents.

1.9 DISPLAY OF SAFETY INFORMATION

1.9.1 Safety Bulletin Board

Within one calendar day(s) after commencement of work, erect a safety bulletin board at the job site. Where size, duration, or logistics of project do not facilitate a bulletin board, an alternative method, acceptable to the Contracting Officer, that is accessible and includes all mandatory information for employee and visitor review, may be deemed as meeting the requirement for a bulletin board. Include and maintain information on safety bulletin board as required by EM 385-1-1, Section 01.A.07. Additional items required to be posted include:

a. Confined space entry permit.

b. Hot work permit.

1.9.2 Safety and Occupational Health (SOH) Deficiency Tracking System

Establish a SOH deficiency tracking system that lists and monitors the status of SOH deficiencies in chronological order. Use the tracking system to evaluate the effectiveness of the APP. A monthly evaluation of the data must be discussed in the QC or SOH meeting with everyone on the project. The list must be posted on the project bulletin board and updated daily, and provide the following information:

a. Date deficiency identified;

b. Description of deficiency;

c. Name of person responsible for correcting deficiency;

d. Projected resolution date;

e. Date actually resolved.

1.10 SITE SAFETY REFERENCE MATERIALS

Maintain safety-related references applicable to the project, including those listed in paragraph REFERENCES. Maintain applicable equipment manufacturer's manuals.

1.11 EMERGENCY MEDICAL TREATMENT

Contractors must arrange for their own emergency medical treatment in accordance with EM 385-1-1. Government has no responsibility to provide

emergency medical treatment.

1.12 NOTIFICATIONS and REPORTS

1.12.1 Mishap Notification

Notify the Contracting Officer as soon as practical, but no more than twenty-four hours, after any mishaps, including recordable accidents, incidents, and near misses, as defined in EM 385-1-1 Appendix Q, any report of injury, illness, or any property damage. For LHE or rigging mishaps, notify the Contracting Officer as soon as practical but not more than 4 hours after mishap. The Contractor is responsible for obtaining appropriate medical and emergency assistance and for notifying fire, law enforcement, and regulatory agencies. Immediate reporting is required for electrical mishaps, to include Arc Flash; shock; uncontrolled release of hazardous energy (includes electrical and non-electrical); load handling equipment or rigging; fall from height (any level other than same surface); and underwater diving. These mishaps must be investigated in depth to identify all causes and to recommend hazard control measures.

Within notification include Contractor name; contract title; type of contract; name of activity, installation or location where accident occurred; date and time of accident; names of personnel injured; extent of property damage, if any; extent of injury, if known, and brief description of accident (for example, type of construction equipment used and PPE used). Preserve the conditions and evidence on the accident site until the Government investigation team arrives on-site and Government investigation is conducted. Assist and cooperate fully with the Government's investigation(s) of any mishap.

1.12.2 Accident Reports

a. Conduct an accident investigation for recordable injuries and illnesses, property damage, and near misses as defined in EM 385-1-1, to establish the root cause(s) of the accident. Complete the applicable USACE Accident Report Form 3394, and provide the report to the Contracting Officer within 5 calendar day(s) of the accident. The Contracting Officer will provide copies of any required or special forms.

b. Near Misses: Near miss reports are considered positive and proactive Contractor safety management actions.

c. Conduct an accident investigation for any load handling equipment accident (including rigging accidents) to establish the root cause(s) of the accident. Complete the LHE Accident Report (Crane and Rigging Accident Report) form and provide the report to the Contracting Officer within 30 calendar days of the accident. Do not proceed with crane operations until cause is determined and corrective actions have been implemented to the satisfaction of the Contracting Officer. The Contracting Officer will provide a blank copy of the accident report form.

1.12.3 LHE Inspection Reports

Submit LHE inspection reports required in accordance with EM 385-1-1 and as specified herein with Daily Reports of Inspections.

1.12.4 Certificate of Compliance and Pre-lift Plan/Checklist for LHE and Rigging

Provide a FORM 16-1 Certificate of Compliance for LHE entering an activity under this contract and in accordance with EM 385-1-1. Post certifications on the crane.

Develop a Standard Lift Plan (SLP) in accordance with EM 385-1-1, Section 16.H.03 using Form 16-2 Standard Pre-Lift Crane Plan/Checklist for each lift planned. Submit SLP to the Contracting Officer for approval within 15 calendar days in advance of planned lift.

1.13 HOT WORK

1.13.1 Permit and Personnel Requirements

Submit and obtain a written permit prior to performing "Hot Work" (i.e. welding or cutting) or operating other flame-producing/spark producing devices, from the COR. A permit is required from the Explosives Safety Office for work in and around where explosives are processed, stored, or handled. CONTRACTORS ARE REQUIRED TO MEET ALL CRITERIA BEFORE A PERMIT IS ISSUED. Provide at least two 20 pound 4A:20 BC rated extinguishers for normal "Hot Work". The extinguishers must be current inspection tagged, and contain an approved safety pin and tamper resistant seal. It is also mandatory to have a designated FIRE WATCH for any "Hot Work" done at this activity. The Fire Watch must be trained in accordance with NFPA 51B and remain on-site for a minimum of one hour after completion of the task or as specified on the hot work permit.

When starting work in the facility, require personnel to familiarize themselves with the location of the nearest fire alarm boxes and place in memory the emergency Fire Department phone number. REPORT ANY FIRE, NO MATTER HOW SMALL, TO THE RESPONSIBLE FIRE DEPARTMENT IMMEDIATELY.

1.13.2 Work Around Flammable Materials

Obtain permit approval from a NFPA Certified Marine Chemist for "HOT WORK" within or around flammable materials (such as fuel systems or welding/cutting on fuel pipes) or confined spaces (such as sewer wet wells, manholes, or vaults) that have the potential for flammable or explosive atmospheres.

Whenever these materials, except beryllium and chromium (VI), are encountered in indoor operations, local mechanical exhaust ventilation systems that are sufficient to reduce and maintain personal exposures to within acceptable limits must be used and maintained in accordance with manufacturer's instruction and supplemented by exceptions noted in EM 385-1-1, Section 06.H

1.14 CONFINED SPACE ENTRY REQUIREMENTS

Confined space entry must comply with Section 34 of EM 385-1-1, OSHA 29 CFR 1926, OSHA 29 CFR 1910, OSHA 29 CFR 1910.146, and OSHA Directive CPL 2.100. Any potential for a hazard in the confined space requires a permit system to be used.

1.14.1 Entry Procedures

Prohibit entry into a confined space by personnel for any purpose,

including hot work, until the qualified person has conducted appropriate tests to ensure the confined or enclosed space is safe for the work intended and that all potential hazards are controlled or eliminated and documented. Comply with EM 385-1-1, Section 34 for entry procedures. Hazards pertaining to the space must be reviewed with each employee during review of the AHA.

1.14.2 Forced Air Ventilation

Forced air ventilation is required for all confined space entry operations and the minimum air exchange requirements must be maintained to ensure exposure to any hazardous atmosphere is kept below its action level.

1.14.3 Sewer Wet Wells

Sewer wet wells require continuous atmosphere monitoring with audible alarm for toxic gas detection.

1.14.4 Rescue Procedures and Coordination with Local Emergency Responders

Develop and implement an on-site rescue and recovery plan and procedures. The rescue plan must not rely on local emergency responders for rescue from a confined space.

1.15 DIVE SAFETY REQUIREMENTS

Develop a Dive Operations Plan, AHA, emergency management plan, and personnel list that includes qualifications, for each separate diving operation. Submit these documents to the District Dive Coordinator (DDC) via the Contracting Officer, for review and approval at least 15 working days prior to commencement of diving operations. These documents must be at the diving location at all times. Provide each of these documents as a part of the project file.

1.16 SEVERE STORM PLAN

In the event of a severe storm warning, the Contractor must:

a. Secure outside equipment and materials and place materials that could be damaged in protected areas.

b. Check surrounding area, including roof, for loose material, equipment, debris, and other objects that could be blown away or against existing facilities.

c. Ensure that temporary erosion controls are adequate.

PART 2 PRODUCTS

Not used.

PART 3 EXECUTION

3.1 CONSTRUCTION AND OTHER WORK

Comply with EM 385-1-1, NFPA 70, NFPA 70E, NFPA 241, the APP, the AHA, Federal and State OSHA regulations, and other related submittals and activity fire and safety regulations. The most stringent standard prevails.

PPE is governed in all areas by the nature of the work the employee is performing. Use personal hearing protection at all times in designated noise hazardous areas or when performing noise hazardous tasks. Safety glasses must be worn or carried/available on each person. Mandatory PPE includes:

a. Hard Hat

b. Long Pants

c. Appropriate Safety Shoes

d. Appropriate Class Reflective Vests

3.1.1 Worksite Communication

Employees working alone in a remote location or away from other workers must be provided an effective means of emergency communications (i.e., cellular phone, two-way radios, land-line telephones or other acceptable means). The selected communication must be readily available (easily within the immediate reach) of the employee and must be tested prior to the start of work to verify that it effectively operates in the area/environment. An employee check-in/check-out communication procedure must be developed to ensure employee safety.

3.1.2 Hazardous Material Exclusions

Notwithstanding any other hazardous material used in this contract, radioactive materials or instruments capable of producing ionizing/non-ionizing radiation (with the exception of radioactive material and devices used in accordance with EM 385-1-1 such as nuclear density meters for compaction testing and laboratory equipment with radioactive sources) as well as materials which contain asbestos, mercury or polychlorinated biphenyls, di-isocyanates, lead-based paint, and hexavalent chromium, are prohibited. The Contracting Officer, upon written request by the Contractor, may consider exceptions to the use of any of the above excluded materials. Low mercury lamps used within fluorescent lighting fixtures are allowed as an exception without further Contracting Officer approval. Notify the Radiation Safety Officer (RSO) prior to excepted items of radioactive material and devices being brought on base.

3.1.3 Unforeseen Hazardous Material

Contract documents identify materials such as PCB, lead paint, and friable and non-friable asbestos and other OSHA regulated chemicals (i.e. 29 CFR Part 1910.1000). If material(s) that may be hazardous to human health upon disturbance are encountered during construction operations, stop that portion of work and notify the Contracting Officer immediately. Within 14 calendar days the Government will determine if the material is hazardous. If material is not hazardous or poses no danger, the Government will direct the Contractor to proceed without change. If material is hazardous and handling of the material is necessary to accomplish the work, the Government will issue a modification pursuant to FAR 52.243-4 Changes and FAR 52.236-2 Differing Site Conditions.

3.2 UTILITY OUTAGE REQUIREMENTS

Apply for utility outages at least 15 days in advance. At a minimum, the written request must include the location of the outage, utilities being affected, duration of outage, any necessary sketches, and a description of the means to fulfill energy isolation requirements in accordance with EM 385-1-1, Section 11.A.02 (Isolation). Some examples of energy isolation devices and procedures are highlighted in EM 385-1-1, Section 12.D. In accordance with EM 385-1-1, Section 12.A.01, where outages involve Government or Utility personnel, coordinate with the Government on all activities involving the control of hazardous energy.

These activities include, but are not limited to, a review of HECP and HEC procedures, as well as applicable Activity Hazard Analyses (AHAs). In accordance with EM 385-1-1, Section 11.A.02 and NFPA 70E, work on energized electrical circuits must not be performed without prior government authorization. Government permission is considered through the permit process and submission of a detailed AHA. Energized work permits are considered only when de-energizing introduces additional or increased hazard or when de-energizing is infeasible.

3.3 OUTAGE COORDINATION MEETING

After the utility outage request is approved and prior to beginning work on the utility system requiring shut-down, conduct a pre-outage coordination meeting in accordance with EM 385-1-1, Section 12.A. This meeting must include the Prime Contractor, the Prime and subcontractors performing the work, the Contracting Officer, and the Public Utilities representative. All parties must fully coordinate HEC activities with one another. During the coordination meeting, all parties must discuss and coordinate on the scope of work, HEC procedures (specifically, the lock-out/tag-out procedures for worker and utility protection), the AHA, assurance of trade personnel qualifications, identification of competent persons, and compliance with HECP training in accordance with EM 385-1-1, Section 12.C. Clarify when personal protective equipment is required during switching operations, inspection, and verification.

3.4 CONTROL OF HAZARDOUS ENERGY (LOCKOUT/TAGOUT)

Provide and operate a Hazardous Energy Control Program (HECP) in accordance with EM 385-1-1 Section 12, 29 CFR 1910.333, 29 CFR 1915.89, ASSP A10.44, NFPA 70E, and paragraph HAZARDOUS ENERGY CONTROL PROGRAM (HECP).

3.4.1 Safety Preparatory Inspection Coordination Meeting with the Government or Utility

For electrical distribution equipment that is to be operated by Government or Utility personnel, the Prime Contractor and the subcontractor performing the work must attend the safety preparatory inspection coordination meeting, which will also be attended by the Contracting Officer's Representative, and required by EM 385-1-1, Section 12.A.02. The meeting will occur immediately preceding the start of work and following the completion of the outage coordination meeting. Both the safety preparatory inspection coordination meeting and the outage coordination meeting must occur prior to conducting the outage and commencing with lockout/tagout procedures.

3.4.2 Lockout/Tagout Isolation

Where the Government or Utility performs equipment isolation and lockout/tagout, the Contractor must place their own locks and tags on each energy-isolating device and proceed in accordance with the HECP. Before any work begins, both the Contractor and the Government or Utility must perform energy isolation verification testing while wearing required PPE detailed in the Contractor's AHA and required by EM 385-1-1, Sections 05.I and 11.B. Install personal protective grounds, with tags, to eliminate the potential for induced voltage in accordance with EM 385-1-1, Section 12.E.06.

3.4.3 Lockout/Tagout Removal

Upon completion of work, conduct lockout/tagout removal procedure in accordance with the HECP. In accordance with EM 385-1-1, Section 12.E.08, each lock and tag must be removed from each energy isolating device by the authorized individual or systems operator who applied the device. Provide formal notification to the Government (by completing the Government form if provided by Contracting Officer's Representative), confirming that steps of de-energization and lockout/tagout removal procedure have been conducted and certified through inspection and verification. Government or Utility locks and tags used to support the Contractor's work will not be removed until the authorized Government employee receives the formal notification.

3.5 FALL PROTECTION PROGRAM

Establish a fall protection program, for the protection of all employees exposed to fall hazards. Within the program include company policy, identify roles and responsibilities, education and training requirements, fall hazard identification, prevention and control measures, inspection, storage, care and maintenance of fall protection equipment and rescue and evacuation procedures in accordance with ASSP Z359.2 and EM 385-1-1, Sections 21.A and 21.D.

3.5.1 Training

Institute a fall protection training program. As part of the Fall Protection Program, provide training for each employee who might be exposed to fall hazards. Provide training by a competent person for fall protection in accordance with EM 385-1-1, Section 21.C. Document training and practical application of the competent person in accordance with EM 385-1-1, Section 21.C.04 and ASSP Z359.2 in the AHA.

3.5.2 Fall Protection Equipment and Systems

Enforce use of personal fall protection equipment and systems designated (to include fall arrest, restraint, and positioning) for each specific work activity in the Site Specific Fall Protection and Prevention Plan and AHA at all times when an employee is exposed to a fall hazard. Protect employees from fall hazards as specified in EM 385-1-1, Section 21.

Provide personal fall protection equipment, systems, subsystems, and components that comply with EM 385-1-1 Section 21.I, 29 CFR 1926.500 Subpart M,ASSP Z359.0, ASSP Z359.1, ASSP Z359.2, ASSP Z359.3, ASSP Z359.4, ASSP Z359.6, ASSP Z359.7, ASSP Z359.11, ASSP Z359.12, ASSP Z359.13, ASSP Z359.14, and ASSP Z359.15.

3.5.2.1 Additional Personal Fall Protection

In addition to the required fall protection systems, other protection such as safety skiffs, personal floatation devices, and life rings, are required when working above or next to water in accordance with EM 385-1-1, Sections 21.O through 21.O.06. Personal fall protection systems and equipment are required when working from an articulating or extendible boom, swing stages, or suspended platform. In addition, personal fall protection systems are required when operating other equipment such as scissor lifts. The need for tying-off in such equipment is to prevent ejection of the employee from the equipment during raising, lowering, travel, or while performing work.

3.5.2.2 Personal Fall Protection Harnesses

Only a full-body harness with a shock-absorbing lanyard or self-retracting lanyard is an acceptable personal fall arrest body support device. The use of body belts is not acceptable. Harnesses must have a fall arrest attachment affixed to the body support (usually a Dorsal D-ring) and specifically designated for attachment to the rest of the system. Snap hooks and carabineers must be self-closing and self-locking, capable of being opened only by at least two consecutive deliberate actions and have a minimum gate strength of 3,600 lbs in all directions. Use webbing, straps, and ropes made of synthetic fiber. The maximum free fall distance when using fall arrest equipment must not exceed 6 feet, unless the proper energy absorbing lanyard is used. Always take into consideration the total fall distance and any swinging of the worker (pendulum-like motion), that can occur during a fall, when attaching a person to a fall arrest system. All full body harnesses must be equipped with Suspension Trauma Preventers such as stirrups, relief steps, or similar in order to provide short-term relief from the effects of orthostatic intolerance in accordance with EM 385-1-1, Section 21.I.06.

3.5.3 Horizontal Lifelines (HLL)

Provide HLL in accordance with EM 385-1-1, Section 21.I.08.d.2. Commercially manufactured horizontal lifelines (HLL) must be designed, installed, certified and used, under the supervision of a qualified person, for fall protection as part of a complete fall arrest system which maintains a safety factor of 2 (29 CFR 1926.500). The competent person for fall protection may (if deemed appropriate by the qualified person) supervise the assembly, disassembly, use and inspection of the HLL system under the direction of the qualified person. Locally manufactured HLLs are not acceptable unless they are custom designed for limited or site specific applications by a Registered Professional Engineer who is qualified in designing HLL systems.

3.5.4 Guardrails and Safety Nets

Design, install and use guardrails and safety nets in accordance with EM 385-1-1, Section 21.F.01 and 29 CFR 1926 Subpart M.

3.5.5 Rescue and Evacuation Plan and Procedures

When personal fall arrest systems are used, ensure that the mishap victim can self-rescue or can be rescued promptly should a fall occur. Prepare a Rescue and Evacuation Plan and include a detailed discussion of the following: methods of rescue; methods of self-rescue or assisted-rescue; equipment used; training requirement; specialized training for the

rescuers; procedures for requesting rescue and medical assistance; and transportation routes to a medical facility. Include the Rescue and Evacuation Plan within the Activity Hazard Analysis (AHA) for the phase of work, in the Fall Protection and Prevention (FP&P) Plan, and the Accident Prevention Plan (APP). The plan must comply with the requirements of EM 385-1-1, ASSP Z359.2, and ASSP Z359.4.

3.6 WORK PLATFORMS

3.6.1 Scaffolding

Provide employees with a safe means of access to the work area on the scaffold. Climbing of any scaffold braces or supports not specifically designed for access is prohibited. Comply with the following requirements:

a. Scaffold platforms greater than 20 feet in height must be accessed by use of a scaffold stair system.

b. Ladders commonly provided by scaffold system manufacturers are prohibited for accessing scaffold platforms greater than 20 feet maximum in height.

c. An adequate gate is required.

d. Employees performing scaffold erection and dismantling must be qualified.

e. Scaffold must be capable of supporting at least four times the maximum intended load, and provide appropriate fall protection as delineated in the accepted fall protection and prevention plan.

f. Stationary scaffolds must be attached to structural building components to safeguard against tipping forward or backward.

g. Special care must be given to ensure scaffold systems are not overloaded.

h. Side brackets used to extend scaffold platforms on self-supported scaffold systems for the storage of material are prohibited. The first tie-in must be at the height equal to 4 times the width of the smallest dimension of the scaffold base.

i. Scaffolding other than suspended types must bear on base plates upon wood mudsills (2 in x 10 in x 8 in minimum) or other adequate firm foundation.

j. Scaffold or work platform erectors must have fall protection during the erection and dismantling of scaffolding or work platforms that are more than 6 feet.

k. Delineate fall protection requirements when working above 6 feet or above dangerous operations in the Fall Protection and Prevention (FP&P) Plan and Activity Hazard Analysis (AHA) for the phase of work.

3.6.2 Elevated Aerial Work Platforms (AWPs)

Workers must be anchored to the basket or bucket in accordance with manufacturer's specifications and instructions (anchoring to the boom may only be used when allowed by the manufacturer and permitted by the CP).

Lanyards used must be sufficiently short to prohibit worker from climbing out of basket. The climbing of rails is prohibited. Lanyards with built-in shock absorbers are acceptable. Self-retracting devices are not acceptable. Tying off to an adjacent pole or structure is not permitted unless a safe device for 100 percent tie-off is used for the transfer.

Use of AWPs must be operated, inspected, and maintained as specified in the operating manual for the equipment and delineated in the AHA. Operators of AWPs must be designated as qualified operators by the Prime Contractor. Maintain proof of qualifications on site for review and include in the AHA.

3.7 EQUIPMENT

3.7.1 Material Handling Equipment (MHE)

a. Material handling equipment such as forklifts must not be modified with work platform attachments for supporting employees unless specifically delineated in the manufacturer's printed operating instructions. Material handling equipment fitted with personnel work platform attachments are prohibited from traveling or positioning while personnel are working on the platform.

b. The use of hooks on equipment for lifting of material must be in accordance with manufacturer's printed instructions. Material Handling Equipment Operators must be trained in accordance with OSHA 29 CFR 1910, Subpart N.

c. Operators of forklifts or power industrial trucks must be licensed in accordance with OSHA.

3.7.2 Load Handling Equipment (LHE)

The following requirements apply. In exception, these requirements do not apply to commercial truck mounted and articulating boom cranes used solely to deliver material and supplies (not prefabricated components, structural steel, or components of a systems-engineered metal building) where the lift consists of moving materials and supplies from a truck or trailer to the ground; to cranes installed on mechanics trucks that are used solely in the repair of shore-based equipment; to crane that enter the activity but are not used for lifting; nor to other machines not used to lift loads suspended by rigging equipment. However, LHE accidents occurring during such operations must be reported.

a. Equip cranes and derricks as specified in EM 385-1-1, Section 16.

b. Notify the Contracting Officer 15 working days in advance of any LHE entering the activity, in accordance with EM 385-1-1, Section 16.A.02, so that necessary quality assurance spot checks can be coordinated. Contractor's operator must remain with the crane during the spot check. Rigging gear must comply with OSHA, ASME B30.9 Standards safety standards.

c. Comply with the LHE manufacturer's specifications and limitations for erection and operation of cranes and hoists used in support of the work. Perform erection under the supervision of a designated person (as defined in ASME B30.5). Perform all testing in accordance with the manufacturer's recommended procedures.

d. Comply with ASME B30.5 for mobile and locomotive cranes, ASME B30.22 for articulating boom cranes, ASME B30.3 for construction tower cranes, ASME B30.8 for floating cranes and floating derricks, ASME B30.9 for slings, ASME B30.20 for below the hook lifting devices and ASME B30.26 for rigging hardware.

e. When operating in the vicinity of overhead transmission lines, operators and riggers must be alert to this special hazard and follow the requirements of EM 385-1-1 Section 11, and ASME B30.5 or ASME B30.22 as applicable.

f. Do not use crane suspended personnel work platforms (baskets) unless the Contractor proves that using any other access to the work location would provide a greater hazard to the workers or is impossible. Do not lift personnel with a line hoist or friction crane. Additionally, submit a specific AHA for this work to the Contracting Officer. Ensure the activity and AHA are thoroughly reviewed by all involved personnel.

g. Inspect, maintain, and recharge portable fire extinguishers as specified in NFPA 10, Standard for Portable Fire Extinguishers.

h. All employees must keep clear of loads about to be lifted and of suspended loads, except for employees required to handle the load.

i. Use cribbing when performing lifts on outriggers.

j. The crane hook/block must be positioned directly over the load. Side loading of the crane is prohibited.

k. A physical barricade must be positioned to prevent personnel access where accessible areas of the LHE's rotating superstructure poses a risk of striking, pinching or crushing personnel.

l. Maintain inspection records in accordance by EM 385-1-1, Section 16.D, including shift, monthly, and annual inspections, the signature of the person performing the inspection, and the serial number or other identifier of the LHE that was inspected. Records must be available for review by the Contracting Officer.

m. Maintain written reports of operational and load testing in accordance with EM 385-1-1, Section 16.F, listing the load test procedures used along with any repairs or alterations performed on the LHE. Reports must be available for review by the Contracting Officer.

n. Certify that all LHE operators have been trained in proper use of all safety devices (e.g. anti-two block devices).

o. Take steps to ensure that wind speed does not contribute to loss of control of the load during lifting operations. At wind speeds greater than 20 mph, the operator, rigger and lift supervisor must cease all crane operations, evaluate conditions and determine if the lift may proceed. Base the determination to proceed or not on wind calculations per the manufacturer and a reduction in LHE rated capacity if applicable. Include this maximum wind speed determination as part of the activity hazard analysis plan for that operation.

3.7.3 Machinery and Mechanized Equipment

a. Proof of qualifications for operator must be kept on the project site for review.

b. Manufacture specifications or owner's manual for the equipment must be on-site and reviewed for additional safety precautions or requirements that are sometimes not identified by OSHA or USACE EM 385-1-1. Incorporate such additional safety precautions or requirements into the AHAs.

3.7.4 Base Mounted Drum Hoists

a. Operation of base mounted drum hoists must comply with EM 385-1-1 and ASSP A10.22.

b. Rigging gear must comply with applicable ASME/OSHA standards

c. When used on telecommunication towers, base mounted drum hoists must comply with TIA-1019, TIA-222, ASME B30.7, 29 CFR 1926.552, and 29 CFR 1926.553.

d. When used to hoist personnel, the AHA must include a written standard operating procedure. Operators must have a physical examination in accordance with EM 385-1-1 Section 16.B.05 and trained, at a minimum, in accordance with EM 385-1-1 Section 16.U and 16.T. The base mounted drum hoist must also comply with OSHA Instruction CPL 02-01-056 and ASME B30.23.

e. Material and personnel must not be hoisted simultaneously.

f. Personnel cage must be marked with the capacity (in number of persons) and load limit in pounds.

g. Construction equipment must not be used for hoisting material or personnel or with trolley/tag lines. Construction equipment may be used for towing and assisting with anchoring guy lines.

3.7.5 Use of Explosives

Explosives must not be used or brought to the project site without prior written approval from the Contracting Officer. Such approval does not relieve the Contractor of responsibility for injury to persons or for damage to property due to blasting operations.

Storage of explosives, when permitted on Government property, must be only where directed and in approved storage facilities. These facilities must be kept locked at all times except for inspection, delivery, and withdrawal of explosives.

3.8 EXCAVATIONS

Soil classification must be performed by a competent person in accordance with 29 CFR 1926 and EM 385-1-1.

3.8.1 Utility Locations

Provide a third party, independent, private utility locating company to

positively identify underground utilities in the work area in addition to any station locating service and coordinated with the station utility department.

3.8.2 Utility Location Verification

Physically verify underground utility locations, including utility depth, by hand digging using wood or fiberglass handled tools when any adjacent construction work is expected to come within 3 feet of the underground system.

3.8.3 Utilities Within and Under Concrete, Bituminous Asphalt, and Other Impervious Surfaces

Utilities located within and under concrete slabs or pier structures, bridges, parking areas, and the like, are extremely difficult to identify. Whenever contract work involves chipping, saw cutting, or core drilling through concrete, bituminous asphalt or other impervious surfaces, the existing utility location must be coordinated with station utility departments in addition to location and depth verification by a third party, independent, private locating company. The third party, independent, private locating company must locate utility depth by use of Ground Penetrating Radar (GPR), X-ray, bore scope, or ultrasound prior to the start of demolition and construction. Outages to isolate utility systems must be used in circumstances where utilities are unable to be positively identified. The use of historical drawings does not alleviate the Contractor from meeting this requirement.

3.9 ELECTRICAL

Perform electrical work in accordance with EM 385-1-1, Appendix A, Sections 11 and 12.

3.9.1 Conduct of Electrical Work

As delineated in EM 385-1-1, electrical work is to be conducted in a de-energized state unless there is no alternative method for accomplishing the work. In those cases obtain an energized work permit from the Contracting Officer. The energized work permit application must be accompanied by the AHA and a summary of why the equipment/circuit needs to be worked energized. Underground electrical spaces must be certified safe for entry before entering to conduct work. Cables that will be cut must be positively identified and de-energized prior to performing each cut. Attach temporary grounds in accordance with ASTM F855 and IEEE 1048. Perform all high voltage cable cutting remotely using hydraulic cutting tool. When racking in or live switching of circuit breakers, no additional person other than the switch operator is allowed in the space during the actual operation. Plan so that work near energized parts is minimized to the fullest extent possible. Use of electrical outages clear of any energized electrical sources is the preferred method.

When working in energized substations, only qualified electrical workers are permitted to enter. When work requires work near energized circuits as defined by NFPA 70, high voltage personnel must use personal protective equipment that includes, as a minimum, electrical hard hat, safety shoes, insulating gloves and electrical arc flash protection for personnel as required by NFPA 70E. Insulating blankets, hearing protection, and switching suits may also be required, depending on the specific job and as delineated in the Contractor's AHA. Ensure that each employee is familiar

with and complies with these procedures and 29 CFR 1910.147.

3.9.2 Qualifications

Electrical work must be performed by QP personnel with verifiable credentials who are familiar with applicable code requirements. Verifiable credentials consist of State, National and Local Certifications or Licenses that a Master or Journeyman Electrician may hold, depending on work being performed, and must be identified in the appropriate AHA. Journeyman/Apprentice ratio must be in accordance with State, Local requirements applicable to where work is being performed.

3.9.3 Arc Flash

Conduct a hazard analysis/arc flash hazard analysis whenever work on or near energized parts greater than 50 volts is necessary, in accordance with NFPA 70E.

All personnel entering the identified arc flash protection boundary must be QPs and properly trained in NFPA 70E requirements and procedures. Unless permitted by NFPA 70E, no Unqualified Person is permitted to approach nearer than the Limited Approach Boundary of energized conductors and circuit parts. Training must be administered by an electrically qualified source and documented.

3.9.4 Grounding

Ground electrical circuits, equipment and enclosures in accordance with NFPA 70 and IEEE C2 to provide a permanent, continuous and effective path to ground unless otherwise noted by EM 385-1-1.

Check grounding circuits to ensure that the circuit between the ground and a grounded power conductor has a resistance low enough to permit sufficient current flow to allow the fuse or circuit breaker to interrupt the current.

3.9.5 Testing

Temporary electrical distribution systems and devices must be inspected, tested and found acceptable for Ground-Fault Circuit Interrupter (GFCI) protection, polarity, ground continuity, and ground resistance before initial use, before use after modification and at least monthly. Monthly inspections and tests must be maintained for each temporary electrical distribution system, and signed by the electrical CP or QP.

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SOURCES FOR REFERENCE PUBLICATIONS

02/19

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SECTION 01 42 00

SOURCES FOR REFERENCE PUBLICATIONS
02/19

PART 1 GENERAL

1.1 REFERENCES

Various publications are referenced in other sections of the specifications to establish requirements for the work. These references are identified in each section by document number, date and title. The document number used in the citation is the number assigned by the standards producing organization (e.g., ASTM B564 Standard Specification for Nickel Alloy Forgings). However, when the standards producing organization has not assigned a number to a document, an identifying number has been assigned for reference purposes.

1.2 ORDERING INFORMATION

The addresses of the standards publishing organizations whose documents are referenced in other sections of these specifications are listed below, and if the source of the publications is different from the address of the sponsoring organization, that information is also provided.

AACE INTERNATIONAL (AACE)
1265 Suncrest Towne Centre Drive
Morgantown, WV 26505-1876 USA
Ph: 304-296-8444
Fax: 304-291-5728
Internet: https://web.aacei.org/

AMERICAN ASSOCIATION OF STATE HIGHWAY AND TRANSPORTATION OFFICIALS (AASHTO)
444 North Capital Street, NW, Suite 249
Washington, DC 20001
Ph: 202-624-5800
Fax: 202-624-5806
E-Mail: info@aashto.org
Internet: https://www.transportation.org/

AMERICAN CONCRETE INSTITUTE (ACI)
38800 Country Club Drive
Farmington Hills, MI 48331-3439
Ph: 248-848-3700
Fax: 248-848-3701
Internet: https://www.concrete.org/

AMERICAN CONCRETE PIPE ASSOCIATION (ACPA)
8445 Freeport Parkway, Suite 350
Irving, TX 75063-2595
Ph: 972-506-7216
Fax: 972-506-7682
E-mail: info@concrete-pipe.org
Internet: https://www.concretepipe.org/

AMERICAN INSTITUTE OF STEEL CONSTRUCTION (AISC)
130 East Randolph, Suite 2000
Chicago, IL 60601
Ph: 312-670-5444
Fax: 312-670-5403
Steel Solutions Center: 866-275-2472
E-mail: solutions@aisc.org
Internet: https://www.aisc.org/

AMERICAN RAILWAY ENGINEERING AND MAINTENANCE-OF-WAY ASSOCIATION (AREMA)
4501 Forbes Blvd., Suite 130
Lanham, MD 20706
Ph: 301-459-3200
E-mail: info@arema.org
Internet: https://www.arema.org

AMERICAN SOCIETY OF MECHANICAL ENGINEERS (ASME)
Two Park Avenue
New York, NY 10016-5990
Ph: 800-843-2763
Fax: 973-882-1717
E-mail: customercare@asme.org
Internet: https://www.asme.org/

AMERICAN SOCIETY OF SAFETY PROFESSIONALS (ASSP)
520 N. Northwest Highway
Park Ridge, IL 60068
Ph: 847-699-2929
E-mail: customerservice@assp.org
Internet: https://www.assp.org/

AMERICAN WATER WORKS ASSOCIATION (AWWA)
6666 W. Quincy Avenue
Denver, CO 80235 USA
Ph: 303-794-7711 or 800-926-7337
Fax: 303-347-0804
Internet: https://www.awwa.org/

AMERICAN WELDING SOCIETY (AWS)
8669 NW 36 Street, #130
Miami, FL 33166-6672
Ph: 800-443-9353
Internet: https://www.aws.org/

AmericanHort (AH)
2130 Stella Court
Columbus, OH 43215
Ph: 614-487-1117 OH
Ph: 202-789-2900 DC
Internet: https://www.americanhort.org/

ASTM INTERNATIONAL (ASTM)
100 Barr Harbor Drive, P.O. Box C700
West Conshohocken, PA 19428-2959
Ph: 610-832-9500
Fax: 610-832-9555
E-mail: service@astm.org
Internet: https://www.astm.org/

CSA GROUP (CSA)
178 Rexdale Blvd.
Toronto, ON, Canada M9W 1R3
Ph: 416-747-4044
Fax: 416-747-2510
E-mail: member@csagroup.org
Internet: https://www.csagroup.org/

FOUNDATION FOR CROSS-CONNECTION CONTROL AND HYDRAULIC RESEARCH (FCCCHR)
USC Foundation Office
Research Annex 219
Los Angeles, CA 90089-7700
Ph: 866-545-6340
Fax: 213-740-8399
E-mail: fccchr@usc.edu
Internet: https://fccchr.usc.edu/

INSTITUTE OF ELECTRICAL AND ELECTRONICS ENGINEERS (IEEE)
445 and 501 Hoes Lane
Piscataway, NJ 08854-4141
Ph: 732-981-0060 or 800-701-4333
Fax: 732-981-9667
E-mail: onlinesupport@ieee.org
Internet: https://www.ieee.org/

MASTER PAINTERS INSTITUTE (MPI)
2800 Ingleton Avenue
Burnaby, BC CANADA V5C 6G7
Ph: 1-888-674-8937
Fax: 1-888-211-8708
E-mail: info@paintinfo.com or techservices@mpi.net
Internet: http://www.mpi.net/

NATIONAL ELECTRICAL MANUFACTURERS ASSOCIATION (NEMA)
1300 North 17th Street, Suite 900
Arlington, VA 22209
Ph: 703-841-3200
Internet: https://www.nema.org

NATIONAL FIRE PROTECTION ASSOCIATION (NFPA)
1 Batterymarch Park
Quincy, MA 02169-7471
Ph: 800-344-3555
Fax: 800-593-6372
Internet: https://www.nfpa.org

NATIONAL MARINE FISHERIES SERVICE (NMFS)

NATIONAL PRECAST CONCRETE ASSOCIATION (NPCA)
1320 City Center Drive, Suite 200
Carmel, IN 46032
Ph: 800 366 7731
Fax: 317-571-0041
Internet: https://precast.org/

SOCIETY FOR PROTECTIVE COATINGS (SSPC)
800 Trumbull Drive
Pittsburgh, PA 15205
Ph: 877-281-7772 or 412-281-2331
Fax: 412-444-3591
E-mail: customerservice@sspc.org
Internet: http://www.sspc.org

TELECOMMUNICATIONS INDUSTRY ASSOCIATION (TIA)
1320 North Courthouse Rosd, Suite 200
Arlington, VA 22201
Ph: 703-907-7700
Fax: 703-907-7727
E-mail: marketing@tiaonline.org
Internet: https://www.tiaonline.org/

U.S. ARMY CORPS OF ENGINEERS (USACE)
CRD-C DOCUMENTS available on Internet:
http://www.wbdg.org/ffc/army-coe/standards
Order Other Documents from:
Official Publications of the Headquarters, USACE
E-mail: hqpublications@usace.army.mil
Internet: http://www.publications.usace.army.mil/
or
https://www.hnc.usace.army.mil/Missions/Engineering-Directorate/TECHINFO/

U.S. FEDERAL AVIATION ADMINISTRATION (FAA)
Order for sale documents from:
Superintendent of Documents
U.S. Government Publishing Office (GPO)
732 N. Capitol Street, NW
Washington, DC 20401
Ph: 202-512-1800 or 866-512-1800
Bookstore: 202-512-0132
Internet: https://www.gpo.gov/
Order free documents from:
U.S. Department of Transportation
Federal Aviation Administration
800 Independence Avenue, SW
Washington, DC 20591
Ph: 866-835-5322
Internet: https://www.faa.gov/

U.S. FEDERAL HIGHWAY ADMINISTRATION (FHWA)
1200 New Jersey Ave., SE
Washington, DC 20590
Ph: 202-366-4000
E-mail: ExecSecretariat.FHWA@dot.gov
Internet: https://www.fhwa.dot.gov/
Order from:
Superintendent of Documents
U.S. Government Publishing Office (GPO)
732 N. Capitol Street, NW
Washington, DC 20401
Ph: 202-512-1800 or 866-512-1800
Bookstore: 202-512-0132
Internet: https://www.gpo.gov/

U.S. FISH AND WILDLIFE SERVICE (USFWS)

U.S. NATIONAL ARCHIVES AND RECORDS ADMINISTRATION (NARA)
8601 Adelphi Road
College Park, MD 20740-6001
Ph: 866-272-6272
Internet: https://www.archives.gov/
Order documents from:
Superintendent of Documents
U.S. Government Publishing Office (GPO)
732 N. Capitol Street, NW
Washington, DC 20401
Ph: 202-512-1800 or 866-512-1800
Bookstore: 202-512-0132
Internet: https://www.gpo.gov/

WASHINGTON STATE DEPARTMENT OF ECOLOGY (WSDE)
300 Desmond Drive, SE
Lacey, WA 98503
Ph: 360-407-6000
Fax: 360-407-6989
Internet:
https://ecology.wa.gov/About-us/Online-tools-publications/Publications-forms

WASHINGTON STATE DEPARTMENT OF TRANSPORTATION (WSDOT)
310 Maple Park Avenue SE
P.O. Box 47300
Olympia, WA 98504-7300
Ph: 360-705-7000
Internet: https://wsdot.wa.gov/

PART 2 PRODUCTS

Not used

PART 3 EXECUTION

Not used

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QUALITY CONTROL

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SECTION 01 45 00.00 10

QUALITY CONTROL
11/16

PART 1 GENERAL

1.1 PAYMENT

Separate payment will not be made for providing and maintaining an effective Quality Control program. Include all associated costs in the applicable Bid Schedule item.

1.2 SUBMITTALS

Government approval is required for submittals with a "G" designation; submittals not having a "G" designation are for information only. When used, a designation following the "G" designation identifies the office that will review the submittal for the Government. Submit the following in accordance with Section 01 33 00 SUBMITTAL PROCEDURES:

SD-01 Preconstruction Submittals

Contractor Quality Control (CQC) Plan; G

SD-06 Test Reports

Verification Statement

PART 2 PRODUCTS

Not Used

PART 3 EXECUTION

3.1 GENERAL REQUIREMENTS

Establish and maintain an effective quality control (QC) system that complies with FAR 52.246-12 Inspection of Construction. QC consist of plans, procedures, and organization necessary to produce an end product which complies with the Contract requirements. The QC system covers all construction operations, both onsite and offsite, and be keyed to the proposed construction sequence. The project superintendent will be held responsible for the quality of work and is subject to removal by the Contracting Officer for non-compliance with the quality requirements specified in the Contract. In this context the highest level manager responsible for the overall construction activities at the site, including quality and production is the project superintendent. The project superintendent maintains a physical presence at the site at all times and is responsible for all construction and related activities at the site, except as otherwise acceptable to the Contracting Officer.

3.2 CONTRACTOR QUALITY CONTROL (CQC) PLAN

Submit no later than 15 days after receipt of notice to proceed, the Contractor Quality Control (CQC) Plan proposed to implement the

requirements FAR 52.246-12 Inspection of Construction. The Government will consider an interim plan for the first 60 days of operation. Construction will be permitted to begin only after acceptance of the CQC Plan or acceptance of an interim plan applicable to the particular feature of work to be started. Work outside of the accepted interim plan will not be permitted to begin until acceptance of a CQC Plan or another interim plan containing the additional work.

3.2.1 Content of the CQC Plan

Include, as a minimum, the following to cover all construction-operations, both onsite and offsite, including work by subcontractors fabricators, suppliers and purchasing agents:

a. A description of the quality control organization, including a chart showing lines of authority and acknowledgment that the CQC staff will implement the three phase control system for all aspects of the work specified. Include a CQC System Manager that reports to the project superintendent.

b. The name, qualifications (in resume format), duties, responsibilities, and authorities of each person assigned a CQC function.

c. A copy of the letter to the CQC System Manager signed by an authorized official of the firm which describes the responsibilities and delegates sufficient authorities to adequately perform the functions of the CQC System Manager, including authority to stop work which is not in compliance with the Contract. Letters of direction to all other various quality control representatives outlining duties, authorities, and responsibilities will be issued by the CQC System Manager. Furnish copies of these letters to the Contracting Officer.

d. Procedures for scheduling, reviewing, certifying, and managing submittals, including those of subcontractors, offsite fabricators, suppliers, and purchasing agents. These procedures must be in accordance with Section 01 33 00 SUBMITTAL PROCEDURES.

e. Control, verification, and acceptance testing procedures for each specific test to include the test name, specification paragraph requiring test, feature of work to be tested, test frequency, and person responsible for each test. (Laboratory facilities approved by the Contracting Officer are required to be used.)

f. Procedures for tracking preparatory, initial, and follow-up control phases and control, verification, and acceptance tests including documentation.

g. Procedures for tracking construction deficiencies from identification through acceptable corrective action. Establish verification procedures that identified deficiencies have been corrected.

h. Reporting procedures, including proposed reporting formats.

i. A list of the definable features of work. A definable feature of work is a task which is separate and distinct from other tasks, has separate control requirements, and is identified by different trades or disciplines, or it is work by the same trade in a different environment. Although each section of the specifications can generally be considered as a definable feature of work, there are

frequently more than one definable features under a particular section. This list will be agreed upon during the coordination meeting.

3.2.2 Acceptance of Plan

Acceptance of the Contractor's plan is required prior to the start of construction. Acceptance is conditional and will be predicated on satisfactory performance during the construction. The Government reserves the right to require the Contractor to make changes in the Contractor Quality Control(CQC) Plan and operations including removal of personnel, as necessary, to obtain the quality specified.

3.2.3 Notification of Changes

After acceptance of the CQC Plan, notify the Contracting Officer in writing of any proposed change. Proposed changes are subject to acceptance by the Contracting Officer.

3.3 COORDINATION MEETING

After the Preconstruction Conference, before start of construction, and prior to acceptance by the Government of the CQC Plan, meet with the Contracting Officer and discuss the Contractor's quality control system. Submit the CQC Plan a minimum of seven calendar days prior to the Coordination Meeting. During the meeting, a mutual understanding of the system details must be developed, including the forms for recording the CQC operations,, control activities, testing, administration of the system for both onsite and offsite work, and the interrelationship of Contractor's Management and control with the Government's Quality Assurance. Minutes of the meeting will be prepared by the Government, signed by both the Contractor and the Contracting Officer and will become a part of the contract file. There can be occasions when subsequent conferences will be called by either party to reconfirm mutual understandings or address deficiencies in the CQC system or procedures which can require corrective action by the Contractor.

3.4 QUALITY CONTROL ORGANIZATION

3.4.1 Personnel Requirements

The requirements for the CQC organization are a Safety and Health Manager, CQC System Manager, and sufficient number of additional qualified personnel to ensure safety and Contract compliance. The Safety and Health Manager reports directly to a senior project (or corporate) official independent from the CQC System Manager. The Safety and Health Manager will also serve as a member of the CQC Staff Personnel identified in the technical provisions as requiring specialized skills to assure the required work is being performed properly will also be included as part of the CQC organization. The Contractor's CQC staff maintains a presence at the site at all times during progress of the work and have complete authority and responsibility to take any action necessary to ensure Contract compliance. The CQC staff will be subject to acceptance by the Contracting Officer. Provide adequate office space, filing systems and other resources as necessary to maintain an effective and fully functional CQC organization. Promptly complete and furnish all letters, material submittals, shop drawing submittals, schedules and all other project documentation to the CQC organization. The CQC organization is responsible to maintain these documents and records at the site at all

times, except as otherwise acceptable to the Contracting Officer.

3.4.2 CQC System Manager

Identify as CQC System Manager an individual within the onsite work organization that is responsible for overall management of CQC and has the authority to act in all CQC matters for the Contractor. The CQC System Manager is required to be a graduate engineer, graduate architect, or a graduate of construction management, with a minimum of five (5) years construction experience on construction similar to this Contract. This CQC System Manager is on the site at all times during construction and is employed by the prime Contractor. The CQC System Manager is assigned no other duties . Identify in the plan an alternate to serve in the event of the CQC System Manager's absence. The requirements for the alternate are the same as the CQC System Manager.

3.4.3 Additional Requirement

In addition to the above experience and education requirements, the Contractor Quality Control(CQC) System Manager and Alternate CQC System Manager are required to have completed the Construction Quality Management (CQM) for Contractors course. If the CQC System Manager does not have a current certification, obtain the CQM for Contractors course certification within 90 days of award. This course is periodically offered by the Naval Facilities Engineering Command and the Army Corps of Engineers. Contact the Contracting Officer for information on the next scheduled class.

The Construction Quality Management Training certificate expires after 5 years. If the CQC System Manager's certificate has expired, retake the course to remain current.

3.4.4 Organizational Changes

Maintain the CQC staff at full strength at all times. When it is necessary to make changes to the CQC staff, revise the CQC Plan to reflect the changes and submit the changes to the Contracting Officer for acceptance.

3.5 SUBMITTALS AND DELIVERABLES

Submittals, if needed, have to comply with the requirements in Section 01 33 00SUBMITTAL PROCEDURES. The CQC organization is responsible for certifying that all submittals and deliverables are in compliance with the contract requirements.

3.6 CONTROL

CQC is the means by which the Contractor ensures that the construction, to include that of subcontractors and suppliers, complies with the requirements of the contract. At least three phases of control are required to be conducted by the CQC System Manager for each definable feature of the construction work as follows:

3.6.1 Preparatory Phase

This phase is performed prior to beginning work on each definable feature of work, after all required plans/documents/materials are approved/accepted, and after copies are at the work site. This phase includes:

a. A review of each paragraph of applicable specifications, reference

codes, and standards. Make available during the preparatory inspection a copy of those sections of referenced codes and standards applicable to that portion of the work to be accomplished in the field. Maintain and make available in the field for use by Government personnel until final acceptance of the work.

b. Review of the Contract drawings.

c. Check to assure that all materials and equipment have been tested, submitted, and approved.

d. Review of provisions that have been made to provide required control inspection and testing.

e. Examination of the work area to assure that all required preliminary work has been completed and is in compliance with the Contract.

f. Examination of required materials, equipment, and sample work to assure that they are on hand, conform to approved shop drawings or submitted data, and are properly stored.

g. Review of the appropriate activity hazard analysis to assure safety requirements are met.

h. Discussion of procedures for controlling quality of the work including repetitive deficiencies. Document construction tolerances and workmanship standards for that feature of work.

i. Check to ensure that the portion of the plan for the work to be performed has been accepted by the Contracting Officer.

j. Discussion of the initial control phase.

k. The Government needs to be notified at least 72 hours in advance of beginning the preparatory control phase. Include a meeting conducted by the CQC System Manager and attended by the superintendent, other CQC personnel (as applicable), and the foreman responsible for the definable feature. Document the results of the preparatory phase actions by separate minutes prepared by the CQC System Manager and attach to the daily CQC report. Instruct applicable workers as to the acceptable level of workmanship required in order to meet contract specifications.

3.6.2 Initial Phase

This phase is accomplished at the beginning of a definable feature of work. Accomplish the following:

a. Check work to ensure that it is in full compliance with contract requirements. Review minutes of the preparatory meeting.

b. Verify adequacy of controls to ensure full contract compliance. Verify required control inspection and testing are in compliance with the contract.

c. Establish level of workmanship and verify that it meets minimum acceptable workmanship standards. Compare with required sample panels as appropriate.

d. Resolve all differences.

e. Check safety to include compliance with and upgrading of the safety plan and activity hazard analysis. Review the activity analysis with each worker.

f. The Government needs to be notified at least 72 hours in advance of beginning the initial phase for definable feature of work. Prepare separate minutes of this phase by the CQC System Manager and attach to the daily CQC report. Indicate the exact location of initial phase for definable feature of work for future reference and comparison with follow-up phases.

g. The initial phase for each definable feature of work is repeated for each new crew to work onsite, or any time acceptable specified quality standards are not being met.

3.6.3 Follow-up Phase

Perform daily checks to assure control activities, including control testing, are providing continued compliance with contract requirements, until completion of the particular feature of work. Record the checks in the CQC documentation. Conduct final follow-up checks and correct all deficiencies prior to the start of additional features of work which may be affected by the deficient work. Do not build upon nor conceal non-conforming work.

3.6.4 Additional Preparatory and Initial Phases

Conduct additional preparatory and initial phases on the same definable features of work if: the quality of on-going work is unacceptable; if there are changes in the applicable CQC staff, onsite production supervision or work crew; if work on a definable feature is resumed after a substantial period of inactivity; or if other problems develop.

3.7 COMPLETION INSPECTION

3.7.1 Punch-Out Inspection

Conduct an inspection of the work by the CQC System Manager near the end of the work, or any increment of the work established by a time stated in FAR 52.211-10 Commencement, Prosecution, and Completion of Work, or by the specifications. Prepare and include in the CQC documentation a punch list of items which do not conform to the approved drawings and specifications, as required by paragraph DOCUMENTATION. Include within the list of deficiencies the estimated date by which the deficiencies will be corrected. Make a second inspection the CQC System Manager or staff to ascertain that all deficiencies have been corrected. Once this is accomplished, notify the Government that the facility is ready for the Government Pre-Final inspection.

3.7.2 Pre-Final Inspection

The Government will perform the pre-final inspection to verify that the facility is complete and ready to be occupied. A Government Pre-Final Punch List may be developed as a result of this inspection. Ensure that all items on this list have been corrected before notifying the Government, so that a Final inspection with the customer can be scheduled. Correct any items noted on the Pre-Final inspection in a

timely manner. These inspections and any deficiency corrections required by this paragraph need to be accomplished within the time slated for completion of the entire work or any particular increment of the work if the project is divided into increments by separate completion dates.

3.7.3 Final Acceptance Inspection

The Contractor's Quality Control Inspection personnel, plus the superintendent or other primary management person, and the Contracting Officer's Representative is required to be in attendance at the final acceptance inspection. Additional Government personnel including, but not limited to, those from Base/Post Civil Facility Engineer user groups, and major commands can also be in attendance. The final acceptance inspection will be formally scheduled by the Contracting Officer based upon results of the Pre-Final inspection. Notify the Contracting Officer at least 14 days prior to the final acceptance inspection and include the Contractor's assurance that all specific items previously identified to the Contractor as being unacceptable, along with all remaining work performed under the Contract, will be complete and acceptable by the date scheduled for the final acceptance inspection. Failure of the Contractor to have all contract work acceptably complete for this inspection will be cause for the Contracting Officer to bill the Contractor for the Government's additional inspection cost in accordance FAR 52.246-12 Inspection of Construction.

3.8 DOCUMENTATION

3.8.1 Quality Control Activities

Maintain current records providing factual evidence that required quality control activities and tests have been performed. Include in these records the work of subcontractors and suppliers on an acceptable form that includes, as a minimum, the following information:

a. The name and area of responsibility of the Contractor/Subcontractor.

b. Operating plant/equipment with hours worked, idle, or down for repair.

c. Work performed each day, giving location, description, and by whom. When Network Analysis (NAS) is used, identify each phase of work performed each day by NAS activity number.

d. Test and control activities performed with results and references to specifications/drawings requirements. Identify the control phase (Preparatory, Initial, Follow-up). List of deficiencies noted, along with corrective action.

e. Quantity of materials received at the site with statement as to acceptability, storage, and reference to specifications/drawings requirements.

f. Submittals and deliverables reviewed, with Contract reference, by whom, and action taken.

g. Offsite surveillance activities, including actions taken.

h. Job safety evaluations stating what was checked, results, and instructions or corrective actions.

i. Instructions given/received and conflicts in plans and specifications.

3.8.2 Verification Statement

Indicate a description of trades working on the project; the number of personnel working; weather conditions encountered; and any delays encountered. Cover both conforming and deficient features and include a statement that equipment and materials incorporated in the work and workmanship comply with the Contract. Furnish the original and one copy of these records in report form to the Government daily within 24 hours after the date covered by the report, except that reports need not be submitted for days on which no work is performed. As a minimum, prepare and submit one report for every 7 days of no work and on the last day of a no work period. All calendar days need to be accounted for throughout the life of the contract. The first report following a day of no work will be for that day only. Reports need to be signed and dated by the Contractor Quality Control(CQC) System Manager. Include copies of test reports and copies of reports prepared by all subordinate quality control personnel within the CQC System Manager Report.

3.9 SAMPLE FORMS

Sample forms enclosed at the end of this section.

3.10 NOTIFICATION OF NONCOMPLIANCE

The Contracting Officer will notify the Contractor of any detected noncompliance with the foregoing requirements. Take immediate corrective action after receipt of such notice. Such notice, when delivered to the Contractor at the work site, will be deemed sufficient for the purpose of notification. If the Contractor fails or refuses to comply promptly, the Contracting Officer can issue an order stopping all or part of the work until satisfactory corrective action has been taken. No part of the time lost due to such stop orders will be made the subject of claim for extension of time or for excess costs or damages by the Contractor.

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RESIDENT MANAGEMENT SYSTEM CONTRACTOR MODE (RMS CM)

11/16

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SECTION 01 45 00.15 10

RESIDENT MANAGEMENT SYSTEM CONTRACTOR MODE (RMS CM)
11/16

PART 1 GENERAL

1.1 REFERENCES

The publications listed below form a part of this section to the extent referenced. The publications are referred to within the text by the basic designation only.

U.S. ARMY CORPS OF ENGINEERS (USACE)

EM 385-1-1	(2014) Safety and Health Requirements Manual

1.2 MEASUREMENT AND PAYMENT

The work of this section is not measured for payment. The Contractor is responsible for the work of this section, without any direct compensation other than the payment received for contract items.

1.3 CONTRACT ADMINISTRATION

The Government will use the Resident Management System (RMS) to assist in its monitoring and administration of this contract. The Government accesses the system using the Government Mode of RMS (RMS GM) and the Contractor accesses the system using the Contractor Mode (RMS CM). The term RMS will be used in the remainder of this section for both RMS GM and RMS CM. The joint Government-Contractor use of RMS facilitates electronic exchange of information and overall management of the contract. The Contractor accesses RMS to record, maintain, input, track, and electronically share information with the Government throughout the contract period in the following areas:

Administration
Finances
Quality Control
Submittal Monitoring
Scheduling
Closeout
Import/Export of Data

1.3.1 Correspondence and Electronic Communications

For ease and speed of communications, exchange correspondence and other documents in electronic format to the maximum extent feasible. Some correspondence, including pay requests and payrolls, are also to be provided in paper format with original signatures. Paper documents will govern, in the event of discrepancy with the electronic version.

1.3.2 Other Factors

Other portions of this document have a direct relationship to the

reporting accomplished through RMS. Particular attention is directed to FAR 52.236-15 Schedules for Construction Contracts; FAR 52.232-27 Prompt Payment for Construction Contracts; FAR 52.232-5 Payments Under Fixed-Priced Construction Contracts; Section 01 32 01.00 10 PROJECT SCHEDULE; Section 01 33 00 SUBMITTAL PROCEDURES; Section 01 35 26 GOVERNMENTAL SAFETY REQUIREMENTS; and Section 01 45 00.00 10 QUALITY CONTROL.

1.4 RMS SOFTWARE

RMS is a web based application. Download, install and be able to utilize the latest version of RMS within 7 calendar days of receipt of the Notice to Proceed. RMS software, user manuals, access and installation instructions, program updates and training information are available from the RMS website (https://rms.usace.army.mil). The Government and the Contractor will have different access authorities to the same contract database through RMS. The common database will be updated automatically each time a user finalizes an entry or change.

1.5 CONTRACT DATABASE - GOVERNMENT

The Government will enter the basic contract award data in RMS prior to granting the Contractor access. The Government entries into RMS will generally be related to submittal reviews, correspondence status, and Quality Assurance(QA)comments, as well as other miscellaneous administrative information.

1.6 CONTRACT DATABASE - CONTRACTOR

Contractor entries into RMS establish, maintain, and update data throughout the duration of the contract. Contractor entries generally include prime and subcontractor information, daily reports, submittals, RFI's, schedule updates and payment requests. RMS includes the ability to import attachments and export reports in many of the modules, including submittals. The Contractor responsibilities for entries in RMS typically include the following items:

1.6.1 Administration

1.6.1.1 Contractor Information

Enter all current Contractor administrative data and information into RMS within 7 calendar days of receiving access to the contract in RMS. This includes, but is not limited to, Contractor's name, address, telephone numbers, management staff, and other required items.

1.6.1.2 Subcontractor Information

Enter all missing subcontractor administrative data and information into RMS CM within 7 calendar days of receiving access to the contract in RMS or within 7 calendar days of the signing of the subcontractor agreement for agreements signed at a later date. This includes name, trade, address, phone numbers, and other required information for all subcontractors. A subcontractor is listed separately for each trade to be performed.

1.6.1.3 Correspondence

Identify all Contractor correspondence to the Government with a serial

number. Prefix correspondence initiated by the Contractor's site office with "S". Prefix letters initiated by the Contractor's home (main) office with "H". Letters are numbered starting from 0001. (e.g., H-0001 or S-0001). The Government's letters to the Contractor will be prefixed with "C" or "RFP".

1.6.1.4 Equipment

Enter and maintain a current list of equipment planned for use or being used on the jobsite, including the most recent and planned equipment inspection dates.

1.6.1.5 Reports

Track the status of the project utilizing the reports available in RMS. The value of these reports is reflective of the quality of the data input. These reports include the Progress Payment Request worksheet, Quality Control (QC) comments, Submittal Register Status, and Three-Phase Control worksheets.

1.6.1.6 Request For Information (RFI)

Create and track all Requests For Information (RFI) in the RMS Administration Module for Government review and response.

1.6.2 Finances

1.6.2.1 Pay Activity Data

Develop and enter a list of pay activities in conjunction with the project schedule. The sum of pay activities equals the total contract amount, including modifications. Each pay activity must be assigned to a Contract Line Item Number (CLIN). The sum of the activities assigned to a CLIN equals the amount of each CLIN.

1.6.2.2 Payment Requests

Prepare all progress payment requests using RMS. Update the work completed under the contract at least monthly, measured as percent or as specific quantities. After the update, generate a payment request and prompt payment certification using RMS. Submit the signed prompt payment certification and payment request as well as supporting data either electronically or by hard copy. Unless waived by the Contracting Officer, a signed paper copy of the approved payment certification and request is also required and will govern in the event of discrepancy with the electronic version.

1.6.3 Quality Control (QC)

Enter and track implementation of the 3-phase QC Control System, QC testing, transferred and installed property and warranties in RMS. Prepare daily reports, identify and track deficiencies, document progress of work, and support other Contractor QC requirements in RMS. Maintain all data on a daily basis. Insure that RMS reflects all quality control methods, tests and actions contained within the Contractor Quality Control (CQC) Plan and Government review comments of same within 7 calendar days of Government acceptance of the CQC Plan.

1.6.3.1 Quality Control (QC) Reports

The Contractor's Quality Control (QC) Daily Report in RMS is the official report. The Contractor can use other supplemental formats to record QC data, but information from any supplemental formats are to be consolidated and entered into the RMS QC Daily Report. Any supplemental information may be entered into RMS as an attachment to the report. QC Daily Reports must be finalized and signed in RMS within 24 hours after the date covered by the report. Provide the Government a printed signed copy of the QC Daily Report, unless waived by the Contracting Officer.

1.6.3.2 Deficiency Tracking.

Use the QC Daily Report Module to enter and track deficiencies. Deficiencies identified and entered into RMS by the Contractor or the Government will be sequentially numbered with a QC or QA prefix for tracking purposes. Enter each deficiency into RMS the same day that the deficiency is identified. Monitor, track and resolve all QC and QA entered deficiencies. A deficiency is not considered to be corrected until the Government indicates concurrence in RMS.

1.6.3.3 Three-Phase Control Meetings

Maintain scheduled and actual dates and times of preparatory and initial control meetings in RMS. Worksheets for the three-phase control meetings are generated within RMS.

1.6.3.4 Labor and Equipment Hours

Enter labor and equipment exposure hours on a daily basis. Roll up the labor and equipment exposure data into a monthly exposure report.

1.6.3.5 Accident/Safety Reporting

Both the Contractor and the Government enter safety related comments in RMS as a deficiency. The Contractor must monitor, track and show resolution for safety issues in the QC Daily Report area of the RMS QC Module. In addition, follow all reporting requirements for accidents and incidents as required in EM 385-1-1, Section 01 35 26 GOVERNMENTAL SAFETY REQUIREMENTS and as required by any other applicable Federal, State or local agencies.

1.6.3.6 Definable Features of Work

Enter each feature of work, as defined in the approved CQC Plan, into the RMS QC Module. A feature of work may be associated with a single or multiple pay activities, however a pay activity is only to be linked to a single feature of work.

1.6.3.7 Activity Hazard Analysis

Import activity hazard analysis electronic document files into the RMS QC Module utilizing the document package manager.

1.6.4 Submittal Management

Enter all current submittal register data and information into RMS within 7 calendar days of receiving access to the contract in RMS. The information shown on the submittal register following the specification

Section 01 33 00 SUBMITTAL PROCEDURES will already be entered into the RMS database when access is granted. Group electronic submittal documents into transmittal packages to send to the Government, except very large electronic files, samples, spare parts, mock ups, color boards, or where hard copies are specifically required. Track transmittals and update the submittal register in RMS on a daily basis throughout the duration of the contract. Submit hard copies of all submittals unless waived by the Contracting Officer.

1.6.5 Schedule

Enter and update the contract project schedule in RMS by either manually entering all schedule data or by importing the Standard Data Exchange Format (SDEF) file, based on the requirements in Section 01 32 01.00 13 PROJECT SCHEDULE.

1.6.6 Closeout

Closeout documents, processes and forms are managed and tracked in RMS by both the Contractor and the Government. Ensure that all closeout documents are entered, completed and documented within RMS.

1.7 IMPLEMENTATION

Use of RMS as described in the preceding paragraphs is mandatory. Ensure that sufficient resources are available to maintain contract data within the RMS system. RMS is an integral part of the Contractor's required management of quality control.

1.8 NOTIFICATION OF NONCOMPLIANCE

Take corrective action within 7 calendar days after receipt of notice of RMS non-compliance by the Contracting Officer.

PART 2 PRODUCTS

Not Used

PART 3 EXECUTION

Not Used

-- End of Section --

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DIVISION 01 - GENERAL REQUIREMENTS

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TEMPORARY CONSTRUCTION FACILITIES AND CONTROLS

05/18

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SECTION 01 50 00

TEMPORARY CONSTRUCTION FACILITIES AND CONTROLS
05/18

PART 1 GENERAL

1.1 REFERENCES

The publications listed below form a part of this specification to the extent referenced. The publications are referred to within the text by the basic designation only.

AMERICAN WATER WORKS ASSOCIATION (AWWA)

AWWA C511	(2017) Reduced-Pressure Principle Backflow Prevention Assembly

FOUNDATION FOR CROSS-CONNECTION CONTROL AND HYDRAULIC RESEARCH (FCCCHR)

FCCCHR List	(continuously updated) List of Approved Backflow Prevention Assemblies

NATIONAL FIRE PROTECTION ASSOCIATION (NFPA)

NFPA 70	(2017; ERTA 1-2 2017; TIA 17-1; TIA 17-2; TIA 17-3; TIA 17-4; TIA 17-5; TIA 17-6; TIA 17-7; TIA 17-8; TIA 17-9; TIA 17-10; TIA 17-11; TIA 17-12; TIA 17-13; TIA 17-14; TIA 17-15; TIA 17-16; TIA 17-17) National Electrical Code
NFPA 241	(2019) Standard for Safeguarding Construction, Alteration, and Demolition Operations

U.S. ARMY CORPS OF ENGINEERS (USACE)

EM 385-1-1	(2014) Safety and Health Requirements Manual

U.S. FEDERAL AVIATION ADMINISTRATION (FAA)

FAA AC 70/7460-1	(2015; Rev L) Obstruction Marking and Lighting

U.S. FEDERAL HIGHWAY ADMINISTRATION (FHWA)

MUTCD	(2015) Manual on Uniform Traffic Control Devices

1.2 SUBMITTALS

Government approval is required for submittals with a "G" designation; submittals not having a "G" designation are for information only. When

used, a designation following the "G" designation identifies the office that will review the submittal for the Government Submit the following in accordance with Section 01 33 00 SUBMITTAL PROCEDURES:

SD-01 Preconstruction Submittals

Construction Site Plan; G

Traffic Control Plan; G

Haul Road Plan; G

SD-07 Certificates

Backflow Tester Certification

Backflow Preventers Certificate of Full Approval

1.3 CONSTRUCTION SITE PLAN

Prior to the start of work, submit a site plan showing the locations and dimensions of temporary facilities (including layouts and details, equipment and material storage area (onsite and offsite), and access and haul routes, avenues of ingress/egress to the fenced area and details of the fence installation. Identify any areas which may have to be graveled to prevent the tracking of mud. Indicate if the use of a supplemental or other staging area is desired. Show locations of safety and construction fences, site trailers, construction entrances, trash dumpsters, temporary sanitary facilities, and worker parking areas.

1.4 BACKFLOW PREVENTERS CERTIFICATE

Certificate of Full Approval from FCCCHR List, University of Southern California, attesting that the design, size and make of each backflow preventer has satisfactorily passed the complete sequence of performance testing and evaluation for the respective level of approval. Certificate of Provisional Approval will not be acceptable.

1.4.1 Backflow Tester Certificate

Prior to testing, submit to the Contracting Officer certification issued by the State or local regulatory agency attesting that the backflow tester has successfully completed a certification course sponsored by the regulatory agency. Tester must not be affiliated with any company participating in any other phase of this Contract.

1.4.2 Backflow Prevention Training Certificate

Submit a certificate recognized by the State or local authority that states the Contractor has completed at least 10 hours of training in backflow preventer installations. The certificate must be current.

PART 2 PRODUCTS

2.1 TEMPORARY SIGNAGE

2.1.1 Bulletin Board

Within one calendar day of mobilization on site and prior to the commencement of work activities, provide a clear weatherproof covered bulletin board not less than 36 by 48 inches in size for displaying the Equal Employment Opportunity poster, a copy of the wage decision contained in the contract, Wage Rate Information poster, Safety and Health Information as required by EM 385-1-1 Section 01 and other information approved by the Contracting Officer. Coordinate requirements herein with 01 35 26 GOVERNMENTAL SAFETY REQUIREMENTS.

2.1.2 Project Identification Signs

The requirements for the signs, their content, and location are as indicated in attachment 01 50 00-A. Erect signs within 15 days after receipt of the notice to proceed. Correct the data required by the safety sign daily, with light colored metallic or non-metallic numerals. Locate minimum of one project identification sign at the project site in a conspicuous place easily accessible to all employees, and in location as approved by the Contracting Officer.

2.1.3 Warning Signs

Post temporary signs, tags, and labels to give workers and the public adequate warning and caution of construction hazards according to the EM 385-1-1 Section 04. Attach signs to the perimeter fencing every 150 feet warning the public of the presence of contruction hazards. Signs must require unauthorized persons to keep out of the construction site. Correct the data required by safety signs daily.

2.2 TEMPORARY TRAFFIC CONTROL

2.2.1 Haul Roads

Construct access and haul roads necessary for proper prosecution of the work under this contract in accordance with EM 385-1-1 Section 04. Construct with suitable grades and widths; sharp curves, blind corners, and dangerous cross traffic are be avoided. Submit haul road plan for approval. Provide necessary lighting, signs, barricades, and distinctive markings for the safe movement of traffic. The method of dust control, although optional, must be adequate to ensure safe operation at all times. Location, grade, width, and alignment of construction and hauling roads are subject to approval by the Contracting Officer. Lighting must be adequate to assure full and clear visibility for full width of haul road and work areas during any night work operations.

2.2.2 Barricades

Erect and maintain temporary barricades to limit public access to hazardous areas. Whenever safe public access to paved areas such as roads, parking areas or sidewalks is prevented by construction activities or as otherwise necessary to ensure the safety of both pedestrian and vehicular traffic barricades will be required. Securely place barricades clearly visible with adequate illumination to provide sufficient visual warning of the hazard during both day and night.

2.3 FENCING

Provide fencing along the construction site and at all open excavations and tunnels to control access by unauthorized personnel. Safety fencing must be highly visible to be seen by pedestrians and vehicular traffic. Specific fencing requirements are as described herein. All fencing will meet the requirements of EM 385-1-1.

2.3.1 Polyethylene Mesh Safety Fencing

Temporary safety fencing must be a high visibility orange colored, high density polyethylene grid, a minimum of 48 inches high and maximum mesh size of 2 inches. Fencing must extend from the grade to a minimum of 48 inches above the grade and be tightly secured to T-posts spaced as necessary to maintain a rigid and taut fence. Fencing must remain rigid and taut with a minimum of 200 pounds of force exerted on it from any direction with less than 4 inches of deflection.

2.3.2 Chain Link Panel Fencing

Temporary panel fencing must be galvanized steel chain link panels 6 feet high. Multiple fencing panels may be linked together at the bases toform long spens as needed. Each panel base must be weighted down using sand bags or other suitable materials in order for the fencing to withstand anticipated winds while remaining upright. Fencing must remain rigid and taut with a minimum of 200 pounds of force exerted on it from any direction with less than 4 inches of deflection.

2.3.3 Post-Driven Chain Link Fencing

Temporary post-driven fencing must be galvanized chain link fencing 6 feet high supported by an tightly secured to galvanized steel posts driven below grade. Fence posts must be located on minimum 10 foot centers. Posts may be set in various sufaces such as sand, soil, ashpalt or concrete as necessary. Chain link fencing must remain rigid and taut with a minimum of 200 pounds of force exerted on it from any direction with less than 4 inches of deflection. Fencing and posts must be completely removed at the completion of construction and any surfaces disturbed or damaged must be restored to its original condition. Underground utilities must be located and identified prior to setting fence posts. Fence must be equipped with a lockable gate. Gate must remain locked when construction personnel are not present.

2.4 TEMPORARY WIRING

Provide temporary wiring in accordance with EM 385-1-1 Section 11, NFPA 241 and NFPA 70. Include monthly inspection and testing of all equipment and apparatus.

2.5 BACKFLOW PREVENTERS

Reduced pressure principle type conforming to the applicable requirements AWWA C511. Provide backflow preventers complete with 150 pound flanged cast iron, bronze mounted gate valve and strainer, 304 stainless steel or bronze, internal parts.

PART 3 EXECUTION

3.1 EMPLOYEE PARKING

Construction contract employees will park privately owned vehicles in an area designated by the Contracting Officer. This area will be within reasonable walking distance of the construction site. Employee parking must not interfere with existing and established parking requirements of the government installation.

3.2 TEMPORARY BULLETIN BOARD

Locate the bulletin board at the project site in a conspicuous place easily accessible to all employees, as approved by the Contracting Officer.

3.3 AVAILABILITY AND USE OF UTILITY SERVICES

3.3.1 Temporary Utilities

Provide temporary utilities required for construction. Materials may be new or used, must be adequate for the required usage, not create unsafe conditions, and not violate applicable codes and standards.

3.3.2 Sanitation

a. Provide and maintain within the construction area minimum field-type sanitary facilities approved by the Contracting Officer and periodically empty wastes into a municipal, district, or station sanitary sewage system, or remove waste to a commercial facility. Obtain approval from the system owner prior to discharge into any municipal, district, or commercial sanitary sewer system. Any penalties or fines associated with improper discharge will be the responsibility of the Contractor. Coordinate with the Contracting Officer and follow station regulations and procedures when discharging into the station sanitary sewer system. Maintain these conveniences at all times. Include provisions for pest control and elimination of odors. Government toilet facilities will not be available to Contractor's personnel.

3.3.3 Telephone

Make arrangements and pay all costs for telephone facilities desired.

3.3.4 Obstruction Lighting of Cranes

Provide a minimum of 2 aviation red or high intensity white obstruction lights on temporary structures (including cranes) over 100 feet above ground level. Light construction and installation must comply with FAA AC 70/7460-1. Lights must be operational during periods of reduced visibility, darkness, and as directed by the Contracting Officer.

3.3.5 Fire Protection

Provide temporary fire protection equipment for the protection of personnel and property during construction. Remove debris and flammable materials daily to minimize potential hazards.

3.4 TRAFFIC PROVISIONS

3.4.1 Maintenance of Traffic

a. Conduct operations in a manner that will not close any thoroughfare or interfere in any way with traffic on railways or highways except with written permission of the Contracting Officer at least 15 calendar days prior to the proposed modification date, and provide a Traffic Control Plan detailing the proposed controls to traffic movement for approval. The plan must be in accordance with State and local regulations and the MUTCD, Part VI. . Contractor may move oversized and slow-moving vehicles to the worksite provided requirements of the highway authority have been met.

b. Conduct work so as to minimize obstruction of traffic, and maintain traffic on at least half of the roadway width at all times. Obtain approval from the Contracting Officer prior to starting any activity that will obstruct traffic.

c. Provide, erect, and maintain, at contractors expense, lights, barriers, signals, passageways, detours, and other items, that may be required by the Life Safety Signage, overhead protection authority having jurisdiction.

3.4.2 Protection of Traffic

Maintain and protect traffic on all affected roads during the construction period except as otherwise specifically directed by the Contracting Officer. Measures for the protection and diversion of traffic, including the provision of watchmen and flagmen, erection of barricades, placing of lights around and in front of equipment the work, and the erection and maintenance of adequate warning, danger, and direction signs, will be as required by the State and local authorities having jurisdiction. Protect the traveling public from damage to person and property. Minimize the interference with public traffic on roads selected for hauling material to and from the site. Investigate the adequacy of existing roads and their allowable load limit. Contractor is responsible for the repair of any damage to roads caused by construction operations.

3.4.3 Rush Hour Restrictions

Do not interfere with the peak traffic flows preceding and during normal operations without notification to and approval by the Contracting Officer.

3.4.4 Dust Control

Dust control methods and procedures must be approved by the Contracting Officer. Coordinate dust control methods with 01 57 19 TEMPORARY ENVIRONMENTAL CONTROLS.

3.5 GOVERNMENT FIELD OFFICE

3.5.1 Resident Engineer's Office

Provide the Government Resident Engineer with an office. Required office space shall include approximately 600 square feet for the exclusive use of the Government with power, water, appropriate office furniture, internet access, heat and air-conditioning, and perform any necessary maintenance. Provide one portable toilet and regular sanitation services as needed or,

if available, a trailer with a standard restroom and all appropriate connections.

(1) The office shall have a minimum of one window with operable window blinds. Two 3-foot x 5-foot desks and two 3-foot x 5-foot plans tables. The desks shall have side drawers and a lockable center drawer, for a minimum of five drawers. The plans tables shall have one central drawer. Provide two five-wheeled, padded, ergonomic desk chair for each desk. The office shall have two four-legged, padded "Guest Chairs" similar to the Ergonomic Swivel Chairs and roller mat. The office shall be furnished with a 12-inch x 18-inch x 6-foot metal locker with a shelf, coat hanger rod, and three clothes hooks. Provide one ten-pound, multi-purpose, dry chemical fire extinguishers, rated for type A, B and C fires. Mount extinguisher at a strategic location, coordinated with the Contracting Office. One shelf, 12 inches x 24 inches, mounted on wall within 18 inches of punch down block. Provide one minimum 3-foot x 4-foot whiteboard. Provide one walk-off mat at each building entrance. A water cooler shall be provided for drinking water along with 10 gallons of filtered drinking water per week.

(2) Connected, working electrical and communications outlets shall be provided for each office area and the conference room. Telephone service shall be provided for the duration of time that the Contractor provides telephone service for himself. The Government will pay only charges for long distance calls made by Government personnel. Provide commercially-dedicated and static dual T-1 circuit with 3MB minimum of dedicated bandwidth (for Government use only); dynamic service circuits are not to be provided to government users.

(3) Provide janitorial services for the field office trailer, once per week, which will include consumable supplies for the restroom.

(4) Provide one refrigerator/freezer (minimum 18 cf), one 16" x 16" bowel sink with cold and hot water in 6' long counter top and base cabinets, one paper towel dispenser, one liquid hand soap dispenser, and one garbage can. Provide regular supply of paper towels and liquid hand soap. The contractor shall be responsible for maintenance and repair of all break room equipment.

(5) Provide adequate parking for 3 cars.

(6) The office, electrical, communication, parking and gravel sidewalks shall be ready for occupancy prior to the start of any onsite construction activity. The office and furnishings will remain the property of the Contractor. The Contractor shall be responsible for installing all utility hookups, tie downs, skirting, slabs, foundations, steps and landings to meet all local, county, state and Federal codes and regulations. Upon completion of the project, the trailer shall be removed from the site, all utilities and site improvements associated with the office shall be removed, and the site restored to match surrounding conditions.

3.6 PLANT COMMUNICATIONS

Whenever the individual elements of the plant are located so that operation by normal voice between these elements is not satisfactory, install a satisfactory means of communication, such as telephone or other suitable devices and make available for use by Government personnel.

3.7 TEMPORARY PROJECT SAFETY FENCING

As soon as practicable, but not later than 15 days after the date established for commencement of work, furnish and erect temporary project safety fencing at the work site. Maintain the safety fencing during the life of the contract and, upon completion and acceptance of the work, removefrom the work site.

3.8 CLEANUP

Remove construction debris, waste materials, packaging material and the like from the work site daily. Any dirt or mud which is tracked onto paved or surfaced roadways must be cleaned away. Store any salvageable materials resulting from demolition activities within the fenced area described above or at the supplemental storage area. Neatly stack stored materials not in trailers, whether new or salvaged.

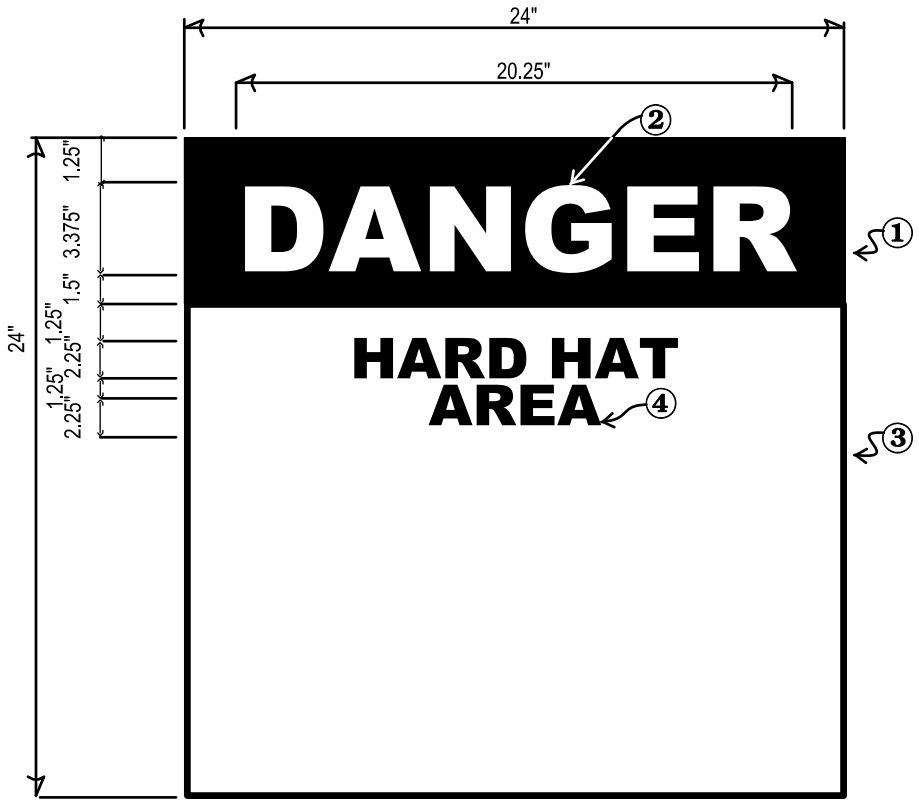
3.9 RESTORATION OF STORAGE AREA

Upon completion of the project remove the bulletin board, signs, barricades, haul roads, and any other temporary products from the site. After removal of trailers, materials, and equipment from within the fenced area, remove the fence. Restore areas used during the performance of the contract to the original or better condition. Remove gravel used to traverse grassed areas and restore the area to its original condition, including top soil and seeding as necessary.

-- End of Section --

ATTACHMENT 01 50 00-A

PROJECT AND SAFETY SIGNS



- SIGN SHALL BE FABRICATED FROM .125 THICK 6061-T6 ALUMINUM PANEL
- COLOR
    1. SAFETY RED (SR)
    2. WHITE
    3. WHITE
    4. BLACK
- LETTERING SHALL BE HELVETICA BOLD TYPOGRAPHY.
- LETTERS AND BACKGROUND SHALL BE REFLECTIVE SHEETING MATERIAL.
- SIGNS SHALL BE POSTED AT 6'-6" (BOTTOM SIGN TO GRADE) OR AS DIRECTED BY THE CONTRACTING OFFICER.
- LETTERING TO BE CENTERED ON PANEL.

The use of signs to identify Corps managed or supervised design, construction, and rehabilitation projects - both for military and civil works - is an important part of efforts to keep the public informed of Corps work. For this purpose, a construction project sign package has been adopted. This package consists of two signs: one for project identification and the other to show on-the-job safety performance of the contractor.

These two signs are to be displayed side by side and mounted for reading by passing viewers. Exact placement location will be designated by the contracting officer's representative.

The panel sizes and graphic formats have been standardized for visual consistency throughout all Corps operations.

Panels are fabricated using HDO plywood or aluminum with dimensional lumber uprights and bracing. The sign faces are nonreflective vinyl.

All legends are to be die-cut or computer-cut in the sizes and typefaces specified and applied to the white panel background following the graphic formats shown on pages 16-2 and 16-3. The Communication Red panel on the left side of the construction project sign with Corps Signature (reverse version) is screen-printed onto the white background.

A display of these two signs is shown on the following two pages. Mounting and fabrication details are provided on page 16-4.

Special applications or situations not covered in these guidelines should be referred to the district Sign Program Manager.

Below are two samples of the Construction Project Identification sign showing how this panel is adaptable for use to identify either military (top) or civil works projects (bottom). The graphic format for this 4'x 6' sign panel follows the legend guidelines and layout as specified below. The large 4'x 4' section of the panel on the right is to be white with black legend. The 2'x 4' section of the sign on the left with the full Corps Signature (reverse version) is to be screen-printed Communication Red on the white background The designation of a sponsor in the area indicated is optional with Military or Civil Works construction signs. Signs may list one sponsoring entity. If agreement on a sponsor designation cannot be achieved, the area should be left blank.

This sign is to be placed with the Safety Performance sign shown on the following page. Mounting and fabrication details are provided on page 16-4.

Special applications or situations not covered in these guidelines should be referred to the district Sign Program Manager.

Legend Group 1: One- to two-line description of Corps relationship to project.
Color: White
Typeface: 1.25" Helvetica Regular
Maximum line length: 19"

Legend Group 2: Division or District Name (optional). Placed below 10.5" reverse Signature (6" Castle).
Color: White
Typeface: 1.25" Helvetica Regular

Legend Group 2a: One- to three-line identification of Military or Civil Works sponsor (optional). Place below Corps Signature to cross-align with Group 5a-b.
Color: White
Typeface: 1.25" Helvetica Regular
Maximum line length: 19"

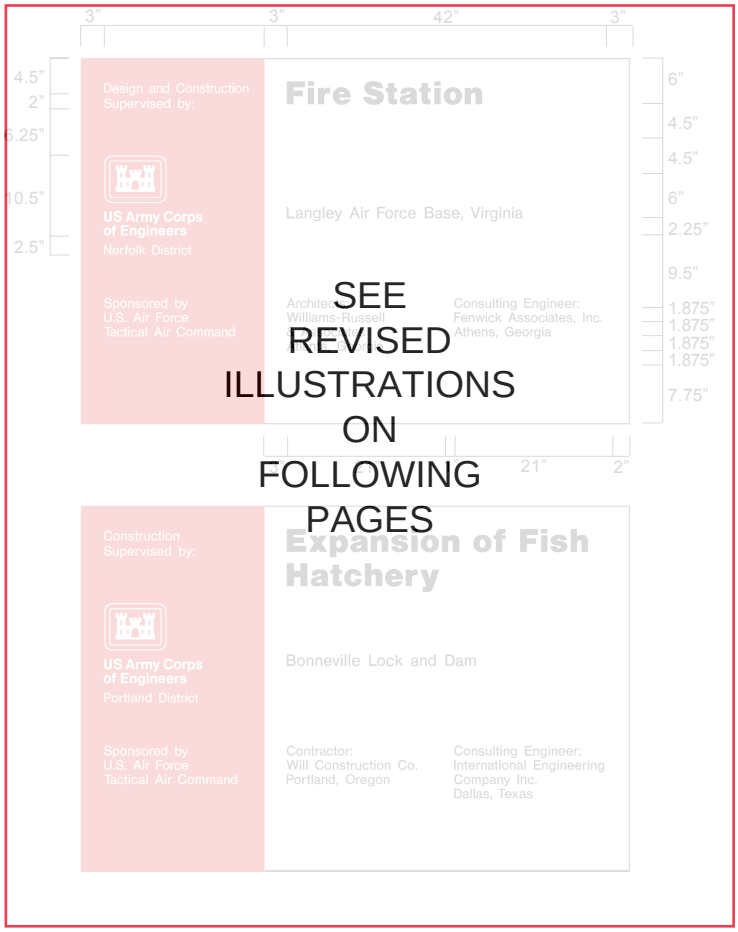
Legend Group 3: One- to three-line project title legend describes the work being done under this contract.
Color: Black
Typeface: 3" Helvetica Bold
Maximum line length: 42"

Legend Group 4: One- to two-line identification of project or facility (civil works) or name of sponsoring department (military).
Color: Black
Typeface: 1.5" Helvetica Regular
Maximum line length: 42"

Cross-align the first line of Legend Group 4 with the first line of the Corps Signature (US Army Corps) as shown.

Legend Groups 5a-b: One- to five-line identification of prime contractors including: type (architect, general contractor, etc.), corporate or firm name, city, state. Use of Legend Group 5 is optional.
Color: Black
Typeface: 1.25" Helvetica Regular
Maximum line length: 21"

All typography is flush left and rag right, upper and lower case with initial capitals only as shown. Letter- and word-spacing to follow Corps standards as specified in Appendix D.

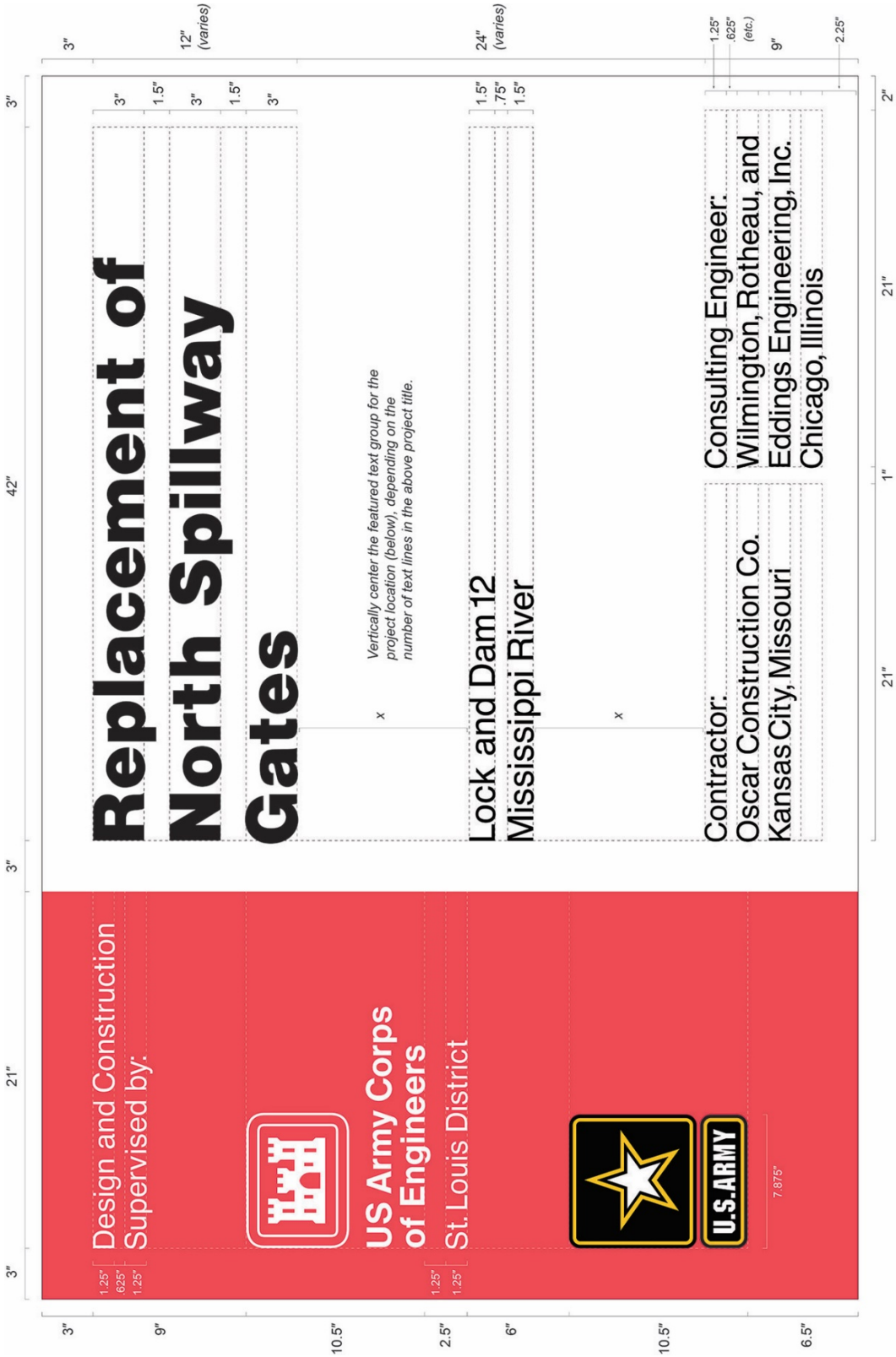


SEE REVISED ILLUSTRATIONS ON FOLLOWING PAGES

Sign Type	Legend Size (A)	Panel Size	Post Size	Specification Code	Mounting Height	Color Bkg/Lgd
CID-01	various	4'x6'	4"x4"	HDO-3	48"	WH-RD/BK

ATTACHMENT A: Example Graphic of Signage with Dimensions for MILCON Project

ATTACHMENT B: Example Graphic of Signage with Dimensions for Civil Works Project



Each contractor's safety record is to be posted on Corps managed or supervised construction projects and mounted with the Construction Project Identification sign specified on page 16-2.

The graphic format, color, size and typefaces used on the sign are to be reproduced exactly as specified below. The title with First Aid logo in the top section of the sign, and the performance record captions are standard for all signs of this type. Legend groups 2 and 3 below identify the project and the contractor and are to be placed on the sign as shown.

Safety record numbers are mounted on individual metal plates and are screw-mounted to the background to allow for daily revisions to posted safety performance record.

Special applications or situations not covered in these guidelines should be referred to the district Sign Program Manager.

Legend Group 1: Standard two-line title "Safety is a Job Requirement" with 8" (outside diameter) Safety Green first aid logo.
Color: To match Pantone system 347
Typeface: 3" Helvetica Bold
Color: Black

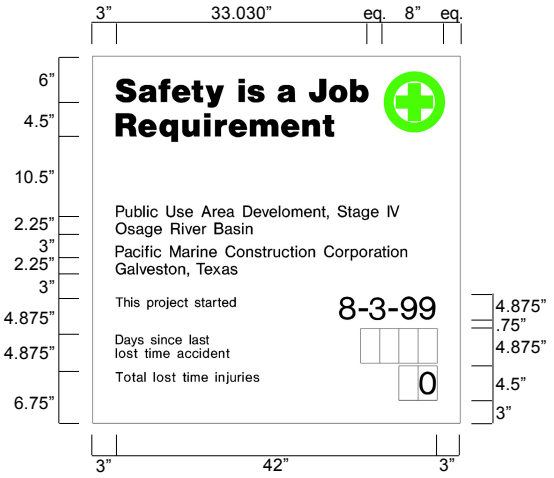
Legend Group 2: One- to two-line project title legend describes the work being done under this contract and name of host project.
Color: Black
Typeface: 1.5" Helvetica Regular
Maximum line length: 42"

Legend Group 3: One- to two-line identification: name of prime contractor and city, state address. Color: Black
Typeface: 1.5" Helvetica Regular
Maximum line length: 42"

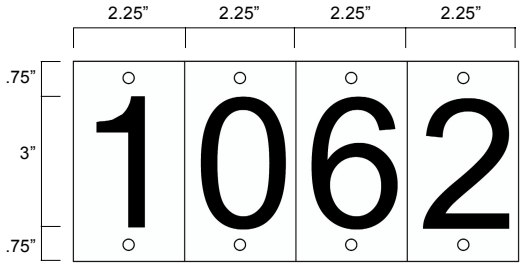
Legend Group 4: Standard safety record captions as shown.
Color: Black
Typeface: 1.25" Helvetica Regular

Replaceable numbers are to be mounted on white .060 aluminum plates and screw-mounted to background.
Color: Black
Typeface: 3" Helvetica Regular
Plate size: 2.5" x 4.5"

All typography is flush left and rag right, upper and lower case with initial capitals only as shown. Letter- and word-spacing to follow Corps standards as specified in Appendix D.



Sign Type	Legend Size (A)	Panel Size	Post Size	Specification Code	Mounting Height	Color Bkg/Lgd
CID-02	various	4'x4'	4"x4"	HDO-3	48"	WH/BK-SG



Fabrication and Mounting Guidelines

All Construction Project Identification signs and Safety Performance signs are to be fabricated and installed as described below. The signs are to be erected at a location designated by the contracting officer representative and shall conform to the size, format, and typographic standards shown on pages16-2 and 16-3. Detailed specifications for HDO plywood panel preparation are provided in Appendix B.

Shown below the mounting diagram is a panel layout grid with spaces provided for project information. Photocopy this page and use as a worksheet when preparing sign legend orders.

For additional information on the proper method to prepare sign panel graphics, contact the district Sign Program Manager.

The sign panels are to be fabricated from .75" High Density Overlay Plywood. Panel preparation to follow HDO specifications provided in Appendix B.

Sign graphics to be prepared on a white nonreflective vinyl film with positionable adhesive backing.

All graphics except for the Communication Red background with Corps Signature on the project sign are to be die-cut or computer-cut nonreflective vinyl, prespaced legends prepared in the sizes and typefaces specified and applied to the background panel following the graphic formats shown on pages 16-2 and 16-3.

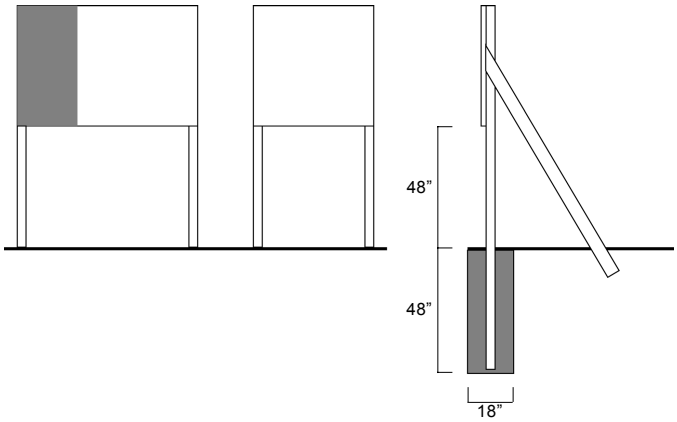
The 2'x 4' Communication Red panel (to match Pantone system 032) with full Corps Signature (reverse version) is to be screen-printed on the white background. Identification of the district or division may be applied under the signature with white cut vinyl letters prepared to Corps standards.

Drill and insert six (6) .375" T-nuts from the front face of the HDO sign panel. Position holes as shown. Flange of T-nut to be flush with sign face.

Apply graphic panel to prepared HDO plywood panel following manufacturers' instructions.

Sign uprights to be structural grade 4" x 4" treated Douglas Fir or Southern Yellow Pine, No.1 or better. Post to be 12' long. Drill six (6) .375" mounting holes in uprights to align with T-nuts in sign panel. Countersink (.5") back of hole to accept socket head cap screw (4" x .375").

Assemble sign panel and uprights. Imbed assembled sign panel and uprights in 4' hole. Local soil conditions and/or wind loading may require bolting additional 2" x 4" struts on inside face of uprights to reinforce installation as shown.



Construction Project Identification Sign
Legend Group 1: Corps Relationship

1. _____
2. _____

Legend Group 2: Division/District Name

1. _____
2. _____

Legend Group 2a: Military/Civil Works Sponsor

1. _____
2. _____

Legend Group 3: Project Title

1. _____
2. _____
3. _____

Legend Group 4: Facility Name

1. _____
2. _____

Legend Group 5: Contractor/A&E

1. _____
2. _____
3. _____
4. _____
5. _____

Legend Group 5b: Contractor/A&E

1. _____
2. _____
3. _____
4. _____
5. _____

Safety Performance Sign
Legend Group 2: Project Title

1. _____
2. _____

Legend Group 3: Contractor/A&E

1. _____
2. _____

SECTION TABLE OF CONTENTS

DIVISION 01 - GENERAL REQUIREMENTS

SECTION 01 56 00

CARE AND DIVERSION OF WATER

-- End of Section Table of Contents --

SECTION
01 56 00

CARE AND DIVERSION OF WATER

PART 1 GENERAL

1.1 SCOPE

The Yakima River is designated as a class AA surface water body by the Washington State Department of Ecology. It is of vital importance to protect these resources from contamination. This section describes the requirements for the diversion, collection, and conveyance of waters generated by construction processes, seepage, dewatering, precipitation, or any other controllable waters falling onto or diverted around the construction site or waste and spoils areas.

The Contractor shall be responsible for the care and diversion (C&D) of any water required during construction for the duration of the contract. This includes design, fabrication and/or construction of diversions, cofferdams, dewatering systems, temporary fish passage, fish exclusion, and any other necessary supporting features to protect fish and water quality during construction. Furnish all labor, equipment, and materials necessary for the construction, unless otherwise indicated.

1.2 PUBLICATIONS

1.2.1 REFERENCES

The publications listed below form a part of this specification to the extent referenced. The publications are referred to within the text by the basic designation only.

U.S. ARMY CORPS OF ENGINEERS (USACE)

EM 385-1-1	(2014) Safety and Health Requirements Manual
USACE Fish Rescue	(2016) Report on Fish Rescue Effort along the White River for Unscheduled Repair of the Barrier

NATIONAL MARINE FISHERIES SERVICE (NMFS)

NMFS Biological Opinion	(2017) Endangered Species Act Section 7(a)(2) Biological Opinion, and Magnuson-Stevens Fishery Conservation and Management Act Essential Fish Habitat Response for the Yakima River Gap to Gap Ecosystem Restoration Project, Yakima County, Washington (included as Attachment Bto 01 57 19)
NMFS Electrofishing Protocol	(2000) Guidelines for Electrofishing Waters Containing Salmonids Listed Under

the Endangered Species Act (SEE 01 57 19-C)

U.S. FISH AND WILDLIFE SERVICE (USFWS)

USFWS Fish Rescue	(2012) Washington Fish and Wildlife Office U. S. Fish and Wildlife Service Recommended Fish Exclusion, Capture, Handling, and Electroshocking Protocols and Standards

WASHINGTON STATE DEPARTMENT OF ECOLOGY (WSDE)

SMMEW	Stormwater Management Manual for Eastern Washington
WQC Order #20108	(2021) Washington State Department of Ecology Water Quality Certification, Yakima River Gap to Gap Ecosystem , Yakima, County, WA (included as Attachment A to 01 57 19)

1.2.2 Applicable Regulations

Comply with the most current version of the following list of environmental regulations where applicable. This list is not inclusive of all environmental laws and regulations, but represents those that are most likely to apply to work under this Contract.

Clean Water Act/Federal Water Pollution Control Act:

a. Section 401 as implemented by regulations including, but not limited to 40 CFR 121 and applicable State regulations.

b. Section 402 as implemented by regulation including, but not limited to 40 CFR 110-113, 116-117, and 121-131.

c. Section 404 as implemented by regulations including, but not limited to 33 CFR 320-330, 332, 335-338.

1.3 SUBMITTALS

Government approval is required for submittals with a "G" designation; submittals not having a "G" designation are for information only. When used, a designation following the "G" designation identifies the office that will review the submittal for the Government. The following shall be submitted in accordance with Section 01 33 00 SUBMITTAL PROCEDURES:

SD-01 Preconstruction Submittals

Care and Diversion Work Plan; G,DO

Evacuation Plan; G,DO

In-Water Safety Plan

SD-02 Shop Drawings

Shop Drawings; G,DO

SD-05 Design Data

Design Calculations; G,DO

1.4 GENERAL INFORMATION

1.4.1 General

This section covers any care and diversion of water systems used for completion of the in-water portion of work in this Contract. The temporary care and diversion of water systems shall be designed, fabricated, and/or constructed by the Contractor. See Section 01 57 19 TEMPORARY ENVIRONMENTAL CONTROLS and the requirements for a Stormwater Pollution Prevention Plan for additional requirements. Also see EARTHWORK for specific requirements related to construction of the Newland Pond berms.

1.4.2 Historical Flow Data

The construction site is located on the Yakima River between the Naches River confluence and Union Gap. Streamflows are the Parker gage downstream are very similar to those at Union Gap. Observed historical river flows at Union Gap are available on the USGS website:

https://waterdata.usgs.gov/nwis/uv?site_no=12500450

Streamflows are influenced by upstream reservoir regulation and diversions by the U.S. Bureau of Reclamation who operates several stream gages on tributaries such as the Naches River:
https://www.usbr.gov/pn/hydromet/yakima/rtindex/yakflows.html

10-day foreceasted precipitation and streamflows in the basin are provided by the National Weather Service River Forecast Center.
https://www.nwrfc.noaa.gov/rfc/.

High resolution weather forecast data (precipitation, temperature, etc.) is available at https://a.atmos.washington.edu/wrfrt/gfsinit.html

1.4.2.1 Water Elevations and Flooding

Site water levels fluctuate with the elevation of the Yakima River. Some work areas are above the seasonal groundwater table while others are below it. Soils are gravelly and generally free draining. Flood risk is lowest July through October. The driest (lowest groundwater table) time of year is October. Streamflows can also be very low during extended cold spells, however these periods can include severe flooding (February 1996). Refer to historical online aerial imagery, project topopgraphic data for typical inundation and vegeation in work areas during non-flood periods. Water surface profiles for 2019 channel conditions can be provided upon request to aid contractor care and diversion work plan development however these do not provide accurate estimates of water levels landward of levees.

Refer to Attachment 01 56 00-B for tables of estimated water surface elevations at key locations along the Yakima River to aid in planning construction activities. The contractor is reposible for monitoring site conditions and establishing relationships between streamflow at the gage and local water surface elevations if such information is needed to conduct construction activities.

1.4.3 In-Water Work Defined

Perform all in-water work activities during the in-water work (IWW) window. In-water work is any work below the wetted perimeter including crossing wetted stream channels that have a surface water connection to the Yakima River. Work may be conducted any time above the wetted perimeter, or when the stream bed is dry, or if the waterbody or wetland has no surface water connection to the Yakima River (e.g. isolated gravel pits). The requirements for in-water activities are described in the WQC Order #20108 and the 2017 NMFS Biological Opinion See Section 01 57 19 TEMPORARY ENVIRONMENTAL CONTROLS for in-water work window.
.

1.5 CARE AND DIVERSION WORK PLAN

Submit a detailed Care and Diversion Work Plan (C&D Work Plan) showing the proposed method(s) and design of facilities for care and diversion of water during construction. The C&D Work Plan shall include detailed drawings and calculations designed and/or reviewed by a licensed professional engineer. Submit the C&D Work Plan within 30 days of Notice to Proceed.

a. Include any/all diversion, cofferdam, dewatering systems, temporary fish passage, fish exclusion and supporting features including description of design, construction, operation, sequencing, schedule, performance monitoring and removal. See Paragraph DESIGN REQUIREMENTS below.

b. Coordinate Newland Pond care and diversion work plan elements with requirements of EARTHWORK section 2.3.2.1.

c. Include a list of equipment to be used (for example, excavators, cranes, drill rig size and type) and a list of applicable equipment operator qualifications.

d. The C&D Work Plan shall include, but is not limited to, water crossings, diversion, cofferdam, dewatering system, temporary fish passage, fish exclusion, and supporting features locations, dimensions, materials, design calculations, and sufficient detail to verify compliance with design requirements in this specification.

e. The C&D Work Plan shall completely address installation, operation, transitions, maintenance, and removal of the temporary structures and features including backfilling and compacting of excavation work, restoration of channel, restoration of vegetated areas, and restoration of wetlands disturbed during construction.

f. The C&D Work Plan shall meet the requirements found in the WQC Order # 20108 and 2017 NMFS Biological Opinion.

g. C&D phasing and temporary features shall be incorporated into the project schedule required in Section 01 32 01.00 10 PROJECT SCHEDULE. The schedule shall clearly identify temporary construction features and IWW activities including start and finish dates. At a minimum, the following features shall be specifically addressed in the schedule: cofferdams, water crossings, fish exclusion, and

restoration.

h. Review, accept, and incorporate the attached water quality monitoring plan into the C&D Work Plan. See Attachment 01 57 19-A *Water Quality Certification Monitoring Plan*.

i. No work associated with the C&D Work Plan shall start until the plan is approved by the Government, which will include review and approval by the Washington State Department of Ecology. Nothing in this specification shall relieve the Contractor from full responsibility for the adequacy of the C&D Work Plan.

j. C&D Work Plan will include a schedule of planned construction activities with historical ranges of river flows for the proposed work period(s). For any penetration of a flood control levee that is not mitigated with a containment berm or setback levee (that maintains the existing level of protection) work shall be scheduled outside of flood season (July through October). The plan will also include contingencies in the event that high water is predicted during the "non flood" work window. For any construction activities that occur during the flood season (November through June) indicate in the work plan diversion methods that will be used to maintain the existing level of flood protection.

1.5.1 Changes

All subsequent changes to the C&D Work Plan by the Contractor shall be approved by the Contracting Officer's Representative (COR) prior to implementation.

1.6 EVACUATION PLAN

Prepare and submit an Evacuation Plan prior to any activities taking place in the river. The Evacuation Plan shall contain a phone list that includes, but is not limited to, these staff: key Contractor personnel, the Government Quality Assurance Representative (GQAR), and the Contracting Officer's Representative. It is still the responsibility of the Contractor to monitor river flows and weather. Include the individuals listed above in weekly coordination meetings with the Government.

1.7 IN-WATER SAFETY PLAN

The Contractor shall be responsible for developing and implementing a plan that describes measures to be used to protect worker safety around flowing water and other water bodies. Work shall be done in accordance with EM 385-1-1.

1.8 SHOP DRAWINGS

Submit all shop drawings needed to show diversion, cofferdam, dewatering systems, and supporting features.

1.9 DESIGN CALCULATIONS

Submit all design criteria and calculations used for design of the diversion, cofferdam, dewatering systems, temporary fish passage, fish exclusion, and supporting features. Include calculations, sketches, and layout drawings as needed to show how the systems work including

hydraulics through temporary fish passage and the fish barrier.

PART 2 PRODUCTS

2.1 MATERIALS AND EQUIPMENT

Provide all materials, equipment, and labor for diversion, dewatering, temporary fish passage, and supporting facilities to the extent required for performing the contract work in accordance with the care and diversion of water plans. Provide sufficient standby pumps and auxiliary equipment to prevent any interruption of pumping operations during breakdown and maintenance periods.

PART 3 EXECUTION

The Contractor shall be responsible for the selection of suitable method(s), design, installation, and operations of the systems required during the performance of the work under these specifications.

3.1 DESIGN OF TEMPORARY SYSTEMS

a. Temporary diversion, cofferdam, dewatering systems, temporary fish passage, and supporting features shall be designed by a licensed professional civil engineer with at least 10 years of experience in the design, installation, and operation of systems of comparable complexity and similar geologic conditions. Designs shall meet the requirements of the publications listed in Paragraph REFERENCES above.

b. Control, by acceptable means, all water regardless of source, and treatment and disposal of the water. Confine all discharge piping and/or ditches to the available easement.

c. Complete all C&D activities and temporary facilities for construction within the provided construction limits.

3.2 DESIGN REQUIREMENTS

This section covers the functional requirements that must be addressed in the C&D Work Plan.

3.2.1 Environmental Requirements

Care and Diversion of Water activities shall be in compliance with Section 01 57 19 TEMPORARY ENVIRONMENTAL CONTROLS.

3.2.2 River Flows

a. See Paragraph HISTORICAL FLOW DATA above.

b. The Contractor is responsible for managing sediment and debris through the construction site.

c. Provide all necessary scour protection for temporary facilities and partially constructed features of the proposed facility.

3.2.3 Stormwater and Seepage

Employ ditches, swales, berms, sand bag walls, sumps, pumps, and other means to collect all stormwater and seepage and convey it away from

disturbed areas to the extent practicable. Direct all stormwater and seepage water in contact with disturbed areas away from the Yakima River wherever practical, and filter it to the extent practicable before entering the river. Use silt fences and straw bale check dams in conjunction with ditches, swales, and berms. Alternate methods designed by the Contractor and approved by the Contracting Officer may be used to direct runoff if soil conditions, topography, or other physical constraints prevent the use of methods shown on the drawings.

3.2.4 Utilities

The Contractor shall be responsible for utilities necessary for construction activities including, but not limited to: power, water, sewer, communications, and compressed air.

3.3 CONSTRUCTION OF TEMPORARY SYSTEMS

a. Construct and maintain necessary cofferdams, diversions, dewatering systems, and supporting features for the care and diversion of the river and surface water including all features necessary to accommodate the site constraints. The temporary systems shall be constructed using a method approved by the COR.

b. Information regarding the subcontractors to be used, along with their experience and qualifications, shall be included in the qualifications and project experience section of the C&D Work Plan. The same experience and qualification requirements apply to the dewatering and drilling subcontractors.

c. Construction of the temporary diversion, dewatering, or fish passage systems shall not begin until the Government has approved the C&D Work Plan and all the required submittals, data calculations, and design. The data calculations shall include sketches and layout drawings as needed to show how the systems work. Approval shall not relieve the Contractor of the responsibility to satisfactorily complete the work.

3.4 WATER DIVERSION ACTIVITIES

Design, provide, and maintain water diversion as necessary for construction in the Yakima River or any other flowing waters.

3.4.1 River Flows

The Contractor shall be responsible for monitoring the weather and river flows, and for managing river flow through the construction site 24 hours a day, seven days a week throughout construction according to the approved C&D Work Plan and the WQC Order #20108.

-- End of Section --

Yakima River Hydrology Information

The City of Yakima WA is arid experiencing 25% of the rainfall typical of cities in western Washington state (8 inches per year). The wettest months are November through January. The driest months are July and August. Yakima average high and low temperatures range from 63 F to 36 F annually with extremes ranging from 110 F to -25F. More than 20 inches of snowfall occurs annually. Climate data source: https://en.wikipedia.org/wiki/Yakima,_Washington#Climate

The Yakima River in the project reach is fed by both the Yakima and Naches Rivers and agricultural canals that divert water to and from the river. The average annual discharge between 1966 and 2019 ranges from 1800 to 6600 cubic feet per second (cfs). The river reaches maximum discharge in the late fall and winter in response to intense rainstorms originating from the Pacific Ocean. The maximum recorded discharge is 53,300 cfs associated with the February 1996 flood event. While snow melt or frozen ground is a component of flooding it is not necessary for large floods to occur. While the river also experiences its highest daily average flows in the spring snowmelt season, upstream dams store much of this runoff for agricultural uses, releasing this water in the summer and fall for downstream irrigators. Flows typically remain elevated above natural base flows until late October. In the event of widespread outbreak of arctic air, the project area can freeze for days or weeks at a time, and runoff can diminish to a level that flows are similar to October minimums. This occurs infrequently. Flows are measured by the USGS at the gage near Union Gap (https://waterdata.usgs.gov/nwis/uv?site_no=12500450). Average daily flows are shown in Table 1. Figure 1 shows the variability by day over the period of record. Figure 2 shows the percent chance a flow is exceeded in any day in a year.

These flow rates can be used to provide estimated water levels in the project reach. Upon request the Government can provide estimates of seasonal water levels at specific locations along the river from hydraulic models, however more reliable estimates of local water levels can be obtained by installing a monitoring station and relating water elevations to measured river discharge.

Shallow groundwater fed by surface water is present throughout the project area and no monitoring wells are present to provide seasonal elevations. Because of the deep gravelly soils, water levels in ditches, ponds, and channels provide an indication of groundwater elevations near these locations.

Table 1: Mean daily flows for the Yakima River

00060, Discharge, cubic feet per second,												
Day of month	Mean of daily mean values for each day for water year of record in, ft3/s (Calculation Period 1966-10-01 -> 2020-09-30)											
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1	2,410	3,450	3,540	4,420	5,480	6,450	4,410	3,390	2,950	2,250	1,790	2,490
2	2,410	3,260	3,420	4,370	5,500	6,420	4,250	3,410	2,920	2,130	1,750	2,920
3	2,400	3,090	3,410	4,280	5,530	6,560	4,100	3,410	2,860	2,040	1,740	3,260
4	2,430	3,030	3,420	4,240	5,520	6,650	4,020	3,400	2,840	2,020	1,740	3,050
5	2,560	3,020	3,470	4,220	5,590	6,690	4,030	3,390	2,800	1,980	1,770	2,880
6	2,670	3,070	3,620	4,370	5,750	6,630	3,920	3,400	2,810	1,950	1,780	2,640
7	2,660	3,250	3,650	4,490	5,860	6,540	3,820	3,430	2,780	1,930	1,980	2,570
8	3,220	3,570	3,520	4,590	5,960	6,390	3,790	3,440	2,770	1,910	2,030	2,450
9	3,220	3,800	3,530	4,700	6,010	6,130	3,810	3,420	2,760	1,920	1,890	2,680
10	3,000	3,510	3,760	4,750	5,990	5,930	3,790	3,390	2,740	1,910	1,870	2,790
11	2,930	3,330	3,830	4,730	6,030	5,740	3,770	3,390	2,690	1,900	1,880	2,660
12	2,750	3,210	3,890	4,720	6,160	5,480	3,740	3,360	2,650	1,870	1,920	2,630
13	2,630	3,140	4,150	4,780	6,230	5,430	3,730	3,340	2,620	1,830	2,140	2,610
14	2,620	3,090	4,130	4,950	6,220	5,520	3,740	3,350	2,600	1,810	2,060	2,800
15	2,890	3,250	4,120	4,930	6,300	5,570	3,680	3,350	2,610	1,790	2,010	2,770
16	3,300	3,620	4,160	4,830	6,740	5,640	3,640	3,360	2,600	1,720	1,990	2,830
17	3,520	3,780	4,210	4,840	6,700	5,620	3,630	3,370	2,560	1,610	1,960	2,750
18	3,360	3,650	4,100	4,810	6,710	5,440	3,650	3,360	2,560	1,520	2,110	2,690
19	3,290	3,620	4,100	4,820	6,670	5,410	3,650	3,330	2,560	1,460	2,040	2,630
20	3,120	3,910	4,110	4,990	6,600	5,360	3,630	3,300	2,520	1,510	1,990	2,570
21	3,010	3,940	4,030	5,240	6,620	5,360	3,600	3,330	2,510	1,630	1,970	2,590
22	2,920	3,770	4,020	5,270	6,680	5,390	3,570	3,330	2,500	1,660	1,960	2,680
23	2,800	3,780	4,040	5,280	6,680	5,390	3,550	3,280	2,480	1,680	2,030	2,540
24	2,950	3,700	4,040	5,470	6,710	5,280	3,550	3,290	2,460	1,620	2,200	2,480
25	3,270	3,680	4,010	5,520	6,760	5,120	3,540	3,290	2,430	1,590	2,540	2,520
26	3,180	3,600	4,000	5,420	6,760	4,980	3,530	3,260	2,390	1,570	2,700	2,840
27	3,040	3,480	3,980	5,420	6,720	4,840	3,490	3,220	2,370	1,600	2,520	2,970
28	2,940	3,540	3,920	5,530	6,560	4,670	3,470	3,180	2,350	1,630	2,360	2,740
29	2,910	5,440	3,890	5,590	6,480	4,530	3,470	3,110	2,340	1,640	2,340	2,550
30	2,910		3,970	5,520	6,500	4,520	3,450	3,080	2,290	1,640	2,510	2,630
31	3,220		4,200		6,450		3,420	3,030		1,710		2,580

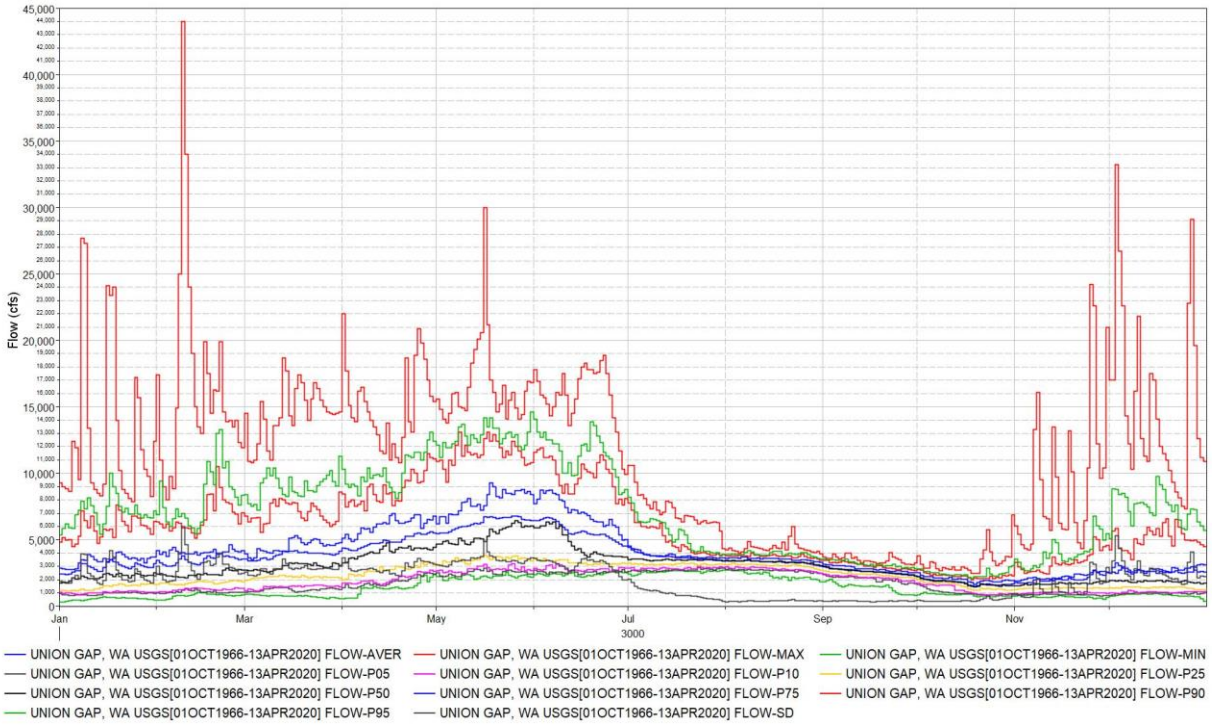


Figure 1. Yakima River at Union Gap daily statistics, 1966-2020. Pxx = xx percent chance of exceedance on a given day.

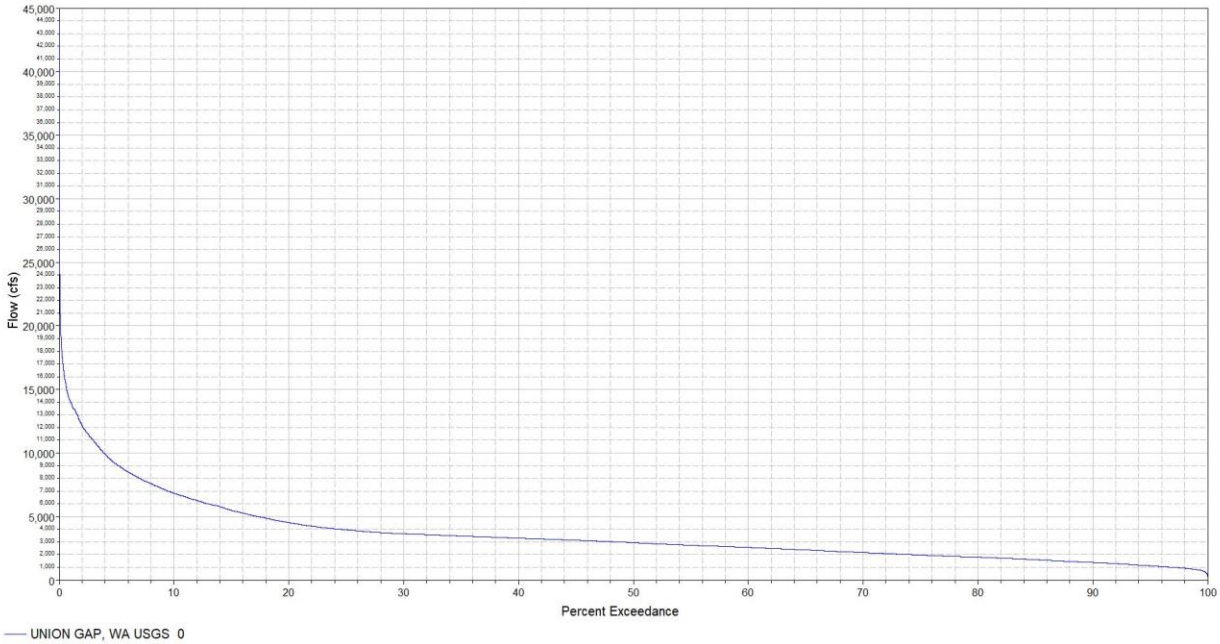


Figure 2. Yakima River at Union Gap percent chance that a flow is exceeded on any day in the period of record, 1966-2020.

CENWS-ENH-H 25 May 2022

MEMORANDUM FOR RECORD

SUBJECT: Rating Curves, Rating Tables, and Inundation Maps for Construction, Yakima 1135 Ecosystem Restoration Project

Summary: The following tables and figures (Exhibits 1-19) illustrate the expected ranges of flows, stages, and inundations in the Yakima 1135 Sportsman Park project area at four different locations relevant to construction: the Sportsman Park side channel entrance, the Sportsman Park side channel exit, the SR24 bridge, and the Blue Slough culvert entrance. These ranges are given for predicted conditions in the field during Base Bid construction and/or Option 1 construction, wherever relevant. Inundation maps of the Sportsman Park area are also shown for both Base Bid conditions and Option 1 conditions, at flows matching the lowest recorded monthly average flow (540 cfs), the average annual flow (3600 cfs), and the highest recorded monthly average flow (15160 cfs).

Note that the rating curves at these Sportsman Park area locations likely also reflect the expected groundwater table elevations that may be encountered in excavations close to these sites.

The subsequent tables and figures (Exhibits 20-27) illustrate the expected flows, stages, and inundations in the Yakima 1135 DID1 project area at two locations: the channel bend where the Yakima River mainstem runs into DID1, and the downstream end of DID1. The data given at these locations pertain to existing conditions as modeled in 2020, not to any predicted future condition. It is possible that by the time of Option 2 construction, the hydraulics of this area will have undergone changes that render these data obsolete.

Finally, a statistical plot showing the range of expected daily flows in the Yakima River throughout the year is also included (Exhibit 28).

Ethan Cheng, E.I.T.
Civil Engineer (Hydraulic)

Exhibit 1: Sportsman Park project area rating locations

Exhibit 2: Sportsman Park side channel entrance, rating table, Base Bid

Sportsman Side Channel Entrance Flow & Stage (Base Bid)	Monthly Avg		Lowest Monthly Avg on Record		Highest Monthly Avg on Record	
	Flow (cfs)	Stage (ft)	Flow (cfs)	Stage (ft)	Flow (cfs)	Stage (ft)
Jan	2927	1015.0	540	1011.7	7490	1018.0
Feb	3463	1015.4	889	1012.3	14290	1020.7
Mar	3838	1015.7	752	1012.0	14340	1020.7
Apr	4884	1016.6	1608	1013.3	12780	1020.1
May	6255	1017.4	2475	1014.4	15160	1021.0
Jun	5623	1017.0	2480	1014.4	13410	1020.3
Jul	3719	1015.6	2650	1014.7	6878	1017.7
Aug	3325	1015.2	2351	1014.2	4123	1016.0
Sep	2610	1014.5	1411	1013.1	3355	1015.4
Oct	1780	1013.5	896	1012.3	2587	1014.5
Nov	2051	1013.9	710	1012.0	5354	1016.9
Dec	2693	1014.7	882	1012.3	11200	1019.5

Exhibit 3: Sportsman Park side channel entrance, rating curve, Base Bid

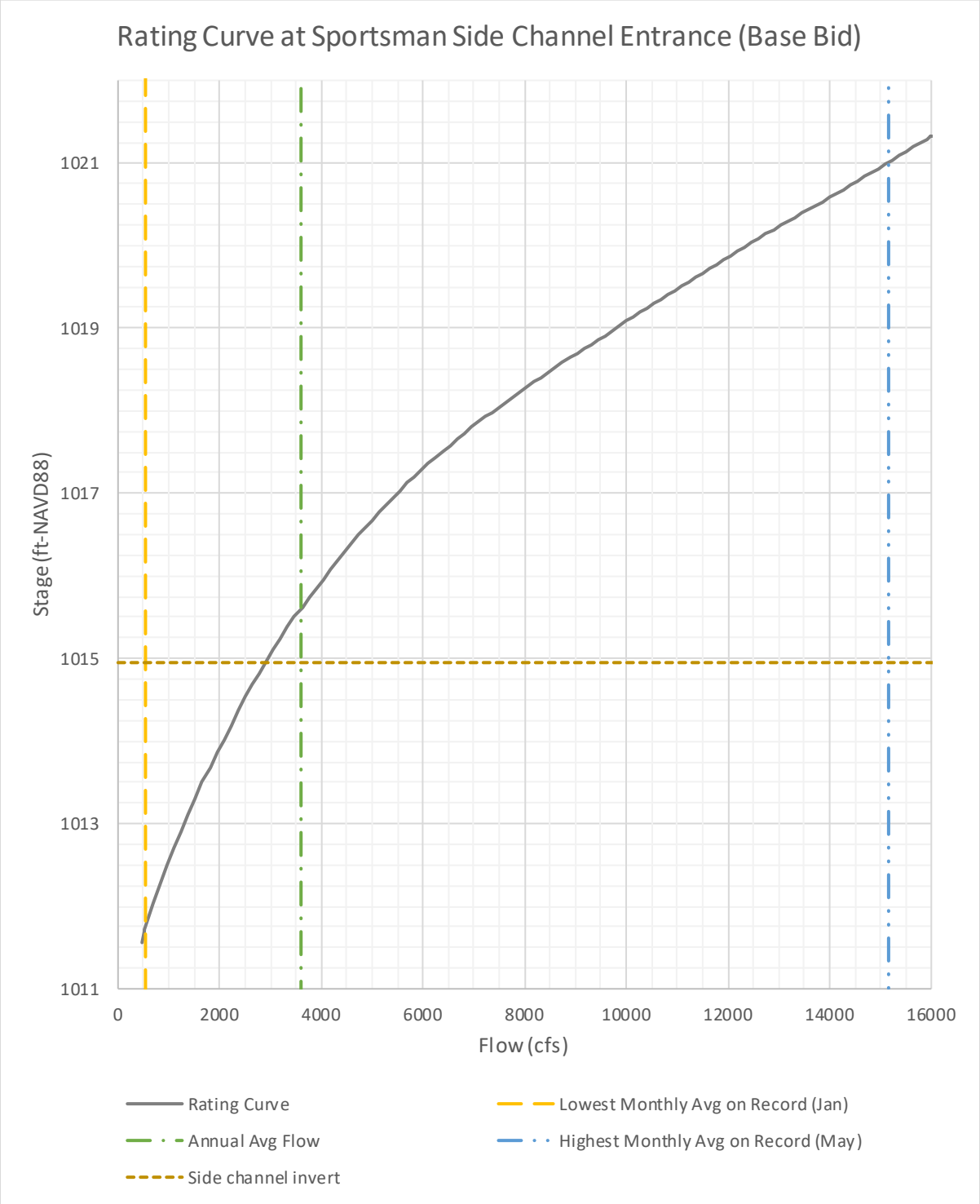


Exhibit 4: Sportsman Park side channel exit, rating table, Base Bid

Sportsman Side Channel Exit Flow & Stage (Base Bid)	Monthly Avg		Lowest Monthly Avg on Record		Highest Monthly Avg on Record	
	Flow (cfs)	Stage (ft)	Flow (cfs)	Stage (ft)	Flow (cfs)	Stage (ft)
Jan	2927	1000.5	540	998.1	7490	1003.0
Feb	3463	1000.9	889	998.5	14290	1004.9
Mar	3838	1001.2	752	998.3	14340	1004.9
Apr	4884	1001.8	1608	999.4	12780	1004.5
May	6255	1002.5	2475	1000.2	15160	1005.1
Jun	5623	1002.2	2480	1000.2	13410	1004.7
Jul	3719	1001.1	2650	1000.3	6878	1002.8
Aug	3325	1000.8	2351	1000.1	4123	1001.4
Sep	2610	1000.3	1411	999.3	3355	1000.9
Oct	1780	999.6	896	998.5	2587	1000.3
Nov	2051	999.8	710	998.3	5354	1002.1
Dec	2693	1000.4	882	998.5	11200	1004.1

Exhibit 5: Sportsman Park side channel exit, rating curve, Base Bid

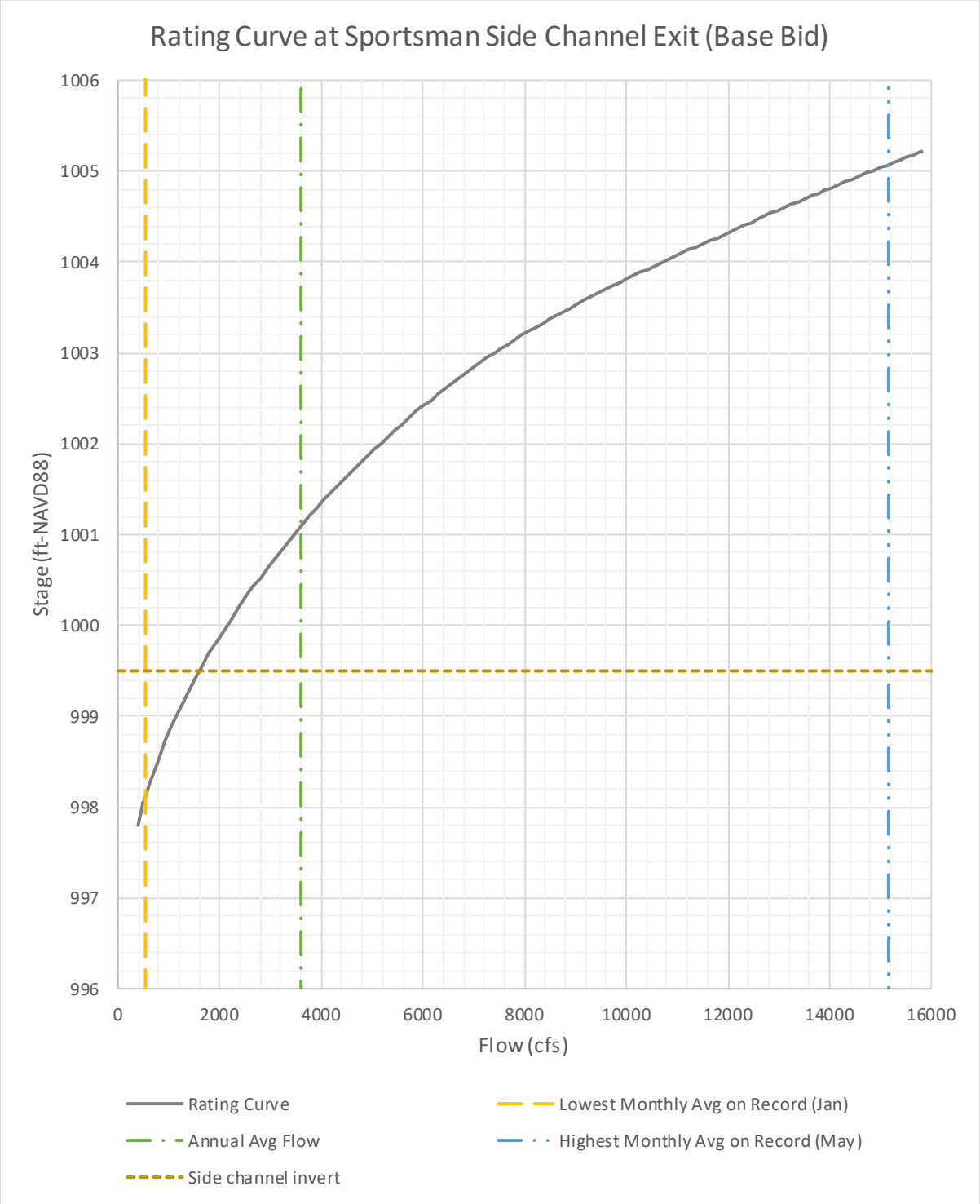


Exhibit 6: Sportsman Park side channel entrance, rating table, Option 1

Sportsman Side Channel Entrance Flow & Stage (Option 1)	Monthly Avg		Lowest Monthly Avg on Record		Highest Monthly Avg on Record	
	Flow (cfs)	Stage (ft)	Flow (cfs)	Stage (ft)	Flow (cfs)	Stage (ft)
Jan	2927	1015.1	540	1012.6	7490	1017.7
Feb	3463	1015.6	889	1013.1	14290	1020.0
Mar	3838	1015.8	752	1012.9	14340	1020.0
Apr	4884	1016.4	1608	1013.9	12780	1019.5
May	6255	1017.1	2475	1014.8	15160	1020.3
Jun	5623	1016.8	2480	1014.8	13410	1019.8
Jul	3719	1015.7	2650	1014.9	6878	1017.4
Aug	3325	1015.4	2351	1014.7	4123	1016.0
Sep	2610	1014.9	1411	1013.7	3355	1015.5
Oct	1780	1014.1	896	1013.1	2587	1014.9
Nov	2051	1014.4	710	1012.9	5354	1016.7
Dec	2693	1015.0	882	1013.1	11200	1019.0

Exhibit 7: Sportsman Park side channel entrance, rating curve, Option 1

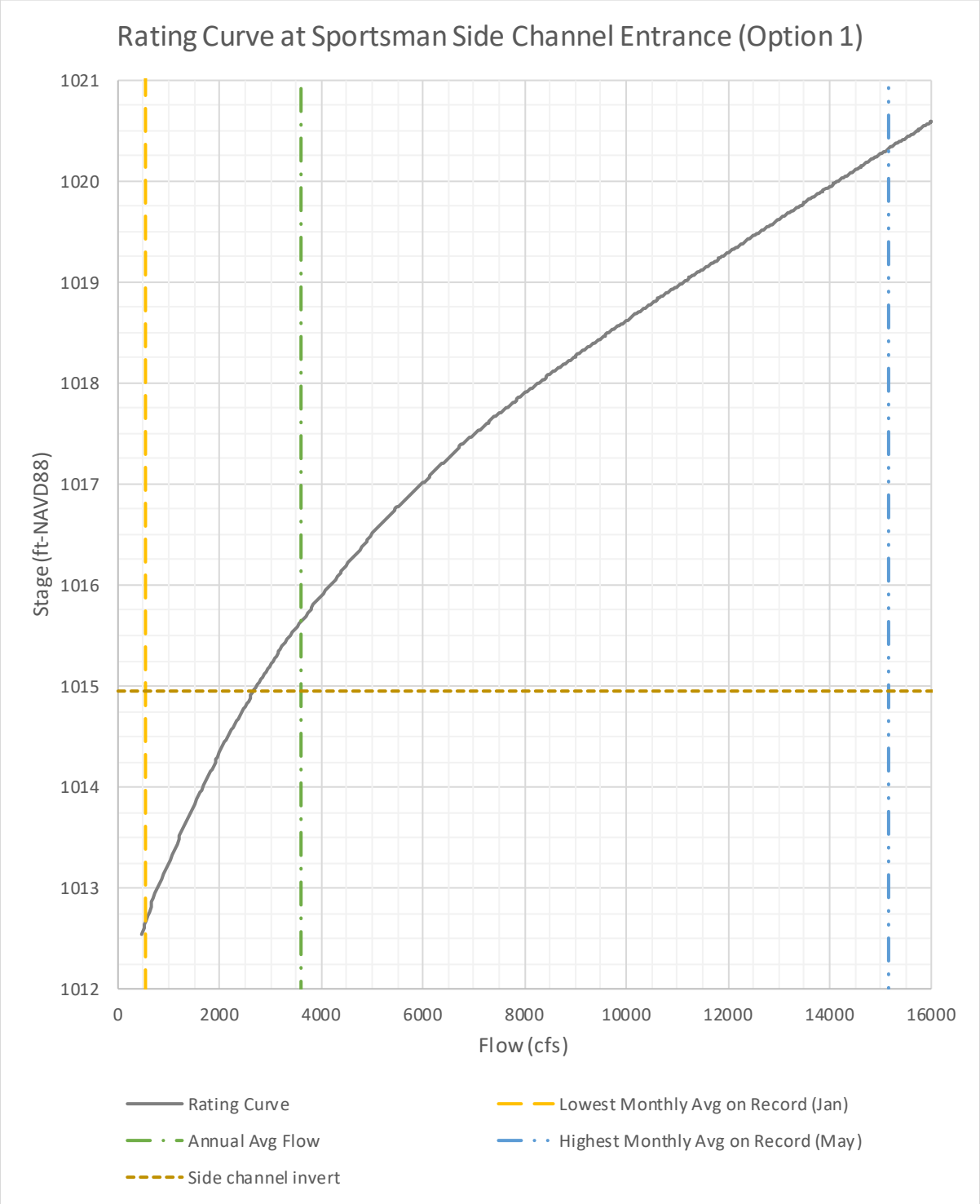


Exhibit 8: Sportsman Park side channel exit, rating table, Option 1

Sportsman Side Channel Exit Flow & Stage (Base Bid)	Monthly Avg		Lowest Monthly Avg on Record		Highest Monthly Avg on Record	
	Flow (cfs)	Stage (ft)	Flow (cfs)	Stage (ft)	Flow (cfs)	Stage (ft)
Jan	2927	1000.3	540	997.9	7490	1002.8
Feb	3463	1000.6	889	998.4	14290	1005.1
Mar	3838	1000.9	752	998.2	14340	1005.1
Apr	4884	1001.5	1608	999.2	12780	1004.6
May	6255	1002.2	2475	999.9	15160	1005.3
Jun	5623	1001.9	2480	999.9	13410	1004.8
Jul	3719	1000.8	2650	1000.0	6878	1002.5
Aug	3325	1000.5	2351	999.8	4123	1001.1
Sep	2610	1000.0	1411	999.0	3355	1000.6
Oct	1780	999.4	896	998.4	2587	1000.0
Nov	2051	999.6	710	998.2	5354	1001.8
Dec	2693	1000.1	882	998.4	11200	1004.1

Exhibit 9: Sportsman Park side channel exit, rating curve, Option 1

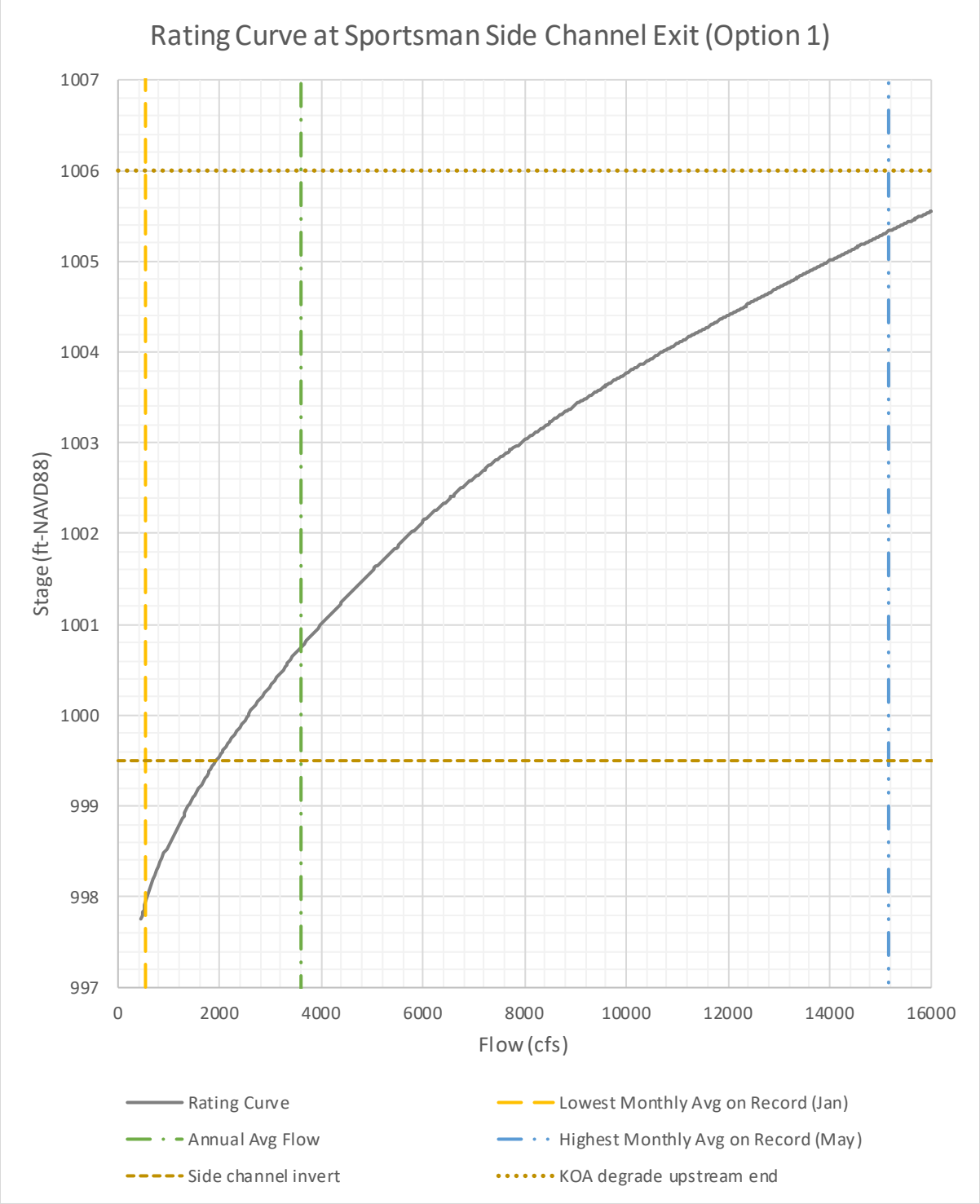


Exhibit 10: SR24 bridge, rating table, Option 1

SR24 Flow & Stage (Option 1)	Monthly Avg		Lowest Monthly Avg on Record		Highest Monthly Avg on Record	
	Flow (cfs)	Stage (ft)	Flow (cfs)	Stage (ft)	Flow (cfs)	Stage (ft)
Jan	2927	992.8	540	990.0	7490	995.5
Feb	3463	993.3	889	990.7	14290	998.2
Mar	3838	993.5	752	990.4	14340	998.2
Apr	4884	994.2	1608	991.7	12780	997.7
May	6255	994.9	2475	992.5	15160	998.5
Jun	5623	994.6	2480	992.5	13410	997.9
Jul	3719	993.4	2650	992.6	6878	995.2
Aug	3325	993.2	2351	992.3	4123	993.7
Sep	2610	992.6	1411	991.3	3355	993.2
Oct	1780	991.8	896	990.7	2587	992.5
Nov	2051	992.1	710	990.4	5354	994.4
Dec	2693	992.6	882	990.7	11200	997.1

Exhibit 11: SR24 bridge, rating curve, Option 1

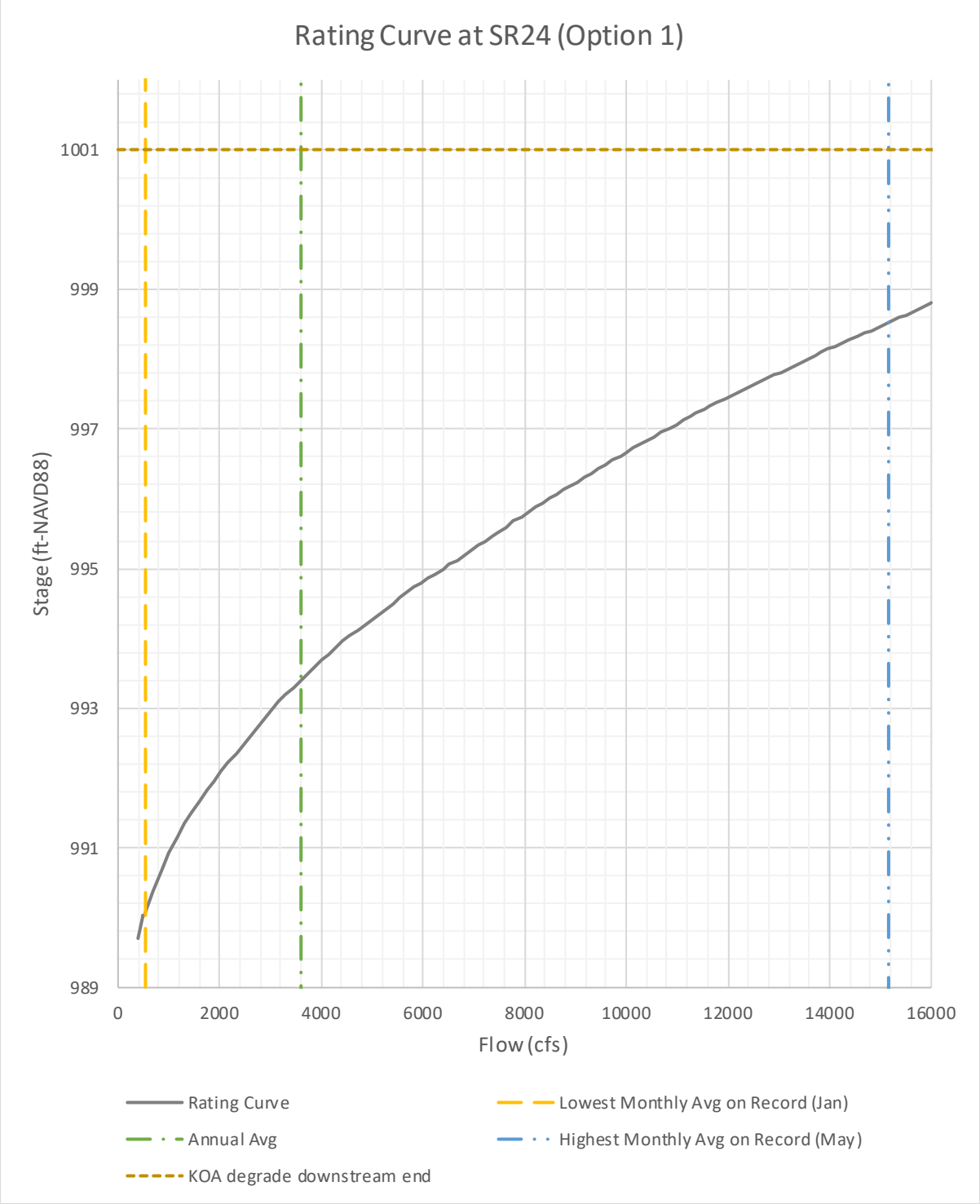


Exhibit 12: Blue Slough culvert entrance, rating table, Option 1

Blue Slough Culvert Entrance Flow & Stage (Option 1)	Monthly Avg		Lowest Monthly Avg on Record		Highest Monthly Avg on Record	
	Flow (cfs)	Stage (ft)	Flow (cfs)	Stage (ft)	Flow (cfs)	Stage (ft)
Jan	2927	1005.1	540	#N/A	7490	1007.2
Feb	3463	1005.4	889	#N/A	14290	1009.2
Mar	3838	1005.6	752	#N/A	14340	1009.2
Apr	4884	1006.1	1608	#N/A	12780	1008.8
May	6255	1006.7	2475	1004.4	15160	1009.4
Jun	5623	1006.5	2480	1004.4	13410	1009.0
Jul	3719	1005.5	2650	1004.8	6878	1007.0
Aug	3325	1005.3	2351	#N/A	4123	1005.7
Sep	2610	1004.8	1411	#N/A	3355	1005.3
Oct	1780	#N/A	896	#N/A	2587	1004.8
Nov	2051	#N/A	710	#N/A	5354	1006.3
Dec	2693	1004.9	882	#N/A	11200	1008.4

Exhibit 13: Blue Slough culvert entrance, rating curve, Option 1

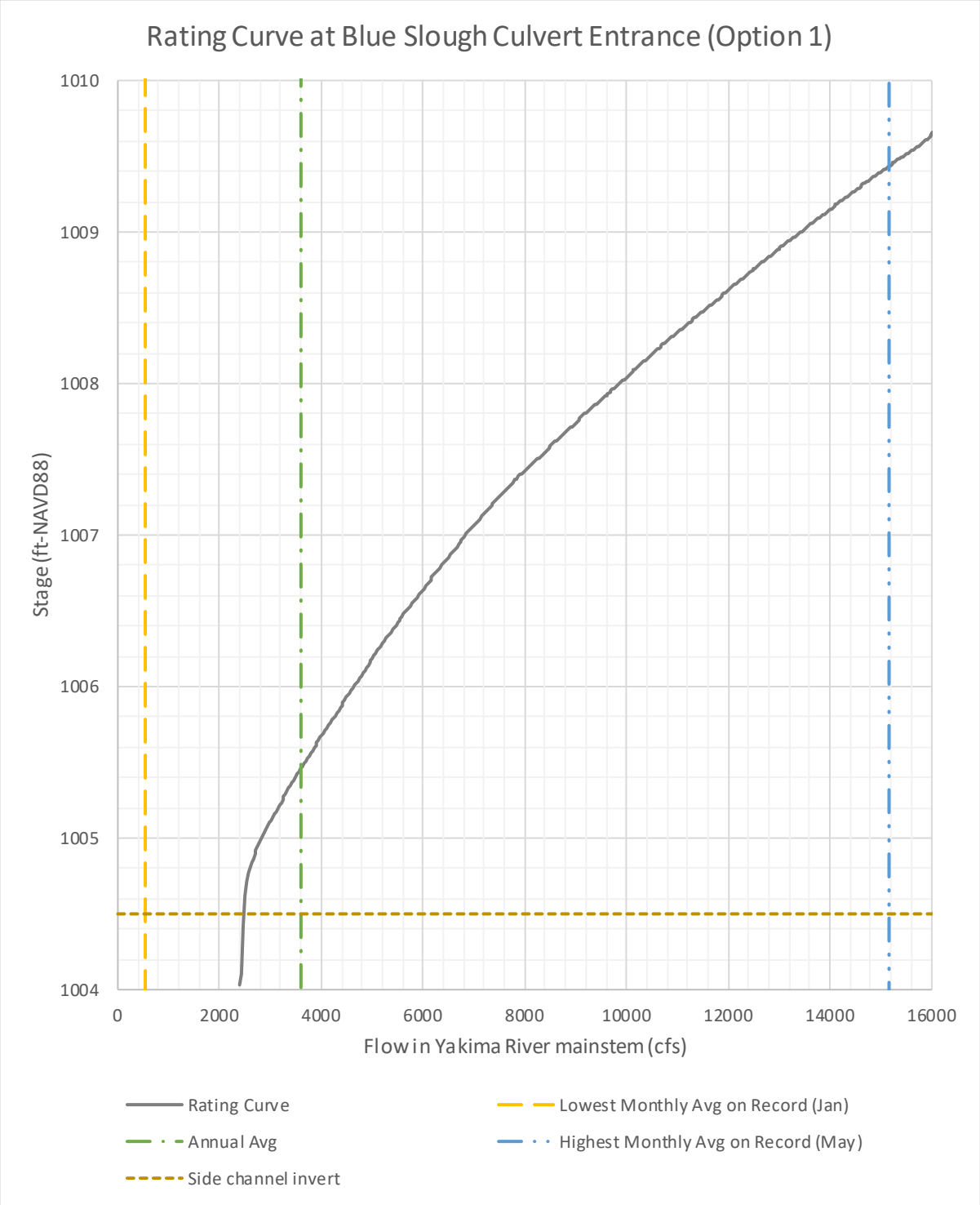


Exhibit 14: Inundation, Sportsman Park area, lowest monthly average flow on record (540 cfs), Base Bid

Exhibit 15: Inundation, Sportsman Park area, annual average flow (3600 cfs), Base Bid

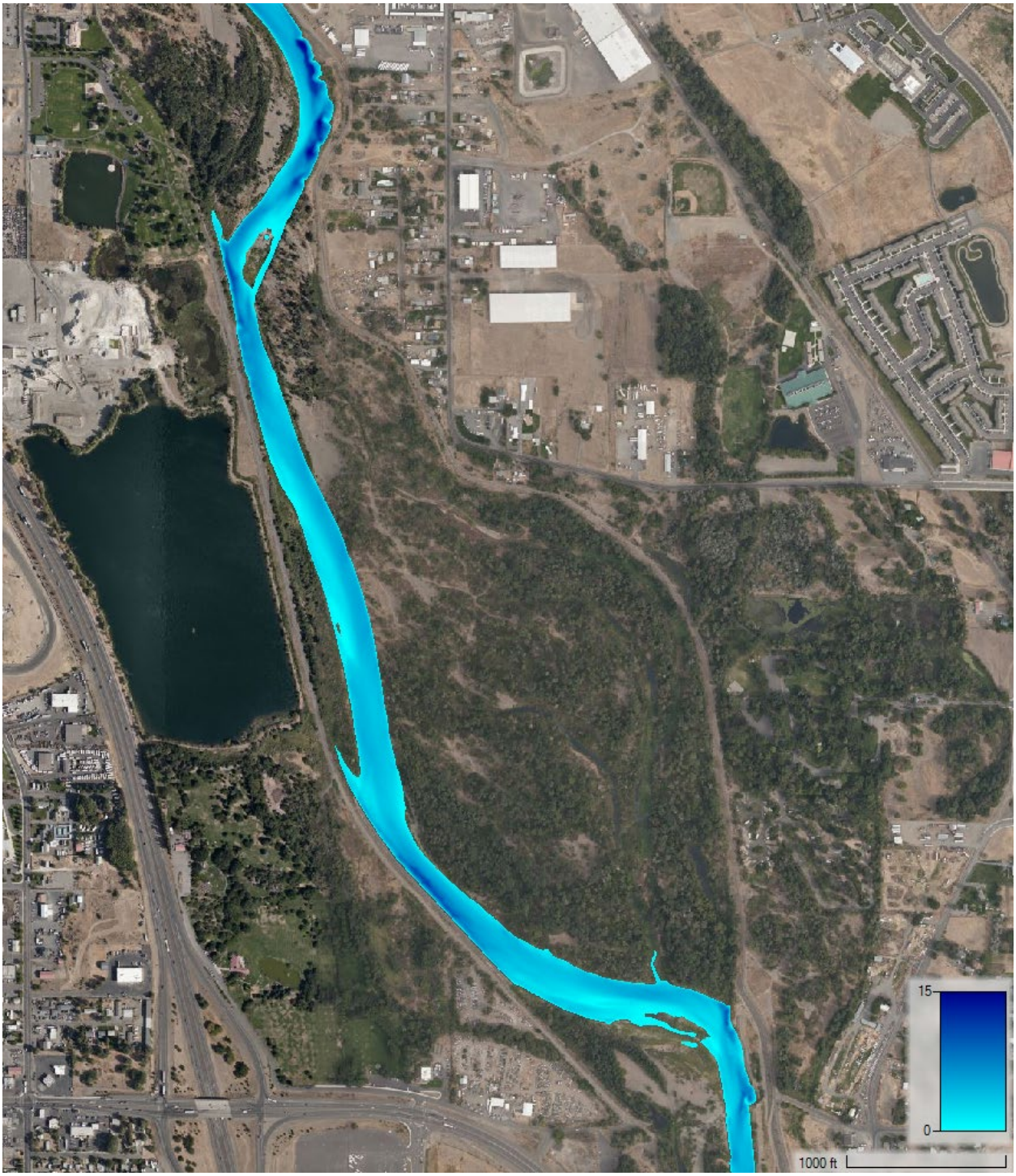


Exhibit 16: Inundation, Sportsman Park area, highest monthly average flow on record (15160 cfs), Base Bid

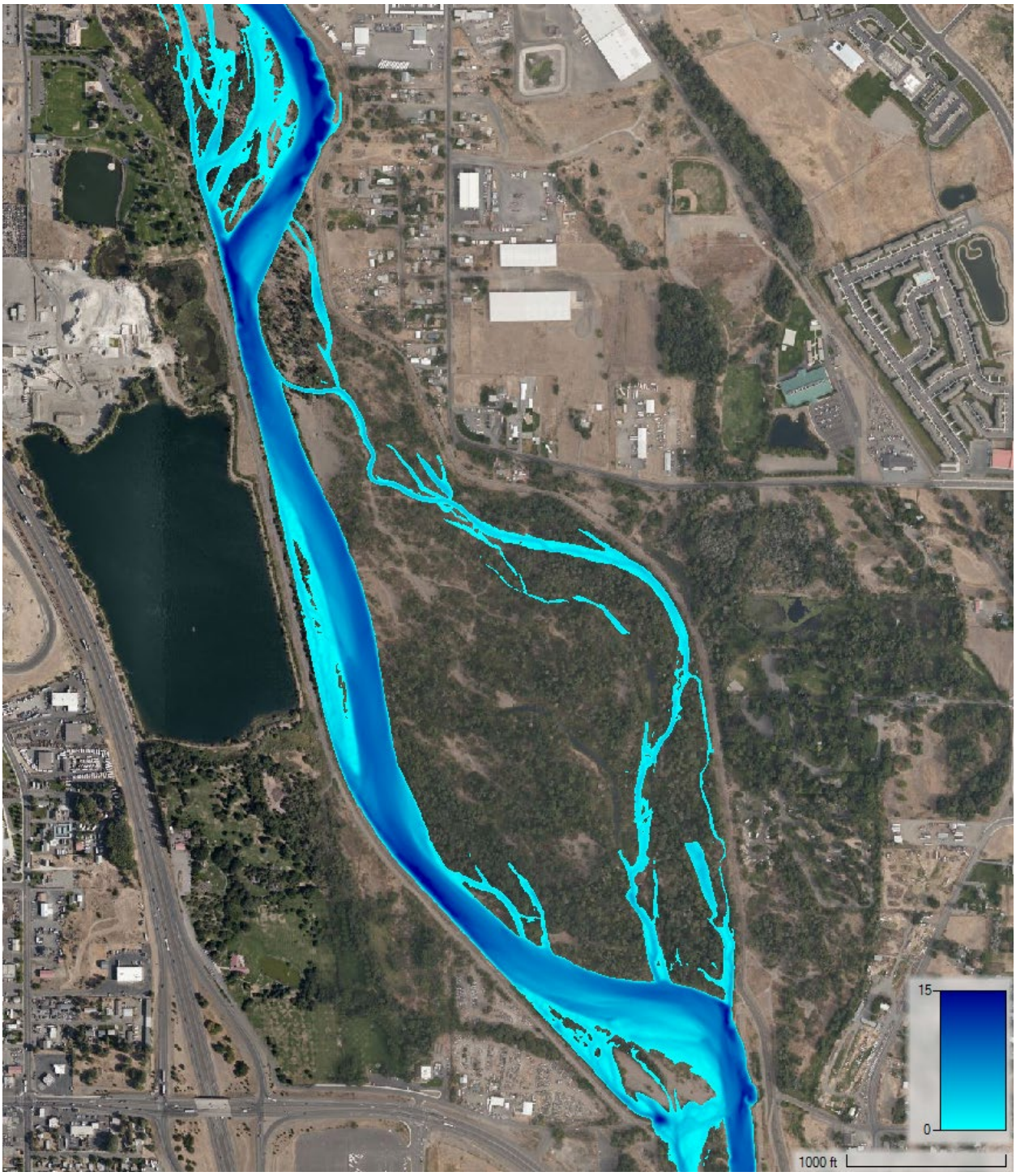


Exhibit 17: Inundation, Sportsman Park area, lowest monthly average flow on record (540 cfs), Option 1

Exhibit 18: Inundation, Sportsman Park area, annual average flow (3600 cfs), Option 1

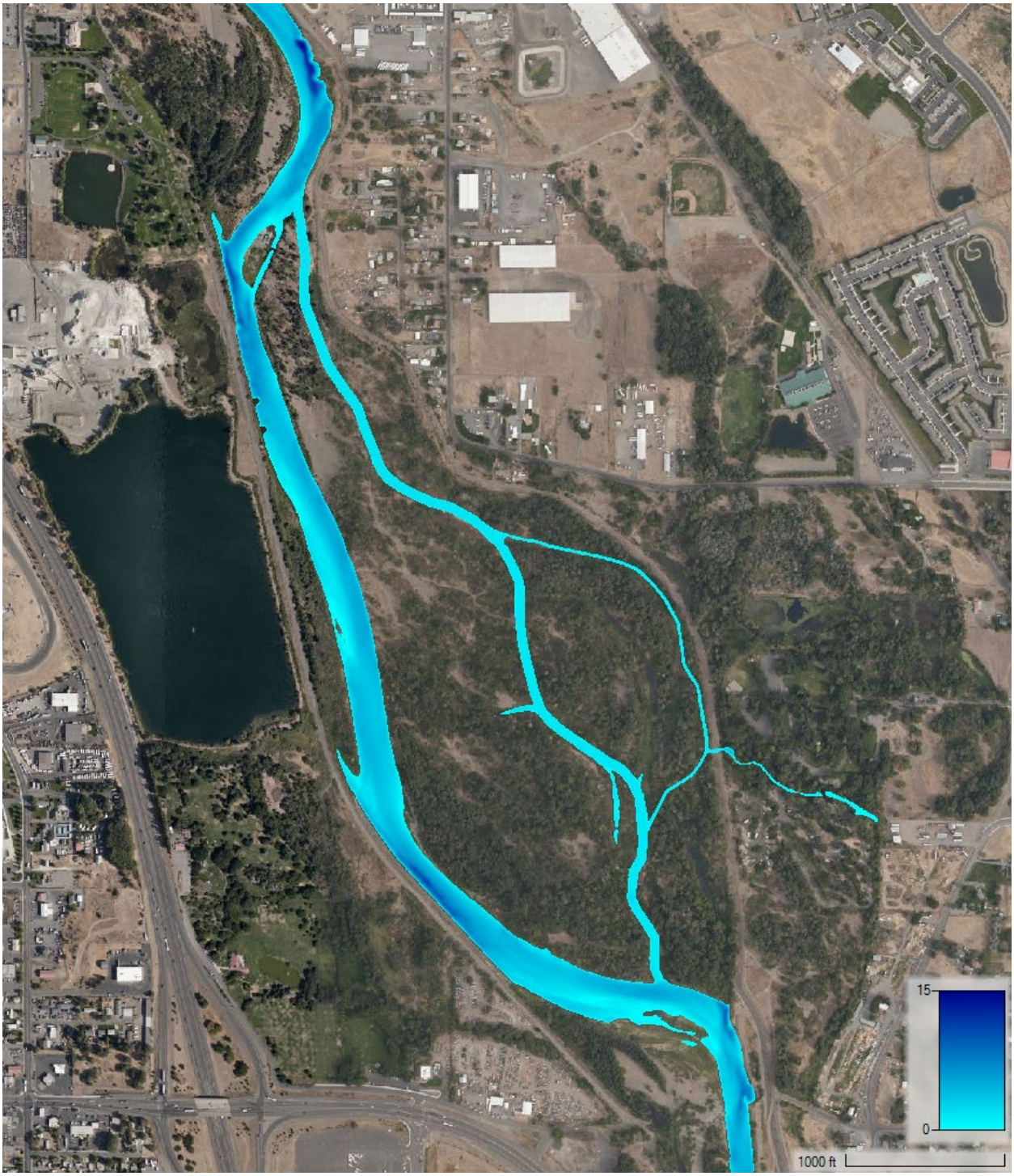


Exhibit 19: Inundation, Sportsman Park area, highest monthly average flow on record (15160 cfs), Option 1

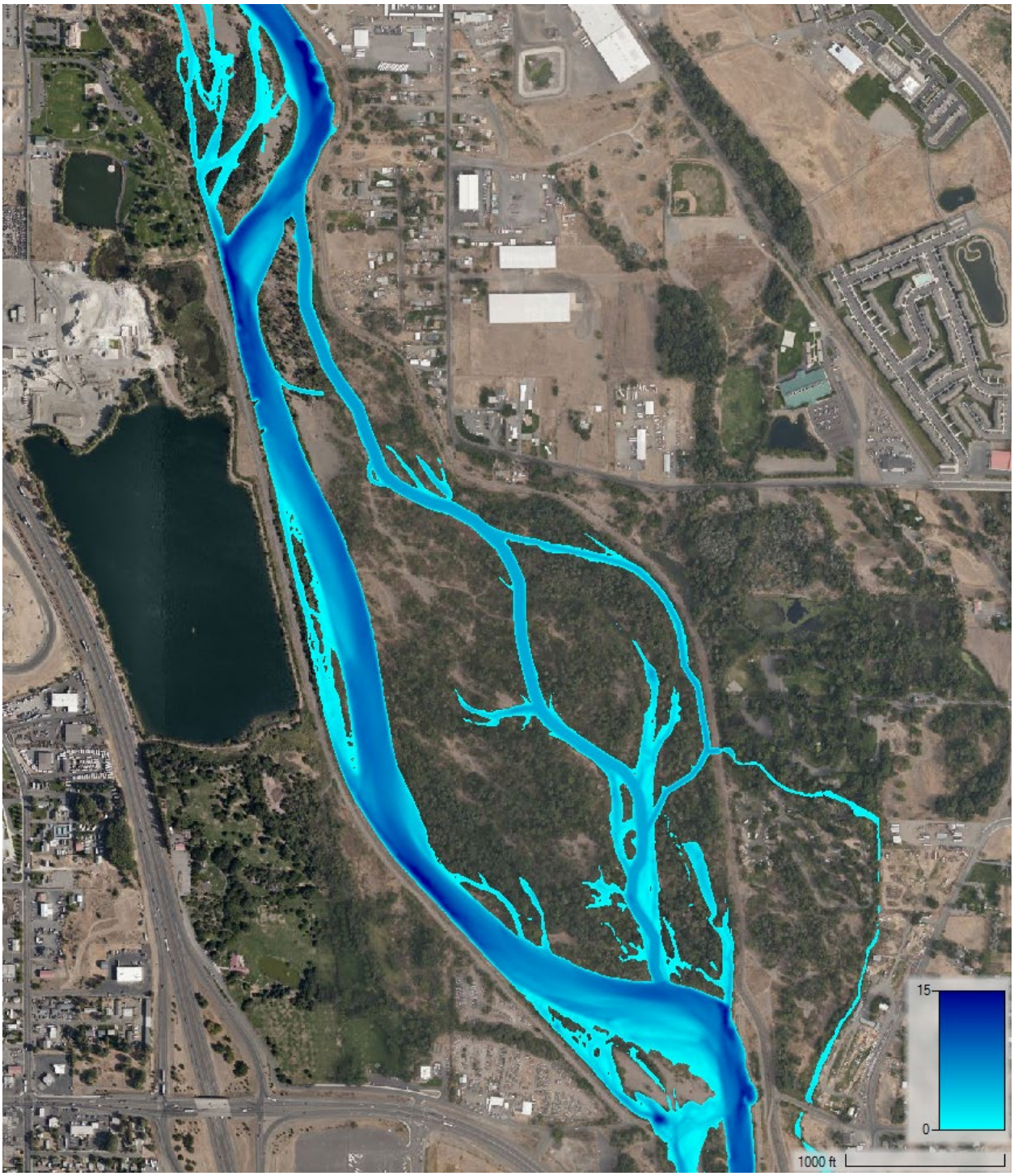


Exhibit 20: DID1 project area rating locations

Exhibit 21: DID1 channel bend, rating table, existing conditions (2020)

DID1 Channel Bend Flow & Stage (Existing Conditions, 2020)	Monthly Avg		Min Monthly Avg on Record		Max Monthly Avg on Record	
	Flow (cfs)	Stage (ft)	Flow (cfs)	Stage (ft)	Flow (cfs)	Stage (ft)
Jan	2927	985.1	540	982.1	7490	988.5
Feb	3463	985.6	889	982.6	14290	991.7
Mar	3838	985.9	752	982.4	14340	991.7
Apr	4884	986.8	1608	983.6	12780	991.1
May	6255	987.7	2475	984.7	15160	992.0
Jun	5623	987.3	2480	984.7	13410	991.4
Jul	3719	985.8	2650	984.8	6878	988.1
Aug	3325	985.5	2351	984.5	4123	986.2
Sep	2610	984.8	1411	983.5	3355	985.5
Oct	1780	984.0	896	982.6	2587	984.8
Nov	2051	984.3	710	982.4	5354	987.1
Dec	2693	984.8	882	982.6	11200	990.4

Exhibit 22: DID1 channel bend, rating curve, existing conditions (2020)

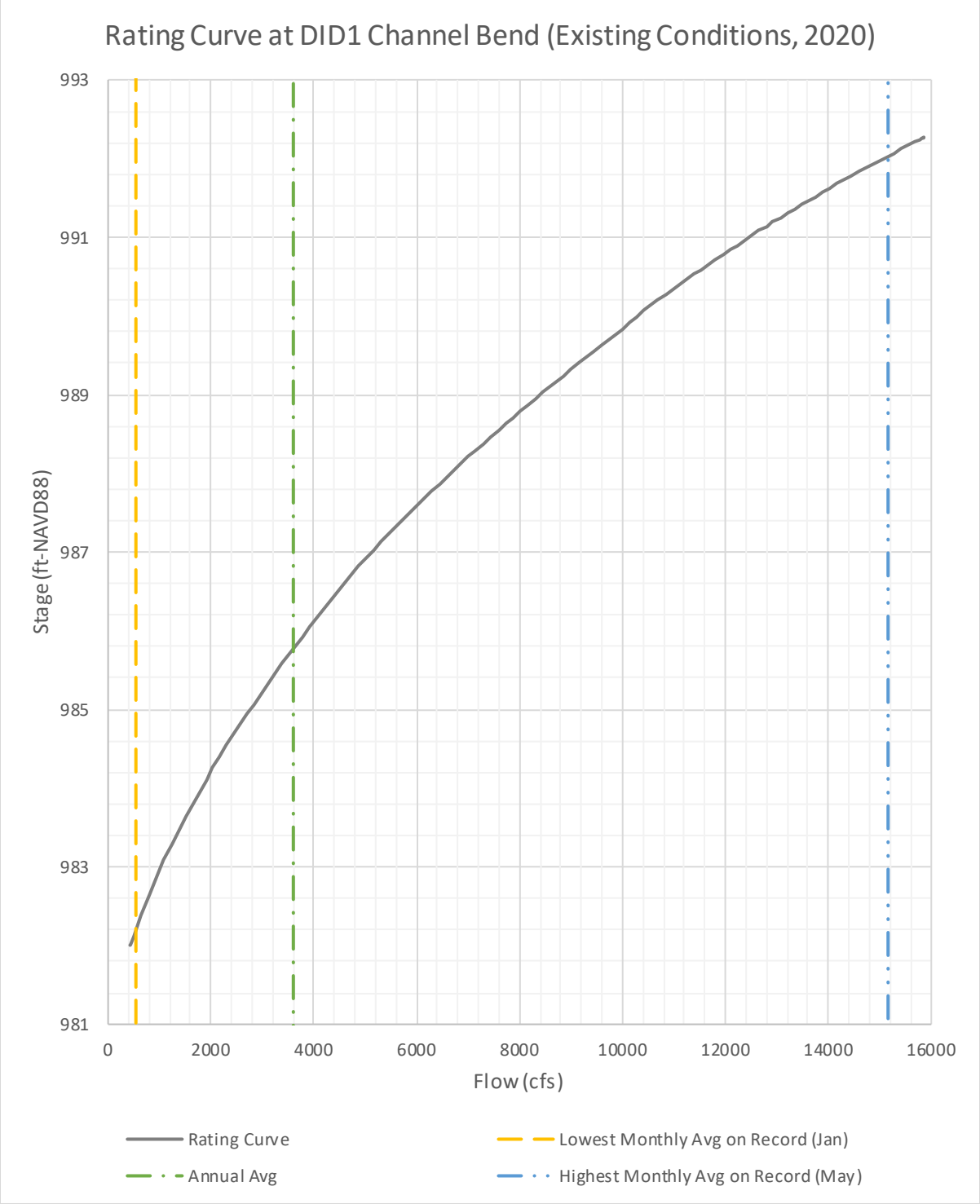


Exhibit 23: DID1 downstream end, rating table, existing conditions (2020)

DID1 Downstream End Flow & Stage (Existing Conditions, 2020)	Monthly Avg		Min Monthly Avg on Record		Max Monthly Avg on Record	
	Flow (cfs)	Stage (ft)	Flow (cfs)	Stage (ft)	Flow (cfs)	Stage (ft)
Jan	2927	970.9	540	968.9	7490	972.4
Feb	3463	971.2	889	969.3	14290	973.5
Mar	3838	971.4	752	969.1	14340	973.5
Apr	4884	971.7	1608	970.1	12780	973.3
May	6255	972.2	2475	970.6	15160	973.6
Jun	5623	972.0	2480	970.6	13410	973.3
Jul	3719	971.3	2650	970.7	6878	972.3
Aug	3325	971.1	2351	970.5	4123	971.5
Sep	2610	970.7	1411	969.9	3355	971.1
Oct	1780	970.1	896	969.3	2587	970.7
Nov	2051	970.3	710	969.1	5354	971.9
Dec	2693	970.7	882	969.3	11200	973.1

Exhibit 24: DID1 downstream end, rating curve, existing conditions (2020)

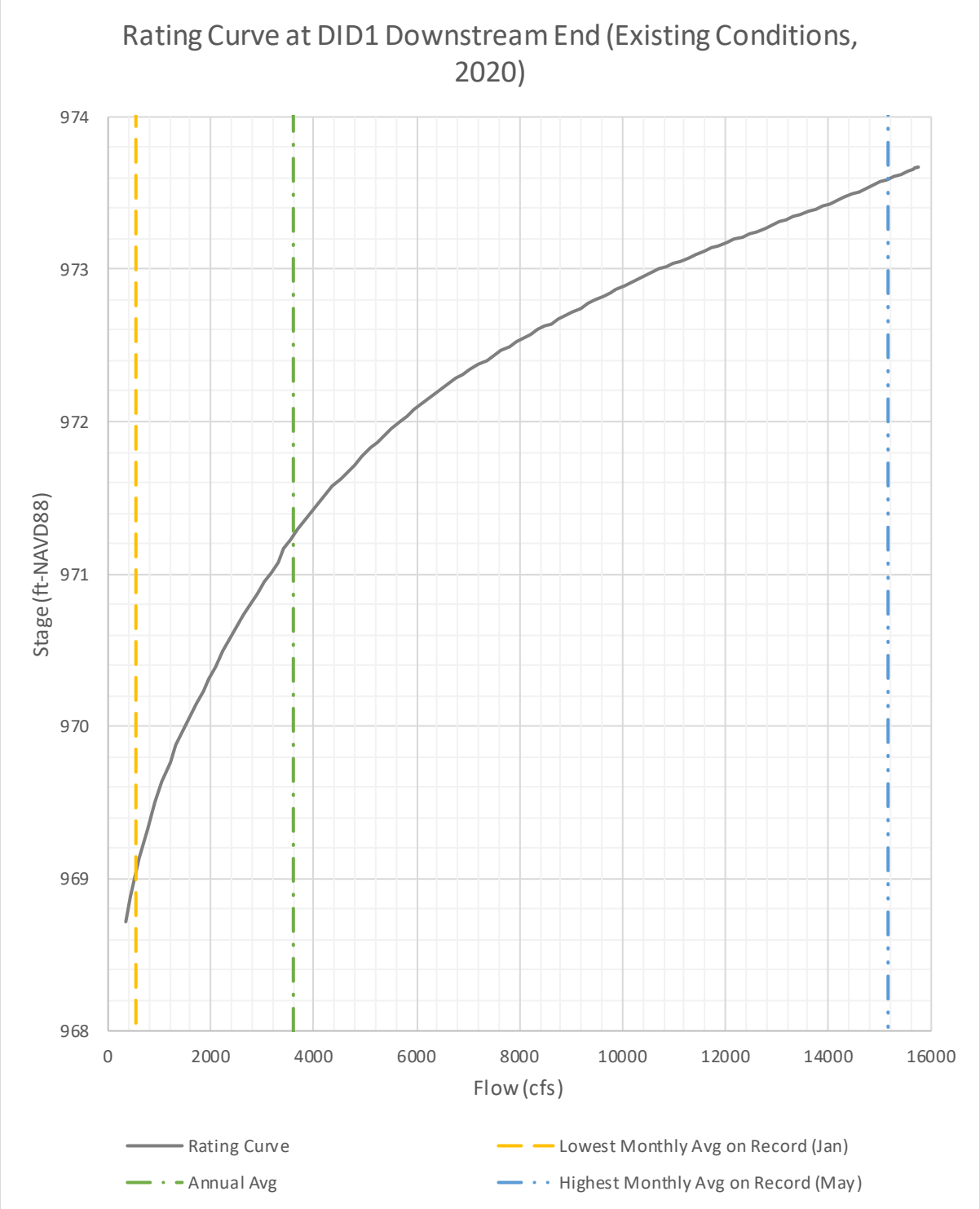


Exhibit 25: Inundation, DID1 area, lowest monthly average flow on record (540 cfs), existing conditions (2020)

Exhibit 26: Inundation, DID1 area, annual average flow (3600 cfs), existing conditions (2020)

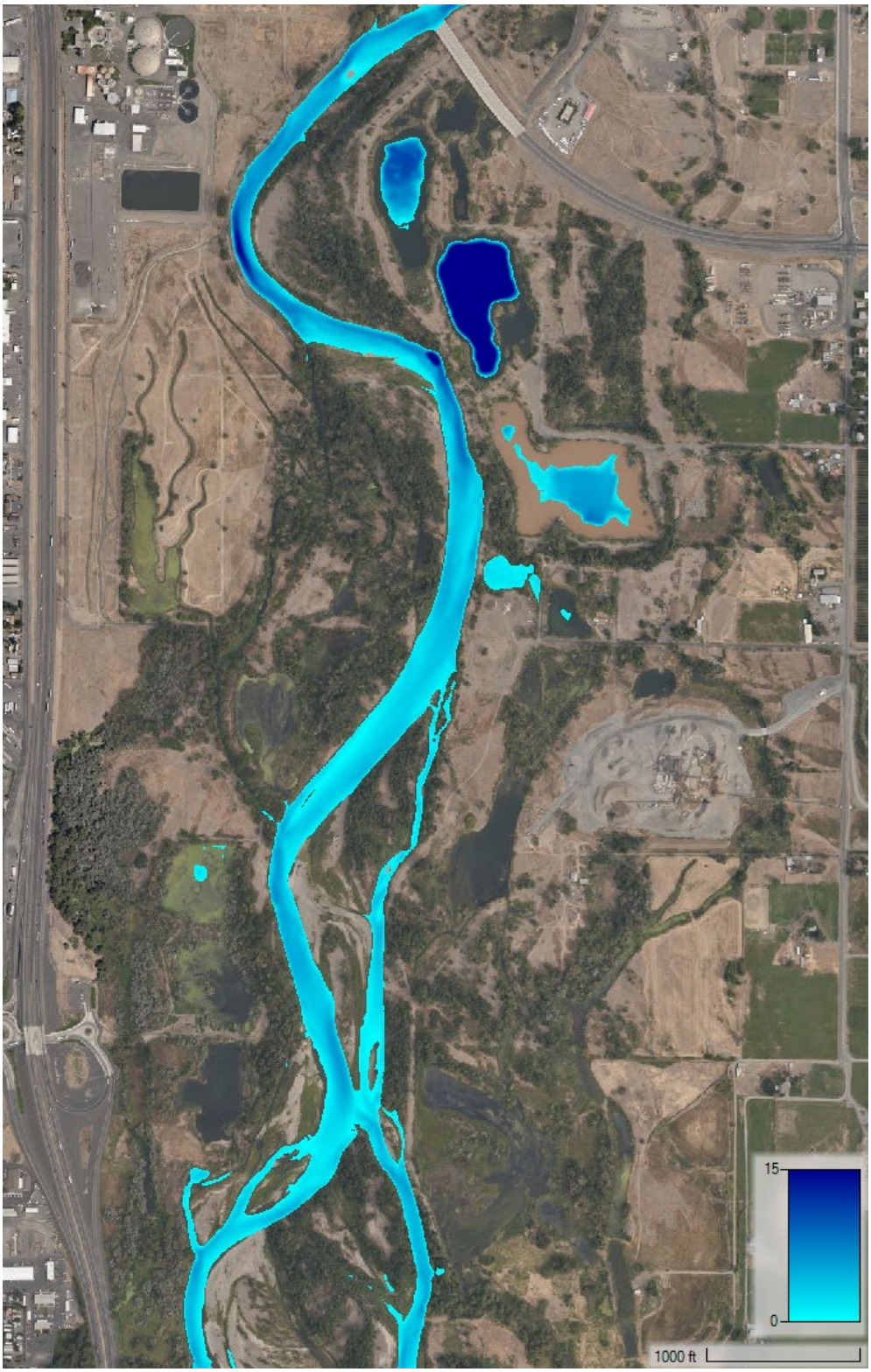


Exhibit 27: Inundation, DID1 area, highest monthly average flow on record (15160 cfs), existing conditions (2020)

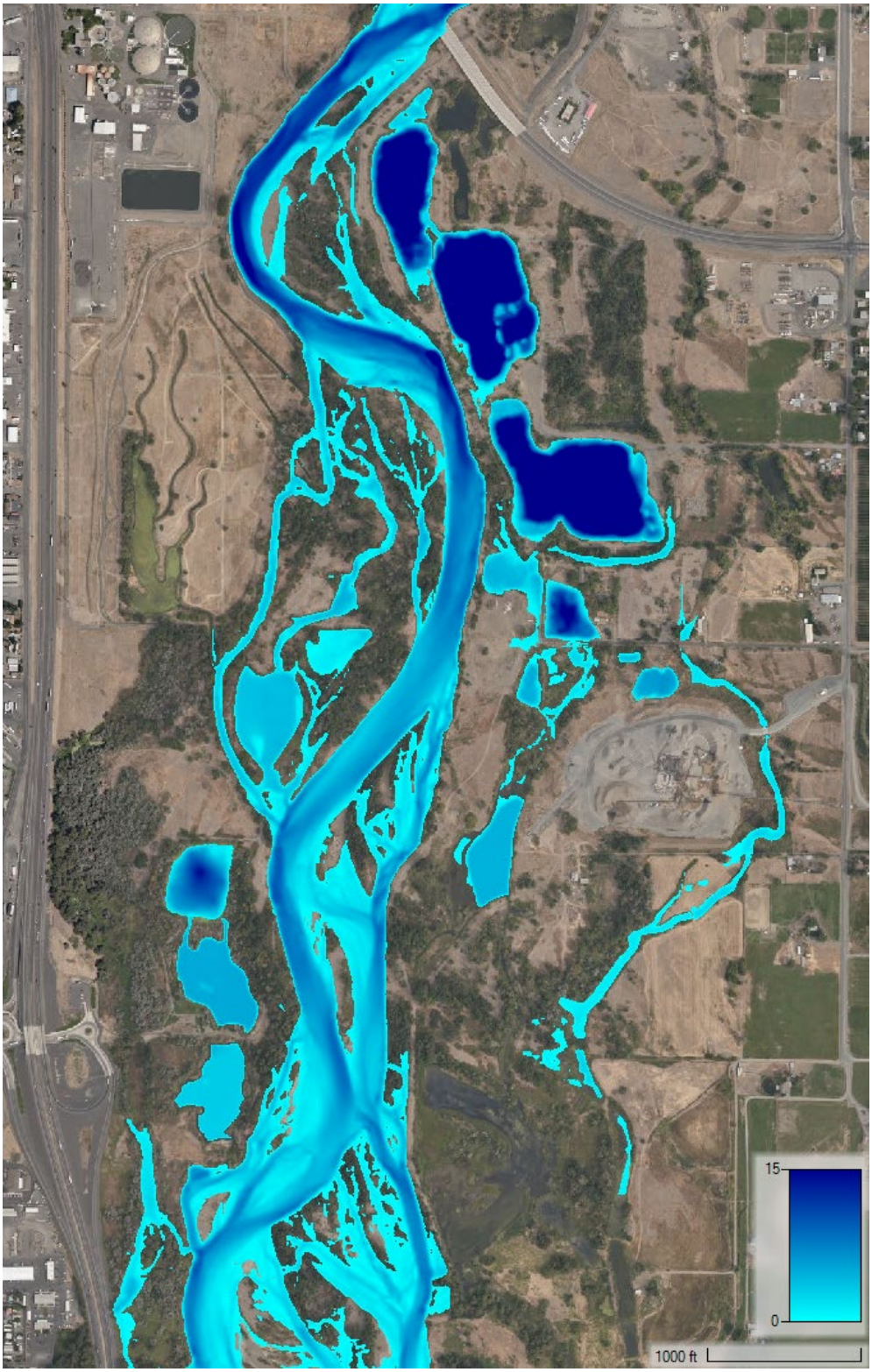
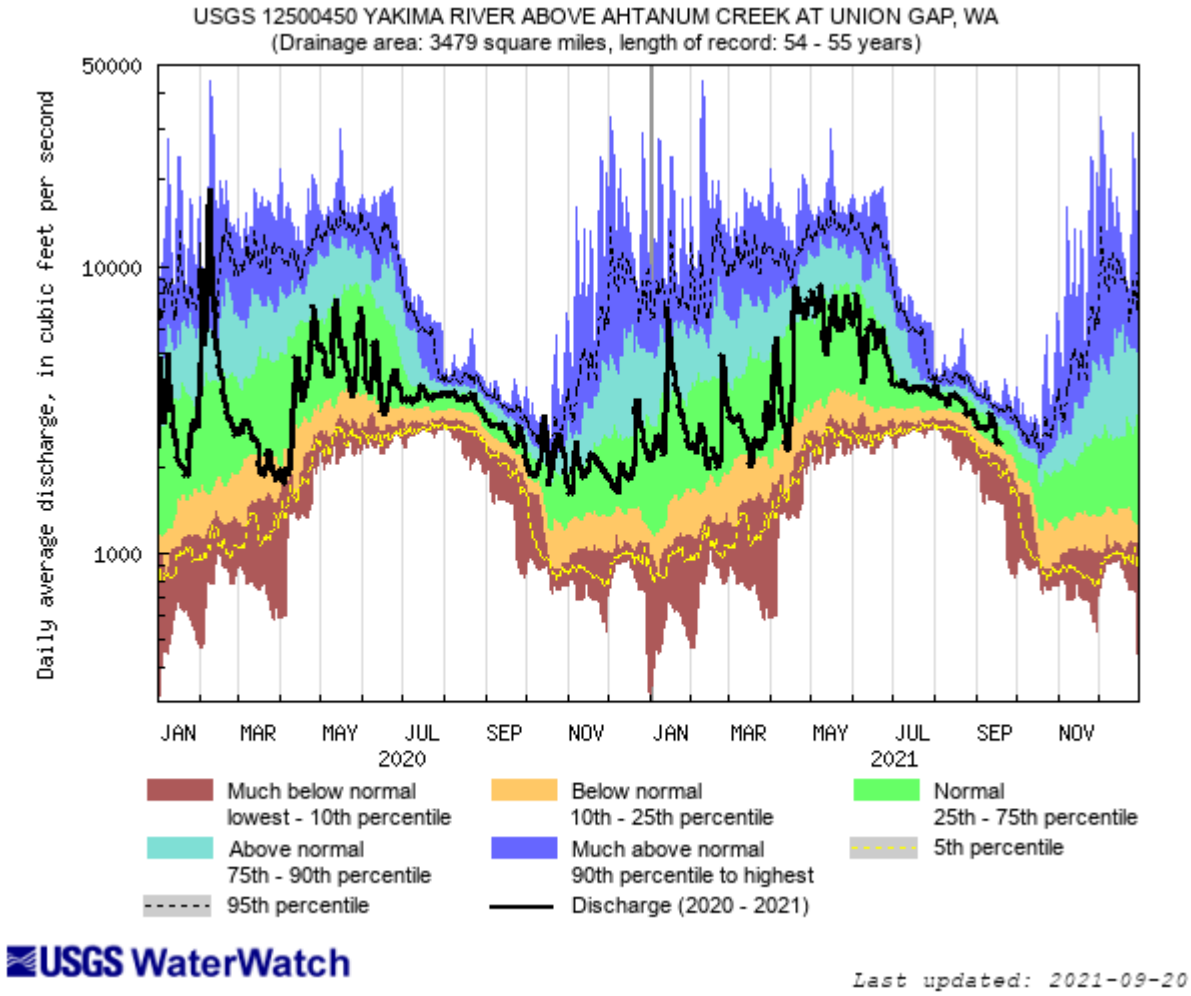


Exhibit 28: Yakima River at Union Gap daily statistics, 1966-2021



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11/15

ATTACHMENTS:

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SECTION 01 57 19

TEMPORARY ENVIRONMENTAL CONTROLS
11/15

PART 1 GENERAL

1.1 SCOPE

Employ environmental controls to assure that environmental resources found in the project area are protected from harm. In accomplishing this task, prepare plans to implement those environmental controls and follow mandated agency requirements identified in this section including Attachments.

1.2 REFERENCES

The publications listed below form a part of this specification to the extent referenced. The publications are referred to within the text by the basic designation only.

U.S. NATIONAL ARCHIVES AND RECORDS ADMINISTRATION (NARA)

29 CFR 1910.120	Hazardous Waste Operations and Emergency Response
29 CFR 1910.1053	Respirable Crystalline Silica
29 CFR 1926.1153	Respirable Crystalline Silica
33 CFR 320	Corps of Engineers: General Regulatory Policies
40 CFR 50	National Primary and Secondary Ambient Air Quality Standards
40 CFR 64	Compliance Assurance Monitoring
40 CFR 112	Oil Pollution Prevention
40 CFR 122.26	Storm Water Discharges (Applicable to State NPDES Programs, see section 123.25)
40 CFR 241	Guidelines for Disposal of Solid Waste
40 CFR 243	Guidelines for the Storage and Collection of Residential, Commercial, and Institutional Solid Waste
40 CFR 258	Subtitle D Landfill Requirements
40 CFR 261	Identification and Listing of Hazardous Waste
40 CFR 261.7	Residues of Hazardous Waste in Empty Containers

40 CFR 262	Standards Applicable to Generators of Hazardous Waste
40 CFR 263	Standards Applicable to Transporters of Hazardous Waste
40 CFR 264	Standards for Owners and Operators of Hazardous Waste Treatment, Storage, and Disposal Facilities
40 CFR 265	Interim Status Standards for Owners and Operators of Hazardous Waste Treatment, Storage, and Disposal Facilities
40 CFR 266	Standards for the Management of Specific Hazardous Wastes and Specific Types of Hazardous Waste Management Facilities
40 CFR 268	Land Disposal Restrictions
40 CFR 273	Standards for Universal Waste Management
40 CFR 279	Standards for the Management of Used Oil
40 CFR 300	National Oil and Hazardous Substances Pollution Contingency Plan
40 CFR 300.125	National Oil and Hazardous Substances Pollution Contingency Plan - Notification and Communications
40 CFR 355	Emergency Planning and Notification
49 CFR 171	General Information, Regulations, and Definitions
49 CFR 172	Hazardous Materials Table, Special Provisions, Hazardous Materials Communications, Emergency Response Information, and Training Requirements
49 CFR 173	Shippers - General Requirements for Shipments and Packagings
49 CFR 178	Specifications for Packagings

WASHINGTON STATE DEPARTMENT OF ECOLOGY (WSDE)

WSDE SMM	(2014) Washington State Stormwater Management Manual for Western Washington
WQC Order #20108	(2021) Washington State Department of Ecology Water Quality Certification, Yakima River Gap to Gap Ecosystem , Yakima, County, WA (included as Attachment A to 01 57 19)

1.3 APPLICABLE REGULATIONS

Comply with the most current version of the following list of environmental regulations where applicable. This list is not inclusive of all environmental laws and regulations, but represents those that are most likely to apply to work under this contract.

Clear Water Act/Federal Water Pollution Control Act:

(1) Section 401 as implemented by regulations including, but not limited to, 40 CFR 121 and applicable State regulations.

(2) Section 402 as implemented by regulation including, but not limited to, 40 CFR 110-113, 116-117, 121-131, and applicable State regulations.

(3) Section 404 as implemented by regulations including, but not limited to, 33 CFR 320-330, 332, and 335-338.

1.4 DEFINITIONS

1.4.1 Archaeological Resource

Archaeological resource is defined in Archaeological Resources Protection Act (43 CFR 7), Section 7.3 Definitions. Archaeological resource means any material remains of human life or activities which are at least 100 years of age, and which are of archaeological interest.

1.4.2 Class I and II Ozone Depleting Substance (ODS)

Class I ODS is defined in Section 602(a) of The Clean Air Act. A list of Class I ODS can be found on the EPA website at the following weblink. https://www.epa.gov/ozone-layer-protection/ozone-depleting-substances.

Class II ODS is defined in Section 602(s) of The Clean Air Act. A list of Class II ODS can be found on the EPA website at the following weblink. https://www.epa.gov/ozone-layer-protection/ozone-depleting-substances.

1.4.3 Contractor Generated Hazardous Waste

Contractor generated hazardous waste is materials that, if abandoned or disposed of, may meet the definition of a hazardous waste. These waste streams would typically consist of material brought on site by the Contractor to execute work, but are not fully consumed during the course of construction. Examples include, but are not limited to, excess paint thinners (i.e. methyl ethyl ketone, toluene), waste thinners, excess paints, excess solvents, waste solvents, excess pesticides, and contaminated pesticide equipment rinse water.

1.4.4 Electronics Waste

Electronics waste is discarded electronic devices intended for salvage, recycling, or disposal.

1.4.5 Environmental Pollution and Damage

Environmental pollution and damage is the presence of chemical, physical, or biological elements or agents which adversely affect human health or welfare; unfavorably alter ecological balances of importance to human

life; affect other species of importance to humankind; or degrade the environment aesthetically, culturally or historically.

1.4.6 Environmental Protection

Environmental protection is the prevention/control of pollution and habitat disruption that may occur to the environment during construction. The control of environmental pollution and damage requires consideration of land, water, and air; biological and cultural resources; and includes management of visual aesthetics; noise; solid, chemical, gaseous, and liquid waste; radiant energy and radioactive material as well as other pollutants.

1.4.7 Hazardous Debris

As defined in paragraph SOLID WASTE, debris that contains listed hazardous waste (either on the debris surface, or in its interstices, such as pore structure) in accordance with 40 CFR 261. Hazardous debris also includes debris that exhibits a characteristic of hazardous waste in accordance with 40 CFR 261.

1.4.8 Hazardous Materials

Hazardous materials as defined in 49 CFR 171 and listed in 49 CFR 172.

Hazardous material is any material that: Is regulated as a hazardous material in accordance with 49 CFR 173; or requires a Safety Data Sheet (SDS) in accordance with 29 CFR 1910.120; or during end use, treatment, handling, packaging, storage, transportation, or disposal meets or has components that meet or have potential to meet the definition of a hazardous waste as defined by 40 CFR 261 Subparts A, B, C, or D. Designation of a material by this definition, when separately regulated or controlled by other sections or directives, does not eliminate the need for adherence to that hazard-specific guidance which takes precedence over this section for "control" purposes. Such material includes ammunition, weapons, explosive actuated devices, propellants, pyrotechnics, chemical and biological warfare materials, medical and pharmaceutical supplies, medical waste and infectious materials, bulk fuels, radioactive materials, and other materials such as asbestos, mercury, and polychlorinated biphenyls (PCBs).

1.4.9 Hazardous Waste

Hazardous Waste is any material that meets the definition of a solid waste and exhibit a hazardous characteristic (ignitability, corrosivity, reactivity, or toxicity) as specified in 40 CFR 261, Subpart C, or contains a listed hazardous waste as identified in 40 CFR 261, Subpart D.

1.4.10 Historic Properties

Historic Properties is defined at 54 USC 300308 and 36 CFR 800.16. Historic Properties generally includes any material remains that are at least 50 years old and are of either archaeological, historical, or cultural significance, and consequently would be eligible for listing in the National Register of Historic Places (NRHP). Examples of Historic Properties include, but are not limited to: archaeological sites such as lithic scatters, villages, procurement areas, resource extractions sites, rock shelters, rock art, shell middens; and historic era sites such as trash scatters, homesteads, railroads, ranches, logging camps, and any

structures or buildings.

1.4.11 Land Application

Land Application means spreading or spraying discharge water at a rate that allows the water to percolate into the soil. No sheeting action, soil erosion, discharge into storm sewers, discharge into defined drainage areas, or discharge into the "waters of the United States" must occur. Comply with federal, state, and local laws and regulations.

1.4.12 Municipal Separate Storm Sewer System (MS4) Permit

MS4 permits are those held by installations to obtain NPDES permit coverage for their stormwater discharges.

1.4.13 National Pollutant Discharge Elimination System (NPDES)

The NPDES permit program controls water pollution by regulating point sources that discharge pollutants into waters of the United States.

1.4.14 Oily Waste

Oily waste are those materials that are, or were, mixed with Petroleum, Oils, and Lubricants (POLs) and have become separated from that POLs. Oily wastes also means materials, including wastewaters, centrifuge solids, filter residues or sludges, bottom sediments, tank bottoms, and sorbents which have come into contact with and have been contaminated by, POLs and may be appropriately tested and discarded in a manner which is in compliance with other state and local requirements.

This definition includes materials such as oily rags, "kitty litter" sorbent clay and organic sorbent material. These materials may be land filled provided that: It is not prohibited in other state regulations or local ordinances; the amount generated is "de minimus" (a small amount); it is the result of minor leaks or spills resulting from normal process operations; and free-flowing oil has been removed to the practicable extent possible. Large quantities of this material, generated as a result of a major spill or in lieu of proper maintenance of the processing equipment, are a solid waste. As a solid waste, perform a hazardous waste determination prior to disposal. As this can be an expensive process, it is recommended that this type of waste be minimized through good housekeeping practices and employee education.

1.4.15 Regulated Waste

Regulated waste are solid wastes that have specific additional federal, state, or local controls for handling, storage, or disposal.

1.4.16 Sediment

Sediment is soil and other debris that have eroded and have been transported by runoff water or wind.

1.4.17 Solid Waste

Solid waste is a solid, liquid, semi-solid or contained gaseous waste. A solid waste can be a hazardous waste, non-hazardous waste, or non-Resource Conservation and Recovery Act (RCRA) regulated waste. Types of solid waste typically generated at construction sites may include:

1.4.17.1 Debris

Debris is non-hazardous solid material generated during the construction, demolition, or renovation of a structure that exceeds 2.5-inch particle size that is: a manufactured object; plant or animal matter; or natural geologic material (for example, cobbles and boulders), broken or removed concrete, masonry, and rock asphalt paving; ceramics; roofing paper and shingles. Inert materials may be reinforced with or contain ferrous wire, rods, accessories and weldments. A mixture of debris and other material such as soil or sludge is also subject to regulation as debris if the mixture is comprised primarily of debris by volume, based on visual inspection.

1.4.17.2 Green Waste

Green waste is the vegetative matter from landscaping, land clearing and grubbing, including, but not limited to, grass, bushes, scrubs, small trees and saplings, tree stumps and plant roots. Marketable trees, grasses and plants that are indicated to remain, be re-located, or be re-used are not included.

1.4.17.3 Material not regulated as solid waste

Material not regulated as solid waste is nuclear source or byproduct materials regulated under the Federal Atomic Energy Act of 1954 as amended; suspended or dissolved materials in domestic sewage effluent or irrigation return flows, or other regulated point source discharges; regulated air emissions; and fluids or wastes associated with natural gas or crude oil exploration or production.

1.4.17.4 Non-Hazardous Waste

Non-hazardous waste is waste that is excluded from, or does not meet, hazardous waste criteria in accordance with 40 CFR 263.

1.4.17.5 Recyclables

Recyclables are materials, equipment and assemblies such as doors, windows, door and window frames, plumbing fixtures, glazing and mirrors that are recovered and sold as recyclable, wiring, insulated/non-insulated copper wire cable, wire rope, and structural components. It also includes commercial-grade refrigeration equipment with Freon removed, household appliances where the basic material content is metal, clean polyethylene terephthalate bottles, cooking oil, used fuel oil, textiles, high-grade paper products and corrugated cardboard, stackable pallets in good condition, clean crating material, and clean rubber/vehicle tires. Metal meeting the definition of lead contaminated or lead based paint contaminated may be included as recyclable if sold to a scrap metal company. Paint cans that meet the definition of empty containers in accordance with 40 CFR 261.7 may be included as recyclable if sold to a scrap metal company.

1.4.17.6 Surplus Soil

Surplus soil is existing soil that is in excess of what is required for this work, including aggregates intended, but not used, for on-site mixing of concrete, mortars, and paving. Contaminated soil meeting the definition of hazardous material or hazardous waste is not included and

must be managed in accordance with paragraph HAZARDOUS MATERIAL MANAGEMENT.

1.4.17.7 Scrap Metal

This includes scrap and excess ferrous and non-ferrous metals such as reinforcing steel, structural shapes, pipe, and wire that are recovered or collected and disposed of as scrap. Scrap metal meeting the definition of hazardous material or hazardous waste is not included.

1.4.17.8 Wood

Wood is dimension and non-dimension lumber, plywood, chipboard, hardboard. Treated or painted wood that meets the definition of lead contaminated or lead based contaminated paint is not included. Treated wood includes, but is not limited to, lumber, utility poles, crossties, and other wood products with chemical treatment.

1.4.18 Surface Discharge

Surface discharge means discharge of water into drainage ditches, storm sewers, creeks or "waters of the United States". Surface discharges are discrete, identifiable sources and require a permit from the governing agency. Comply with federal, state, and local laws and regulations.

1.4.19 Wastewater

Wastewater is the used water and solids from a community that flow to a treatment plant.

1.4.19.1 Stormwater

Stormwater is any precipitation in an urban or suburban area that does not evaporate or soak into the ground, but instead collects and flows into storm drains, rivers, and streams.

1.4.20 Waters of the United States

Waters of the United States means Federally jurisdictional waters, including wetlands, that are subject to regulation under Section 404 of the Clean Water Act or navigable waters, as defined under the Rivers and Harbors Act.

1.4.21 Wetlands

Wetlands are those areas that are inundated or saturated by surface or groundwater at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions.

1.4.22 Universal Waste

The universal waste regulations streamline collection requirements for certain hazardous wastes in the following categories: batteries, pesticides, mercury-containing equipment (for example, thermostats), and lamps (for example, fluorescent bulbs). The rule is designed to reduce hazardous waste in the municipal solid waste (MSW) stream by making it easier for universal waste handlers to collect these items and send them for recycling or proper disposal. These regulations can be found at 40 CFR 273.

1.5 SUBMITTALS

Government approval is required for submittals with a "G" designation; submittals not having a "G" designation are for information only. When used, a designation following the "G" designation identifies the office that will review the submittal for the Government. Submit the following in accordance with Section 01 33 00 SUBMITTAL PROCEDURES:

SD-01 Preconstruction Submittals

Preconstruction Survey

Solid Waste Management Permit; G

Regulatory Notifications; G

Environmental Protection Plan; G

Stormwater Pollution Prevention Plan (SWPPP); G

Stormwater Notice of Intent (for NPDES coverage under the general permit for construction activities); G

Dirt and Dust Control Plan; G

Employee Training Records; G

Environmental Manager Qualifications; G

Fish Exclusion And Rescue Plan; G, DO

Lighting Plan; G

SD-06 Test Reports

Inspection Reports

Monthly Solid Waste Disposal Report; G

SD-07 Certificates

Employee Training Records; G

Erosion and Sediment Control Inspector Qualifications

Environmental Manager; G, DO

Contractor's Biologist; G, DO

Fish Biologist; G, DO

SD-11 Closeout Submittals

Stormwater Pollution Prevention Plan Compliance Notebook; G

Stormwater Notice of Termination (for NPDES coverage under the general permit for construction activities); G

Waste Determination Documentation; G

Assembled Employee Training Records; G

Solid Waste Management Permit; G

Project Solid Waste Disposal Documentation Report; G

Hazardous Waste/Debris Management; G

Regulatory Notifications; G

Sales Documentation; G

As-Built Topographic Survey

1.6 ENVIRONMENTAL PROTECTION REQUIREMENTS

Provide and maintain, during the life of the contract, environmental protection as defined. Plan for and provide environmental protective measures to control pollution that develops during construction practice. Plan for and provide environmental protective measures required to correct conditions that develop during the construction of permanent or temporary environmental features associated with the project. Protect the environmental resources within the project boundaries and those affected outside the limits of permanent work during the entire duration of this Contract. Comply with federal, state, and local regulations pertaining to the environment, including water, air, solid waste, hazardous waste and substances, oily substances, and noise pollution.

The Contractor is responsible for complying with WQC Order #20108, as well as the conditions in Attachment 01 57 19-B, National Marine Fisheries Service (NMFS) Biological Opinion. Specific directions to the Contractor related to these documents are contained in other specification sections. These reports are included for reference only.

Tests and procedures assessing whether construction operations comply with Applicable Environmental Laws may be required. Analytical work must be performed by qualified laboratories; and where required by law, the laboratories must be certified.

1.6.1 Work Restrictions

1.6.1.1 In-water Work

In-water work for construction will conform with the NMFS BiOp. The in-water work window is 1 October through 28 February. In-water work is any work below the wetted perimeter including crossing wetted stream channels that have a surface water connection to the Yakima River. Work may be conducted any time above the wetted perimeter, or when the stream bed is dry, or if the waterbody or wetland has no surface water connection to the Yakima River (e.g. isolated gravel pits).

1.6.2 Conservation Measures and Best Management Practices (BMPs)

Several measures will be employed during construction to minimize adverse project effects on protected species and their habitat.

a. Existing roadways or travel paths will be used for access ways

whenever possible and stream crossings will be minimized.

b. The number of temporary access roads will be minimized and roads will be designed to avoid adverse effects like creating excessive erosion and to avoid crossing slopes greater than 30%.

c. All temporary access-ways not needed for future access will be removed (including gravel surfaces) and re-seeded before project completion.

d. As much as practicable, any large wood, native vegetation, weed-free topsoil, and native channel material displaced by construction will be stockpiled for site restoration.

e. When construction is finished, the construction area will be cleaned up and rehabilitated (reseeded) as necessary.

f. Within seven calendar days of completion of site improvements, any disturbed bank and riparian areas shall be protected using native vegetation or other erosion control measures as appropriate.

g. Obtaining construction materials and equipment from local producers or vendors to minimize energy use for shipping.

h. Encouraging construction personnel to carpool or use a crew shuttle van

i. Turning off equipment when not in use to reduce idling.

j. Maintaining equipment in good working order to maximize fuel efficiency.

k. Routing truck traffic through areas where the number of stops and delays will be minimized, and using off-peak travel times to maximize fuel efficiency.

l. Implementing emission-control technologies for construction equipment.

m. Using ultra low sulfur (for air quality) and biodiesel fuels in construction equipment.

n. Using renewable energy produced onsite or offsite. For example, using solar-powered generators to supply electricity for field offices and construction lighting.

BMPs Implemented During Construction:

a. Equipment used near the water will be cleaned prior to construction.

b. Biodegradable hydraulic fluids will be used in machinery where appropriate.

c. Refueling will occur with spill prevention and control measures in place.

d. Construction equipment shall be regularly checked for drips or leaks.

e. At least one fuel spill kit with absorbent pads will be onsite at all times.

f. At least one biologist will be onsite or available during construction.

g. Additional required BMPs are listed in WQC Order #20108.

1.7 QUALITY ASSURANCE

1.7.1 Environmental Permits

Work on this project is covered under the WQC Order #20108. Comply with all conditions of this certification. Apply for an NPDES permit (see Paragraph STORMWATER NOTICE OF INTENT FOR CONSTRUCTION ACTIVITIES below). The Stormwater Pollution Prevention Plan (SWPPP) must follow and use BMPs as outlined in the latest version of WSDE SMM.

1.7.2 Preconstruction Survey and Protection of Features

This paragraph supplements the Contract Clause PROTECTION OF EXISTING VEGETATION, STRUCTURES, EQUIPMENT, UTILITIES, AND IMPROVEMENTS. Prior to start of any onsite construction activities, perform a Preconstruction Survey of the project site with the Contracting Officer and USACE Biologist, and take photographs showing existing environmental conditions in and adjacent to the site. Submit a report for the record. Include in the report a plan describing the features requiring protection under the provisions of the Contract Clauses, which are not specifically identified on the drawings as environmental features requiring protection along with the condition of trees, shrubs and grassed areas immediately adjacent to the site of work and adjacent to the Contractor's assigned storage area and access route(s), as applicable. The Contractor and the Contracting Officer will sign this survey report upon mutual agreement regarding its accuracy and completeness. Protect those environmental features included in the survey report and any indicated on the drawings, regardless of interference that their preservation may cause to the work under the Contract.

1.7.3 Regulatory Notifications

Provide regulatory notification requirements in accordance with federal, state and local regulations. In cases where the Government will also provide public notification (such as stormwater permitting), coordinate with the Contracting Officer. Submit copies of regulatory notifications to the Contracting Officer at least 30 days prior to commencement of work activities. Typically, regulatory notifications must be provided for the following (this listing is not all-inclusive): demolition, renovation, NPDES defined site work, construction, removal or use of a permitted air emissions source, and remediation of controlled substances (asbestos, hazardous waste, lead paint).

1.7.4 Environmental Brief

Attend an environmental brief to be included in the preconstruction meeting. Provide the following information: types, quantities, and use of hazardous materials that will be brought onsite; and types and quantities of wastes/wastewater that may be generated during the Contract. Discuss the results of the Preconstruction Survey at this time.

Prior to initiating any work on site, meet with the Contracting Officer and USACE Biologist to discuss the proposed Environmental Protection Plan (EPP). Develop a mutual understanding relative to the details of environmental protection, including measures for protecting natural and cultural resources, required reports, required permits, permit requirements (such as mitigation measures), and other measures to be taken.

1.7.5 Environmental Manager

Appoint in writing an Environmental Manager for the project site. The Environmental Manager is directly responsible for coordinating contractor compliance with federal, state and local requirements. The Environmental Manager must ensure compliance with Hazardous Waste Program requirements (including hazardous waste handling, storage, manifesting, and disposal); implement the EPP; ensure environmental permits are obtained, maintained, and closed out; ensure compliance with Stormwater Program requirements; ensure compliance with Hazardous Materials (storage, handling, and reporting) requirements; and coordinate any remediation of regulated substances (lead, asbestos, PCB transformers). This can be a collateral position; however, the person in this position must be trained to adequately accomplish the following duties: ensure waste segregation and storage compatibility requirements are met; inspect and manage Satellite Accumulation areas; ensure only authorized personnel add wastes to containers; ensure Contractor personnel are trained in 40 CFR requirements in accordance with their position requirements; coordinate removal of waste containers; and maintain the Environmental Records binder and required documentation, including environmental permits compliance and close-out. Submit Environmental Manager Qualifications to the Contracting Officer.

1.7.6 Contractor's Biologist

The Contractor's Biologist will be a professionally qualified person who has obtained at least a Bachelor of Arts or Science degree in biology, ecology, or natural resources management, and has a minimum of three years of work experience in biological field data collection, wetlands delineation, fisheries data collection, natural resources management, or other similar and related work experience.

The Contractor's Biologist shall also have familiarity with the following:

a. Pacific Northwest regional riverine environments and the plant and animal species requiring protection;

b. State and federal protected species and their accurate identification;

c. The appropriate methods and materials for environmental protection during construction; and

d. Water quality monitoring methods and instruments.

The Contractor's Biologist must be available to conduct monitoring of construction activities of the project and be professionally qualified to report on environmental protections and impacts. The Contractor's Biologist will follow the procedures outlined in Attachment 01 57 19-A *Water Quality Certification and Water Quality Monitoring Plan*.

1.7.7 Fish Biologist for Electrofishing and Fish Handling

The Fish Biologist will be professionally qualified person who has obtained at least a Bachelor of Science degree in fish biology, ecology, or natural resources management, and has a minimum of five years of work experience in fish biology, fisheries research, or directly related work involving fish handling.

The Fish Biologist shall also have familiarity with the following:

a. Pacific Northwest regional riverine environments fish species requiring protection;

b. State and federal protected species and their accurate identification;

c. The appropriate methods and materials for environmental protection and fish handling during construction; and

d. Water quality monitoring methods and instruments.

The fish biologist must be available to conduct monitoring of construction activities of the project and be professionally qualified to report on environmental protections and impacts specifically to fish species. The fish biologist must have training in safety in electrofishing sufficient to lead a work crew in electrofishing.

1.7.8 Employee Training Records

Prepare and maintain Employee Training Records throughout the term of the contract meeting applicable 40 CFR requirements. Provide Employee Training Records in the Environmental Records Binder. Submit these Assembled Employee Training Records to the Contracting Officer at the conclusion of the project, unless otherwise directed.

Train personnel to meet state requirements. Conduct environmental protection/pollution control meetings for personnel prior to commencing construction activities. Contact additional meetings for new personnel and when site conditions change. Include in the training and meeting agenda: methods of detecting and avoiding pollution; familiarization with statutory and contractual pollution standards; installation and care of devices, vegetative covers, and instruments required for monitoring purposes to ensure adequate and continuous environmental protection/pollution control; anticipated hazardous or toxic chemicals or wastes, and other regulated contaminants; recognition and protection of archaeological sites, artifacts, waters of the United States, and endangered species and their habitat that are known to be in the area. Provide copy of the Erosion and Sediment Control Inspector Qualifications as defined by EPA to project COR and USACE Biologist.

1.7.9 Non-Compliance Notifications

The Contracting Officer will notify the Contractor in writing of any observed noncompliance with federal, state or local environmental laws or regulations, permits, and other elements of the Contractor's EPP. After receipt of such notice, inform the Contracting Officer of the proposed corrective action and take such action when approved by the Contracting Officer. The Contracting Officer may issue an order stopping all or part of the work until satisfactory corrective action has been taken. FAR

52.242-14 Suspension of Work provides that a suspension, delay, or interruption of work due to the fault or negligence of the Contractor allows for no adjustments to the contract for time extensions or equitable adjustments. In addition to a suspension of work, the Contracting Officer may use additional authorities under the contract or law.

1.8 ENVIRONMENTAL PROTECTION PLAN

The purpose of the EPP is to present an overview of known or potential environmental issues that must be considered and addressed during construction. Include in the EPP measures for protecting natural and cultural resources, required reports, and other measures to be taken. Meet with the Contracting Officer, USACE Biologist and USACE Archaeologist to discuss the EPP and develop a mutual understanding relative to the details for environmental protection including measures for protecting natural resources, required reports, and other measures to be taken. Submit the EPP within 30 days after notice to proceed and not less than 10 days before the preconstruction meeting. Revise the EPP throughout the project to include any reporting requirements, changes in site conditions, or contract modifications that change the project scope of work in a way that could have an environmental impact. No requirement in this section will relieve the Contractor of any applicable federal, state, and local environmental protection laws and regulations. During Construction, identify, implement, and submit for approval any additional requirements to be included in the EPP. Maintain the current version onsite.

The EPP includes, but is not limited to, the following elements:

1.8.1 General Overview and Purpose

1.8.1.1 Descriptions

A brief description of each specific plan required by environmental permit or elsewhere in this Contract such as stormwater pollution prevention plan, spill control plan, solid waste management plan, wastewater management plan, air pollution control plan, contaminant prevention plan, a historical, archaeological, cultural resources, biological resources and wetlands plan, traffic control plan Hazardous, Toxic and Radioactive Waste (HTRW) Plan Non-Hazardous Solid Waste Disposal Plan borrowing material plan.

1.8.1.2 Duties

The duties and level of authority assigned to the person(s) on the job site who oversee environmental compliance, such as who is responsible for adherence to the EPP, who is responsible for spill cleanup and training personnel on spill response procedures, who is responsible for manifesting hazardous waste to be removed from the site (if applicable), and who is responsible for training the Contractor's environmental protection personnel.

1.8.1.3 Procedures

A copy of any standard or project-specific operating procedures that will be used to effectively manage and protect the environment on the project site.

1.8.1.4 Communications

Communication and training procedures that will be used to convey

environmental management requirements to Contractor employees and subcontractors.

1.8.1.5 Contact Information

Emergency contact information contact information (office phone number, cell phone number, and e-mail address).

1.8.2 General Site Information

1.8.2.1 Drawings

Drawings showing locations of proposed temporary excavations or embankments for haul roads, stream crossings, jurisdictional wetlands, material storage areas, structures, sanitary facilities, storm drains and conveyances, and stockpiles of excess soil.

1.8.2.2 Work Area

Work area plan showing the proposed activity in each portion of the area and identify the areas of limited use or nonuse. Include measures for marking the limits of use areas, including methods for protection of features to be preserved within authorized work areas and methods to control runoff and to contain materials on site, and a traffic control plan.

1.8.2.3 Documentation

A letter signed by an officer of the firm appointing the Environmental Manager and stating that person is responsible for managing and implementing the Environmental Program as described in this contract. Include in this letter the Environmental Manager's authority to direct the removal and replacement of non-conforming work. In addition, each project engineer and sub-contractor shall read and sign Attachment A of the WQC Order #20108, affirming that they have read and understand the conditions of the order, and provide copies to the Contracting Officer for submittal to WSDOE.

1.8.3 Management of Natural Resources

a. Land resources

b. Tree protection

c. Replacement of damaged landscape features

d. Temporary construction

e. In-water work

f. Fish and wildlife resources

g. Wetland areas

1.8.4 Protection of Historical and Archaeological Resources

a. Objectives

b. Methods

1.8.5 Stormwater Management and Control

a. Ground cover

b. Erodible soils

c. Temporary measures

(1) Structural Practices

(2) Temporary and permanent stabilization

d. Effective selection, implementation and maintenance of Best Management Practices (BMPs).

1.8.6 Protection of the Environment from Waste Derived from Contractor Operations

Control and disposal of solid and sanitary waste. Control and disposal of hazardous waste.

This item consist of the management procedures for hazardous waste to be generated. As a minimum, include the following:

a. List of the types of hazardous wastes expected to be generated

b. Procedures to ensure a written waste determination is made for appropriate wastes that are to be generated

c. Sampling/analysis plan, including laboratory method(s) that will be used for waste determinations and copies of relevant laboratory certifications

d. Methods and proposed locations for hazardous waste accumulation/storage (that is, in tanks or containers)

e. Management procedures for storage, labeling, transportation, and disposal of waste (treatment of waste is not allowed unless specifically noted)

f. Management procedures and regulatory documentation ensuring disposal of hazardous waste complies with Land Disposal Restrictions (40 CFR 268)

g. Management procedures for recyclable hazardous materials such as lead-acid batteries, used oil, and similar

h. Used oil management procedures in accordance with 40 CFR 279; Hazardous waste minimization procedures

i. Plans for the disposal of hazardous waste by permitted facilities; and Procedures to be employed to ensure required employee training records are maintained.

1.8.7 Prevention of Releases to the Environment

Procedures to prevent releases to the environment

Notifications in the event of a release to the environment

1.8.8 Regulatory Notification and Permits

Demonstrate that compliance with those permits have been obtained or applied for by including copies of applicable environmental permits. The EPP will not be approved until the NPDES has been obtained.

1.8.9 Clean Air Act Compliance

Equipment operation, activities, or processes will be in accordance with all Federal, State, and local air emission and performance laws and standards. Construction equipment will include dust suppression methods to minimize airborne particulate matter that would be created during any ground disturbing activities that could create dust. Additionally, all equipment and vehicles will be required to be kept in good operating condition to minimize exhaust emissions. Standard practices will be used to control fugitive dust during the construction phase and during daily operations and maintenance of the proposed project.

1.8.9.1 Haul Route

Submit truck and material haul routes along with a Dirt and Dust Control Plan for controlling dirt, debris, and dust on roadways. As a minimum, identify in the plan the subcontractor and equipment for cleaning along the haul route and measures to reduce dirt, dust, and debris from roadways.

1.8.9.2 Compliant Materials

Provide the Government a list of and SDSs for all hazardous materials proposed for use on site. Materials must be compliant with all Clean Air Act regulations for emissions including solvent and volatile organic compound contents, and applicable National Emission Standards for Hazardous Air Pollutants requirements.

1.9 LIGHTING PLAN

If lights are necessary for night-time work, prepare a lighting plan for the work area. The use of directional lights shall be employed with no lights being directed to illuminate:

a. The Yakima River (unless necessary for in-water work or emergency operations).

b. Tributaries to the Yakima River.

The suite of full spectrum lighting should be avoided. The lighting plan will be submitted to the Corps for review and approval.

1.10 FISH EXCLUSION AND RESCUE PLAN

Submit a Fish Exclusion and Rescue Plan prior to initiation of any construction activities. The plan shall include fish protection methods for in-water work where the USACE Biologist determines risk of presence of fish. The specific requirements are detailed in Part 3, Paragraph FISH EXCLUSION AND RESCUE DURING DEWATERING below.

1.11 LICENSES AND PERMITS

Obtain licenses and permits required for the construction of the project and in accordance with FAR 52.236-7 Permits and Responsibilities. Notify the Government of all general use permitted equipment the Contractor plans to use on site. This paragraph supplements the Contractor's responsibility under FAR 52.236-7 Permits and Responsibilities.

1.12 ENVIRONMENTAL RECORDS BINDER

Maintain on-site a separate three-ring Environmental Records Binder and submit at the completion of the project. Make separate parts within the binder that correspond to each submittal listed under paragraph CLOSEOUT SUBMITTALS in this section.

1.13 SOLID WASTE MANAGEMENT PERMIT

Provide the Contracting Officer with written notification of the quantity of anticipated solid waste or debris that is anticipated or estimated to be generated by construction. Include in the report the locations where various types of waste will be disposed or recycled. Include letters of acceptance from the receiving location or as applicable; submit one copy of the receiving location state and local Solid Waste Management Permit or license showing such agency's approval of the disposal plan before transporting wastes off Government property.

1.13.1 Monthly Solid Waste Disposal Report

Monthly, submit a solid waste disposal report to the Contracting Officer. For each waste, the report will state the classification (using the definitions provided in this section), amount, location, and name of the business receiving the solid waste.

PART 2 PRODUCTS

Not Used

PART 3 EXECUTION

3.1 FISH EXCLUSION AND RESCUE DURING DEWATERING

3.1.1 General

Prior to construction site dewatering, breaching of earthen berms holding water, or activities in other areas as determined in the Environmental Protection Plan, fish exclusion procedures will be implemented and then fish will be captured and relocated to avoid direct mortality and to minimize take.

Conduct fish removal and relocation in accordance with the conditions of collection permits issued by Washington Department of Fish and Wildlife (WDFW) and Endangered Species Act (ESA) requirements listed in the National Marine Fisheries Service (NMFS) BiOp that may be required to conduct these activities.

The Contractor's Biologist will remain on-site during the entire process of dewatering. If the site is exposed to warm air temperatures at the time of fish relocation then all capture activities will occur during morning periods. The Contractor's Biologist will periodically measure air and

water temperatures and cease activities when water temperature exceeds levels allowed by WDFW and NMFS.

3.1.2 Fish Exclusion

Provide block nets upstream and downstream of the work site in such a manner as to exclude salmonids from entering the area. In the event that the fish passage controls fail, perform additional fish rescues to remove the fish from the working area prior to recommencing construction.

3.1.3 Seine Nets

Seines (soft, non-abrasive nylon material) and dip nets shall be used as the primary fish rescue technique unless otherwise specified or conditions are unsuitable or unsafe. Handle all fish as little as possible and in a manner that minimizes stress to the fish.

3.1.4 Traps and Nets

If traps or fyke nets are used for fish relocation, trapping or netting may begin fourteen days prior to work site dewatering. Check traps and nets daily. Seines and other netting may be used where appropriate.

3.1.5 Electrofishing

If electrofishing is used, it shall conform to the guidelines described in Attachment 01 57 19-C Guidelines for Electrofishing Waters Containing Salmonids Listed Under the Endangered Species Act. The electrofishing team shall have at least one hundred hours of cumulative electrofishing experience. The operations will not resort to the use of electrofishing equipment unless and until other, less injurious methods have removed most or all of the adult and sub-adult fish (i.e., fish in excess of 300 millimeters).

3.1.6 Dewater Pumping

If areas are dewatered by pumping, the Contractor's Biologist will begin to capture fish before pumping begins, if the site conditions allow. If the site is too deep to seine, the Contractor's Biologist will begin capturing fish with a dip-net as the water level is reduced. If pumping is required to reduce water depths for the removal of fish, the Contractor's Biologist will construct a mesh net around the pump area so that fish are not entrained into the pump.

3.1.7 Release Location

An appropriate release location will be selected in advance for different life-stages of the captured species, and the Contractor's Biologist will release fish only in those pre-determined locations. These release locations will be selected on the basis of having water temperature similar to that of the capture location, and having ample habitat.

3.1.8 Staffing

Personnel doing capture and release will be a qualified fish biologist, or will be acting under direct supervision of a qualified fish biologist, and will have been familiarized with these protocols in advance.

3.1.9 Fish Handling Techniques

a. Prior to conducting activities that may involve handling fish, individuals shall ensure that hands are free of sunscreen, lotion, or insect repellent.

b. Release captured fish as soon as possible. If stressed from electrofishing, release fish as soon as they appear capable of normal swimming behavior.

c. If fish are held temporarily, provide a healthy environment for the stressed fish and minimize holding time. Water to water transfers, the use of shaded, dark containers, and supplemental oxygen shall be considered in designing fish relocation actions. Ensure that water temperatures are adequate to support salmonids.

d. Keep large and small fish in separate containers to reduce predation.

e. Record species, numbers, size or age-class and condition (e.g. healthy, injured, and dead) if any captured or observed in the project area.

f. Remove salmonids to a river location downstream of the barrier and coffered areas, or block nets unless the USACE biologist approves holding in a temporary tank.

3.1.10 Monitoring and Reporting

3.1.10.1 Reporting of Fish Collected

For all captured individuals, the Contractor's Biologist will identify and record species, estimate year-classes, and estimate numbers at the time of release. Fish will not be anesthetized or measured. The method, location and time of capture will be included. Submit a report summarizing fish relocation activities to the Corps and Washington Department of Fish and Wildlife (WDFW) within five days after the relocation effort.

3.1.10.2 Reporting of ESA Listed Species Captured or Injured

When an Endangered Species Act (ESA) species is incidentally captured during fish rescue activities, it shall be immediately released at the point of capture and reported to the USACE Biologist. Report all mortalities of ESA species associated with the fish rescue activities or observed during the course of any other work to the USACE Biologist and specific federal agency:

NMFS Law Enforcement if injured or dead listed species are found:
(206) 526-6133
(800) 853-1964

3.2 PROTECTION OF NATURAL RESOURCES

Minimize interference with, disturbance to, and damage to fish, wildlife, and plants, including their habitats. Prior to the commencement of activities, consult with the Contracting Officer and USACE Biologist regarding rare species or sensitive habitats that need to be protected. The protection of rare, threatened, and endangered animal and plant species identified, including their habitats, is the Contractor's

responsibility.

Preserve the natural resources within the project boundaries and outside the limits of permanent work. Restore to an equivalent or improved condition upon completion of work that is consistent with the requirements of the NMFS BiOp or as otherwise specified. Confine construction activities to within the limits of the work indicated or specified.

3.2.1 Flow Ways

Do not alter water flows or otherwise significantly disturb the native habitat adjacent to the project and critical to the survival of fish and wildlife, except as specified and permitted.

3.2.2 Vegetation

Except in areas to be cleared, do not remove, cut, deface, injure, or destroy trees or shrubs without the Contracting Officer's permission. Do not fasten or attach ropes, cables, or guys to existing nearby trees for anchorages unless authorized by the Contracting Officer. Where such use of attached ropes, cables, or guys is authorized, the Contractor is responsible for any resultant damage.

Protect existing trees that are to remain to ensure they are not injured, bruised, defaced, or otherwise damaged by construction operations. Remove displaced rocks from uncleared areas. Coordinate with the Contracting Officer and USACE Biologist to determine appropriate action for trees and other landscape features scarred or damaged by equipment operations.

3.2.3 In-water Work

The movement of materials or equipment must be accomplished without violating water pollution control standards of the federal, state, and local governments. Construction of stream crossing structures must be in compliance with any required permits including, but not limited to, Clean Water Act Section 404, and Section 401 WQC Order #20108.

In-water work will conform to conditions in WQC Order #20108 and comply with Washington State Water Quality Standards (WAC 173-201A)

As indicated in WQC Order #20108, Section D, during in-water construction activities, water quality monitoring shall be accomplished through the implementation of the approved Water Quality Monitoring Plan (see Attachment 01 57 19-A). The Contractor's Biologist shall perform the water quality monitoring and report data to the USACE Biologist at the end of each workday.

3.2.4 Streams

Stream crossings must allow movement of materials or equipment without violating water pollution control standards of the federal, state, and local governments. Construction of stream crossing structures must be in compliance with any required permits including, but not limited to, Clean Water Act Section 404, and Section 401 Water Quality.

The Contracting Officer's approval and appropriate permits are required before any equipment will be permitted to ford live streams. In areas where frequent crossings are required, install temporary culverts or bridges. Obtain Contracting Officer's approval prior to installation.

Remove temporary culverts or bridges upon completion of work, and repair the area to its original condition unless otherwise required by the Contracting Officer.

3.3 STORMWATER

Do not discharge stormwater from construction sites to the sanitary sewer. If the water is noted or suspected of being contaminated, it may only be released to the storm drain system if the discharge is specifically permitted. Obtain authorization in advance from the Contracting Officer for any release of contaminated water.

3.3.1 Construction General Permit

Provide a Construction General Permit as required by 40 CFR 122.26 or the State of Washington General Permit. Under the terms and conditions of the permit, install, inspect, maintain BMPs, prepare stormwater erosion and sediment control inspection reports, and submit SWPPP inspection reports. Maintain construction operations and management in compliance with the terms and conditions of the general permit for stormwater discharges from construction activities.

3.3.1.1 Stormwater Pollution Prevention Plan

Submit a project-specific Stormwater Pollution Prevention Plan (SWPPP) for Government approval as part of the Environmental Protection Plan prior to the commencement of work (See Paragraph ENVIRONMENTAL PROTECTION PLAN (EPP) above). A copy will also be provided to the USACE Biologist. The SWPPP must meet the requirements of 40 CFR 122.26 and the EPA General Permit for stormwater discharges from construction sites as well as the Construction Stormwater General Permit from WSDOE located at: https://ecology.wa.gov/Regulations-Permits/Permits-certifications/Stormwater-general-permits/Construction-stormwater-permit

Include the following:

a. Comply with terms of the EPA general permit for stormwater discharges from construction activities. Prepare SWPPP in accordance with EPA requirements.

b. Select applicable BMPs from EPA Fact Sheets located at https://www.epa.gov/npdes/national-menu-best-management-practices-bmps-stormwater# or in accordance with applicable state or local requirements.

c. Include a completed copy of the Notice of Intent, BMP Inspection Report Template, and Stormwater Notice of Termination, except for the effective date.

Prepare the SWPPP in accordance with the requirements outlined in 40 CFR 122.26, the Construction Stormwater General Permit, and the latest version of the Stormwater Management Manual for Eastern Washington. The SWPPP must be completed and approved prior to submitting the NOI. A narrative of the storm water management and control should include the following:

a. A brief project description

b. Total disturbed acreage in accordance with EPA's Construction General Permit definitions.

c. United States Waters that the project will drain onto

d. The sequence of construction events

e. Stormwater BMPs that will be applied to the site. The following steps shall be taken as best management practices and offsetting measures to reduce and/or mitigate (minimize) adverse effects:

1. Equipment used near the water will be cleaned prior to construction.

2. Staging and refueling areas will occur a minimum of 50 feet and, where practical, 200 feet from waters of the state including Wetlands.

3. Regularly check construction equipment for drips or leaks. Any leak will be fixed promptly or the equipment will be removed from the project site.

4. At least one fuel spill kit with absorbent pads will be onsite at all times.

5. Drive trains of equipment will not operate in moving water and work will occur from the top of the bank. Only the excavator bucket with thumb attachment will extend into the water.

6. Plantings will be planted in the fall with native shrubs trees and grasses.

7. Additional required BMPs are listed in WQC Order #20108. The Contractor can propose additional BMPs for stormwater control.

f. Site map showing location of BMP measures.

g. Description of periodic and routine inspections.

h. How and where hazardous materials will be handled and stored on site.

i. Exposed soil coverage practices.

j. Final site stabilization method(s).

3.3.1.2 Stormwater Notice of Intent for Construction Activities

Prepare and submit the Notice of Intent for NPDES coverage under the general permit for construction activities to the Contracting Officer for review and approval.

Submit the approved NOI and appropriate permit fees onto the appropriate federal or state agency for approval. No land disturbing activities may commence without permit coverage. Maintain an approved copy of the SWPPP at the onsite construction office, and continually update as regulations require, reflecting current site conditions.

3.3.1.3 Inspection Reports

Submit "Inspection Reports" to the Contracting Officer in accordance with the Construction General Permit.

3.3.1.4 Stormwater Pollution Prevention Plan Compliance Notebook

Create and maintain a three ring binder of documents that demonstrate compliance with the Construction General Permit. Include a copy of the permit Notice of Intent, proof of permit fee payment, SWPPP and SWPPP update amendments, inspection reports and related corrective action records, copies of correspondence with the EPA, and a copy of the permit Notice of Termination in the binder. At project completion, the notebook becomes property of the Government. Provide the compliance notebook to the Contracting Officer.

3.3.1.5 Stormwater Notice of Termination for Construction Activities

Submit a Notice of Termination to the Contracting Officer for approval once construction is complete and final stabilization has been achieved on all portions of the site for which the permittee is responsible. Once approved, submit the Notice of Termination to the appropriate state or federal agency. Prepare as-built topographic survey information required by the permitting agency for certification of the stormwater management system, and provide to the Contracting Officer.

3.3.2 Erosion and Sediment Control Measures

Provide erosion and sediment control measures in accordance with state and local laws and regulations. Preserve vegetation to the maximum extent practicable.

Erosion control inspection reports may be compiled as part of a stormwater pollution prevention plan inspection reports.

3.3.2.1 Erosion and Sediment Control Measures

Provide erosion and sediment control measures in accordance with state and local laws and regulations. Preserve vegetation to the maximum extent practicable.

The erosion and sediment controls selected and maintained shall be such that water quality standards are not violated as a result of construction activities. Keep the area of bare soil exposed at any one time by construction operations to a minimum. Construct or install temporary and permanent erosion and sediment control in accordance with best management practices (BMPs). BMPs include, but are not limited to, vegetation cover, stream bank stabilization, slope stabilization, silt fences, construction of terraces, interceptor channels, sediment traps, inlet and outfall protection, diversion channels, and sedimentation basins. The Contractor's best management practices must be in accordance with SMMWW. Remove any temporary measures after the area has been stabilized.

The following measures shall be implemented as necessary:

a. Silt fence installed to minimize transport of sediment beyond the active construction area. A high-visibility silt fence may aid in marking access routes and clearing limits.

b. Rock check dams to reduce flow velocity over steep slopes and/or straw bale dams to filter sediment in low-velocity, low-flow areas.

c. Clearing limits that are marked and visible during construction to reduce impacts and disturbance within the Project area.

d. Equipment washing stations located near surface streets to remove sediment from equipment prior to movement of equipment onto surface streets and/or use of street sweepers or hand sweeping of surface streets to remove sediment and debris transported off site.

e. All efforts will be made to locate storage and staging areas in flat areas above the ordinary high water line with appropriate erosion and sediment control measures, such as gravel pads.

f. The number of trips made through the project site by heavy equipment will be minimized.

Erosion control inspection reports may be compiled as part of a stormwater pollution prevention plan inspection report.

Provide seeding in accordance with Section 32 93 00 PLANTING.

3.3.3 Work Area Limits

Mark the areas that need not be disturbed under this Contract prior to commencing construction activities. Mark or fence environmentally sensitive areas within the general work area that are not to be disturbed with high visibility construction fencing (HVF) prior to commencement of construction activities.. Protect monuments and markers before construction operations commence. Where construction operations are to be conducted during darkness, any markers must be visible in the dark. Personnel must be knowledgeable of the purpose for marking and protecting particular objects.

3.3.4 Contractor Facilities and Work Areas

Place field offices, staging areas, stockpile storage, and temporary buildings in areas designated on the drawings or as directed by the Contracting Officer. Move or relocate the Contractor facilities only when approved by the Government. Provide erosion and sediment controls for onsite borrow and spoil areas to prevent sediment from entering nearby waters. Control temporary excavation and embankments for plant or work areas to protect adjacent areas.

3.4 SURFACE AND GROUNDWATER

3.4.1 Waters of the United States

Do not enter, disturb, destroy, or allow discharge of contaminants into waters of the United States except as authorized herein. The protection of waters of the United States shown on the drawings in accordance with paragraph LICENSES AND PERMITS is the Contractor's responsibility. Authorization to enter specific waters of the United States identified does not relieve the Contractor from any obligation to protect other waters of the United States within, adjacent to, or in the vicinity of the construction site and associated boundaries.

3.5 PROTECTION OF CULTURAL RESOURCES

3.5.1 Archaeological Resources

If, during excavation or other construction activities, any previously unidentified or unanticipated historical, archaeological, and cultural

resources are discovered or found, activities that may damage or alter such resources will be suspended. Resources covered by this paragraph include, but are not limited to: any human skeletal remains or burials; artifacts; shell, midden, bone, charcoal, or other deposits; rock or coral alignments, pavings, wall, or other constructed features; and any indication of agricultural or other human activities. Upon such discovery or find, immediately notify the Contracting Officer so that the appropriate authorities may be notified and a determination made as to their significance and what, if any, special disposition of the finds should be made. Cease all activities that may result in impact to or the destruction of these resources. Secure the area and prevent employees or other persons from trespassing on, removing, or otherwise disturbing such resources. The Government retains ownership and control over archaeological resources.

3.6 AIR RESOURCES

Equipment operation, activities, or processes will be in accordance with 40 CFR 64 and state air emission and performance laws and standards.

3.6.1 Burning

Burning is prohibited.

3.6.2 Dust Control

Keep dust down at all times, including during nonworking periods. Sprinkle or treat, with dust suppressants, the soil at the site, haul roads, and other areas disturbed by operations. Dry power brooming will not be permitted. Instead, use vacuuming, wet mopping, wet sweeping, or wet power brooming. Air blowing will be permitted only for cleaning nonparticulate debris such as steel reinforcing bars. Only wet cutting will be permitted for cutting concrete blocks, concrete, and bituminous concrete. Do not unnecessarily shake bags of cement, concrete mortar, or plaster. Since these products contain Crystalline Silica, comply with the applicable OSHA standard, 29 CFR 1910.1053 or 29 CFR 1926.1153 for controlling exposure to Crystalline Silica Dust.

3.6.2.1 Particulates

Dust particles, aerosols and gaseous by-products from construction activities, and processing and preparation of materials (such as from asphaltic batch plants) must be controlled at all times, including weekends, holidays, and hours when work is not in progress. Maintain excavations, stockpiles, haul roads, permanent and temporary access roads, plant sites, spoil areas, borrow areas, and other work areas within or outside the project boundaries free from particulates that would exceed 40 CFR 50, state, and local air pollution standards or that would cause a hazard or a nuisance. Sprinkling, chemical treatment of an approved type, baghouse, scrubbers, electrostatic precipitators, or other methods will be permitted to control particulates in the work area. Sprinkling, to be efficient, must be repeated to keep the disturbed area damp. Provide sufficient, competent equipment available to accomplish these tasks. Perform particulate control as the work proceeds and whenever a particulate nuisance or hazard occurs. Comply with state and local visibility regulations.

3.6.3 Odors

Control odors from construction activities. The odors must be in compliance with state regulations and local ordinances and may not constitute a health hazard.

3.7 WASTE MINIMIZATION

Minimize the use of hazardous materials and the generation of waste. Include procedures for pollution prevention/ hazardous waste minimization in the Hazardous Waste Management Section of the EPP.

3.7.1 Salvage, Reuse and Recycle

Identify anticipated materials and waste for salvage, reuse, and recycling. Describe actions to promote material reuse, resale or recycling. To the extent practicable, all scrap metal must be sent for reuse or recycling and will not be disposed of in a landfill.

Include the name, physical address, and telephone number of the hauler, if transported by a franchised solid waste hauler. Include the destination and, unless exempted, provide a copy of the state or local permit (cover) or license for recycling.

3.7.2 Nonhazardous Solid Waste Diversion Report

Maintain an inventory of nonhazardous solid waste diversion and disposal of construction and demolition debris. Submit a report to the Contracting Officer on the first working day after each fiscal year quarter, starting the first quarter that nonhazardous solid waste has been generated. Include the following in the report:

Construction and Demolition (C&D) Debris Disposed	cubic yards or tons, as appropriate
C&D Debris Recycled	cubic yards or tons, as appropriate
C&D Debris Composted	cubic yards or tons, as appropriate
Total C&D Debris Generated	cubic yards or tons, as appropriate
Waste Sent to Waste-To-Energy Incineration Plant (This amount should not be included in the recycled amount)	cubic yards or tons, as appropriate

3.8 WASTE MANAGEMENT AND DISPOSAL

3.8.1 Waste Determination Documentation

Complete a Waste Determination form (provided at the pre-construction conference) for Contractor-derived wastes to be generated. All potentially hazardous solid waste streams that are not subject to a specific exclusion or exemption from the hazardous waste regulations (e.g. scrap metal, domestic sewage) or subject to special rules, (lead-acid batteries and precious metals) must be characterized in accordance with the requirements of 40 CFR 261 or corresponding applicable state or local regulations. Base waste determination on user knowledge of the processes and materials used, and analytical data when necessary. Consult with the Contracting Officer for guidance on specific requirements. Attach support documentation to the Waste Determination form. As a minimum, provide a Waste Determination form for the following waste (this listing is not inclusive): oil- and latex -based painting and caulking products, solvents, adhesives, aerosols, petroleum products, and containers of the original materials.

3.8.2 Solid Waste Management

3.8.2.1 Project Solid Waste Disposal Documentation Report

Provide copies of the waste handling facilities' weight tickets, receipts, bills of sale, and other sales documentation. In lieu of sales documentation, a statement indicating the disposal location for the solid waste that is signed by an employee authorized to legally obligate or bind the firm may be submitted. The sales documentation must include the receiver's tax identification number and business, EPA or state registration number, along with the receiver's delivery and business addresses and telephone numbers. For each solid waste retained for the Contractor's own use, submit the information previously described in this paragraph on the solid waste disposal report. Prices paid or received do not have to be reported to the Contracting Officer unless required by other provisions or specifications of this Contract or public law.

3.8.2.2 Control and Management of Solid Wastes

Pick up solid wastes, and place in covered containers that are regularly emptied. Do not prepare or cook food on the project site. Prevent contamination of the site or other areas when handling and disposing of wastes. At project completion, leave the areas clean. Employ segregation measures so that no hazardous or toxic waste will become co-mingled with non-hazardous solid waste. Solid waste disposal offsite must comply with most stringent local, state, and federal requirements, including 40 CFR 241, 40 CFR 243, and 40 CFR 258.

Manage hazardous material used in construction, including but not limited to, aerosol cans, waste paint, cleaning solvents, contaminated brushes, and used rags, in accordance with 49 CFR 173.

3.8.3 Control and Management of Hazardous Waste

Do not dispose of hazardous waste on Government property. Do not discharge any waste to a sanitary sewer, storm drain, or to surface waters or conduct waste treatment or disposal on Government property without written approval of the Contracting Officer.

3.8.3.1 Hazardous Waste/Debris Management

Identify construction activities that will generate hazardous waste or debris. Provide a documented waste determination for resultant waste streams. Identify, label, handle, store, and dispose of hazardous waste or debris in accordance with federal, state, and local regulations, including 40 CFR 261, 40 CFR 262, 40 CFR 263, 40 CFR 264, 40 CFR 265, 40 CFR 266, and 40 CFR 268.

Manage hazardous waste in accordance with the approved Hazardous Waste Management Section of the EPP. Store hazardous wastes in approved containers in accordance with 49 CFR 173 and 49 CFR 178. Hazardous waste generated within the confines of Government facilities is identified as being generated by the Government. Prior to removal of any hazardous waste from Government property, hazardous waste manifests must be signed by personnel from the Conracting Officer. Do not bring hazardous waste onto Government property. Provide the Contracting Officer with a copy of waste determination documentation for any solid waste streams that have any potential to be hazardous waste or contain any chemical constituents listed in 40 CFR 372-SUBPART D.

3.8.4 Releases/Spills of Oil and Hazardous Substances

3.8.4.1 Response and Notifications

Exercise due diligence to prevent, contain, and respond to spills of hazardous material, hazardous substances, hazardous waste, sewage, regulated gas, petroleum, lubrication oil, and other substances regulated in accordance with 40 CFR 300. Maintain spill cleanup equipment and materials at the work site. In the event of a spill, take prompt, effective action to stop, contain, curtail, or otherwise limit the amount, duration, and severity of the spill/release. In the event of any releases of oil and hazardous substances, chemicals, or gases; immediately (within 15 minutes) notify the Contracting Officer and the state or local authority.

Submit verbal and written notifications as required by the federal (40 CFR 300.125 and 40 CFR 355), state, local regulations and

instructions. Provide copies of the written notification and documentation that a verbal notification was made within 20 days. Spill response must be in accordance with 40 CFR 300 and applicable state and local regulations. Contain and clean up these spills without cost to the Government.

Designate an individual who will report any spills or hazardous substance releases and who will follow up with complete documentation. This individual will immediately notify the Contracting Officer in addition to the legally required Federal, State, and local reporting channels (including the National Response Center 1-800-424-8802) if a reportable quantity is released to the environment. Provide a list of the required reporting channels and telephone numbers.

3.8.4.2 Clean Up

Clean up hazardous and non-hazardous waste spills. Reimburse the Government for costs incurred including sample analysis materials, clothing, equipment, and labor if the Government will initiate its own spill cleanup procedures, for Contractor- responsible spills, when: Spill cleanup procedures have not begun within one hour of spill discovery/occurrence; or, in the Government's judgment, spill cleanup is inadequate and the spill remains a threat to human health or the environment.

3.8.5 Wastewater

3.8.5.1 Disposal of wastewater must be as specified below.

3.8.5.1.1 Treatment

Do not allow wastewater from construction activities, such as onsite material processing, concrete curing, foundation and concrete clean-up, water used in concrete trucks, and forms to enter water ways or to be discharged prior to being treated to remove pollutants. Dispose of the construction- related waste water by collecting and placing it in a retention pond where suspended material can be settled out or the water can evaporate to separate pollutants from the water. The site for the retention pond must be coordinated and approved with the Contracting Officer. The residue left in the pond prior to completion of the project must be removed, tested, and disposed of off- Government property in accordance with federal, state, and local laws and regulations. Backfill the area to the original grade, top-soiled, and seeded or sodded. Test the water in the retention pond and have the results reviewed and approved by the Contracting Officer prior to being discharged or disposed of off-Government property.

3.8.5.1.2 Surface Discharge

For discharge of ground water, Surface discharge in accordance with the requirements of the state STORMWATER DISCHARGES FROM CONSTRUCTION SITES permit.

3.8.5.1.3 Land Application

Water generated from the flushing of lines after hydrostatic testing must be land- applied in accordance with federal, state, and local laws and regulations for land application.

3.9 HAZARDOUS MATERIAL MANAGEMENT

Include hazardous material control procedures in the Safety Plan, in accordance with Section 01 35 26 GOVERNMENTAL SAFETY REQUIREMENTS. Address procedures and proper handling of hazardous materials, including the appropriate transportation requirements. Do not bring hazardous material onto Government property that does not directly relate to requirements for the performance of this contract. Submit an SDS and estimated quantities to be used for each hazardous material to the Contracting Officer prior to bringing the material on the installation. Typical materials requiring SDS and quantity reporting include, but are not limited to, oil and latex based painting and caulking products, solvents, adhesives, aerosol, and petroleum products. Use hazardous materials in a manner that minimizes the amount of hazardous waste generated. Containers of hazardous materials must have National Fire Protection Association labels or their equivalent. Certify that hazardous materials removed from the site are hazardous materials and do not meet the definition of hazardous waste, in accordance with 40 CFR 261.

3.10 PREVIOUSLY USED EQUIPMENT

Clean previously used construction equipment prior to bringing it onto the project site. Equipment must be free from soil residuals, egg deposits from plant pests, noxious weeds, and plant seeds. Consult with the U.S. Department of Agriculture jurisdictional office for additional cleaning requirements.

3.11 PETROLEUM, OIL, LUBRICANT (POL) STORAGE AND FUELING

POL products include flammable or combustible liquids, such as gasoline, diesel, lubricating oil, used engine oil, hydraulic oil, mineral oil, and cooking oil. Store POL products and fuel equipment and motor vehicles in a manner that affords the maximum protection against spills into the environment. Manage and store POL products in accordance with EPA 40 CFR 112, and other federal, state, regional, and local laws and regulations. Use secondary containments, dikes, curbs, and other barriers, to prevent POL products from spilling and entering the ground, storm or sewer drains, stormwater ditches or canals, or navigable waters of the United States. Describe in the EPP (see paragraph ENVIRONMENTAL PROTECTION PLAN) how POL tanks and containers must be stored, managed, and inspected and what protections must be provided. Storage of fuel on the project site must be in accordance with EPA, state, and local laws and regulations and paragraph OIL STORAGE INCLUDING FUEL TANKS.

3.11.1 Used Oil Management

Manage used oil generated on site in accordance with 40 CFR 279. Determine if any used oil generated while onsite exhibits a characteristic of hazardous waste. Used oil containing 1,000 parts per million of solvents is considered a hazardous waste and disposed of at the Contractor's expense. Used oil mixed with a hazardous waste is also considered a hazardous waste.

3.11.2 Oil Storage Including Fuel Tanks

Provide secondary containment and overfill protection for oil storage tanks. A berm used to provide secondary containment must be of sufficient size and strength to contain the contents of the tanks plus 5 inches freeboard for precipitation. Construct the berm to be impervious to oil

for 72 hours that no discharge will permeate, drain, infiltrate, or otherwise escape before cleanup occurs. Use drip pans during oil transfer operations; adequate absorbent material must be onsite to clean up any spills and prevent releases to the environment. Cover tanks and drip pans during inclement weather. Provide procedures and equipment to prevent overfilling of tanks. If tanks and containers with an aggregate aboveground capacity greater than 1320 gallons will be used onsite (only containers with a capacity of 55 gallons or greater are counted), provide and implement a SPCC plan meeting the requirements of 40 CFR 112. Do not bring underground storage tanks to the installation for Contractor use during a project. Submit the SPCC plan to the Contracting Officer for approval.

Monitor and remove any rainwater that accumulates in open containment dikes or berms. Inspect the accumulated rainwater prior to draining from a containment dike to the environment, to determine there is no oil sheen present.

3.12 INADVERTENT DISCOVERY OF PETROLEUM-CONTAMINATED SOIL OR HAZARDOUS WASTES

If petroleum-contaminated soil, or suspected hazardous waste is found during construction that was not identified in the Contract documents, immediately notify the Contracting Officer. Do not disturb this material until authorized by the Contracting Officer.

3.13 POST CONSTRUCTION CLEANUP

Clean up areas used for construction in accordance with Contract Clause: "Cleaning Up". Unless otherwise instructed in writing by the Contracting Officer, remove traces of temporary construction facilities such as haul roads, work area, structures, foundations of temporary structures, stockpiles of excess or waste materials, and other vestiges of construction prior to final acceptance of the work. Grade parking area and similar temporarily used areas to conform with surrounding contours.

3.14 CONTINGENCY MEASURES

When an environmental protection measure is found to be ineffective, corrective actions shall be taken immediately including repair or replacement of the measure to ensure water and fish habitat protection.

-- End of Section --

IN THE MATTER OF GRANTING	)	**ORDER No. 20108,**
A WATER QUALITY	)	**First Amendment**
CERTIFICATION TO	)	
U.S. Army Corps of Engineers – Seattle	)	
District	)	
In accordance with 33U.S.C. 1341	)	
(FWPCA §401), RCW 90.48.120, RCW	)	
90.48.260 and Chapter 173-201A WAC	)	

TO: U.S. Army Corps of Engineers
Attn: Laura Boerner
PO Box 3755
Seattle, WA 98134

On June 10, 2021 the Washington Department of Ecology (Ecology) issued a 401 Water Quality Certification to U.S. Army Corps of Engineers – Seattle District for the above-referenced project pursuant to the provisions of 33 U.S.C. 1341 (FWPCA § 401).

Ecology received a request on December 8, 2021 for the modification of the in-water work dates provided within Order No. 20108. The issued in water work dates (per consultation with WA Department of Fish and Wildlife (WDFW) Habitat Biologist) are in direct conflicted with the winter in-water work window (October 1 – February 28) issued by the U.S. Fish and Wildlife Service and the National Marine Fisheries Service. Through additional consultation with WDFW Habitat Biologist, the winter in-water work window is satisfactory.

Order No. 20108 dated June 10, 2021 is hereby amended as follows:

I. Condition number C.2 which reads:

In-Water Work Window Timing
The following in-water work windows apply to the project:

June 1 - September 15 of each year.
• *Justification – This condition is reaffirming the project will take place during a time period that will not harm fish or other aquatic species.*
• *Citation – Chapter 77.55 RCW, Chapter 90.48 RCW, Chapter 90.48.030 RCW, Chapter 90.48.080 RCW, Chapter 173-201A WAC, Chapter 173-201A-300 WAC, Chapter 173-201A-330 WAC, Chapter 173-225-010 WAC, and Chapter 220-660 WAC.*

Is replaced with:

In-Water Work Window Timing
The following in-water work windows apply to the project:

October 1 – February 28 of each year.

No other conditions or requirements of the above referenced Order are affected by this amendment.

Ecology retains continuing jurisdiction to make modifications hereto through supplemental order, if it appears necessary to further protect the public interest.

Failure to comply with this amended Order may result in the issuance of civil penalties or other actions whether administrative or judicial, to enforce the terms of this amended Order.

YOUR RIGHT TO APPEAL

You have a right to appeal this Order to the Pollution Control Hearings Board (PCHB) within 30 days of the date of receipt of this Order. The appeal process is governed by Chapter 43.21B RCW and Chapter 371-08 WAC. "Date of receipt" is defined in RCW 43.21B.001(2).

To appeal you must do all of the following within 30 days of the date of receipt of this Order:

- File your appeal and a copy of this Order with the PCHB (see addresses below). Filing means actual receipt by the PCHB during regular business hours.
- Serve a copy of your appeal and this Order on Ecology in paper form - by mail or in person. (See addresses below.) E-mail is not accepted.

You must also comply with other applicable requirements in Chapter 43.21B RCW and Chapter 371-08 WAC.

Address and location information

Filing an appeal with the PCHB:

Mailing Address:
Pollution Control Hearings Board
PO Box 40903
Olympia, WA 98504-0903

Street Address:
Pollution Control Hearings Board
1111 Israel RD SW
STE 301
Tumwater, WA 98501

Serving a copy of the appeal on Ecology:

Mailing Address:
Department of Ecology
Attn: Appeals Processing Desk
PO Box 47608
Olympia, WA 98504-7608

Street Address:
Department of Ecology
Attn: Appeals Processing Desk
300 Desmond Drive SE
Lacey, WA 98503

CONTACT INFORMATION

Please direct all questions about this Order to:

Lori White
Department of Ecology
Central Regional Office
1250 W Alder Street
Union Gap, WA 98903
(509) 575-2616
lori.white@ecy.wa.gov

MORE INFORMATION

- **Pollution Control Hearings Board Website**
  http://www.eluho.wa.gov/Board/PCHB
- **Chapter 43.21B RCW - Environmental and Land Use Hearings Office – Pollution Control Hearings Board**
  http://app.leg.wa.gov/RCW/default.aspx?cite=43.21B
- **Chapter 371-08 WAC – Practice And Procedure**
  http://app.leg.wa.gov/WAC/default.aspx?cite=371-08
- **Chapter 34.05 RCW – Administrative Procedure Act**
  http://app.leg.wa.gov/RCW/default.aspx?cite=34.05

12/20/2021

Gary Graff, PWS
Regional Section Manager
Shorelands and Environmental Assistance Program

DATE

STATE OF WASHINGTON
DEPARTMENT OF ECOLOGY
1250 West Alder Street • Union Gap, Washington 98903-0009 • (509) 575-2490

June 10, 2021

U.S. Army Corps of Engineers
Attn: Laura Boerner
PO Box 3755
Seattle, Washington 98134

RE: Water Quality Certification Order No. 20108 for Yakima River Gap to Gap Ecosystem, Yakima County, Washington

Dear Melissa Leslie:

On December 18, 2021, the U.S. Army Corps of Engineers – Seattle District submitted a request for a Section 401 Water Quality Certification (WQC) under the federal Clean Water Act for the Yakima River Gap to Gap Ecosystem, Yakima County, Washington.

On behalf of the state of Washington, the Department of Ecology certifies that the work described in the Section 401 Request and supporting documents complies with applicable provisions of Sections 301, 302, 303, 306, and 307 of the Clean Water Act, as amended, and applicable state laws. This WQC is subject to the conditions contained in the enclosed Order.

Please ensure that anyone doing work under this Order has read, is familiar with, and is able to follow all of the provisions within the attached Order.

If you have any questions about this decision, please contact Lori White at (509) 575-2616. The enclosed Order may be appealed by following the procedures described within the Order.

Sincerely,

Gary Graff, PWS
Regional Section Manager
Shorelands and Environmental Assistance Program

Enclosure

e-cc: Melissa Leslie, US Army Corps of Engineers
Loree' Randall, Ecology
Eric Bartrand, WDFW
ECY RE FEDPERMITS

.IN THE MATTER OF GRANTING A WATER QUALITY CERTIFICATION TO U.S. Army Corps of Engineers – Seattle District pursuant to 33 U.S.C. 1341 (FWPCA § 401), RCW 90.48.120, RCW 90.48.260 and Chapter 173-201A WAC	)))))))	**ORDER # 20108** Yakima River Gap to Gap Ecosystem Restoration, Yakima River, located in Yakima County, Washington.

U.S. Army Corps of Engineers
Attn: Laura Boerner
PO Box 3755
Seattle, WA 98134

On October 08, 2020, the U.S. Army Corps of Engineers - Seattle District (Corps) submitted a pre-filing meeting request to the Department of Ecology (Ecology). On December 18, 2020, the Corps submitted a request for a Section 401 Water Quality Certification (WQC) under the federal Clean Water Act for the Yakima River Gap to Gap Ecosystem Restoration Project, located in Yakima County, Washington. On December 22, 2021, the Corps informed Ecology that the deadline for making a decision on this project would be June 16, 2021. Ecology issued a public notice for the project on January 19, 2021.

The proposed project entails eight main actions:

Measure 1.0 DID#1 Floodplain Process Restoration:
Diking Improvement District #1 levee to be removed.

Central Pre-Mix gravel processing center to remain.
Radio Station Towers to remain.
Private residences to be demolished prior to construction

Measure 1.1 Floodplain Topographic Restoration:
Private residences to be demolished prior to construction

Measure 1.2 Remove SR24 Cross Dike and KOA Levee; install SR 24 buried sill:
Measure 2.0 Sportsman Island Channel Restoration:

Measure 2.1 Sportsman Upstream Groin Removal:
Federal left bank levee to remain; groins to be removed.

Measure 2.2 Lake Buchanan Spurs:
Federal right bank levee to remain.

Measure 4.0 Blue Slough Automated Headgate:
Blue Slough head gate and culvert to be replaced.

Measure 7.0 Spring Creek Reconnection: Measure 7.0 was proposed to reconnect Spring Creek to the Yakima River by removing compacted roadbed from the mouth of Spring Creek.

The project site(s) are located in Sections 20, 21, 28, & 33 Township 12N, Range 19E, within Water Resource Inventory Area (WRIA) 37, Lower Yakima Watershed.

AUTHORITIES

In exercising authority under 33 U.S.C. § 1341, RCW 90.48.120, and RCW 90.48.260, Ecology has reviewed the WQC request pursuant to the following:

1. Conformance with applicable water quality-based, technology-based, and toxic or pretreatment effluent limitations as provided under 33 U.S.C. §§1311, 1312, 1313, 1316, and 1317 (FWPCA §§ 301, 302, 303, 306, and 307);

2. Conformance with the state water quality standards contained in Chapter 173-201A WAC and authorized by 33 U.S.C. §1313 and by Chapter 90.48 RCW, and with other applicable state laws;

3. Conformance with the provision of using all known, available, and reasonable methods to prevent and control pollution of state waters as required by RCW 90.48.010; and,

4. Conformance with Washington's prohibition on discharges that cause or tend to cause pollution of waters of the state of Washington. RCW 90.48.080

With this Water Quality Certification (WQC) Order, Ecology is granting with conditions, the Corps request for a Section 401 Water Quality Certification for the Yakima River Gap to Gap project, located in Yakima County. Ecology has determined that the proposed discharges will comply with all applicable state water quality requirements, provided that the project is conducted in accordance with the Section 401 Water Quality Certification request that Ecology received on December 18, 2020, the supporting documents referenced in Table 1 below, **and the conditions of this WQC Order.**

Table 1. Supporting Documents

Date Received	**Document Type**	**Title & Date**	**Author**
10/8/2020	Pre-Filling Meeting Request	Pre-filling Meeting Request (10/08/2020)	Corps
12/18/2020	Joint Aquatic Resources (JAR) Form	Joint Aquatic Resources Form (undated)	Corps

12/18/2020	Drawings	Attached to JARPA (undated)	Corps
1/4/2021	National Environmental Policy Act Public Notice	Append I, Finding of No Significant Impact (5/20/2019), in Integrated Detailed Project Report and Environmental Assessment (June 2018)	Corps
12/18/2020	Monitoring and Adaptive Management Plan	Monitoring and Adaptive Management Plan (1/27/2021)	Corps
5/17/2021	Revegetation Plan	Cottonwood recruitment, (5/17/202)	Yakima County
1/27/2021	Revegetation Plan	Seedmixes (1/27/2021)	Corps
5/4/2021	Blue Slough Mitigation Plan (CPM site)	Blue Slough/CPM Mitigation plan (5/4/2021)	Corps
2/12/2021	Modeling	Sportsman Island Wetted Channel, (2/12/2021)	Corps
12/18/2020	Report	CWA Sect 404 Analysis (12/18/2021)	Corps
12/18/2020	Report	Functional Equivalency Analysis (12/18/2021)	Corps
12/18/2020	Report	Integrated Detailed Project Report and Environmental Assessment (June 2018)	Corps
12/22/2020	Memorandum	Reasonable Period of Time (12/22/2021)	Corps
12/18/2020	Water Quality Monitoring Plan	Water Quality Monitoring Plan (12/18/2021)	Corps
12/18/2021	Wetland Delineation	Wetland Delineation and Assessment Report (10/2020)	Corps
2/12/2021	Plan	Did #1 Degrade Plan View (CD102-3) (undated)	Corps
2/12/2021	Drawing	Proposed Staging Area- CPM	Corps

		Preservation (Undated)	
5/4/2021	Plan	CPM Impacts and Mitigation (undated)	Corps

Issuance of this Section 401 Water Quality Certification for this proposal does not authorize U.S. Army Corps of Engineers – Seattle District (Corps) to exceed applicable state water quality standards (Chapter 173-201A WAC), ground water quality standards (Chapter 173-200 WAC) or sediment quality standards (Chapter 173-204 WAC). Furthermore, nothing in this WQC absolves the Corps from liability for contamination and any subsequent cleanup of surface waters, ground waters, or sediments resulting from project construction or operations.

A. General Conditions

1. In this WQC Order, the term "Project Proponent" shall mean the U.S. Army Corps of Engineers – Seattle District and its agents, assignees, and contractors.
   - *Justification – Ecology needs to identify that conditions of this WQC Order apply to anyone conducting work on behalf of the Project Proponent to ensure compliance with the water quality standards and other applicable state laws.*
   - *Citation – 40 CFR 121.1(j), Chapter 90.48 RCW, Chapter 90.48.080 RCW, Chapter 90.48.120 RCW, Chapter 90.48.260 RCW, Chapter 173-200 WAC, Chapter 173-201A WAC, and Chapter 173-225-010 WAC.*

2. All submittals required by this WQC Order shall be sent to Ecology's Headquarters Office, Attn: Federal Permit Manager, via e-mail to fednotification@ecy.wa.gov and cc to lori.white@ecy.wa.gov. The submittals shall be identified with Order #20108 and include the Project Proponent's name, project name, project contact, and the contact phone number.
   - *Justification – Ecology needs to identify where information and submittals are to be submitted to be in compliance with the requirements of this WQC Order.*
   - *Citation – 40 CFR 121, Chapter 90.48 RCW, Chapter 90.48.120 RCW, Chapter 90.48.260 RCW, Chapter 173-201A WAC, and Chapter 173-225-010 WAC.*

3. Work authorized by this WQC Order is limited to the work described in the WQC request package received by Ecology on December 18, 2020, and the supporting documentation identified in Table 1 above.
   - *Justification – Ecology has the authority to prevent and control pollution of state waters. By authorizing a discharge into a water of the state, through a WQC, Ecology is certifying the project as proposed will not negatively impact our state's water quality. Therefore, it is imperative the project is conducted as it was presented during the review process. Any deviations from information within the WQC Request package and this WQC Order must be disclosed prior to the initiation of the planned work.*

- *Citation – 40 CFR 121, Chapter 90.48 RCW, Chapter 90.48.030 RCW, Chapter 90.48.120 RCW, Chapter 90.48.260 RCW, Chapter 173-200 WAC, Chapter 173-201A WAC, Chapter 173-204 WAC, and Chapter 173-225-010 WAC.*

4. The Project Proponent shall keep copies of this WQC Order on the job site and readily available for reference by Ecology personnel, the construction superintendent, construction managers and lead workers, and state and local government inspectors.
   - *Justification – All parties (including on-site contractors) must be aware of and comply with the WQC Order for the protection of water quality.*
   - *Citation – 40 CFR 121.3, Chapter 90.48 RCW, Chapter 90.48.030 RCW, Chapter 173-201A WAC, and Chapter 173-225-010 WAC.*

5. The Project Proponent shall provide access to the project site and all mitigation sites upon request by Ecology personnel for site inspections, monitoring, and/or necessary data collection, to ensure that conditions of this Order are being met.
   - *Justification – Ecology must be able to investigate and inspect construction sites and facilities for compliance with all state rules and laws.*
   - *Citation – Chapter 90.48 RCW, Chapter 90.48.030 RCW, Chapter 90.48.090 RCW, Chapter 173-201A WAC, and Chapter 173-225-010 WAC.*

6. The Project Proponent shall ensure that all project engineers, contractors, and other workers at the project site with authority to direct work have read and understand relevant conditions of this Order and all permits, approvals, and documents referenced in this Order. The Project Proponent shall provide Ecology a signed statement (see Attachment A for an example) before construction begins.
   - *Justification – Ecology needs to ensure that anyone conducting work at the project, on behalf of the Project Proponent, are aware of and understand the required conditions of this WQC Order to ensure compliance with the water quality standards and other applicable state laws.*
   - *Citation – 40 CFR 121.1(j), Chapter 90.48 RCW, Chapter 90.48.030 RCW, Chapter 173-201A WAC, and Chapter 173-225-010 WAC.*

7. This Order does not authorize direct, indirect, permanent, or temporary impacts to waters of the state or related aquatic resources, except as specifically provided for in conditions of this Order.
   - *Justification – Ecology has the authority to prevent and control pollution of state waters, and to protect designated uses. By authorizing a discharge into a water of the state, through a water quality certification, we are certifying the project as proposed will not negatively impact our state's water quality and will comply with the state's water quality requirements. Therefore, it is imperative the project is conducted as it was presented during the review process, and as conditioned herein.*

- *Citation – Chapter 90.48 RCW, Chapter 90.48.030 RCW, Chapter 173-201A WAC, Chapter 173-201A-300(2)(e)(i) WAC, Chapter 173-201A-310 WAC, Chapter 173-204-120 WAC, and Chapter 173-225-010 WAC.*

8. Failure of any person or entity to comply with the WQC Order may result in the issuance of civil penalties or other actions, whether administrative or judicial, to enforce the state's water quality standards.
   - *Justification – Ecology must protect waters of the state from all discharges and potential discharges of pollution that can affect water quality to protect aquatic life and beneficial uses; civil penalties and other enforcement actions are the primary means of securing compliance with water quality requirements.*
   - *Citation – Chapter 90.48 RCW, Chapter 90.48.030 RCW, Chapter 90.48.037 RCW, Chapter 90.48.080 RCW, Chapter 90.48.120 RCW, Chapter 90.48.142 RCW, Chapter 90.48.144 RCW, and Chapter 173-225-010 WAC.*

B. Notification Requirements

1. The following notification shall be made via phone or e-mail (e-mail is preferred) to Ecology's Federal Permit Manager via e-mail to fednotification@ecy.wa.gov and cc to lori.white@ecy.wa.gov. Notifications shall be identified with Order No. 20108 and include the Project Proponents name, project name, project location, project contact and the contact phone number.

   a. Immediately following a violation of state water quality standards or when the project is out of compliance with any conditions of this Order.
   b. At least ten (10) days prior to all pre-construction meetings
   c. At least ten (10) days prior to conducting initial in-water work activities for each in-water work window.
   d. Within seven (7) days of completing in-water work activities for each in-water work window.
   e. At least seven (7) days within project completion.
      - *Justification – Ecology must be aware of when a project starts and ends and whether there are any issues. This allows Ecology to evaluate compliance with the state water quality requirements.*
      - *Citation – Chapter 90.48 RCW, Chapter 90.48.030 RCW, Chapter 173-201A WAC, Chapter 173-201A-300–330 WAC, Chapter 173-204 WAC, and Chapter 173-225-010 WAC.*

2. In addition to the phone or e-mail notification required under B.1.a. above, the Project Proponent shall submit a detailed written report to Ecology within five (5) days that describes the nature of the event, corrective action taken and/or planned, steps to be taken to prevent a recurrence, results of any samples taken, and any other pertinent information.

- *Justification – Ensure the Project Proponent remains in full compliance with state water quality requirements for the duration of the project.*
- *Citation – Chapter 90.48 RCW, Chapter 90.48.120 RCW, Chapter 173-201A WAC, and Chapter 173-225-010 WAC.*

C. Timing

1. This Order will expire September 15, 2026.
   - *Justification – Certifications are required for any license or permit that authorizes an activity that may result in a discharge. Ecology needs to be able to specify how long the WQC Order will be in effect.*
   - *Citation – 40 CFR 121 and Chapter 173-225-010 WAC.*

2. In-Water Work Window Timing
   The following in-water work windows apply to the project:

   June 1 - September 15 of each year.
   - *Justification – This condition is reaffirming the project will take place during a time period that will not harm fish or other aquatic species.*
   - *Citation – Chapter 77.55 RCW, Chapter 90.48 RCW, Chapter 90.48.030 RCW, Chapter 90.48.080 RCW, Chapter 173-201A WAC, Chapter 173-201A-300 WAC, Chapter 173-201A-330 WAC, Chapter 173-225-010 WAC, and Chapter 220-660 WAC.*

D. Water Quality Monitoring & Criteria

1. This Order does not authorize the Project Proponent to exceed applicable turbidity standards beyond the limits established in WAC 173-201A-200(1)(e)(i).
   - *Justification – This condition provides citation to the appropriate water quality standard criteria to protect surface waters of the state. Ecology must protect waters of the state from all discharges and potential discharges of pollution that can affect water quality to protect aquatic life and beneficial uses.*
   - *Citation – Chapter 90.48 RCW, Chapter 90.48.030 RCW, Chapter 90.48.080 RCW, Chapter 173-201A WAC, Chapter 173-201A-300–330 WAC, Chapter 173-204-120 WAC, and Chapter 173-225-010 WAC.*

2. The Project Proponent shall conduct water quality monitoring as described in the approved *Water Quality Monitoring Plan, Yakima River Gap to Gap Ecosystem Restoration* (hereafter referred to as the WQMP) dated October 2020.
   - *Justification – This condition is necessary to ensure that the monitoring as proposed by the Project Proponent and authorized by Ecology is conducted to protect water quality. Ecology must protect waters of the state from all discharges and potential*

discharges of pollution that can affect water quality to protect aquatic life and beneficial uses.

- *Citation – Chapter 90.48 RCW, Chapter 90.48.030 RCW, Chapter 90.48.080 RCW, Chapter 173-201A WAC, Chapter 173-201A-300–330 WAC, Chapter 173-204-120 WAC, and Chapter 173-225-010 WAC.*

3. Monitoring results shall be submitted monthly to Ecology's Federal Permit Manager, per condition A2.
   - *Justification – This information is necessary for Ecology to determine if the project was implemented as approved by the WQC Order and that no adverse impacts to water quality or beneficial uses occurred.*
   - *Citation – Chapter 90.48 RCW, Chapter 90.48.030 RCW, Chapter 90.48.080 RCW, Chapter 173-201A WAC, Chapter 173-201A-300–330 WAC, Chapter 173-204-120 WAC, and Chapter 173-225-010 WAC.*

4. Visible turbidity anywhere beyond the temporary area of mixing (point of compliance) from the activity shall be considered an exceedance of the standard.
   - *Justification – This condition specifically informs the Project Proponent of when they would be out of compliance with the water quality standards and an obvious sign of water quality degradation. Ecology must protect waters of the state from all discharges and potential discharges of pollution that can affect water quality to protect aquatic life and beneficial uses.*
   - *Citation – Chapter 90.48 RCW, Chapter 90.48.030 RCW, Chapter 90.48.080 RCW, Chapter 173-201A WAC, Chapter 173-201A-300–330 WAC, Chapter 173-204-120 WAC, and Chapter 173-225-010 WAC.*

5. If water quality exceedances for turbidity are observed outside the point of compliance, the Project Proponent or the contractor shall assess the cause of the water quality problem and take immediate action to modify or stop, contain, and correct the problem and prevent further water quality turbidity exceedances.
   - *Justification – Ecology must protect waters of the state from all discharges and potential discharges of pollution and know if there are exceedances of the water quality standards that protect aquatic life and beneficial uses.*
   - *Citation – Chapter 90.48 RCW, Chapter 90.48.030 RCW, Chapter 90.48.080 RCW, Chapter 173-201A WAC, Chapter 173-201A-300–330 WAC, Chapter 173-204-120 WAC, and Chapter 173-225-010 WAC.*

E. Construction

General Conditions

1. All work in and near waters of the state shall be conducted to minimize turbidity, erosion, and other water quality impacts. Construction stormwater, sediment, and erosion control Best Management Practices (BMPs) suitable to prevent exceedances of state water quality

standards shall be in place before starting maintenance and shall be maintained throughout the duration of the activity.

- *Justification – Disturbed areas without appropriate BMP's and construction methods can discharge excess sediment to waters of the state and degrade water quality. Ecology must protect waters of the state from all discharges and potential discharges of pollution that can affect water quality to protect aquatic life and beneficial uses.*
- *Citation – Chapter 90.48 RCW, Chapter 90.48.030 RCW, Chapter 90.48.080 RCW, Chapter 173-201A WAC, Chapter 173-201A-300–330 WAC, Chapter 173-204-120 WAC, and Chapter 173-225-010 WAC.*

2. All clearing limits, stockpiles, staging areas, and trees to be preserved shall clearly be marked prior to commencing construction activities and maintained until all work is completed for each project.
   - *Justification – Ensures that the project proponent preserves sensitive areas from discharges and potential discharges of pollution that can affect water quality to protect aquatic life and beneficial uses.*
   - *Citation – Chapter 90.48 RCW, Chapter 90.48.030 RCW, Chapter 90.48.080 RCW, Chapter 173-201A WAC, Chapter 173-201A-300–330 WAC, Chapter 173-204-120 WAC, and Chapter 173-225-010 WAC.*
3. No stockpiling or staging of materials shall occur at or below the OHWM of any waterbody.
   - *Justification – Ecology must protect waters of the state from all discharges and potential discharges of pollution that can affect water quality to protect aquatic life and beneficial uses.*
   - *Citation – Chapter 90.48 RCW, Chapter 90.48.030 RCW, Chapter 90.48.080 RCW, Chapter 173-201A WAC, Chapter 173-201A-300–330 WAC, Chapter 173-204-120 WAC, and Chapter 173-225-010 WAC.*

4. The Project Proponent shall obtain the Construction Stormwater Permit (National Pollutant Discharge Elimination System – NPDES) from the Department of Ecology for this project.
   - *Justification – Ecology must protect waters of the state from all discharges and potential discharges of pollution that can affect water quality to protect aquatic life and beneficial uses.*
   - *Citation – 40 CFR 123, Chapter 90.48 RCW, Chapter 90.48.030 RCW, Chapter 90.48.080 RCW, Chapter 173-201A WAC, Chapter 173-201A-300–330 WAC, Chapter 173-204-120 WAC, and Chapter 173-225-010 WAC.*

5. No petroleum products, fresh concrete, lime or concrete, chemicals, or other toxic or deleterious materials shall be allowed to enter waters of the state.
   - *Justification – Concrete, petroleum products or other waste materials are detrimental to water quality. Ecology must protect waters of the state from all discharges and*

potential discharges of pollution that can affect water quality to protect aquatic life and beneficial uses.

- *Citation – Chapter 90.48 RCW, Chapter 90.48.030 RCW, Chapter 90.48.080 RCW, Chapter 173-201A WAC, Chapter 173-201A-300–330 WAC, Chapter 173-204-120 WAC, and Chapter 173-225-010 WAC.*

6. All construction debris, excess sediment, and other solid waste material shall be properly managed and disposed of in an upland disposal site approved by the appropriate regulatory authority.
   - *Justification – Ecology must be assured that the Project Proponent is managing and disposing of material to protect waters of the state from all discharges and potential discharges of pollution that can affect water quality to protect aquatic life and beneficial uses.*
   - *Citation – Chapter 90.48 RCW, Chapter 90.48.030 RCW, Chapter 90.48.080 RCW, Chapter 173-201A WAC, Chapter 173-201A-300–330 WAC, Chapter 173-204-120 WAC, and Chapter 173-225-010 WAC.*

7. Within the project limits[1] all environmentally sensitive areas including, but not limited to, wetlands, wetland buffers, and mitigation areas shall be fenced with high visibility construction (HVF) prior to commencing construction activities. Construction activities include equipment staging, materials storage, and work vehicle parking. <u>Note: This condition does not apply to activities such as pre-construction surveying and installing HVF and construction zone signage.</u>
   a. If the project will be constructed in stages[2] a detailed description and drawings of the stages shall be sent to Ecology for review at least 20 days prior to placing HVF.
   b. Condition 2.a. shall apply to each stage.
   c. All field staff shall be trained to recognize HVF, understand its purpose and properly install it in the appropriate locations.
   d. HVF shall be maintained until all work is completed for each project or each stage of a staged project.
   - *Justification – Ecology must be assured that the Project Proponent has marked the sensitive areas that are not to be impacted to ensure that they are not damaged from any discharges or potential discharges of pollution that can affect water quality to protect aquatic life and beneficial uses.*
   - *Citation – Chapter 90.48 RCW, Chapter 90.48.030 RCW, Chapter 90.48.080 RCW, Chapter 173-201A WAC, Chapter 173-201A-300–330 WAC, Chapter 173-204-120 WAC, and Chapter 173-225-010 WAC.*

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[1] Project limits include mitigation sites, staging areas, borrow sources, and other sites developed or used to support project construction.
[2] A stage is part of a project that has been separated into at least two distinct areas to be built during separate timeframes.

8. All clearing limits, stockpiles, staging areas, and trees to be preserved shall clearly be marked prior to commencing construction activities and maintained until all work is completed for each project.
   - *Justification – Ensures that the project proponent preserves sensitive areas from discharges and potential discharges of pollution that can affect water quality to protect aquatic life and beneficial uses.*
   - *Citation – Chapter 90.48 RCW, Chapter 90.48.030 RCW, Chapter 90.48.080 RCW, Chapter 173-201A WAC, Chapter 173-201A-300–330 WAC, Chapter 173-204-120 WAC, and Chapter 173-225-010 WAC.*

9. Turbid de-watering water associated with in-water work shall not be discharged directly to waters of the state, including wetlands. Turbid de-watering water shall be routed to an upland area for on-site or off-site settling.
   - *Justification – Ecology must protect waters of the state from all discharges and potential discharges of pollution that can affect water quality to protect aquatic life and beneficial uses.*
   - *Citation – Chapter 90.48 RCW, Chapter 90.48.030 RCW, Chapter 90.48.080 RCW, Chapter 90.56 RCW, Chapter 173-201A WAC, Chapter 173-201A-300–330 WAC, Chapter 173-204-120 WAC, and Chapter 173-225-010 WAC.*

10. Clean de-watering water associated with in-water work that has been tested and confirmed to meet water quality standards may be discharged directly to waters of the state including wetlands. The discharge outfall method shall be designed and operated so as not to cause erosion or scour in the stream channel, banks, or vegetation.
    - *Justification – Ecology must protect waters of the state from all discharges and potential discharges of pollution that can affect water quality to protect aquatic life and beneficial uses.*
    - *Citation – Chapter 90.48 RCW, Chapter 90.48.030 RCW, Chapter 90.48.080 RCW, Chapter 90.56 RCW, Chapter 173-201A WAC, Chapter 173-201A-300–330 WAC, Chapter 173-204-120 WAC, and Chapter 173-225-010 WAC.*

<u>Equipment & Maintenance</u>

11. Staging areas will be located a minimum of 50 feet and, where practical, 200 feet, from waters of the state including wetlands.
    - *Justification – Requiring a minimum setback ensures that material will not end up in waters of the state. Ecology must protect waters of the state from all discharges and potential discharges of pollution that can affect water quality to protect aquatic life and beneficial uses.*
    - *Citation – Chapter 90.48 RCW, Chapter 90.48.030 RCW, Chapter 90.48.080 RCW, Chapter 90.56 RCW, Chapter 173-201A WAC, Chapter 173-201A-300–330 WAC, Chapter 173-204-120 WAC, and Chapter 173-225-010 WAC.*

12. Equipment used for this project shall be free of external petroleum-based products while used around the waters of the state, including wetlands. Accumulation of soils or debris shall be removed from the drive mechanisms (wheels, tires, tracks, etc.) and the undercarriage of equipment prior to its use around waters of the state, including wetlands.
    - *Justification – Ecology must protect waters of the state from all discharges and potential discharges of pollution that can affect water quality to protect aquatic life and beneficial uses.*
    - *Citation – Chapter 90.48 RCW, Chapter 90.48.030 RCW, Chapter 90.48.080 RCW, Chapter 90.56 RCW, Chapter 173-201A WAC, Chapter 173-201A-300–330 WAC, Chapter 173-204-120 WAC, Chapter 173-225-010 WAC.*

13. No equipment shall enter, operate, be stored or parked within any sensitive area except as specifically provided for in this Order.
    - *Justification – Ecology must protect waters of the state from all discharges and potential discharges of pollution that can affect water quality to protect aquatic life and beneficial uses.*
    - *Citation – Chapter 90.48 RCW, Chapter 90.48.030 RCW, Chapter 90.48.080 RCW, Chapter 90.56 RCW, Chapter 173-201A WAC, Chapter 173-201A-300–330 WAC, Chapter 173-204-120 WAC, and Chapter 173-225-010 WAC.*

14. Fuel hoses, oil drums, oil or fuel transfer valves and fittings, etc., shall be checked regularly for drips or leaks, and shall be maintained and stored properly to prevent spills into state waters.
    - *Justification – Ecology must protect waters of the state from all discharges and potential discharges of pollution that can affect water quality to protect aquatic life and beneficial uses.*
    - *Citation – Chapter 90.48 RCW, Chapter 90.48.030 RCW, Chapter 90.48.080 RCW, Chapter 90.56 RCW, Chapter 173-201A WAC, Chapter 173-201A-300–330 WAC, Chapter 173-204-120 WAC, and Chapter 173-225-010 WAC.*

15. Wash water containing oils, grease, or other hazardous materials resulting from washing of equipment or working areas shall not be discharged into state waters. The Project Proponent shall set up a designated area for washing down equipment.
    - *Justification – Ecology must protect waters of the state from all discharges and potential discharges of pollution that can affect water quality to protect aquatic life and beneficial uses.*
    - *Citation – Chapter 90.48 RCW, Chapter 90.48.030 RCW, Chapter 90.48.080 RCW, Chapter 90.56 RCW, Chapter 173-201A WAC, Chapter 173-201A-300–330 WAC, Chapter 173-204-120 WAC, and Chapter 173-225-010 WAC.*

<u>Bank Stabilization</u>

16. Prior to returning stream flow to the de-watered work area, all proposed bank protection measures shall be in place.

- *Justification – This condition would limit re-suspension of sediment that could cause water quality exceedances. Ecology must protect waters of the state from all discharges and potential discharges of pollution that can affect water quality to protect aquatic life and beneficial uses.*
- *Citation – Chapter 90.48 RCW, Chapter 90.48.030 RCW, Chapter 90.48.080 RCW, Chapter 173-201A WAC, Chapter 173-201A-300–330 WAC, Chapter 173-204-120 WAC, and Chapter 173-225-010 WAC.*

<u>Dredging</u>

17. The Project Proponent shall use an environmental bucket to dredge. A clamshell bucket may be used when necessary.
    - *Justification – Ecology has reviewed the project and the BMPs for a specific type of dredging. Changes to the dredging method would require different BMPs. If new dredging methods are proposed, a new WQC pre-filing meeting request, followed by a new WQC request (after requisite 30-days) is required.*
    - *Citation – 40 CFR 121, Chapter 90.48 RCW, Chapter 90.48.030 RCW, Chapter 90.48.080 RCW, Chapter 90.52-040 RCW, Chapter 90.54.020(2)(b) RCW, Chapter 173-201A WAC, Chapter 173-201A-240(5)(b) WAC, and Chapter 173-204-400(2).*

18. Dredging operations shall be conducted in a manner that minimizes the disturbance and siltation of adjacent waters and prevents the accidental discharge of petroleum products, chemicals or other toxic or deleterious substances into state waters.
    - *Justification – Ecology must protect waters of the state from all discharges and potential discharges of pollution that can affect water quality to protect aquatic life and beneficial uses.*
    - *Citation – Chapter 90.48 RCW, Chapter 90.48.030 RCW, Chapter 90.48.080 RCW, Chapter 90.56 RCW, Chapter 173-201A WAC, Chapter 173-201A-300–330 WAC, Chapter 173-204-120 WAC, Chapter 173-225-010 WAC.*

19. Dredged material shall be used to create the levee or disposed of at an upland location.
    - *Justification – Ecology must protect waters of the state from all discharges and potential discharges of pollution that can affect water quality to protect aquatic life and beneficial uses.*
    - *Citation – Chapter 90.48 RCW, Chapter 90.48.030 RCW, Chapter 90.48.080 RCW, Chapter 90.56 RCW, Chapter 173-201A WAC, Chapter 173-201A-300–330 WAC, Chapter 173-204-120 WAC, Chapter 173-225-010 WAC.*

20. Any material temporarily stockpiled within the project site prior to being taken to an approved upland facility shall be fully contained and not allowed to enter waters of the state.
    - *Justification – Ecology must protect waters of the state from all discharges and potential discharges of pollution that can affect water quality to protect aquatic life and beneficial uses.*

- *Citation – Chapter 90.48 RCW, Chapter 90.48.030 RCW, Chapter 90.48.080 RCW, Chapter 90.56 RCW, Chapter 173-201A WAC, Chapter 173-201A-300–330 WAC, Chapter 173-204-120 WAC, Chapter 173-225-010 WAC.*

F. Wetlands

1. The Project Proponent shall ensure that no material is stockpiled within existing wetlands or their buffers at the wetland mitigation site(s) at any time, unless otherwise provided for in the Mitigation Plan.
   - *Justification –Ecology must protect water of the state from all potential discharges that can affect water quality. The water quality standards, along with mitigation, protect wetlands as well as permitting some level of degradation where unavoidable or necessary, however we must ensure that stockpiles are not placed in existing wetlands that have not been reviewed and mitigated.*
   - *Citation –40 C.F.R. 131.12, Chapter 90.48 RCW, Chapter 90.54 RCW, Chapter 90.74 RCW, Chapter 173-201A, Chapter 173-201A-260 (3) (i-ii), and Chapter 173-201A-300.*

2. The Project Proponent shall ensure that no construction debris is deposited within existing wetlands or their buffers at the wetland mitigation site(s) at any time, unless otherwise provided for in the Mitigation Plan.
   - *Justification – Ecology must protect waters of the state from all discharges and potential discharges that can affect water quality to protect aquatic life and beneficial uses.*
   - *Citation: RCW 90.48 and WAC 173-201A.*

3. The Project Proponent shall not use hay or straw on exposed or disturbed soil at the mitigation site(s), unless otherwise provided for in the Mitigation Plan.
   - *Justification – The purpose of the mitigation site is to replace or mitigate for the loss of wetlands due to the project discharge, therefore Ecology needs to ensure that the wetlands, as purposed for mitigation, are not overtaken with weeds.*
   - *Citation: RCW 90.48 and WAC 173-201A.*

4. If weed-barrier fabric is used on the site, the Project Proponent shall use only water-permeable, fully biodegradable, non-toxic weed-barrier fabric for the entire-site and/or individual plant weed control, unless otherwise approved by Ecology. If non-biodegradable plastic weed-barrier fabric, is included in the Mitigation Plan, it shall be used only at the base of individual plants and shall be removed before it starts to break down, before it interferes with plant growth, or before the end of the monitoring period, whichever comes first.
   - *Justification –This condition is necessary to ensure the success of any revegetation planting and for weed control that is required as part of the mitigation for the impact from the discharge into waters of the state.*

- *Citation – 40 C.F.R. 131.12, Chapter 90.48 RCW, Chapter 90.54 RCW, Chapter 90.74 RCW, Chapter 173-201A, Chapter 173-201A-260 (3) (i-ii), and Chapter 173-201A-300.*

5. If seeding is used for temporary erosion control, it must be a seed mix consisting of native, annual, non-invasive plant species, unless otherwise provided for in the Mitigation Plan.
   - *Justification – This condition is necessary for weed control.*
   - *Citation – 40 C.F.R. 131.12, Chapter 90.48 RCW, Chapter 90.54 RCW, Chapter 90.74 RCW, Chapter 173-201A, Chapter 173-201A-260 (3) (i-ii), and Chapter 173-201A-300.*

<u>Monitoring and Maintenance</u>

6. Monitoring and maintenance shall be conducted in accordance with the *Yakima River Gap to Gap Ecosystem Restoration Project, Draft Monitoring and Adaptive Management Plan* dated April 2018 for a period of 10 years.
   - *Justification –. Implementation of the monitoring plan is necessary to ensure that the mitigation sites are monitored and maintained as proposed to mitigate the impact from the projects dischargers.*
   - *Citation – 40 C.F.R. 131.12, Chapter 90.48 RCW, Chapter 90.54 RCW, Chapter 90.74 RCW, Chapter 173-201A, Chapter 173-201A-260 (3) (i-ii), and Chapter 173-201A-300.*

7. The Project Proponent shall submit to Ecology (see A.2) monitoring reports documenting mitigation site conditions for years 1, 2, 3, 5, 7, and 10. The monitoring reports must:

   a. Be submitted by December 31 of each monitoring year. Include one hard copy and one electronic file.

   b. Include the information listed in Attachment A (Information Required for Monitoring Reports).

   - *Justification - Monitoring reports are necessary to track environmental changes at mitigation sites throughout the monitoring period to ensure that the impact from the projects dischargers are successfully mitigated.*
   - *Citation – 40 C.F.R. 131.12, Chapter 90.48 RCW, Chapter 90.54 RCW, Chapter 90.74 RCW, Chapter 173-201A, Chapter 173-201A-260 (3) (i-ii), and Chapter 173-201A-300.*

8. The Project Proponent shall implement the Mitigation Plan's contingency measures if the Mitigation Plan's goals, objectives, or performance standards are not being met.
   - *Justification –A contingency plan is necessary in case the actions undertaken for the mitigation fail or only partially succeed.*

- *Citation – 40 C.F.R. 131.12, Chapter 90.48 RCW, Chapter 90.54 RCW, Chapter 90.74 RCW, Chapter 173-201A, Chapter 173-201A-260 (3) (i-ii), and Chapter 173-201A-300.*

9. Prior to implementing contingency measures not specified in the Mitigation Plan, the Project Proponent shall consult with Ecology and then update contingency measures within the projects mitigation plan.
   - *Justification –. A contingency plan is necessary in case the actions undertaken for the mitigation fail or only partially succeed. There are times that additional measures are needed and Ecology needs to be involved in the discussion as the Project Proponent updates the Mitigation Plan. Ecology needs notification that the course of action has changed and to ensure it is an appropriate direction forward.*
   - *Citation – 40 C.F.R. 131.12, Chapter 90.48 RCW, Chapter 90.54 RCW, Chapter 90.74 RCW, Chapter 173-201A, Chapter 173-201A-260 (3) (i-ii), and Chapter 173-201A-300.*

10. When necessary to meet the performance standards, the Project Proponent shall replace dead or dying plants with the same species, or an appropriate native plant alternative, during the current or upcoming planting season and note species, numbers, and approximate locations of all replacement plants in the subsequent monitoring report.
    - *Justification – This condition is necessary to ensure the success of the mitigation planting.*
    - *Citation –40 C.F.R. 131.12, Chapter 90.48 RCW, Chapter 90.54 RCW, Chapter 90.74 RCW, Chapter 173-201A, Chapter 173-201A-260 (3) (i-ii), and Chapter 173-201A-300.*

11. Invasive species (including common reed, *Phragmites* sp.; reed canary grass, *Phalaris arundinacea*; Russian olive, *Elaeagnus angustifolia*; black locust, *Robinia pseudoacacia*; Chinese elm, *Ulmus parvifolia*; and kochia, *Bassia scoparia*) and Yakima County Class A noxious weeds shall not exceed 20% aerial coverage.
    - *Justification – This condition is necessary to keep the amount of non-native and noxious weeds at a minimum and to reduce competition with native species.*
    - *Citation –40 C.F.R. 131.12, Chapter 17.10 RCW, Chapter 90.48 RCW, Chapter 90.54 RCW, Chapter 90.74 RCW, Chapter 16–750 WAC, Chapter 173-201A, Chapter 173-201A-260 (3) (i-ii), and Chapter 173-201A-300.*

12. For monitoring years five (5) and ten (10), the Project Proponent shall use the currently approved federal wetland delineation manual and appropriate regional supplement to delineate all compensatory wetlands and include delineation information (e.g., data sheets, maps, wetland size, etc.) in the monitoring reports.
    - *Justification – This condition is necessary to ensure the project does not result in a net loss of wetland function and values as a result of the stream restoration project.*

- *Citation – 40 C.F.R. 131.12, Chapter 90.48 RCW, Chapter 90.54 RCW, Chapter 90.74 RCW, Chapter 173-201A, Chapter 173-201A-260 (3) (i-ii), and Chapter 173-201A-300.*

13. If the Project Proponent has not met all compensatory mitigation conditions by the end of the monitoring period, additional monitoring, additional mitigation, or both maybe needed. Conditions include specifications in the approved Mitigation Plan, such as performance standards for the mitigation site.
    - *Justification – This condition is necessary to ensure all planted and restored areas are appropriately vegetated; the river, floodplain, and side channels are functioning as intended; water levels are functioning as predicted; and the proposed amount of wetland is established as a result of the ecosystem restoration project.*
    - *Citation –40 C.F.R. 131.12, Chapter 90.48 RCW, Chapter 90.54 RCW, Chapter 90.74 RCW, Chapter 173-201A, Chapter 173-201A-260 (3) (i-ii), and Chapter 173-201A-300.*

G. Emergency/Contingency Measures

1. The Project Proponent shall develop and implement a spill prevention and containment plan for this project.
    - *Justification – Ecology must ensure that the Project Proponent has a plan to prevent pollution from entering waterways. Ecology must protect waters of the state from all discharges and potential discharges of pollution that can affect water quality to protect aquatic life and beneficial uses.*
    - *Citation – Chapter 90.48 RCW, Chapter 90.48.030 RCW, Chapter 90.48.080 RCW, Chapter 90.56 RCW, Chapter 90.56.280 RCW, Chapter 173-201A WAC, Chapter 173-201A-300–330 WAC, Chapter 173-204-120 WAC, Chapter 173-225-010 WAC, and Chapter 173-303-145 WAC.*

2. The Project Proponent shall have adequate and appropriate spill response and cleanup materials available on site to respond to any release of petroleum products or any other material into waters of the state.
    - *Justification – Ecology must have assurance that the Project Proponent has the material readily available in order to address any spills that might occur to protect waters of the state. Ecology must protect waters of the state from all discharges and potential discharges of pollution that can affect water quality to protect aquatic life and beneficial uses.*
    - *Citation – Chapter 90.48 RCW, Chapter 90.48.030 RCW, Chapter 90.48.080 RCW, Chapter 90.56 RCW, Chapter 90.56.280 RCW, Chapter 173-201A WAC, Chapter 173-201A-300–330 WAC, Chapter 173-204-120 WAC, Chapter 173-225-010 WAC, and Chapter 173-303-145 WAC.*

3. Fuel hoses, oil drums, oil or fuel transfer valves and fittings, etc., shall be checked regularly for drips or leaks, and shall be maintained and stored properly to prevent spills into state waters.
   - *Justification – Ecology must protect waters of the state from all discharges and potential discharges of pollution that can affect water quality to protect aquatic life and beneficial uses.*
   - *Citation – Chapter 90.48 RCW, Chapter 90.48.030 RCW, Chapter 90.48.080 RCW, Chapter 90.56 RCW, Chapter 90.56.280 RCW, Chapter 173-201A WAC, Chapter 173-201A-300–330 WAC, Chapter 173-204-120 WAC, Chapter 173-225-010 WAC, and Chapter 173-303-145 WAC.*

4. Work causing distressed or dying fish and discharges of oil, fuel, or chemicals into state waters or onto land with a potential for entry into state waters <u>is prohibited</u>. If such work, conditions, or discharges occur, the Project Proponent shall notify Ecology's Federal Permit Manager per condition A2 and immediately take the following actions:
   a. Cease operations at the location of the non-compliance.
   b. Assess the cause of the water quality problem and take appropriate measures to correct the problem and prevent further environmental damage.
   c. In the event of a discharge of oil, fuel, or chemicals into state waters, or onto land with a potential for entry into state waters, containment and cleanup efforts shall begin immediately and be completed as soon as possible, taking precedence over normal work. Cleanup shall include proper disposal of any spilled material and used cleanup materials.
   d. Immediately notify Ecology's Regional Spill Response Office and the Washington State Department of Fish & Wildlife with the nature and details of the problem, any actions taken to correct the problem, and any proposed changes in operation to prevent further problems.
   e. Immediately notify the National Response Center at 1-800-424-8802, for actual spills to water only.
   - *Justification – This condition is necessary to prevent oil and hazardous materials spills from causing environmental damage and to ensure compliance with water quality requirements. The sooner a spill is reported, the quicker it can be addressed, resulting in less harm. Ecology must protect waters of the state from all discharges and potential discharges of pollution that can affect water quality to protect aquatic life and beneficial uses.*
   - *Citation – Chapter 90.48 RCW, Chapter 90.48.030 RCW, Chapter 90.48.080 RCW, Chapter 90.56 RCW, Chapter 90.56.280 RCW, Chapter 173-201A WAC, Chapter 173-201A-300–330 WAC, Chapter 173-204-120 WAC, Chapter 173-225-010 WAC, and Chapter 173-303-145 WAC.*

5. Notify Ecology's Regional Spill Response Office immediately if chemical containers (e.g. drums) are discovered on-site or any conditions present indicating disposal or burial of chemicals on-site that may impact surface water or ground water.

- *Justification – Oil and hazardous materials spills cause environmental damage. The sooner a spill is reported, the quicker it can be addressed, resulting in less harm. Ecology must protect waters of the state from all discharges and potential discharges of pollution that can affect water quality to protect aquatic life and beneficial uses.*
- *Citation – Chapter 90.48 RCW, Chapter 90.48.030 RCW, Chapter 90.48.080 RCW, Chapter 90.56 RCW, Chapter 90.56.280 RCW, Chapter 173-201A WAC, Chapter 173-201A-300–330 WAC, Chapter 173-204-120 WAC, Chapter 173-225-010 WAC, and Chapter 173-303-145 WAC.*

YOUR RIGHT TO APPEAL

You have a right to appeal this Order to the Pollution Control Hearing Board (PCHB) within 30 days of the date of receipt of this Order. The appeal process is governed by Chapter 43.21B RCW and Chapter 371-08 WAC. "Date of receipt" is defined in RCW 43.21B.001(2).

To appeal you must do both of the following within 30 days of the date of receipt of this Order:

- File your appeal and a copy of this Order with the PCHB (see addresses below). Filing means actual receipt by the PCHB during regular business hours.
- Serve a copy of your appeal and this Order on Ecology in paper form - by mail or in person. (See addresses below.) E-mail is not accepted.

You must also comply with other applicable requirements in Chapter 43.21B RCW and Chapter 371-08 WAC.

ADDRESS AND LOCATION INFORMATION

Street Addresses	Mailing Addresses
Department of Ecology Attn: Appeals Processing Desk 300 Desmond Drive SE Lacey, WA 98503 **Pollution Control Hearings Board** 1111 Israel Road SW STE 301 Tumwater, WA 98501	**Department of Ecology** Attn: Appeals Processing Desk PO Box 47608 Olympia, WA 98504-7608 **Pollution Control Hearings Board** PO Box 40903 Olympia, WA 98504-0903

CONTACT INFORMATION

Please direct all questions about this Order to:

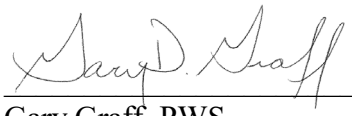
Lori White
Department of Ecology
Central Regional Office
1250 W Alder Street
Union Gap, WA 98903
(509) 575-2616
lori.white@ecy.wa.gov

MORE INFORMATION

- **Pollution Control Hearings Board Website**
  http://www.eluho.wa.gov/Board/PCHB
- **Chapter 43.21B RCW - Environmental and Land Use Hearings Office – Pollution Control Hearings Board**
  http://app.leg.wa.gov/RCW/default.aspx?cite=43.21B
- **Chapter 371-08 WAC – Practice And Procedure**
  http://app.leg.wa.gov/WAC/default.aspx?cite=371-08
- **Chapter 34.05 RCW – Administrative Procedure Act**
  http://app.leg.wa.gov/RCW/default.aspx?cite=34.05
- **Chapter 90.48 RCW – Water Pollution Control**
  http://app.leg.wa.gov/RCW/default.aspx?cite=90.48
- **Chapter 173.204 WAC – Sediment Management Standards**
  http://apps.leg.wa.gov/WAC/default.aspx?cite=173-204
- **Chapter 173-200 WAC – Water Quality Standards for Ground Waters of the State of Washington**
  http://apps.leg.wa.gov/WAC/default.aspx?cite=173-200
- **Chapter 173-201A WAC – Water Quality Standards for Surface Waters of the State of Washington**
  http://apps.leg.wa.gov/WAC/default.aspx?cite=173-201A

SIGNATURE

Dated this 10th day of June, 2021 at the Department of Ecology, Union Gap Washington.



Gary Graff, PWS
Regional Section Manager
Shorelands and Environmental Assistance Program

Attachment A
Information Required for Monitoring Reports

Yakima River Gap to Gap Ecosystem
Ecology Order # 20108

Ecology requires the following information for monitoring reports submitted under this Order. Ecology will accept additional information that may be required by other agencies.

Background Information

1) Project name.
2) Ecology Order number and the Corps reference number.
3) Name and contact information of the person preparing the monitoring report. Also, if different from the person preparing the report, include the names of:
   a) The applicant
   b) The landowner
   c) The party responsible for the monitoring activities.
4) Dates the monitoring data were collected.
5) Date the report was produced.

Mitigation Project Information

6) Brief description of the mitigation project, including acreage of Cowardin classes and mitigation type(s) (re-establishment, rehabilitation, creation, enhancement, preservation, upland, buffers).
7) Description of the monitoring approach and methods. For each performance standard being measured provide the following information:
   a) Description of the sampling technique (e.g., monitoring point for soil or hydrology, line or point intercept method, ocular estimates in individually placed plots). If you are using a standardized technique, provide a reference for that method.
   b) Size and shape of plots or transects.
   c) Number of sampling locations and how you determined the number of sampling locations to use.
   d) Percent of the mitigation area being sampled.
   e) Locations of sampling (provide a map showing the locations), how you determined where to place the sampling locations (e.g., simple random sample), and whether they are permanent or temporary.
   f) Schedule for sampling (how often and when).
   g) Description of how the data was evaluated and analyzed.
8) Summary table(s) comparing performance standards with monitoring results and whether each standard has been met.
9) Discussion of how the monitoring data were used to determine whether the site(s) is meeting performance standards.

10) Goals and objectives and a discussion of whether the project is progressing toward achieving them.
11) Summary, including dates, of management actions implemented at the site(s), for example, maintenance and corrective actions.
12) Summary of any difficulties or significant events that occurred on the site that may affect the success of the project.
13) Specific recommendations for additional maintenance or corrective actions with a timetable.
14) Photographs taken at permanent photo stations and other photographs, as needed. Photos must be dated and clearly indicate the direction the camera is facing. Photo pans are recommended.
15) Vicinity map showing the geographic location of the site(s) with landmarks.
16) Mitigation site map(s), 8-1/2" x 11" or larger, showing the following:
    a) Boundary of the site(s).
    b) Location of permanent photo stations and any other photos taken.
    c) Data sampling locations, such as points, plots, or transects.
    d) Approximate locations of any replanted vegetation.
    e) Changes to site conditions since the last report, such as areas of regrading, a shift in the location of Cowardin classes or habitat features, or a change in water regime.

    Include the month and year when each map was produced or revised. The site map(s) should reflect on-the-ground conditions during the most recent monitoring year.

WATER QUALITY MONITORING PLAN
Yakima River Gap to Gap Ecosystem Restoration
Yakima, Washington
Prepared October 2020

The U.S. Army Corps of Engineers (Corps) will conduct ecosystem restoration in the Yakima River Gap to Gap reach and will execute this water quality monitoring plan. This document describes the construction water quality monitoring plan to ensure compliance with Washington State water quality standards to meet the conditions of the State of Washington Department of Ecology (Ecology) Section 401 Water Quality Certification. Specific items covered include project locations, construction scheduling, monitoring locations, monitoring methods and equipment, reporting, monitoring response actions, and contingency plans. Responsible parties named in this document are the "Contractor" to include the contractor's project manager and environmental monitoring staff, the Corps' "Environmental Coordinator", and the Corps' "Construction Representative".

I. Project Measures

1. Measure 1.0 DID#1 Floodplain Process Restoration: No in-water work; bank disturbing activities.
2. Measure 1.1 Floodplain Topographic Restoration: No in-water work; bank disturbing activities.
3. Measure 1.2 Remove SR24 Cross Dike and KOA Levee, including three 70-foot-long segments of riprap armor below ordinary high water; install SR 24 buried sill: In-water work to remove 210 square feet of riprap.
4. Measure 2.0 Sportsman Island Channel Restoration: No in-water work; however, groundwater fed historic channel outflow may discharge to the Yakima River at certain times of the year.
5. Measure 2.1 Sportsman Upstream Groin Removal: In-water work to remove groins in Yakima River.
6. Measure 2.2 Lake Buchanan Spurs: In-water work to install spurs in Yakima River.
7. Measure 4.0 Blue Slough Automated Headgate: No in-water work; project area is disconnected from the Yakima River.

II. Construction Schedule

Construction may commence in October 2021 and is expected to take up to 2.5 years to complete, ending in April 2024. Work in the upland areas will occur year-round through the construction period. In-water work will occur only during the approved fish window of 1 October through 28 February, as approved by the National Marine Fisheries Service (NMFS) and U.S. Fish and Wildlife Service.

Multiple sites could be under construction on any day during the construction period and in-water work window. The construction schedule is flexible and will change depending upon individual progress at each site. Therefore, the monitoring plan is flexible in identifying the monitoring activities and monitoring locations. Monitoring points are recommended at locations to characterize the upstream background conditions for each project site and at the downstream ends of each construction reach.

III. Water Quality Parameters

The Yakima River has one listed aquatic life use designations in WRIA 37, that of "Spawning/Rearing" (WAC 173-201A-602, Table 602). In this category, the following criteria apply:

- Temperature – Highest 7-DADmax 17.5°C (63.5°F) for Spawning and Rearing
- Dissolved Oxygen – Lowest 1-day minimum 8.0 mg/L
- Turbidity – shall not exceed
    - 5 nephlometric turbidity units (NTU) over background when the background is 50 NTU or less; or
    - a 10 percent increase in turbidity when the background turbidity is more than 50 NTU
- Total Dissolved Gas – shall not exceed 110 percent of saturation at any point of sample collection.
- pH – pH shall be within the range of 6.5 to 8.5, with a human-caused variation within the above range of less than 0.5 units.

The proposed construction has no possibility of affecting any of the above parameters listed above except for turbidity; therefore, only the turbidity criteria are relevant to this water quality monitoring program in the Yakima River.

IV. Monitoring Locations

Visual inspections are performed at each construction site, as well as predetermined water quality monitoring stations. Monitoring will evaluate BMPs; check for fuel, lubricant, and oil spills; and construction waste disposal; whereas the predetermined water quality monitoring stations will evaluate turbidity by collecting and analyzing samples. Corps staff and Contractor staff will visit each of the active construction sites daily and conduct the visual inspections.

Pursuant to WAC 173-201A-200, construction sites must meet water quality criteria for the following instream flows at time of construction:

- Less than 10 cubic feet per second (cfs): 100 feet downstream
- 10 – 100 cfs: 200 feet downstream
- Greater than 100 cfs: 300 feet downstream.

Locations of water quality sampling sites shall be at the following distances from in-water work and bank disturbing activities:

- Background: at least 300 feet upstream from in-water work
- Early Warning: 200 feet downstream from in-water work
- Point of Compliance: 300 feet downstream from in-water work

The Corps expects the entire length of the Yakima River throughout the project area to be accessible on foot and from many points along the left and right banks of the river. The Corps has secured rights-of-entry and construction access easements for all project sites.

V. Monitoring Procedures

A. General Turbidity Monitoring

- Turbidity will be sampled using a portable turbidimeter that is equivalent and can be calibrated to the Corps' Hach Turbidimeter – 2100 (or equivalent). The meter shall be calibrated daily to read from 0 to 100 NTUs, prior to collecting samples.
- Sampling will begin at the start of in-water work each day.
- Samples will be collected a minimum of every 2 hours throughout the first day of in-water construction activity at each project site. Background samples will be collected at the same frequency as the POC samples.
- If, after a minimum of one full day, the monitoring results verify that turbidity levels from a certain sediment-generating activity are remaining consistent with criteria at WAC 173-201A-602, then turbidity monitoring may be reduced or stopped for that activity. Monitoring would be resumed during new sediment-generating activities or if precipitation events or any other changes would result in higher or lower project-related turbidity.
- Subsequent sampling after the first full construction day at each site is dependent on monitoring results, but if continued, shall be a minimum of 3 times daily during in-water activity at the monitoring locations.
- Turbidity measurement will be taken along the thalweg of the channel, if feasible, and 1 foot below the surface of the water.
- All monitoring data will use the field data collection form (Figure 1) to record measurements and report to the Corps' Environmental Coordinator.
- Monitors will note daily calibration, periodic turbidity readings, compare them to background readings, note the numerical difference between background and POC data, and identify the construction activities occurring at the site.
- Visual monitoring for turbidity will continue throughout construction. Any noticeable plume will trigger physical sampling at background and each downstream station to ensure compliance.

WAC 173-201A-200(1)(e) states turbidity shall not exceed 5 NTU over background turbidity when the background turbidity is 50 NTU or less or have more than a 10 percent increase in turbidity when the background turbidity is more than 50 NTU.

B. Turbidity Exceedance Monitoring and Actions

If monitoring shows that the work is approaching turbidity limits under WAC 73-201A-200(1)(e), the in-water activity will be slowed. If this occurs, the Corps will use All Known and Reasonable pollution prevention and mitigation Technologies (AKART) to reduce turbidity. Some of these measures may include a silt boom around the work area and/or a water inflatable dam at the upstream end of the work area.

If turbidity monitoring reveals an exceedance at the designated POC locations, the Contractor will document the event and report to Ecology, then will inform the Environmental Coordinator and Construction Representative. These Corps staff will meet immediately at the problem construction site. Actions taken by the Corps and Contractor are to immediately stop work, assess the problem, and implement secondary levels of BMPs and contingency plans. Hourly monitoring will continue while construction activities are restarted. Once turbidity falls to acceptable levels, then the General Turbidity Monitoring Schedule will resume.

If, after implementation of all reasonable erosion/sediment control BMPs and contingency measures, the hourly turbidity monitoring still indicates exceedance of water quality standards, then the Environmental Coordinator will notify Ecology that water quality standards cannot be met, summarize all BMPs implemented to date, and suggest revised construction methods, BMPs, and project approach. The Environmental Coordinator and Construction Representative will then implement revised BMPs and contingencies per the correspondence with Ecology, and restart the project. Hourly monitoring will continue throughout this process until monitoring results indicate the BMP and construction method revisions have been effective at reducing turbidity levels.

C. General Fuel and Lubricant Monitoring

Fuel and lubricants will be monitored daily by visual observation at each construction site. The Corps Construction Representative is responsible for monitoring for fuels and lubricants at the project sites during all construction operations. Environmental monitors will inspect the site once daily at a random time.

If any visible sheen is observed at the site at any time, then the machinery will be pulled from the water, shut down, repaired, and use of an absorbent boom or clean up kits to contain the spills will be implemented. The Contractor will place booms spanning the channel immediately below the spill to contain it. If any fuels or lubricants are spilled onto the ground, they will immediately be absorbed with granular absorbents or pads then contaminated soils shall be removed. The use of detergents to disperse oily sheens is not permitted.

D. Upland Construction Stormwater BMP Maintenance and Inspection

The Contractor will be responsible for obtaining a Construction General Stormwater Permit and adhering to the Stormwater Pollution Prevention Plan (SWPPP). Visual inspections of all cleared and graded areas of the construction site will be performed daily and within 12 hours of the end of a storm with rainfall amounts greater than 0.5 inches. The Contractor will conduct the

inspection and report to the Corps' Environmental Coordinator using the monitoring data sheet. The inspection will verify that the structural BMPs are in good condition and are minimizing erosion and stormwater runoff from upland areas. The Corps' Environmental Coordinator will flag for additional inspection any reports of consecutive BMP problems that are not addressed within 24 hours and may conduct random inspections to ensure compliance.

E. Waste Monitoring

The Contractor will perform visual inspections at each construction site to check on proper disposal of waste associated with the project. This includes disposal of construction materials, as well as human wastes. Improper handling or disposal of waste materials will be noted on daily monitoring sheets and reported to the Construction Representative and Environmental Coordinator. The Corps' Environmental Coordinator will flag for additional inspection any reports of consecutive improper waste disposal that are not addressed within 24 hours and may conduct random inspections to ensure compliance.

VI. Reporting

A. Contractor and Environmental Coordinator Responsibilities

The Contractor shall record all monitoring activities on a daily monitoring sheet for each project site. The Contractor shall provide a spreadsheet with all water quality monitoring data to the Environmental Coordinator at the end of each day or the following morning. The Contractor shall provide a written summary memorandum to the Environmental Coordinator at the end of each construction week. The Environmental Coordinator will provide a monthly summary to Ecology of monitoring results and any additional BMPs implemented. The Environmental Coordinator will contact Ecology if water quality standards cannot be met and all reasonable BMPs have been implemented; then further consultation between the agencies will ensue. The Environmental Coordinator will provide a final programmatic construction monitoring report to Corps Management and Ecology within 60 days of completion of construction at all sites.

B. Notification of Exceedances

The Contractor shall notify Ecology of exceedances that are detected through water quality sampling within 24 hours of occurrence and notify the Environmental Coordinator as soon as possible after notifying Ecology. The Contractor shall provide the following information:

- A description of the nature and cause of non-compliance, including the quantity and quality of any unauthorized discharges;
- The period of non-compliance, including exact dates, duration, and times and/or the anticipated time when the construction work will return to compliance;
- The steps taken, or to be taken, to reduce, eliminate, and prevent recurrence of the non-compliance.

The Contractor shall provide this information to Ecology's 401/CZM Federal Project Manager: Phone: (360) 407-6300

Phone: (425) 649-7000
Fax: (425) 649-7098
Email: fednotification@ecy.wa.gov

C. Notification of Spills

The Contractor shall notify Ecology of any oil or other toxic material spills immediately to Ecology's 24-hour Spill Response Team at 1-800-258-5990, and within 24 hours to Ecology's 401/CZM Federal Project Manager at the phone numbers listed above.

In addition, the Contractor will submit a written report to Ecology within 5 days after notification of an exceedance describing the nature of the violation, corrective action taken and/or planned, steps to be taken to prevent a recurrence, results of any samples, taken, photographs, and any other pertinent information.

D. Employee Training

The Contractor shall host an employee training meeting prior to construction to educate construction and environmental monitoring staff about the requirements and expectations of the SWPPP. The Contractor is responsible for implementation of training prior to the start of construction and monitoring activities. The meeting will include background on the components and goals of the SWPPP and hands-on training for upland and in-water BMP installation and maintenance, spill prevention, response, good housekeeping, proper material handling, disposal and control of water, equipment fueling, and proper storage, washing, and inspection procedures. The Contractor shall coordinate the date and time of training with the Environmental Coordinator and Construction Representative.

FIGURE 1: Example Data Collection Sheet for Construction Water Quality Monitoring

Date:	**Weather:**			**Site Designation/Location:**			
Time	Construction Activity	Background (NTU)	Reference to State Criteria (NTU)	Early Warning (NTU)	Point of Compliance (NTU)	Difference between background and POC	Description of visible plume (length downstream, width as % of channel)

UNITED STATES DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
NATIONAL MARINE FISHERIES SERVICE
West Coast Region
1201 NE Lloyd Boulevard, Suite 1100
Portland, OR 97232

July 13, 2017

Refer to NMFS Nos:
WCR-2017-6789

Melissa Leslie
Section Chief, Watershed and Terrestrial Resources
Corps of Engineers
P. O. Box 3755
Seattle, WA 98124-3755

Re: Endangered Species Act Section 7(a)(2) Biological Opinion, and Magnuson-Stevens Fishery Conservation and Management Act Essential Fish Habitat Response for the Yakima River Gap to Gap Ecosystem Restoration Project, Yakima County, Washington (Sixth Field Hydrologic Unit Code: 170300030206 City of Yakima-Yakima River)

Dear Ms. Leslie:

Thank you for your email of April 10, 2017, requesting initiation of consultation with NOAA's National Marine Fisheries Service (NMFS) pursuant to section 7 of the Endangered Species Act of 1973 (ESA) (16 U.S.C. 1531 et seq.) for ecosystem restoration on the Yakima River.

We also reviewed the likely effects of the proposed action on essential fish habitat, pursuant to section 305(b) of the Magnuson-Stevens Fishery Conservation and Management Act (16 U.S.C. 1855(b)), and concluded that the action would adversely affect the EFH of Pacific Coast salmon. Therefore, we have included the results of that review in Section 3 of this document.

In the biological opinion (Opinion), NMFS concludes that the proposed action is not likely to jeopardize the continued existence of ESA-listed Middle Columbia River (MCR) steelhead (*Oncorhynchus mykiss*). NMFS also determined the action will not destroy or adversely modify designated critical habitat for MCR steelhead. Rationale for our conclusions is provided in the attached Opinion.

As required by section 7 of the ESA, NMFS provided an incidental take statement (ITS) with the Opinion. The ITS describes reasonable and prudent measures (RPMs) NMFS considers necessary or appropriate to minimize incidental take associated with the proposed action. The take statement sets forth nondiscretionary terms and conditions, including reporting requirements that the Corps and any person who performs the action must comply with to carry out the RPMs.

Incidental take from the proposed action that meets these terms and conditions will be exempt from the ESA take prohibition.

Our EFH analysis includes two conservation recommendations to avoid, minimize, or otherwise offset potential adverse effects to EFH. If your response is inconsistent with the EFH conservation recommendations, the Corps must explain why, including the justification for any disagreements over the effects of the action and the recommendations. In response to increased oversight of overall EFH program effectiveness by the Office of Management and Budget, NMFS established a quarterly reporting requirement to determine how many conservation recommendations are provided as part of each EFH consultation and how many are adopted by the action agency. Therefore, in your statutory reply to the EFH portion of this consultation, we ask that you clearly identify the number of conservation recommendations accepted.

Please contact Jody Walters of the Columbia Basin Branch at (509) 962-8911 ext. 803, jody.walters@noaa.gov if you have any questions concerning this consultation, or if you require additional information.

Sincerely,

for Barry A. Thom
Regional Administrator

Enclosure

cc: [*File*]
Eric Bartrand, WDFW

Endangered Species Act (ESA) Section 7(a)(2) Biological Opinion and Magnuson-Stevens Fishery Conservation and Management Act Essential Fish Habitat Response

Yakima River Gap to Gap Ecosystem Restoration Project

NMFS Consultation Number: WCR-2017-6789

Action Agency: U. S. Army Corps of Engineers

Affected Species and NMFS' Determinations:

ESA-Listed Species	Status	Is Action Likely to Adversely Affect Species?	Is Action Likely To Jeopardize the Species?	Is Action Likely to Adversely Affect Critical Habitat?	Is Action Likely To Destroy or Adversely Modify Critical Habitat?
Middle Columbia River steelhead (*O. mykiss*)	Threatened	Yes	No	Yes	No

Fishery Management Plan That Identifies EFH in the Project Area	Does Action Have an Adverse Effect on EFH?	Are EFH Conservation Recommendations Provided?
Pacific Coast Salmon	Yes	Yes

Consultation Conducted By: National Marine Fisheries Service, West Coast Region

Issued By: Michael Crouse

for Barry A. Thom
Regional Administrator

Date: 07/13/2017

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ACRONYM GLOSSARY

BA	Biological Assessment
CFR	Code of Federal Regulations
Corps	Corps of Engineers
DPS	Distinct Population Segment
DQA	Data Quality Act
EFH	Essential Fish Habitat
ESA	Endangered Species Act
ESU	Evolutionarily Significant Unit
FR	Federal Register
ICTRT	Interior Columbia Basin Technical Recovery Team
ISAB	Independent Scientific Advisory Board
ITS	Incidental Take Statement
MCR	Middle Columbia River
MPG	Major Population Group
MSA	Magnuson-Stevens Fishery Conservation and Management Act
NLAA	Not Likely to Adversely Affect
NMFS	National Marine Fisheries Service
NTU	Nephelometric Turbidity Units
NWFSC	Northwest Fisheries Science Center
OMB	Office of Management and Budget
Opinion	Biological Opinion
PBF	Physical and Biological Feature
PCE	Primary Constituent Element
PFMC	Pacific Fishery Management Council
RM	River Mile
RPM	Reasonable and Prudent Measure
sq ft	Square Feet
SR	State Route
U.S.C.	United States Code
USGCRP	U.S. Global Change Research Program
VSP	Viable Salmonid Population

1. INTRODUCTION

This Introduction section provides information relevant to the other sections of this document and is incorporated by reference into Sections 2 and 3 below.

1.1 Background

National Marine Fisheries Service (NMFS) prepared the biological opinion (Opinion) and incidental take statement (ITS) portions of this document in accordance with section 7(b) of the Endangered Species Act (ESA) of 1973 (16 U.S.C. 1531 et seq.), and implementing regulations at 50 CFR 402.

We also completed an essential fish habitat (EFH) consultation on the proposed action, in accordance with section 305(b)(2) of the Magnuson-Stevens Fishery Conservation and Management Act (MSA) (16 U.S.C. 1801 et seq.) and implementing regulations at 50 CFR 600.

We completed pre-dissemination review of this document using standards for utility, integrity, and objectivity in compliance with applicable guidelines issued under the Data Quality Act (DQA) (section 515 of the Treasury and General Government Appropriations Act for Fiscal Year 2001, Public Law 106-554). The document will be available through NMFS' Public Consultation Tracking System (https://pcts.nmfs.noaa.gov/pcts-web/homepage.pcts). A complete record of this consultation is on file at the NMFS Columbia Basin Branch office.

1.2 Consultation History

We received a request for consultation and Biological Assessment (BA) from the Corps of Engineers (Corps) on April 10, 2017. The Corps determined that the project was "Not Likely to Adversely Affect" (NLAA) the Middle Columbia River (MCR) steelhead Distinct Population Segment (DPS) and designated critical habitat. We disagreed with this determination based on analyses in other recent Yakima River consultations (2011/01991; 2012/01745; WCR-2016-5868; WCR-2016-5869), and on a review of the best available science (citations in the Effects section of this document). On April 24, 2017, we informed the Corps we could not concur with their NLAA determination, and on May 1, 2017, we requested additional information that was necessary for us to analyze the effects of the proposed work.

On May 16, 2017, we toured the project with the Corps, United States Fish and Wildlife Service, and Yakima County, the local project sponsor. On May 22, 2017, the Corps sent the information we requested. We then had the information necessary to finish analyzing the effects of the proposed action and consultation was initiated.

1.3 Proposed Federal Action

"Action" means all activities or programs of any kind authorized, funded, or carried out, in whole or in part, by federal agencies (50 CFR 402.02).

The Corps is proposing to restore ecosystem process, structure, and function in the Gap to Gap Reach of the Yakima River. The need for the action arises from the degradation of natural ecosystem processes stemming from the disconnection of the river with its historic floodplain, mainly due to the extensive levee system. The proposed action is authorized by section 1135 of the Water Resources and Development Act of 1986, as amended (section 1135). Section 1135 provides the Corps the authority to evaluate potential modifications to existing Corps projects for the purpose of improving the environment in the public interest. Measures at off-project locations that have been affected by the construction or operation of the project can be undertaken, if such measures do not conflict with the authorized project purpose.

The proposed action will restore more frequent inundation to a large area of historic floodplain while greatly improving off-channel habitat. The project actions span 4 miles of the river, from river mile (RM) 109 near the Spring Creek confluence to RM 113 just downstream of the Terrace Heights Bridge. The BA describes nine measures of the proposed action, which are summarized below.

Measure 1.0: Diking Improvement District (DID) #1 Floodplain Process Restoration
The Corps will remove all (1.7 miles) of the DID #1 levee to restore hydrology and natural processes to the historic floodplain. This levee is located on the left bank, immediately downstream of the State Route (SR) 24 bridge. The upstream end of the DID#1 levee currently ties into the downstream end of the Yakima Authorized left bank levee. The levee does not tie into high ground at the downstream end because it extends beyond the area of potential impacts from flooding.

By removing this levee, the total amount of shoreline armoring will be reduced by 9 percent in the 10-mile-long Gap to Gap Reach, and about 320 acres of floodplain will be reconnected to the river. An additional several hundred acres downstream could be incidentally activated as floodplain as a result of improved surface hydrology conditions.

The Corps will rebuild (i.e., set back) this levee to maintain the existing level of flood protection for features outside of the project area. The realigned levee design consists of two overlapping levee segments to manage flood risk while allowing the passage of Blue Slough, a distributary channel of the Yakima River, across the line of protection. Two small roads will be raised to ensure access to the new levee.

Measure 1.1: Floodplain Topographic Restoration
This measure is sited in the historic floodplain that will be reconnected to the river by Measure 1.0, on the left bank just south of the SR 24 Bridge. The area includes three decommissioned gravel pits (the Newland Pits) and upland disposal piles. The measure consists of the following three actions:

1) Removal of aggraded point bar material that has resulted from the fixed meander downstream of the SR 24 Bridge. When implemented with Measure 1.0, this will allow re-initiation of normal channel migration processes. It would also distribute energy more evenly across the channel, and reduce the potential for immediate avulsion into the pits.

2) Use of excavated material to place causeways in the three pits to reduce the risk and effect of floodplain pit capture and any associated headcutting upstream. In addition, all large trees and woody vegetation cleared as part of the project would be used as backfill within the ponds. The woody material would increase roughness and channel stability within the partially filled pits, would likely partially re-sprout, and enhance habitat.

3) Removal of remnant gravel pit spoils from the floodplain to allow the river more conveyance and wetted area within the floodplain area reconnected through Measure 1.0 and deposit of that material in the former pits.

Once the floodplain is regraded, the Corps expects the river will go out of bank at a 2-year frequency and begin sculpting side channels. The Corps will also excavate pilot channels to focus the flow energy into areas most likely to remain stable while the floodplain adjusts to levee removal.

Measure 1.2: KOA Floodplain Restoration
This measure is located on the left bank between Sportsman's Park and SR 24. In 2012, a large portion of the federal levee was rebuilt along a setback alignment under PL 84-99, but about 1,500 feet of remnant levee was left in place. The Corps will remove this remnant levee, reconnecting the river with about 15 acres of floodplain. The Corps will also remove an approximately 800-foot spur dike isolating this area from the DID #1 floodplain area downstream.

This measure will be dependent on Measure 1.0, which includes new levee construction to ensure that removal of the remnant levee does not increase offsite flooding. Removal of the remnant levee and the spur dike will allow water to flow freely into the restored DID #1 floodplain area. The Corps will use the removed fill as borrow material for the levee rebuild included in Measure 1.0. The federal levee and current SR 24 Bridge and approach have been designed to accommodate the increased erosion and scour risk associated with this restoration effort. A buried grade control sill will be installed to help mitigate the risks of floodplain overflows avulsing into the Newland Pits.

Measure 2.0: Sportsman Island Channel Restoration
This measure includes the restoration of the side channel that formed Sportsman Island. In the last several decades the river has occupied a single deep narrow channel at low flow, the side channel size has reduced, and the river has developed 3 "fixed" meanders. The "fixed meanders" have caused the associated point bars to aggrade with generally finer sands and gravels, which has buried most of the former side channel habitat on Sportsman Island. The main river channel has narrowed and incised, greatly simplifying available habitat and limiting spawning opportunities.

This measure will restore 20 acres of side channel habitat, reconnect the upstream and downstream ends of the island, allowing for additional conveyance, create a more even distribution of stream energy across this leveed reach (improving spawning conditions), and reconnect various side channels along the alignment. The Corps predicts the new channel will be

inundated at the 2-year flow, which will redistribute flow away from the right bank levee and reduce flood stages.

The Corps will excavate three relatively straight side channels requiring removal of approximately 100,000 cubic yards of alluvium and woody debris. The excavated material will be contributed towards Measure 1.0 and/or Measure 1.1. The design consists of two smaller anabranch channels at the head of the island that combine to form a 100-foot-wide, 2,550-foot-long primary side channel/anabranch that would tie in to an existing natural side channel towards the downstream end of the island. This constructed channel will also convey surface water to a smaller side channel that feeds water into Blue Slough. The Corps expects that natural processes will rapidly sculpt the banks and bed of the side channel, adding complexity (sinuosity, large wood, pool-riffle sequences, bars, side channels) that would be initially absent from the as-built channel.

Measure 2.1: Sportsman Upstream Groin Removal
A series of groins installed by the Corps following the 1996 flood have been effective at preventing erosion along the levee, but have been equally effective at shifting main flows towards the downstream right bank levee near Buchanan Lake. In addition, substrate has been accreting at the upstream end of the Sportsman's Park Island, preventing flow to side channels. The Corps will remove portions of the three downstream-most groins to encourage more flow to the island and its side channel habitat, including the channel the Corps will construct.

Measure 2.2: Lake Buchanan Spurs
The Corps will build a series of low, riprap spurs along the existing right bank federal levee adjacent to Buchanan Lake. These spurs will increase local water surface elevations, directing flow into the new pilot channel excavated through Sportsman Island (Measure 2.0), and they will reduce velocities and stream power in the main channel at the base of the levee. The spurs will be located at two sites along the levee, spaced 120 feet apart.

Measure 4.0: Blue Slough Automated Headgate
Blue Slough is a relic channel running about 2 miles parallel to the Yakima River. The inlet is at the Sportsman Park campground where flows can be controlled manually with a headgate to prevent flooding in the slough. The Corps will replace the headgate with an automated structure that will allow floodplain managers to maintain a normative hydrograph in the slough without increasing flood risk. The Corps will also remove sediment and debris at the culvert, install a trash rack, and install flow control weirs to ensure adequate head is available at low flows.

At the outlet back to the Yakima River, they will replace an existing energy dissipater with a pre-formed scour pool lined with riprap or river cobbles to dissipate energy and to provide resting areas for adult salmonids as they access the culvert. They will also add a flow control weir to partially backwater the culvert outlet to facilitate upstream passage by juvenile salmonids at low flows. Benefits would accrue to approximately 2 miles/12 acres of this historic channel as a result of this hydrologic restoration measure.

Measure 4.1: Blue Slough Culverts
The Corps estimates that, due to the backwater effect associated with 4 undersized culverts, flooding would begin at a flow of 20 cubic feet per second (cfs). The Corps will upgrade the undersized culverts that cross Blue Slough, a distributary of the Yakima River, at Sportsman's Park, Blue Crane Lane, an unnamed private road and Lester Lane. To meet Corps emergency management engineering requirements (ER 500-1-1), a hand-operated slide gate closure structure will be added to the culvert at either the unnamed road or at Lester Lane. Upgrading the four undersized culverts will significantly improve passage for all native salmonids and life stages through Blue Slough. Passage in the Yakima River will not be affected.

Measure 7.0: Spring Creek Reconnection
Spring Creek is a groundwater fed tributary of the Yakima River. Since construction of Interstate 82 in the 1970s, Spring Creek has flowed across a compacted former haul road, creating an approximate 3-foot waterfall into a former gravel pit. This has disconnected this valuable spawning and rearing habitat from the Yakima River. The Corps will remove the compacted road bed, restoring fish access to 14 acres of locally rare, cold water off-channel habitat.

For all of these measures combined, the Corps estimates that approximately 21,700 square feet (sq ft) of benthic habitat will be disturbed by heavy equipment (when building the spurs), and approximately 26 acres of vegetation will be removed. Most of the vegetation will not be along the water but elsewhere on the floodplain (e.g., Sportsman Island and landward of the existing DID#1 levee). This vegetation removal will be necessary for the long-term benefit of improved floodplain connectivity and normative river processes.

Measures including in-water work that could affect steelhead include the Sportsman Island channel restoration, rock groin removal upstream of Sportsman Island, spur construction at the Lake Buchanan levee, and the road bed removal in Spring Creek. The in-water work will occur from October 1 through February 28. In-water work is expected to last two construction seasons. The BA identifies conservation measures and best management practices, which we incorporate here by reference. In addition, the Corps will place rock individually in the river, rather than dumping it when they build the spurs. They will also release water slowly into any newly excavated channels (e.g., on Sportsman Island) to minimize suspended sediment delivery. Finally, the Corps will implement a water quality sampling protocol. In summary, they will regularly monitor turbidity 300 feet downstream of sediment-generating activities. Maximum turbidity levels will meet WAC 173-201A-210 (i.e., turbidity must not exceed 5 Nephelometric Turbidity Units (NTUs) over background when the background is 50 NTUs or less; or a 10-percent increase in turbidity when the background turbidity is more than 50 NTUs). If turbidity levels exceed these values, activities will cease and actions will be taken to avoid or reduce turbidity levels.

"Interrelated actions" are those that are part of a larger action and depend on the larger action for their justification. "Interdependent actions" are those that have no independent utility apart from the action under consideration (50 CFR 402.02). After completion of construction, Yakima County, would assume operations and maintenance responsibility for the entire project footprint. For example, some maintenance of the Blue Slough headgate, such as removing debris could be required, and levee maintenance could include repairs and vegetation removal. If any of this

work has to occur below the ordinary high water mark, the County would need a permit from the Corps, and the Corps would decide if consultation with NMFS was warranted.

2. ENDANGERED SPECIES ACT: BIOLOGICAL OPINION AND INCIDENTAL TAKE STATEMENT

The ESA establishes a national program for conserving threatened and endangered species of fish, wildlife, plants, and the habitat upon which they depend. As required by section 7(a)(2) of the ESA, each federal agency must ensure that its actions are not likely to jeopardize the continued existence of endangered or threatened species, or adversely modify or destroy their designated critical habitat. Per the requirements of the ESA, federal action agencies consult with NMFS and section 7(b)(3) requires that, at the conclusion of consultation, NMFS provides an Opinion stating how the agency's actions would affect listed species and their critical habitats. If incidental take is reasonably certain to occur, section 7(b)(4) requires NMFS to provide an ITS that specifies the impact of any incidental taking and includes non-discretionary reasonable and prudent measures (RPMs) and terms and conditions to minimize such impacts.

2.1 Analytical Approach

This Opinion includes both a jeopardy analysis and an adverse modification analysis. The jeopardy analysis relies upon the regulatory definition of "to jeopardize the continued existence of" a listed species, which is "to engage in an action that would be expected, directly or indirectly, to reduce appreciably the likelihood of both the survival and recovery of a listed species in the wild by reducing the reproduction, numbers, or distribution of that species" (50 CFR 402.02). Therefore, the jeopardy analysis considers both survival and recovery of the species.

This Opinion relies on the definition of "destruction or adverse modification," which "means a direct or indirect alteration that appreciably diminishes the value of critical habitat for the conservation of a listed species. Such alterations may include, but are not limited to, those that alter the physical or biological features essential to the conservation of a species or that preclude or significantly delay development of such features" (81 FR 7214).

The designation of critical habitat for MCR steelhead uses the term primary constituent element (PCE) or essential features. The new critical habitat regulations (81 FR 7414) replace this term with physical or biological features (PBFs). The shift in terminology does not change the approach used in conducting a "destruction or adverse modification" analysis, which is the same regardless of whether the original designation identified PCEs, PBFs, or essential features. In this Opinion, we use the term PBF to mean PCE or essential feature, as appropriate for the specific critical habitat.

We use the following approach to determine whether a proposed action is likely to jeopardize listed species or destroy or adversely modify critical habitat:

- Identify the rangewide status of the species and critical habitat expected to be adversely affected by the proposed action.

- Describe the environmental baseline in the action area.
- Analyze the effects of the proposed action on both species and their habitat using an "exposure-response-risk" approach.
- Describe any cumulative effects in the action area.
- Integrate and synthesize the above factors by: (1) reviewing the status of the species and critical habitat; and (2) adding the effects of the action, the environmental baseline, and cumulative effects to assess the risk that the proposed action poses to species and critical habitat.
- Reach a conclusion about whether species are jeopardized or critical habitat is adversely modified.
- Suggest a reasonable and prudent alternative to the proposed action, if necessary.

2.2 Rangewide Status of the Species and Critical Habitat

This Opinion examines the status of each species that would be adversely affected by the proposed action. The status is determined by the level of extinction risk that the listed species face, based on parameters considered in documents such as recovery plans, status reviews, and listing decisions. This informs the description of the species' likelihood of both survival and recovery. The species status section also helps to inform the description of the species' current "reproduction, numbers, or distribution" as described in 50 CFR 402.02. The Opinion also examines the condition of critical habitat throughout the designated area, evaluates the conservation value of the various watersheds and coastal and marine environments that make up the designated area, and discusses the current function of the essential PBFs that help to form that conservation value.

2.2.1 Status of the Species

When examining the status of a species, NMFS uses criteria that describe a "Viable Salmonid Population" (VSP) (McElhany et al. 2000). Attributes associated with a VSP are the levels of abundance (number of adult spawners in natural production areas), productivity (adult progeny per parent), and the spatial structure and diversity necessary to: (1) safeguard the genetic diversity of the listed Evolutionarily Significant Unit (ESU) or DPS, (2) enhance its capacity to adapt to various environmental conditions, and (3) allow it to become self-sustaining in the natural environment.

In 2007, the Interior Columbia Basin Technical Recovery Team (ICTRT) further defined population-level viability criteria to address, abundance, productivity, spatial structure and diversity (ICTRT 2007a). These viability attributes are influenced by survival, behavior, and experiences throughout the entire life cycle, characteristics that are influenced in turn by habitat and other environmental conditions. The present risk faced by the ESU/DPS informs NMFS' determination of whether additional risk will appreciably reduce the likelihood that the ESU/DPS will survive or recover in the wild. The greater the present risk, the more likely any additional risk resulting from the proposed action's effects on the abundance (population size), productivity, distribution, or genetic diversity of the ESU/DPS will be an appreciable reduction (McElhany et al. 2000).

Middle Columbia River Steelhead. The MCR steelhead DPS was listed as threatened on March 25, 1999 (64 FR 14517), and its threatened status was reaffirmed on June 28, 2005 (70 FR 37160), August 15, 2011 (76 FR 50448), and May 26, 2016 (81 FR 33468). The DPS includes all naturally-spawning populations of steelhead using tributaries upstream and exclusive of the Wind River, Washington, and the Hood River, Oregon, excluding the Upper Columbia River and its tributaries (upstream of the Yakima River) and the Snake River. The ICTRT (2007b) identified 20 populations in four major population groups (MPGs) (Eastern Cascades, John Day River, the Umatilla River/Walla Walla drainages, and the Yakima River). Three of these populations are extinct: the White Salmon and Crooked River populations in the Eastern Cascades MPG, and the Willow Creek population in the Umatilla River/Walla Walla MPG. Seven artificial propagation programs are considered part of the DPS: the Touchet River Endemic, Yakima River Kelt Reconditioning Program (in Satus Creek, Toppenish Creek, Naches River, and Upper Yakima River), Umatilla River, and the Deschutes River steelhead hatchery programs. Major watersheds within this DPS include the Klickitat, Fifteen Mile, Deschutes, John Day, Umatilla, Yakima, and Walla Walla River Basins. NMFS has defined the steelhead DPSs to include only the anadromous members of this species (70 FR 67130).

Our approach to assessing the current status of a steelhead DPS is based on evaluating information on the abundance, productivity, spatial structure, and diversity of the anadromous component of this species (Good et al. 2005, 70 FR 67130). Many steelhead populations along the U.S. West Coast co-occur with conspecific populations of resident rainbow trout. There may be situations where reproductive contributions from resident rainbow trout may mitigate short-term extinction risk for some steelhead DPSs (Good et al. 2005, 70 FR 67130). We assume that any benefits to an anadromous population resulting from the presence of a conspecific resident form will be reflected in direct measures of the current status of the anadromous form (Ford 2011).

Life History. Life history characteristics for MCR steelhead are similar to those of other inland steelhead DPSs. Most fish smolt at two years and spend one to two years in salt water before re-entering freshwater, where they may remain up to a year before spawning (Howell et al. 1985). All steelhead upstream of The Dalles Dam are summer-run fish that enter the Columbia River from June to August (Reisenbichler et al. 1992). Adult steelhead ascend mainstem rivers and their tributaries throughout the winter and spring, spawning in the late winter through spring. Fry emergence typically occurs between May and August.

Limiting Factors. The major factors limiting recovery of the MCR steelhead DPS include: (1) mainstem Columbia River hydropower system mortality, (2) reduced streamflow in tributaries, (3) impaired passage in tributaries, (4) excessive sediment, (5) degraded water quality, and (6) altered channel morphology (NMFS 2005a).

Abundance and Productivity. According to the most recent 5-year status review (2010 to 2014 data), 7 of 15 populations are currently above the minimum abundance thresholds identified by the ICTRT (Northwest Fisheries Science Center (NWFSC) 2015). There are insufficient data to identify five-year abundances for the Klickitat River and Rock Creek. Total escapement and natural-origin escapements for all five John Day populations increased relative to Ford's (2011) prior 5-year review. 5-year geometric mean natural origin and total abundance estimates for all

four populations in the Yakima River MPG also increased relative to the prior review (Table 1). Total spawning escapements have increased in the most recent brood cycle for all three populations in the Umatilla-Walla Walla MPG as well. In the Eastern Cascades MPG, total escapement and natural-origin escapements for two of three populations have increased since the previous 5-year review.

The proposed action will take place within the Yakima River Basin MPG population boundaries and will affect the Naches and Upper Yakima populations. The MCR Steelhead Recovery Plan (NMFS 2009) characterized five MCR steelhead populations as being at high risk of extinction in terms of abundance based on 1995 to 2004 spawner numbers. Two of those high-risk populations included the Naches and Upper Yakima. However, Ford (2011) rated the Naches population integrated abundance and productivity risk as moderate, and the Upper Yakima River population risk was also rated moderate in the NWFSC (2015) review. The Satus and Toppenish Creek populations were rated low for the integrated abundance and productivity risk of extinction NWFSC (2015). Recent spawner abundances are given in Table 1.

Table 1. Minimum abundance thresholds set by the Interior Columbia Basin Technical Recovery Team (ICTRT 2007b), and the most recent 5-year geometric mean of natural spawner counts for Yakima River steelhead populations (NWFSC 2015).

Population	ICTRT minimum abundance threshold	Natural spawner abundance, 2005–2009	Natural spawner abundance, 2010–2014
Satus Creek	1,000	807	1,585
Toppenish Creek	500	468	575
Naches River	1,500	823	1,775
Upper Yakima River	1,500	155	390

Spatial Structure and Diversity. The NWFSC (2015) reported no change in the integrated spatial structure and diversity risk for all 17 MCR steelhead populations relative to the previous status review by Ford (2011). Two populations are considered to be at low risk, 14 at moderate risk, and 1 with a high risk of extinction based on spatial structure and diversity criteria. Within the Yakima River MPG, Satus and Toppenish Creeks, and the Naches River are at moderate risk of extinction, while the Upper Yakima population is characterized as high risk.

Biological Risk Summary. The NWFSC (2015) reported that there have been improvements in the viability ratings for some of the component populations, but the MCR Steelhead DPS is not currently meeting the viability criteria described in the Mid-Columbia Steelhead Recovery Plan. Natural origin returns to the majority of populations in two of the four MPGs in this DPS increased modestly relative to the levels reported in the previous 5-year review. Abundance estimates for 2 of 3 populations with sufficient data in the remaining two MPGs (Eastside Cascades and Umatilla/Walla Walla) were marginally lower. Updated information indicates that stray levels into the John Day River populations have decreased in recent years. Out-of-basin hatchery stray proportions, although reduced, remain high in spawning reaches within the Deschutes River Basin populations. In general, the majority of population level viability ratings remained unchanged from prior reviews for each MPG within the DPS (NWFSC 2015). For the Yakima River MPG, NWFSC (2015) gave overall viability ratings of Viable for the Satus and Toppenish Creek populations, Moderate for the Naches River population, and High Risk for the Upper Yakima River population.

Climate Change. Climate change has negative implications for salmon, steelhead, and their designated critical habitat in the Pacific Northwest (Independent Scientific Advisory Board (ISAB) 2007, Scheuerell and Williams 2005, Zabel et al. 2006). Average annual Northwest air temperatures have increased by approximately 1°C since 1900, or about 50 percent more than the global average over the same period (ISAB 2007). The latest climate models project a warming of 0.1°C to 0.6°C per decade over the next century.

Several studies have demonstrated that climate change has the potential to affect ecosystems in nearly all tributaries throughout the Interior Columbia Basin (Battin et al. 2007, ISAB 2007). While the intensity of effects will vary by region (ISAB 2007), climate change is generally expected to alter aquatic habitat (water yield, peak flows, and stream temperature). As climate change alters the structure and distribution of rainfall, snowpack, and glaciations, each factor will in turn alter riverine hydrographs. Given the increasing certainty that climate change is occurring and is accelerating (Battin et al. 2007), NMFS anticipates salmonid habitats will be affected. Climate and hydrology models project significant reductions in both total snow pack and low-elevation snow pack in the Pacific Northwest over the next 50 years (Mote and Salathé 2009), changes that will shrink the extent of the snowmelt-dominated habitat available to salmon. Such changes may restrict our ability to conserve diverse salmon life histories.

The earth's oceans are also warming, with considerable inter-annual and inter-decadal variability superimposed on the longer-term trend (Bindoff et al. 2007). Historically, warm periods in the coastal Pacific Ocean have coincided with relatively low abundances of salmon and steelhead, while cooler ocean periods have coincided with relatively high abundances (Scheuerell and Williams 2005, Zabel et al. 2006, U.S. Global Change Research Program (USGCRP) 2009). Ocean conditions adverse to salmon and steelhead may be more likely under a warming climate (Zabel et al. 2006). Moreover, as atmospheric carbon emissions increase, increasing levels of carbon are absorbed by the oceans, changing the pH of the water. Marine fish species have exhibited negative responses to ocean acidification conditions that include changes in growth, survivorship, and behavior. Marine phytoplankton species have shown diverse responses to elevated pCO_2 under laboratory conditions including changes in growth rate and calcification (reviewed in Feely et al. 2012).

The ISAB identified a number of effects climate change would have on Columbia Basin salmon. A few of these include: 1) water temperature increases, and depletion of cold water habitat that could reduce the amount of suitable salmon habitat by about 22 percent by 2090 in Washington State, 2) variations in precipitation that may alter the seasonal hydrograph and modify shallow mainstem rearing habitat, and 3) earlier snowmelt and higher spring flows with warmer temperatures that may cause spring Chinook salmon and steelhead yearlings to smolt and emigrate to the ocean earlier in the spring (ISAB 2007, O'Neal 2002).

Climate change is expected to make recovery targets for these salmon populations more difficult to achieve. However, habitat restoration action can address the adverse impacts of climate change on salmon. Examples include restoring connections to historical floodplains, and freshwater and estuarine habitats to provide fish refugia and areas to store excess floodwaters; protecting and restoring riparian vegetation to ameliorate stream temperature increases; and

purchasing or applying easements to lands that provide important cold water or refuge habitat (Battin et al. 2007, ISAB 2007).

2.2.2 Status of Critical Habitat

Critical habitat includes the stream channels to the lateral extent defined by the Ordinary High Water Mark (33 CFR 319.11). In 2005, in designating critical habitat, NMFS designated only those habitats that were occupied and contained certain habitat attributes called "primary constituent elements" (PCEs, now referred to as PBFs) that are essential to support one or more life stages. The 2005 designation also analyzed areas that will provide the greatest biological benefits for listed salmon and balanced the economic and other costs for areas considered for designation. The PBFs are identified in the documents designating critical habitat (NMFS 2005b).

NMFS designated critical habitat for MCR steelhead in the Upper Yakima, Naches, Lower Yakima, Middle Columbia/Lake Wallula, Walla Walla, Umatilla, Middle Columbia/Hood, Klickitat, Upper John Day, North Fork John Day, Middle Fork John Day, Lower John Day, Lower Deschutes, Trout, and Upper Columbia/Priest Rapids subbasins; and the Columbia River migration corridor. There are 114 watersheds within the range of this DPS. Nine watersheds received a low conservation value rating, 24 received a medium rating, and 81 received a high rating (NMFS 2005b). Conservation ranking is related to a number of factors, and does not necessarily reflect the quality or condition of PBFs within the various watersheds.

Many factors, both human-caused and natural, have contributed to the decline of the functional condition of the essential features of PBFs of designated critical habitat. Steelhead habitat has been altered through activities such as urban development, logging, grazing, power generation, and agriculture. These habitat alterations have resulted in the loss of important spawning and rearing habitat, and the loss or degradation of migration corridors. The following are the major factors that impair the essential features of the PBFs within designated critical habitat for MCR steelhead:

1. Mainstem Columbia River hydropower system mortality (freshwater migration corridors without obstructions).

2. Reduced tributary stream flow (freshwater spawning sites with water quantity conditions supporting spawning, incubation and larval development; freshwater rearing sites with water quantity to form and maintain physical habitat conditions that support juvenile growth and development).

3. Impaired passage in tributaries (freshwater rearing sites with water quantity to form and maintain physical habitat conditions that support juvenile growth and development; freshwater migration corridors with water quantity conditions supporting juvenile and adult mobility and survival).

4. Excessive sediment in tributaries (spawning sites with substrate to support egg incubation and larval growth and development; juvenile migration corridors and rearing sites with forage to support juvenile growth and development).

5. Degraded tributary water quality (spawning sites with water quality to support egg incubation and larval growth and development; juvenile rearing sites and migration corridors with water quality supporting juvenile growth and development).

6. Altered tributary channel morphology (freshwater spawning sites with water quantity and quality conditions and substrate supporting spawning, incubation and larval development; freshwater rearing sites with floodplain connectivity to form and maintain physical habitat conditions that support juvenile growth and development).

Climate change is expected to alter critical habitat as described in Section 2.2 by generally increasing temperature and peak flows and decreasing base flows. Although changes will not be spatially homogenous, effects of climate change will generally decrease the capacity of critical habitat to support successful spawning, rearing, and migration.

The three freshwater PBFs that are present in the action area are listed below in Table 2, and the condition of these PBFs in the action area is discussed in greater detail in the Environmental Baseline section, which follows.

Table 2. Critical habitat physical and biological features relevant to this consultation.

PBF Site	PBF Characteristics	Species Life Stage
Freshwater spawning	Water quality, water quantity, substrate	Spawning, incubation, and larval development
Freshwater rearing	Water quantity, floodplain connectivity	Juvenile growth and mobility
	Water quality, forage	Juvenile development
	Natural cover	Juvenile mobility and survival
Freshwater migration	Free of artificial obstructions, water quality and quantity, natural cover	Juvenile and adult mobility and survival

2.3 Action Area

"Action area" means all areas to be affected directly or indirectly by the federal action and not merely the immediate area involved in the action (50 CFR 402.02).

The action area will extend from the upstream-most rock groin the Corps will remove upstream of Sportsman Island, to 300 feet downstream of the point where Blue Slough empties back into the Yakima River mainstem. This encompasses the area where fish could potentially be exposed to increased suspended sediment concentrations. The action area is used by MCR steelhead, including the Naches and Upper Yakima River populations, and is designated critical habitat (September 2, 2005, 70 FR 52630). This area serves as a migration corridor, rearing habitat, and

potentially as spawning habitat. The action area is also designated as EFH for Chinook salmon and coho salmon (Pacific Fishery Management Council (PFMC) 2014).

2.4 Environmental Baseline

The "environmental baseline" includes the past and present impacts of all federal, state, or private actions and other human activities in the action area, the anticipated impacts of all proposed federal projects in the action area that have already undergone formal or early section 7 consultation, and the impact of state or private actions that are contemporaneous with the consultation in process (50 CFR 402.02).

The Yakima River in the action area is designated MCR steelhead critical habitat, serving as a migration corridor for adults to reach key upstream spawning habitat, and potentially serving as spawning habitat. The mainstem also provides a migration corridor and year-round rearing habitat for juveniles.

Threats and limiting factors for the Naches and Upper Yakima steelhead populations are described in the 2009 Yakima Steelhead Recovery Plan (Conley et al. 2009). Two major threats affecting conditions in the action area are floodplain development (including the levee system), and Yakima River flow regulation. Floodplain development has displaced what was once a large network of diverse channel and floodplain habitats, which provided excellent habitat for steelhead. The majority of the floodplain is now occupied by agricultural, suburban, and urban development. In addition, most of the floodplain is isolated from the river by levees and transportation infrastructure.

Effects of floodplain development and the levee system in the action area include: (1) an extensive restriction of the channel migration zone, reducing or eliminating large wood and sediment recruitment and other processes that help create aquatic habitat; (2) blocked access to the floodplain, impairing or preventing many ecological processes (e.g., fish access to off-channel habitats, nutrient exchange, hyporheic zone function), and ensuring on-going flood damage to the levee system; (3) an extensive reduction in riparian zone vegetation and function, including the food, shade, and overhead cover it provides for fish; and (4) decreased water quality due to pollutants delivered from developed areas.

Channelization in the Yakima River has also resulted in incision of the main channel (J. Freudenthal, Senior Natural Resources Specialist, Yakima County, pers. comm), reducing connectivity with side channels that typically provide productive habitat. In addition, this channelization has caused bed sediments to become coarser (J. Freudenthal, Senior Natural Resources Specialist, Yakima County, pers. comm), which appears to have reduced the potential for steelhead spawning.

At a more localized scale, levee face edge habitat is severely limited in rearing potential due to the riprap and to limited riparian vegetation. Riprapped banks without wood or roughness support lower forage densities and less habitat complexity for salmonids. In addition, riprap and other large rock that has been eroded away from the levees impairs benthic habitat, for example by covering potential spawning gravels.

In an unregulated condition, flows in the Yakima Basin would be dominated by snowmelt-driven discharge peaks in May or June that then decline to ground-water-driven base flows in August and September. Late autumn rainfall and minor snowmelt would augment summer base flow, with Chinook winds causing occasional winter high water events. Steelhead are adapted to these natural seasonal flow patterns, which maintained a variety of habitats and facilitated migratory behavior (Conley et al. 2009).

Managed flow now provides discharge out of phase with the natural hydrograph, reducing the ability of the action area to support critical habitat functions and productivity of MCR steelhead. Generally, instream flow problems stem from chronically low discharge levels in spring during reservoir refill periods to inordinately high flows when downstream irrigation demands are being met. Thus, the hydrograph exhibits diminished winter and spring flows, and unnaturally high flows from late July through August. These flows are out of phase with the ecology of MCR steelhead. For example, sustained high flows associated with irrigation water deliveries are hypothesized to reduce growth and survival of young-of-the-year steelhead and promote residency for older juveniles (Conley et al. 2009).

NMFS has produced two other Opinions for actions that occurred within the action area of the proposed project. In the Yakima Authorized Levee System Repairs consultation, we determined in-water work would kill or injure 84 juvenile steelhead (NMFS Consultation Number: 2012/01745). These 84 fish were spread across multiple cohorts because construction extended from winter 2009 to summer 2012. Most of these fish would presumably be from the Naches population.

In the Jefferies and Jensen Levee Rehabilitation consultation, we determined in-water work would kill or injure 2 juvenile steelhead (NMFS Consultation Number: 2011/01991). We also concluded that the action would perpetuate an existing disconnection of 2,028 acres of property landward of the levees by restricting channel migration. However, the project also provided for reconnection of 115 acres of formerly isolated floodplain habitat, which would restore significant ecological functions, including salmonid rearing, flood refuge, and possibly spawning. We determined that this was likely to cause an incremental increase in the conservation value of critical habitat PCEs in the action area.

2.5 Effects of the Action

Under the ESA, "effects of the action" means the direct and indirect effects of an action on the species or critical habitat, together with the effects of other activities that are interrelated or interdependent with that action, that will be added to the environmental baseline (50 CFR 402.02). Indirect effects are those that are caused by the proposed action and are later in time, but still are reasonably certain to occur.

2.5.1 Effects on ESA-Listed Species

Steelhead presence in the action area. During the October 1 through February 28 in-water work window, steelhead juveniles of at least two age classes will be present in the action area and within the project footprint. Low numbers of adults may also be present in the action area.

Mechanical Injury. We expect that some juvenile steelhead present during construction at the rock groin removal and spur construction sites will seek refuge in porous substrates such as cobble and riprap. Therefore, they are at risk of being crushed by equipment or buried by riprap placed to build the spurs. NMFS expects that, due to very low densities of adult MCR steelhead in the Yakima River during construction, none will be exposed to construction effects.

We referred to steelhead densities reported in Mullan et al. (1992) to estimate the number of juvenile fish that will be directly injured or killed by burial or crushing. Mullan et al. (1992) reported that juvenile steelhead densities in poor quality habitat in Columbia River tributaries averaged 2.4 per 120 square yards (1.3 age-0, plus 1.1 parr per 120 square yards). NMFS considers the levee site where the spurs will be built to be poor quality because it is composed of riprap with little habitat complexity and minimal riparian function. The rock groins provide relatively better habitat due to some limited hydraulic complexity. We applied a density of 12.3 juvenile steelhead per 120 square yards to this "average" habitat (Mullan et al. 1992).

We estimate that 25 percent of steelhead occupying the rock groin (1,320 sq ft) and spur (21,700 sq ft) footprints will be injured or killed; some fish will flee the immediate area, and others will be protected within the matrix of existing riprap. Given these in-water construction footprints and the estimated densities noted above, we estimate that construction will injure or kill 16 juvenile steelhead. Using steelhead life-stage survival rates in Quinn (2005), this would be a 0.28 adult equivalent. We consider this a maximum effect because some of the *O. mykiss* affected by the action are likely resident forms. Thus, while we estimate the death or injury total to be 16 juvenile steelhead, this is likely an overestimate and the effect to the population will likely be less.

Suspended Sediments. The Corps' in-water activities are likely to increase suspended sediment concentrations. However, by placing the rock individually, the amount of substrate that will be disturbed will be minimal, the disturbance will not be continuous, and the suspended sediment will be quickly diluted by the current. In addition, the Corps will monitor turbidity and will halt in-water activities if turbidity measured 300 feet downstream of the in-water activity exceeds background levels by 5 NTUs. These efforts will keep suspended sediment concentrations low and will limit the duration of potential exposure. Based on criteria outlined in Newcombe and Jensen (1996), adverse effects will be unlikely.

Benthic Habitat Disturbance and Riparian Vegetation Removal. The Corps will disturb about 1,320 sq ft of substrate to remove the rock groins (based on the estimated footprint of the rock groins just upstream that we recently consulted on; NMFS tracking number: WCR-2016-5868) and about 21,700 sq ft to build the spurs. These activities will kill or displace benthic invertebrates, reducing available forage for juvenile steelhead. Aquatic invertebrates could start recolonizing within days to months after construction (Miller and Golladay 1996, Paltridge et al.

1997, Fowler 2004, Korsu 2004). Some aquatic insect life cycles can extend up to 3 years (Pennak 1953, Hilsenhoff 1981), but most aquatic insects in the north temperate zone have an annual life cycle (Merritt and Cummins 1996). Thus, we estimate that recolonization of the disturbed areas will mostly occur within a year.

The Corps will also remove vegetation from the floodplain. Most removal will occur away from flowing water (e.g., on Sportsman Island and landward of the DID#1 levee), but some loss of allochthonous input, such as leaf litter and terrestrial insect fallout will still occur, affecting juvenile steelhead forage availability. As the new off-channel habitat (e.g., on Sportsman Island) becomes available to fish within one or two years of project initiation, forage availability will increase above current baseline conditions.

Together, the benthic habitat disturbance and loss of allochthonous input will decrease potential forage production and availability to juvenile steelhead. Food, related to degraded or reduced riparian vegetation, is one of the limiting factors for the lower mainstem and upper Yakima River (Conley et al. 2009). James' et al. (1999) data suggested that rainbow trout, spring-run Chinook salmon, mountain whitefish, and redside shiner were all competing for food, and Pearsons et al. (2001) concluded that food was limiting growth of rainbow trout and spring-run Chinook salmon.

Based on this information, it is likely that a forage decrease due to the proposed action will increase competition for food among steelhead juveniles, requiring expenditure of extra energy, and thus slower growth. Slower-growing individuals will be more susceptible to predation and have decreased chances for overwinter survival. This effect will last about a year until benthic invertebrates recolonize the action area and new off-channel habitat becomes available, which will provide additional benthic production and more aquatic area to receive allochthonous input.

2.5.2 Effects to Critical Habitat

The PBF characteristics affected by the proposed action are water quality, floodplain connectivity, substrate, forage, and natural cover.

Water Quality. In-water construction activities will increase suspended sediments. This will only affect water quality during and immediately following construction, causing no long-term effects to critical habitat.

Floodplain Connectivity. Levees restrict normal river processes such as channel migration and floodplain access, preventing side channel formation, erosion of natural banks, and large wood recruitment; all processes that support other PBFs. The confined channel increases the river's erosive power during high water events. This has led to coarsening of bed sediments and to incision of the Yakima River channel (J. Freudenthal, Senior Natural Resources Specialist, Yakima County, pers. comm.), vertically isolating the river from the floodplain areas that are not protected by levees. The proposed action, including levee removal, will help restore floodplain connectivity and function.

Substrate. Levees can prevent spawning gravel recruitment that would otherwise occur via bank erosion and entrainment in an unconfined channel. Bank erosion also provides a sediment source that creates riparian habitat, creates and maintains diverse structure and habitat functions, and modulates changes in channel morphology and pattern (Florsheim et al. 2008). The proposed action will increase opportunity for gravel recruitment and substrate sorting.

Forage. The Corps will remove riparian vegetation and disturb or cover about 23,000 sq ft of substrate, which will temporarily reduce forage availability. However, the proposed action will result in new, off-channel habitat, and better floodplain function in general, which will provide more diverse aquatic habitat and an increased riparian zone. This will result in more forage availability in the long term.

Natural Cover. Restoring floodplain function will increase habitat complexity, providing more natural cover. For example, there will be increased riparian area and vigor, providing overhead cover and large wood recruitment. There will also be increased off-channel habitat, providing shallow water cover for juvenile steelhead, and refuge during high flows.

In summary, there will be short-term effects to some of the PBF characteristics due to construction activities. Beginning the next season after construction, all of these PBFs will improve well beyond current baseline conditions due to restored floodplain function. The proposed action will address habitat recovery strategies identified in the Yakima Steelhead Recovery Plan, including restoring floodplain connectivity and function, restoring channel structure and complexity, and restoring riparian condition and future large wood recruitment (Conley et al. 2009).

2.6 Cumulative Effects

"Cumulative effects" are those effects of future state or private activities, not involving federal activities, that are reasonably certain to occur within the action area of the federal action subject to consultation (50 CFR 402.02). Future federal actions that are unrelated to the proposed action are not considered in this section because they require separate consultation pursuant to section 7 of the ESA.

In the Yakima Steelhead Recovery Plan, Conley et al. (2009) report that rapid population growth and development is occurring in both Yakima and Kittitas Counties. In many areas, forest and agricultural lands are being converted to residential, commercial, and industrial uses. This development is often located adjacent to streambanks, which can result in the reduction or elimination of riparian zones and increased flood hazards. The probability of conflict between new land uses and floodplain and stream channel functions (which sustain fish habitat and conveyance of water and sediment) is high (Conley et al. 2009). These changes in land use will probably affect other habitat features such as water quality and quantity, which are important to the survival and recovery of the listed species. The overall effect will likely be negative unless carefully planned for, and mitigated, or avoided.

Yakima County, the City of Yakima, the Bureau of Reclamation, the Corps and other partners have invested considerable effort in the past 10 years into planning and implementing work to

acquire floodplain properties, demolish structures, and set back existing levees in the Gap to Gap reach. River channel restoration is expected to continue through the Gap to Gap Floodplain Restoration and Enhancement Plan [Plan]). Projects included in the Plan address the fish habitat restoration goals set forth in the Yakima Steelhead Recovery Plan. These activities will continue to reduce the impacts of the Yakima Authorized levee system, and some of them will not involve federal actions. In general, these activities will continue to improve the conservation value of critical habitat in the action area.

We did not identify any other future non-federal activities that would significantly change the present pattern of land uses and stressors to steelhead. In total, due to the continuing efforts of local communities to restore floodplain function in the Gap to Gap reach, we expect beneficial cumulative effects will outweigh the negative effects of continued development in the action area.

2.7 Integration and Synthesis

The Integration and Synthesis section is the final step in our assessment of the risk posed to species and critical habitat as a result of implementing the proposed action. In this section, we add the effects of the action (Section 2.5) to the environmental baseline (Section 2.4) and the cumulative effects (Section 2.6), taking into account the status of the species and critical habitat (Section 2.2), to formulate the agency's Opinion as to whether the proposed action is likely to: (1) appreciably reduce the likelihood of both the survival and recovery of a listed species in the wild by reducing its numbers, reproduction, or distribution; or (2) appreciably diminish the value of designated or proposed critical habitat for the conservation of the species.

The MCR steelhead DPS is unviable because a majority of populations are at moderate risk of extinction. The DPS cannot achieve viability without significant improvements in abundance, productivity, and diversity for many populations. The Upper Yakima and Naches populations of MCR steelhead are present in the action area. The Upper Yakima is among those populations most at risk in the DPS. Despite increased abundance in recent years, the Upper Yakima and Naches populations are short of recovery goals for both abundance and productivity.
Urban development, logging, grazing, power generation, and agriculture have all resulted in the loss of important spawning and rearing habitat, and the loss or degradation of migration corridors.

Within the action area, the primary impacts limiting recovery of MCR steelhead and their critical habitat are flow regulation and human development in the floodplain, including miles of federal levees. Cumulative effects are likely to improve habitat functions to some degree as local governments pursue floodplain restoration and focus additional floodplain development in areas that will have limited impact.

The proposed action will affect juveniles through construction activities. We estimate 16 juveniles will be injured or killed during construction activities. The number injured or killed would be the equivalent of 0.3 adult steelhead. We believe we have been liberal in expanding the effects to juveniles, and thus up to the adult population level (i.e., our adult equivalent estimate assumes that all juvenile *O. mykiss* affected are steelhead and that they will all die from those

effects). There will also be a short-term decrease in forage, which will lead to slower growth and thus decreased survival of some juvenile steelhead. This effect will last about a year until benthic invertebrates recolonize the action area, and restored floodplain connectivity begins to provide additional benthic productivity and allochthonous input. We could not confidently estimate the number of individuals that will be affected, but they will be spread over two to three cohorts from both the Naches and Upper Yakima populations, so effects in terms of adult equivalents will be very minimal.

In the context of each population's 5-year geomean abundance (1,775 spawners for the Naches population and 390 for the Upper Yakima population), we do not expect the death of these juveniles to meaningfully affect adult returns. Even in consideration of the impaired status of the two populations, the environmental baseline, and expected cumulative effects in the action area, the number of steelhead that will be injured or killed will be too small to affect abundance and productivity at the population level, much less at the MCR DPS level. The small number of adult equivalents lost will also not affect spatial structure or diversity of the populations.

The proposed action will also result in a long-term improvement to the floodplain connectivity, substrate, forage, and natural cover PBF characteristics, which will show increased function above the current, degraded habitat baseline. There will be an increase in conservation value of the critical habitat in the action area by virtue of the increase in available area and of the increased quality (broader range of thermal regimes, cover types, substrate types, etc.). We expect that because of these improvements, more adults will spawn here, more juveniles will rear here, and those that do will survive at better than average rates. We cannot yet predict the extent of these improvements, but it is very reasonable to expect that they will be significant.

2.8 Conclusion

After reviewing and analyzing the current status of the listed species and critical habitat, the environmental baseline within the action area, the effects of the proposed action, any effects of interrelated and interdependent activities, and cumulative effects, it is NMFS' Opinion that the proposed action is not likely to jeopardize the continued existence of MCR steelhead or destroy or adversely modify its designated critical habitat.

2.9 Incidental Take Statement

Section 9 of the ESA and federal regulations pursuant to section 4(d) of the ESA prohibit the take of endangered and threatened species, respectively, without a special exemption. "Take" is defined as to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture or collect, or to attempt to engage in any such conduct. "Harm" is further defined by regulation to include significant habitat modification or degradation that actually kills or injures fish or wildlife by significantly impairing essential behavioral patterns, including breeding, spawning, rearing, migrating, feeding, or sheltering (50 CFR 222.102). "Incidental take" is defined by regulation as takings that result from, but are not the purpose of, carrying out an otherwise lawful activity conducted by the federal agency or applicant (50 CFR 402.02). Section 7(b)(4) and section 7(o)(2) provide that taking that is incidental to an otherwise lawful agency action is not considered to be

prohibited taking under the ESA if that action is performed in compliance with the terms and conditions of this ITS.

2.9.1 Amount or Extent of Take

In the Opinion, NMFS determined that incidental take of MCR steelhead is reasonably certain to occur due to exposure to mechanical injury and to a reduced forage base. Only the juvenile (young-of-year and yearling) life stages will be adversely affected. As discussed in and based on the methodology described in Section 2.5.1, we expect construction activities will injure or kill 16 juvenile steelhead.

Because of additional uncertainty in estimating the number of individuals that will be affected by reduced forage, we will use a habitat surrogate to account for this take. The extent of habitat change to which juvenile steelhead will be exposed is readily discernible and presents a reliable measure of the extent of take that can be monitored and tracked. Therefore, when the specific number of individuals "harmed" cannot be predicted, NMFS quantifies the extent of take based on the extent of habitat modified (June 3, 1986, 51 FR 19926 at 19954).

The estimated extent of habitat affected by construction activities represents the extent of take exempted in this ITS. The amount of take will increase as the area disturbed by construction activities increases. Therefore, the extent of take is best identified by the total area the Corps is proposing to excavate and fill (23,000 sq ft), and the total area of floodplain vegetation removal (26 acres); the effects of which have been analyzed in this Opinion. The Corps shall reinitiate consultation if their in-water construction footprint (i.e., the area where excavation or fill occurs) exceeds 23,000 sq ft or if the total area of floodplain vegetation removal exceeds 26 acres.

2.9.2 Effect of the Take

In the Opinion, NMFS determined that the amount or extent of anticipated take, coupled with other effects of the proposed action, is not likely to result in jeopardy to the species or destruction or adverse modification of critical habitat.

2.9.3 Reasonable and Prudent Measures

"Reasonable and prudent measures" are nondiscretionary measures that are necessary or appropriate to minimize the impact of the amount or extent of incidental take (50 CFR 402.02).

Full application of conservation measures included as part of the proposed action, together with use of the RPMs and terms and conditions described below, are necessary and appropriate to minimize the likelihood of incidental take of MCR steelhead due to completion of the proposed action.

The Corps shall minimize incidental take by:

1. Minimizing the extent of construction activities.
2. Minimizing effects on forage.

3. Monitoring the project to ensure that the conservation measures are meeting the objective of minimizing take and that the amount or extent of take is not exceeded.

2.9.4 Terms and Conditions

The terms and conditions described below are non-discretionary, and the Corps or any applicant must comply with them in order to implement the RPMs (50 CFR 402.14). The Corps or any applicant has a continuing duty to monitor the impacts of incidental take and must report the progress of the action and its impact on the species as specified in this ITS (50 CFR 402.14). If the entity to whom a term and condition is directed does not comply with the following terms and conditions, protective coverage for the proposed action would likely lapse.

1. The following terms and conditions implement RPM 1:
    a. Do not exceed an in-water footprint of 23,020 sq ft where working with construction equipment.

2. The following terms and conditions implement RPM 2:
    a. Do not exceed an in-water footprint of 23,020 sq ft where aquatic invertebrates could be displaced, injured, or killed.
    b. Do not exceed a vegetation disturbance footprint of 26 acres.

3. The following terms and conditions implement RPM 3:
    a. Within 90 days following the completion of the proposed construction project, the Corps shall report all monitoring items to include, at a minimum, the following:
        i. Project identification
            1. Project name: Yakima River Gap to Gap Ecosystem Restoration; NMFS Tracking Numbers: WCR-2017-6789
            2. Corps contact person
        ii. Construction details
            1. Starting and ending dates for construction work
            2. Total area (sq ft) of in-water construction footprint
            3. Total area (sq ft) of floodplain vegetation disturbance
            4. Results of turbidity monitoring
            5. As-built plans
            6. A description of any elements of the project that were constructed differently than depicted in the BA, associated addendums and communications, or this Opinion
    b. If take is exceeded, contact NMFS promptly to determine a course of action.
    c. All reports will be sent to National Marine Fisheries Service, Washington State Habitat Office, Attention Jody Walters, 304 South Water Street, Suite 201, Ellensburg, Washington 98926. NOTICE: To follow inactive projects and, if necessary, withdraw the Opinion for an incomplete project, the Corps shall provide an annual report even if no actual work was completed in a particular year.

2.10 Reinitiation of Consultation

This concludes formal consultation for the Yakima River Gap to Gap Ecosystem Restoration Project.

As 50 CFR 402.16 states, reinitiation of formal consultation is required where discretionary federal agency involvement or control over the action has been retained or is authorized by law and if: (1) the amount or extent of incidental taking specified in the ITS is exceeded, (2) new information reveals effects of the agency action that may affect listed species or critical habitat in a manner or to an extent not considered in this Opinion, (3) the agency action is subsequently modified in a manner that causes an effect on the listed species or critical habitat that was not considered in this Opinion, or (4) a new species is listed or critical habitat designated that may be affected by the action.

3. MAGNUSON-STEVENS FISHERY CONSERVATION AND MANAGEMENT ACT ESSENTIAL FISH HABITAT RESPONSE

Section 305(b) of the MSA directs federal agencies to consult with NMFS on all actions or proposed actions that may adversely affect EFH. The MSA (section 3) defines EFH as "those waters and substrate necessary to fish for spawning, breeding, feeding, or growth to maturity." Adverse effect means any impact that reduces quality or quantity of EFH, and may include direct or indirect physical, chemical, or biological alteration of the waters or substrate and loss of (or injury to) benthic organisms, prey species and their habitat, and other ecosystem components, if such modifications reduce the quality or quantity of EFH. Adverse effects on EFH may result from actions occurring within EFH or outside of it and may include site-specific or EFH-wide impacts, including individual, cumulative, or synergistic consequences of actions (50 CFR 600.810). Section 305(b) also requires NMFS to recommend measures that can be taken by the action agency to conserve EFH.

This analysis is based, in part, on the EFH assessment provided by the Corps and descriptions of EFH for Pacific Coast salmon contained in the fishery management plans developed by the PFMC and approved by the Secretary of Commerce (PFMC 2014).

3.1 Essential Fish Habitat Affected by the Project

The proposed project action area includes EFH for Chinook salmon (*O. tshawytscha*) and coho salmon (*O. kisutch*) (PFMC 2014). Habitat areas of particular concern within the action area include complex channel and floodplain habitat, and spawning habitat (PFMC 2014).

3.2 Adverse Effects on Essential Fish Habitat

Based on information provided in the BA, associated communications, and the analysis of effects presented in the ESA portion of this document, NMFS concludes that the proposed action will adversely affect EFH designated for Chinook salmon and coho salmon. Construction activity will cause a reduction in forage production lasting about one year.

Specifically, NMFS has determined that the action will adversely affect EFH as follows:

1. Removal of riparian vegetation will decrease cover and allochthonous input (those most vegetation removal will not occur adjacent to the wetted channel).
2. In-water excavation will disturb, displace, and kill aquatic invertebrates (forage).

3.3 Essential Fish Habitat Conservation Recommendations

We provide the following conservation recommendations:

1. Do not exceed an in-water footprint of 23,020 sq ft where aquatic invertebrates could be displaced, injured, or killed.
2. Do not exceed a vegetation disturbance footprint of 26 acres.

Fully implementing these EFH conservation recommendations would protect, by avoiding or minimizing the adverse effects described in Section 3.2, above, about 26.5 acres of designated EFH for Pacific Coast salmon.

3.4 Statutory Response Requirement

As required by section 305(b)(4)(B) of the MSA, the federal agency must provide a detailed response in writing to NMFS within 30 days after receiving an EFH Conservation Recommendation. Such a response must be provided at least 10 days prior to final approval of the action if the response is inconsistent with any of NMFS' EFH Conservation Recommendations unless NMFS and the federal agency have agreed to use alternative time frames for the federal agency response. The response must include a description of measures proposed by the agency for avoiding, minimizing, mitigating, or otherwise offsetting the impact of the activity on EFH. In the case of a response that is inconsistent with the Conservation Recommendations, the federal agency must explain its reasons for not following the recommendations, including the scientific justification for any disagreements with NMFS over the anticipated effects of the action and the measures needed to avoid, minimize, mitigate, or offset such effects (50 CFR 600.920(k)(1)).

In response to increased oversight of overall EFH program effectiveness by the Office of Management and Budget (OMB), NMFS established a quarterly reporting requirement to determine how many conservation recommendations are provided as part of each EFH consultation and how many are adopted by the action agency. Therefore, we ask that in your statutory reply to the EFH portion of this consultation, you clearly identify the number of conservation recommendations accepted.

3.5 Supplemental Consultation

The Corps must reinitiate EFH consultation with NMFS if the proposed action is substantially revised in a way that may adversely affect EFH, or if new information becomes available that affects the basis for NMFS' EFH Conservation Recommendations (50 CFR 600.920(l)).

4. DATA QUALITY ACT DOCUMENTATION AND PRE-DISSEMINATION REVIEW

The DQA specifies three components contributing to the quality of a document. They are utility, integrity, and objectivity. This section of the Opinion addresses these DQA components, documents compliance with the DQA, and certifies that this Opinion has undergone pre-dissemination review.

4.1 Utility

Utility principally refers to ensuring that the information contained in this consultation is helpful, serviceable, and beneficial to the intended users. The intended user of this Opinion is the Corps. Other interested users could include the Bureau of Reclamation, Washington DFW, Yakama Nation, and Yakima County. Individual copies of this Opinion were provided to the Corps. This Opinion will be posted on the Public Consultation Tracking System website (https://pcts.nmfs.noaa.gov/pcts-web/homepage.pcts). The format and naming adheres to conventional standards for style.

4.2 Integrity

This consultation was completed on a computer system managed by NMFS in accordance with relevant information technology security policies and standards set out in Appendix III, 'Security of Automated Information Resources,' OMB Circular A-130; the Computer Security Act; and the Government Information Security Reform Act.

4.3 Objectivity

Information Product Category: Natural Resource Plan

Standards: This consultation and supporting documents are clear, concise, complete, and unbiased; and were developed using commonly accepted scientific research methods. They adhere to published standards including the NMFS ESA Consultation Handbook, ESA regulations, 50 CFR 402.01 et seq., and the MSA implementing regulations regarding EFH, 50 CFR 600.

Best Available Information: This consultation and supporting documents use the best available information, as referenced in the References section. The analyses in this Opinion and EFH consultation contain more background on information sources and quality.

Referencing: All supporting materials, information, data and analyses are properly referenced, consistent with standard scientific referencing style.

Review Process: This consultation was drafted by NMFS staff with training in ESA and MSA implementation, and reviewed in accordance with West Coast Region ESA quality control and assurance processes.

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National Marine Fisheries Service

Guidelines for Electrofishing Waters Containing Salmonids Listed Under the Endangered Species Act

June 2000

Purpose and Scope

The purpose of this document is to provide guidelines for the safe use of backpack electrofishing in waters containing salmonids listed by the National Marine Fisheries Service (NMFS) under the Endangered Species Act (ESA). It is expected that these guidelines will help improve electrofishing technique in ways which will reduce fish injury and increase electrofishing efficiency. These guidelines and sampling protocol were developed from NMFS research experience and input from specialists in the electrofishing industry and fishery researchers. This document outlines electrofishing procedures and guidelines that NMFS has determined to be necessary and advisable when working in freshwater systems where threatened or endangered salmon and steelhead may be found. As such, the guidelines provide a basis for reviewing proposed electrofishing activities submitted to NMFS in the context of ESA Section 10 permit applications as well as scientific research activities proposed for coverage under an ESA Section 4(d) rule.

These guidelines specifically address the use of backpack electrofishers for sampling juvenile or adult salmon and steelhead that are *not* in spawning condition. Electrofishing in the vicinity of adult salmonids in spawning condition and electrofishing near redds are not discussed as there is no justifiable basis for permitting these activities except in very limited situations (e.g., collecting brood stock, fish rescue, etc.). The guidelines also address sampling and fish handling protocols typically employed in electrofishing studies. While the guidelines contain many specifics, they are not intended to serve as an electrofishing manual and do not eliminate the need for good judgement in the field.

Finally, it is important to note that researchers wishing to use electrofishing in waters containing listed salmon and steelhead are not necessarily precluded from using techniques or equipment not addressed in these guidelines (e.g., boat electrofishers). However, prior to authorizing the take of listed salmonids under the ESA, NMFS will require substantial proof that such techniques/equipment are clearly necessary for a particular study and that adequate safeguards will be in place to protect threatened or endangered salmonids. Additional information regarding these guidelines or other research issues dealing with salmon and steelhead listed under the ESA can be obtained from NMFS' Protected Resources Divisions in:

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Appropriateness of Electrofishing

Backpack electrofishing for salmonids has been a principal sampling technique for decades, however, recent ESA listings underscore the need to regulate the technique and assess its risks and benefits to listed species (Nielsen 1998). With over 25 Evolutionarily Significant Units (ESUs) of threatened or endangered salmonids now identified along the U.S. West Coast, researchers can expect to encounter one or more listed species in nearly every river basin in California, Oregon, Washington, and Idaho. There are few if any non-invasive ways to collect distribution, abundance, or morpho-physiological data on salmonids in freshwater. This is reflected in the requirement that all activities that involve intentional take of juvenile salmonids for research or enhancement of an ESA listed species require an ESA Section 10 permit from NMFS. While NMFS has not precluded the use of electrofishing in all cases, researchers must present rigorous study designs and methods for handling fish prior to NMFS authorizing electrofishing to take listed salmonids under the ESA.

NMFS believes there is ample evidence that electrofishing can cause serious harm to fish and the general agency position is to encourage researchers to seek out other less invasive ways to sample listed species. Direct observation by snorkeling is one of the least invasive ways to collect information concerning abundance and distribution, although there can be both practical (e.g., poor viability) and statistical (e.g., large numbers of fish, low observation probability) constraints to direct observation. Preliminary efforts should be directed at study designs that use less invasive methods. If such methods cannot provide the quality of data required or when the benefit exceeds potential mortality risk, then electrofishing can be considered. Electrofishing used on a limited basis to calibrate direct observations (e.g., Hankin and Reeves 1988) is commonly used and methods are currently under development that increase the use of direct observation counts (e.g., bounded counts, "multiple snorkel passes") which, in many cases, will further reduce the need for electrofishing.

Electrofishing Guidelines

Training

Field supervisors and crew members must have appropriate training and experience with electrofishing techniques. Training for field supervisors can be acquired from programs such as those offered from the U. S. Fish and Wildlife Service - National Conservation Training Center (*Principles and Techniques of Electrofishing* course) where participants are presented information concerning such topics as electric circuit and field theory, safety training, and fish injury awareness and minimization. A crew leader having at least 100 hours of electrofishing experience in the field using similar equipment must train the crew. The crew leader's experience must be documented and available for confirmation; such documentation may be in the form of a logbook. The training must occur before an inexperienced crew begins any electrofishing and should be conducted in waters that do not contain ESA-listed fish. Field crew training must include the following elements:

1. A review of these guidelines and the equipment manufacturer's recommendations, including basic gear maintenance.
2. Definitions of basic terminology (e.g. galvanotaxis, narcosis, and tetany) and an explanation of how electrofishing attracts fish.
3. A demonstration of the proper use of electrofishing equipment (including an explanation of how gear can injure fish and how to recognize signs of injury) and of the role each crew member

performs.

4. A demonstration of proper fish handling, anesthetization, and resuscitation techniques.
5. A field session where new individuals actually perform each role on the electrofishing crew.

Research Coordination

Research activities should be coordinated with fishery personnel from other agencies/parties to avoid duplication of effort, oversampling small populations, and unnecessary stress on fish. Researchers should actively seek out ways to share data on threatened and endangered species so that fish samples yield as much information as possible to the research community. NMFS believes that the state fishery agencies should play a major role in coordinating salmonid research and encourages researchers to discuss their study plans with these agencies prior to approaching NMFS for an ESA permit.

Initial Site Surveys and Equipment Settings

1. In order to avoid contact with spawning adults or active redds, researchers must conduct a careful visual survey of the area to be sampled before beginning electrofishing.
2. Prior to the start of sampling at a new location, water temperature and conductivity measurements should be taken to evaluate electroshocker settings and adjustments. **No electrofishing should occur when water temperatures are above 18°C or are expected to rise above this temperature prior to concluding the electrofishing survey. In addition, studies by NMFS scientists indicate that no electrofishing should occur in California coastal basins when conductivity is above 350 µS/cm.**
3. Whenever possible, a block net should be placed below the area being sampled to capture stunned fish that may drift downstream.
4. Equipment must be in good working condition and operators should go through the manufacturer's preseason checks, adhere to all provisions, and record major maintenance work in a logbook.
5. Each electrofishing session must start with all settings (voltage, pulse width, and pulse rate) set to the **minimums** needed to capture fish. These settings should be gradually increased only to the point where fish are immobilized and captured, and generally not allowed to exceed conductivity-based maxima (Table 1). Only direct current (DC) or pulsed direct current (PDC) should be used.

Table 1. Guidelines for initial and maximum settings for backpack electrofishing.

	Initial settings	Maximum settings		Notes
Voltage	100 V	Conductivity (µS/cm)	Max. Voltage	In California coastal basins, settings should never exceed 400 volts. Also, no electrofishing should occur in these basins if conductivity is greater than 350 µS/cm.
		< 100	1100 V	
		100 - 300	800 V	
		> 300	400 V	
Pulse width	500 µs	5 ms		
Pulse rate	30 Hz	70 Hz		*In general*, exceeding 40 Hz will injure more fish

Electrofishing Technique

1. Sampling should begin using straight DC. Remember that the power needs to remain on until the fish is netted when using straight DC. If fish capture is unsuccessful with initial low voltage, gradually increase voltage settings with straight DC.
2. If fish capture is not successful with the use of straight DC, then set the electrofisher to lower voltages with PDC. If fish capture is unsuccessful with low voltages, increase pulse width, voltage, and pulse frequency (duration, amplitude, and frequency).
4. Electrofishing should be performed in a manner that minimizes harm to the fish. Stream segments should be sampled systematically, moving the anode continuously in a herringbone pattern (where feasible) through the water. Care should be taken when fishing in areas with high fish concentrations, structure (e.g., wood, undercut banks) and in shallow waters where most backpack electrofishing for juvenile salmonids occurs. Voltage gradients may be high when electrodes are in shallow water where boundary layers (water surface and substrate) tend to intensify the electrical field.
5. Do not electrofish in one location for an extended period (e.g., undercut banks) and regularly check block nets for immobilized fish.
6. Fish should not make contact with the anode. Remember that the zone of potential injury for fish is 0.5 m from the anode.
7. Electrofishing crews should be generally observant of the condition of the fish and change or terminate sampling when experiencing problems with fish recovery time, banding, injury, mortality, or other indications of fish stress.
8. Netters should not allow the fish to remain in the electrical field any longer than necessary by removing stunned fish from the water immediately after netting.

Sample Processing and Recordkeeping

1. Fish should be processed as soon as possible after capture to minimize stress. This may require a larger crew size.
2. All sampling procedures must have a protocol for protecting held fish. Samplers must be aware of the conditions in the containers holding fish; air pumps, water transfers, etc., should be used as necessary to maintain safe conditions. Also, large fish should be kept separate from smaller prey-sized fish to avoid predation during containment.
3. Use of an approved anesthetic can reduce fish stress and is recommended, particularly if additional handling of fish is required (e.g., length and weight measurements, scale samples, fin clips, tagging).
4. Fish should be handled properly (e.g., wetting measuring boards, not overcrowding fish in buckets, etc.).
5. Fish should be observed for general condition and injuries (e.g., increased recovery time, dark bands, apparent spinal injuries). Each fish should be completely revived before releasing at the location of capture. A plan for achieving efficient return to appropriate habitat should be developed before each sampling session. Also, every attempt should be made to process and release ESA-listed specimens first.
8. Pertinent water quality (e.g., conductivity and temperature) and sampling notes (e.g., shocker settings, fish condition/injuries/mortalities) should be recorded in a logbook to improve technique and help train new operators. *It is important to note that records of injuries or mortalities pertain to the entire electrofishing survey, including the fish sample work-up.*

Citations and Other References

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SECTION 01 74 19

CONSTRUCTION WASTE MANAGEMENT AND DISPOSAL

02/19

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SECTION 01 74 19

CONSTRUCTION WASTE MANAGEMENT AND DISPOSAL
02/19

PART 1 GENERAL

1.1 DEFINITIONS

1.1.1 Co-mingle

The practice of placing unrelated materials together in a single container, usually for benefits of convenience and speed.

1.1.2 Construction Waste

Waste generated by construction activities, such as scrap materials, damaged or spoiled materials, temporary and expendable construction materials, and other waste generated by the workforce during construction activities.

1.1.3 Demolition Debris/Waste

Waste generated from demolition activities, including minor incidental demolition waste materials generated as a result of Intentional dismantling of all or portions of a building, to include clearing of building contents that have been destroyed or damaged.

1.1.4 Disposal

Depositing waste in a solid waste disposal facility, usually a managed landfill, regulated in the US under the Resource Conservation and Recovery Act (RCRA).

1.1.5 Diversion

The practice of diverting waste from disposal in a landfill, by means of eliminating or minimizing waste, or reuse of materials.

1.1.6 Final Construction Waste Diversion Report

A written assertion by a material recovery facility operator identifying constituent materials diverted from disposal, usually including summary tabulations of materials, weight in short-ton.

1.1.7 Recycling

The series of activities, including collection, separation, and processing, by which products or other materials are diverted from the solid waste stream for use in the form of raw materials in the manufacture of new products sold or distributed in commerce, or the reuse of such materials as substitutes for goods made of virgin materials, other than fuel.

1.1.8 Reuse

The use of a product or materials again for the same purpose, in its original form or with little enhancement or change.

1.1.9 Salvage

Usable, salable items derived from buildings undergoing demolition or deconstruction, parts from vehicles, machinery, other equipment, or other components.

1.1.10 Source Separation

The practice of administering and implementing a management strategy to identify and segregate unrelated waste at the first opportunity.

1.2 CONSTRUCTION WASTE (INCLUDES DEMOLITION DEBRIS/WASTE)

Divert a minimum of 60 percent by weight of the project construction waste and demolition debris/waste from the landfill. Follow applicable industry standards in the management of waste. Apply sound environmental principles in the management of waste. (1) Practice efficient waste management when sizing, cutting, and installing products and materials and (2) use all reasonable means to divert construction waste and demolition debris/waste from landfills and incinerators and to facilitate the recycling or reuse of excess construction materials.

1.3 CONSTRUCTION WASTE MANAGEMENT

Implement a construction waste management program for the project. Take a pro-active, responsible role in the management of construction construction waste, recycling process, disposal of demolition debris/waste, and require all subcontractors, vendors, and suppliers to participate in the construction waste management program. Establish a process for clear tracking, and documentation of construction waste and demolition debris/waste.

1.3.1 Implementation of Construction Waste Management Program

Develop and document how the construction waste management program will be implemented in a construction waste management plan. Submit a Construction Waste Management Plan to the Contracting Officer for approval. Construction waste and demolition debris/waste materials include un-used construction materials not incorporated in the final work, as well as demolition debris/waste materials from demolition activities or deconstruction activities. In the management of waste, consider the availability of viable markets, the condition of materials, the ability to provide material in suitable condition and in a quantity acceptable to available markets, and time constraints imposed by internal project completion mandates.

1.3.2 Oversight

The Quality Control Manager, as specified in Section 01 45 00.00 10 QUALITY CONTROL, is responsible for overseeing and documenting results from executing the construction waste management plan for the project.

1.3.3 Special Programs

Implement any special programs involving rebates or similar incentives related to recycling of construction waste and demolition debris/waste materials. Retain revenue or savings from salvaged or recycling, unless otherwise directed. Ensure firms and facilities used for recycling, reuse, and disposal are permitted for the intended use to the extent required by federal, state, and local regulations.

1.3.4 Special Instructions

Provide on-site instruction of appropriate separation, handling, recycling, salvage, reuse, and return methods to be used by all parties at the appropriate stages of the projects. Designation of single source separating or commingling will be clearly marked on the containers.

1.3.5 Waste Streams

Delineate waste streams and characterization, including estimated material types and quantities of waste, in the construction waste management plan. Manage all waste streams associated with the project. Typical waste streams are listed below. Include additional waste steams not listed:

a. Land Clearing Debris
b. Asphalt
c. Masonry and CMU
d. Concrete
e. Metals (e.g. banding, stud trim, ductwork, piping, rebar, roofing, other trim, steel, iron, galvanized, stainless steel, aluminum, copper, zinc, bronze, etc.)
f. Wood (nails and staples allowed)
g. Glass
h. Paper
i. Plastics (PET, HDPE,PVC,LDPE,PP,PS, Other)
j. Gypsum
k. Non-hazardous paint and paint cans
l. Carpet
m. Ceiling Tiles
n. Insulation
o. Beverage Containers

1.4 SUBMITTALS

Government approval is required for submittals with a "G" designation; submittals not having a "G" designation are for information only. When used, a designation following the "G" designation identifies the office that will review the submittal for the Government. Submit the following in accordance with Section 01 33 00 SUBMITTAL PROCEDURES:

SD-01 Preconstruction Submittals

Construction Waste Management Plan; G

SD-06 Test Reports

Quarterly Reports

Annual Report

SD-11 Closeout Submittals

Final Construction Waste Diversion Report

1.5 MEETINGS

Conduct Construction Waste Management meetings. After award of the Contract and prior to commencement of work, schedule and conduct a meeting with the Contracting Officer to discuss the proposed construction waste management plan and to develop a mutual understanding relative to the management of the construction waste management program and how waste diversion requirements will be met.

The requirements of this meeting may be fulfilled during the coordination and mutual Understanding meeting outlined in Section 01 45 00.00 10 QUALITY CONTROL. At a minimum, discuss and document waste management goals at following meetings:

a. Preconstruction meeting.

b. Regular Quality Control meetings.

c. Work safety meeting (if applicable).

1.6 CONSTRUCTION WASTE MANAGEMENT PLAN

Submit Construction Waste Management Plan within 15 days after notice to proceed. Revise and resubmit Construction Waste Management Plan until it receives final approval from the Contracting Officer, in order for construction to begin. Manage demolition debris/waste or deconstruction materials in accordance with the approved construction waste management plan.

An approved construction waste management plan will not relieve the Contractor of responsibility for compliance with applicable environmental regulations or meeting project cumulative waste diversion requirement. Ensure all subcontractors receive a copy of the approved Construction Waste Management Plan. The plan demonstrates how to meet the project waste diversion requirement. Also, include the following in the plan:

a. Identify the names of individuals responsible for waste management and waste management tracking, along with roles and responsibilities on the project..

b. Actions that will be taken to reduce solid waste generation, including coordination with subcontractors to ensure awareness and participation.

c. Description of the regular meetings to be held to address waste management.

d. Description of the specific approaches to be used in recycling/reuse of the various materials generated, including the areas on site and equipment to be used for processing, sorting, and temporary storage of materials.

e. Name of landfill and/or incinerator to be used.

f. Identification of local and regional re-use programs, including non-profit organizations such as schools, local housing agencies, and

organization that accept used materials such as material exchange networks and resale stores. Include the name, location, phone number for each re-use facility identified, and provide a copy of the permit or license for each facility.

g. List of specific materials, by type and quantity, that will be salvaged for resale, salvaged and reused on the current project, salvaged and stored for reuse on a future project, or recycled. Identify the recycling facilities by name, address, and phone number.

h. Identification of materials that cannot be recycled or reused with an explanation or justification, to be approved by the Contracting Officer.

i. Description of the means by which any materials identified in item (g) above will be protected from contamination.

j. Description of the means of transportation of the recyclable materials (whether materials will be site-separated and self-hauled to designated centers, or whether mixed materials will be collected by a waste hauler and removed from the site).

k. Copy of training plan for subcontractors and other services to prevent contamination by co-mingling materials identified for diversion and waste materials.

Distribute copies of the waste management plan to each subcontractor, Quality Control Manager, and the Contracting Officer.

1.7 RECORDS (DOCUMENTATION)

1.7.1 General

Maintain records to document the types and quantities of waste generated and diverted though re-use, recycling and/or sale to third parties; through disposal to a landfill or incinerator facility. Provide explanations for any materials not recycled, reused or sold. Collect and retain manifests, weight tickets, sales receipts, and invoices specifically identifying diverted project waste materials or disposed materials.

1.7.2 Accumulated

Maintain a running record of materials generated and diverted from landfill disposal, including accumulated diversion rates for the project. Make records available to the Contracting Officer during construction or incidental demolition activities. Provide a copy of the diversion records to the Contracting Officer upon completion of the construction, incidental demolitions or minor deconstruction activities.

1.8 REPORTS

1.8.1 General

Maintain current construction waste diversion information on site for periodic inspection by the Contracting Officer. Include in the quarterly reports, annual reports and final reports: the project name, contract information, information for waste generated, diverted and disposed of for the current reporting period and show cumulative totals for the project.

Reports must identify quantifies of waste by type and disposal method. Also include in each report, supporting documentation to include manifests, weigh tickets, receipts, and invoices specifically identifying the project and waste material type and weighted sum.

1.8.2 Quarterly Reporting

Provide cumulative reports at the end of each quarter (December, March, June, and September, corresponding with the federal fiscal year for reporting purposes). Submit quarterly reports not later than 15 calendar days after the preceding quarter has ended.

1.8.3 Annual Reporting

Provide a cumulative construction waste diversion report annually. Submit annual report not later than 30 calendar days after the preceding fourth quarter has ended.

1.9 FINAL CONSTRUCTION WASTE DIVERSION REPORT

A Final Construction Waste Diversion Report is required at the end of the project. Provide Final Construction Waste Diversion Report 60 days prior to the Beneficial Occupancy Date (BOD).

1.10 COLLECTION

Collect, store, protect, and handle reusable and recyclable materials at the site in a manner which prevents contamination, and provides protection from the elements to preserve their usefulness and monetary value. Provide receptacles and storage areas designated specifically for recyclable and reusable materials and label them clearly and appropriately to prevent contamination from other waste materials. Keep receptacles or storage areas neat and clean.

Train subcontractors and other service providers to either separate waste streams or use the co-mingling method as described in the construction waste management plan. Handle hazardous waste and hazardous materials in accordance with applicable regulations and coordinate with Section 01 57 19 TEMPORARY ENVIRONMENTAL CONTROLS. Separate materials by one of the following methods described herein:

1.10.1 Source Separation Method

Separate waste products and materials that are recyclable from trash and sort as described below into appropriately marked separate containers and then transport to the respective recycling facility for further processing. Deliver materials in accordance with recycling or reuse facility requirements (e.g., free of dirt, adhesives, solvents, petroleum contamination, and other substances deleterious to the recycling process). Separate materials into the category types as defined in the construction waste management plan.

1.10.2 Co-Mingled Method

Place waste products and recyclable materials into a single container and then transport to an authorized recycling facility, which meets all applicable requirements to accept and dispose of recyclable materials in accordance with all applicable local, state and federal regulations. The

Co-mingled materials must be sorted and processed in accordance with the approved construction waste management plan.

1.10.3 Other Methods

Other methods proposed by the Contractor may be used when approved by the Contracting Officer.

1.11 DISPOSAL

Control accumulation of waste materials and trash. Recycle or dispose of collected materials off-site at intervals approved by the Contracting Officer and in compliance with waste management procedures as described in the waste management plan. Except as otherwise specified in other sections of the specifications, dispose of in accordance with the following:

1.11.1 Reuse

Give first consideration to reusing construction and demolition materials as a disposition strategy. Recover for reuse materials, products, and components as described in the approved construction waste management plan. Coordinate with the Contracting Officer to identify onsite reuse opportunities or material sales or donation available through Government resale or donation programs. Sale of recovered materials is allowed on the Installation.

1.11.2 Recycle

Recycle non-hazardous construction and demolition/debris materials that are not suitable for reuse. Track rejection of contaminated recyclable materials by the recycling facility. Rejected recyclables materials will not be counted as a percentage of diversion calculation. Recycle all fluorescent lamps, HID lamps, mercury (Hg) -containing thermostats and ampoules, and PCBs-containing ballasts and electrical components as directed by the Contracting Officer. Do not crush lamps on site as this creates a hazardous waste stream with additional handling requirements.

1.11.3 Waste

Dispose by landfill or incineration only those waste materials with no practical use, economic benefit, or recycling opportunity.

PART 2 PRODUCTS

Not used.

PART 3 EXECUTION

Not used. -- End of Section --

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DIVISION 01 - GENERAL REQUIREMENTS

SECTION 01 78 00

CLOSEOUT SUBMITTALS

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SECTION 01 78 00

CLOSEOUT SUBMITTALS
08/11

PART 1 GENERAL

1.1 REFERENCES

The publications listed below form a part of this specification to the extent referenced. The publications are referred to within the text by the basic designation only.

U.S. ARMY CORPS OF ENGINEERS (USACE)

ERDC/ITL TR-12-1	(2015) A/E/C Graphics Standard, Release 2.0
ERDC/ITL TR-12-6	(2015) A/E/C CAD Standard - Release 6.0

1.2 DEFINITIONS

1.2.1 As-Built Drawings

As-built drawings are developed and maintained by the Contractor and depict actual conditions, including deviations from the Contract Documents. These deviations and additions may result from coordination required by, but not limited to: contract modifications; official responses to Contractor submitted Requests for Information; direction from the Contracting Officer; designs which are the responsibility of the Contractor, and differing site conditions. Maintain the as-builts throughout construction as red-lined PDF files. These files serve as the basis for the creation of the record drawings.

1.2.2 Record Drawings

The record drawings are the final compilation of actual conditions reflected in the as-built drawings.

1.3 SOURCE DRAWING FILES

Request the full set of electronic drawings, in the source format, for Record Drawing preparation, after award and at least 30 days prior to required use.

1.3.1 Terms and Conditions

Data contained on these electronic files must not be used for any purpose other than as a convenience in the preparation of construction drawings and data for the referenced project. Any other use or reuse shall be at the sole risk of the Contractor and without liability or legal exposure to the Government. The Contractor must make no claim and waives to the fullest extent permitted by law, any claim or cause of action of any nature against the Government, its agents or sub consultants that may arise out of or in connection with the use of these electronic files. The Contractor must, to the fullest extent permitted by law, indemnify and hold the Government harmless against all damages, liabilities or costs,

including reasonable attorney's fees and defense costs, arising out of or resulting from the use of these electronic files.

These electronic CAD drawing files are not construction documents. Differences may exist between the CAD files and the corresponding construction documents. The Government makes no representation regarding the accuracy or completeness of the electronic CAD files, nor does it make representation to the compatibility of these files with the Contractor hardware or software. In the event that a conflict arises between the signed and sealed construction documents prepared by the Government and the furnished Source drawing files, the signed and sealed construction documents govern. The Contractor is responsible for determining if any conflict exists. Use of these Source Drawing files does not relieve the Contractor of duty to fully comply with the contract documents, including and without limitation, the need to check, confirm and coordinate the work of all contractors for the project. If the Contractor uses, duplicates or modifies these electronic source drawing files for use in producing construction drawings and data related to this contract, remove all previous indicia of ownership (seals, logos, signatures, initials and dates).

1.4 SUBMITTALS

Government approval is required for submittals with a "G" designation; submittals not having a "G" designation are for information only. When used, a designation following the "G" designation identifies the office that will review the submittal for the Government Submit the following in accordance with Section 01 33 00 SUBMITTAL PROCEDURES:

SD-03 Product Data

Warranty Management Plan
Warranty Tags
Spare Parts Data

SD-10 Operation and Maintenance Data
For any equipment furnished include Manufacturer isntructions and operating procedures.

SD-11 Closeout Submittals

As-Built Drawings; G
Record Drawings; G
As-Built Record of Equipment and Materials
Final Approved Shop Drawings
Construction Contract Specifications

1.5 SPARE PARTS DATA

Submit two copies of the Spare Parts Data list.

a. Indicate manufacturer's name, part number, nomenclature, and stock level required for maintenance and repair. List those items that may be standard to the normal maintenance of the system.

1.6 QUALITY CONTROL

Additions and corrections to the contract drawings must be equal in quality and detail to that of the originals. Line colors, line weights, lettering, layering conventions, and symbols must conform to ERDC/ITL TR-12-6.

1.7 WARRANTY MANAGEMENT

1.7.1 Warranty Management Plan

Develop a warranty management plan which contains information relevant to the clause Warranty of Construction. At least 30 days before the planned pre-warranty conference, submit four sets of the warranty management plan. Include within the warranty management plan all required actions and documents to assure that the Government receives all warranties to which it is entitled. The plan must be in narrative form and contain sufficient detail to render it suitable for use by future maintenance and repair personnel, whether tradesmen, or of engineering background, not necessarily familiar with this contract. The term "status" as indicated below must include due date and whether item has been submitted or was accomplished. Warranty information made available during the construction phase must be submitted to the Contracting Officer for approval prior to each monthly pay estimate. Assemble approved information in a binder and turn over to the Government upon acceptance of the work. The construction warranty period will begin on the date of project acceptance and continue for the full product warranty period. A joint 4 month and 9 month warranty inspection will be conducted, measured from time of acceptance, by the Contractor, Contracting Officer and the Customer Representative. Include within the warranty management plan , but not limited to, the following:

a. Roles and responsibilities of all personnel associated with the warranty process, including points of contact and telephone numbers within the organizations of the Contractors, subcontractors, manufacturers or suppliers involved.

b. Furnish with each warranty the name, address, and telephone number of each of the guarantor's representatives nearest to the project location.

c. Listing and status of delivery of all Certificates of Warranty for extended warranty items.

d. A list for each warranted equipment, item, feature of construction or system indicating:

(1) Name of item.
(2) Model.
(3) Location where installed.
(4) Name and phone numbers of manufacturers or suppliers.
(5) Names, addresses and telephone numbers of sources of spare parts.
(6) Warranties and terms of warranty. Include one-year overall warranty of construction, including the starting date of warranty of construction. Items which have extended warranties must be indicated with separate warranty expiration dates.
(7) Cross-reference to warranty certificates as applicable.
(8) Starting point and duration of warranty period.
(9) Summary of maintenance procedures required to continue the

warranty in force.
(10) Cross-reference to specific pertinent Operation and Maintenance manuals.
(11) Organization, names and phone numbers of persons to call for warranty service.
(12) Typical response time and repair time expected for various warranted equipment.

e. The plans for attendance at the 4 and 9 month post-construction warranty inspections conducted by the Government.

1.7.2 Performance Bond

The Performance Bond must remain effective throughout the construction period.

a. In the event the Contractor fails to commence and diligently pursue any construction warranty work required, the Contracting Officer will have the work performed by others, and after completion of the work, will charge the remaining construction warranty funds of expenses incurred by the Government while performing the work, including, but not limited to administrative expenses.

b. In the event sufficient funds are not available to cover the construction warranty work performed by the Government at the Contractor's expense, the Contracting Officer will have the right to recoup expenses from the bonding company.

c. Following oral or written notification of required construction warranty repair work, respond in a timely manner. Written verification will follow oral instructions. Failure to respond will be cause for the Contracting Officer to proceed against the Contractor.

1.7.3 Pre-Warranty Conference

Prior to contract completion, and at a time designated by the Contracting Officer, meet with the Contracting Officer to develop a mutual understanding with respect to the requirements of this section. Communication procedures for Contractor notification of construction warranty defects, priorities with respect to the type of defect, reasonable time required for Contractor response, and other details deemed necessary by the Contracting Officer for the execution of the construction warranty will be established/reviewed at this meeting. In connection with these requirements and at the time of the Contractor's quality control completion inspection, furnish the name, telephone number and address of a licensed and bonded company which is authorized to initiate and pursue construction warranty work action on behalf of the Contractor. This point of contact will be located within the local service area of the warranted construction, be continuously available, and be responsive to Government inquiry on warranty work action and status. This requirement does not relieve the Contractor of any of its responsibilities in connection with other portions of this provision.

1.7.4 Contractor's Response to Construction Warranty Service Requirements

Following oral or written notification by the Contracting Officer, respond to construction warranty service requirements in accordance with the "Construction Warranty Service Priority List" and the three categories of

priorities listed below. Submit a report on any warranty item that has been repaired during the warranty period. Include within the report the cause of the problem, date reported, corrective action taken, and when the repair was completed. If the Contractor does not perform the construction warranty within the timeframe specified, the Government will perform the work and back charge the construction warranty payment item established.

a. First Priority Code 1. Perform onsite inspection to evaluate situation, and determine course of action within 4 hours, initiate work within 6 hours and work continuously to completion or relief.

b. Second Priority Code 2. Perform onsite inspection to evaluate situation, and determine course of action within 8 hours, initiate work within 24 hours and work continuously to completion or relief.

c. Third Priority Code 3. All other work to be initiated within 3 work days and work continuously to completion or relief.

d. The "Construction Warranty Service Priority List" is as follows:

Code 3-All work associated with this contract.

1.7.5 Warranty Tags

Submit 2 warranty tags showing the layout and design. The date of acceptance and the QC signature must remain blank until the project is accepted for beneficial occupancy. Show the following information on the tag.

Type of product/material	
Model number	
Serial number	
Contract number	
Warranty period from/to	
Inspector's signature	
Construction Contractor	
Address	
Telephone number	
Warranty contact	
Address	

Telephone number	
Warranty response time priority code	
WARNING - PROJECT PERSONNEL TO PERFORM ONLY OPERATIONAL MAINTENANCE DURING THE WARRANTY PERIOD.	

PART 2 PRODUCTS

2.1 GOVERNMENT FURNISHED MATERIALS

The Government will provide an optical disc (CD or DVD) at the preconstruction conference that contains the following:

a. One set of "as-designed" electronic CAD files in the specified software and format revised to reflect all amendments and the final contract PDF drawings. The CAD files are provided to enable preparation of as-built or as-constructed drawings. If discrepancies exist between the CAD files and the contract PDF drawings, correct the CAD files to show the contract PDF drawings.

2.2 SYSTEM DESCRIPTION

Prepare the CAD drawing files in format compatible with a Windows 7 operating system.

2.2.1 Additional Drawings

If additional drawings are required, prepare them using the specified electronic file format applying ERDC/ITL TR-12-6 and ERDC/ITL TR-12-1. The title block and drawing border to be used for any new final record drawings must be identical to that used on the contract drawings.

2.2.1.1 Sheet Numbers and File Names

If a sheet needs to be added between two sequential sheets, append a Supplemental Drawing Designator in accordance with ERDC/ITL TR-12-6 Adding a drawing sheet, and ERDC/ITL TR-12-1 Adding or deleting drawing sheets and index sheet procedures.

PART 3 EXECUTION

3.1 AS-BUILT DRAWINGS

Provide and maintain PDF versions of the contract drawings for As-Built Drawings.

3.1.1 Markup Guidelines

Make comments and markup the drawings complete without reference to letters, memos, or materials that are not part of the As-Built drawing. Show what was changed, how it was changed, where item(s) were relocated and change related details. These working as-built markups must be neat, legible and accurate as follows:

a. Use base colors of red, green, and blue. Color code for changes as follows:

(1) Special (Blue) - Items requiring special information, coordination, or special detailing or detailing notes.

(2) Deletions (Red) - Over-strike deleted graphic items (lines), lettering in notes and leaders.

(3) Additions (Green) - Added items, lettering in notes and leaders.

b. Provide a legend if colors other than the "base" colors of red, green, and blue are used.

c. Add and denote any additional equipment or material facilities, service lines, incorporated under As-Built Revisions if not already shown in legend.

d. Use frequent written explanations on markup drawings to describe changes. Do not totally rely on graphic means to convey the revision.

e. Use legible lettering and precise and clear digital values when marking prints. Clarify ambiguities concerning the nature and application of change involved.

f. Wherever a revision is made, also make changes to related section views, details, legend, profiles, plans and elevation views, schedules, notes and call out designations, and mark accordingly to avoid conflicting data on all other sheets.

g. For deletions, cross out all features, data and captions that relate to that revision.

h. For changes on small-scale drawings and in restricted areas, provide large-scale inserts, with leaders to the applicable location.

i. Indicate one of the following when attaching a print or sketch to a markup print:

1) Add an entire drawing to contract drawings.

2) Change the contract drawing to show (indicate what is being modified).

3) Provided for reference only to further detail the initial design.

j. Incorporate all shop and fabrication drawings into the markup drawings.

3.1.2 As-Built Drawings Content

Revise As-Built Drawings in accordance with ERDC/ITL TR-12-1 and ERDC/ITL TR-12-6. Provide 2 sets of paper copies from PDF drawings to show the as-built conditions by red-line process during the execution of the project. Keep these working as-built markup drawings current on a weekly basis and at least one set available on the jobsite at all times. Changes from the contract drawings which are made during construction or additional information which might be uncovered in the course of construction must be accurately and neatly recorded as they occur by means of details and notes. Submit the working as-built markup drawings for

approval prior to submission of each monthly pay estimate. For failure to maintain the working and final record drawings as specified herein, the Contracting Officer will withhold 10 percent of the monthly progress payment until approval of updated drawings. Show on the as-built drawings, but not limited to, the following information:

a. The actual location, kinds and sizes of all sub-surface utility lines. In order that the location of these lines and appurtenances may be determined in the event the surface openings or indicators become covered over or obscured, show by offset dimensions to two permanently fixed surface features the end of each run including each change in direction on the record drawings. Locate valves, splice boxes and similar appurtenances by dimensioning along the utility run from a reference point. Also record the average depth below the surface of each run.

b. The location and dimensions of any changes within the building structure.

c. Layout and schematic drawings of electrical circuits and piping.

d. Correct grade, elevations, cross section, or alignment of roads, earthwork, structures or utilities if any changes were made from contract plans.

e. Changes in details of design or additional information obtained from working drawings specified to be prepared and/or furnished by the Contractor; including but not limited to shop drawings, fabrication, erection, installation plans and placing details, pipe sizes, insulation material, dimensions of equipment foundations, etc.

f. The topography, invert elevations and grades of drainage installed or affected as part of the project construction.

g. Changes or Revisions which result from the final inspection.

h. Where contract drawings or specifications present options, show only the option selected for construction on the working as-built markup drawings.

i. If borrow material for this project is from sources on Government property, or if Government property is used as a spoil area, furnish a contour map of the final borrow pit/spoil area elevations.

j. Systems designed or enhanced by the Contractor, such as HVAC controls, fire alarm, fire sprinkler, and irrigation systems.

k. Changes in location of equipment and architectural features.

j. Modifications (include within change order price the cost to change working as-built markup drawings to reflect modifications).

l. Actual location of anchors, construction and control joints, etc., in concrete.

m. Unusual or uncharted obstructions that are encountered in the contract work area during construction.

n. Location, extent, thickness, and size of stone protection particularly

where it will be normally submerged by water.

3.2 RECORD DRAWING FILES

If additional drawings are required, prepare them using the specified electronic file format applying ERDC/ITL TR-12-6 and ERDC/ITL TR-12-1. The title block and drawing border to be used for any new final record drawings must be identical to that used on the contract drawings. Accomplish additions and corrections to the contract drawings using CAD files. Provide all program files and hardware necessary to prepare final PDF record drawings. The Contracting Officer will review final PDF record drawings for accuracy and return them to the Contractor for required corrections, changes, additions, and deletions.

3.2.1 Rename the CAD Drawing files

Rename the CAD Drawing files using the contract number as the Project Code field,(e.g., W912DW19R0010-A102.DWG) or as instructed in the Pre-Construction conference. Use only those renamed files for the marked-up changes. Make all changes on the layer/level as the original item.

a. For

c. When final revisions have been completed, show the wording "RECORD DRAWING AS-BUILTS" followed by the name of the Contractor in letters at least 3/16 inch high on the cover sheet drawing. Date RECORD DRAWING AS-BUILTS" drawing revisions in the revision block.

d. Within 20 days after Government approval of all of the working record drawings for a phase of work, prepare the final CAD record drawings for that phase of work and submit PDF drawing files and two sets of prints for review and approval. The Government will promptly return one set of prints annotated with any necessary corrections. Within 10 days revise the CAD files accordingly at no additional cost and submit one set of final prints for the completed phase of work to the Government. Within 20 days of substantial completion of all phases of work, submit the final record drawing package for the entire project. Submit one set of electronic CAD files, and one set of the approved working record PDF files on an optical disc with two sets of prints. The CAD files must be complete in all details and identical in form and function to the CAD drawing files supplied by the Government. Make any transactions or adjustments necessary to accomplish this. The Government reserves the right to reject any drawing files it deems incompatible with the customer's CAD system. Paper prints, drawing files and storage media submitted will become the property of the Government upon final approval. Failure to submit final record PDF drawing files, CAD files and marked prints as specified will be cause for withholding any payment due under this contract. Approval and acceptance of final record drawings must be accomplished before final payment is made.

3.3 RECORD DRAWINGS

Prepare final record drawings after the completion of each definable feature of work as listed in the Contractor Quality Control Plan (Foundations, Utilities, Structural Steel, etc., as appropriate for the project). Transfer the changes from the approved working as-built markup drawings to the original electronic CAD drawing files. Modify the

as-built CAD drawing files to correctly show the features of the project as-built by bringing the working CAD drawing set into agreement with approved working as-built markup drawings, and adding such additional drawings as may be necessary. Refer to ERDC/ITL TR-12-1 Chapter 11 Drawing Revisions. Jointly review the working as-built markup drawings with printouts from working as-built CAD drawing PDF files for accuracy and completeness. Monthly review of working as-built CAD drawing PDF file printouts must cover all sheets revised since the previous review. These PDF drawing files are part of the permanent records of this project. Any drawings damaged or lost must be satisfactorily replaced at no expense to the Government.

a. Drawing revisions (include within change order price the cost to change working and final record drawings to reflect revisions) and compliance with the following procedures.

(1) Follow directions in the revision for posting descriptive changes.

(2) The revision delta size must be 5/16 inch unless the area where the delta is to be placed is crowded. Use a smaller size delta for crowded areas.

(3) Place a revision delta at the location of each deletion.

(4) For new details or sections which are added to a drawing, place a revision delta by the detail or section title.

(5) For minor changes, place a revision delta by the area changed on the drawing (each location).

(6) For major changes to a drawing, place a revision delta by the title of the affected plan, section, or detail at each location.

(7) For changes to schedules or drawings, place a revision delta either by the schedule heading or by the change in the schedule.

3.3.1 Final Record Drawing Package

Submit the final record PDF and CAD drawings package for the entire project within 20 days of substantial completion of all phases of work. Submit one set of ANSI D size PDF and CAD files on optical disc, read-only memory (ROM), two sets of ANSI D size prints and one set of the approved working record drawings. The package must be complete in all details and identical in form and function to the contract drawing files supplied by the Government.

3.4 FINAL APPROVED SHOP DRAWINGS

Submit final approved project shop drawings 30 days after transfer of the completed facility.

3.5 CONSTRUCTION CONTRACT SPECIFICATIONS

Submit final PDF file record construction contract specifications, including revisions thereto, 30 days after transfer of the completed facility.

3.6 AS-BUILT RECORD OF EQUIPMENT AND MATERIALS

Furnish one copy of preliminary record of equipment and materials used on the project 15 days prior to final inspection. This preliminary submittal will be reviewed and returned 2 days after final inspection with Government comments. Submit Two sets of final record of equipment and materials 10 days after final inspection. Key the designations to the related area depicted on the contract drawings. List the following data:

RECORD OF DESIGNATED EQUIPMENT AND MATERIALS DATA				
Description	Specification Section	Manufacturer and Catalog, Model, and Serial Number	Composition and Size	Where Used

3.7 CLEANUP

Leave premises "broom clean." Clean interior and exterior glass surfaces exposed to view; remove temporary labels, stains and foreign substances; polish transparent and glossy surfaces; vacuum carpeted and soft surfaces. Clean equipment and fixtures to a sanitary condition. Replace filters of operating equipment. Clean debris from roofs, gutters, downspouts and drainage systems. Sweep paved areas and rake clean landscaped areas. Remove waste and surplus materials, rubbish and construction facilities from the site..

-- End of Section --

SECTION TABLE OF CONTENTS

DIVISION 01 - GENERAL REQUIREMENTS

SECTION 01 78 23

OPERATION AND MAINTENANCE DATA

08/15

-- End of Section Table of Contents --

SECTION 01 78 23

OPERATION AND MAINTENANCE DATA
08/15

PART 1 GENERAL

This section is specific to the Blue Slough automatic head gate (Option 1) and appurtenant features controlling flow into Blue Slough and the new Blue Slough levee and appurtenant access and drainage features (Option 2). The information developed by the Contractor to satisfy the requirements of this section will be compiled into an appendix to be included with the Yakima Left Bank Federal Levee O&M Manual. The Contractor will create a new Blue Slough levee O&M manual using the existing Federal Levee O&M manual as a template. With the exception of production of record drawings, no O&M data will be prepared for other project elements.

1.1 OPERATION AND MAINTENANCE DATA

For the Blue Slough automatic headgate, trash rack and culvert submit Operation and Maintenance (O&M) Data for the provided equipment, product, or system, defining the importance of system interactions, troubleshooting, and long-term preventive operation and maintenance. Organize and present information in sufficient detail to clearly explain O&M requirements at the system, equipment, component, and subassembly level. Include an index preceding each submittal. Submit in accordance with this section and Section 01 33 00 SUBMITTAL PROCEDURES.

1.1.1 Package Quality

Documents must be fully legible. Operation and Maintenance data must be consistent with the manufacturer's standard brochures, schematics, printed instructions, general operating procedures, and safety precautions.

1.1.2 Package Content

Provide data package content in accordance with paragraph SCHEDULE OF OPERATION AND MAINTENANCE DATA PACKAGES. Comply with the data package requirements specified in the individual technical sections, including the content of the packages and addressing each product, component, and system designated for data package submission.

1.1.3 Changes to Submittals

Provide manufacturer-originated changes or revisions to submitted data if a component of an item is so affected subsequent to acceptance of the O&M Data.Submit changes, additions, or revisions required by the Contracting Officer for final acceptance of submitted data within 30 calendar days of the notification of this change requirement.

1.2 OPERATION AND MAINTENANCE MANUAL FILE FORMAT

Assemble data packages into electronic Operation and Maintenance Manuals. Assemble each manual into a composite electronically indexed file using the most current version of Adobe Acrobat or similar software capable of producing PDF file format.

1.2.1 Organization

Bookmark Product and Drawing Information documents using the current version of CSI MasterFormat numbering system, and arrange submittals using the specification sections as a structure. Use CSI MasterFormat and UFGS numbers along with descriptive bookmarked titles that explain the content of the information that is being bookmarked.

1.3 TYPES OF INFORMATION REQUIRED IN O&M DATA PACKAGES

The following are a detailed description of the data package items listed in paragraph SCHEDULE OF OPERATION AND MAINTENANCE DATA PACKAGES.

1.3.1 Operating Instructions

Provide specific instructions, procedures, and illustrations for the following phases of operation for the installed model and features of each system:

1.3.1.1 Safety Precautions and Hazards

List personnel hazards and equipment or product safety precautions for operating conditions. List all residual hazards identified in the Activity Hazard Analysis provided under Section 01 35 26 GOVERNMENT SAFETY REQUIREMENTS. Provide recommended safeguards for each identified hazard.

1.3.1.2 Operator Prestart

Provide procedures required to install, set up, and prepare each system for use.

1.3.1.3 Startup, Shutdown, and Post-Shutdown Procedures

Provide narrative description for Startup, Shutdown and Post-shutdown operating procedures including the control sequence for each procedure.

1.3.1.4 Normal Operations

Provide Control Diagrams with data to explain operation and control of systems and specific equipment. Provide narrative description of Normal Operating Procedures.

1.3.1.5 Emergency Operations

Provide Emergency Procedures for equipment malfunctions to permit a short period of continued operation or to shut down the equipment to prevent further damage to systems and equipment. Provide Emergency Shutdown Instructions for fire, explosion, spills, or other foreseeable contingencies. Provide guidance and procedures for emergency operation of utility systems including required valve positions, valve locations and zones or portions of systems controlled.

1.3.1.6 Operator Service Requirements

Provide instructions for services to be performed by the operator such as lubrication, adjustment, inspection, and recording gauge readings.

1.3.1.7 Environmental Conditions

Provide a list of Environmental Conditions (temperature, humidity, and other relevant data) that are best suited for the operation of each product, component or system. Describe conditions under which the item equipment should not be allowed to run.

1.3.1.8 Operating Log

Provide forms, sample logs, and instructions for maintaining necessary operating records.

1.3.2 Preventive Maintenance

Provide the following information for preventive and scheduled maintenance to minimize repairs for the installed model and features of each system. Include potential environmental and indoor air quality impacts of recommended maintenance procedures and materials.

1.3.2.1 Lubrication Data

Include the following preventive maintenance lubrication data, in addition to instructions for lubrication required under paragraph OPERATOR SERVICE REQUIREMENTS:

a. A table showing recommended lubricants for specific temperature ranges and applications.

b. Charts with a schematic diagram of the equipment showing lubrication points, recommended types and grades of lubricants, and capacities.

c. A Lubrication Schedule showing service interval frequency.

1.3.2.2 Preventive Maintenance Plan, Schedule, and Procedures

Provide manufacturer's schedule for routine preventive maintenance, inspections, condition monitoring (predictive tests) and adjustments required to ensure proper and economical operation and to minimize repairs. Provide instructions stating when the systems should be retested. Provide manufacturer's projection of preventive maintenance work-hours on a daily, weekly, monthly, and annual basis including craft requirements by type of craft. For periodic calibrations, provide manufacturer's specified frequency and procedures for each separate operation.

a. Define the anticipated time required to perform each of each test (work-hours), test apparatus, number of personnel identified by responsibility, and a testing validation procedure permitting the record operation capability requirements within the schedule. Provide a remarks column for the testing validation procedure referencing operating limits of time, pressure, temperature, volume, voltage, current, acceleration, velocity, alignment, calibration, adjustments, cleaning, or special system notes. Delineate procedures for preventive maintenance, inspection, adjustment, lubrication and cleaning necessary to minimize repairs.

b. Repair requirements must inform operators how to check out, troubleshoot, repair, and replace components of the system. Include electrical and mechanical schematics and diagrams and diagnostic

techniques necessary to enable operation and troubleshooting of the system after acceptance.

1.3.3 Repair

Provide manufacturer's recommended procedures and instructions for correcting problems and making repairs.

1.3.3.1 Troubleshooting Guides and Diagnostic Techniques

Provide step-by-step procedures to promptly isolate the cause of typical malfunctions. Describe clearly why the checkout is performed and what conditions are to be sought. Identify tests or inspections and test equipment required to determine whether parts and equipment may be reused or require replacement.

1.3.3.2 Wiring Diagrams and Control Diagrams

Provide point-to-point drawings of wiring and control circuits including factory-field interfaces. Provide a complete and accurate depiction of the actual job specific wiring and control work. On diagrams, number electrical and electronic wiring and pneumatic control tubing and the terminals for each type, identically to actual installation configuration and numbering.

1.3.3.3 Repair Procedures

Provide instructions and a list of tools required to repair or restore the product or equipment to proper condition or operating standards.

1.3.3.4 Removal and Replacement Instructions

Provide step-by-step procedures and a list of required tools and supplies for removal, replacement, disassembly, and assembly of components, assemblies, subassemblies, accessories, and attachments. Provide tolerances, dimensions, settings and adjustments required. Use a combination of text and illustrations.

1.3.3.5 Spare Parts and Supply Lists

Provide lists of spare parts and supplies required for repair to ensure continued service or operation without unreasonable delays. Special consideration is required for facilities at remote locations. List spare parts and supplies that have a long lead-time to obtain.

1.3.3.6 Repair Work-Hours

Provide manufacturer's projection of repair work-hours including requirements by type of craft. Identify, and tabulate separately, repair that requires the equipment manufacturer to complete or to participate.

1.3.4 Appendices

Provide information required below and information not specified in the preceding paragraphs but pertinent to the maintenance or operation of the product or equipment. Include the following:

1.3.4.1 Product Submittal Data

Provide a copy of SD-03 Product Data submittals documented with the required approval.

1.3.4.2 Certificates

Provide a copy of SD-07 Certificates submittals documented with the required approval.

1.3.4.3 Manufacturer's Instructions

Provide a copy of SD-08 Manufacturer's Instructions submittals documented with the required approval.

1.3.4.4 O&M Submittal Data

Provide a copy of SD-10 Operation and Maintenance Data submittals documented with the required approval.

1.3.4.5 Parts Identification

Provide identification and coverage for the parts of each component, assembly, subassembly, and accessory of the end items subject to replacement. Include special hardware requirements, such as requirement to use high-strength bolts and nuts. Identify parts by make, model, serial number, and source of supply to allow reordering without further identification. Provide clear and legible illustrations, drawings, and exploded views to enable easy identification of the items. When illustrations omit the part numbers and description, both the illustrations and separate listing must show the index, reference, or key number that will cross-reference the illustrated part to the listed part. Group the parts shown in the listings by components, assemblies, and subassemblies in accordance with the manufacturer's standard practice. Parts data may cover more than one model or series of equipment, components, assemblies, subassemblies, attachments, or accessories, such as typically shown in a master parts catalog.

1.3.4.6 Warranty Information

List and explain the various warranties and clearly identify the servicing and technical precautions prescribed by the manufacturers or contract documents in order to keep warranties in force. Include warranty information for primary components of the system. Provide copies of warranties required by Section 01 78 00 CLOSEOUT SUBMITTALS.

1.3.4.7 Extended Warranty Information

List all warranties for products, equipment, components, and sub-components whose duration exceeds one year. For each warranty listed, indicate the applicable specification section, duration, start date, end date, and the point of contact for warranty fulfillment. Also, list or reference the specific operation and maintenance procedures that must be performed to keep the warranty valid. Provide copies of warranties required by Section 01 78 00 CLOSEOUT SUBMITTALS.

1.3.4.8 Personnel Training Requirements

Provide information available from the manufacturers that is needed for

use in training designated personnel to properly operate and maintain the equipment and systems.

1.3.4.9 Testing Equipment and Special Tool Information

Include information on test equipment required to perform specified tests and on special tools needed for the operation, maintenance, and repair of components. Provide final set points.

1.3.4.10 Testing and Performance Data

Include completed prefunctional checklists, functional performance test forms, and monitoring reports. Include recommended schedule for retesting and blank test forms. Provide final set points.1.3.4.11 Field Test Reports and Manufacturer's Field Reports

Provide a copy of Field Test Reports (SD-06) and Manufacturer's Field Reports (SD-09) submittals documented with the required approval.

1.3.4.12 Contractor Information

Provide a list that includes the name, address, and telephone number of the General Contractor and each Subcontractor who installed the product or equipment, or system. For each item, also provide the name address and telephone number of the manufacturer's representative and service organization that can provide replacements most convenient to the project site. Provide the name, address, and telephone number of the product, equipment, and system manufacturers.

1.4 SCHEDULE OF OPERATION AND MAINTENANCE DATA PACKAGES

Provide the O&M data packages specified in individual technical sections. The information required in each type of data package follows:

1.4.1 Data Package 1

a. Safety precautions and hazards

b. Cleaning recommendations

c. Maintenance and repair procedures

d. Warranty information

e. Extended warranty information

f. Contractor information

g. Spare parts and supply list

1.4.2 Data Package 2

a. Safety precautions and hazards

b. Normal operations

c. Environmental conditions

d. Lubrication data

e. Preventive maintenance plan, schedule, and procedures

f. Cleaning recommendations

g. Maintenance and repair procedures

h. Removal and replacement instructions

i. Spare parts and supply list

j. Parts identification

k. Warranty information

l. Extended warranty information

m. Contractor information

1.4.3 Data Package 3

a. Safety precautions and hazards

b. Operator prestart

c. Startup, shutdown, and post-shutdown procedures

d. Normal operations

e. Emergency operations

f. Environmental conditions

g. Operating log

h. Lubrication data

i. Preventive maintenance plan, schedule, and procedures

j. Cleaning recommendations

k. Troubleshooting guides and diagnostic techniques

l. Wiring diagrams and control diagrams

m. Maintenance and repair procedures

n. Removal and replacement instructions

o. Spare parts and supply list

p. Product submittal data

q. O&M submittal data

r. Parts identification

s. Warranty information

t. Extended warranty information

u. Testing equipment and special tool information

v. Testing and performance data

w. Contractor information

x. Field test reports

1.4.4 Data Package 4

a. Safety precautions and hazards

b. Operator prestart

c. Startup, shutdown, and post-shutdown procedures

d. Normal operations

e. Emergency operations

f. Operator service requirements

g. Environmental conditions

h. Operating log

i. Lubrication data

j. Preventive maintenance plan, schedule, and procedures

k. Cleaning recommendations

l. Troubleshooting guides and diagnostic techniques

m. Wiring diagrams and control diagrams

n. Repair procedures

o. Removal and replacement instructions

p. Spare parts and supply list

q. Repair work-hours

r. Product submittal data

s. O&M submittal data

t. Parts identification

u. Warranty information

v. Extended warranty information

w. Personnel training requirements

x. Testing equipment and special tool information

y. Testing and performance data

z. Contractor information

aa. Field test reports

1.4.5 Data Package 5

a. Safety precautions and hazards

b. Operator prestart

c. Start-up, shutdown, and post-shutdown procedures

d. Normal operations

e. Environmental conditions

f. Preventive maintenance plan, schedule, and procedures

g. Troubleshooting guides and diagnostic techniques

h. Wiring and control diagrams

i. Maintenance and repair procedures

j. Removal and replacement instructions

k. Spare parts and supply list

l. Product submittal data

m. Manufacturer's instructions

n. O&M submittal data

o. Parts identification

p. Testing equipment and special tool information

q. Warranty information

r. Extended warranty information

s. Testing and performance data

t. Contractor information

u. Field test reports

PART 2 PRODUCTS

a. Levee Operations and Maintenance Manual. The Contractor in coordination with the Seattle District (USACE) Levee Safety office will prepare a new Blue Slough Levee Operations and Maintenance Manual to include all new flood risk management features constructed under Options 1 and 2. These include new levees and connected culverts, ramps, gates and other features. New as-built drawings of these features prepared by the Contractor

will be included. Consult with Seattle District Levee Safety Office for additional requirements.

b. Blue Slough automatic headgate O&M manual appendix. Per the requirements of this section prepare an appendix to be included with the updated levee O&M manual that specify the operations and maintenance procedures to be followed to ensure the headgate and appurtenant equipment remain functional and operable.

PART 3 EXECUTION

Not Used. -- End of Section --

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DIVISION 03 - CONCRETE

SECTION 03 30 53

MISCELLANEOUS CAST-IN-PLACE CONCRETE

05/14

-- End of Section Table of Contents --

SECTION 03 30 53

MISCELLANEOUS CAST-IN-PLACE CONCRETE
05/14

PART 1 GENERAL

1.1 SUMMARY

Perform all work in accordance with ACI 318.

1.2 REFERENCES

The publications listed below form a part of this specification to the extent referenced. The publications are referred to within the text by the basic designation only.

AMERICAN CONCRETE INSTITUTE (ACI)

ACI 117	(2010; Errata 2011) Specifications for Tolerances for Concrete Construction and Materials and Commentary
ACI 301	(2016) Specifications for Structural Concrete
ACI 304R	(2000; R 2009) Guide for Measuring, Mixing, Transporting, and Placing Concrete
ACI 305R	(2020) Guide to Hot Weather Concreting
ACI 306R	(2016) Guide to Cold Weather Concreting
ACI 318	(2014; Errata 1-2 2014; Errata 3-5 2015; Errata 6 2016; Errata 7-9 2017) Building Code Requirements for Structural Concrete (ACI 318-14) and Commentary (ACI 318R-14)
ACI 347R	(2014; Errata 1 2017) Guide to Formwork for Concrete
ACI SP-66	(2004) ACI Detailing Manual

ASTM INTERNATIONAL (ASTM)

ASTM A615/A615M	(2020) Standard Specification for Deformed and Plain Carbon-Steel Bars for Concrete Reinforcement
ASTM A1064/A1064M	(2017) Standard Specification for Carbon-Steel Wire and Welded Wire Reinforcement, Plain and Deformed, for Concrete
ASTM C31/C31M	(2021a) Standard Practice for Making and Curing Concrete Test Specimens in the Field

ASTM C33/C33M	(2018) Standard Specification for Concrete Aggregates
ASTM C39/C39M	(2021) Standard Test Method for Compressive Strength of Cylindrical Concrete Specimens
ASTM C94/C94M	(2021b) Standard Specification for Ready-Mixed Concrete
ASTM C143/C143M	(2020) Standard Test Method for Slump of Hydraulic-Cement Concrete
ASTM C150/C150M	(2021) Standard Specification for Portland Cement
ASTM C172/C172M	(2017) Standard Practice for Sampling Freshly Mixed Concrete
ASTM C173/C173M	(2016) Standard Test Method for Air Content of Freshly Mixed Concrete by the Volumetric Method
ASTM C231/C231M	(2017a) Standard Test Method for Air Content of Freshly Mixed Concrete by the Pressure Method
ASTM C260/C260M	(2010a; R 2016) Standard Specification for Air-Entraining Admixtures for Concrete
ASTM C309	(2019) Standard Specification for Liquid Membrane-Forming Compounds for Curing Concrete
ASTM C494/C494M	(2019) Standard Specification for Chemical Admixtures for Concrete
ASTM C595/C595M	(2021) Standard Specification for Blended Hydraulic Cements
ASTM C618	(2019) Standard Specification for Coal Fly Ash and Raw or Calcined Natural Pozzolan for Use in Concrete
ASTM C685/C685M	(2017) Standard Specification for Concrete Made by Volumetric Batching and Continuous Mixing
ASTM C920	(2018) Standard Specification for Elastomeric Joint Sealants
ASTM C989/C989M	(2018a) Standard Specification for Slag Cement for Use in Concrete and Mortars
ASTM C1064/C1064M	(2017) Standard Test Method for Temperature of Freshly Mixed Hydraulic-Cement Concrete

ASTM C1157/C1157M	(2020a) Standard Performance Specification for Hydraulic Cement
ASTM C1602/C1602M	(2018) Standard Specification for Mixing Water Used in Production of Hydraulic Cement Concrete
ASTM D75/D75M	(2019) Standard Practice for Sampling Aggregates
ASTM D98	(2015) Calcium Chloride
ASTM D412	(2016) Standard Test Methods for Vulcanized Rubber and Thermoplastic Elastomers - Tension
ASTM D471	(2016a) Standard Test Method for Rubber Property - Effect of Liquids
ASTM D1752	(2018) Standard Specification for Preformed Sponge Rubber, Cork and Recycled PVC Expansion Joint Fillers for Concrete Paving and Structural Construction

U.S. ARMY CORPS OF ENGINEERS (USACE)

COE CRD-C 513	(1974) Corps of Engineers Specifications for Rubber Waterstops
COE CRD-C 572	(1974) Corps of Engineers Specifications for Polyvinylchloride Waterstops

U.S. NATIONAL ARCHIVES AND RECORDS ADMINISTRATION (NARA)

40 CFR 247	Comprehensive Procurement Guideline for Products Containing Recovered Materials

1.3 SUBMITTALS

Government approval is required for submittals with a "G" or "S" classification. Submittals not having a "G" or "S" classification are for information only. When used, a code following the "G" classification identifies the office that will review the submittal for the Government. Submit the following in accordance with Section 01 33 00 SUBMITTAL PROCEDURES:

SD-02 Shop Drawings

Installation Drawings; G, DO

SD-03 Product Data

Air-Entraining Admixture
Accelerating Admixture
Water-Reducing or Retarding Admixture
Curing Materials
Expansion Joint Filler Strips, Premolded
Joint Sealants - Field Molded Sealants
Waterstops

Conveying and Placing Concrete
Formwork
Mix Design Data; G, DO
Ready-Mix Concrete
Curing Compound

SD-06 Test Reports

Aggregates
Concrete Mixture Proportions; G, DO

Compressive Strength Testing; G, DO
Slump; G, DO
Air Content
Water

SD-07 Certificates

Cementitious Materials
Pozzolan
CPG for recycled materials or appropriate Waiver Form
Aggregates
Delivery Tickets

SD-08 Manufacturer's Instructions

Curing Compound

1.4 QUALITY ASSURANCE

Indicate specific locations of Concrete Placement, Forms, Steel Reinforcement, Accessories, Expansion Joints, Construction Joints, Control Joints on installation drawings and include, but not be limited to, square feet of concrete placements, thicknesses and widths, plan dimensions, and arrangement of cast-in-place concrete section.

1.4.1 Regulatory Requirements

The state statutory and regulatory requirements form a part of this specification to the extent referenced. Submit CPG for recycled materials or appropriate Waiver Form.

PART 2 PRODUCTS

2.1 SYSTEM DESCRIPTION

The Government retains the option to sample and test joint sealer, joint filler material, waterstop, aggregates and concrete to determine compliance with the specifications. Provide facilities and labor as may be necessary to assist the Government in procurement of representative test samples. Obtain samples of aggregates at the point of batching in accordance with ASTM D75/D75M. Sample concrete in accordance with ASTM C172/C172M. Determine slump and air content in accordance with ASTM C143/C143M and ASTM C231/C231M, respectively, when cylinders are molded. Prepare, cure, and transport compression test specimens in accordance with ASTM C31/C31M. Test compression test specimens in accordance with ASTM C39/C39M. Take samples for strength tests not less than once each shift in which concrete is produced. Provide a minimum of

five specimens from each sample; two to be tested at 28 days (90 days if pozzolan is used) for acceptance, two will be tested at 7 days for information and one held in reserve.

2.1.1 Strength

Acceptance test results are the average strengths of two specimens tested at 28 days (90 days if pozzolan is used). The strength of the concrete is considered satisfactory so long as the average of three consecutive acceptance test results equal or exceed the specified compressive strength, f'c, but not more than 20 percent, and no individual acceptance test result falls below f'c by more than 500 psi.

2.1.2 Construction Tolerances

Apply a Class "C" finish to all surfaces except those specified to receive a Class "D" finish. Apply a Class "D" finish to all post-construction surfaces which will be permanently concealed. Surface requirements for the classes of finish required are as specified in ACI 117.

2.1.3 Concrete Mixture Proportions

Concrete mixture proportions are the responsibility of the Contractor. Mixture proportions must include the dry weights of cementitious material(s); the nominal maximum size of the coarse aggregate; the specific gravities, absorptions, and saturated surface-dry weights of fine and coarse aggregates; the quantities, types, and names of admixtures; and quantity of water per yard of concrete. Provide materials included in the mixture proportions of the same type and from the same source as will be used on the project. The specified compressive strength f'c is 5,000 psi at 28 days (90 days if pozzolan is used). The maximum nominal size coarse aggregate is 1-1/2 inch, in accordance with ACI 304R. The air content must be between 4.5 and 7.5 percent with a slump between 2 and 5 inches. The maximum water-cementitious material ratio is 0.45. Submit the applicable test reports and mixture proportions that will produce concrete of the quality required, ten days prior to placement of concrete.

2.2 MATERIALS

Submit manufacturer's literature from suppliers which demonstrates compliance with applicable specifications for the specified materials.

2.2.1 Cementitious Materials

Submit Manufacturer's certificates of compliance, accompanied by mill test reports, attesting that the concrete materials meet the requirements of the specifications in accordance with the Special Clause "CERTIFICATES OF COMPLIANCE". Also, certificates for all material conforming to EPA's Comprehensive Procurement Guidelines (CPG), in accordance with 40 CFR 247. Provide cementitious materials that conform to the appropriate specifications listed.

2.2.1.1 Portland Cement

ASTM C150/C150M, Type II, with tri-calcium aluminates (C3A) content less than 10 percent and a maximum cement-alkali content of 0.80 percent Na2Oe (sodium oxide) equivalent.

2.2.1.2 Blended Hydraulic Cement

Provide blended cement conforming to ASTM C595/C595M and ASTM C1157/C1157M, Type IP, IL or IS, including the optional requirement for mortar expansion and consist of a mixture of ASTM C150/C150M Type I, or Type II cement and a complementary cementing material. The slag added to the Type IS blend must be ASTM C989/C989M ground granulated blast-furnace slag. The pozzolan added to the Type IP blend must be ASTM C618 Class F, interground with the cement clinker. Provide the manufacturer's written statement that the amount of pozzolan in the finished cement will not vary more than plus or minus 5 mass percent of the finished cement from lot-to-lot or within a lot. Do not change the percentage and type of mineral admixture used in the blend from that submitted for the aggregate evaluation and mixture proportioning.

2.2.1.3 Pozzolan

Provide pozzolan that conforms to ASTM C618, Class F, including requirements of Tables 1A and 2A.

2.2.2 Aggregates

For fine and coarse aggregates meet the quality and grading requirements of ASTM C33/C33M. Provide aggregates that do not contain any substance which may be deleteriously reactive with the alkalies in the cement. Submit certificates of compliance and test reports for aggregates showing the material(s) meets the quality and grading requirements of the specifications under which it is furnished.

2.2.3 Admixtures

Provide admixtures, when required or approved, in compliance with the appropriate specification listed. Retest chemical admixtures that have been in storage at the project site, for longer than 6 months or that have been subjected to freezing, at the expense of the Contractor at the request of the Contracting Officer and will be rejected if test results are not satisfactory.

2.2.3.1 Air-Entraining Admixture

Provide air-entraining admixture that meets the requirements of ASTM C260/C260M.

2.2.3.2 Accelerating Admixture

Provide calcium chloride meeting the requirements of ASTM D98. Other accelerators must meet the requirements of ASTM C494/C494M, Type C or E.

2.2.3.3 Water-Reducing or Retarding Admixture

Provide water-reducing or retarding admixture meeting the requirements of ASTM C494/C494M, Type A, B, or D.

2.2.4 Water

Mixing and curing water in compliance with the requirements of ASTM C1602/C1602M; free of injurious amounts of oil, acid, salt, or alkali. Submit test report showing water complies with ASTM C1602/C1602M.

2.2.5 Reinforcing Steel

Provide reinforcing bars conforming to the requirements of ASTM A615/A615M, Grade 60, deformed. Provide welded steel wire reinforcement conforming to the requirements of ASTM A1064/A1064M. Detail reinforcement not indicated in accordance with ACI 301 and ACI SP-66.

2.2.6 Expansion Joint Filler Strips, Premolded

Expansion joint filler strips, premolded of sponge rubber conforming to ASTM D1752, Type I.

2.2.7 Joint Sealants - Field Molded Sealants

Conform to ASTM C920, Type M, Grade NS, Class 25, use NT for vertical joints and Type M, Grade P, Class 25, use T for horizontal joints. Provide polyethylene tape, coated paper, metal foil, or similar type bond breaker materials. The backup material needs to be compressible, nonshrink, nonreactive with the sealant, and a nonabsorptive material such as extruded butyl or polychloroprene foam rubber. Immediately prior to installation of field-molded sealants, clean the joint of all debris and further cleaned using water, chemical solvents, or other means as recommended by the sealant manufacturer or directed.

2.2.8 Formwork

Design and engineer the formwork as well as its construction in accordance with ACI 301 Section 2 and 5 and ACI 347R. Fabricate of wood, steel, or other approved material. Submit formwork design prior to the first concrete placement.

2.2.9 Form Coatings

Provide form coating in accordance with ACI 301.

2.2.10 Curing Materials

Provide curing materials in accordance with ACI 301, Section 5.

2.3 READY-MIX CONCRETE

Provide ready-mix concrete with mix design data conforming to ACI 301 Part 2. Submit delivery tickets in accordance with ASTM C94/C94M for each ready-mix concrete delivery, include the following additional information: .

a. Type and brand cement

b. Cement content in 94-pound bags per cubic yard of concrete

c. Maximum size of aggregate

d. Amount and brand name of admixture

e. Total water content expressed by water cementitious material ratio

2.4 ACCESSORIES

2.4.1 Waterstops

2.4.1.1 PVC Waterstop

Polyvinylchloride waterstops conforming to COE CRD-C 572.

2.4.1.2 Rubber Waterstop

Rubber waterstops conforming to COE CRD-C 513.

2.4.1.3 Thermoplastic Elastomeric Rubber Waterstop

Thermoplastic elastomeric rubber waterstops conforming to ASTM D471.

2.4.1.4 Hydrophilic Waterstop

Swellable strip type compound of polymer modified chloroprene rubber that swells upon contact with water conforming to ASTM D412 as follows: Tensile strength 420 psi minimum; ultimate elongation 600 percent minimum. Minimum hardness of 50 on the type A durometer and the volumetric expansion ratio in distilled water at 70 degrees F; 3 to 1 minimum.

2.4.2 Curing Compound

Provide curing compound conforming to ASTM C309. Submit manufactures instructions for placing curing compound.

PART 3 EXECUTION

3.1 PREPARATION

Prepare construction joints to expose coarse aggregate. The surface must be clean, damp, and free of laitance. Remove snow, ice, standing or flowing water, loose particles, debris, and foreign matter. Satisfactorily compact earth foundations. Make spare vibrators available. Placement cannot begin until the entire preparation has been accepted by the Government.

3.1.1 Embedded Items

Secure reinforcement in place after joints, anchors, and other embedded items have been positioned. Arrange internal ties so that when the forms are removed the metal part of the tie is not less than 2 inches from concrete surfaces permanently exposed to view or exposed to water on the finished structures. Prepare embedded items so they are be free of oil and other foreign matters such as loose coatings or rust, paint, and scale. The embedding of wood in concrete is permitted only when specifically authorized or directed. Provide all equipment needed to place, consolidate, protect, and cure the concrete at the placement site and in good operating condition.

3.1.2 Formwork Installation

Forms must be properly aligned, adequately supported, and mortar-tight. Provide smooth form surfaces, free from irregularities, dents, sags, or holes when used for permanently exposed faces. Chamfer all exposed joints

and edges , unless otherwise indicated.

3.1.3 Production of Concrete

3.1.3.1 Ready-Mixed Concrete

Provide ready-mixed concrete conforming to ASTM C94/C94M except as otherwise specified.

3.1.3.2 Concrete Made by Volumetric Batching and Continuous Mixing

Conform to ASTM C685/C685M.

3.1.4 Waterstops

Install and splice waterstops as directed by the manufacturer.

3.2 CONVEYING AND PLACING CONCRETE

Convey and place concrete in accordance with ACI 301, Section 5.

3.2.1 Cold-Weather Requirements

Place concrete in cold weather in accordance with ACI 306R

3.2.2 Hot-Weather Requirements

Place concrete in hot weather in accordance with ACI 305R

3.3 FINISHING

3.3.1 Temperature Requirement

Do not finish or repair concrete when either the concrete or the ambient temperature is below 50 degrees F.

3.3.2 Finishing Formed Surfaces

Remove all fins and loose materials , and surface defects including filling of tie holes. Repair all honeycomb areas and other defects. Remove all unsound concrete from areas to be repaired. Ream or chip surface defects greater than 1/2 inch in diameter and holes left by removal of tie rods in all surfaces not to receive additional concrete and fill with dry-pack mortar. Brush-coat the prepared area with an approved epoxy resin or latex bonding compound or with a neat cement grout after dampening and filling with mortar or concrete. Use a blend of portland cement and white cement in mortar or concrete for repairs to all surfaces permanently exposed to view shall be so that the final color when cured is the same as adjacent concrete.

3.3.3 Finishing Unformed Surfaces

Finish unformed surfaces in accordance with ACI 301, Section 5.

3.3.4 Expansion and Contraction Joints

Make expansion and contraction joints in accordance with the details shown or as otherwise specified.

3.4 CURING AND PROTECTION

Cure and protect in accordance with ACI 301, Section 5.

3.5 FORM WORK

Provide form work in accordance with ACI 301, Section 2 and Section 5.

3.5.1 Removal of Forms

Remove forms in accordance with ACI 301, Section 2.

3.6 STEEL REINFORCING

Reinforcement must be free from loose, flaky rust and scale, and free from oil, grease, or other coating which might destroy or reduce the reinforcement's bond with the concrete.

3.6.1 Fabrication

Shop fabricate steel reinforcement in accordance with ACI 318 and ACI SP-66. Provide shop details and bending in accordance with ACI 318 and ACI SP-66.

3.6.2 Splicing

Perform splices in accordance with ACI 318 and ACI SP-66.

3.6.3 Supports

Secure reinforcement in place by the use of metal or concrete supports, spacers, or ties.

3.7 EMBEDDED ITEMS

Before placing concrete, take care to determine that all embedded items are firmly and securely fastened in place. Provide embedded items free of oil and other foreign matter, such as loose coatings of rust, paint and scale. Embedding of wood in concrete is permitted only when specifically authorized or directed.

3.8 TESTING AND INSPECTING

Report the results of all tests and inspections conducted at the project site informally at the end of each shift. Submit written reports weekly. Deliver within three days after the end of each weekly reporting period. See Section 01 45 00.00 10 QUALITY CONTROL.

3.8.1 Field Testing Technicians

The individuals who sample and test concrete must have demonstrated a knowledge and ability to perform the necessary test procedures equivalent to the ACI minimum guidelines for certification of Concrete Field Testing Technicians, Grade I.

3.8.2 Preparations for Placing

Inspect foundation or construction joints, forms, and embedded items in sufficient time prior to each concrete placement to certify that it is ready to receive concrete.

3.8.3 Sampling and Testing

a. Obtain samples and test concrete for quality control during placement. Sample fresh concrete for testing in accordance with ASTM C172/C172M. Make six test cylinders.

b. Test concrete for compressive strength at 7 and 28 days for each design mix and for every 100 cubic yards of concrete. Test two cylinders at 7 days; two cylinders at 28 days; and hold two cylinders in reserve. Conform test specimens to ASTM C31/C31M. Perform compressive strength testing conforming to ASTM C39/C39M.

c. Test slump at the site of discharge for each design mix in accordance with ASTM C143/C143M. Check slump once during each shift that concrete is produced.

d. Test air content for air-entrained concrete in accordance with ASTM C231/C231M. Test concrete using lightweight or extremely porous aggregates in accordance with ASTM C173/C173M. Check air content at least once during each shift that concrete is placed.

e. Determine temperature of concrete at time of placement in accordance with ASTM C1064/C1064M. Check concrete temperature at least once during each shift that concrete is placed.

3.8.4 Action Required

3.8.4.1 Placing

Do not begin placement until the availability of an adequate number of acceptable vibrators, which are in working order and have competent operators, has been verified. Discontinue placing if any lift is inadequately consolidated.

3.8.4.2 Air Content

Whenever an air content test result is outside the specification limits, adjust the dosage of the air-entrainment admixture prior to delivery of concrete to forms.

3.8.4.3 Slump

Whenever a slump test result is outside the specification limits, adjust the batch weights of water and fine aggregate prior to delivery of concrete to the forms. Make the adjustments so that the water-cementitious material ratio does not exceed that specified in the submitted concrete mixture proportion and the required concrete strength is still met.

-- End of Section --

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PLANT-PRECAST CONCRETE PRODUCTS FOR BELOW GRADE CONSTRUCTION
05/16

PART 1 GENERAL

1.1 REFERENCES

The publications listed below form a part of this specification to the extent referenced. The publications are referred to within the text by the basic designation only.

AMERICAN CONCRETE INSTITUTE (ACI)

ACI 211.1	(1991; R 2009) Standard Practice for Selecting Proportions for Normal, Heavyweight and Mass Concrete
ACI 211.2	(1998; R 2004) Standard Practice for Selecting Proportions for Structural Lightweight Concrete
ACI 305R	(2020) Guide to Hot Weather Concreting
ACI 306.1	(1990; R 2002) Standard Specification for Cold Weather Concreting
ACI 318	(2014; Errata 1-2 2014; Errata 3-5 2015; Errata 6 2016; Errata 7-9 2017) Building Code Requirements for Structural Concrete (ACI 318-14) and Commentary (ACI 318R-14)

AMERICAN CONCRETE PIPE ASSOCIATION (ACPA)

ACPA QPC	(202016) QCast Plant Certification Manual

AMERICAN WELDING SOCIETY (AWS)

AWS D1.1/D1.1M	(2020; Errata 1 2021) Structural Welding Code - Steel
AWS D1.4/D1.4M	(2011) Structural Welding Code - Reinforcing Steel

ASTM INTERNATIONAL (ASTM)

ASTM A36/A36M	(2019) Standard Specification for Carbon Structural Steel
ASTM A153/A153M	(2016a) Standard Specification for Zinc Coating (Hot-Dip) on Iron and Steel Hardware
ASTM A615/A615M	(2020) Standard Specification for Deformed and Plain Carbon-Steel Bars for Concrete

	Reinforcement
ASTM A706/A706M	(2016) Standard Specification for Low-Alloy Steel Deformed and Plain Bars for Concrete Reinforcement
ASTM A767/A767M	(2016) Standard Specification for Zinc-Coated (Galvanized) Steel Bars for Concrete Reinforcement
ASTM A775/A775M	(2017) Standard Specification for Epoxy-Coated Steel Reinforcing Bars
ASTM A884/A884M	(2019) Standard Specification for Epoxy-Coated Steel Wire and Welded Wire Reinforcement
ASTM A1064/A1064M	(2017) Standard Specification for Carbon-Steel Wire and Welded Wire Reinforcement, Plain and Deformed, for Concrete
ASTM C31/C31M	(2021a) Standard Practice for Making and Curing Concrete Test Specimens in the Field
ASTM C39/C39M	(2021) Standard Test Method for Compressive Strength of Cylindrical Concrete Specimens
ASTM C138/C138M	(2017a) Standard Test Method for Density (Unit Weight), Yield, and Air Content (Gravimetric) of Concrete
ASTM C143/C143M	(2020) Standard Test Method for Slump of Hydraulic-Cement Concrete
ASTM C171	(2020) Standard Specification for Sheet Materials for Curing Concrete
ASTM C173/C173M	(2016) Standard Test Method for Air Content of Freshly Mixed Concrete by the Volumetric Method
ASTM C192/C192M	(2019) Standard Practice for Making and Curing Concrete Test Specimens in the Laboratory
ASTM C231/C231M	(2017a) Standard Test Method for Air Content of Freshly Mixed Concrete by the Pressure Method
ASTM C309	(2019) Standard Specification for Liquid Membrane-Forming Compounds for Curing Concrete
ASTM C443	(2021) Standard Specification for Joints for Concrete Pipe and Manholes, Using Rubber Gaskets

ASTM C857	(2016) Standard Practice for Minimum Structural Design Loading for Underground Precast Concrete Utility Structures
ASTM C858	(2010; E 2012) Standard Specification for Underground Precast Concrete Utility Structures
ASTM C877	(2021) Standard Specification for External Sealing Bands for Concrete Pipe, Manholes, and Precast Box Sections
ASTM C891	(2020) Standard Practice for Installation of Underground Precast Concrete Utility Structures
ASTM C920	(2018) Standard Specification for Elastomeric Joint Sealants
ASTM C923	(2008; R 2013; E 2016) Standard Specification for Resilient Connectors Between Reinforced Concrete Manhole Structures, Pipes and Laterals
ASTM C990	(2009; R 2019) Standard Specification for Joints for Concrete Pipe, Manholes and Precast Box Sections Using Preformed Flexible Joint Sealants
ASTM C1064/C1064M	(2017) Standard Test Method for Temperature of Freshly Mixed Hydraulic-Cement Concrete
ASTM C1107/C1107M	(2020) Standard Specification for Packaged Dry, Hydraulic-Cement Grout (Nonshrink)
ASTM C1244	(2020) Standard Test Method for Concrete Sewer Manholes by the Negative Air Pressure (Vacuum) Test Prior to Backfill
ASTM C1478	(2019) Standard Specification for Storm Drain Resilient Connectors Between Reinforced Concrete Storm Sewer Structures, Pipes and Laterals

CSA GROUP (CSA)

CSA A23.4	(2016; R 2021) Precast Concrete - Materials and Construction

NATIONAL PRECAST CONCRETE ASSOCIATION (NPCA)

NPCA QC Manual	(2017) Quality Control Manual for Precast and Prestressed Concrete Plants

1.2 SUBMITTALS

All submittals are the responsibility of the precast concrete producer. Government approval is required for submittals with a "G" or "S"

classification. Submittals not having a "G" or "S" classification are for information only. When used, a code following the "G" classification identifies the office that will review the submittal for the Government. Submit the following in accordance with Section 01 33 00 SUBMITTAL PROCEDURES:

SD-01 Preconstruction Submittals

Quality Control Procedures

SD-02 Shop Drawings

Standard Precast Units; G
Custom-Made Precast Units; G
Special Finishes

SD-03 Product Data

Standard Precast Units
Proprietary Precast Units
Embedded Items
Accessories

SD-05 Design Data

Design Calculations; G
Concrete Mix Proportions

SD-06 Test Reports

Test Reports

SD-07 Certificates

Quality Control Procedures

1.3 QUALITY ASSURANCE

Demonstrate adherence to the standards set forth in NPCA QC Manual or ACPA QPC. Meet requirements written in the subparagraphs below.

1.3.1 NPCA and ACPA Plant Certification

The precast concrete producer must be certified by the National Precast Concrete Association's or the American Concrete Pipe Association's Plant Certification Program prior to and during production of the products for this project.

1.3.2 Qualifications, Quality Control and Inspection

1.3.2.1 Qualifications

Select a precast concrete producer that has been in the business of producing precast concrete units similar to those specified for a minimum of 3 years. The precast concrete producer must maintain a permanent quality control department or retain an independent testing agency on a continuing basis.

1.3.2.2 Quality Control Procedures

Submit quality control procedures established by the precast manufacturer in accordance with NPCA QC Manual and ACPA QPC. Show that the following QC tests are performed as required and in accordance with the ASTM standards indicated.

1.3.2.2.1 Slump

Perform a slump test for each 150 cu yd of concrete produced, or once a day, whichever comes first. Perform slump tests in accordance with ASTM C143/C143M.

1.3.2.2.2 Temperature

Measure the temperature of fresh concrete when slump or air content tests are made and when compressive test specimens are made in accordance with ASTM C1064/C1064M.

1.3.2.2.3 Compressive Strength

Make at least four compressive strength specimens for each 150 cubic yards of concrete of each mix in accordance with the following Standards: ASTM C31/C31M, ASTM C192/C192M, ASTM C39/C39M.

1.3.2.2.4 Air Content

Perform tests for air content on air-entrained, wet-cast concrete for each 150 cu yd of concrete, but not less often than once each day when air-entrained concrete is used. Determine the air content in accordance with either ASTM C231/C231M or ASTM C173/C173M for normal weight aggregates and ASTM C173/C173M for lightweight aggregates.

1.3.2.2.5 Unit Weight

Perform tests for unit weight a minimum of once per week to verify the yield of batch mixes. Perform unit weight tests for each 100 cu yd of lightweight concrete in accordance with ASTM C138/C138M.

1.3.2.3 Inspection

The Contracting Officer may place an inspector in the plant when the units covered by this specification are being manufactured. The burden of payment for plant inspection will be clearly detailed in the specification. The precast concrete producer must give notice 14 days prior to the time the units will be available for plant inspection. Neither the exercise nor waiver of inspection at the plant will affect the Government's right to enforce contractual provisions after units are transported or erected.

1.3.2.4 Test Reports

Submit the following:

1.3.2.4.1 Material Certifications or Laboratory Test Reports

Include mill tests and all other test data, for portland cement, blended cement, pozzolans, ground granulated blast furnace slag, silica fume, aggregate, admixtures, and curing compound proposed for use on this

project.

1.3.2.4.2 Mix Test

Submit reports showing that the mix has been successfully tested to produce concrete with the properties specified and will be suitable for the job conditions. Such tests may include compressive strength, flexural strength, plastic or hardened air content, freeze thaw durability, abrasion and absorption. Clearly detail in the specifications special tests for precast concrete or cast-in items.

1.3.2.4.3 Self-Consolidating Concrete

Submit sufficient documentation, when the use of self-consolidating concrete (SCC) is proposed, showing a minimum of 30-days production track records demonstrating that SCC is appropriate for casting of the product.

1.3.2.4.4 In-Plant QA/QC Inspection Reports

Submit inspection reports upon the request of the Contracting Officer.

1.4 DELIVERY, STORAGE, AND HANDLING

1.4.1 Delivery

Deliver precast units to the site in accordance with the delivery schedule to avoid excessive build-up of units in storage at the site. Upon delivery to the jobsite, all precast concrete units will be inspected by the Contracting Officer for quality and final acceptance.

1.4.2 Storage

Store units off the ground or in a manner that minimizes potential damage.

1.4.3 Handling

Handle, transport, and store products in a manner to minimize damage. Lifting devices or holes must be consistent with industry standards. Perform lifting with methods or devices intended for this purpose as indicated on shop drawings.

PART 2 PRODUCTS

2.1 SYSTEM DESCRIPTION

Furnish precast concrete units designed and fabricated by an experienced and acceptable precast concrete manufacturer who has been, for at least three years, regularly and continuously engaged in the manufacture of precast concrete work similar to that indicated on the drawings. Coordinate precast work with the work of other trades. Below grade structures must comply with ASTM C858.

2.1.1 Standard Precast Units

Design standard precast concrete units to withstand indicated design load conditions in accordance with applicable industry design standards ACI 318, ASTM C857. Design must also consider stresses induced during handling, shipping and installation as to avoid product cracking or other handling damage. Indicate design loads for precast concrete units on the shop

drawings. Submit drawings for standard precast concrete units furnished by the precast concrete producer for approval by the Contracting Officer. These drawings must demonstrate that the applicable industry design standards have been met. Include installation and construction information on shop drawings. Include details of steel reinforcement size and placement as well as supporting design calculations, if appropriate. Produce precast concrete units in accordance with the approved drawings. Submit cut sheets, for standard precast concrete units, showing conformance to project drawings and requirements, and to applicable industry design standards listed in this specification.

2.1.2 Custom-Made Precast Units

Submit design calculations for custom-made precast units, prepared and sealed by a registered professional engineer, for approval prior to fabrication. Include in the calculations the analysis of units for lifting stresses and the sizing of lifting devices. Submit drawings furnished by the precast concrete producer for approval by the Contracting Officer. Show on these drawings complete design, installation, and construction information in such detail as to enable the Contracting Officer to determine the adequacy of the proposed units for the intended purpose. Include details of steel reinforcement size and placement as well as supporting design calculations, if appropriate. Produce precast concrete units in accordance with the approved drawings.

2.1.3 Proprietary Precast Units

Products manufactured under franchise arrangements must conform to all the requirements specified by the franchiser. Items not included in the franchise specification, but included in this specification, must conform to the requirements in this specification. Submit standard plans or informative literature, for proprietary precast concrete units. Make available supporting calculations and design details upon request. Provide sufficient information as to demonstrate that such products will perform the intended task.

2.1.4 Joints and Sealants

Provide joints and sealants between adjacent units of the type and configuration indicated on shop drawings meeting specified design and performance requirements.

2.1.5 Concrete Mix Design

2.1.5.1 Concrete Mix Proportions

Base selection of proportions for concrete on the methodology presented in ACI 211.1 for normal weight concrete and ACI 211.2 for lightweight concrete. Develop the concrete proportions using the same type and brand of cement, the same type and brand of pozzolan, the same type and gradation of aggregates, and the same type and brand of admixture that will be used in the manufacture of precast concrete units for the project. Do not use calcium chloride in precast concrete containing reinforcing steel or other embedded metal items. At a minimum of thirty days prior to precast concrete unit manufacturing, the precast concrete producer will submit a mix design and proportions for each strength and type of concrete that will be used. Furnish a complete list of materials, including quantity, type, brand and applicable data sheets for all mix design constituents as well as applicable reference specifications. The

use of self-consolidating concrete is permitted, provided that mix design proportions and constituents meet the requirements of this specification.

2.1.5.2 Concrete Strength

Provide precast concrete units with a 28-day compressive strength (f'c) of 5000 psi.

2.1.5.3 Water-to-Cement Ratio

Where exposed to freezing and thawing, furnish concrete containing entrained air and with a water-cementitious ratio of 0.45 or less. Where not exposed to freezing, but required to have a low permeability, furnish concrete with a water-cementitious ratio of 0.48 or less. Where exposed to deicer salts, brackish water, or seawater, furnish concrete with a water-cementitious ratio of 0.40 or less, for corrosion protection.

2.1.5.4 Air Content

The air content of concrete that will be exposed to freezing conditions must be within the limits given below.

	AIR CONTENT PERCENT	
NOMINAL MAXIMUM AGGREGATE SIZE	EXPOSURE CLASS F1	EXPOSURE CLASSES F2 and F3
3/8 inch	6.0	7.5
1/2 inch	5.5	7.0
3/4 inch	5.0	6.0
1.0 inch	4.5	6.0
1.5 inch	4.5	5.5
Note: For specified compressive strengths greater than 5000 psi, air content may be reduced 1 percent		

2.2 MATERIALS

Except as otherwise specified in the following paragraphs, conform material to Section 03 30 53 MISCELLANEOUS CAST-IN-PLACE CONCRETE.

2.2.1 Pigments

Non-fading and lime-resistant

2.2.2 Reinforcement

2.2.2.1 Reinforcing Bars

a. Deformed Billet-steel: ASTM A615/A615M

b. Deformed Low-alloy steel: ASTM A706/A706M

2.2.2.2 Reinforcing Wire

a. Plain Wire: ASTM A1064/A1064M

b. Deformed Wire: ASTM A1064/A1064M

2.2.2.3 Welded Wire Reinforcement

a. Plain Wire: ASTM A1064/A1064M

b. Deformed Wire: ASTM A1064/A1064M

2.2.2.4 Epoxy Coated Reinforcement

a. Reinforcing Bars: ASTM A775/A775M

b. Wires and Welded Wire: ASTM A884/A884M

2.2.2.5 Galvanized Reinforcement

Provide galvanized reinforcement conforming to ASTM A767/A767M.

2.2.3 Inserts and Embedded Metal

All items embedded in concrete must be of the type required for the intended task, and meet the following standards.

a. Structural Steel Plates, Angles, etc.: ASTM A36/A36M

b. Hot-dipped Galvanized: ASTM A153/A153M

c. Proprietary Items: In accordance with manufacturers published literature

2.2.4 Accessories

Submit proper installation instructions and relevant product data for items including, but not limited to, sealants, gaskets, connectors, steps, cable racks and other items installed before or after delivery.

a. Rubber Gaskets for Circular Concrete Sewer Pipe and Culvert Pipe: ASTM C443.

b. External Sealing Bands for Noncircular Sewer, Storm Drain and Culvert Pipe: ASTM C877.

c. Preformed Flexible Joint Sealants for Concrete Pipe, Manholes, and Manufactured Box Sections: ASTM C990.

d. Elastomeric Joint Sealants: ASTM C920

2.2.5 Pipe Entry Connectors

Pipe entry connectors must conform to ASTM C923 or ASTM C1478.

2.2.6 Grout

Nonshrink Grout must conform to ASTM C1107/C1107M. Cementitious grout

must be a mixture of portland cement, sand, and water. Proportion one part cement to approximately 2.5 parts sand, with the amount of water based on placement method. Provide air entrainment for grout exposed to the weather.

PART 3 EXECUTION

3.1 FABRICATION AND PLACEMENT

Perform fabrication in accordance with NPCA QC Manual or ACPA QPC unless specified otherwise.

3.1.1 Forms

Use forms, for manufacturing precast concrete products, of the type and design consistent with industry standards and practices. They should be capable of consistently providing uniform products and dimensions. Construct forms so that the forces and vibrations to which the forms will be subjected can cause no product damage. Clean forms of concrete build-up after each use. Apply form release agents according to the manufacturers recommendations and do not allow to build up on the form casting surfaces.

3.1.2 Reinforcement

Follow applicable ASTM Standard or ACI 318 for placement and splicing. Fabricate cages of reinforcement either by tying the bars, wires or welded wire reinforcement into rigid assemblies or by welding, where permissible, in accordance with AWS D1.4/D1.4M. Position reinforcing as specified by the design and so that the concrete cover conforms to requirements. The tolerance on concrete cover must be one-third of that specified but not more than 1/2 inch. Provide concrete cover not less than 1/2 inch. Take positive means to assure that the reinforcement does not move significantly during the casting operations.

3.1.3 Embedded Items

Position embedded items at locations specified in the design documents. Perform welding in accordance with AWS D1.1/D1.1M when necessary. Hold rigidly in place inserts, plates, weldments, lifting devices and other items to be imbedded in precast concrete products so that they do not move significantly during casting operations. Submit product data sheets and proper installation instruction for anchors, lifting inserts and other devices. Clearly indicate the products dimensions and safe working load.

3.2 CONCRETE

3.2.1 Concrete Mixing

Mixing operations must produce batch-to-batch uniformity of strength, consistency, and appearance.

3.2.2 Concrete Placing

Deposit concrete into forms as near to its final location as practical. Keep the free fall of the concrete to a minimum. Consolidate concrete in such a manner that segregation of the concrete is minimized and honeycombed areas are kept to a minimum. Use vibrators to consolidate concrete with frequencies and amplitudes sufficient to produce well

consolidated concrete.

3.2.2.1 Cold Weather Concreting

Perform cold weather concreting in accordance with ACI 306.1.

a. Provide adequate equipment for heating concrete materials and protecting concrete during freezing or near-freezing weather.

b. All concrete materials, reinforcement, forms, fillers, and ground with which concrete is to come in contact must be free from frost.

c. Do not use frozen materials or materials containing ice.

d. In cold weather the temperature of concrete at the time of placing must not be below 45 degrees F. Discard concrete that freezes before its compressive strength reaches 500 psi.

3.2.2.2 Hot Weather Concreting

Follow recommendations for hot weather concreting in ACI 305R. During hot weather, give proper attention to constituents, production methods, handling, placing, protection, and curing to prevent excessive concrete temperatures or water evaporation that could impair required strength or serviceability of the member or structure. The temperature of concrete at the time of placing must not exceed 90 degrees F.

3.2.3 Concrete Curing

Commence curing immediately following the initial set and completion of surface finishing.

3.2.3.1 Curing by Moisture Retention

Prevent moisture evaporation from exposed surfaces until adequate strength for stripping is reached by one of the following methods:

a. Cover with polyethylene sheets a minimum of 6 mils thick in accordance with ASTM C171.

b. Cover with burlap or other absorptive material and keep continually moist.

c. Use a membrane-curing compound, conforming to ASTM C309 and applied at a rate not less than 200 square ft/gallon, or in accordance with manufacturers' recommendations.

3.2.3.2 Curing with Heat and Moisture

Do not subject concrete to steam or hot air until after the concrete has attained its initial set. Apply steam, if used, within a suitable enclosure, which permits free circulation of the steam in accordance with CSA A23.4. If hot air is used for curing, take precautions to prevent moisture loss from the concrete. The temperature of the concrete must not be permitted to exceed 150 degrees F. These requirements do not apply to products cured with steam under pressure in an autoclave.

3.2.4 Surface Finish

Finish unformed surfaces of wet-cast precast concrete products as specified. If no finishing procedure is specified, finish such surfaces using a strike-off to level the concrete with the top of the form.

3.2.4.1 Formed Non-Architectural Surfaces

Cast surfaces against approved forms following industry practices in cleaning forms, designing concrete mixes, placing and curing concrete. Normal color variations, form joint marks, small surface holes caused by air bubbles, and minor chips and spalls will be accepted but no major imperfections, honeycombs or other major defects will be permitted.

3.2.4.2 Unformed Surfaces

Finish unformed surfaces with a vibrating screed, or by hand with a float. Normal color variations, minor indentations, minor chips and spalls will be accepted. Major imperfections, honeycombs, or other major defects are not permitted.

3.2.4.3 Special Finishes

Troweled, broom or other finishes must be according to the requirements of project documents and performed in accordance with industry standards or supplier specifications. Submit finishes for approval when required by the project documents. The sample finishes must be approved prior to the start of production.

3.2.5 Stripping Products from Forms

Do not remove products from the forms until the concrete reaches the compressive strength for stripping required by the design. If no such requirement exists, products may be removed from the forms after the final set of concrete provided that stripping damage is minimal.

3.2.6 Patching and Repair

No repair is required to formed surfaces that are relatively free of air voids and honeycombed areas, unless the surfaces are required by the design to be finished.

3.2.6.1 Repairing Minor Defects

Defects that will not impair the functional use or expected life of a precast concrete product may be repaired by any method that does not impair the product.

3.2.6.2 Repairing Honeycombed Areas

When honeycombed areas are to be repaired, remove all loose material and cut back the areas into essentially horizontal or vertical planes to a depth at which coarse aggregate particles break under chipping rather than being dislodged. Use proprietary repair materials in accordance with the manufacturer's instructions. If a proprietary repair material is not used, saturate the area with water. Immediately prior to repair, the area should be damp, but free of excess water. Apply a cement-sand grout or an approved bonding agent to the chipped surfaces, followed immediately by consolidating an appropriate repair material into the cavity.

3.2.6.3 Repairing Major Defects

Evaluate, by qualified personnel, defects in precast concrete products which impair the functional use or the expected life of products to determine if repairs are feasible and, if so, to establish the repair procedure.

3.2.7 Shipping Products

Do not ship products until they are at least five days old, unless it can be shown that the concrete strength has reached at least 75 percent of the specified 28-day strength, or that damage will not result, impairing the performance of the product.

3.3 INSTALLATION

3.3.1 Site Access

It is the Contractor's responsibility to provide adequate access to the site to facilitate hauling, storage and proper handling of the precast concrete products.

3.3.2 General Requirements

a. Install precast concrete products to the lines and grades shown in the contract documents or otherwise specified.

b. Lift products by suitable lifting devices at points provided by the precast concrete producer.

c. Install products in accordance with the precast concrete producer's instructions. In the absence of such instructions, install underground utility structures in accordance with ASTM C891. Install pipe and manhole sections in accordance with the procedures outlined by the American Concrete Pipe Association.

d. Field modifications to the product will relieve the precast producer of liability even if such modifications result in the failure of the product.

3.3.3 Water Tightness

Where water tightness is a necessary performance characteristic of the precast concrete product's end use, watertight joints, connectors and inserts should be used to ensure the integrity of the entire system.

3.4 FIELD QUALITY CONTROL

3.4.1 Site Tests

When water tightness testing is required for an underground product, use one of the following methods:

3.4.2 Vacuum Testing

Prior to backfill vacuum test system according to ASTM C1244.

3.4.3 Water Testing

Perform water testing according to the contract documents and precast concrete producer's recommendations.

-- End of Section --

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DIVISION 05 - METALS

SECTION 05 50 13

MISCELLANEOUS METAL FABRICATIONS

05/17, CHG 1: 08/18

-- End of Section Table of Contents --

SECTION 05 50 13

MISCELLANEOUS METAL FABRICATIONS
05/17, CHG 1: 08/18

PART 1 GENERAL

1.1 REFERENCES

The publications listed below form a part of this specification to the extent referenced. The publications are referred to within the text by the basic designation only.

AMERICAN INSTITUTE OF STEEL CONSTRUCTION (AISC)

AISC 303	(2016) Code of Standard Practice for Steel Buildings and Bridges

AMERICAN SOCIETY OF MECHANICAL ENGINEERS (ASME)

ASME B18.2.1	(2012; Errata 2013) Square and Hex Bolts and Screws (Inch Series)
ASME B18.2.2	(2015) Nuts for General Applications: Machine Screw Nuts, Hex, Square, Hex Flange, and Coupling Nuts (Inch Series)
ASME B18.6.2	(2020) Square Head Set Screws and Slotted Headless Set Screws (Inch Series)
ASME B18.6.3	(2013; R 2017) Machine Screws, Tapping Screws, and Machine Drive Screws (Inch Series)
ASME B18.21.1	(2009; R 2016) Washers: Helical Spring-Lock, Tooth Lock, and Plain Washers (Inch Series)
ASME B18.21.2M	(1999; R 2014) Lock Washers (Metric Series)
ASME B18.22M	(1981; R 2017) Metric Plain Washers

AMERICAN WELDING SOCIETY (AWS)

AWS D1.1/D1.1M	(2020; Errata 1 2021) Structural Welding Code - Steel

ASTM INTERNATIONAL (ASTM)

ASTM A29/A29M	(2020) Standard Specification for General Requirements for Steel Bars, Carbon and Alloy, Hot-Wrought
ASTM A36/A36M	(2019) Standard Specification for Carbon Structural Steel
ASTM A47/A47M	(1999; R 2018; E 2018) Standard

	Specification for Ferritic Malleable Iron Castings
ASTM A53/A53M	(2020) Standard Specification for Pipe, Steel, Black and Hot-Dipped, Zinc-Coated, Welded and Seamless
ASTM A108	(2013) Standard Specification for Steel Bar, Carbon and Alloy, Cold-Finished
ASTM A123/A123M	(2017) Standard Specification for Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products
ASTM A153/A153M	(2016a) Standard Specification for Zinc Coating (Hot-Dip) on Iron and Steel Hardware
ASTM A307	(2021) Standard Specification for Carbon Steel Bolts, Studs, and Threaded Rod 60 000 PSI Tensile Strength
ASTM A500/A500M	(2021a) Standard Specification for Cold-Formed Welded and Seamless Carbon Steel Structural Tubing in Rounds and Shapes
ASTM A653/A653M	(2020) Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process
ASTM A780/A780M	(2020) Standard Practice for Repair of Damaged and Uncoated Areas of Hot-Dip Galvanized Coatings
ASTM A924/A924M	(2020) Standard Specification for General Requirements for Steel Sheet, Metallic-Coated by the Hot-Dip Process
ASTM C1513	(2018) Standard Specification for Steel Tapping Screws for Cold-Formed Steel Framing Connections
ASTM D1187/D1187M	(1997; E 2011; R 2011) Asphalt-Base Emulsions for Use as Protective Coatings for Metal
ASTM E488/E488M	(2015) Standard Test Methods for Strength of Anchors in Concrete and Masonry Elements
ASTM F1554	(2020) Standard Specification for Anchor Bolts, Steel, 36, 55, and 105-ksi Yield Strength

MASTER PAINTERS INSTITUTE (MPI)

MPI 79	(2016) Primer, Alkyd, Anti-Corrosive for Metal

SOCIETY FOR PROTECTIVE COATINGS (SSPC)

SSPC SP 3	(2018) Power Tool Cleaning
SSPC SP 6/NACE No.3	(2007) Commercial Blast Cleaning

U.S. ARMY CORPS OF ENGINEERS (USACE)

EM 385-1-1	(2014) Safety and Health Requirements Manual

1.2 SUBMITTALS

Government approval is required for submittals with a "G" or "S" classification. Submittals not having a "G" or "S" classification are for information only. When used, a code following the "G" classification identifies the office that will review the submittal for the Government. Submit the following in accordance with Section 01 33 00 SUBMITTAL PROCEDURES:

SD-02 Shop Drawings
Embedded Angles and Plates, Installation Drawings; G, DO

SD-03 Product Data

Certified Mill Test Reports for Chemistry and Mechanical Properties; G

1.3 QUALIFICATION OF WELDERS

Qualify welders in accordance with AWS D1.1/D1.1M. Use procedures, materials, and equipment of the type required for the work.

1.4 DELIVERY, STORAGE, AND PROTECTION

Protect from corrosion, deformation, and other types of damage. Store items in an enclosed area free from contact with soil and weather. Remove and replace damaged items with new items.

1.5 MISCELLANEOUS REQUIREMENTS

1.5.1 Fabrication Drawings

Submit fabrication drawings showing layout(s), connections to structural system, and anchoring details as specified in AISC 303.

1.5.2 Installation Drawings

Submit templates, erection, and installation drawings indicating thickness, type, grade, class of metal, and dimensions. Show construction details, reinforcement, anchorage, and installation in relation to the building construction.

PART 2 PRODUCTS

2.1 MATERIALS

Provide exposed fastenings of compatible materials (avoid contact of

dissimilar metals). Coordinate color and finish with the material to which fastenings are applied. Submit the manufacturer's certified mill reports which clearly show the applicable ASTM mechanical and chemical requirements together with the actual test results for the supplied materials.

2.1.1 Structural Carbon Steel

Provide in accordance with ASTM A36/A36M.

2.1.2 Structural Tubing

Provide in accordance with ASTM A500/A500M.

2.1.3 Steel Pipe

Provide in accordance with ASTM A53/A53M, Type E or S, Grade B.

2.1.4 Fittings for Steel Pipe

Provide standard malleable iron fittings in accordance with ASTM A47/A47M.

2.1.5 Anchor Bolts

Provide in accordance with ASTM F1554. Where exposed, provide anchor bolts of the same material, color, and finish as the metal to which they are applied.

2.1.5.1 Expansion Anchors, Sleeve Anchors, or Adhesive Anchors

Provide expansion anchors, sleeve anchors, adhesive anchors per Contractor's design. Design values listed are as tested in accordance with ASTM E488/E488M.

2.1.5.2 Lag Screws and Bolts

Provide in accordance with ASME B18.2.1, type and grade best suited for the purpose.

2.1.5.3 Bolts, Nuts, Studs and Rivets

Provide in accordance with ASME B18.2.2 or ASTM A307.

2.1.5.4 Screws

Provide in accordance with ASME B18.2.1, ASME B18.6.2, ASME B18.6.3 and ASTM C1513.

2.1.5.5 Washers

Provide plain washers in accordance with ASME B18.22M, ASME B18.21.1. Provide beveled washers for American Standard beams and channels, square or rectangular, tapered in thickness, and smooth. Provide lock washers in accordance with ASME B18.21.2M, ASME B18.21.1.

2.1.5.6 Welded Headed Shear Studs

Provide in accordance with ASTM A108 or ASTM A29/A29M-12.

2.2 FABRICATION FINISHES

2.2.1 Galvanizing

Hot-dip galvanize items specified to be zinc-coated, after fabrication where practicable. Provide galvanizing in accordance with ASTM A123/A123M, ASTM A153/A153M, ASTM A653/A653M or ASTM A924/A924M, Z275 G90.

2.2.2 Galvanize

Trashrack, including members, anchor bolts, grating fasteners, washers, and parts or devices necessary for proper installation, unless indicated otherwise.

2.2.3 Repair of Zinc-Coated Surfaces

Repair damaged surfaces with galvanizing repair method and paint in accordance with ASTM A780/A780M or by application of stick or thick paste material specifically designed for repair of galvanizing, as approved by Contracting Officer. Clean areas to be repaired and remove slag from welds. Heat, with a torch, surfaces to which stick or paste material will be applied. Heat to a temperature sufficient to melt the metals in the stick or paste. Spread molten material uniformly over surfaces to be coated and wipe off excess material.

2.2.4 Shop Cleaning and Painting

2.2.4.1 Surface Preparation

Blast clean surfaces in accordance with SSPC SP 6/NACE No.3. Surfaces that will be exposed in spaces above ceiling or in attic spaces, crawl spaces, furred spaces, and chases may be cleaned in accordance with SSPC SP 3 in lieu of being blast cleaned. Wash cleaned surfaces which become contaminated with rust, dirt, oil, grease, or other contaminants with solvents until thoroughly clean. Steel to be embedded in concrete must be free of dirt and grease prior to embed. Do not paint or galvanize bearing surfaces, including contact surfaces within slip critical joints. Shop coat these surfaces with rust prevention.

2.2.4.2 Pretreatment, Priming and Painting

Apply pre-treatment, primer, and paint in accordance with manufacturer's printed instructions.

2.2.5 Nonferrous Metal Surfaces

Protect by plating, anodic, or organic coatings.

2.3 MISCELLANEOUS PLATES AND SHAPES

Provide trashrack, connections, fasteners, and welds.

Provide angles and plates in accordance with ASTM A36/A36M, for embedment as indicated. Galvanize embedded items exposed to the elements in accordance with ASTM A123/A123M.

PART 3 EXECUTION

3.1 GENERAL INSTALLATION REQUIREMENTS

Install items at locations indicated in accordance with manufacturer's instructions. Verify all field dimensions prior to fabrication. Include materials and parts necessary to complete each assembly, whether indicated or not. Miss-alignment and miss-sizing of holes for fasteners is cause for rejection. Conceal fastenings where practicable. Joints exposed to weather must be watertight.

3.2 WORKMANSHIP

Provide miscellaneous metalwork that is true and accurate in shape, size, and profile. Make angles and lines continuous and straight. Make curves consistent, smooth and unfaceted. Provide continuous welding along the entire area of contact except where tack welding is permitted. Do not tack weld exposed connections. Unless otherwise indicated and approved, provide a smooth finish on exposed surfaces. Provide countersuck rivets where exposed. Provide coped and mitered corner joints aligned flush and without gaps.

3.3 ANCHORAGE, FASTENINGS, AND CONNECTIONS

Provide anchorage as necessary, whether indicated or not, for fastening miscellaneous metal items securely in place. Include slotted inserts, expansion shields, through bolts for masonry, headed shear studs, machine and carriage bolts for steel, through bolts, lag bolts, and screws for wood. Do not use wood plugs. Provide non-ferrous attachments for non-ferrous metal. Provide exposed fastenings of compatible materials (avoid contact of dissimilar metals), that generally match in color and finish the surfaces to which they are applied. Conceal fastenings where practicable. Provide all fasteners flush with the surfaces they fasten, unless indicated otherwise.

3.4 BUILT-IN WORK

Where necessary and not otherwise indicated, form built-in metal work for anchorage with concrete or masonry. Provide built-in metal work in ample time for securing in place as the work progresses.

3.5 WELDING

Perform welding, welding inspection, and corrective welding in accordance with AWS D1.1/D1.1M. Use continuous welds on all exposed connections. Grind visible welds smooth in the finished installation. Provide welded headed shear studs in accordance with AWS D1.1/D1.1M, Clause 7, except as otherwise specified. Provide in accordance with the safety requirements of EM 385-1-1.

3.6 DISSIMILAR METALS

Where dissimilar metals are in contact, protect surfaces with a coating in accordance with MPI 79 to prevent galvanic or corrosive action. Where aluminum is in contact with concrete, plaster, mortar, masonry, wood, or absorptive materials subject to wetting, protect in accordance with ASTM D1187/D1187M, asphalt-base emulsion. Clean surfaces with metal shavings from installation at the end of each work day.

3.7 PREPARATION

3.7.1 Material Coatings and Surfaces

Remove rust preventive coating just prior to field erection, using a remover approved by the metal manufacturer. Surfaces, when assembled, must be free of rust, grease, dirt and other foreign matter.

3.7.2 Environmental Conditions

Do not clean or paint surfaces when damp or exposed to foggy or rainy weather, when metallic surface temperature is less than minus 5 degrees F above the dew point of the surrounding air, or when surface temperature is below 45 degrees F or over 95 degrees F, unless approved by the Contracting Officer. Metal surfaces to be painted must be dry for a minimum of 48 hours prior to the application of primer or paint.

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DIVISION 31 - EARTHWORK

SECTION 31 00 00

EARTHWORK

08/08

ATTACHMENTS:

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, drawings, and the exploration logs included within the drawings and as attachment 31 00 00A

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SECTION 31 00 00

EARTHWORK
08/08

PART 1 GENERAL

1.1 CRITERIA FOR BIDDING

Base bids on the following criteria:

a. Surface elevations are as indicated. Volumes of materials indicated are in-place, compacted.

b. Pipes or other artificial obstructions, except those indicated, will not be encountered.

c. Ground water elevations indicated by the boring logs were those existing at the time subsurface investigations were made and do not necessarily represent ground water elevation at the time of construction.

d. Subsurface soil descriptions are indicated by the exploration logs in the drawings.

1.2 REFERENCES

The publications listed below form a part of this specification to the extent referenced. The publications are referred to within the text by the basic designation only.

ASTM INTERNATIONAL (ASTM)

ASTM C136/C136M	(2019) Standard Test Method for Sieve Analysis of Fine and Coarse Aggregates
ASTM D1140	(2017) Standard Test Methods for Determining the Amount of Material Finer than 75-µm (No. 200) Sieve in Soils by Washing
ASTM D1556/D1556M	(2015; E 2016) Standard Test Method for Density and Unit Weight of Soil in Place by Sand-Cone Method
ASTM D1557	(2012; E 2015) Standard Test Methods for Laboratory Compaction Characteristics of Soil Using Modified Effort (56,000 ft-lbf/ft3) (2700 kN-m/m3)
ASTM D2167	(2015) Density and Unit Weight of Soil in Place by the Rubber Balloon Method
ASTM D2487	(2017) Standard Practice for

	Classification of Soils for Engineering Purposes (Unified Soil Classification System)
ASTM D2937	(2017; E 2017; E 2018) Standard Test Method for Density of Soil in Place by the Drive-Cylinder Method
ASTM D4318	(2017; E 2018) Standard Test Methods for Liquid Limit, Plastic Limit, and Plasticity Index of Soils
ASTM D6938	(2017a) Standard Test Method for In-Place Density and Water Content of Soil and Soil-Aggregate by Nuclear Methods (Shallow Depth)

1.3 DEFINITIONS

1.3.1 Satisfactory Materials

Satisfactory materials comprise any materials classified within the specifications as acceptable or specifically identifed for use.

1.3.2 Unsatisfactory Materials

Materials which do not comply with the requirements for satisfactory materials are unsatisfactory. Unless otherwise identified, unsatisfactory materials also include man-made fills; trash; refuse; backfills from previous construction; and material classified as satisfactory which contains root and other organic matter or frozen material. Notify the Contracting Officer when encountering any contaminated materials.

1.3.3 Cohesionless and Cohesive Materials

Cohesionless materials include materials classified in ASTM D2487 as GW, GP, SW, and SP. Cohesive materials include materials classified as GC, SC, ML, CL, MH, and CH. Materials classified as GM and SM will be identified as cohesionless only when the fines are nonplastic. Perform testing, required for classifying materials, in accordance with ASTM D4318, ASTM C136/C136M and ASTM D1140.

1.3.4 Degree of Compaction

Degree of compaction required, except as noted in the second sentence, is expressed as a percentage of the maximum dry density obtained by the test procedure presented in ASTM D1557 abbreviated as a percent of laboratory maximum density. For soils with more than 30 percent by weight of their particles retained on the 3/4 inch sieve, prepare a test section to assess field compaction.

1.3.5 Topsoil

Material suitable for topsoil is defined as: Natural, friable soil representative of productive, well-drained soils in the area, free of subsoil, stumps, rocks larger than one inch diameter, brush, weeds, toxic substances, and other material detrimental to plant growth.

1.3.6 Hard/Unyielding Materials

Hard/Unyielding materials comprise weathered rock, dense consolidated deposits, or conglomerate materials which are not included in the definition of "rock" with stones greater than 3 inch in any dimension or as defined by the pipe manufacturer, whichever is smaller. These materials usually require the use of heavy excavation equipment, ripper teeth, or jack hammers for removal.

1.3.7 Rock

Solid homogeneous interlocking crystalline material with firmly cemented, laminated, or foliated masses or conglomerate deposits, neither of which can be removed without systematic drilling and blasting, drilling and the use of expansion jacks or feather wedges, or the use of backhoe-mounted pneumatic hole punchers or rock breakers; also large boulders, buried masonry, or concrete other than pavement exceeding 1/2 cubic yard in volume. Removal of hard material will not be considered rock excavation because of intermittent drilling and blasting that is performed merely to increase production.

1.3.8 Unstable Material

Unstable materials are too wet, loose, or soft to properly support the utility pipe, conduit, or appurtenant structure.

1.3.9 Cobble Material

Cobble material pertains to excavated alluvium with a gradation (in-situ or processed) that consists of greater than 50% particles by mass retained (or number) that are 4-inches or larger, unless otherwise specified, with less than 10% sand or fines. Cobble material is primarily intended for use as backfill for berms along the Sportsman side channels, backfill for log structures, and construction of berms at the Newland Ponds. Cobble material used along levees for armoring shall conform to the gradation requirements of 35 31 19 and placement requirements of this section. Cobble material used for log structure backfill shall conform to the requirements of 35 44 00 and this section.

1.3.10 Rock Fill

Rock fill is defined as placed and compacted fill soil where the presence of particles greater than 4 inches in diameter comprise 25 percent or more by volume.

1.4 SYSTEM DESCRIPTION

Subsurface soil exploration logs are shown on the drawings. This data represents the best subsurface information available; however, variations may exist in the subsurface between exploration locations. Groundwater at time of drilling is indicated on the logs, but may not be representative of groundwater level and may vary at the time of construction.

1.4.1 Embankment and Backfill Materials

At least 30 days prior to delivery of any Contractor furnished material to the site, submit soil classification test results, moisture-density curves, gradation curves, and laboratory results of the required tests of

the proposed material. Materials for embankment and backfill construction may be obtained from required excavation of the existing levee and river channel if the material meets fill requirements. If additional suitable embankment or backfill material is required, this material shall be obtained from sources provided by the Contractor.

Materials obtained from required excavations which meet, or which can be processed to meet, the requirements for each embankment material or any other material required for this project may be utilized in the embankment or as backfill with the exception of where specifically indicated on the habitat structure drawings. All roots, limbs, and wood fragments shall be removed from embankment materials. Do not use materials containing sod, other organic or perishable material, trash, debris, and/or frozen materials in the embankment. Submit the source or sources intended to provide materials for embankment construction. If a source is selected other than a commercial quarry or other commercial entity from which earth or rock material will be directly purchased and where the Contractor or his subcontractor will perform the borrow excavation, submit a written statement indicating permission to utilize the area.

Obtain all Federal, State, and local permits which may be required for excavation and reclamation of the borrow area. Furnish a copy of the plan and procedures to be utilized for reclamation. Submit material samples from any proposed borrow source.

1.4.2 Haul Roads

Haul roads shall be located and constructed as approved by the COR within the project boundaries shown on the drawings. Prior to the commencement of construction, submit for approval a Haul Road Site Plan detailing the location of all haul roads within the project limits. Haul roads shall be constructed to maintain the intended traffic, be free draining, and be maintained in good condition throughout the contract period. Haul roads shall be removed after work is completed, and the impacted area restored to its preconstruction conditions. All haul roads within the right-of-way that will remain as public thoroughfares after construction shall be cleaned daily and maintained in the preconstruction condition.

All costs associated with these haul roads shall be included in the Contractor's bid. Damage to existing roads and pathways that are to remain after construction shall be repaired to their former condition. This includes any areas between entry and exit points on the levee as well as any surfaces used for access or staging to the entire project area, including privately owned land.

1.4.3 Slides and Foundation Failures

When sliding occurs in any part of the embankment and backfills after they have been placed, but prior to final acceptance of all work, repair the slide as directed by the COR. When the slide is caused through the fault of the Contractor, the repair shall be made at no cost to the Government. When the slide is not the fault of the Contractor, an equitable adjustment in the contract price shall be made pursuant to the Contract Clause CHANGES to cover the cost of the repairs.

1.4.4 Classification of Excavation

No consideration will be given to the nature of the materials, and all

excavation will be designated as unclassified excavation.

1.4.5 Blasting

Blasting will not be permitted.

1.4.6 Dewatering Work Plan

Submit procedures for accomplishing dewatering work. Procedures should be based on the data resources and information presented in Section 01 56 00 CARE AND DIVERSION OF WATER as well as the exploration logs included in the drawings and in 31 00 00-A.

1.5 SUBMITTALS

Government approval is required for submittals with a "G" designation; submittals not having a "G" designation are for information only. When used, a designation following the "G" designation identifies the office that will review the submittal for the Government. Submit the following in accordance with Section 01 33 00 SUBMITTAL PROCEDURES:

SD-01 Preconstruction Submittals

Dewatering Work Plan; G,DO

Newland Ponds Berms Work Plan; G,DO

Embankment And Backfill Materials; G,DO

Haul Road Site Plan; G

Opening Of Any Excavation Or Borrow Pit; G

Rock Fill Construction Plan; G, DO

SD-03 Product Data

Utilization of Excavated Materials; G,DO

Quarry Spalls

Running Course; G, DO

Shoulder Ballast

SD-06 Test Reports

Testing; G, DO

Within 24 hours of conclusion of physical tests, submit three copies of test results, including calibration curves and results of calibration tests.

SD-07 Certificates

Testing; G, DO

1.6 Work Plans

1.6.1 Dewatering Work Plan

Submit procedures for accomplishing dewatering work. Procedures should be based on the data resources and information presented in Section 01 56 00 CARE AND DIVERSION OF WATER as well as the exploration logs included in the drawings and in 31 00 00A. Note the requirements to prepare and evacuation plan as part of Section 01 56 00.

PART 2 PRODUCTS

2.1 BURIED WARNING AND IDENTIFICATION TAPE

Provide polyethylene plasticandmetallic core or metallic-faced, acid- and alkali-resistant, polyethylene plastic warning tape manufactured specifically for warning and identification of buried utility lines. Provide tape on rolls, 3 inches minimum width, color coded as specified below for the intended utility with warning and identification imprinted in bold black letters continuously over the entire tape length. Warning and identification to read, "CAUTION, BURIED (intended service) LINE BELOW" or similar wording. Provide permanent color and printing, unaffected by moisture or soil.

Warning Tape Color Codes	
Red	Electric
Yellow	Gas, Oil; Dangerous Materials
Orange	Telephone and Other Communications
Blue	Water Systems
Green	Sewer Systems
White	Steam Systems
Gray	Compressed Air

2.2 MATERIAL FOR RIP-RAP ARMORING

Materials for rip-rap armoring shall conform to the following paragraphs as well as Section 35 31 19 STONE PROTECTION FOR STRUCTURES.

2.2.1 Bedding Material

Bedding Layer / Quarry Spalls shall conform to Section 35 31 19 STONE PROTECTION FOR STRUCTURES.

2.2.2 Shoulder Ballast

The shoulder ballast shall be composed of tough, durable particles, adequately free from thin, flat and elongated pieces, and shall contain no

organic matter nor soft, friable particles in quantities considered objectionable by the COR/GDA. The aggregate shall meet the quality requirements of ASTM C33/C33M. Grading shall conform to the following requirements:

Los Angeles Wear, 500 Rev 40 percent max.
Degradation Factor 15 min.

TABLE 1 - BALLAST GRADATION	
Sieve Size	Percent Passing
2.5 inch	99-100
2 inch	65-100
1 INCH	50-85
NO. 4	26-44
NO. 40	16 MAX
NO. 200	9.0 MAX
DUST RATIO	2/3 MAX
SAND EQUIVALENT	35 MIN

2.2.3 Quarry Spalls

Provide quarry spalls according to Section 35 31 19 STONE PROTECTION FOR STRUCTURES.

2.2.4 Riprap

Provide riprap according to Section 35 31 19 STONE PROTECTION FOR STRUCTURES.

2.3 EMBANKMENT MATERIAL

Satisfactory embankment material shall consist of materials generated from the locations indicated in the plans for degrade and removal and shall be free of material as defined in the paragraph UNSATISFACTORY MATERIAL

2.3.1 Blue Slough Levee

Materials for the construction of the Blue Slough Levee shall be generated from existing levee degrade features only. If additional suitable embankment or backfill material is required the contractor shall submit soil classification test results 15 days prior to use.

2.3.2 Newland Ponds Berms

Materials for the construction of the Newland Ponds Berms shall be

generated from all spoils associated with channel excavations and existing levee degrades areas. Contractor should attempt to prioritize the fill consisting of sands and gravel for any material placed below the water surface elevation at the time of construction. The order in which the berms are constructed shall reflect what is indicated on the drawings and be included in the Newland Ponds Berms Work Plan as described in the following paragraph.

2.3.2.1 Newland Ponds Berms Work Plan

Prior to the start of work, submit for Government approval a work plan associated with the construction of the Newland Ponds berms features. The work plan should include at a minimum the proposed access and haul routes, equipment, methodology and material storage area (onsite and offsite). Indicate if the construction requires specific site conditions such as dewatering, temporary diversion of water, surface water elevations as examples. Procedures for dewatering should be based on the data resources and information presented in Section 01 56 00 CARE AND DIVERSION OF WATER, drawings, and the exploration logs included within the drawings and as attachment 31 00 00A. For construction below the pond water surface, provide methodology for surveying and verifying the constructed condition in accordance with plans. Based on the intended methods proposed, submit for approval in the work plan tolerances for materials placed below the pond water surface. The work plan shall be reviewed and stamped by a registered professional engineer licensed in Washington state with a minimum of 5 years of experience in earth fill embankments and slope stability. The work plan shall meet all applicable safety standards as required by Engineering Manual 385-1-1: Safety and Health Requirement as well as all local and state safety standards.

Procedures should be based on the data resources and information presented in Section 01 56 00 CARE AND DIVERSION OF WATER as well as the exploration logs included in the drawings and in 31 00 00A.

2.3.3 Running Course

The top 6 inches of the embankment shall be comprised of a crushed surfacing manufactured from ledge rock, talus, or gravel. The materials shall be uniform in quality and substantially free from wood, roots, bark, and other extraneous material and shall meet the following quality test requirements:

Los Angeles Wear, 500 Rev. 35 percent max.
Degradation Factor 25 min

Sieve Size	Percent Passing (By Weight)
1 1/4 inch	99-100
1 inch	80-100
5/8 inch	50-80
No. 4	25-45
No. 40	3-18

Sieve Size	Percent Passing (By Weight)
No. 200	10.0 max

Running course shall also have a minimum fracture content of 75 percent and a minimum sand equivalent content of 40 percent.

PART 3 EXECUTION

3.1 STRIPPING OF TOPSOIL

Where indicated or directed, strip topsoil to a minimum depth of 12 inches. Strip and prepare the subgrade soils in accordance with Paragraph SUBGRADE PREPARATION below which requires a stripping depth for unsatifactory material beneath structures. Spread topsoil on areas already graded and prepared for topsoil, or transported and deposited in stockpiles convenient to areas that are to receive application of the topsoil later, or at locations indicated or specified. Keep topsoil separate from other excavated materials, brush, litter, objectionable weeds, roots, stones larger than 12 inches in diameter, and other materials that would interfere with planting and maintenance operations. Remove any surplus of topsoil from excavations and gradings as specified. Strippings may be reused on-site.

3.2 GENERAL EXCAVATION

Perform excavation of every type of material encountered within the limits of the project to the lines, grades, and elevations indicated and as specified. Perform the grading in accordance with the typical sections shown and the tolerances specified in paragraph FINISHING. Transport satisfactory excavated materials and place in fill or embankment within the limits of the work. Excavate unsatisfactory materials encountered within the limits of the work below grade and replace with satisfactory materials as directed. Include such excavated material and the satisfactory material ordered as replacement in excavation. Dispose surplus satisfactory excavated material not required for fill or embankment in areas approved for surplus material storage or designated waste areas. Dispose unsatisfactory excavated material in designated waste or spoil areas. During construction, perform excavation and fill in a manner and sequence that will provide proper drainage at all times. Excavate material required for fill or embankment in excess of that produced by excavation within the grading limits from the borrow areas indicated or from other approved areas selected by the Contractor as specified.

3.2.1 Ditches, Gutters, and Channel Changes

Finish excavation of ditches, gutters, and channel changes by cutting accurately to the cross sections, grades, and elevations shown on plans. Do not excavate ditches and gutters below grades shown. Backfill the excessive open ditch or gutter excavation with satisfactory, thoroughly compacted, material or with suitable stone or cobble to grades shown. Dispose excavated material as shown or as directed, except in no case allow material be deposited a maximum 4 feet from edge of a ditch. Maintain excavations free from detrimental quantities of leaves, brush, sticks, trash, and other debris until final acceptance of the work.

3.2.2 Drainage

Provide for the collection and disposal of surface and subsurface water encountered during construction. Completely drain construction site during periods of construction to keep soil materials sufficiently dry. Construct storm drainage features (ponds/basins) at the earliest stages of site development, and throughout construction grade the construction area to provide positive surface water runoff away from the construction activity or provide temporary ditches, swales, and other drainage features and equipment as required to maintain dry soils. When unsuitable working platforms for equipment operation and unsuitable soil support for subsequent construction features develop, remove unsuitable material and provide new soil material as specified herein. It is the responsibility of the Contractor to assess the soil and ground water conditions presented by the plans and specifications and to employ necessary measures to permit construction to proceed.

3.2.3 Dewatering

For construction of levees, culverts, ramps and revetments, control groundwater flowing toward or into excavations to prevent sloughing of excavation slopes and walls, boils, uplift and heave in the excavation and to eliminate interference with orderly progress of construction. Do not permit French drains, sumps, ditches or trenches within 3 feet of the foundation of any structure, except with specific written approval, and after specific contractual provisions for restoration of the foundation area have been made. Take control measures by the time the excavation reaches the water level in order to maintain the integrity of the in situ material. While the excavation is open, maintain the water level continuously, at least 2 feet below the working level. Relieve hydrostatic head in previous zones below subgrade elevation in layered soils to prevent uplift.

For excavated ditches, channels, ponds and temporary excavations related to installation of fish habitat, work in the wet is permitted provided that the the grades and dimensions can be safely controlled and verified without violating project permit conditions. When possible sequence the work from downstream to upstream end of the channel to allow for encountered groundwater to drain from the work area. Cofferdams, pumps, ditches and other measures will be utilized if sloughing or other instabilities prevent control or verification of the work or jeopardize safety or if construction activities threaten to result in unpermitted water quality impacts.

3.2.4 Trench Excavation Requirements

Excavate the trench as recommended by the manufacturer of the pipe to be installed. Slope trench walls below the top of the pipe, or make vertical, and of such width as recommended in the manufacturer's printed installation manual. Provide vertical trench walls where no manufacturer's printed installation manual is available. Shore trench walls more than 4 feet high, cut back to a stable slope, or provide with equivalent means of protection for employees who may be exposed to moving ground or cave in. Excavate trench walls which are cut back to at least the angle of repose of the soil. Give special attention to slopes which may be adversely affected by weather or moisture content. The width of trenches at any point below the top of the pipe shall be not greater than the outside diameter of the pipe plus 6 inches to permit satisfactory

jointing and thorough tamping of the bedding material under and around the pipe. Where recommended trench widths are exceeded, provide redesign, stronger pipe, or special installation procedures by the Contractor. The Contractor is responsible for the cost of redesign, stronger pipe, or special installation procedures without any additional cost to the Government.

3.2.4.1 Bottom Preparation

Grade the bottoms of trenches accurately to provide uniform bearing and support for the bottom quadrant of each section of the pipe. Excavate bell holes to the necessary size at each joint or coupling to eliminate point bearing. Remove stones of 3 inches or greater in any dimension, or as recommended by the pipe manufacturer, whichever is smaller, to avoid point bearing.

3.2.4.2 Removal of Unyielding Material

Where unyielding material is encountered in the bottom of the trench, remove such material 6 inches inch below the required grade and replaced with suitable materials as provided in paragraph BACKFILLING AND COMPACTION.

3.2.4.3 Removal of Unstable Material

Where unstable material is encountered in the bottom of the trench, remove such material to the depth directed and replace it to the proper grade with select granular material as provided in paragraph BACKFILLING AND COMPACTION. When removal of unstable material is required due to the Contractor's fault or neglect in performing the work, the Contractor is responsible for excavating the resulting material and replacing it without additional cost to the Government.

3.2.4.4 Excavation for Appurtenances

Provide excavation for manholes, catch-basins, inlets, or similar structures of sufficient size to permit the placement and removal of forms for the full length and width of structure footings and foundations as shown. This also applies to the removal of existing structures and the installation of precast items. Clean rock or loose debris and cut to a firm surface either level, stepped, or serrated, as shown or as directed. Remove loose disintegrated rock and thin strata. Specify removal of unstable material. When concrete or masonry is to be placed in an excavated area, take special care not to disturb the bottom of the excavation. Do not excavate to the final grade level until just before the concrete or masonry is to be placed.

3.2.5 Underground Utilities

The Contractor is responsible for movement of construction machinery and equipment over pipes and utilities during construction. Perform work adjacent to non-Government utilities as indicated in accordance with procedures outlined by utility company. Excavation made with power-driven equipment is not permitted within 2 feet of known Government-owned utility or subsurface construction. For work immediately adjacent to or for excavations exposing a utility or other buried obstruction, excavate by hand. Start hand excavation on each side of the indicated obstruction and continue until the obstruction is uncovered or until clearance for the new grade is assured. Support uncovered lines or other existing work affected

by the contract excavation until approval for backfill is granted by the Contracting Officer. Report damage to utility lines or subsurface construction immediately to the Contracting Officer.

3.3 SELECTION OF BORROW MATERIAL

Select borrow material to meet the requirements and conditions of the particular fill or embankment for which it is to be used. Obtain borrow material from approved private sources. Unless otherwise provided in the contract, obtain the right to procure material, pay royalties and other charges involved, and bear the expense of developing the sources including rights-of-way for hauling from the owners.

Unless specifically provided, do not obtain borrow within the limits of the project site without prior written approval. Consider necessary clearing, grubbing, and satisfactory drainage of borrow pits and the disposal of debris related operations to the borrow excavation.

3.4 OPENING AND DRAINAGE OF EXCAVATION AND BORROW PITS

Notify the Contracting Officer sufficiently in advance of the opening of any excavation or borrow pit or borrow areas to permit elevations and measurements of the undisturbed ground surface to be taken. Except as otherwise permitted, excavate borrow pits and other excavation areas providing adequate drainage. Transport overburden and other spoil material to designated spoil areas or otherwise dispose of as directed. Provide neatly trimmed and drained borrow pits after the excavation is completed. Ensure that excavation of any area, operation of borrow pits, or dumping of spoil material results in minimum detrimental effects on natural environmental conditions.

3.5 GRADING AREAS

Where indicated, divide work into grading areas within which satisfactory excavated material will be placed in embankments, fills, and required backfills. Do not haul satisfactory material excavated in one grading area to another grading area except when so directed in writing. Place and grade stockpiles of satisfactory and unsatisfactory as specified. Keep stockpiles in a neat and well drained condition, giving due consideration to drainage at all times. Clear, grub, and seal by rubber-tired equipment, the ground surface at stockpile locations; separately stockpile excavated satisfactory and unsatisfactory materials. Protect stockpiles of satisfactory materials from contamination which may destroy the quality and fitness of the stockpiled material. If the Contractor fails to protect the stockpiles, and any material becomes unsatisfactory, remove and replace such material with satisfactory material from approved sources at no additional cost to the Government.

3.6 SUBGRADE PREPARATION

3.6.1 General Requirements

Remove and replace unsatisfactory material with satisfactory materials, as directed by the Contracting Officer, in surfaces to receive fill or in excavated areas. Strip topsoil in accordance with paragraph STRIPPING OF TOPSOIL.

Overexcavation for ground surface preperation shall not be performed except at the direction of the COR and shall meet the requirements as

described in Paragraph EXCAVATION. Overexcavation depths shall not exceed 2 feet in depth except when deleterious materials are present which may impact stability or underseepage performance. Scarify the surface to a depth of 6 inches before the fill is started. Plow, step, bench, or break up sloped surfaces steeper than 1 vertical to 4 horizontal so that the fill material will bond with the existing material. All regions that will receive fill will be approved prior to placement by the COR. When the subgrade is part fill and part excavation or natural ground, scarify the excavated or natural ground portion to a depth of 12 inches and compact it as specified for the adjacent fill.

3.6.2 Frozen Material

Do not place material on surfaces that are muddy, frozen, or contain frost. Finish compaction by sheepsfoot rollers, pneumatic-tired rollers, steel-wheeled rollers, or other approved equipment well suited to the soil being compacted. Moisten material as necessary to provide the moisture content that will readily facilitate obtaining the specified compaction with the equipment used.

3.7 UTILIZATION OF EXCAVATED MATERIALS

All excavated materials of natural origin (river or floodplain alluvium, imported granular materials) are to be reused on site where indicated. There are three primary classes of excavated materials, cobble, levee and general. Cobble materials are greater than 50% by volume gravel and cobble greater than 4-inches, including boulders. Levee materials originate from man-made embankments and generally are intended for re-use within new levees provided the materials meet new levee embankment requirements. General excavated materials are all other excavated materials that are to be reused onsite where no material type is indicated. Cobble can be used as general excavated material if the indicated quantity of cobble backfill is less than the excavated quantity. The drawings specify the utilization of encountered materials.

Dispose unsatisfactory materials removed from excavations into designated waste disposal or spoil areas. Use satisfactory material removed from excavations, insofar as practicable, in the construction of fills, embankments, subgrades, shoulders, bedding (as backfill), and for similar purposes. Submit procedure and location for disposal of unused satisfactory material. Submit proposed source of borrow material. Do not waste any satisfactory excavated material without specific written authorization. Dispose of satisfactory material, authorized to be wasted, in designated areas approved for surplus material storage or designated waste areas as directed. Clear and grub newly designated waste areas on Government-controlled land before disposal of waste material thereon. Stockpile and use coarse rock from excavations for constructing slopes or embankments adjacent to streams, or sides and bottoms of channels and for protecting against erosion. Unless othewise indicated, do not dispose excavated material to obstruct the flow of any stream, endanger a partly finished structure, impair the efficiency or appearance of any structure, or be detrimental to the completed work in any way.

3.7.1 PLACEMENT AND COMPACTION OF EXCAVATED MATERIAL

Prepare ground surface on which fill or backfill is to be placed and provide compaction requirements for fill materials in conformance with the applicable portions of paragraphs SUBGRADE PREPARATION above. Place and compact material in accordance with paragraph FILLING AND COMPACTION.

3.8 FILLING AND COMPACTION

Place fill or backfill adjacent to any and all types of structures, in successive horizontal layers of loose material not more than 12 inches in depth. Compact to at least 90 percent laboratory maximum density for cohesive materials or 95 percent laboratory maximum density for cohesionless materials, to prevent wedging action or eccentric loading upon or against the structure. Maximum dry density shall be determined in accordance with ASTM D1557. Backfill material must be within the range of -2 to +2 percent of optimum moisture content at the time of compaction. Removes large boulders and cobbles as necessary to meet compaction requirements.

Prepare ground surface on which fill or backfill is to be placed and provide compaction requirements for fill materials in conformance with the applicable portions of paragraphs SUBGRADE PREPARATION above. Finish compaction by sheepsfoot rollers, pneumatic-tired rollers, steel-wheeled rollers, vibratory compactors, or other approved equipment.

3.8.1 TRENCH BACKFILL

Backfill for all culverts and storm drainage utilities shall be in accordance with the applicable portions of Section 33 40 00 STORM DRAINAGE UTILITIES

3.9 SPECIAL REQUIREMENTS

Special requirements for both excavation and backfill relating to the specific utilities are as follows:

3.9.1 Rip-Rap Construction

Provide riprap as indicated in Section 35 31 19 STONE, CHANNEL, SHORELINE/COASTAL PROTECTION FOR STRUCTURES. Construct riprap on bedding material in the areas indicated. Trim and dress indicated areas to conform to cross sections, lines, and grades shown within a tolerance of minus 0.0 to plus 0.5 feet.

3.9.1.1 Bedding Placement

Spread bedding material uniformly to a thickness of at least 3 inches on prepared subgrade as indicated. Finish bedding to present even surface free from mounds and windrows.

3.9.1.2 Stone Placement

Place rock for rip-rap on prepared bedding material to produce a well graded mass with the minimum practicable percentage of voids in conformance with lines and grades indicated. Distribute larger rock fragments, with dimensions extending the full depth of the rip-rap throughout the entire mass and eliminate "pockets" of small rock fragments. Rearrange individual pieces by mechanical equipment or by hand as necessary to obtain the distribution of fragment sizes specified above.

3.9.1.3 Newland Ponds Fill

Fill placed to establish the inter-pond fill sites are not anticipated to be completely dewatered at the time of construction. Grading shall be completed to conform as shown on the plans with minimal compactive effort being applied until fill placement is above the surface water elevation at the time of construction. All fill placed above the surface water elevation shall conform to the criteria specified in paragraph FILLING AND COMPACTION.

3.10 EMBANKMENTS

Construct embankments from satisfactory materials free of organic or frozen material. Remove boulders, cobbles and rocks as necessary to meet compaction requirements. Where the presence of particles greater than 4 inches in diameter consist of 25 percent or more by volume, material will follow the requirements in paragraph ROCK FILL AND COMPACTION.

Where new earth embankments tie-in to existing embankments, the contractor shall meets the requirements presented in paragraph SUBGRADE PREPARATION. Fill and compaction requirements for earth embankments shall meet those specified in paragraph FILLING AND COMPACTION. Finish compaction by sheepsfoot rollers, pneumatic-tired rollers, steel-wheeled rollers, vibratory compactors, or other approved equipment.

3.11 Rock Fill and Compaction

Requirements in the following paragraphs pertain to all embankments EXCLUDING the Newland Pond Berms, as construction requirements are to be included in the Newland Ponds Berms Work Plan submittal. Where the use of rock fill (including cobble fill) is permissible or directed by the drawings, submit for approval a Rock Fill Construction Plan. See the following paragraph for requirements.

3.11.1 Rock Fill Construction Plan

Submit for approval by the Government District Office a constuction plan for the placement of rock fill based on a 100 linear foot test section. The test section will be constructed as the rock fill material is placed for embankment or berm construction. Additional placement of the rock fill will not be permissible until the Government District Office receives and approves the Rock Fill Construction Plan. As a minimum the construction plan shall include the following:

a. For compaction use a 10-ton, minumum, vibratory roller having a dynamic force of at least 30,000-pounds impact per vibration and at least 1,000 vibrations per minute. The roller shall make four full coverages for each 6 inches, or any fraction of 6 inches, of lift depth.

b. Rollers must exert reasonably even pressure over the area covered. Limit the speed of vibratory rollers to no more than 1.5 mph.

c. If possible, the Contractor shall compact the material even further by routing empty and loaded hauling equipment evenly over the entire width of the embankment.

d. For each lift perform a proof-roll in the systematic method as presented in paragraph PROOF-ROLLING. Each lift shall be monitored by

the COR.

e. Any proposed deviation from paragraph FILLING AND COMPACTION.

Additional criteria may need to be developed at the discretion of the COR to determine appropriate methodolgies to meet the required level of compaction, such as moisture conditioning. All techniques and methodoligies used in the approved test section shall be used in the filling and compaction of all rock fill. As the particle size distribution may vary, criteria may need to be refined or altered depending on performance and at the direction of the COR.

Should excessive moisture threaten the stability of the embankment the Engineer may order the Contractor to alter the operation. This may include alternating layers of wet and dry materials, drying materials before placing, or halting Work in the problem areas. In this case the Contracting Agency will not increase payment, but will pay the unit Contract prices for the pay items that apply

3.12 FINISHING

Finish the surface of excavations, embankments, and subgrades to a smooth and compact surface in accordance with the lines, grades, and cross sections or elevations shown. Finish gutters and ditches in a manner that will result in effective drainage. Finish the surface of areas to be turfed from settlement or washing to a smoothness suitable for the application of turfing materials. Repair graded, topsoiled, or backfilled areas prior to acceptance of the work, and re-established grades to the required elevations and slopes.

3.12.1 General Finish Tolerance

Provide the degree of finish for graded areas within 0.1 foot of the grades and elevations indicated except that the degree of finish for subgrades specified in paragraph SUBGRADE PREPARATION.

3.12.2 Newland Pond Berms Finish Tolerance

For regions below the pond water surface see paragraph NEWLAND PONDS BERMS WORK PLANS; above the pond water surface, finishing shall be provided as indicated in paragraph GENERAL FINISH TOLERANCES.

3.12.3 Subgrade and Embankments

During construction, keep embankments and excavations shaped and drained. Maintain ditches and drains along subgrade to drain effectively at all times. Do not disturb the finished subgrade by traffic or other operation. Protect and maintain the finished subgrade in a satisfactory condition until ballast, subbase, base, or pavement is placed. Do not permit the storage or stockpiling of materials on the finished subgrade. Do not lay subbase, base course, ballast, or pavement until the subgrade has been checked and approved, and in no case place subbase, base, surfacing, pavement, or ballast on a muddy, spongy, or frozen subgrade.

3.12.3.1 Proof Rolling

The following paragraph only applies to embankments where the subgrade elevation is above the surface water elevation at the time of construction.

Prior to embankment construction, finish proof rolling on an exposed subgrade free of surface water (wet conditions resulting from rainfall) which would promote degradation of an otherwise acceptable subgrade. After stripping, proof roll the existing subgrade of the wetland embankments with six passes of a dump truck loaded with soil to gross capacity. Operate the truck in a systematic manner to ensure the number of passes over all areas, and at speeds between 2-1/2 to 3-1/2 mph. Notify the COR a minimum of three days prior to proof rolling. Perform proof rolling in the presence of the COR. Undercut rutting or pumping of material as directed by the COR and replace with satisfactory embankment material. Prepare bids based on replacing approximately 5,000 square feet, with an average depth of one foot at various locations.

3.12.4 Grading Around Structures

Construct areas within 5 feet outside of each building and structure line true-to-grade, shape to drain, and maintain free of trash and debris until final inspection has been completed and the work has been accepted.

3.13 TESTING

Perform testing by a Corps validated commercial testing laboratory or the Contractor's validated testing facility. Submit qualifications of the Corps validated commercial testing laboratory or the Contractor's validated testing facilities. If the Contractor elects to establish testing facilities, do not permit work requiring testing until the Contractor's facilities have been inspected, Corps validated and approved by the Contracting Officer.

All testing requirements described in the following sections pertain to all placed and compacted fill not classified as Rock Fill as is defined in paragraph ROCK FILL.

a. Determine field in-place density in accordance with ASTM D1556/D1556M, ASTM D2167, or ASTM D6938. When ASTM D6938 is used, check the calibration curves and adjust using only the sand cone method as described in ASTM D1556/D1556M. ASTM D6938 results in a wet unit weight of soil in determining the moisture content of the soil when using this method.

b. Report field in-place density tests with degree of compaction and moisture content based on the refffff

b. Check the calibration curves furnished with the moisture gauges along with density calibration checks as described in ASTM D6938; check the calibration of both the density and moisture gauges at the beginning of a job on each different type of material encountered and at intervals as directed by the Contracting Officer. ASTM D2937, use the Drive Cylinder Method only for soft, fine-grained, cohesive soils. When test results indicate, as determined by the Contracting Officer, that compaction is not as specified, remove the material, replace and recompact to meet specification requirements.

c. Perform tests on recompacted areas to determine conformance with specification requirements. Appoint a registered professional civil engineer to certify inspections and test results. These certifications shall state that the tests and observations were performed by or under the direct supervision of the engineer and that the results are representative of the materials or conditions being

certified by the tests. The following number of tests, if performed at the appropriate time, will be the minimum acceptable for each type operation.

3.13.1 Fill and Backfill Material Gradation

One test per 500 cubic yards stockpiled or in-place source material. Determine gradation of fill and backfill material in accordance with ASTM C136/C136Mand ASTM D1140. For requirements pertaining to trench backfill for utilities such as storm drainage and culverts, see division STORM DRAINAGE UTILITIES 33 44 00.

3.13.2 In-Place Densities

a. One test per 500 square feet, or fraction thereof, of each lift of fill or backfill areas compacted by other than hand-operated machines.

b. One test per 500 square feet, or fraction thereof, of each lift of fill or backfill areas compacted by hand-operated machines.

c. One test per 100 linear feet, or fraction thereof, of each lift of embankment.

3.13.3 Check Tests on In-Place Densities

If ASTM D6938 is used, check in-place densities by ASTM D1556/D1556M as follows:

a. One check test per lift for each 10,000 square feet, or fraction thereof, of each lift of fill or backfill compacted by other than hand-operated machines.

b. One check test per lift for each 10,000 square feet, of fill or backfill areas compacted by hand-operated machines.

c. One check test per lift for each 1,000 linear feet, or fraction thereof, of embankment or backfill.

3.13.4 Moisture Contents

In the stockpile, excavation, or borrow areas, perform a minimum of two tests per day per type of material or source of material being placed during stable weather conditions. During unstable weather, perform tests as dictated by local conditions and approved by the Contracting Officer.

3.13.5 Optimum Moisture and Laboratory Maximum Dry Density

Perform tests for each type material or source of material including borrow material to determine the optimum moisture and laboratory maximum density values. Optimum moisture and laboratory maxium dry density will be determined in accordance with ASTM D1557. One representative test per 1000 cubic yards of placed fill and backfill, or when any change in material occurs which may affect the optimum moisture content or laboratory maximum density.

3.13.6 Tolerance Tests for Subgrades

Perform continuous checks on the degree of finish specified in paragraph SUBGRADE PREPARATION during construction of the subgrades.

3.13.7 Field Gradation Testing of Cobble Materials

Select and stockpile representative cobble materials that will be reused as backfill where cobble materials are indicated and to aid in quality control using visual inspection of cobble material stockpiles and embankments. Use standard seive tests or Wolman Pebble Counts to establish that the materials meet the requirements in the Definitions paragraph prior to constructing cobble material embankments.

3.14 DISPOSITION OF SURPLUS MATERIAL

All surplus soil shall be reused in the indicated areas shown on the drawings. All surplus material comprised of brush, stumps, roots, and timber shall be reused in the large woody debris or structures as indicated in the drawings. Any waste or other refuse not suitable for reuse in the project features shall be removed from the project site to a licensed/permitted facility .

-- End of Section --

DRILLING LOG

DIVISION	USACE NWS
INSTALLATION	Yakima, Washington
SHEET	1 OF 1 SHEETS
1. PROJECT	Yakima Ecosystem Restoration
9. COORDINATE SYSTEM	EPSG: 6599
HORIZONTAL	NAD83
VERTICAL	NAVD88
10. SIZE AND TYPE OF BIT	4.25" I.D/8.25" O.D Hollow Stem Auger
2. HOLE NUMBER	2020-BH-01
LOCATION COORDINATES	N 452279.294 E 1651803.602
11. MANUFACTURER'S DESIGNATION OF DRILL	Mobile Drill B57
3. DRILLING AGENCY	Holt Services, Inc.
12. TOTAL SAMPLES	DISTURBED 8 / UNDISTURBED 0
4. NAME OF DRILLER	Abe Causland
13. TOTAL NUMBER CORE BOXES	0
5. DIRECTION OF BORING	☒ VERTICAL ☐ INCLINED
DEG FROM VERTICAL	---
BEARING	
14. ELEVATION GROUND WATER	6.8
15. DATE BORING	STARTED 3/23/20 / COMPLETED 3/23/20
6. THICKNESS OF OVERBURDEN	
16. ELEVATION TOP OF BORING	990'
7. DEPTH DRILLED INTO ROCK	
17. TOTAL CORE RECOVERY FOR BORING	N/A
8. TOTAL DEPTH OF BORING	26
18. SIGNATURE AND TITLE OF INSPECTOR	Justin McCarley - Geologist

ELEV	DEPTH	LEGEND	FIELD CLASSIFICATION OF MATERIALS (Description)	% REC	Samp No.	RQD %	REMARKS	Blows/ 0.5 ft	N-Value
			SILT with sand (ML); up to 5% rounded gravel; 15% fine to coarse sand; 80% silty, medium dense, non-plastic, rapid dilatant fines; gray to brown, dry to wet (ALLUVIUM)	40	S-3			4 5 9	14
				100	S-4			13 12 9	21
				40	S-5			12 16 14	30
982.5	7.5								
			Silty GRAVEL with sand (GM); 82% dense to very dense, rounded gravel; 15% coarse sand; 3% silty, non-plastic, rapid dilatant fines; wet (ALLUVIUM)	67	S-6		Gradation testing was done on hollow stem auger cuttings.	16 19 19	38
				67	S-7			12 24 27	51
975.0	15.0								
			Silty SAND (SM); up to 5% rounded gravel; 80% dense, fine to coarse sand; 15-20% silty, non-plastic, rapid dilatant fines; gray, wet (ALLUVIUM)	43	S-8			53	53 /
970.0	20.0								
			Silty GRAVEL with sand (GM); 50% very dense, rounded gravel; 30% fine to coarse sand; 20% silty, non-plastic, rapid dilatant fines; gray, wet (ALLUVIUM)	27	S-9			46 35 50	85
				50	S-10			4 55	55 /
964.0	26.0						Driller notes very dense gravel/cobble-like drilling at about 25.5 feet. Drill met refusal at 26 feet.		

0.0
4.3
8.6
12.9
17.1
21.4
25.7

BOTTOM OF BOREHOLE AT 26.0 ft

DRILLING LOG

DIVISION	USACE NWS
INSTALLATION	Yakima, Washington
SHEET	1 OF 1 SHEETS
1. PROJECT	Yakima Ecosystem Restoration
9. COORDINATE SYSTEM	EPSG: 6599
HORIZONTAL	NAD83
VERTICAL	NAVD88
10. SIZE AND TYPE OF BIT	4.25" I.D/8.25" O.D Hollow Stem Auger
2. HOLE NUMBER	2020-BH-02
LOCATION COORDINATES	N 452179.13 E 1652014.907
11. MANUFACTURER'S DESIGNATION OF DRILL	Mobile Drill B57
3. DRILLING AGENCY	Holt Services, Inc.
12. TOTAL SAMPLES	DISTURBED 8 / UNDISTURBED 0
4. NAME OF DRILLER	Abe Causland
13. TOTAL NUMBER CORE BOXES	0
5. DIRECTION OF BORING	☒ VERTICAL ☐ INCLINED
DEG FROM VERTICAL	---
BEARING	
14. ELEVATION GROUND WATER	6
15. DATE BORING	STARTED 3/24/20 / COMPLETED 3/24/20
6. THICKNESS OF OVERBURDEN	
16. ELEVATION TOP OF BORING	992'
7. DEPTH DRILLED INTO ROCK	
17. TOTAL CORE RECOVERY FOR BORING	N/A
8. TOTAL DEPTH OF BORING	24.4
18. SIGNATURE AND TITLE OF INSPECTOR	Justin McCarley - Geologist

ELEV	DEPTH	LEGEND	FIELD CLASSIFICATION OF MATERIALS (Description)	% REC	Samp No.	RQD %	REMARKS	Blows/ 0.5 ft	N-Value	
			Sandy SILT (ML); up to 5% rounded gravel; 40-50% very fine to fine sand; 50-60% medium dense, silty, non-plastic, rapid dilatant fines; dark brown, dry to wet, scattered organics (ALLUVIUM)	47	S-3			1 3 5	8	0.0
				47	S-4			5 5 7	12	
987.5	4.5									4.3
			Silty SAND with gravel (SM); 17% rounded gravel; 55.7% loose to medium dense, fine to coarse sand; 27.3% silty, non-plastic, rapid dilatant fines; gray to brown, wet (ALLUVIUM)	100	S-5		Gradation testing was done on hollow stem auger cuttings.	1 2 1	3	
				80	S-6			0 0 0	0	8.6
982.0	10.0									
			Well-graded SAND with gravel (SW); 20% fine, rounded gravel; 70% dense, fine to coarse sand; 10% silty, non-plastic, rapid dilatant fines; gray, wet (ALLUVIUM)	40	S-7			15 50	50 /	12.9
				100	S-8			38 44 33	77	17.1
				80	S-9			28 49 52	100+	21.4
967.6	24.4			107	S-10		Driller notes very dense gravel/cobble-like drilling at about 22.5 feet. Drill met refusal at 23 feet. Final SPT to 24.4 feet.	27 49 50	99	

BOTTOM OF BOREHOLE AT 24.4 ft

DRILLING LOG

DIVISION	USACE NWS
INSTALLATION	Yakima, Washington
SHEET	1 OF 1 SHEETS
1. PROJECT	Yakima Ecosystem Restoration
9. COORDINATE SYSTEM	EPSG: 6599
HORIZONTAL	NAD83
VERTICAL	NAVD88
10. SIZE AND TYPE OF BIT	4.25" I.D/8.25" O.D Hollow Stem Auger
2. HOLE NUMBER	2020-BH-03
LOCATION COORDINATES	N 451007.625 E 1651717.314
11. MANUFACTURER'S DESIGNATION OF DRILL	Mobile Drill B57
3. DRILLING AGENCY	Holt Services, Inc.
12. TOTAL SAMPLES	DISTURBED 7 / UNDISTURBED 0
4. NAME OF DRILLER	Abe Causland
13. TOTAL NUMBER CORE BOXES	0
14. ELEVATION GROUND WATER	7
5. DIRECTION OF BORING	☒ VERTICAL ☐ INCLINED
DEG FROM VERTICAL	---
BEARING	
15. DATE BORING	STARTED 3/25/20 / COMPLETED 3/25/20
6. THICKNESS OF OVERBURDEN	
16. ELEVATION TOP OF BORING	984'
7. DEPTH DRILLED INTO ROCK	
17. TOTAL CORE RECOVERY FOR BORING	N/A
8. TOTAL DEPTH OF BORING	16.5
18. SIGNATURE AND TITLE OF INSPECTOR	Justin McCarley - Geologist

ELEV	DEPTH	LEGEND	FIELD CLASSIFICATION OF MATERIALS (Description)	% REC	Samp No.	RQD %	REMARKS	Blows/ 0.5 ft	N-Value
			Sandy SILT with gravel (ML); 20% rounded gravel; 25% fine to medium sand; 55% loose, silty, non-plastic, rapid dilatant fines; brown to dark brown, dry, scattered organics (ALLUVIUM)	47	S-3			1 1 2	3
			... becomes medium dense to dense at 3 feet depth	53	S-4			2 7 16	23
				0	S-5			8 50 /2	50
979.0	5.0								
			Well-graded GRAVEL with silt (GW-GM); 79% dense to very dense, rounded gravel; 11.2% coarse to fine sand; 9.8% silty, non-plastic, rapid dilatant fines; gray, wet, 6 inch thick ash lens at 6.5 ft (ALLUVIUM)	73	S-6		Gradation testing was done on hollow stem auger cuttings.	24 29 22	51
				47	S-7			8 19 17	36
				40	S-8			11 18 20	38
				60	S-9		Driller notes very dense gravel/cobble-like drilling at about 15.5 feet. Drill met refusal at 15.9 feet.	43 43 43	86
967.5	16.5								

0.0 4.3 8.6 12.9

BOTTOM OF BOREHOLE AT 16.5 ft

DRILLING LOG

DIVISION	USACE NWS
INSTALLATION	Yakima, Washington
SHEET	1 OF 1 SHEETS
1. PROJECT	Yakima Ecosystem Restoration
9. COORDINATE SYSTEM	EPSG: 6599
HORIZONTAL	NAD83
VERTICAL	NAVD88
10. SIZE AND TYPE OF BIT	4.25" I.D/8.25" O.D Hollow Stem Auger
2. HOLE NUMBER	2020-BH-04
LOCATION COORDINATES	N 450791.947 E 1652080.103
11. MANUFACTURER'S DESIGNATION OF DRILL	Mobile Drill B57
3. DRILLING AGENCY	Holt Services, Inc.
12. TOTAL SAMPLES	DISTURBED 8 / UNDISTURBED 0
4. NAME OF DRILLER	Abe Causland
13. TOTAL NUMBER CORE BOXES	0
5. DIRECTION OF BORING	☒ VERTICAL ☐ INCLINED
DEG FROM VERTICAL	---
BEARING	
14. ELEVATION GROUND WATER	4
15. DATE BORING	STARTED 3/23/20 / COMPLETED 3/23/20
6. THICKNESS OF OVERBURDEN	
16. ELEVATION TOP OF BORING	980'
7. DEPTH DRILLED INTO ROCK	
17. TOTAL CORE RECOVERY FOR BORING	N/A
8. TOTAL DEPTH OF BORING	26.3
18. SIGNATURE AND TITLE OF INSPECTOR	Justin McCarley - Geologist

ELEV	DEPTH	LEGEND	FIELD CLASSIFICATION OF MATERIALS (Description)	% REC	Samp No.	RQD %	REMARKS	Blows/ 0.5 ft	N-Value
977.5	2.5		Silty SAND (SM); up to 5% rounded gravel; 55-60% loose, sub-rounded to rounded, fine to coarse sand; 40% silty, non-plastic, rapid dilatant fines; gray to brown, dry, 3 inch thick lens of ash at 2.2 feet depth (ALLUVIUM)	40	S-3			1 2 2	4
972.5	7.5		Well-graded GRAVEL with silt (GW-GM); 74% medium dense to dense, rounded gravel; 12.2% fine to coarse sand; 13.8% silty, non-plastic, rapid dilatant fines; gray, dry to wet (ALLUVIUM)	47	S-4		Gradation testing was done on hollow stem auger cuttings.	18 16 15	31
				100	S-5			8 15 3	18
964.0	16.0		Well-graded SAND with gravel (SW-SM); 20% rounded gravel; 70% very dense, coarse sand; 10% silty, non-plastic, rapid dilatant fines; gray to brown, wet (ALLUVIUM)	53	S-6			26 33 25	58
			... becomes medium dense below 10 feet depth	40	S-7			19 16 12	28
953.7	26.3		Silty GRAVEL with sand (GM); 60% dense, rounded gravel; 20% coarse sand; 20% silty, non-plastic, rapid dilatant fines; gray to brown, wet (ALLUVIUM)	67	S-8			12 11 8	19
				29	S-9			21 49 50	99
				31	S-10		Driller notes very dense gravel/cobble-like drilling at about 25 feet. Drill met refusal at 25.4 feet.	50	50 /

0.0 4.3 8.6 12.9 17.1 21.4 25.7

BOTTOM OF BOREHOLE AT 26.3 ft

DRILLING LOG	DIVISION USACE NWS	INSTALLATION Yakima, Washington	SHEET 1 OF 1 SHEETS

1. PROJECT Yakima Ecosystem Restoration	9. COORDINATE SYSTEM EPSG: 6599 · HORIZONTAL NAD83 · VERTICAL NAVD88
	10. SIZE AND TYPE OF BIT 4.25" I.D/8.25" O.D Hollow Stem Auger
2. HOLE NUMBER 2020-BH-05 · LOCATION COORDINATES N 449312.754 E 1651949.68	11. MANUFACTURER'S DESIGNATION OF DRILL Mobile Drill B57
3. DRILLING AGENCY Holt Services, Inc.	12. TOTAL SAMPLES · DISTURBED 7 · UNDISTURBED 0
4. NAME OF DRILLER Abe Causland	13. TOTAL NUMBER CORE BOXES 0
5. DIRECTION OF BORING ☒ VERTICAL ☐ INCLINED · DEG FROM VERTICAL --- · BEARING	14. ELEVATION GROUND WATER 4.5
	15. DATE BORING · STARTED 3/25/20 · COMPLETED 3/25/20
6. THICKNESS OF OVERBURDEN	16. ELEVATION TOP OF BORING 976'
7. DEPTH DRILLED INTO ROCK	17. TOTAL CORE RECOVERY FOR BORING N/A
8. TOTAL DEPTH OF BORING 17	18. SIGNATURE AND TITLE OF INSPECTOR Justin McCarley - Geologist

ELEV	DEPTH	LEGEND	FIELD CLASSIFICATION OF MATERIALS (Description)	% REC	Samp No.	RQD %	REMARKS	Blows/ 0.5 ft	N-Value
			Sandy elastic SILT (MH); 10% rounded gravel; 30% fine sand; 60% loose, silty, medium plasticity, medium to rapid dilatant fines; brown, dry (ALLUVIUM)	80	S-3			1 2 3	5
973.0	3.0		Well-graded GRAVEL with silt and sand (GW-GM); 53% medium dense, rounded gravel; 32.4% fine to coarse sand; 14.6% silty, non-plastic, rapid dilatant fines; gray to brown, dry to wet (ALLUVIUM)	67	S-4		Gradation testing was done on hollow stem auger cuttings.	2 1 6	7
				60	S-5			15 15 9	24
			... becomes dense to very dense below 8 feet depth	100	S-6			21 33 24	57
				40	S-7			17 23 17	40
				0	S-8		Driller notes very dense gravel/cobble-like drilling at about 16 feet. Drill met refusal at 16.7 feet. Final SPT to 17.0 feet.	31 52	52 /
959.0	17.0			70	S-9			31 51	51 /

0.0 · 4.3 · 8.6 · 12.9

BOTTOM OF BOREHOLE AT 17.0 ft

DRILLING LOG

DIVISION	USACE NWS
INSTALLATION	Yakima, Washington
SHEET	1 OF 1 SHEETS
1. PROJECT	Yakima Ecosystem Restoration
9. COORDINATE SYSTEM	EPSG: 6599
HORIZONTAL	NAD83
VERTICAL	NAVD88
10. SIZE AND TYPE OF BIT	4.25" I.D/8.25" O.D Hollow Stem Auger
2. HOLE NUMBER	2020-BH-06
LOCATION COORDINATES	N 447780.015 E 1651927.427
11. MANUFACTURER'S DESIGNATION OF DRILL	Mobile Drill B57
3. DRILLING AGENCY	Holt Services, Inc.
12. TOTAL SAMPLES	DISTURBED 6 / UNDISTURBED 0
4. NAME OF DRILLER	Abe Causland
13. TOTAL NUMBER CORE BOXES	0
5. DIRECTION OF BORING	☒ VERTICAL ☐ INCLINED
DEG FROM VERTICAL	---
BEARING	
14. ELEVATION GROUND WATER	2
15. DATE BORING	STARTED 3/26/20 / COMPLETED 3/26/20
6. THICKNESS OF OVERBURDEN	
16. ELEVATION TOP OF BORING	971'
7. DEPTH DRILLED INTO ROCK	
17. TOTAL CORE RECOVERY FOR BORING	N/A
8. TOTAL DEPTH OF BORING	16.5
18. SIGNATURE AND TITLE OF INSPECTOR	Justin McCarley - Geologist

ELEV	DEPTH	LEGEND	FIELD CLASSIFICATION OF MATERIALS (Description)	% REC	Samp No.	RQD %	REMARKS	Blows/ 0.5 ft	N-Value
			Well-graded GRAVEL (GW); 92% medium dense, rounded gravel; 6.2% fine to coarse sand, 2.8% silty, non- to low plasticity, rapid dilatant fines; gray, wet (ALLUVIUM)	40	S-3		Gradation testing was done on hollow stem auger cuttings.	1 6 20	26
				53	S-4			8 20 21	41
				47	S-5			5 9 14	23
			... becomes dense to very dense below 7.5 feet depth	33	S-6			31 39 29	68
				67	S-7			27 31 22	53
954.5	16.5			53	S-8		Driller notes very dense gravel/cobble-like drilling at about 15.5 feet. Drill met refusal at 15.8 feet.	10 20 20	40

0.0
4.3
8.6
12.9

BOTTOM OF BOREHOLE AT 16.5 ft

DRILLING LOG

DIVISION	USACE NWS
INSTALLATION	Yakima, Washington
SHEET	1 OF 1 SHEETS
1. PROJECT	Yakima Ecosystem Restoration
9. COORDINATE SYSTEM	EPSG: 6599
HORIZONTAL	NAD83
VERTICAL	NAVD88
10. SIZE AND TYPE OF BIT	4.25" I.D/8.25" O.D Hollow Stem Auger
2. HOLE NUMBER	2020-BH-07
LOCATION COORDINATES	N 446606.865 E 1651937.164
11. MANUFACTURER'S DESIGNATION OF DRILL	Mobile Drill B57
3. DRILLING AGENCY	Holt Services, Inc.
12. TOTAL SAMPLES	DISTURBED 6 / UNDISTURBED 0
4. NAME OF DRILLER	Abe Causland
13. TOTAL NUMBER CORE BOXES	0
5. DIRECTION OF BORING	☒ VERTICAL ☐ INCLINED
DEG FROM VERTICAL	---
BEARING	
14. ELEVATION GROUND WATER	1.5
15. DATE BORING	STARTED 3/26/20 / COMPLETED 3/26/20
6. THICKNESS OF OVERBURDEN	
16. ELEVATION TOP OF BORING	968'
7. DEPTH DRILLED INTO ROCK	
17. TOTAL CORE RECOVERY FOR BORING	N/A
8. TOTAL DEPTH OF BORING	16.5
18. SIGNATURE AND TITLE OF INSPECTOR	Justin McCarley - Geologist

ELEV	DEPTH	LEGEND	FIELD CLASSIFICATION OF MATERIALS (Description)	% REC	Samp No.	RQD %	REMARKS	Blows/ 0.5 ft	N-Value
			Silty GRAVEL with sand (GM); 45% medium dense, angular gravel; 35% fine to coarse sand; 20% silty, non-plastic, rapid dilatant fines; gray, wet, crushed aggregate (ROAD GRAVEL)	53	S-3			7 12 14	26
965.1	2.9								
			Silty SAND (SM); 1% rounded gravel, 51.5% fine sand, 47.5% very soft, clayey, silty, medium plasticity, slow dilatant fines; dark gray, wet, organic odor (ALLUVIUM)	27	S-4		Gradation testing was done on hollow stem auger cuttings.	1 6 6	12
				87	S-5			0 0 0	0
960.5	7.5								
			Well-graded SAND with silt and gravel (SW-SM); 30% rounded gravel; 60% medium dense to dense, fine to coarse sand; 10% silty, non-plastic, rapid dilatant fines; gray, wet (ALLUVIUM)	7	S-6			12 10 13	23
				110	S-7			10 50	50 /
			... becomes very dense below 12 feet depth						
951.5	16.5			67	S-8		Driller notes very dense gravel/cobble-like drilling at about 15.7 feet. Drill met refusal at 16 feet.	7 43 38	81

0.0
4.3
8.6
12.9

BOTTOM OF BOREHOLE AT 16.5 ft

TEST PIT LOG

US Army Corps of Engineers®

USACE NWS

Test Pit Designation 2020-TP-01

1. PROJECT	Yakima Ecosystem Restoration
2. LOCATION	Yakima, Washington
3. EXCAVATION CONTRACTOR	Holt Services, Inc.
4. APPROXIMATE GROUND SURFACE ELEVATION	1008'
5. OPERATOR Pete Helle	EQUIPMENT Caterpillar 305E2 CR
6. LOCATION COORDINATES	N 458590.731 E 1650329.822
7. DATE STARTED 3/4/20	DATE COMPLETED 3/4/20
8. COORDINATE SYSTEM EPSG: 6599	HORIZONTAL NAD83 / VERTICAL NAVD88
9. TOTAL DEPTH OF TEST PIT	7'
10. APPROXIMATE GROUND WATER ELEVATION	1002.0'
11. LOGGER	Justin McCarley - Geologist
12. TIME OF READING	3/4/2020

ELEV (FT)	DEPTH (ft)	GRAPHIC LOG	SOIL DESCRIPTION	LAB TESTING	SAMPLE NO.	REMARKS
	0		Sandy SILT with gravel (ML), 16% fine to coarse, rounded gravels (1 to 2 inches); about 15% rounded cobbles up to 6 inches diameter; 32% fine to coarse sand, 52% medium dense, silty, non-plastic, rapid dilatant fines; brown to gray, dry, numerous organics, homogeneous (ALLUVIUM)			
	1				S-1	
1006.5			Well-graded GRAVEL with silt and sand (GW-GM), 60-70% dense, fine to coarse, rounded gravel; about 50% rounded cobbles up to 12 inches diameter; 25% sub-rounded to rounded, fine to coarse sand; 5-10% silty, non-plastic, rapid dilatant fines; gray to dark brown, dry, imbricated gravels, scattered organics (ALLUVIUM)			
	2					
	3					
	4					
	5				S-2	
1002.0	6 ▽					
			Well-graded GRAVEL with sand (GW); 70% dense, fine to coarse, rounded gravel; about 50% rounded cobbles up to 12 inches diameter; 28.4% rounded, fine to coarse sand; 1.6% silty, non-plastic, rapid dilatant fines; gray to dark brown, imbricated gravels, wet (ALLUVIUM)		S-3	Rapid seepage at top of apparent groundwater table and pit sides began caving. Excavation terminated.
1001.0	7					

BOTTOM OF TEST PIT AT 7.0 ft

TP LOG - HIGA2 TEMPLATE.GPJ - 5/5/20 21:12 - L:\01-TECHNICAL\00-RESOURCES\60-GINT\PROJECTS\2800 FILES\2837 - YAKIMA ECOSYSTEM RESTORATION.GPJ

TEST PIT LOG

US Army Corps of Engineers®

USACE NWS

Test Pit Designation 2020-TP-02

1. PROJECT	Yakima Ecosystem Restoration
2. LOCATION	Yakima, Washington
3. EXCAVATION CONTRACTOR	Holt Services, Inc.
4. APPROXIMATE GROUND SURFACE ELEVATION	1002'
5. OPERATOR Pete Helle	EQUIPMENT Caterpillar 305E2 CR
6. LOCATION COORDINATES	N 455856.178 E 1650640.689
7. DATE STARTED 3/4/20	DATE COMPLETED 3/4/20
8. COORDINATE SYSTEM EPSG: 6599	HORIZONTAL NAD83 / VERTICAL NAVD88
9. TOTAL DEPTH OF TEST PIT	7.5'
10. APPROXIMATE GROUND WATER ELEVATION	N/A
11. LOGGER	Justin McCarley - Geologist
12. TIME OF READING	3/4/2020

ELEV (FT)	DEPTH (ft)	GRAPHIC LOG	SOIL DESCRIPTION	LAB TESTING	SAMPLE NO.	REMARKS
	0		Well-graded GRAVEL with sand (GW); 74% medium dense, rounded gravel; about 60% rounded cobbles up to 12 inches diameter; 23% fine to coarse, sub-angular to angular sand; 3% silty, non-plastic, rapid dilatant fines; gray to brown, dry, homogeneous (LEVEE FILL)			
	1					
	2				S-1	
	3					
	4				S-2	
	5					
	6					
	7				S-3	Excavation terminated at contact with native material.
994.5						

BOTTOM OF TEST PIT AT 7.5 ft

TP LOG - HIGA2 TEMPLATE.GPJ - 5/5/20 21:12 - L:\01-TECHNICAL\00-RESOURCES\60-GINT\PROJECTS\2800 FILES\2837 - YAKIMA ECOSYSTEM RESTORATION.GPJ

TEST PIT LOG

US Army Corps of Engineers®

USACE NWS

Test Pit Designation 2020-TP-03

1. PROJECT	Yakima Ecosystem Restoration
2. LOCATION	Yakima, Washington
3. EXCAVATION CONTRACTOR	Holt Services, Inc.
4. APPROXIMATE GROUND SURFACE ELEVATION	996'
5. OPERATOR Pete Helle	EQUIPMENT Caterpillar 305E2 CR
6. LOCATION COORDINATES	N 454506.08 E 1650471.274
7. DATE STARTED 3/4/20	DATE COMPLETED 3/4/20
8. COORDINATE SYSTEM EPSG: 6599	HORIZONTAL NAD83 / VERTICAL NAVD88
9. TOTAL DEPTH OF TEST PIT	8'
10. APPROXIMATE GROUND WATER ELEVATION	N/A
11. LOGGER	Justin McCarley - Geologist
12. TIME OF READING	3/4/2020

ELEV (FT)	DEPTH (ft)	GRAPHIC LOG	SOIL DESCRIPTION	LAB TESTING	SAMPLE NO.	REMARKS
	0		Well-graded GRAVEL with sand (GW); 62% dense, rounded, fine to coarse gravel; about 20% rounded cobbles up to 9 inches diameter; 35% sub-angular, fine to coarse sand; 3% silty, non-plastic, rapid dilatant fines; gray to brown, dry, homogeneous, occasional lenses of low to medium plasticity fines (EMBANKMENT FILL)			
	1					
					S-1	
	2					
	3					
	4					
					S-3	
	5					
	6					
	7					
					S-2	Material became dense, hard-ripping, unable to continue excavation.
988.0	8					

BOTTOM OF TEST PIT AT 8.0 ft

TP LOG - HIGA2 TEMPLATE.GPJ - 5/5/20 21:12 - L:\01-TECHNICAL\00-RESOURCES\60-GINT\PROJECTS\2800 FILES\2837 - YAKIMA ECOSYSTEM RESTORATION.GPJ

TEST PIT LOG

US Army Corps of Engineers®

USACE NWS

Test Pit Designation 2020-TP-04

1. PROJECT	Yakima Ecosystem Restoration
2. LOCATION	Yakima, Washington
3. EXCAVATION CONTRACTOR	Holt Services, Inc.
4. APPROXIMATE GROUND SURFACE ELEVATION	989'
5. OPERATOR Pete Helle	EQUIPMENT Caterpillar 305E2 CR
6. LOCATION COORDINATES	N 452654.563 E 1651411.371
7. DATE STARTED 3/4/20	DATE COMPLETED 3/4/20
8. COORDINATE SYSTEM EPSG: 6599	HORIZONTAL NAD83 / VERTICAL NAVD88
9. TOTAL DEPTH OF TEST PIT	8'
10. APPROXIMATE GROUND WATER ELEVATION	982.9'
11. LOGGER	Justin McCarley - Geologist
12. TIME OF READING	3/4/2020

ELEV (FT)	DEPTH (ft)	GRAPHIC LOG	SOIL DESCRIPTION	LAB TESTING	SAMPLE NO.	REMARKS
	0		Silty SAND (SM); 4% rounded, fine to coarse gravel; about 5% rounded cobbles up to 6 inches diameter; 61.1% medium dense, fine to coarse, sub-rounded to rounded sand; 34.9% silty, non-plastic, rapid dilatant fines; gray to light brown, dry, scattered roots (ALLUVIUM)			
	1				S-1	
	2		... lens of silty SAND; 70-80% medium dense, fine to coarse, sub-rounded to rounded sand; 20-30% silty, non-plastic fines; light brown to gray, dry, pinches out rapidly from maximum thickness of 12 inches, not sampled			
985.9	3		Well-graded GRAVEL with sand (GW); 79% dense, rounded, fine to coarse gravel; about 30% rounded cobbles up to 12 inches diameter; 19.4% fine to coarse, sub-rounded to rounded sand; 1.6% silty, non-plastic, rapid dilatant fines; gray to brown, moist to wet, imbricated gravels, homogeneous (ALLUVIUM)			
	4				S-2	
	5					
	6					
	7				S-3	Rapid seepage at top of apparent groundwater table and pit sides began caving. Excavation terminated.
981.0	8					

BOTTOM OF TEST PIT AT 8.0 ft

TP LOG - HIGA2 TEMPLATE.GPJ - 5/5/20 21:12 - L:\01-TECHNICAL\00-RESOURCES\60-GINT\PROJECTS\2800 FILES\2837 - YAKIMA ECOSYSTEM RESTORATION.GPJ

TEST PIT LOG

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USACE NWS

Test Pit Designation 2020-TP-05

1. PROJECT	Yakima Ecosystem Restoration
2. LOCATION	Yakima, Washington
3. EXCAVATION CONTRACTOR	Holt Services, Inc.
4. APPROXIMATE GROUND SURFACE ELEVATION	980'
5. OPERATOR Pete Helle	EQUIPMENT Caterpillar 305E2 CR
6. LOCATION COORDINATES	N 449743.946 E 1652437.662
7. DATE STARTED 3/4/20	DATE COMPLETED 3/4/20
8. COORDINATE SYSTEM EPSG: 6599	HORIZONTAL NAD83 / VERTICAL NAVD88
9. TOTAL DEPTH OF TEST PIT	6.8'
10. APPROXIMATE GROUND WATER ELEVATION	974.8'
11. LOGGER	Justin McCarley - Geologist
12. TIME OF READING	3/4/2020

ELEV (FT)	DEPTH (ft)	GRAPHIC LOG	SOIL DESCRIPTION	LAB TESTING	SAMPLE NO.	REMARKS
	0		Silty SAND (SM); 11% rounded gravel; 50.8% medium dense, fine sand; 38.2% silty, non-plastic, rapid dilatant fines; dark brown, dry (ALLUVIUM)			
	1					
	2				S-1	
976.8	3					
			Well-graded GRAVEL with sand (GW); 84% dense, fine to coarse, rounded gravel; about 25% rounded cobbles up to 6 inches diameter; 15.6% fine to coarse, sub-rounded to rounded sand; 0.4% silty, non-plastic, rapid dilatant fines; gray to brown, dry to wet, homogenous (ALLUVIUM)			
	4					
	5				S-2	
	6				S-3	Rapid seepage at top of apparent groundwater table and pit sides caving. Excavation terminated.
973.2						

BOTTOM OF TEST PIT AT 6.8 ft

TP LOG - HIGA2 TEMPLATE.GPJ - 5/5/20 21:12 - L:\01-TECHNICAL\00-RESOURCES\60-GINT\PROJECTS\2800 FILES\2837 - YAKIMA ECOSYSTEM RESTORATION.GPJ

TEST PIT LOG

US Army Corps of Engineers®

USACE NWS

Test Pit Designation 2020-TP-06

1. PROJECT	Yakima Ecosystem Restoration
2. LOCATION	Yakima, Washington
3. EXCAVATION CONTRACTOR	Holt Services, Inc.
4. APPROXIMATE GROUND SURFACE ELEVATION	991'
5. OPERATOR Pete Helle	EQUIPMENT Caterpillar 305E2 CR
6. LOCATION COORDINATES	N 452642.478 E 1650138.908
7. DATE STARTED 3/4/20	DATE COMPLETED 3/4/20
8. COORDINATE SYSTEM EPSG: 6599	HORIZONTAL NAD83 / VERTICAL NAVD88
9. TOTAL DEPTH OF TEST PIT	8'
10. APPROXIMATE GROUND WATER ELEVATION	N/A
11. LOGGER	Justin McCarley - Geologist
12. TIME OF READING	3/4/2020

ELEV (FT)	DEPTH (ft)	GRAPHIC LOG	SOIL DESCRIPTION	LAB TESTING	SAMPLE NO.	REMARKS
	0		Well-graded GRAVEL with sand (GW); 80-85% medium dense, sub-angular to angular, coarse gravel up to 0.5 inches diameter; 15% coarse, sub-angular sand; up to 5% silty, non-plastic, rapid dilatant fines; gray, dry, homogeneous, aggregate, not sampled (ROAD BASE)			
989.5	1		Well-graded GRAVEL with sand (GW); 77% dense, fine to coarse rounded gravel; about 30% rounded cobbles up to 9 inches diameter; 20% fine to coarse sand; 3% silty, non-plastic, rapid dilatant fines; gray to brown, dry, homogeneous (LEVEE FILL)			
	2				S-1	
	3					
	4					
	5				S-2	
	6					
	7				S-3	Excavation terminated at contact with native material.
983.0	8					

BOTTOM OF TEST PIT AT 8.0 ft

TP LOG - HIGA2 TEMPLATE.GPJ - 5/5/20 21:12 - L:\01-TECHNICAL\00-RESOURCES\60-GINT\PROJECTS\2800 FILES\2837 - YAKIMA ECOSYSTEM RESTORATION.GPJ

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TECHNICAL REPORT

Report To: Justin McCarley, GIT
Cornforth Consultants, Inc
10250 SW Greenburg RD #111
Portland, Oregon 97223

Date: 04/17/2020

Lab No.: 20-040

Project: 2837 – Yakima Ecosystem Restoration

Project No.: 3285.1.1

Report of: Moisture contents, Atterberg limits, particle size analysis, and Proctor testing

Sample Identification

NTI completed moisture contents, Atterberg limits, particle size analysis, and Proctor testing of samples delivered to our laboratory by a Cornforth representative on March 11, 2020. Testing was performed in accordance with the standards indicated. Per your request, due to sample size limitations as a result of large oversized materials, we split samples into smaller sub-lots for the particle size analysis. In addition, we re-used material where necessary. Our laboratory test results are summarized on the following tables and sheets.

Laboratory Testing

Moisture Content of Soils (ASTM D2216)	
Sample ID	**Moisture Content (%)**
TP-1 S-1 @ 1.0 – 2.0 ft.	13.3
TP-1 S-3 @ 6.5 ft.	7.0
TP-2 S-2 @ 4.0 ft.	6.0
TP-3 S-3 @ 4.0 ft.	10.4
TP-4 S-1 @ 1.0 ft.	10.1
TP-4 S-2 @ 5.5 ft.	1.6
TP-5 S-1 @ 2.0 ft.	22.4
TP-5 S-3 @ 6.0 ft.	8.9
TP-6 S-2 @ 4.0 ft.	3.2

Atterberg Limits (ASTM D4318)			
Sample ID	**Liquid Limit**	**Plastic Limit**	**Plasticity Index**
TP-3 S-3 @ 4.0 ft.	NP	NP	NP
TP-5 S-1 @ 2.0 ft.	36	25	11

Attachments: Laboratory Test Results
Copies: Addressee

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 REVIEWED BY: Tom Ginsbach

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TECHNICAL REPORT

Report To: Justin McCarley, GIT
Cornforth Consultants, Inc
10250 SW Greenburg RD #111
Portland, Oregon 97223

Date: 04/17/2020

Lab No.: 20-040

Project: 2837 – Yakima Ecosystem Restoration

Project No.: 3285.1.1

Laboratory Testing

Dry Particle Size Analysis of Soil (ASTM C136)			
Sieve Size	**TP-2 S-2 @ 4.0 ft. Percent Passing**	**TP-3 S-3 @ 4.0 ft. Percent Passing**	**TP-6 S-2 @ 4.0 ft. Percent Passing**
4”	100	100	100
3”	87	81	86
2”	72	70	69
1 ½”	64	60	59
1”	52	53	43
¾”	44	50	37
½”	37	45	30
⅜”	33	43	27
¼”	28	40	24
#4	26	38	23
#8	22	33	21
#10	21	31	20
#16	19	28	19
#30	13	22	16
#40	10	19	13
#50	7	15	9
#100	3	8	3

Notes: Dry sieves per ASTM C136 were completed for these samples.
This allowed dry sieved material to be used for maximum density testing.
Sample and material sizes did not meet ASTM standards.

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TECHNICAL REPORT

Report To: Justin McCarley, GIT
Cornforth Consultants, Inc
10250 SW Greenburg RD #111
Portland, Oregon 97223

Date: 04/17/2020

Lab No.: 20-040

Project: 2837 – Yakima Ecosystem Restoration

Project No.: 3285.1.1

Laboratory Testing

Particle Size Analysis of Soil (ASTM D422)			
Sieve Size	**TP-1 S-1 @ 1.0 – 2.0 ft. Percent Passing**	**TP-4 S-1 @ 1.0 ft. Percent Passing**	**TP-5 S-1 @ 2.0 ft. Percent Passing**
4”	--	--	--
3”	100	100	--
2”	93	99	--
1 ½”	93	98	--
1”	92	97	100
¾”	89	97	96
½”	87	96	95
⅜”	86	96	94
¼”	85	96	94
#4	84	96	93
#8	82	96	90
#10	81	96	89
#16	80	95	86
#30	79	52	81
#40	78	48	78
#50	76	45	57
#100	65	39	41
#200	51.9	34.9	38.2

Note: The sample size for TP-4 S-1 @1.0 ft did not meet ASTM standards

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TECHNICAL REPORT

Report To: Justin McCarley, GIT
Cornforth Consultants, Inc
10250 SW Greenburg RD #111
Portland, Oregon 97223

Date: 04/17/2020

Lab No.: 20-040

Project: 2837 – Yakima Ecosystem Restoration

Project No.: 3285.1.1

Laboratory Testing

Particle Size Analysis of Soil (ASTM C136/117)			
Sieve Size	**TP-1 S-3 @ 6.5 ft. Percent Passing**	**TP-4 S-2 @ 5.5 ft. Percent Passing**	**TP-5 S-3 @ 6.0 ft. Percent Passing**
4”	--	100	100
3”	100	90	91
2”	92	78	69
1 ½”	84	64	51
1”	72	45	38
¾”	63	36	32
½”	51	27	26
⅜”	44	24	23
¼”	35	22	20
#4	30	21	18
#8	21	21	16
#10	19	21	16
#16	14	20	15
#30	8	19	12
#40	5	16	10
#50	3	10	7
#100	2	3	3
#200	1.6	1.6	0.4

Note: Sample sizes did not meet ASTM standards

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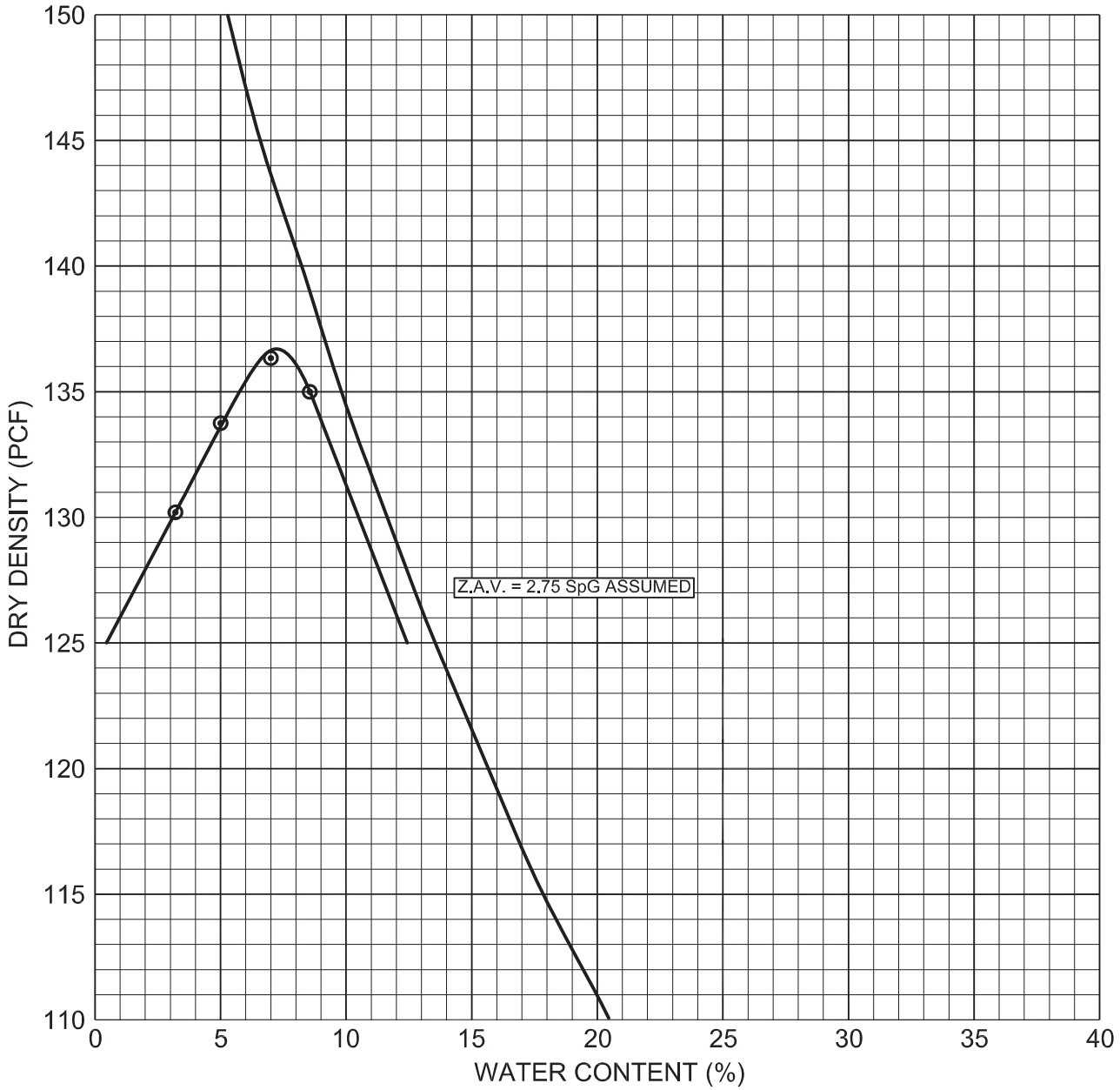

SOIL TYPE	TEST METHOD	MAXIMUM DRY DENSITY (PCF)	OPTIMUM WATER CONTENT (%)	PERCENT OVERSIZE	CORRECTED MAXIMUM DRY DENSITY (PCF)	CORRECTED WATER CONTENT (%)
	ASTM D1557 METHOD C	136.7	7.5	*58	*---	*---

SAMPLE SOURCE: TP-2: S-1, S-2, COMBINED AND SCALPED OVER 3/4 " SCREEN
DATE TESTED: 04/14/20 *SAMPLE OVERSIZE PERCENTAGE IS BEYOND CORRECTION ALLOWED BY ASTM STANDARDS
NOTE: SAMPLE MATERIAL REUSED FROM ASTM C136/117

MAXIMUM DENSITY TEST RESULTS

PROJECT NO. 3285.1.1	CORNFORTH CONSULTANTS, INC 2837 - YAKIMA ECOSYSTEM RESTORATION	LAB NO. 20-040

Effective Date: 5/12/03

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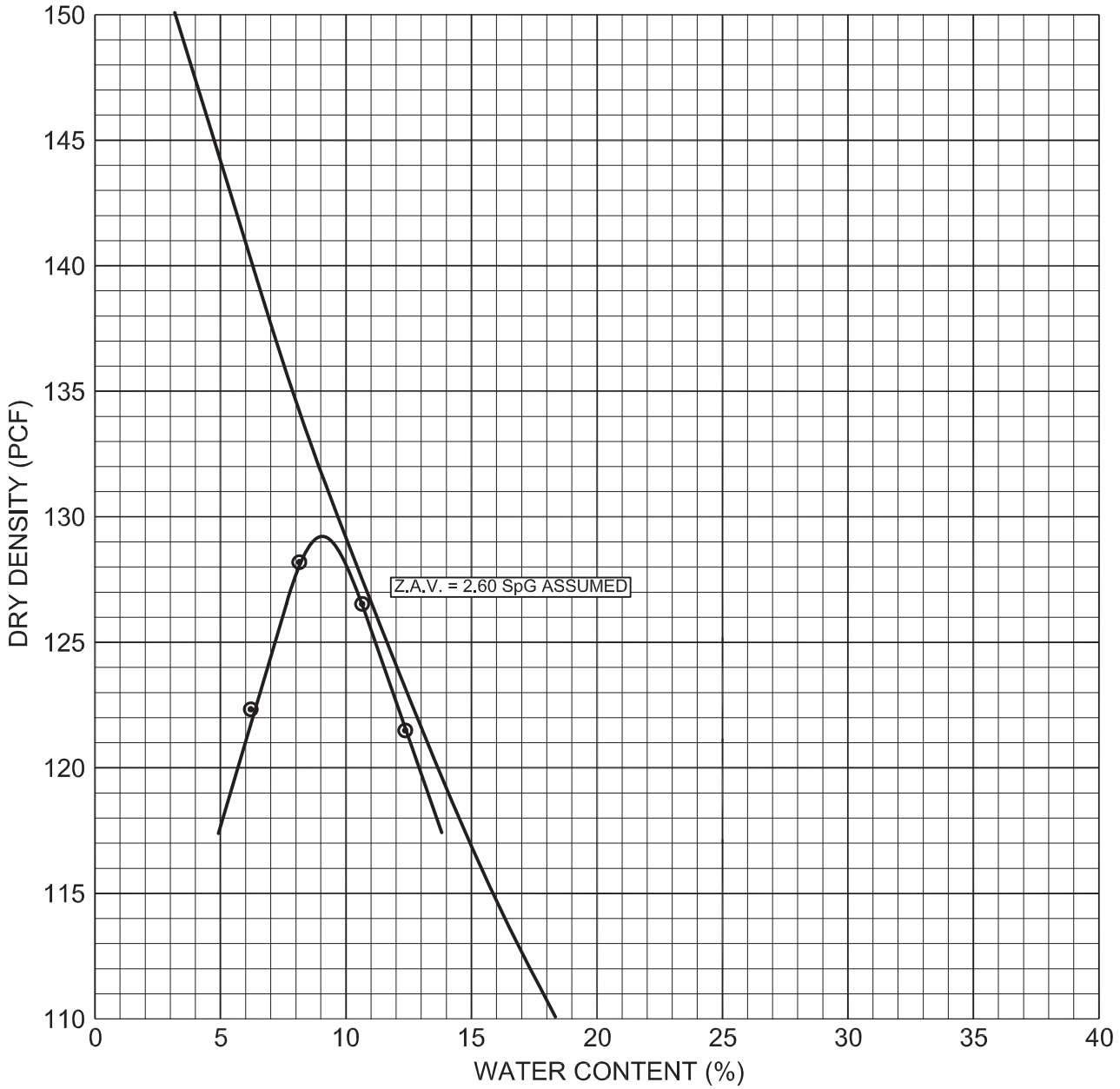


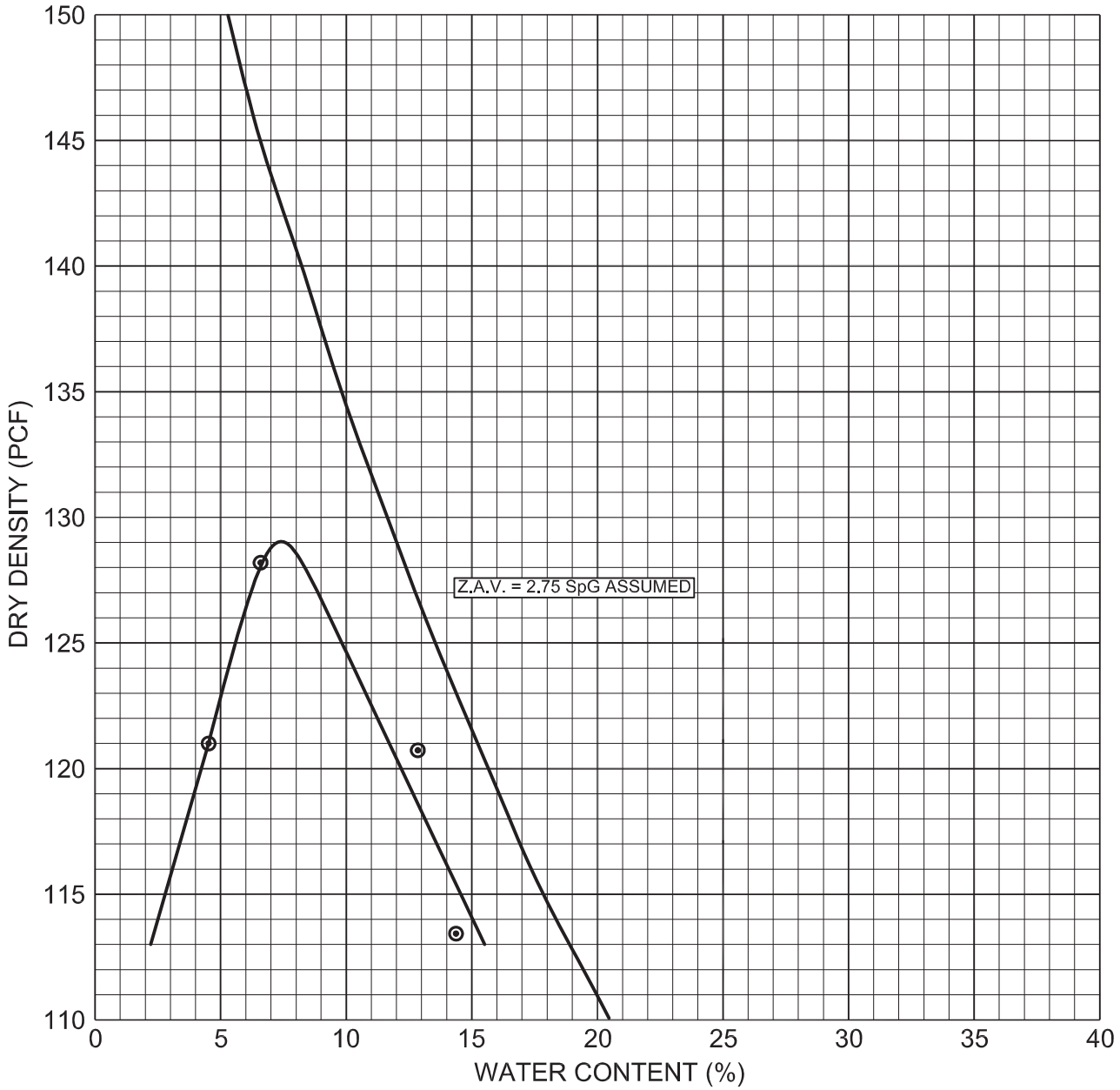
SOIL TYPE	TEST METHOD	MAXIMUM DRY DENSITY (PCF)	OPTIMUM WATER CONTENT (%)	PERCENT OVERSIZE	CORRECTED MAXIMUM DRY DENSITY (PCF)	CORRECTED WATER CONTENT (%)
	ASTM D1557 METHOD C	129.2	9.1	*45	*---	*---

SAMPLE SOURCE: TP-3: S-2, S-3, COMBINED AND SCALPED OVER 3/4 " SCREEN
DATE TESTED: 04/14/20 *SAMPLE OVERSIZE PERCENTAGE IS BEYOND CORRECTION ALLOWED BY ASTM STANDARDS
NOTE: SAMPLE MATERIAL REUSED FROM ASTM C136/117

MAXIMUM DENSITY TEST RESULTS

PROJECT NO. 3285.1.1	CORNFORTH CONSULTANTS, INC 2837 - YAKIMA ECOSYSTEM RESTORATION	LAB NO. 20-040

Effective Date: 5/12/03



SOIL TYPE	TEST METHOD	MAXIMUM DRY DENSITY (PCF)	OPTIMUM WATER CONTENT (%)	PERCENT OVERSIZE	CORRECTED MAXIMUM DRY DENSITY (PCF)	CORRECTED WATER CONTENT (%)
	ASTM D1557 METHOD C	129.0	7.5	25	136.5	7.2

SAMPLE SOURCE: TP-6: S-1, S-3, COMBINED AND SCALPED OVER 3/4 " SCREEN
DATE TESTED: 04/15/20
NOTE: SAMPLE MATERIAL REUSED FROM ASTM C136/117

MAXIMUM DENSITY TEST RESULTS

PROJECT NO. 3285.1.1	CORNFORTH CONSULTANTS, INC 2837 - YAKIMA ECOSYSTEM RESTORATION	LAB NO. 20-040

Effective Date: 5/12/03

Northwest Testing, Inc.
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COOPER TESTING LABORATORY

Corrosivity Tests Summary

CTL # 942-006 **Date:** 3/18/2020 **Tested By:** PJ **Checked:** PJ
Client: Cornforth Consultants **Project:** YAKIMA Ecosystem Restoration **Proj. No:** 2837
Remarks:

Sample Location or ID			Resistivity @ 15.5 °C (Ohm-cm)			Chloride	Sulfate		pH	ORP (Redox)		Sulfide	Moisture	Soil Visual Description
			As Rec.	Min	Sat.	mg/kg	mg/kg	%				Qualitative	At Test	
						Dry Wt.	Dry Wt.	Dry Wt.		E_H (mv)	At Test	by Lead	%	
Boring	Sample, No.	Depth, ft.	ASTM G57	Cal 643	ASTM G57	ASTM D4327	ASTM D4327	ASTM D4327	ASTM G51	ASTM G200	Temp °C	Acetate Paper	ASTM D2216	
2020TP1	S-3	6.5	-	-	106,808	3	20	0.0020	6.9	-	-	-	4.0	Dark Brown GRAVEL w/ Silt & Sand

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TECHNICAL REPORT

Report To: Justin McCarley, GIT
Cornforth Consultants, Inc
10250 SW Greenburg RD #111
Portland, Oregon 97223

Date: 04/24/2020

Lab No.: 20-066

Project: 2837 – Yakima Ecosystem Restoration

Project No.: 3285.1.1

Report of: Moisture content, Atterberg limits, and particle size analysis

Sample Identification

NTI completed moisture content, Atterberg limits, and particle size analysis testing on samples delivered to our laboratory by a Cornforth representative on March 31, 2020. Testing was performed in accordance with the standards indicated. Per your request, due to sample size limitations as a result of large oversized materials, we split samples into smaller sub-lots for the particle size analysis. Our laboratory test results are summarized on the following tables and pages.

Laboratory Testing

Moisture Content of Soils (ASTM D2216)	
Sample ID	**Moisture Content (%)**
BH-01 S-1 @ 0 - 10 ft.	2.0
BH-01 S-5 @ 5 ft.	8.2
BH-02 S-1 @ 0 - 10 ft.	9.7
BH-02 S-7 @ 10 ft.	34.2
BH-03 S-1 @ 0 - 10 ft.	3.0
BH-04 S-1 @ 0 - 10 ft.	4.1
BH-05 S-1 @ 0 - 7 ft.	11.6
BH-05 S-4 @ 2.5 ft.	23.8
BH-06 S-1 @ 0 – 7.5 ft.	8.2
BH-07 S-1 @ 0 - 7.5 ft.	31.3
BH-07 S-5 @ 5 ft.	87.8

Atterberg Limits (ASTM D4318)			
Sample ID	**Liquid Limit**	**Plastic Limit**	**Plasticity Index**
BH-01 S-5 @ 5 ft.	NP	NP	NP
BH-02 S-7 @ 10 ft.	NP	NP	NP
BH-05 S-4 @ 2.5 ft.	33	24	9
BH-07 S-5 @ 5 ft.	47	33	14

Attachments: Laboratory Test Results
Copies: Addressee

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 REVIEWED BY: Tom Ginsbach

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TECHNICAL REPORT

Report To: Justin McCarley, GIT
Cornforth Consultants, Inc
10250 SW Greenburg RD #111
Portland, Oregon 97223

Date: 04/24/2020

Lab No.: 20-066

Project: 2837 – Yakima Ecosystem Restoration

Project No.: 3285.1.1

Laboratory Testing

Particle Size Analysis of Soil (ASTM C136/117)

Sieve Size	BH-01 S-1 @ 0 - 10 ft. Percent Passing	BH-03 S-1 @ 0 - 10 ft. Percent Passing	BH-04 S-1 @ 0 - 10 ft. Percent Passing	BH-05 S-1 @ 0 - 7 ft. Percent Passing	BH-06 S-1 @ 0 - 7.5 ft. Percent Passing
4”	--	--	--	--	100
3”	100	100	--	100	97
2”	98	97	100	93	84
1 ½”	85	96	96	89	67
1”	73	83	76	76	31
¾”	58	66	60	66	18
½”	41	45	38	58	11
⅜”	32	33	31	53	10
¼”	22	24	27	49	9
#4	18	21	26	47	9
#8	13	19	25	44	8
#10	12	19	25	41	8
#16	10	18	24	38	7
#30	8	17	23	33	6
#40	7	17	22	30	6
#50	6	16	20	26	5
#100	4	13	17	20	4
#200	3.0	9.8	13.8	14.6	2.8

Note: Sample size of BH-06 S-1 @ 0 - 7.5 ft did not meet ASTM standards

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TECHNICAL REPORT

Report To: Justin McCarley, GIT
Cornforth Consultants, Inc
10250 SW Greenburg RD #111
Portland, Oregon 97223

Date: 04/24/2020

Lab No.: 20-066

Project: 2837 – Yakima Ecosystem Restoration

Project No.: 3285.1.1

Laboratory Testing

Particle Size Analysis of Soil (ASTM D422)		
Sieve Size	**BH-02 S-1 @ 0 - 10 ft. Percent Passing**	**BH-07 S-1 @ 0 - 7.5 ft. Percent Passing**
4”	--	--
3”	--	--
2”	100	--
1 ½”	98	--
1”	96	--
¾”	93	--
½”	90	--
⅜”	87	100
¼”	85	99
#4	83	99
#8	81	99
#10	80	99
#16	78	97
#30	73	92
#40	67	87
#50	59	79
#100	40	61
#200	27.3	47.5

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SECTION TABLE OF CONTENTS

DIVISION 31 - EARTHWORK

SECTION 31 05 19

GEOTEXTILE

08/08

-- End of Section Table of Contents --

SECTION 31 05 19

GEOTEXTILE
08/08

PART 1 GENERAL

1.1 MEASUREMENT

Measure the as-built surface area, covered by geotextile, in square yards. Allowance will be made for geotextile in anchor and/or drainage trenches but no allowance will be made for waste, overlaps, damaged materials, repairs, or materials used for the convenience of the Contractor.

1.2 PAYMENT

Geotextile installed and accepted will be paid for at the respective contract unit price in the bidding schedule. This unit price will include the cost of materials, equipment, installation, testing, and other costs associated with placement of the geotextile.

1.3 REFERENCES

The publications listed below form a part of this specification to the extent referenced. The publications are referred to within the text by the basic designation only.

ASTM INTERNATIONAL (ASTM)

ASTM D4354	(2012; R 2020) Sampling of Geosynthetics for Testing
ASTM D4355/D4355M	(2014) Deterioration of Geotextiles from Exposure to Light, Moisture and Heat in a Xenon-Arc Type Apparatus
ASTM D4491/D4491M	(2017) Standard Test Methods for Water Permeability of Geotextiles by Permittivity
ASTM D4533/D4533M	(2015) Standard Test Method for Trapezoid Tearing Strength of Geotextiles
ASTM D4632/D4632M	(2015a) Grab Breaking Load and Elongation of Geotextiles
ASTM D4751	(2020) Standard Test Method for Determining Apparent Opening Size of a Geotextile
ASTM D4759	(2011; R 2018) Standard Practice for Determining the Specification Conformance of Geosynthetics
ASTM D4873/D4873M	(2017) Standard Guide for Identification, Storage, and Handling of Geosynthetic Rolls and Samples

ASTM D6241	(2014) Standard Test Method for the Static Puncture Strength of Geotextiles and Geotextile-Related Products Using a 50-mm Probe

1.4 SUBMITTALS

Government approval is required for submittals with a "G" designation; submittals not having a "G" designation are for information only. When used, a designation following the "G" designation identifies the office that will review the submittal for the Government. Submit the following in accordance with Section 01 33 00 SUBMITTAL PROCEDURES:

SD-03 Product Data

Thread
Manufacturing Quality Control Sampling and Testing

SD-04 Samples

Quality Assurance Samples and Tests

SD-07 Certificates

Geotextile

1.5 DELIVERY, STORAGE, AND HANDLING

Deliver, store, and handle geotextile in accordance with ASTM D4873/D4873M.

1.5.1 Delivery

Notify the Contracting Officer a minimum of 24 hours prior to delivery and unloading of geotextile rolls packaged in an opaque, waterproof, protective plastic wrapping. The plastic wrapping shall not be removed until deployment. If quality assurance samples are collected, immediately rewrap rolls with the plastic wrapping. Geotextile or plastic wrapping damaged during storage or handling shall be repaired or replaced, as directed. Label each roll with the manufacturer's name, geotextile type, roll number, roll dimensions (length, width, gross weight), and date manufactured.

1.5.2 Storage

Protect rolls of geotextile from construction equipment, chemicals, sparks and flames, temperatures in excess of 160 degrees F, or any other environmental condition that may damage the physical properties of the geotextile. To protect geotextile from becoming saturated, either elevate rolls off the ground or place them on a sacrificial sheet of plastic in an area where water will not accumulate.

1.5.3 Handling

Handle and unload geotextile rolls with load carrying straps, a fork lift with a stinger bar, or an axial bar assembly. Rolls shall not be dragged along the ground, lifted by one end, or dropped to the ground.

PART 2 PRODUCTS

2.1 RAW MATERIALS

A minimum of 7days prior to scheduled use, submit manufacturer's certificate of compliance stating that the geotextile meets the requirements of this section. For needle punched geotextiles, the manufacturer shall also certify that the geotextile has been continuously inspected using permanent on-line full-width metal detectors and does not contain any needles which could damage other geosynthetic layers. The certificate of compliance shall be attested to by a person having legal authority to bind the geotextile manufacturer.

2.1.1 Geotextile

Provide geotextile that is a woven pervious sheet of polymeric material consisting of long-chain synthetic polymers composed of at least 95 percent by weight polyolefins, polyesters, or polyamides. The use of woven slit film geotextiles (i.e. geotextiles made from yarns of a flat, tape-like character) will not be allowed. Add stabilizers and/or inhibitors to the base polymer, as needed, to make the filaments resistant to deterioration by ultraviolet light, oxidation, and heat exposure. Regrind material, which consists of edge trimmings and other scraps that have never reached the consumer, may be used to produce the geotextile. Post-consumer recycled material shall not be used. Geotextile shall be formed into a network such that the filaments or yarns retain dimensional stability relative to each other, including the edges. Geotextiles shall meet the requirements specified in Table 1. Where applicable, Table 1 property values represent minimum average roll values (MARV) in the weakest principal direction. Values for AOS represent maximum average roll values.

TABLE 1
MINIMUM PHYSICAL REQUIREMENTS FOR DRAINAGE GEOTEXTILE

PROPERTY	UNITS	ACCEPTABLE VALUES	TEST METHOD
GRAB STRENGTH	LBS	315	ASTM D4632/D4632M
SEAM STRENGTH	LBS	270	ASTM D4632/D4632M
PUNCTURE	LBS	620	ASTM D6241
TRAPEZOID TEAR	LBS	112	ASTM D4533/D4533M
APPARENT OPENING SIZE	U.S. SIEVE	NO. 40 MAX.	ASTM D4751
PERMITTIVITY	SEC -1	0.1	ASTM D4491/D4491M

TABLE 1
MINIMUM PHYSICAL REQUIREMENTS FOR DRAINAGE GEOTEXTILE

ULTRAVIOLET DEGRADATION	PERCENT	50 AT 500 HRS	ASTM D4355/D4355M

2.1.2 Thread

A minimum of 7 days prior to scheduled use, submit proposed thread type for sewn seams along with data sheets showing the physical properties of the thread. Construct sewn seams with high-strength polyester, nylon, or other approved thread type. Thread shall have ultraviolet light stability equivalent to the geotextile and the color shall contrast with the geotextile.

2.2 MANUFACTURING QUALITY CONTROL SAMPLING AND TESTING

The Manufacturer is responsible for establishing and maintaining a quality control program to assure compliance with the requirements of the specification. A minimum of 7 days prior to scheduled use, submit manufacturer's quality control manual. Documentation describing the quality control program shall be made available upon request. Perform manufacturing quality control sampling and testing in accordance with the manufacturer's approved quality control manual. As a minimum, geotextiles shall be randomly sampled for testing in accordance with ASTM D4354, Procedure A. Acceptance of geotextile shall be in accordance with ASTM D4759. Tests not meeting the specified requirements will result in the rejection of applicable rolls.

PART 3 EXECUTION

3.1 QUALITY ASSURANCE SAMPLES AND TESTS

3.1.1 Quality Assurance Samples

Provide assistance to the Contracting Officer in the collection of quality assurance samples for quality assurance testing; assign 7 days in the schedule to allow for testing. Collect samples upon delivery to the site at the request of the Contracting Officer. Lot size for quality assurance sampling shall be considered to be the shipment quantity of the product or a truckload of the product, whichever is smaller. The unit size shall be considered one roll of geotextile. Identify samples with a waterproof marker by manufacturer's name, product identification, lot number, roll number, and machine direction. The date and a unique sample number shall also be noted on the sample. Discard the outer layer of the geotextile roll prior to sampling a roll. Samples shall then be collected by cutting the full-width of the geotextile sheet a minimum of 3 feet long in the machine direction. Rolls which are sampled shall be immediately resealed in their protective covering.

3.1.2 Quality Assurance Tests

The Contracting Officer will provide quality assurance samples to an Independent Laboratory. Samples will be tested to verify that geotextile meets the requirements specified in Table 1. Test method ASTM D4355/D4355M shall not be performed on the collected samples. Geotextile product acceptance shall be based on ASTM D4759. Tests not meeting the specified

requirements will result in the rejection of applicable rolls.

3.2 INSTALLATION

3.2.1 Subgrade Preparation

The surface underlying the geotextile shall be smooth and free of ruts or protrusions which could damage the geotextile. Subgrade materials and compaction requirements shall be in accordance with Section 31 00 00.

3.2.2 Placement

Notify the Contracting Officer a minimum of 24 hours prior to installation of geotextile. Geotextile rolls which are damaged or contain imperfections shall be repaired or replaced as directed. The geotextile shall be laid flat and smooth so that it is in direct contact with the subgrade. The geotextile shall also be free of tensile stresses, folds, and wrinkles. On slopes steeper than 10 horizontal on 1 vertical, lay the geotextile with the machine direction of the fabric parallel to the slope direction.

3.3 SEAMS

3.3.1 Overlap Seams

Continuously overlap geotextile panels a minimum of 12 inches at all longitudinal and transverse joints. Where seams must be oriented across the slope, lap the upper panel over the lower panel. If approved, sewn seams may be used instead of overlapped seams.

3.4 PROTECTION

Protect the geotextile during installation from clogging, tears, and other damage. Damaged geotextile shall be repaired or replaced as directed. Use adequate ballast (e.g. sand bags) to prevent uplift by wind. The geotextile shall not be left uncovered for more than 1 day after installation.

3.5 REPAIRS

Repair torn or damaged geotextile. Clogged areas of geotextile shall be removed. Perform repairs by placing a patch of the same type of geotextile over the damaged area. The patch shall extend a minimum of 12 inches beyond the edge of the damaged area. Patches shall be continuously fastened using approved methods. The machine direction of the patch shall be aligned with the machine direction of the geotextile being repaired. Remove and replace geotextile rolls which cannot be repaired. Repairs shall be performed at no additional cost to the Government

3.6 PENETRATIONS

Construct engineered penetrations of the geotextile by methods recommended by the geotextile manufacturer.

3.7 COVERING

Do not cover geotextile prior to inspection and approval by the Contracting Officer. Place cover material in a manner that prevents soil from entering the geotextile overlap zone, prevents tensile stress from

being mobilized in the geotextile, and prevents wrinkles from folding over onto themselves. On side slopes, backfill shall be placed from the bottom of the slope upward. Cover material shall not be dropped onto the geotextile from a height greater than 1 foot. No equipment shall be operated directly on top of the geotextile without approval of the Contracting Officer. Equipment placing cover material shall not stop abruptly, make sharp turns, spin their wheels, or travel at speeds exceeding 5 mph.

-- End of Section --

SECTION TABLE OF CONTENTS

DIVISION 31 - EARTHWORK

SECTION 31 11 00

CLEARING AND GRUBBING

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SECTION 31 11 00

CLEARING AND GRUBBING
11/18

PART 1 GENERAL

1.1 SUBMITTALS

Government approval is required for submittals with a "G" designation; submittals not having a "G" designation are for information only. When used, a designation following the "G" designation identifies the office that will review the submittal for the Government. Submit the following in accordance with Section 01 33 00 SUBMITTAL PROCEDURES:

SD-01 Preconstruction Submittals

Vegetation Management Plan; D, DO

The contractor provided vegetation management plan will include maps of proposed disturbance areas in correspondence with marked clearing limits, areas of significant vegetation that will be preserved (if marked by County of Corps) within work limits, trees and other vegetation that will be salvaged for onsite habitat use, lists of equipment that will be used to clear and process vegetation, hauling routes, and disposal areas. Include proposed equipment, procedures and safety protocols for tree removal and qualifications of personel responsible for clearing trees (licensed arborist of forester).

SD-03 Product Data

Tree Wound Paint

1.2 DELIVERY, STORAGE, AND HANDLING

Deliver materials to the site, and handle in a manner which will maintain the materials in their original manufactured or fabricated condition until ready for use.

PART 2 PRODUCTS

2.1 MATERIALS

2.1.1 Tree Wound Paint

Use bituminous based paint from standard manufacture specially formulated for tree wounds.

PART 3 EXECUTION

3.1 PREPARATION

3.1.1 Protection

3.1.1.1 Roads and Walks

Keep roads and walks free of dirt and debris at all times.

3.1.1.2 Trees, Shrubs, and Existing Facilities

Protect trees and vegetation to be left standing from damage incident to clearing, grubbing, and construction operations by the erection of barriers or by such other means as the circumstances require.

3.1.1.3 Utility Lines

Protect existing utility lines that are indicated to remain from damage. Notify the Contracting Officer immediately of damage to or an encounter with an unknown existing utility line. The Contractor is responsible for the repair of damage to existing utility lines that are indicated or made known to the Contractor prior to start of clearing and grubbing operations. When utility lines which are to be removed are encountered within the area of operations, notify the Contracting Officer in ample time to minimize interruption of the service. Refer to Section 01 30 00 ADMINISTRATIVE REQUIREMENTS and Section 01 57 19 TEMPORARY ENVIRONMENTAL CONTROLS for additional utility protection.

3.2 CLEARING

Clearing consists of the removal of trees/timber, snags, brush, and rubbish occurring within the areas to be cleared. Consistent with the Contractor's Vegetation Management Plan, conserve any cleared trees, non-herbaceous vegetation, tree limbs and slash, and onsite woody debris for reuse as habitat as indicated on the drawings. Onsite vegetation is typical for riparian settings and range from mature cottonwoods to emerging willows. Refer to the drawings for desired lengths of timber for placement and resuse on site. Bidders shall assume that provided crews and equipment shall be able to safely fell, handle, haul and place logs with attached rootwads weighing as much as 25,000 lb and stem diameters exceeding 6-ft. Rootwads are to be left intact on boles. Bole lengths to be maximum that equipment can safely handle hauling with off-road equipment. Clearing also includes the removal and disposal of structures that obtrude, encroach upon, or otherwise obstruct the work.

Stumps and other herbaceous vegetation in areas to be cleared, except where vegetation is indicated or directed to be left standing. Trim dead branches 1-1/2 inches or more in diameter on trees designated to be left standing within the cleared areas and trim all branches to the heights indicated or directed. Neatly cut close to the bole of the tree or main branches, limbs and branches to be trimmed. Paint, with an approved tree-wound paint, cuts more than 1-1/2 inches in diameter. Apply herbicide in accordance with the manufacturer's label to the top surface of stumps designated not to be removed.

Remove all crack willow, Himalayan blackberry, evergreen blackberry, knotweed species, scotch broom, English ivy, morning glory, English

laurel, European hawthorne, and other invasive non-native species encountered within the disturbed project area as defined by the Construction Limits as shown on the drawings, including staging areas. Remove all invasives with manual methods to the greatest extent possible. Other control methods, including limited spot application of approved herbicide, could be employed if necessary if manual removal is not effective. Blackberry canes located in areas of high density native vegetation shall be cut by hand and the cane stubs shall be treated with herbicide that targets the roots.

3.2.1 Tree Removal

Remove trees in accordance with the Vegetation Management Plan. Where indicated or directed, trees and stumps that are designated as trees shall be removed from areas outside those areas designated for clearing and grubbing. This work includes the felling of such trees and the removal of their stumps and roots as specified in paragraph GRUBBING. Dispose of trees as specified in paragraph DISPOSAL OF MATERIALS.

All trees will be removed with rootwads attached. This may require cutting trees to manageble lenghts prior to pushing the remaining stem and rootwad over. Trees will be pushed over in a controlled manner to avoid unnecessary damage to adjacent standing trees. Remove excess soil from rootwads. Minimize trimming of rootwads. Deck trees in staging areas in an orderly manner to aid identificaiton, measurement and retrieval. Sort tree tops, limbs, slash seperate from decks of logs, bolls and logs with rootwads.

Trees with diameters at breast height (DBH) of less than 12-inches are considered equivalent to slash material.

3.2.2 Pruning

Prunetrees designated to be left standing within the cleared areas of dead branches 1-1/2 inches or more in diameter; and trim branches to heights and in a manner as indicated. Neatly cut limbs and branches to be trimmed close to the bole of the tree or main branches. Paint cuts more than 1-1/4 inches in diameter with an approved tree wound paint.

3.2.3 Grubbing

Adjacent to levees, revetments, and culverts grubbing consists of the removal and disposal of stumps, roots larger than 3 inches in diameter, and matted roots from the designated grubbing areas. Remove material to be grubbed, together with logs and other organic or metallic debris not suitable for foundation purposes, to a depth of not less than 18 inches below the original surface level of the ground in areas indicated to be grubbed and in areas indicated as construction areas under this contract.

For habitat channels and fill areas, grubbing consists of remvoal of roots and stumps that interfere with grading work. No subexcavation is necessary.

Fill depressions made by grubbing with suitable material and compact to make the surface conform with the original adjacent surface of the ground or design.

3.3 DISPOSAL OF MATERIALS

Dispose of excess materials in accordance with the approved Vegetation Management Plan and solid waste management permit and include those materials in the solid waste management report.

All vegeation and woody materials of natural origin shall be temporarily stored in staging areas in an orderly manner until placed as habitat in areas indicated on the drawings. The primary disposal areas for vegetation will be the Newland Ponds. All other man-made materials and debris indicated for removal or encountered within the work limits or generated from construction activities will be hauled off site and disposed of in County approved landfills.

-- End of Section --

SECTION TABLE OF CONTENTS

DIVISION 32 - EXTERIOR IMPROVEMENTS

SECTION 32 93 00

PLANTING

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-- End of Section Table of Contents --

SECTION 32 93 00

PLANTING
03/21

PART 1 GENERAL

1.1 REFERENCES

The publications listed below form a part of this specification to the extent referenced. The publications are referred to within the text by the basic designation only.

AMERICANHORT (AH)

ANSI/ANLA Z60.1	(2004) American Standard for Nursery Stock

ASTM INTERNATIONAL (ASTM)

ASTM D2434	(1968; R 2006) Permeability of Granular Soils (Constant Head)
ASTM D2974	(2020; E 2020) Moisture, Ash, and Organic Matter of Peat and Other Organic Soils

WASHINGTON STATE DEPARTMENT OF TRANSPORTATION (WSDOT)

WSDOT 9-14	(2009) Standard Specification - Erosion Control and Roadside Planting Materials

1.2 RELATED REQUIREMENTS

Section 31 00 00 EARTHWORK, Section 31 11 00 CLEARING AND GRUBBING and Section 01 57 19 TEMPORARY ENVIRONMENTAL CONTROLS applies to this section for pesticide use and plant establishment requirements, with additions and modifications herein.

1.3 DEFINITIONS

a. Backfill: The earth used to replace or the act of replacing earth in an excavation.

b. Balled and Burlapped Stock: Plants dug with firm, natural balls of earth in which they were grown, with ball size not less than sizes indicated; wrapped with burlap, tied, rigidly supported, and drum laced with twine with the root flare visible at the surface of the ball as recommended by ANSI/ANLA Z60.1.

c. Bare-Root Stock: Plants with a well-branched, fibrous-root system developed by transplanting or root pruning, with soil or growing medium removed, and with not less than minimum root spread according to ANSI/ANLA Z60.1 for type and size of plant required.

d. Certified Arborist: Arborist certified by International Society of Arboriculture.

e. Critical Root Zone (CRZ): The zone around an existing tree to protect.

CRZ is defined as one foot offset from the centerline of the trunk for every inch of caliper at diameter breast height (DBH); i.e. 12-inches at DBH equals 12-foot radius CRZ.

f. Compost: a mixture that consists largely of decayed organic matter and is used in amending and conditioning soil.

g. Container-Grown Stock: Healthy, vigorous, well-rooted plants grown in a container, with a well-established root system reaching sides of container and maintaining a firm ball when removed from container. Container shall be rigid enough to hold ball shape and protect root mass during shipping and be sized according to ANSI Z60.1 for type and size of plant required.

h. Duff Layer: The surface layer of native topsoil that is composed of mostly decayed leaves, twigs, and detritus.

i. Fabric Bag-Grown Stock: Healthy, vigorous, well-rooted plants established and grown in-ground in a porous fabric bag with well established root system reaching sides of fabric bag. Fabric bag size is not less than diameter, depth, and volume required by ANSI Z60.1 for type and size of plant.

j. Finish Grade: Elevation of finished surface of planting soil.

k. Infiltration: the process by which water on the ground surface enters the soil. Testing per requirements herein are defined by ASTM D2434.

l. Inspection Certificates. All plant material shall meet requirements of State and Federal laws with respect to inspection for plant diseases and infestation. Inspection certificates required by law shall accompany each shipment of plant material and submitted to the Contracting Officer's Representative.

m. Organic content: expressed as a percentage of dry weight achieved through combustion of organic material in a soil or aggregate, Loss on Ignition (LOI) per ASTM D2974.

n. Pesticide: A substance or mixture intended for preventing, destroying, repelling, or mitigating a pest. This includes insecticides, miticides, herbicides, fungicides, rodenticides, and molluscicides. It also includes substances or mixtures intended for use as a plant regulator, defoliant, or desiccant.

o. Hazard level of pesticides: Environmental Protection Agency defines pesticides into levels of hazard: Hazard Category I products are marked with the signal word DANGER, Hazard Category II products are marked with the signal word WARNING, Hazard Category III products are marked with the signal word CAUTION.

p. Pests: Living organisms that occur where they are not desired, or that cause damage to plants, animals, or people. These include insects, mites, grubs, mollusks (snails and slugs), rodents (gophers, moles, and mice), unwanted plants (weeds), fungi, bacteria, and viruses.

q. Planting Area: Areas to be planted.

r. Plant; Plants; Plant Material: These terms refer to vegetation in general, including trees, shrubs, vines, ground covers, ornamental

grasses, bulbs, corms, tubers, or herbaceous vegetation. See WSDOT 9-14.6(1).

s. Root Flare: Also called "trunk flare." The area at the base of the plant's stem or trunk where the stem or trunk broadens to form roots; the area of transition between the root system and the stem or trunk.

t. Stem Girdling Roots: Roots that encircle the stems (trunks) of trees below the soil surface.

u. Street Tree Grade: Trees with straight trunks full and symmetrical branching central leader and be developed grown and propagated with a full branching crown. This designation requires the highest grade of nursery shade or ornamental tree production.

v. Subgrade: Surface or elevation of subsoil remaining after excavation is complete, or the top surface of a fill or backfill before topsoil or bioretention is placed.

w. Subsoil: All soil beneath the topsoil layer of the soil profile, and typified by the lack of organic matter and soil organisms.

x. Surface Soil: Soil that is present at the top layer of the existing soil profile at the Project site. In undisturbed areas, the surface soil is typically topsoil; but in disturbed areas such as urban environments, the surface soil can be subsoil.

y Seed Tackifier: A hydroseeding tackifier acts as a bonding agent such that the layering of the seed is uniformly and evenly distributed. In the hydroseeding process, a slurry of seed, mulch, fertilizer, green dye, and other additives is sprayed over the ground.

z. Topsoil: Planting soils: a mix of soil components that create planting medium modified with amendments and/or fertilizers to produce a soil mixture best for plant growth. Sources include existing, native surface topsoil; existing, in-place surface soil; imported planting soils, or manufactured topsoil that is modified with soil amendments and fertilizers to produce a soil mixture that will support plant life and other functions and to satisfy requirements herein. Topsoil shall be free from weed seed and weed debris.

1.4 SUBMITTALS

Government approval is required for submittals with a "G" classification. Submittals not having a "G" classification are for information only. When used, a code following the "G" classification identifies the office that will review the submittal for the Government. Submit the following in accordance with Section 01 33 00 SUBMITTAL PROCEDURES:

SD-01 Preconstruction Submittals

State Landscape Contractor's License; G

Time Restrictions and Planting Conditions; G

Indicate anticipated dates and locations for each type of planting.

SD-03 Product Data

Mulch

Nursery Certifications; G

SD-07 Certificates

Inspection Certificates; G

SD-11 Closeout Submittals

As-Built Report

Year 1 Monitoring Report

1.5 QUALITY ASSURANCE

1.5.1 Nursery Certifications

a. Submit within 20 days after contract date a list of all plant material indicating source of supply order invoice, size and quantity of species or variety and location where grown.

b. Indicate on nursery letterhead the name of plants in accordance with the quantity, size and conditions as indicated on the Drawings and Plant Material Listing. All plant material shall be legibly tagged. Tagging may be by species or variety with minimum of one tag per ten trees or shrubs.

c. Inspection certificate.

d. Mycorrhizal fungi inoculum for plant material treated

1.5.2 State Landscape Contractor's License

Construction company must hold a landscape contractors license in the state where the work is performed and have a minimum of five years landscape construction experience. Submit copy of license and three references for similar work completed in the last five years.

1.5.3 Pre-Installation Meeting

Convene a pre-installation meeting a minimum of one week prior to commencing work of this section. Require attendance of parties directly affecting work of this section. Review conditions of operations, procedures and coordination with related work. Agenda must include the following:

a. Tour, inspect, and discuss conditions of planting materials.

b. Review planting schedule and maintenance.

c. Review required inspections.

d. Review environmental procedures.

1.6 DELIVERY, STORAGE, AND HANDLING

1.6.1 Delivery

Notify on-site field staff seven days or more in advance of deliveries to ensure required coordination of on-site inspection. Plant material showing damage from shipping, while in storage, or during planting may be rejected by the COR and shall be replaced by the Contractor at no cost to the Government.

1.6.1.1 Branched Plant Delivery

Deliver with branches tied and exposed branches covered with material which allows air circulation. Prevent damage to branches, trunks, root systems, and root balls and desiccation of leaves.

1.6.1.2 Plant Labels

Deliver plants with durable waterproof labels in weather-resistant ink. Provide labels stating the correct botanical and common plant name and variety as applicable and size as specified in the list of required plants. Attach to plants, bundles, and containers of plants. Groups of plants may be labeled by tagging one plant. Labels must be legible for a minimum of 60 days after delivery to the planting site.

1.6.2 Storage

1.6.2.1 Plant Storage and Protection

Store and protect plants not planted on the day of arrival at the site as follows:

a. Shade and protect plants in outside storage areas from the wind and direct sunlight until planted.

b. Heel-in bare root plants.

c. Protect balled and burlapped plants from freezing or drying out by covering the balls or roots with moist burlap, sawdust, wood chips, shredded bark, peat moss, or other approved material. Provide covering which allows air circulation.

d. Keep plants in a moist condition until planted by watering with a fine mist spray.

e. Do not store plant material directly on concrete or bituminous surfaces.

1.6.2.2 Topsoil

Prior to stockpiling topsoil, eradicate on site undesirable growing vegetation. Clear and grub existing vegetation three to four weeks prior to stockpiling existing topsoil.

1.6.3 Handling

Do not drop or dump plants from vehicles. Avoid damaging plants being moved from nursery or storage area to planting site. Handle all plants carefully to avoid damaging or breaking the earth ball or root structure.

Do not handle plants by the trunk or stem. Puddle bare-root plants after removal from the heeling-in bed to protect roots from drying out. Remove damaged plants from the site.

1.6.4 TIME LIMITATION

Except for container-grown plant material, the time limitation from digging to installing plant material must be a maximum of 90 days. The time limitation between installing the plant material and placing the mulch must be a maximum of 24 hours.

1.7 TIME RESTRICTIONS AND PLANTING CONDITIONS

Coordinate installation of planting materials during optimal planting seasons for each type of plant material required.

1.7.1 Planting Dates

Planting operations shall be performed only during periods when the weather and site conditions are conducive to successful planting. When special conditions warrant a variance to the planting operations, proposed planting times shall be submitted for approval. Place seed on sites disturbed by construction immediately after the disturbance as construction progresses. Avoid placing seed during winter months. Planting shall not be permitted during the following conditions:

1. Cold weather: less than 32 degrees F.

2. Hot weather: greater than 80 degrees F.

3. Wet weather: saturated soil, indicated by standing water or surface ponding.

4. Windy weather: wind velocity greater than 30 m.p.h.

1.7.2 Restrictions

Do not plant when ground is frozen, snow covered, muddy, or when air temperature exceeds 80 degrees Fahrenheit. Do not plant when soil temperature is below 41 degrees Fahrenheit.

1.8 GUARANTEE

1.8.1 Plant Material guarantee

All furnished plant material shall have a warranty against defects including death and unsatisfactory growth, except for defects resulting from lack of adequate maintenance, neglect, or abuse by the Government or by unusual weather conditions (such as extreme temperatures or precipitation levels) for the warranty period. The warranty shall be for plant growth to be in a vigorous growing condition for a minimum 12-month period beginning on the date of inspection by the COR.

1.8.2 Plant Material replacement

Remove and immediately replace all plants in accordance with the Drawings and specifications, as determined by the COR or USACE biologist, to be unsatisfactory during the initial planting installation. The cost of such replacements is at the Contractor's expense.

As determined by the COR and on-site field staff, replace all plants that are dead in accordance with the drawings and specifications. Replace all plant material that is in an unhealthy or unsightly condition, and that have lost their natural shape due to dead branches or other causes due to the Contractor's negligence. Remove and replace dead or damaged planting materials immediately unless required to plant in the succeeding planting season. The cost of such replacements is at the Contractor's expense.

1.8.2.1 Plant Survival Guarantee

Ensure 100 percent survival of all plants for one year after installation is complete. In the event survival is below 100 percent, replace dead plants to achieve a 100 percent survival. Ensure 80 percent survival after year 2. In the event survival is below 80 percent at year 2, replace dead plants to achieve 80 percent survival.

PART 2 PRODUCTS

2.1 PLANTS

All native plant material shall be nursery grown. Cold storage plants will not be permitted. Rooted stock and seeds used for this project shall consist of native Eastern Washington and/or Eastern Oregon genetic origin. Documentation of sourcing and quantities of plant materials shall be required prior to the start of construction. Substitutions of species, quantities, and container-size may only be made with the approval of USACE.

2.1.1 Regulations and Varieties

Existing trees and shrubs to remain must be protected and a planting plan be arranged around them. Furnish nursery stock in accordance with ANSI/ANLA Z60.1, except as otherwise specified or indicated. Each plant or group of planting must have a "key" number indicated on the nursery certifications of the plant schedule. Furnish plants grown under climatic conditions similar to those in the locality of the project. Plants specified must be indigenous, low maintenance varieties, tolerant of site's existing soils and climate without supplemental irrigation or fertilization once established. Plants of the same specified size must be of uniform size and character of growth. Plants must be chosen with their mature size and growth habit in mind to avoid over-planting and conflict with other plants, structures or underground utility lines. All plants must comply with all Federal and State Laws requiring inspection for plant diseases and infestation.

2.1.2 Shape and Condition

Well-branched, well-formed, sound, vigorous, healthy planting stock free from disease, sunscald, windburn, abrasion, and harmful insects or insect eggs and having a healthy, normal, and undamaged root system.

2.1.2.1 Deciduous Trees and Shrubs

Symmetrically developed and of uniform habit of growth, with straight boles or stems, and free from objectionable disfigurements.

2.1.2.2 Evergreen Trees and Shrubs

Well developed symmetrical tops with typical spread of branches for each

particular species or variety.

2.1.2.3 Ground Covers and Vines

Number and length of runners and clump sizes indicated, and of the proper age for the grade of plants indicated, furnished in removable containers, integral containers, or formed homogeneous soil section.

2.1.3 Plant Size

Minimum sizes measured after pruning and with branches in normal position, must conform to measurements indicated, based on the average width or height of the plant for the species as specified in ANSI/ANLA Z60.1. Plants larger in size than specified may be provided with approval of the Contracting Officer. When larger plants are provided, increase the ball of earth or spread of roots in accordance with ANSI/ANLA Z60.1.

2.1.4 Root Ball Size

All box-grown, field potted, field boxed, collected, plantation grown, bare root, balled and burlapped, container grown, processed-balled, and in-ground fabric bag-grown root balls must conform to ANSI/ANLA Z60.1. All wrappings and ties must be biodegradable. Root growth in container grown plants must be sufficient to hold earth intact when removed from containers. Root bound plants will not be accepted.

2.1.5 Growth of Trunk and Crown

2.1.5.1 Deciduous Trees

A height to caliper relationship must be provided in accordance with ANSI/ANLA Z60.1. Height of branching must bear a relationship to the size and species of tree specified and with the crown in good balance with the trunk. The trees must not be "poled" or the leader removed.

a. Single stem: The trunk must be reasonably straight and symmetrical with crown and have a persistent main leader.

b. Multi-stem: All countable stems, in aggregate, must average the size specified. To be considered a stem, there must be no division of the trunk which branches more than 6 inches from ground level.

2.1.5.2 Deciduous Shrubs

Deciduous shrubs must have the height and number of primary stems recommended by ANSI/ANLA Z60.1. Acceptable plant material must be well shaped, with sufficient well-spaced side branches, and recognized by the trade as typical for the species grown in the region of the project.

2.1.5.3 Coniferous Evergreen Plant Material

Coniferous Evergreen plant material must have the height-to-spread ratio recommended by ANSI/ANLA Z60.1. The coniferous evergreen trees must not be "poled" or the leader removed. Acceptable plant material must be exceptionally heavy, well shaped and trimmed to form a symmetrical and tightly knit plant. The form of growth desired must be as indicated.

2.1.5.4 Broadleaf Evergreen Plant Material

Broadleaf evergreen plant material must have the height-to-spread ratio recommended by ANSI/ANLA Z60.1. Acceptable plant material must be well shaped and recognized by the trade as typical for the variety grown in the region of the project.

2.1.5.5 Ground Cover and Vine Plant Material

Ground cover and vine plant material must have the minimum number of runners and length of runner recommended by ANSI/ANLA Z60.1. Plant material must have heavy, well developed and balanced crown with vigorous, well developed root system and must be furnished in containers.

2.1.5.6 Seeded Area Material

There are four types of seeded material to be used at this site. All seed mix shall be 98 percent pure with a pretested germination rate of 80 percent unless otherwise specified. All dry native seed shall be "non-endophyte enhanced".

1. Seed Mix #1: Blue Slough setback levee:

Species	**Common Name**	**Percent of Mix by Weight**
Poa secunda	Sandberg's bluegrass	30%
Pseudoroegneria spicata	Bluebunch wheatgrass	5%
Lolium multiflorum	Annual ryegrass	65%

2. Seed Mix #2: KOA and DID #1 levee removal footprints, northern half of Sportsman Island, all other upland areas disturbed by construction: Deeper soil moisture, inundated on the 2-5 year scale.

Species	**Common Name**	**Percent of Mix by Weight**
Agrostis exarata	Spiked bentgrass	8.75%
Deschampsia elongata	Slender hairgrass	10%
Leymus cinereus	Basin wildrye	40%
Poa secunda	Sandberg's bluegrass	41.25%

3. Seed Mix #3: Impacted wetland areas adjacent to Blue Slough setback levee construction and southern half of Sportsman Island: Shallower soil moisture, inundated on the 2-5 year scale.

Species	**Common Name**	**Percent of Mix by Weight**
Agrostis exarata	Spiked bentgrass	3.75%

Species	Common Name	Percent of Mix by Weight
Deschampsia elongata	Slender hairgrass	7.5%
Festuca rubra	Red fescue	38.75%
Hordeum brachyantherum	Meadow barley	18.75%
Leymus cinereus	Basin wildrye	12.5

4. Seed Mix #4: All impacted areas on the CPM Processing Site along Blue Slough and the new excavated channels (see Planting Plan design sheets).

Species	Common Name	Percent of Mix by Weight
Agropyron spicatum	Secar bluebunch wheatgrass	28%
Asclepias speciosa	Showy milkweed	1%
Erigonum heracleoides	Wyeth buckwheat	5%
Koeleria macrantha	Prairie junegrass	10%
Leymus cinereus	Basin wildrye	25%
Lupinus caudatus	Tailcup lupine	2%
Poa sandbergii	Sandberg bluegrass	20%
Stipa comata	Needle-N-Thread	10%

2.2 TOPSOIL

2.2.1 Existing Soil

Soil used for planting will consist of native soil located on-site. No imported topsoil, compost, fertilizers, or lime shall be used.

2.2.2 Off-Site Topsoil

No off-site topsoil, compost, or lime shall be used.

2.3 MULCH

Wood chip mulch: Bark or wood chip mulch shall be derived from Douglas fir, pine, or hemlock tree species. It shall not contain resin, tannin, or other compounds in quantities that would be detrimental to plant life. Wood chip mulch material shall be medium size (1/2-inch to 3-inch). Wood chip mulch shall be free of man-made material and invasive species. Green vegetation shall be less than 10 percent of the mulch by volume.

2.4 SOURCE QUALITY CONTROL

a. The USACE biologist or on-site field staff will inspect all plant material before it is planted, either at the time of delivery on-site or at the grower's nursery. All plant material not meeting specification requirements will be rejected and separated from acceptable materials. Plants inspected on-site and rejected for not meeting specifications must be removed from the site immediately, or red-tagged and removed as soon as possible.

b. At no cost to the Government, replace rejected trees, shrubs, and groundcovers with plant material of same species or variety that meet specification requirements.

c. Approval of plant materials at any time shall not impair the subsequent right of inspection and rejection during progress of the work.

d. Plants will be delivered or stored on-site no more than 48 hours prior to planting.

PART 3 EXECUTION

3.1 EXTENT OF WORK

Provide soil preparation for tree and shrub, planting, and a mulch topdressing of all newly graded finished earth surfaces, unless indicated otherwise. All areas inside or outside the limits of construction that are disturbed by the Contractor's operations shall be reseeded.

3.2 PREPARATION

3.2.1 Protection

Protect existing and proposed landscape features, elements, and sites from damage or contamination. Protect trees, vegetation, and other designated features by erecting high-visibility, reusable construction fencing. Locate fence no closer to trees than the drip line. Plan equipment and vehicle access to minimize and confine soil disturbance and compaction to areas indicated on Drawings.

3.2.2 Layout

Stake out approved plant material locations on the project site before digging plant pits. The Contracting Officer reserves the right to adjust plant material locations to meet field conditions. Provide on-site locations for excavated rock, soil, and vegetation. Do not disturb topsoil and vegetation in areas outside those indicated on Drawings.

3.2.3 Erosion Control

Provide erosion control and seeding with native plant species to protect slopes.

3.3 PLANT BED PREPARATION

3.3.1 Subgrade Preparation

1. Prior to grading, conduct weed control activities to remove dense stands of weeds (see Approved Herbicides in section

"Vegetation Maintenance") and keep areas mowed to 4 to 6 inches in height.

2. Finish grading shall be inspected and approved by the Contracting Officer's Representative prior to planting.

3. Locate all utilities prior to the commencement of work. Take all necessary precautions to avoid disturbing or damaging sub-surface elements. If subsurface elements are uncovered, promptly notify the Contracting Officer's Representative.

4. Rip the areas slated for planting to reduce soil compaction.

5. Establish sub-grade elevations that will accommodate final topsoil depths per Planting Details, topsoil requirements and mulch depths as specified and shown on drawings. Depth of plant pit excavation shall be as indicated and provide proper relation between top of root ball and finished grade.

6. Remove cobbles, rocks, concrete, asphalt and other debris over 1 inch in any dimension and legally dispose of them.

7. Examine planting areas for conditions that will adversely affect execution, permanence, and quality of work and survival of plant material.

3.3.2 Planting Preparation

Grade all planting areas to a smooth, even surface with loose, uniformly fine texture. Roll and rake, remove ridges, and fill depressions to meet finish grades. Limit fine grading to areas that can be planted in the immediate future. Remove trash, debris, stones larger than 1-inches in any dimension, and other objects that may interfere with planting or establishment operations.

Moisten prepared areas before planting when soil is dry. Water thoroughly and allow surface to dry before planting. Do not create muddy soil. Restore prepared areas if eroded or otherwise disturbed after fine grading and before planting.

3.4 PLANT INSTALLATION

3.4.1 Bare-Root Trees and Shrubs

Plant so roots are arranged in a natural position. Place roots in water a minimum of 30 minutes prior to planting. Carefully work topsoil among roots. Tamp remainder of backfill, place mulch topdressing and water.

3.4.2 Handling and Setting

Move plant materials only by supporting the root ball. Set plants per depths shown on drawings. Hold plumb in the center of the pit until soil has been tamped firmly around root ball. Set plant materials, in relation to surrounding finish grade, one to two inches above depth at which they were grown in the nursery, or container. Replace plant material whose root balls are cracked or damaged either before or during the planting process.

Plant material must be set in plant beds according to the drawings. Backfill soil mixture must be placed on previously scarified subsoil to

completely surround the root balls, and must be brought to a smooth and even surface, blending to existing areas.

3.4.3 Placement of Mulch Topdressing

Place specified mulch topdressing to a depth of 4 inches.

3.4.4 Mulch Topdressing

Provide 2-foot radius weed-free mulch topdressing rings around plants to a depth of 4 inches after completion of plant installation and before watering. Keep mulch out of the crowns of shrubs. Place mulch a minimum 2 to 3 inches away from trunk of shrub or tree.

3.4.5 Seeded Area Installation

Seed all areas as described above in Section "Seeded Area Material". Follow the manufacturer's installation recommendations for greatest success with designated product and full hydroseeded coverage outcome.

Loosen topsoil to depth of four inches, remove all roots, rubbish, and extraneous matter. All areas to be seeded shall be graded to a smooth even surface. Roll, rake, remove ridges, and fill depressions as required to drain. Perform seeding operations when the soil is dry and when winds do not exceed five miles per hour velocity. Prevent seeded areas from being walked on for 3 weeks after installation except as needed for watering.

All seeding shall be done with tackifier application per manufacturer's recommendations. Do not add seed to the slurry until immediately prior to beginning the operation, and do not allow slurry to remain in the tank more than 30 minutes.

Minimize shadow areas by spraying the seed from multiple angles or in multiple passes. Provide full coverage with no visible soil. Soil must be uniformly covered and applied in more than one layer with no more than 2,000 pounds per acre in any one layer. Allow sufficient cure time for hydroseed application between layers and after completing application.

Do not apply the product below the Ordinary High Water Mark (OHWM).

3.4.6 Watering

Start watering areas planted as required by temperature and wind conditions. Apply water at a rate sufficient to ensure thorough wetting of soil to a depth of 12 inches without run off or puddling. Watering of other plant material or adjacent areas must be prevented.

3.5 RESTORATION AND CLEAN UP

3.5.1 Restoration

Any areas that have been damaged from the planting operation must be restored to original condition at the Contractor's expense.

3.5.2 Documentation

Maintain a log of maintenance activities identifying time and date of maintenance visits, tasks performed, and any maintenance problems or concerns. Submit log monthly and with all maintenance pay requests to COR.

Identify anticipated number of maintenance visits for up-coming month within year before warranty inspection.

3.5.3 Site Maintenance

Keep premises reasonably free from accumulation of debris. At completion of each area of work, remove all debris, equipment, and surplus material. Furnish temporary equipment such as tools, hose or other water equipment, and other equipment required for performance of maintenance work.

3.5.4 Vegetation Maintenance

Maintenance shall include cultivating, replanting at the 1-year and 2-year guarantee completion, watering, pruning (only as directed), and invasive weed control. Re-set settled plants to proper grade and upright position. Restore planting saucer and adjacent material and remove dead material. Repair planting beds as required.

Correct or remove defective plant material as soon as possible after deficiencies become apparent and weather and season permit. Replant within specified planting dates. Replant within specified planting areas shown on the plans.

Weeds may be hand-dug from around the tree and shrub plantings before placement of additional weed mats or mulching. Weed control associated with the maintenance program also includes spot spraying individual plants with herbicides around tree and shrub plantings. Herbicides will be used according to manufacturer's instructions and in full accordance with applicable local, state, and federal laws. Herbicides will be applied with equipment that best meets the control needs for a particular target species and minimizes damage to native species. Chemicals will not be applied in the event of rain or wind speeds above 10 miles per hour. The combined cover of Himalayan Blackberry, reed canarygrass, purple loosestrife, common reed, and Canada thistle will be 20% or less at year 1 and year 2.

Approved herbicides:

Common name	**Trade name**	**Surfactant**	**Target species**
imazapyr	Habitat	Dyne-amic or equivalent	Aquatic species, broadleaves Most prevalent example: reed canarygrass
aminopyralid	Milestone	Dyne-amic or equivalent	Broadleaves Most prevalent example: Canada thistle
chlorsulfuran	Telar	Dyne-amic or equivalent	Selective broadleaves Most prevalent example: perennial pepperweed

Common name	Trade name	Surfactant	Target species
glyphosate	Rodeo	LI 700 or equivalent	Non-selective herbicide for perennial weeds Most prevalent example: tall fescue

Place plant protection kits to suppress herbivory if it is determined that such actions can improve plant vigor and growth.

Thin volunteer trees (red alder, big-leaf maple, etc.) to allow for best growth. An average spacing of 10 feet on center for desired volunteer trees is recommended.

Continually monitor plant health and irrigate as necessary to avoid drying out of plant materials and as required to promote healthy growth. Water trees, plants, and ground cover beds within the first twenty-four hours of initial planting. Water at least once per week during the dry season, which is approximately June through September. Watering shall occur for the first 2 years for plant establishment. An above-ground irrigation system will be needed to provide adequate water to the plantings. System maintenance may include replacing or mending broken pipe, replacing or adjusting sprinkler heads, repairing valves, and replacing or adjusting the timing mechanisms. Maintenance may also include draining the system with air pressure to remove all water, to prevent damage during freezing conditions or the system can be removed during the winter months.

3.5.5 Clean Up

Excess and waste material must be removed from the installed area and must be disposed offsite at an approved landfill, recycling center, or composting center. Separate and recycle or reuse the landscape waste materials. All planting areas shall be in a weed-free condition.

3.5.6 Reporting

a. As-built Report:
After completing construction and planting of the CPM property, the Contractor shall submit to the Corps an as-built report, including plan sheets, documenting site conditions at Year Zero. The as-built report shall be submitted to the Corps 30 days after planting is complete. The as-built report shall document permanent vegetation monitoring transect locations and photo points.

b. Year 1 Monitoring Report:
The Contractor shall monitor the planting area the following pring/fall after CPM property planting has taken place. The monitoring report describing and quantifying the level of success of the plantings shall be submitted to the Corps for review and approval.

On site vegetation sampling methods shall include quadrant sampling to measure the percent cover of herb, shrub, and tree species. The quadrant sampling locations will correspond with the photopoints and the transects. Trees, shrubs, and herbs that have been planted shall be visually evaluated to determine survival, health, and vigor of each plant. The categories to be used shall include: Live, Stressed, Tip Die Back, Basal

Sprouts, Not found, Apparently Dead, and Dead.

Grasses will be noted, but will not be measured, except as relevant to invasive species presence. Species composition, percent of total cover, and canopy cover will be measured at each point. In addition, invasive species that were not planted will be noted and their density recorded. Nonnative invasive species cover will be recorded in the herbaceous plots.

The monitoring report will consider, but is not limited to:

1. Plant species composition and cover values for vegetation in the CPM planting areas;

2. Survival rate of planted vegetation;

3. Wildlife use; and

4. Existing or ongoing degradation in the planting area.

3.5.7 Completion and Acceptance

Upon request by the Contractor, the COR will inspect the planted areas to determine acceptance. Provide notification at least ten working days before the requested inspection date. Planted areas will be accepted provided all requirements, including the maintenance period, have been complied with and plant materials are alive and in a healthy, vigorous condition.

-- End of Section --

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DIVISION 33 - UTILITIES

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STORM DRAINAGE UTILITIES

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SECTION 33 40 00

STORM DRAINAGE UTILITIES
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PART 1 GENERAL

1.1 REFERENCES

The publications listed below form a part of this specification to the extent referenced. The publications are referred to within the text by the basic designation only.

AMERICAN ASSOCIATION OF STATE HIGHWAY AND TRANSPORTATION OFFICIALS (AASHTO)

AASHTO HB-17	(2002; Errata 2003; Errata 2005, 17th Edition) Standard Specifications for Highway Bridges
AASHTO M 167M/M 167	(2017) Standard Specification for Corrugated Steel Structural Plate, Zinc-Coated, for Field-Bolted Pipe, Pipe-Arches, and Arches
AASHTO M 190	(2004; R 2017) Standard Specification for Asphalt-Coated Corrugated Metal Culvert Pipe and Pipe Arches
AASHTO M 243	(1996; R 2017) Standard Specification for Field-Applied Coating of Corrugated Metal Structural Plate for Pipe, Pipe-Arches, and Arches
AASHTO M 294	(2017) Standard Specification for Corrugated Polyethylene Pipe, 300- to 1500-mm (12- to 60-in.) Diameter
AASHTO MP 20	(2013; R 2017) Standard Specification for Steel-Reinforced Polyethylene (PE) Ribbed Pipe, 300- to 1500-mm (12- to 60-in) Diameter

AMERICAN RAILWAY ENGINEERING AND MAINTENANCE-OF-WAY ASSOCIATION (AREMA)

AREMA Eng Man	(2017) Manual for Railway Engineering

ASTM INTERNATIONAL (ASTM)

ASTM A742/A742M	(2020) Standard Specification for Steel Sheet, Metallic Coated and Polymer Precoated for Corrugated Steel Pipe
ASTM A760/A760M	(2015, R 2020) Standard Specification for Corrugated Steel Pipe, Metallic-Coated for

	Sewers and Drains
ASTM A762/A762M	(2019) Standard Specification for Corrugated Steel Pipe, Polymer Precoated for Sewers and Drains
ASTM A798/A798M	(2017) Standard Practice for Installing Factory-Made Corrugated Steel Pipe for Sewers and Other Applications
ASTM A807/A807M	(2017) Standard Practice for Installing Corrugated Steel Structural Plate Pipe for Sewers and Other Applications
ASTM A849	(2015) Standard Specification for Post-Applied Coatings, Pavings, and Linings for Corrugated Steel Sewer and Drainage Pipe
ASTM A929/A929M	(2018) Standard Specification for Steel Sheet, Metallic-Coated by the Hot-Dip Process for Corrugated Steel Pipe
ASTM C425	(2004; R 2013) Standard Specification for Compression Joints for Vitrified Clay Pipe and Fittings
ASTM C443	(2021) Standard Specification for Joints for Concrete Pipe and Manholes, Using Rubber Gaskets
ASTM C877	(2021) Standard Specification for External Sealing Bands for Concrete Pipe, Manholes, and Precast Box Sections
ASTM C923	(2008; R 2013; E 2016) Standard Specification for Resilient Connectors Between Reinforced Concrete Manhole Structures, Pipes and Laterals
ASTM C990	(2009; R 2019) Standard Specification for Joints for Concrete Pipe, Manholes and Precast Box Sections Using Preformed Flexible Joint Sealants
ASTM D1056	(2014) Standard Specification for Flexible Cellular Materials - Sponge or Expanded Rubber
ASTM D1171	(2016; E 2016) Standard Test Method for Rubber Deterioration - Surface Ozone Cracking Outdoors (Triangular Specimens)
ASTM D1557	(2012; E 2015) Standard Test Methods for Laboratory Compaction Characteristics of Soil Using Modified Effort (56,000 ft-lbf/ft3) (2700 kN-m/m3)
ASTM D2167	(2015) Density and Unit Weight of Soil in

	Place by the Rubber Balloon Method
ASTM D2321	(2020) Standard Practice for Underground Installation of Thermoplastic Pipe for Sewers and Other Gravity-Flow Applications
ASTM D3212	(2007; R 2020) Standard Specification for Joints for Drain and Sewer Plastic Pipes Using Flexible Elastomeric Seals
ASTM D3350	(2012) Polyethylene Plastics Pipe and Fittings Materials
ASTM D6938	(2017a) Standard Test Method for In-Place Density and Water Content of Soil and Soil-Aggregate by Nuclear Methods (Shallow Depth)
ASTM F477	(2014) Standard Specification for Elastomeric Seals (Gaskets) for Joining Plastic Pipe
ASTM F714	(2013; R 2019) Standard Specification for Polyethylene (PE) Plastic Pipe (DR-PR) Based on Outside Diameter
ASTM F894	(2019) Standard Specification for Polyethylene (PE) Large Diameter Profile Wall Sewer and Drain Pipe
ASTM F2562/F2562M	(2015) Specification for Steel Reinforced Thermoplastic Ribbed Pipe and Fittings for Non-Pressure Drainage and Sewerage

1.2 SUBMITTALS

Government approval is required for submittals with a "G" or "S" classification. Submittals not having a "G" or "S" classification are for Contractor Quality Control approval. Submit the following in accordance with Section 01 33 00 SUBMITTAL PROCEDURES:

SD-04 Samples

Pipe for Culverts and Storm Drains

SD-07 Certificates

Resin Certification

Oil Resistant Gasket

Hydrostatic Test on Watertight Joints

Determination of Density

Post-Installation Inspection Report

SD-08 Manufacturer's Instructions

Placing Pipe

1.3 DELIVERY, STORAGE, AND HANDLING

1.3.1 Delivery and Storage

Materials delivered to site shall be inspected for damage, unloaded, and stored with a minimum of handling. Materials shall not be stored directly on the ground. The inside of pipes and fittings shall be kept free of dirt and debris. Before, during, and after installation, plastic pipe and fittings shall be protected from any environment that would result in damage or deterioration to the material. Keep a copy of the manufacturer's instructions available at the construction site at all times and follow these instructions unless directed otherwise by the Contracting Officer. Solvents, solvent compounds, lubricants, elastomeric gaskets, and any similar materials required to install plastic pipe shall be stored in accordance with the manufacturer's recommendations and shall be discarded if the storage period exceeds the recommended shelf life. Solvents in use shall be discarded when the recommended pot life is exceeded.

1.3.2 Handling

Materials shall be handled in a manner that ensures delivery to the trench in sound, undamaged condition. Pipe shall be carried to the trench, not dragged.

PART 2 PRODUCTS

2.1 PIPE FOR CULVERTS AND STORM DRAINS

Pipe for culverts and storm drains shall be of the sizes indicated and shall conform to the requirements specified.

2.1.1 Corrugated Steel Pipe

ASTM A760/A760M, zinc or aluminum (Type 2) coated pipe of either:

a. Type I pipe with helical 2-2/3 by 1/2 inch corrugations.

b. Type IR pipe with helical 3/4 by 3/4 by 7-1/2 inch corrugations.

2.1.1.1 Fully Bituminous Coated

AASHTO M 190 Type A and ASTM A760/A760M zinc or aluminum (Type 2) coated pipe of either:

a. Type I pipe with helical 2-2/3 by 1/2 inch corrugations.

b. Type IR pipe with helical 3/4 by 3/4 by 7-1/2 inch corrugations.

2.1.1.2 Half Bituminous Coated, Part Paved

AASHTO M 190 Type B and ASTM A760/A760M zinc or aluminum (Type 2) coated Type I pipe with helical 2-2/3 by 1/2 inch corrugations.

2.1.1.3 Fully Bituminous Coated, Part Paved

AASHTO M 190 Type C and ASTM A760/A760M zinc or aluminum (Type 2) coated Type I pipe with helical 2-2/3 by 1/2 inch corrugations.

2.1.1.4 Fully Bituminous Coated, Fully Paved

AASHTO M 190 Type D and ASTM A760/A760M zinc or aluminum (Type 2) coated Type I pipe with helical 2-2/3 by 1/2 inch corrugations.

2.1.1.5 Concrete-Lined

ASTM A760/A760M zinc coated Type I corrugated steel pipe with helical 2-2/3 by 1/2 inch corrugations and a concrete lining in accordance with ASTM A849.

2.1.1.6 Polymer Precoated

ASTM A762/A762M corrugated steel pipe fabricated from ASTM A742/A742M Grade 10/10 polymer precoated sheet of either:

a. Type I pipe with helical 2-2/3 by 1/2 inch corrugations.

b. Type IR pipe with helical 3/4 by 3/4 by 7-1/2 inch corrugations.

2.1.1.7 Polymer Precoated, Part Paved

ASTM A762/A762M Type I corrugated steel pipe and AASHTO M 190 Type B (modified), paved invert only, fabricated from ASTM A742/A742M Grade 10/10 polymer precoated sheet with helical 2-2/3 by 1/2 inch corrugations.

2.1.1.8 Polymer Precoated, Fully Paved

ASTM A762/A762M Type I corrugated steel pipe and AASHTO M 190 Type D (modified), fully paved only, fabricated from ASTM A742/A742M Grade 10/10 polymer precoated sheet with helical 2-2/3 by 1/2 inch corrugations.

2.1.2 Structural Plate, Steel Pipe, Pipe Arches and Arches

Assembled with galvanized steel nuts and bolts, from galvanized corrugated steel plates conforming to AASHTO M 167M/M 167. Pipe coating, when required, shall conform to the requirements of AASHTO M 190 Type A . Thickness of plates shall be as indicated.

2.1.3 Polyethylene (PE) Pipe

Submit the pipe manufacturer's resin certification, indicating the cell classification of PE used to manufacture the pipe, prior to installation of the pipe. The minimum cell classification for polyethylene plastic shall apply to each of the seven primary properties of the cell classification limits in accordance with ASTM D3350.

2.1.3.1 Smooth Wall PE Pipe

ASTM F714, maximum DR of 21 for pipes 3 to 24 inches in diameter and maximum DR of 26 for pipes 26 to 48 inches in diameter. Pipe shall be produced from PE certified by the resin producer as meeting the requirements of ASTM D3350, minimum cell class 335434C.

2.1.3.2 Corrugated PE Pipe

AASHTO M 294, Type S . For slow crack growth resistance, acceptance of resins shall be determined by using the notched constant ligament-stress (NCLS) test meeting the requirements of AASHTO M 294. Pipe walls shall have the following properties:

Nominal Size (inch))	Minimum Wall Area (square in/ft)	Minimum Moment of Inertia of Wall Section (in. to the 4th/in.)
12	1.5	0.024
15	1.91	0.053
18	2.34	0.062
24	3.14	0.116
30	3.92	0.163
36	4.50	0.222
42	4.69	0.543
48	5.15	0.543
54	5.67	0.800
60	6.45	0.800

2.1.3.3 Profile Wall PE Pipe

ASTM F894, RSC 160, produced from PE certified by the resin producer as meeting the requirements of ASTM D3350, minimum cell class 334433C. Pipe walls shall have the following properties:

Nominal Size (inch)	Minimum Wall Area (square in/ft)	Minimum Moment of Inertia of Wall Section (in to the 4th/in)	
		Cell Class 334433C	Cell Class 335434C
18	2.96	0.052	0.038
21	4.15	0.070	0.051
24	4.66	0.081	0.059
27	5.91	0.125	0.091
30	5.91	0.125	0.091
33	6.99	0.161	0.132

Nominal Size (inch)	Minimum Wall Area (square in/ft)	Minimum Moment of Inertia of Wall Section (in to the 4th/in)	
		Cell Class 334433C	Cell Class 335434C
36	7.81	0.202	0.165
42	8.08	0.277	0.227
48	8.82	0.338	0.277

2.1.4 Steel Reinforced Polyethylene (SRPE) Pipe

SRPE pipe will meet the requirements of ASTM F2562/F2562M 8 - 120 inch diameter pipe and AASHTO MP 20 (12 - 60 inch diameter pipe).

2.2 PERFORATED PIPING

2.2.1 Corrugated Steel Pipe

ASTM A760/A760M, Type III, zinc-coated.

2.3 DRAINAGE STRUCTURES

2.3.1 Flared End Sections

Sections shall be of a standard design fabricated from zinc coated steel sheets meeting requirements of ASTM A929/A929M.

2.4 MISCELLANEOUS MATERIALS

2.4.1 Joints

2.4.1.1 Flexible Watertight Joints

a. Flexible watertight joints shall be made with plastic or rubber-type gaskets for concrete pipe and with factory-fabricated resilient materials for clay pipe. The design of joints and the physical requirements for preformed flexible joint sealants shall conform to ASTM C990, and rubber-type gaskets shall conform to ASTM C443. Factory-fabricated resilient joint materials shall conform to ASTM C425. Gaskets shall have not more than one factory-fabricated splice, except that two factory-fabricated splices of the rubber-type gasket are permitted if the nominal diameter of the pipe being gasketed exceeds 54 inches.

b. Rubber gaskets shall comply with the oil resistant gasket requirements of ASTM C443. Certified copies of test results shall be delivered to the Contracting Officer before gaskets or jointing materials are installed. Alternate types of watertight joint may be furnished, if specifically approved.

2.4.1.2 External Sealing Bands

Requirements for external sealing bands shall conform to ASTM C877.

2.4.1.3 Flexible Watertight, Gasketed Joints

a. Gaskets: When infiltration or exfiltration is a concern for pipe lines, the couplings may be required to have gaskets. The closed-cell expanded rubber gaskets shall be a continuous band approximately 7 inches wide and approximately 3/8 inch thick, meeting the requirements of ASTM D1056, Type 2 A1 , and shall have a quality retention rating of not less than 70 percent when tested for weather resistance by ozone chamber exposure, Method B of ASTM D1171. Rubber O-ring gaskets shall be 13/16 inch in diameter for pipe diameters of 36 inches or smaller and 7/8 inch in diameter for larger pipe having 1/2 inch deep end corrugation. Rubber O-ring gaskets shall be 1-3/8 inches in diameter for pipe having 1 inch deep end corrugations. O-rings shall meet the requirements of ASTM C990 or ASTM C443. Preformed flexible joint sealants shall conform to ASTM C990, Type B.

b. Connecting Bands: Connecting bands shall be of the type, size and sheet thickness of band, and the size of angles, bolts, rods and lugs as indicated or where not indicated as specified in the applicable standards or specifications for the pipe. Exterior rivet heads in the longitudinal seam under the connecting band shall be countersunk or the rivets shall be omitted and the seam welded. Watertight joints shall be tested and shall meet the test requirements of paragraph HYDROSTATIC TEST ON WATERTIGHT JOINTS.

2.4.1.4 Smooth Wall PE Plastic Pipe

Pipe shall be joined using butt fusion method as recommended by the pipe manufacturer.

2.4.1.5 Corrugated PE Plastic Pipe

Pipe joints shall be water tight and shall conform to the requirements in AASHTO M 294. Water tight joints shall be made using a PE coupling and rubber gaskets as recommended by the pipe manufacturer. Rubber gaskets shall conform to ASTM F477.

2.4.1.6 Profile Wall PE Plastic Pipe

Joints shall be gasketed or thermal weld type with integral bell in accordance with ASTM F894.

2.4.1.7 Steel Reinforced Polyethylene (SRPE) Pipe

SRPE joints shall meet the requirements of ASTM D3212.

2.4.2 Flap Gates

Flap Gates shall be medium -duty with circular opening and double-hinged. Top pivot points shall be adjustable. The seat shall be one-piece cast iron with a raised section around the perimeter of the waterway opening to provide the seating face. The seating face of the seat shall be stainless steel . The cover shall be one-piece cast iron with necessary reinforcing rib, lifting eye for manual operation, and bosses to provide a pivot point connection with the links. The seating face of the cover shall be stainless steel . Links or hinge arms shall be cast or ductile iron. Holes of pivot points shall be bronze bushed. All fasteners shall be either galvanized steel, bronze or stainless steel.

2.5 RESILIENT CONNECTORS

Flexible, watertight connectors used for connecting pipe to manholes and inlets shall conform to ASTM C923.

2.6 EROSION CONTROL RIP RAP

Provide non-erodible rock not exceeding 15 inches in its greatest dimension and choked with sufficient small rocks to provide a dense mass with a minimum thickness of as indicated.

PART 3 EXECUTION

3.1 INSTALLATION OF PIPE CULVERTS, STORM DRAINS, AND DRAINAGE STRUCTURES

Excavation of trenches, and for appurtenances and backfilling for culverts and storm drains, shall be in accordance with the applicable portions of Section 31 00 00 EARTHWORK, and the requirements specified below.

3.1.1 Trenching

The width of trenches at any point below the top of the pipe shall be not greater than the outside diameter of the pipe plus 6 inches to permit satisfactory jointing and thorough tamping of the bedding material under and around the pipe. Sheeting and bracing, where required, shall be placed within the trench width as specified, without any overexcavation. Where trench widths are exceeded, redesign with a resultant increase in cost of stronger pipe or special installation procedures will be necessary. Cost of this redesign and increased cost of pipe or installation shall be borne by the Contractor without additional cost to the Government.

3.1.2 Removal of Rock

Rock in either ledge or boulder formation shall be replaced with suitable materials to provide a compacted earth cushion having a thickness between unremoved rock and the pipe of at least 8 inches or 1/2 inch for each foot of fill over the top of the pipe, whichever is greater, but not more than three-fourths the nominal diameter of the pipe. Where bell-and-spigot pipe is used, the cushion shall be maintained under the bell as well as under the straight portion of the pipe. Rock excavation shall be as specified and defined in Section 31 00 00 EARTHWORK .

3.1.3 Removal of Unstable Material

Where wet or otherwise unstable soil incapable of properly supporting the pipe, as determined by the Contracting Officer, is unexpectedly encountered in the bottom of a trench, such material shall be removed to the depth required and replaced to the proper grade with select granular material, compacted as provided in paragraph BACKFILLING. When removal of unstable material is due to the fault or neglect of the Contractor while performing shoring and sheeting, water removal, or other specified requirements, such removal and replacement shall be performed at no additional cost to the Government.

3.2 BEDDING

The bedding surface for the pipe shall provide a firm foundation of

uniform density throughout the entire length of the pipe.

3.2.1 Corrugated Steel and Aluminum Pipe

Bedding for corrugated steel and aluminum pipe and pipe arch shall be in accordance with ASTM A798/A798M. It is not required to shape the bedding to the pipe geometry. However, for pipe arches, either shape the bedding to the relatively flat bottom arc or fine grade the foundation to a shallow v-shape. Bedding for corrugated structural plate pipe shall meet requirements of ASTM A807/A807M.

3.2.2 Plastic Pipe

Bedding for PVC, PE, SRPE and PP pipe shall meet the requirements of ASTM D2321. Use Class IB or II material for bedding, haunching, and initial backfill.

3.3 PLACING PIPE

Each pipe shall be thoroughly examined before being laid; defective or damaged pipe shall not be used. Plastic pipe, excluding SRPE pipe shall be protected from exposure to direct sunlight prior to laying, if necessary to maintain adequate pipe stiffness and meet installation deflection requirements. Pipelines shall be laid to the grades and alignment indicated. Proper facilities shall be provided for lowering sections of pipe into trenches. Lifting lugs in vertically elongated pipe shall be placed in the same vertical plane as the major axis of the pipe. Pipe shall not be laid in water, and pipe shall not be laid when trench conditions or weather are unsuitable for such work. Diversion of drainage or dewatering of trenches during construction shall be provided as necessary. Deflection of installed flexible pipe shall not exceed the following limits:

TYPE OF PIPE	MAXIMUM ALLOWABLE DEFLECTION (percent)
Corrugated Steel and Aluminum	5
Concrete-Lined Corrugated Steel	3
Plastic (PVC, PE, SRPE, and PP)	5

Note post installation requirements of paragraph DEFLECTION TESTING in PART 3 of this specification for all pipe products including deflection testing requirements for flexible pipe.

3.3.1 PE, SRPE, and Dual Wall and Triple Wall PP Pipe

Laying shall be with the separate sections joined firmly on a bed shaped to line and grade and shall follow manufacturer's guidelines.

3.3.2 Corrugated Steel and Aluminum Pipe and Pipe Arch

Laying shall be with the separate sections joined firmly together, with the outside laps of circumferential joints pointing upstream, and with longitudinal laps on the sides. Part paved pipe shall be installed so that the centerline of bituminous pavement in the pipe, indicated by

suitable markings on the top at each end of the pipe sections, coincides with the specified alignment of pipe. Fully paved steel pipe or pipe arch shall have a painted or otherwise applied label inside the pipe or pipe arch indicating sheet thickness of pipe or pipe arch. Any unprotected metal in the joints shall be coated with bituminous material as specified in AASHTO M 190 or AASHTO M 243. Interior coating shall be protected against damage from insertion or removal of struts or tie wires. Lifting lugs shall be used to facilitate moving pipe without damage to exterior or interior coatings. During transportation and installation, pipe or pipe arch and coupling bands shall be handled with care to preclude damage to the coating, paving or lining. Damaged coatings, pavings and linings shall be repaired in accordance with the manufacturer's recommendations prior to placing backfill. Pipe on which coating, paving or lining has been damaged to such an extent that satisfactory field repairs cannot be made shall be removed and replaced. Vertical elongation, where indicated, shall be accomplished by factory elongation. Suitable markings or properly placed lifting lugs shall be provided to ensure placement of factory elongated pipe in a vertical plane.

3.3.3 Structural-Plate Steel

Structural plate shall be installed in accordance with ASTM A807/A807M. Structural plate shall be assembled in accordance with instructions furnished by the manufacturer. Instructions shall show the position of each plate and the order of assembly. Bolts shall be tightened progressively and uniformly, starting at one end of the structure after all plates are in place. The operation shall be repeated to ensure that all bolts are tightened to meet the torque requirements of 200 foot-pounds plus or minus 50 foot-pounds. Any power wrenches used shall be checked by the use of hand torque wrenches or long-handled socket or structural wrenches for amount of torque produced. Power wrenches shall be checked and adjusted frequently as needed, according to type or condition, to ensure proper adjustment to supply the required torque.

3.3.4 Multiple Culverts

Where multiple lines of pipe are installed, adjacent sides of pipe shall be at least half the nominal pipe diameter or 3 feet apart, whichever is less.

3.3.5 Jacking Pipe Through Fills

Methods of operation and installation for jacking pipe through fills shall conform to requirements specified in Volume 1, Chapter 1, Part 4 of AREMA Eng Man.

3.4 JOINTING

3.4.1 Corrugated Steel and Aluminum Pipe

3.4.1.1 Field Joints

Transverse field joints shall be designed so that the successive connection of pipe sections will form a continuous line free of appreciable irregularities in the flow line. In addition, the joints shall meet the general performance requirements described in ASTM A798/A798M. Suitable transverse field joints which satisfy the requirements for one or more of the joint performance categories can be obtained with the following types of connecting bands furnished with

suitable band-end fastening devices: corrugated bands, bands with projections, flat bands, and bands of special design that engage factory reformed ends of corrugated pipe. The space between the pipe and connecting bands shall be kept free from dirt and grit so that corrugations fit snugly. The connecting band, while being tightened, shall be tapped with a soft-head mallet of wood, rubber or plastic, to take up slack and ensure a tight joint. The annular space between abutting sections of part paved, and fully paved pipe and pipe arch, in sizes 30 inches or larger, shall be filled with a bituminous material after jointing. Field joints for each type of corrugated metal pipe shall maintain pipe alignment during construction and prevent infiltration of fill material during the life of the installations. The type, size, and sheet thickness of the band and the size of angles or lugs and bolts shall be as indicated or where not indicated, shall be as specified in the applicable standards or specifications for the pipe.

3.4.1.2 Flexible Watertight, Gasketed Joints

Installation shall be as recommended by the gasket manufacturer for use of lubricants and cements and other special installation requirements. The gasket shall be placed over one end of a section of pipe for half the width of the gasket. The other half shall be doubled over the end of the same pipe. When the adjoining section of pipe is in place, the doubled-over half of the gasket shall then be rolled over the adjoining section. Any unevenness in overlap shall be corrected so that the gasket covers the end of pipe sections equally. Connecting bands shall be centered over adjoining sections of pipe, and rods or bolts placed in position and nuts tightened. Band Tightening: The band shall be tightened evenly, even tension being kept on the rods or bolts, and the gasket; the gasket shall seat properly in the corrugations. Watertight joints shall remain uncovered for a period of time designated, and before being covered, tightness of the nuts shall be measured with a torque wrench. If the nut has tended to loosen its grip on the bolts or rods, the nut shall be retightened with a torque wrench and remain uncovered until a tight, permanent joint is assured.

3.5 BACKFILLING

3.5.1 Backfilling Pipe in Trenches

After the pipe has been properly bedded, selected material from excavation or borrow, at a moisture content that will facilitate compaction, shall be placed along both sides of pipe in layers not exceeding 6 inches in compacted depth. The backfill material shall be free of trash, debris, roots, organic matter or other deleterious materials. The backfill shall be brought up evenly on both sides of pipe for the full length of pipe. The fill shall be thoroughly compacted under the haunches of the pipe. Each layer shall be thoroughly compacted with mechanical tampers or rammers. This method of filling and compacting shall continue until the fill has reached an elevation equal to the midpoint (spring line) of concrete pipe or has reached an elevation of at least 12 inches above the top of the pipe for flexible pipe. The remainder of the trench shall be backfilled and compacted by spreading and rolling or compacted by mechanical rammers or tampers in layers not exceeding 12 inches. Tests for density shall be made as necessary to ensure conformance to the compaction requirements specified below. Where it is necessary, in the opinion of the Contracting Officer, that sheeting or portions of bracing used be left in place, the contract will be adjusted accordingly. Untreated sheeting shall not be left in place beneath structures or

pavements.

3.5.2 Backfilling Pipe in Fill Sections

For pipe placed in fill sections, backfill material and the placement and compaction procedures shall be as specified below. The fill material shall be uniformly spread in layers longitudinally on both sides of the pipe, not exceeding 6 inches in compacted depth, and shall be compacted by rolling parallel with pipe or by mechanical tamping or ramming. Prior to commencing normal filling operations, the crown width of the fill at a height of 12 inches above the top of the pipe shall extend a distance of not less than twice the outside pipe diameter on each side of the pipe or 12 feet, whichever is less. After the backfill has reached at least 12 inches above the top of the pipe, the remainder of the fill shall be placed and thoroughly compacted in layers not exceeding 18 inches. Use select granular material for this entire region of backfill for flexible pipe installations.

3.5.3 Movement of Construction Machinery

When compacting by rolling or operating heavy equipment parallel with the pipe, displacement of or injury to the pipe shall be avoided. Movement of construction machinery over a culvert or storm drain at any stage of construction shall be at the Contractor's risk. Any damaged pipe shall be repaired or replaced.

3.5.4 Compaction

3.5.4.1 General Requirements

Cohesionless materials include gravels, gravel-sand mixtures, sands, and gravelly sands. Cohesive materials include clayey and silty gravels, gravel-silt mixtures, clayey and silty sands, sand-clay mixtures, clays, silts, and very fine sands. When results of compaction tests for moisture-density relations are recorded on graphs, cohesionless soils will show straight lines or reverse-shaped moisture-density curves, and cohesive soils will show normal moisture-density curves.

3.5.4.2 Minimum Density

Backfill over and around the pipe and backfill around and adjacent to drainage structures shall be compacted to within -2 to +2 percent of optimum moisture content at the time of compaction. The dry density shall be not less than 90 percent of maximum dry density for cohesive material and 95 percent of maximum dry density for cohesionless material. Maximum dry density and optimum moisture shall be determined in accordance with ASTM D1557. Removes large boulders and cobbles as necessary to meet compaction requirements. Density testing and calibration shall conform to the requirements in paragraph DETERMINATION OF DENSITY. Under airfield and heliport pavements, paved roads, streets, parking areas, and similar-use pavements including adjacent shoulder areas, the density shall be not less than 90 percent of maximum density for cohesive material and 95 percent of maximum density for cohesionless material, up to the elevation where requirements for pavement subgrade materials and compaction shall control.

3.6 FIELD QUALITY CONTROL

3.6.1 Tests

Testing is the responsibility of the Contractor. Perform all testing and retesting at no additional cost to the Government.

3.6.1.1 HYDROSTATIC TEST ON WATERTIGHT JOINTS

Watertight joints shall be tested and shall meet test requirements of paragraph HYDROSTATIC TEST ON WATERTIGHT JOINTS. Rubber gaskets shall comply with the oil resistant gasket requirements of ASTM C443. Certified copies of test results shall be delivered to the Contracting Officer before gaskets or jointing materials are installed.

3.6.1.1.1 Concrete, Clay, PVC, PE, SRPE and PP Pipe

A hydrostatic test shall be made on the watertight joint types as proposed. Only one sample joint of each type needs testing; however, if the sample joint fails because of faulty design or workmanship, an additional sample joint may be tested. During the test period, gaskets or other jointing material shall be protected from extreme temperatures which might adversely affect the performance of such materials. Performance requirements for joints in reinforced and nonreinforced concrete pipe shall conform to ASTM C990 or ASTM C443. Test requirements for joints in clay pipe shall conform to ASTM C425. Test requirements for joints in PVC, PE, and PP plastic pipe shall conform to ASTM D3212.

3.6.1.1.2 Corrugated Steel and Aluminum Pipe

A hydrostatic test shall be made on the watertight joint system or coupling band type proposed. The moment strength required of the joint is expressed as 15 percent of the calculated moment capacity of the pipe on a transverse section remote from the joint by the AASHTO HB-17 (Division II, Section 26). The pipe shall be supported for the hydrostatic test with the joint located at the point which develops 15 percent of the moment capacity of the pipe based on the allowable span in feet for the pipe flowing full or 40,000 foot-pounds, whichever is less. Performance requirements shall be met at an internal hydrostatic pressure of 10 psi, for a 10 minute period for both annular corrugated steel and aluminum pipe and helical corrugated steel and aluminum pipe with factory reformed ends.

3.6.1.2 Determination of Density

Testing shall be performed by an approved commercial testing laboratory or by the Contractor subject to approval. Tests shall be performed in sufficient number to ensure that specified density is being obtained. Laboratory tests for moisture-density relations shall be made in accordance with ASTM D1557 except that mechanical tampers may be used provided the results are correlated with those obtained with the specified hand tamper. Field density tests shall be determined in accordance with ASTM D2167 or ASTM D6938. When ASTM D6938 is used, the calibration curves shall be checked and adjusted, if necessary, using the sand cone method as described in paragraph Calibration of the referenced publications. ASTM D6938 results in a wet unit weight of soil and ASTM D6938 shall be used to determine the moisture content of the soil. The calibration curves furnished with the moisture gauges shall be checked along with density calibration checks as described in ASTM D6938. Test results shall

be furnished the Contracting Officer. The calibration checks of both the density and moisture gauges shall be made at the beginning of a job on each different type of material encountered and at intervals as directed.

3.6.1.3 Deflection Testing

Conduct deflection test no sooner than 30 days after completion of final backfill and compaction testing. Clean or flush all lines prior to testing. Perform a deflection test on entire length of installed flexible pipeline upon completion of work adjacent to and over the pipeline, including backfilling, placement of fill, grading, paving, placement of concrete, and any other superimposed loads. Deflection of pipe in the installed pipeline under external loads shall not exceed limits in paragraph PLACING PIPE above as percent of the average inside diameter of pipe. Use a laser profiler or mandrel to determine if allowable deflection has been exceeded.

3.6.1.3.1 Mandrel

Pass the mandrel through each run of pipe by pulling it by hand. If deflection readings in excess of the allowable deflection of average inside diameter of pipe are obtained, stop and begin test from the opposite direction. The mandrel must meet the Pipe Manufacture's recommendations and the following requirements. Provide a Mandrel that is rigid, nonadjustable, has a minimum of 9 fins, pulling rings at each end, and is engraved with the nominal pipe size and mandrel outside diameter. The mandrel must be 5 percent less than the certified-actual pipe diameter for Plastic Pipe, 5 percent less than the certified-actual pipe diameter for Corrugated Steel and Aluminum, 3 percent less than the certified-actual pipe diameter for Concrete-Lined Corrugated Steel and Ductile Iron Culvert. The Government will verify the outside diameter(OD)of the Contractor provided mandrel through the use of Contractor provided proving rings.

3.6.2 Inspection

3.6.2.1 Post-Installation Inspection

Visually inspect each segment of concrete pipe for alignment, settlement, joint separations, soil migration through the joint, cracks, buckling, bulging and deflection. An engineer must evaluate all defects to determine if any remediation or repair is required.

3.6.2.1.1 Concrete

Cracks with a width greater than 0.01 inches. An engineer must evaluate all pipes with cracks with a width greater than 0.01 inches but less than 0.10 inches to determine if any remediation or repair is required.

3.6.2.1.2 Flexible Pipe

Check each flexible pipe (PE, PVC, PP, Corregated Steel And Aluminum) for rips, tears, joint separations, soil migration through the joint, cracks, localized bucking, bulges, settlement and alignment.

3.6.2.1.3 Post-Installation Inspection Report

The deflection results and final post installation inspection report must include: a copy of all video taken, pipe location identification,

equipment used for inspection, inspector name, deviation from design, grade, deviation from line, deflection and deformation of flexible pipe, inspector notes, condition of joints, condition of pipe wall (e.g. distress, cracking, wall damage dents, bulges, creases, tears, holes, etc.).

3.6.3 Repair Of Defects

3.6.3.1 Leakage Test

When leakage exceeds the maximum amount specified, correct source of excess leakage by replacing damaged pipe and gaskets and retest.

3.6.3.2 Deflection Testing

When deflection readings are in excess of the allowable deflection of average inside diameter of pipe are obtained, remove pipe which has excessive deflection and replace with new pipe. Retest 30 days after completing backfill, leakage testing and compaction testing.

3.6.3.3 Inspection

Replace pipe or repair defects indicated in the Post-Installation Inspection Report.

3.6.3.3.1 Concrete

Replace pipes having cracks with a width greater than 0.1 inches.

3.6.3.3.2 Flexible Pipe

Replace pipes having cracks or splits.

3.7 PROTECTION

Protect storm drainage piping and adjacent areas from superimposed and external loads during construction.

3.8 WARRANTY PERIOD

Pipe segments found to have defects during the warranty period must be replaced with new pipe and retested.

-- End of Section --

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Blue Slough Culvert and Headgate (Option 1)

04/06

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SECTION 33 40 00.10

Blue Slough Culvert and Headgate (Option 1)
04/06

PART 1 GENERAL

1.1 1.1 DESCRIPTION OF WORK

All work described within this section option 1 of this contract. The work described in this section includes design and installation of a culvert, headwall, wingwalls, slab, foundations, trash rack and automatic head gate at the Blue Slough upstream connection with the Yakima River. Design requirements are provided in this section.

Work shall be completed as shown on the Drawings and as required in this section.

1.2 1.2 REFERENCES

The publications listed below form a part of this specification to the extent referenced. The publications are referred to within the text by the basic designation only.

NATIONAL ELECTRICAL MANUFACTURERS ASSOCIATION (NEMA)

NEMA ICS 3.1	(2019) Guide for the Application, Handling, Storage, Installation and Maintenance of Medium-Voltage AC Contactors, Controllers and Control Centers

U.S. ARMY CORPS OF ENGINEERS (USACE)

COE 2021-02 TM1	(2021) Technical Memorandum: Hydraulic Modeling in Support of Recommended Operations of Blue Slough Headgate
EM 1110-2-1902	(2003) Slope Stability
EM 1110-2-1913	(2000) Levee Design and Construction
EM 1110-2-2502	(1989) Retaining and Floodwalls

1.3 SUBMITTALS

Government approval is required for submittals with a "G" designation; submittals not having a "G" designation are for information only. When used, a designation following the "G" designation identifies the office that will review the submittal for the Government. Submit the following in accordance with Section 01 33 00 SUBMITTAL PROCEDURES:

SD-01 Preconstruction Submittals

Blue Slough Culvert, Headwall, Wingwalls, Slab, Foundations, Automated Headgate and Trashrack Design and Construction Plan; G, DO

Dewatering Plan; G, DO

Design Engineer's Professional Credentials; G, DO

SD-02 Shop Drawings

Blue Slough Culvert, Headwall, Wingwalls, Slab, and Foundations;G, DO

Trashrack;G, DO

Automated Headgate;G, DO

SD-03 Product Data

Double Wall HDPE Corrugated Plastic Pipe; G, DO

Automated Headgate; G, DO

SD-05 Design Data

Blue Slough Culvert, Headwall, Wingwalls, Slab, Foundations, Automated Headgate and Trashrack Design Calculations; G, DO

Blue slough culvert, headwall, slab, wingwalls, and trashrack design calculations; G, DO; G, DO

Concrete Mix Design; G, DO

System Performance Curves; G,DO

SD-06 Test Reports

Low Pressure Air Testing; G, DO

Television Inspection; G, DO

Concrete Aggregates; G, DO

Concrete Mix Proportions; G, DO

Concrete Compressive Strength Testings; G, DO

Blue Slough Automatic Head Gate Startup Testing;G, DO

SD-10 Operation and Maintenance Data

Operations and Maintenance Manual; G, DO

1.4 Design Requirements

The contractor will furnish Blue Slough Culvert, Headwall, Wingwalls, Slab, Foundations, Automated Headgate and Trashrack Design and Construction Plan for Government approval, meeting performance criteria in this section and all materials and labor to install. The plan shall be submitted 45 days prior to the start of construction and shall include design narrative, and, Blue Slough Culvert, Headwall, Wingwalls, Slab, Foundations, Automated Headgate and Trashrack Design Calculations,

including drawings, as well as a description of all means and methods and controls that shall be required for the installation of the culvert, headwall, wingwalls, slab, foundations and trashrack. The USACE recommended culvert, headwall, wingwalls, slab, foundations and trashrack design concept is shown in the Drawings. The Contractor may use reinforced cast-in-place or precast concrete for headwall, wingwalls, slab, and foundations. Cast-in-place reinforced concrete shall conform to 03 30 53 MISCELLANEOUS CAST-IN-PLACE CONCRETE and precast reinforced concrete shall conform to 03 42 13.00 10 PLANT-PRECAST CONCRETE PRODUCTS FOR BELOW GRADE CONSTRUCTION. Refer to 03 30 53 and 03 42 13.00 10 for concrete mix design, concrete aggregates, concrete mix proportions, and concrete compressive strength testings. The Contractor shall use galvanized steel for the trashrack. Trashrack steel shall conform to 05 50 13 MISCELLANEOUS METAL FABRICATIONS. The design shall meet the following requirements:

1.4.1 General Requirements

a. Location, elevations and geometry of headwall, slab, wingwalls, and trashrack shall be as shown on the drawings. Any required deviations shall be indicated to the COR.

b. Design shall be performed by a Professional Engineer licensed in the State of Washington. Contractor shall submit Design Engineer's Professional Credentials.

c. Headwall shall support an automated headgate (closure gate) as defined below and provide a watertight connection with an HDPE culvert.

d. Wingwalls shall support a removable trashrack as shown on the drawings.

e. All exposed surfaces will be free of burs and sharp edges that could be injurious to fish passing through the trash rack, gate or culvert.

f. All removable metal, mechanical and electrical equipment will be secured/protected to resist theft/vandalism and corrosion. Consult with Yakima County Public Services on general recommendations for theft protection.

1.4.2 Hydraulic Requirements

The closure gate (automated headgate) and appurtenant control equipment shall be instrumented and able to fully open and close under any and all hydraulic loading conditions based on measured discharge through the gate . The intent of the gate is for Blue Slough to rise and fall seasonnaly along with the Yakima River without causing flooding landward of the Federal levee. Flows in the culvert during periods of normal river flow should be unrestricted by the gate unless flow rates through the culvert begin to approach the maximum allowable flow as specified below. The gate will modulate towards the closed position as needed to limit the flow to the specified maximum. The gate will have a manual override or control in the event that the automatic system goes offline. The gate will include a removable stop that prevents full closure to prevent fish stranding in the event of a gate malfunction.

The closure gate provided at the Blue Slough Headgate Structure shall be designed for a minimum head rating of 10 feet. The closure gate shall be held open when flow is under the maximum specified flow rate of 60 cfs.

Gate to be designed for automated opening and closure during conditions when water is flowing through the culvert above the maximum specified flow rate. Refer to COE 2021-02 TM1 for a full list of pertinent hydraulic data and requirements.

System performance curves (combined Culvert, Automated Headgate and Trash Rack Flow rate vs. Headloss) will be provided.

If any power equipment and gate controls are unable to withstand inundation install a pedestal to protect that equipment prior to installation.

Several undersized culverts are located downstream of the headgate and are being upgraded by Yakima County. Until these culverts are upgraded, flooding could occur if the headgate is operating as designed. Yakima County Public Services will provide notice to the Government and Contractor when channel and culvert conditions downstream of the headgate are safe for operations and testing. With the exception of start-up testing the head gate will remain closed until such time that Yakima County provides assurance that it is safe to begin normal operations.

1.4.3 Structural Requirements

The structural design of the headwall, slab, wingwalls, foundations and trashrack shall consider and meet:
EM 1110-2-2104 Strength Design for Reinforced Concrete Hydraulic Structures. Blue slough culvert, headwall, slab, wingwalls, and trashrack design calculations meeting the aforementioned criteria shall be provided.

b. The minimum compressive strength of concrete is 5000 psi at 28 days. Reinforcement shall have a yield of 60 ksi.

c. Steel for trashrack shall be galvanized and have a minimum yield strength of 36 ksi.

d. Trashrack shall be designed to prevent deflection of more than 1 inch when half of the open area is blocked with debris and culvert is operating at full flow capacity. Trashrack shall be removable for maintenance purposes.

Shop drawings for the Blue Slough Culvert, Headwall, Wingwalls, Slab, and Foundations and the Trashrack shall be submitted for review and approval. Shop drawings shall show details of formwork including but not limited to joints, supports, shoring, sequence of form and shoring removal, placement schedule, construction, location and method of forming control joints, locations of inserts, conduit, sleeves and other embedded items; reinforcing steel (bending diagrams, assembly diagrams, splicing and laps of bars, shapes, dimensions, and details of bar reinforcing, accessories and concrete cover); steel components including location, type, and size of bolts, welds, member sizes and lengths, connection details, blocks, copes and cuts.

1.4.4 Geotechnical Requirements

a. Contract will provide an exploration log for the contractor to determine soil properties for design of the headwall, slab, wingwalls and their foundations. This does not preclude the contractor from performing additional subsurface explorations or testing at their discretion.

b. All trench excavation, backfill, and general fill placement shall

conform to the requirements in specification divisions 31 00 00 EARTHWORK and 33 40 00 STORM DRAINAGE UTILITIES.

c. All materials (unless otherwise specified) as well as stability and performance analyses shall meet the criteria as presented in Engineering Manuals EM 1110-2-1902: Slope Stability, EM 1110-2-1913: Levee Design and Construction, EM 1110-2-2502: Retaining and Flood Walls, and EM 1110-2-2902: Conduits, Pipes, and Culverts Associated with Dams and Levee Systems. As a minimum the design and analysis should include the following:

i. Sliding
ii. Global Slope Stability
iii. Settlement
iv. Seepage
v. Culvert Exit Filter (Transition Zone and Filter Diaphragm)

The design shall be reviewed and stamped by a registered professional engineer licensed in Washington state with a minimum of 5 years of experience in earth fill embankments and slope stability.

d. Aggregate base for headwall, culvert bedding and filter materials shall be from commercial sources. All trench and headgate backfill shall be comprised of related excavation spoils. Any additional backfill required shall be from commercial sources.

e. Use material where indicated or directed and as required select material that meets gradation requirements engineering manuals referenced above and in the specifications.

f. Surplus excavation shall not be used as base unless it is determined to be acceptable material per specifications or COR.

1.4.5 Civil Requirements

Submit a professionally stamped Dewatering Plan, subject to USACE approval, for use during the entirety of the installation process of the culvert, headwall, wingwalls, slab, foundations, and trashrack. Effective dewatering is crucial to ensuring structural stability and safe construction. Procedures should be based on the data resources and information presented in Section 01 56 00 CARE AND DIVERSION OF WATER as well as the exploration logs included in the drawings and in 31 00 00A.

Include utility maintenance, restoration, and median planting information on plan.

The culvert at the Blue Slough Headgate shall be comprised of high density polyethylene corrugated pipe which is double walled with smooth interior, 36 inches inside diameter. Complete television inspection and low pressure air testing to verify all internal connections are water tight and free of burs, protrusions or structural defects.

1.4.6 Mechanical Requirements

Motor assembly and power transmission equipment shall be designed to avoid damage during a 100-year flood event and provide uninterrupted service during and after the flood event (refer to COE 2021-02 TM1 for elevations). Motor and power transmission eqpuipment shall be designed to avoid damage casued by floating debris and icing during gate operation.

Gate frame shall be anchored to the headwall surface with structural anchorage designed adequately for pullout and shear forces produced by wind and water loads against the gate assembly. Gate is required to completely seal opening in flow control box when closed. Gate frame and gate to originate from same manufacturer. All gate materials and hardware to be marine grade or approved equivalent and shall be designed to avoid atmospheric and galvanic corrosion. Fasteners shall be tamperproof to avoid theft. Submit shop drawings with calculations demonstrating gate and box are stable and watertight under maximum heads and flow rates. Submit certification that proposed emergency closure gate meet requirements herein. Submit shop drawings for approval prior to fabrication.

1.4.7 Electrical Requirements

Gate shall have flow measuring array sensors and water height sensor(s) connected to gate that is measured through the manufactures gate controller. This will be capable of collecting the flow distribution through the gate inlet and height of water on gate assembly. Automatic and user defined programming for the gate is to be provided at the manufacturer specified electronic control interface. Gate should include controller lockout to prevent unauthorized operation. Gate shall be powered by 12V DC self-contained power source. There should be a battery supply that is connected to the gate that allows for at least 5 days of operation. The batteries shall be charged from solar panels. The contractor shall explain the maintance required to the customer of what will be needed to keep gate operational. If padlock used to secure control interface, provide 3 keys. Keys should match locks used to secure trash rack.

1.5 DELIVERY AND STORAGE

Materials delivered to site shall be inspected for damage, unloaded, and stored with a minimum of handling. Materials shall not be stored directly on the ground. The inside of pipes, fittings and culverts shall be kept free of dirt and debris. Before, during, and after installation, plastic pipe, fittings, and culvert materials shall be protected from any environment that would result in damage or deterioration to the material. Keep a copy of the manufacturer's instructions available at the construction site at all times and follow these instructions unless directed otherwise by the Contracting Officer. Solvents, solvent compounds, lubricants, elastomeric gaskets, and any similar materials required to install plastic pipe shall be stored in accordance with the manufacturer's recommendations and shall be discarded if the storage period exceeds the recommended shelf life. Solvents in use shall be discarded when the recommended pot life is exceeded.

1.6 Handling

Materials shall be handled in a manner that ensures delivery to the site in sound, undamaged condition. Pipe shall be carried to the trench, not dragged.

1.7 WARRANTY

During the warranty period, the Contractor shall provide on-site, on-call maintenance services by Contractor's personnel on the following basis: The service shall be on a per-call basis with 36 hour response.

Contractor shall support the maintenance of all hardware and software of the system. Various personnel of different expertise shall be sent on-site depending on the nature of the maintenance service required. Costs shall include travel, local transportation, living expenses, and labor rates of the service personnel while responding to the service request. The provisions of this Section are not in lieu of, nor relieve the Contractor of, warranty responsibilities covered in this specification. Should the result of the service request be the uncovering of a system defect covered under the warranty provisions, all costs for the call, including the labor necessary to identify the defect, shall be borne by the Contractor.

PART 2 PRODUCTS

2.1 Double Wall HDPE Corrugated Plastic Pipe

Pipe for culverts and storm drains shall be of the sizes indicated and shall conform to the requirements specified. Bed, place and backfill pipe in accordance with requirements in STORM DRAINAGE UTILITIES 33 40 00..

2.2 Blue Slough Culvert, Headwall, Wingwalls, Slab, and Foundations

The reinforced concrete headwall, wingwalls, slab, and foundations for the Blue Slough headgate shall be of the sizes indicated and shall conform to the requirements specified.

2.3 Trashrack

The metal trashrack for for the Blue Slough headgate shall be of the sizes indicated and shall conform to the requirements specified. The trash rack and attachment hardware to be resistant to vandalism/theft and corrosion. Refer to the drawings for bar size, spacing and clear opening width.

2.4 Blue Slough Automatic Head Gate

All equipment and connections to be resistant to vandalism/theft and corrosion resistant.

PART 3 EXECUTION

3.1 INSTALLATION

Per NEMA ICS 3.1, install equipment in accordance with the approved manufacturer's printed installation drawings, instructions, wiring diagrams, and as indicated on project drawings and the approved shop drawings. A field representative of the drive manufacturer shall supervise the installation of all equipment, and wiring.

3.2 FIELD QUALITY CONTROL

Specified products shall be tested as a system for conformance to specification requirements prior to scheduling the acceptance tests. Contractor shall conduct performance verification tests in the presence of Government representative, observing and documenting complete compliance of the system to the specifications. Contractor shall submit a signed copy of the test results, certifying proper system operation before scheduling tests.

3.2.1 Blue Slough Automatic Head Gate Startup Testing

Once all the equipment is in place and Yakima County provides assurance it is safe to do so, follow the manufacturer recommended procedures for starting up, operating, testing to validate that the gate and electical and mechancial systems are fully operable. Provide a startup test report 90 days after installation documenting operability.

3.3 Operations and Maintenance Manual

Upon completion of the work required for execution the contractor shall prepare and submit an Operations and Maintenance Manual for the Blue Slough Headgate and Closure in accordance with specification 01 78 23

3.4 DEMONSTRATION

3.4.1 Training

Coordinate training requirements with the Contracting Officer and Yakima County Public Services.

3.4.1.1 Instructions to Government Personnel

Provide the services of competent instructors who will give full instruction to designated personnel in operation, maintenance, calibration, configuration, and programming of the complete control system. Orient the training specifically to the system installed. Instructors shall be thoroughly familiar with the subject matter they are to teach. The Government personnel designated to attend the training will have a high school education or equivalent. The number of training days of instruction furnished shall be as specified. A training day is defined as eight hours of instruction, including two 15-minute breaks and excluding lunch time; Monday through Friday. Provide a training manual for each student at each training phase which describes in detail the material included in each training program. Provide one additional copy for archiving. Provide equipment and materials required for classroom training. Provide a list of additional related courses, and offers, noting any courses recommended. List each training course individually by name, including duration, approximate cost per person, and location of course. Unused copies of training manuals shall be turned over to the Government at the end of last training session.

3.4.1.2 Operating Personnel Training Program

Provide one 2 hour training session at the site at a time and place mutually agreeable between the Contractor and the Government. Provide session to train 4 operation personnel in the functional operations of the system and the procedures that personnel will follow in system operation. This training shall include:

a. System overview

b. General theory of operation

c. System operation

d. Alarm formats

e. Failure recovery procedures

f. Troubleshooting

3.4.1.3 Engineering/Maintenance Personnel Training

Accomplish the training program as specified. Training shall be conducted on site at a location designated by the Government. Provide a one day training session to train 4 engineering personnel in the functional operations of the system. This training shall include:

a. System overview

b. General theory of operation

c. System operation

d. System configuration

e. Alarm formats

f. Failure recovery procedures

g. Troubleshooting and repair

h. Maintenance and calibration

i. System programming and configuration

3.4.2 Monitoring

During the warranty period compile and report quarterly monitoring data collected by the gate flow/stage sensors and synoptic inundation and flow conditions (photos, depth measurements) upstream and downstream of the headgate to document the inundation and flow associated with various flow rates in the Yakima River and through the culvert. The minimum frequency of synoptic data collection is bi-weekly. Culvert flow/gage data will be collected at a frequency of not less the once per hour.

Monitoring shall consist of flows at the culvert, stages/depths, and visual inspections (photos). Downstream monitoring locations are existng culverts on public right of ways between the Federal Levee and Lester Lane (map to be provided by governemt, 7 sites). Upstream locations are at the main flow split between the Yakima River and constructed side channel, and just upstream of the trash rack (2 sites). Install stage recorders and/or gage boards at monitoring locations and note flow depth/elevation at time of observation. Provide quarterly monitoring reports 30 days after the end of the quarter to the Government and Yakima County Public Services. Note any unusual conditions that influence water discharge or elevation or head gate operation.

-- End of Section --

CENWS-ENH-H 7 May 2021

TECHNICAL MEMORANDUM

SUBJECT: Hydraulic Modeling in Support of Recommended Operations of Blue Slough Headgate

1. As part of the 100% proposed design of the Yakima 1135 Ecosystem Restoration Project, the culvert connecting the Sportsman Park side channel with Blue Slough is to be replaced with a newly designed culvert. The new culvert will be a 36" round corrugated HDPE pipe with smooth liner, approximately 86 feet in length, laid on a flat slope with an invert elevation of 1004 ft (NAVD88). The inlet will be controlled by an automatic, programmable headgate mounted on a concrete headwall with angled wingwalls. A riprap-armored energy dissipator basin will be constructed at the culvert outfall.

2. The USACE Seattle District Hydraulic Engineering section completed a one-dimensional, steady-flow hydraulic model of the uppermost mile of Blue Slough using HEC-RAS version 5.0.7. The model leveraged channel and floodplain geometry collected in the Feasibility phase of the Yakima 1135 project, augmented with new geometry at the upstream end to represent the new culvert, dissipator basin, and Blue Slough channel grading from the culvert outfall to the Washington State Parks-maintained culvert approximately 450 feet downstream. This State Parks culvert, and other driveway culverts further downstream on Blue Slough, are slated to be replaced by Yakima County as part of their Locally Preferred Alternative in the same timeframe of the Yakima 1135 project. In the hydraulic model it was assumed that this State Parks culvert is to be replaced with a 6-foot square concrete box culvert.

3. The proposed headwall of the new Blue Slough culvert includes a trash rack with ½" vertical bars on 6" spacing, and an intake box with multi-stage flow constriction. Determination of the entrance loss coefficient of the intake box was made using head loss data from in the Sizing and Selection Manual for the Rubicon SlipMeter, model SMB-3-10-C. Determination of the entrance loss coefficient of the trash rack was made using head loss equations found in the USBR's Fish Protection at Water Diversions guide (2006). These loss coefficients of 0.13 for the intake and 0.11 for the track were modeled using a composite entrance loss coefficient of 0.24 for the culvert. The Manning's roughness for the culvert interior was set at 0.012 based on textbook values for a smooth HDPE liner. The exit loss coefficient for the culvert was set to a standard value of 1. The Manning's roughness values downstream of the culvert were set to conservative textbook values of 0.04 for the channel and 0.09 for the overbanks.

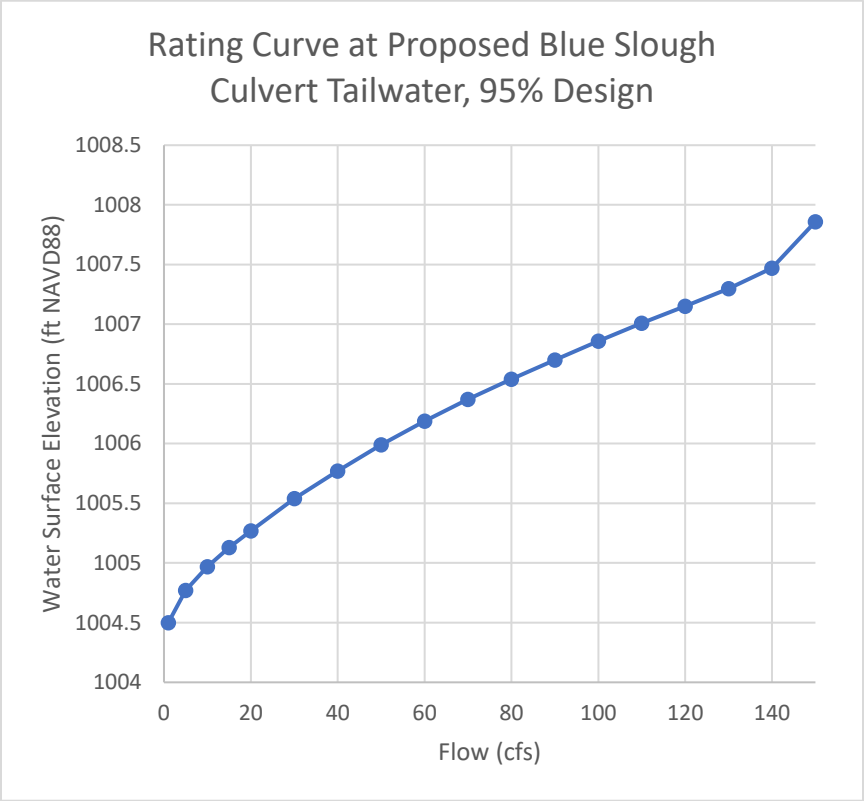
4. Based on the hydraulic model results, Hydraulic Engineering Section recommends headgate operations which limit flow through the culvert to 60 cfs in order to minimize risks of flooding between the culvert outfall and the State Parks culvert. This flow corresponds to a headwater stage of approximately 1009 ft (NAVD88). At the time of the 100% design phase, a water surface elevation of 1009 ft in the Sportsman Park side channel was estimated to roughly correspond to a 50% AEP (2-year average recurrence) flood event in the Yakima River mainstem. However, this relationship may change as river conditions evolve.

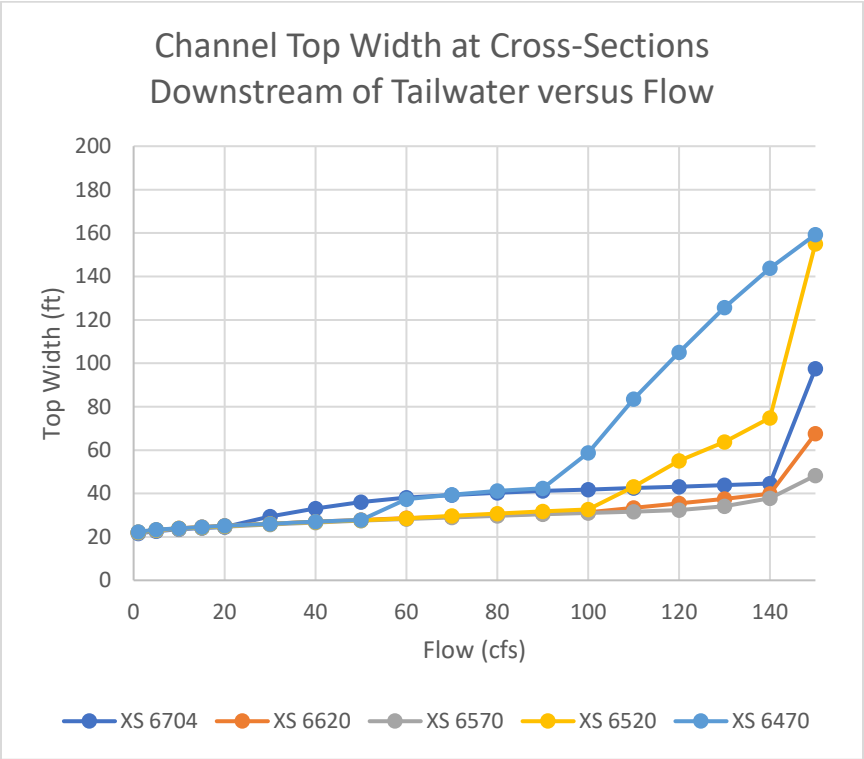
5. The control console of the programmable headgate, any exposed electronics, and any physical override controls on the gate's motor/gear box are to be located at or above elevation 1014.5 ft (NAVD88) to ensure that manual control remains possible in a 1% AEP (100-year average recurrence) flood event. At the time of the 100% design phase, the 1% AEP event was estimated

to correspond to a water surface elevation of 1014 ft (NAVD88). However, this relationship may change as river conditions evolve.

6. Point of contact for further information is Ethan Cheng, Seattle District, US Army Corps of Engineers, ethan.l.cheng@usace.army.mil.

Appendix A. Hydraulic Model Output Plots





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STONE SLOPE PROTECTION FOR STRUCTURES

01/08

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SECTION 35 31 19

STONE SLOPE PROTECTION FOR STRUCTURES
01/08

PART 1 GENERAL

This SECTION shall apply to the type and placement of the riprap and other armoring for stone slope protection on the riverward face of the new levee embankment, on the instream spurs, and on the grade control sill.

1.1 UNIT PRICES

1.2 REFERENCES

The publications listed below form a part of this specification to the extent referenced. The publications are referred to within the text by the basic designation only.

ASTM INTERNATIONAL (ASTM)

ASTM C 127	(2007) Standard Test Method for Density, Relative Density (Specific Gravity), and Absorption of Coarse Aggregate
ASTM C 295	(2008) Petrographic Examination of Aggregates for Concrete
ASTM D 3740	(2010) Minimum Requirements for Agencies Engaged in the Testing and/or Inspection of Soil and Rock as Used in Engineering Design and Construction
ASTM D 4791	(2010) Flat Particles, Elongated Particles, or Flat and Elongated Particles in Coarse Aggregate
ASTM D 4992	(2007) Evaluation of Rock to be Used for Erosion Control
ASTM D 5312	(2004) Evaluation of Durability of Rock for Erosion Control Under Freezing and Thawing Conditions
ASTM D 5313	(2004) Evaluation of Durability of Rock for Erosion Control Under Wetting and Drying Conditions
ASTM D 5519	(2007) Particle Size Analysis of Natural and Man-Made Riprap Materials

U.S. ARMY CORPS OF ENGINEERS (USACE)

COE CRD-C 148	(1969) Method of Testing Stone for Expansive Breakdown on Soaking in Ethylene Glycol

EM 1110-2-1601	(1991; 1994 Change 1) Engineering and Design -- Hydraulic Design of Flood Control Channels
EM 1110-2-2302	(1990) Construction with Large Stone

1.3 DEFINITIONS

1.3.1 Stone Protection

Stone slope protection is defined as a layer of riprap or river cobbles.

1.3.2 Groins

Groins are defined as an elongated rock structure having one end attached to the bank and the other end protruding into the river flow. Groins act to reduce velocities along the bank and create a backwater upstream of the structure.

1.3.3 Riprap

Riprap is defined as a material having a gradation band similar to those specified in EM 1110-2-1601, Chapter 3, uniform graded material or as noted in this specification. Riprap is normally produced by mechanical methods, with a jaw crusher and grizzly after the stone has been mined by blasting in a quarry. Riprap gradations have a maximum top size of 3.5 tons.

1.3.4 Grade Control Sill

A grade control sill is defined as a rock grade control structure to include the horizontal crest, the upstream and downstream slopes, and the heal and toe keys, and channel. Rock for the sill will originate from the onsite riprap armoring the SR 24 Cross Dike or other onsite sources with equivalent characteristics.

1.3.5 River Cobble

River Cobble consists on onsite granualar alluvium that includes 50% or more material in excess of 4-inches in diameter and no more than 15% of material finer than 1 to 2 inches. Material originates from channel excvation work and is not mechanically screened but should be mixed in stockpiles to produce an even gradation when placed. Material may include fines and boulders but is predominately gravel and cobble sized materials, similar to what would be found on the surface of the Yakima River bed or gravel bar. River cobble is used as armor stone in areas that have moderate to low velocities during floods. After ground disturbing activities commence submit locations that are suitable for River Cobble borrow.

1.3.6 Anchor Boulders

Anchor Boulders are large stone particles used for ballasting or holding down LWD and are of natural or quarry origin. Rounded to sub-rounded boulders are preferred over quarried boulders. See 35 44 00 for placement requirements.

1.4 SUBMITTALS

Government approval is required for submittals with a "G" designation; submittals not having a "G" designation are for Contractor Quality Control approval. The following shall be submitted in accordance with Section 01 33 00 SUBMITTAL PROCEDURES:

SD-01 Preconstruction Submittals

Placement Plan; G, DO

SD-03 Product Data

Riprap; G, DO

Quarry Spalls; G

River Cobble; G, DO

Anchor Boulders; G, DO

SD-04 Samples

Stone; G

SD-06 Test Reports

Bulk Specific Gravity; G, DO

Gradation Test at Quarry; G, DO

Drop test record; G, DO

Quarry Inspection Report; G, DO

SD-07 Certificates

Stone; G

Laboratory; G

Weigh Scale Certification

Certified Weight Scale Ticket

1.5 QUALITY ASSURANCE

1.5.1 Stone

1.5.1.1 General

All stone shall be durable material as approved by the Contracting Officer and as required by EM 1110-2-2302. The Contractor shall show that an adequate quantity of material is available and provide quality test data in accordance with this specification, EM 1110-2-2302, and all other relevant standards and requirements. All stone shall be of a suitable quality to ensure permanence in the structure and in the climate in which it is to be used. The stone shall be hard, durable, angular, and free

from cracks, blast fractures, bedding, seams, vugs, veins, and other defects or discontinuities that would tend to increase its deterioration from natural causes. Inspections for cracks, fractures, seams and defects shall be made by visual examination. If, by visual examination, it is determined that 10 percent or more of the stone produced contains hairline cracks, or other defects, then all stone produced by the means and measures which caused the fractures shall be rejected. A hairline crack that is defined as being detrimental shall have a minimum width of 4 mil (0.004 inch)and shall be continuous for one-third the dimension of at least two sides of the stone. The stone shall be clean and free from all foreign matter for inspection. Any foreign material adhering to or combined with the stone as a result of stockpiling shall be removed prior to placement. The selected stone shall match as close as possible the color of the existing riprap on the upstream face of the embankment that shall be left in place adjacent to the work area when tested dry and wet.

1.5.1.2 Sources

The Contractor shall furnish the stone from the source to the Contracting Officer, subject to the conditions herein stated. The Government shall conduct a quarry investigation and evaluate the quality test data provided by the Contractor to determine whether acceptable stone can be produced from the proposed source after the Contractor has completed the Quarry Inspection and report as required in Paragraph Evaluation Testing of Stone - Investigation and Testing. The Contractor shall be responsible for arranging the quarry inspection site visit and shall provide the Contracting Officer a minimum of 10 days notice of the time and location of the visit.

Satisfactory service records of the stone at other work shall be provided to the Contracting Officer. In order for stone to be acceptable on the basis of service records, stone of a similar size, and from similar formation or ledge, must have been placed in a similar thickness and exposed to weathering under similar conditions as are anticipated for this contract, and must have satisfactorily withstood such weathering for a minimum of 20 years. In addition to an acceptable 20 year service record, the Contracting Officer has the option to elect to have representative samples taken and tested.

a. Selection of Source. The Contractor shall designate in writing only one source for stone. The Contractor shall notify the Contracting Officer at least 60 workdays before the stone leaves the quarry. It is the Contractor's responsibility to determine that the stone source selected is capable of providing the quality, quantities and gradation needed and at the rate needed to maintain the scheduled progress of the work. Samples for acceptance testing shall be provided in accordance with this specification. If a source for stone so designated by the Contractor is not accepted for use by the Contracting Officer, the Contractor shall be required to find another source.

b. Acceptance of Materials. Acceptance of a source of stone is not to be construed as acceptance of all material from that source. The right is reserved to reject materials from certain localized areas, zones, strata, ledges, or channels, when such materials are unsuitable for stone as determined by the Contracting Officer. The Contracting Officer also reserves the right to reject individual units of produced specified materials in stockpiles at the quarry, all transfer points, and at the project construction site, when such materials are

determined to be unsuitable.

During the course of the work, the stone may be tested by the Government, if the Contracting Officer determines that testing is necessary. If such tests are determined necessary, the testing will be done in commercial laboratory selected by the Government. Materials produced from a source shall meet all the requirements herein. The cost of testing will be at the Contractor's expense. During the contract period, both prior to and after materials are delivered to the job site, visual inspections and measurements of the stone materials may be performed by the Contracting Officer. If the Contracting Officer, during the inspections, finds that the stone quality, gradation, or weights of stone being furnished are not as specified or are questionable, re-sampling and re-testing by the Contractor shall be required. Sampling of the delivered stone for testing and the manner in which the testing is to be performed shall be as directed by the Contracting Officer. This additional sampling and testing shall be performed at the Contractor's expense. When test results indicate that materials meet specified requirements, an equitable adjustment in the contract price will be made for the sampling and testing. Rejected material shall be removed from the Project site at no cost to the Government.

1.5.1.3 Evaluation Testing of Stone Source

The tests to which the stone may be subjected will include petrographic analysis, specific gravity, unit weight, absorption, wetting and drying, freezing and thawing, and such other tests as may be considered necessary to demonstrate that the stone is of a satisfactory quality. All tests shall be performed as described below or in PART 2. If the Contractor proposes a laboratory which is not validated to perform the tests specified (as described in paragraph Laboratory Certificates, all costs and time associated with validating the laboratory shall be borne by the Contractor.

a. Unit Weight, Bulk Specific Gravity, saturated surface dry (SSD) and Absorption.

   Stone shall weigh more than 162 pounds per cubic foot shall have a bulk specific gravity, saturated surface dry, (SSD), greater than 2.6. The stone shall have an absorption less than 2 percent. The method of test for unit weight bulk specific gravity (SSD) and absorption will be ASTM C 127, except the unit weight will be calculated using bulk specific gravity, saturated surface dry.

b. Samples. Samples of stone from a source shall be taken by a representative of the quarry to the approved laboratory under the supervision of the Contracting Officer for testing and acceptance prior to delivery of any stone from this source to the site of the work. The Contractor shall be responsible for arranging sampling and transport and shall notify the Contracting Officer a minimum of 10 days before the activity.

   Samples shall consist of at least three pieces of stone, roughly cubical in shape and weighing not less than 150 pounds each from each unit that will be used in the production of the required stone. If the source is an undeveloped quarry, or if the operation has been dormant for more than one year, such that fresh samples are not available, the Contractor shall expose fresh rock for 20 feet horizontally and for the full height of the face proposed for

production, prior to the field evaluation. The Contracting Officer may also require documentation of subsurface exploration of an undeveloped quarry in order to determine whether or not sufficient reserves are available.

1.5.1.4 Random Sampling

The stone produced by each source may be sampled by the Government for Quality Assurance testing on the basis of a minimum once each year or once during the production of each 25,000 tons of stone produced each year for the Government. The samples will be evaluated based upon petrographic analysis, specific gravity, unit weight, bulk specific gravity (SSD), and absorption. All random sampling and testing costs shall be borne by the Contractor. Random sampling shall comply with Paragraph Evaluation Testing of Stone.

1.5.1.5 Drop Test

A drop test provides an immediate evaluation of the durability of very large stone during handling of the stone including placement into a structure. For comparability, the test stones shall be dropped from a bucket or by other means from a height of not less than half the average diameter of the stone onto a clean, rigid, nondeflecting surface or second stone of comparable size set on a nonyieldinig surface. Dumping from a truck is not acceptable.

The stone shall be examined carefully before as well as after the completion of the test. Failure criteria is the development of new cracks, opening of old cracks, and the loss of piece from the surface of the stone. Each stone shall be dropped a total of five times for evaluation purposes with examination after each drop. The Contractor shall provide all necessary equipment and operating personnel to perform the testing.

The drop test shall be performed in the presence of the Contracting Officer or representative and USACE Seattle District Geotechnical and Geological personnel at the stone production site. The Contractor shall arrange all testing and shall provide the Contracting Officer a minimum of 10 days notice before the tests are to be performed.

The testing shall require the selection of five suitable stones from each weight size listed for aggregate filter (if specified) and riprap by the Contractor and the USACE. Selected stones shall be approved by the USACE before testing. All stones shall be clean of dust, dirt, debris, or other material that may hinder inspection. Material shall be representative of the stone that shall be used for the work.

The Contractor shall record the results of each test and photograph the stone before the test and the resulting impact of each drop test on each stone. The Contractor shall provide this Drop test record to the Contracting Officer within 5 days of the completion of the tests.

Random drop tests of stone selected by the USACE shall be performed during construction. If the stone fails, the placed material shall be closely inspected. All material displaying hairline cracks shall be removed at no cost to the Government. An additional drop testing program shall be conducted at the stone production site and the quarry stone source shall be inspected for quality. All costs of this additional testing shall be borne by the Contractor at no additional expense to the Government. All

material that is rejected and requires removal at the work site shall be taken off the Project site and disposed of at no cost to the Government. The Contractor shall provide suitable replacement stone to replace the rejected material at no cost to the Government.

1.6 CONSTRUCTION TOLERANCES

The finished surface and stone layer thickness shall not deviate from the lines and grades shown by more than the tolerances listed below. Tolerances are measured perpendicular to the indicated neatlines. Extreme limits of the tolerances given shall not be continuous in any direction for more than five times the nominal stone dimension nor for an area greater than 100 square feet of the structure surface.

NEATLINE TOLERANCES		
MATERIAL	ABOVE NEATLINE (inches)	BELOW NEATLINE (inches)
Riprap	2	2

The intention is that the work shall be built generally to the required elevations, slope and grade, and that the outer surfaces shall be even and present a neat appearance. Placed material not meeting these limits shall be removed or reworked as directed by the Contracting Officer. Payment shall not be made for excess material, which the Contracting Officer permits to remain in place.

PART 2 PRODUCTS

Products shall be as specified below. Materials shall not be amended at the quarry or other location with sand, silt, cuttings, or other quarry cleaning or material products to meet a desired weight for hauling. All materials shall be washed to removed fine particles and allow inspection. Loads arriving at the work site that have been amended with excess fines to meet weight or have not been washed shall be reject and returned to the source at no expense to the Government. All products which require Government approval, must be submitted and approved prior to staging or delivery of materials.

2.1 Laboratory Certificates

For each laboratory in which testing is conducted to meet the requirements as specified, submit Laboratory certificates, provided by the Materials Testing Center (MTC) at CEWES, that validates that the laboratory can perform the required tests. The individual tests shall be listed for which the validation covers along with the date of the inspection.

2.2 STONE

2.2.1 General

2.2.1.1 Evaluation Testing of Stone Investigation and Tests

The Contractor shall have evaluation tests performed on stone samples

collected from the proposed source. The quarry investigation shall be performed by a registered geologist or registered engineer in Washington State. The investigation shall be performed in the presence of the Contracting Officer or representative and USACE Seattle District Geotechnical and Geological personnel. Submit a Quarry Inspection Report shall follow the following outline, at a minimum, all other Federal, State, and local requirements for quarry inspections and reports, and the information outline in ASTM D 4992.

1. Executive Summary
2. Introduction
3. Test Quarry Design and Objectives
   a. Discussion of objectives
   b. Overview of site selection criteria
   c. Thorough presentation of design including layout and slope stability
4. Geological Conditions in the Test Quarry
5. Description of Each Test Blast
   a. Rock type and condition
   b. Hole pattern
   c. Delay pattern
   d. Hole depths and loading design
   e. Explosives, detonators, and delays
   f. Blasted rock mass description
   g. Quarry-run gradation
   h. Laboratory test results
   i. Conclusions
6. Drilling, Loading, and Hauling Equipment and Procedures
7. Description of the Results of Each Presplit Slope Blast
   a. Rock type and condition
   b. Presplit hole and explosive charge configuration
   c. Presplit slope condition
   d. Rock joint analysis and slope stability
   e. Conclusions
8. Rock Processing Results
   a. Description of processing objectives
   b. Description of rock processing equipment
   c. Results of processing each rock type and condition
   d. Gradations and particle shapes
   e. Degradation during each stage of processing
   f. Laboratory test results
9. Conclusions and Recommendations
   a. Conclusions including lessons learned
   b. Recommendations

APPENDICES -- Laboratory Test Sheets, Boring Logs, Field Gradation Test Results, Description of Rock Processing Equipment, Photographic Documentation, Etc.

The tests to which the stone shall be subjected include petrographic examination (ASTM C 295), bulk specific gravity (SSD),unit weight, absorption (ASTM C 127), resistance of stone to freezing and thawing (ASTM D 5312), and if argillaceous limestone and sandstone are used, resistance to wetting and drying (ASTM D 5313). The laboratory to perform the required testing shall be validated based on relevant paragraphs of ASTM D 3740, and certified USACE testing laboratory, and no work requiring testing shall be permitted until the laboratory has been inspected and validated. The first inspection of the facilities shall be at the expense of the Government and any subsequent inspections required because of failure of the first inspection shall be at the expense of the Contractor.

a. Bulk Specific Gravity Range. All stone shall have a minimum bulk specific gravity, saturated surface dry (SSD), of 2.6 based upon water having a unit weight of 62.4 pounds per cubic foot. The method of test for bulk specific gravity (SSD) shall be ASTM C 127.

b. Unit Weight and Absorption. Stone shall weigh more than 165 pounds per cubic foot shall have a bulk specific gravity, saturated surface dry, greater than or equal to 2.6. The stone shall have an absorption less than 2 percent. The method of test for unit weight and absorption shall be ASTM C 127, except the unit weight shall be calculated using bulk specific gravity, saturated surface dry.

c. Petrographic Examination. Stone shall be evaluated in accordance with ASTM C 295, which shall include information required by ASTM D 4992, paragraph 10. COE CRD-C 148 shall be used to perform Ethylene glycol tests required on rocks containing smectite as specified in ASTM D 4992 and on samples identified to contain swelling clays.

d. Resistance to Freezing and Thawing. Stone shall have a maximum loss of 5 percent after the number of cycles specified in ASTM D 5312, Figure 1, when determining the durability of stone when subjected to freezing and thawing in accordance with ASTM D 5312, except the surface area of one side of the sample shall be between 144 and 2,304 square inches.

e. Resistance of Rock to Wetting and Drying. Stone shall have a maximum loss of 2 percent when determining the durability of stone when subject to wetting and drying in accordance with ASTM D 5313, except the surface area of one side of the sample shall be between 144 and 2,304 square inches.

f. Samples. Samples of stone from the designated source shall be taken by a representative of the Quarry under the supervision of the Contractor, Contracting Officer or representative, and USACE Seattle District Geotechnical and Geological personnel, for testing and acceptance prior to delivery of any stone from the source to the site of the work. Information provided with the samples shall include the location within the quarry from which the sample was taken along with a field examination of the quarry. The field examination shall include the information outline in ASTM D 4992, paragraph 7. Samples shall consist of at least three pieces of stone, roughly cubical in shape and weighing not less than 150 pounds each from each unit that shall be used in the production of the required stone. If the source is an undeveloped quarry, or if the operation has been dormant for more than one year such that fresh samples are not available, the Contractor shall expose fresh rock for 20 feet horizontally and for the full height of the face proposed for production, prior to the field evaluation. The Contracting Officer may also require documentation of subsurface exploration of an undeveloped quarry in order to determine whether or not sufficient reserves are available. The samples shall be shipped at the Contractor's expense to a laboratory validated by the USACE to perform the required tests.

The Contractor shall be responsible for arranging the stone sampling and field inspection and shall provide the Contracting Officer with a minimum of 10 days of notice before the activity. All costs of sampling and shipment shall be borne by the Contractor. Loss, damage of, or rejection of the samples during handling and transport to the

laboratory shall result in an additional stone sample selection site visit and shipping of the suitable selected stone to the laboratory at no additional cost to the Government.

g. Tests. Conduct the tests in accordance with applicable ASTM and Corps of Engineers methods of tests, given in the Handbook for Concrete and Cement, in a laboratory validated by the USACE. All costs of testing shall be borne by the Contractor.

2.2.1.2 Quarry Operations

Conduct quarry operations in a manner to produce stone conforming to the requirements specified, this may involve selective quarrying, handling, processing, blending, and loading as necessary, all of which shall be as specified in the Contractor's Quality Control Plan per Section 01 45 00.00 10 QUALITY CONTROL. Control blasting and handling of rock to produce rock of the size ranges and quality specified. Techniques such as the use of proper hole diameter, hole depth, hole angle, burden and spacing distances, types and distribution of explosives delay intervals and sequence, removal of muck piles between each shot, and special handling techniques are required as necessary to produce the specified materials. All aspects of blasting operations shall be specifically designed so that the end product is not damaged from the blasting technique and that the stone is suitable for the intended purpose.

The Contractor shall provide a qualified geologist and material specialist familiar with quarry operations and production of large stone to be stationed at the production quarry during stone production and loading for transport. The personnel shall continually inspect the stone and operations to ensure suitable stone is produced and loaded for transport to the work site. Daily quality control reports of quarry operations shall be provided within 24 hours to the Contracting Officer or representative. The Contractor quarry personnel shall immediately contact the Contractor superintendent and the Contracting Officer or representative of any operation or condition that may impact stone quality and shall reject unsuitable stone at the quarry.

a. Curing Stone

Conduct curing operations on freshly quarried stone to allow it to release stored energy and moisture and to allow the stone to demonstrate that it will not fracture during the energy release and drying-out phase. Stones of sizes which are individually picked by the Contractor along with the Contracting Officer and USACE Seattle District Geotechnical and Geological personnel, shall be temporarily stockpiled at the quarry site a minimum of 30 calendar days before being shipped to the project site. Stockpile site shall be clean and free of debris, soil, mud, water, and away from active face production areas. A minimum of ten stones shall be selected.

b. Stone Quarrying Exclusion Period

Stone quarried between the 15 of September and the 15 of April shall not be approved for use in the project. If the stone is not affected by freeze-thaw cycles, and the durability history of the stone demonstrates that quarrying during the exclusion period has not adverse effect on the durability of the stone, and the Contracting Officer approves the use of stone quarried during the exclusion

period, the stone quarrying period exclusion may be waived by the Contracting Officer. Stone quarried before the the exclusion period at a time which shall not permit sufficient curing time before being subjected to freezing conditions, and which is subject to fracturing as a result of freeze-thaw cycles, shall not be approved for use.

c. Temporary Storage at Quarry

Storage of stone materials subsequent to shipment from the quarry and prior to permanent placement in the required work shall be subject to approval of the Contracting Officer. Underwater storage of stone materials is prohibited. All stone must be quarried and ready for shipment before excavation work may begin. Stone may only be stockpiled at the production quarry.

2.2.1.3 Gradation Test at Quarry

The Contractor shall perform a gradation test or tests on the riprap at the quarry in accordance with paragraph GRADATION TEST METHOD FOR RIPRAP. Take the sample in the presence of the Contracting Officer. Notify the Contracting Officer not less than 3 days in advance of each test. One gradation test(s) shall be performed per 2,000 tons of each size of riprap placed. The gradation tests shall be reported using the forms ENG FORM 2087 GRADATION TEST, ENG FORM 4055 RIPRAP Gradation Curves, and ENG FORM 4794-RIPRAP Gradation Curves (LRA), attached at end of this section. Designate on the test form that portion in tons of the lot tested, which is applicable to this contract. Any deviation from the reported tonnage shall be corrected and recorded on a revised appropriate gradation forms. The sample shall consist of not less than 50 tons of riprap and shall be collected in a random manner which shall provide a sample which accurately reflects the actual gradation arriving at the jobsite.

Failure of the test on the initial sample and on an additional sample will be considered cause for rejection of the quarry and/or quarry process, and all riprap represented by the failed tests shall be set aside and not incorporated into the work. Any additional tests required because of the failure of an initial test sample shall not be considered as one of the other required tests. If collected by the truckload, each truckload shall be representative of the gradation requirements. The Contracting Officer may direct additional testing of the riprap at the project site if the riprap appears, by visual inspection, to be out of gradation. All additional testing cost shall be borne by the Contractor with no additional cost to the Government.

The additional tests shall be performed on in-place materials at the locations directed, or on random loads selected by the Contracting Officer. In-place test areas shall be not less than 12 by 12 feet and shall include the full thickness of the placed riprap layer, without disturbing or including the underlying material and shall meet the minimum sample size specified above. Each pit excavated for an in-place test sample shall be refilled and reworked to provide a surface void of signs of disturbance. One in-place gradation shall be performed on each 2,000 tons or portion thereof placed. If the gradation test fails, additional gradation tests will be required at the Contractor's expense to delineate the limits of unacceptable stone. The additional gradation tests shall not count as part of the minimum number of gradation tests required. The unacceptable stone shall be removed from the project site at no additional cost to the Government. The Contracting Officer may direct this testing under the Contract Clause INSPECTION OF CONSTRUCTION. Provide all

necessary screens, scales and other equipment, and operating personnel, to grade the sample. Certification and test results shall represent riprap shipped from the quarry. Certification and tests results must be received by the Contracting Officer at the jobsite before the riprap is used in the work.

2.2.1.4 Proportional Dimension Limitations

The maximum aspect ratio (greatest dimension:least dimension) of any piece of stone for size ranges shall be not greater than 3:1 when measured across mutually perpendicular axis. Not more than 25 percent (25%) of the stones within a gradation range shall have an aspect ratio greater than 2.5:1. A maximum of 10 percent flat and elongated pieces by weight shall be acceptable. A flat and elongated piece of riprap is defined as having a ratio of width to thickness or length to width greater than 3:1. ASTM D 4791 shall be used as a guide to perform the test. Stone not meeting this requirement shall be rejected and removed from the Project site at no cost to the Government.

2.2.1.5 Riprap Stockpile

Storage of riprap at the worksite is not to be confused with off-site stockpiling of riprap. If the Contractor elects to provide off-site stockpiling areas, the Contracting Officer shall be notified of all such areas. The Contractor's stockpile shall be a maximum of 12 feet high and formed by a series of layers of truckload dumps, where the rock essentially remains where it is placed. Subsequent layers shall be started 10 feet from the edge of the previous layer so that the rock will not roll down the edges of the previous layers. The first layer shall be a maximum of 6 feet high. After being stockpiled, any riprap which has become contaminated with soil or refuse shall not be put into the work unless the contaminating material has been removed from the riprap prior to placement.

b. Off-site Stockpile. Off-site stockpiling of stone shall only be allowed at the quarry. All stone shall be placed on crushed stone or gravel and shall not be placed on the quarry floor or soil. Stockpile area shall be well drained. Stone stockpiled on soil or in water or that becomes contaminated with quarry fines or other material beside the specified stone shall be rejected.

2.2.2 Quarry Spalls

Quarry spalls shall be comprised of stone meeting the requirements provided in paragraph GENERAL. Spalls shall be composed of tough, durable particles, adequately free from thin, flat and elongated pieces, and shall contain no organic matter nor soft, friable particles in quantities considered objectionable by the COR/GDA. The aggregate shall meet the quality requirements of ASTM C33/C33M. Grading shall conform to the following requirements:

Los Angeles Wear, 500 Rev	40 percent max.
Degradation Factor	15 min.

4-8 inch Quarry Spalls	
Percent Passing	Diameter (inches)
D100	8
D40	3
D10	3/4

2-4 inch Quarry Spalls	
Percent Passing	Diameter (inches)
D100	4
D40	2
D10	3/4

2.2.3 Riprap

All salvaged riprap shall be reused where indicated on the drawings. Where salvaged riprap quantities are insufficient to construct the required features, imported armoring and riprap shall meet the following gradation requirements:

Table 1 - Levee Riprap (USACE Class I)		
Percent Passing	Diameter (inches)	Weight (lbs)
D100	12	150
D50	9	50
D10	7	25

Coefficient of Uniformity: 1.5

Table 2 - Grade Sill Control Riprap (USACE Class V)		
Percent Passing	Diameter (inches)	Weight (lbs)
D100	34	3,000
D50	21	750
D10	13	188

Coefficient of Uniformity: 2.2

Riprap shall be within +/- 4 percent of the diameters listed and within +/-10 percent of the weights.

2.2.4 River Cobble

River cobble from on-site excavations will be segragated and stored in stockpiles seperately from earthen material and riprap. River cobble will be utilized for levee armoring where indicated on the drawings in lower erosion risk areas. River cobble placement procedures and methods shall be the same as for placement of riprap. Because of the nature of the borrow source

materials wider variation in the gradation is acceptable. Natural stone from onsite sources is assumed to be suitable provided it meets the gradation requirements. Provide a size-based gradation report for each stockpile for inspection and approval. Gradation testing shall follow standardized procedures (ASTM D 5519). Levee riprap is a suitable replacement for river cobble for levee armoring. River cobble will meet the gradations shown in Table 3.

TABLE 3 - RIVER COBBLE GRADATION	
D100	8-14 in
D85	6-9 in
D50	3-6 in
D15	1-2 in

2.2.5 Anchor Boulders

Anchor boulders used for fish habitat and ballasting or anchoring LWD will have an average diameter not less than 48-in or a weight less than 10,500 lb, hard, durable, free of cracks, and able to withstand a drop test. Average boulder diameters will not exceed 72-in. Rounded to sub-rounded stone of glacial origin is preferred however quarried stone is acceptable if it meets the material requirements for riprap and the specified size requirements above.

PART 3 EXECUTION

3.1 DEMONSTRATION SECTION

Prior to placement of stone for the grade control sill, construct a section of stone protection consisting of riprap and aggregate filter (if indicated) to demonstrate the proposed operations for production placement. The section shall demonstrate procedures and capability of grading, placing toe stone and bank protection within the tolerances specified. The demonstration section shall be 50 feet in length and shall conform to all applicable specifications.

Prior to the placement of stone for the levee construct a section of stone protection consisting of river cobble to demonstrate the proposed operations for production placement. The section shall demonstrate procedures and capability of grading, placing toe stone and bank protection within the tolerances specified. The demonstration section shall be 25 feet in length and shall conform to all applicable specifications.

Prior to the placement of stone for the levee construct a section of stone protection consisting of levee riprap to demonstrate the proposed operations for production placement. The section shall demonstrate procedures and capability of grading, placing toe stone and bank protection within the tolerances specified. The demonstration section shall be 25 feet in length and shall conform to all applicable specifications.

3.1.1 Methods and Equipment

Methods and equipment employed for placement shall demonstrate the adequacy for use in placement of riprap and shall conform with the requirements specified. The quantities of all materials placed within the section shall be accurately tabulated and provided immediately to the Contracting Officer for comparison with computed quantities.

3.1.2 Demonstration Section Evaluation

Do not proceed with placing stone protection prior to the approval of the demonstration section. Within a period of 7 days after completion of the section, the Contracting Officer shall determine the adequacy of the section to function as part of the permanent construction. The Contractor shall be notified as to the acceptability of the section and may be directed to modify methods of construction and remove the section if necessary.

3.1.3 Removal of Demonstration Section

If removal of the demonstration section is required, it shall be conducted in such a manner as to maintain the integrity of the underlying subgrade. The Contractor shall remove the material and transport to the disposal area.

3.2 BASE PREPARATION

Areas on which stone protection are to be placed shall be graded and/or dressed to conform to cross sections and grading plan shown on the contract drawings. The prepared base shall be approved by the Contracting Officer. Where such areas are below the allowable minus tolerance limit they shall be brought to grade by fill with gravel fill and then compacted to a density equal to the adjacent in place material. Immediately prior to placing the stone protection, the prepared base shall be inspected by the Contracting Officer and no material shall be placed thereon until that area has been approved.

3.3 PLACEMENT OF RIPRAP

Within 30 day of notice to proceed, submit a detailed placement plan clearly discussing all methods and procedures of placement of the new riprap backfill including detailed discussions of protection of and placement of the new riprap adjacent to existing facilities during placement work. Include in-place riprap volume requirements by specification and location, on site borrow sources with estimated quantities, and quantities and sources for off-site borrow (if on site sources are insufficient to meet the design requirements). The Contractor shall include gradation band curves for the riprap, and aggregate filter (if specified or indicated). Where materials from multiple sources are placed in the ame location the materials will be blended to produce an even gradation.

3.3.1 General

Riprap shall be placed as indicated on the drawings and in accordance with the following paragraphs.

3.3.2 Placement

Underwater placement shall not be required.

3.3.2.1 Above Water

Riprap shall be placed in a manner which will produce a well-graded, tightly interlocked mass of rock with the minimum practicable percentage of voids, and shall be constructed, within the specified tolerances, to the lines and grades shown on the contract drawings. A tolerance from the slope lines and grades shown on the contract drawings shall be allowed in the finished surface of the riprap, except that the extreme of this tolerance shall not be continuous over an area greater than 200 square feet. The average tolerance of the entire job shall have no more than 20 percent of the tolerances specified above.

Riprap shall be placed by means of crane operated skip-pan (box), dragline bucket, clamshell, rock-bucket, hydraulic excavator , trackhoe, or other approved equipment. Riprap shall not be placed by dumping from haul trucks.

Riprap shall be placed to its full course thickness in one operation and in such manner as to avoid displacing the aggregate filter (if specified). The large stones shall be well distributed and the entire mass of stones in their final position shall be graded to conform to the gradation specified in paragraph RIPRAP. Placement shall begin at the bottom of the area to be covered and continue up slope. Subsequent loads of material shall be placed against previously placed material in such a manner as to ensure a relatively homogenous mass. The finished riprap shall be free from objectionable pockets of small stones and clusters of larger stones. Placing riprap in layers shall not be permitted. Placing riprap by dumping it into chutes, or by similar methods likely to cause segregation of the various sizes, shall not be permitted. Placing riprap by dumping it at the top of the slope and pushing it down the slope shall not be permitted. Riprap shall not be dropped from a height of greater than two feet during placement or when dumping from transport trucks. Riprap shall not be dumped onto hard and rigid surfaces when unloaded from transport trucks. Dumping riprap onto gravel mats is permitted for unloading. No equipment shall be operated directly on completed portions of the stone protection system at any time. The desired distribution of the various sizes of stones throughout the mass shall be obtained by selective loading of the material at the quarry or other source; by controlled dumping of successive loads during final placing; or by other methods of placement which shall produce the specified results. Each truckload shall be representative of the gradation requirements. Equipment shall be able to push rock placed on the slope if required to reduce void spaces between rock clasts.

All dump trucks used in placing the riprap shall be equipped with bottom hinged tailgates or high lift rock gates. The gate releasing mechanism shall be arranged so that it may be operated only from, at, or near the front of the truck.

Rearranging of individual stones shall be required to the extent necessary to obtain a well-graded distribution of stone sizes as specified above. Maintain the stone protection until accepted by the Contracting Officer; any material displaced prior to acceptance due to the Contractor's negligence shall be replaced with no additional payment and to the lines and grades shown on the contract drawings.

Placement of riprap by hand shall be required around the concrete retaining walls, top of slopes, around piezometers, and to in fill areas that are difficult to reach by placement equipment.

3.4 TESTS AND INSPECTIONS

3.4.1 Pre-Production

3.4.1.1 Bulk Specific Gravity

Quantity determinations are contingent upon the range of bulk specific gravity (saturated surface dry (SSD) basis) of stone to be supplied. Therefore, during the process of selecting a source of stone for the project, make an investigation to determine the lowest and highest bulk specific gravity (SSD) of stone available at the source proposed to be utilized for each gradation range of stone. Tests shall be performed at a Government approved testing laboratory.

At least 120 calendar days in advance of shipment of stone to the work site, a copy of bulk specific gravity test results for each gradation range of stone proposed to be furnished. The information shall be furnished prior to preparation of pre-production demonstration stockpiles. The testing results shall be submitted in accordance with paragraph SUBMITTALS.

Test results which display an extraordinarily wide range of values may necessitate additional testing to determine whether the source contains stratas with stones of an acceptable range of bulk specific gravity. The Contractor shall submit a copy of the certification from the regulation agency attesting to the scale's accuracy, and a copy of each certified weight scale ticket 1 working day(s) after weighing.

3.4.1.2 Material Quality

Before selecting a source for preparation of a demonstration stockpile, the Contractor shall be reasonably certain that the source is capable of meeting the quality and source requirements specified in paragraphs SOURCES and EVALUATION TESTING OF STONE, including their respective subparagraphs.

3.4.1.3 Borderline Material Quality

If the COR's evaluation of a demonstration stockpile results in not being able to determine by visual examination whether the material is acceptable or unacceptable, the COR will select at least one but not more than three representative stones from the demonstration stockpile to be prepared for shipment to the testing laboratory for testing in accordance with paragraph EVALUATION TESTING OF STONE. Where specified sizes are in excess of 2,000 pounds, cut or break a representative piece, weighing approximately 2,000 pounds each, off of the selected stones. For specified stone sizes of less than 2,000 pounds but more than 500 pounds, individual samples shall be the size of the largest stone specified for the size range. Samples of stone groupings with a maximum size less than 500 pounds shall contain at least two (2) stones representative of the higher limit of the stone weights specified. In addition, the sample shall be representative of the gradation specified and the minimum weight

of the total sample shall be not less than 500 pounds. The sampling and testing procedures shall be repeated for each strata being quarried. Ship the samples to the laboratory as specified in paragraph EVALUATION TESTING OF STONE. If the laboratory testing reveals the materials are unacceptable, submit a replacement source for approval and proceed with the demonstration stockpile procedures anew. All selection and testing of the new source shall be borne by the Contractor at no expense to the Government.

3.4.1.4 Demonstration Stockpile at Source

Following submittal of the Contractor's Quality Control (CQC) Plan and selection of a source, but prior to the Government's approval of a source and the CQC Plan, make arrangements to provide a pre-production demonstration stockpile for each of the stone size ranges for the project. The stockpiles shall be located at the source of the stone and be shaped in windrow fashion. The stones with a size range greater than 3 tons shall be placed in a single layer with 1 foot of clear space around each stone. Stones under 3 tons in weight shall not be stacked higher than 4 feet. The stones placed in the demonstration stockpiles shall be representative of the overall quality of materials in the source and shall not consist of the best specimens unless it is reasonable to determine that the source will provide the required amount of stone of the applicable size range with a degree of quality no less than that existent in the demonstration stockpile. The quantity of stone in each demonstration stockpile shall be dependent upon the gradation size range to be produced for the project.
The stones placed in the stockpile shall have been preselected by the Contractor's Quality Control Plan (CQCP) inspector or supervisor and acceptable stones over 500 pounds in size shall have been marked with spray paint on three mutually perpendicular sides with a coded mark to denote acceptability for a certain size range. A stockpile of representative reject stones marked with a red "X" shall also be maintained at the site as examples of unacceptable materials or shapes.

3.4.1.5 Evaluation of Demonstration Stockpile at Source

Notify the Contracting Officer when stockpiles are ready for evaluation. The Contractor's approved Quality Control Plan (QCP) supervisor and all QCP inspectors shall accompany the Contracting Officer's Representative (COR) during the Government's evaluation of the demonstration stockpiles. Arrange to have individual stones turned as necessary to accommodate the COR's evaluation. The COR will mark rejected stones with a red "X" and such stones shall be removed to the reject stockpile or to a crusher if one is available. If more than 2 unacceptable stones are found within a stockpile, the entire stockpile will be rejected by the Government and a replacement stockpile will be created for re-evaluation. If the replacement stockpile is rejected, revise and resubmit its Quality Control Plan (QCP) and create another replacement demonstration stockpile for evaluation. If the third demonstration stockpile for a particular size range at a single source is found unacceptable, the source will be disapproved for such size rang and a new source shall be submitted for approval. In addition, submit the name and qualifications for a person to replace the QCP supervisor. The Contractor may choose a replacement source at the time a first or second demonstration stockpile is found unacceptable. The replacement of demonstration stockpiles or stone sources shall be at no additional cost to the Government and with no change in the time of completion.

3.4.1.6 Approval of Demonstration Stockpile at Source

At the time the COR finds the contents of a demonstration stockpile to be acceptable, either through visual examination and through laboratory testing, the Contractor shall be notified in writing that the source, the QCP plan and QCP staff are approved, whereupon the Contractor may proceed with production of materials for the project provided they are consistent with demonstration stockpiles.

3.4.1.7 Duration of Demonstration Stockpile at Source

Other than for being shipped as the final quantities of materials to be placed in the work, each demonstration stockpile shall remain unchanged at the source until all other required material of the size range represented by the stockpile has been shipped from the source.

3.4.2 Placement Control

3.4.2.1 Quality Control Measures

Establish and maintain quality control for all work performed at the job site under this section to assure compliance with contract requirements. Maintain records of the quality control tests, inspections and corrective actions. Quality control measures shall cover all construction operations including, but not limited to, the placement of all materials to the slope and grade lines shown and in accordance with this section.

3.4.2.2 Check Surveys

Surveys made by the Contractor are required on each material placed for determining that the materials are acceptably placed in the work. Make checks as the work progresses to verify lines, grades and thicknesses established for completed work. At least one (1) check survey as specified below shall be made for each twenty-five (25) foot section as shown as practicable after completion. Following placement of each type of material, the cross section of each step of the work shall be approved by the Contracting Officer before proceeding with the next step of the work. Approval of cross sections based upon check surveys shall not constitute final acceptance of the work. Cross sections shall be taken on lines 25 feet apart, measured along the structure reference line, with readings at 5-foot intervals and at beaks along the lines. However, other cross section spacing and reading intervals may be used if determined appropriate by the Contracting Officer. Additional elevations shall be taken as the Contracting Officer may deem necessary or advisable. The surveys shall be conducted in the presence of an authorized representative of the Contracting Officer.

c. Stockpiled Riprap. If the Contractor elects to stockpile riprap offsite, the riprap shall be weighed immediately before placement by the method described above.

(1) Determination of Excess Stone. All stone outside the limits and tolerances of the cross sections of the structure, except variations so minor as not to be measurable, shall be deducted from the quantity of new stone for which payment is to be made. Weight of excess stone shall be determined from the cross sections obtained by the method provided for in paragraph FINAL SURVEYS, on the basis that the cubic feet of volume (including voids) for each type of stone, is equal to one ton or 2,000 pounds for the bulk

specific gravity and percentage of voids shown. Should any excess stone be disclosed above the tolerance line as defined in paragraph TOLERANCES, its volume will be computed by the average end area method, based upon the cross section in the following manner. The average end area of excess stone above the tolerance line for two (2) successive cross sections, multiplied by the distance between the cross sections will be accepted as the volume. In addition to the above, stone, which has been delivered to the site and has been lost or wasted or otherwise not properly incorporated into the final required work, shall be deducted from the quantity for which payment is to be made.

(2) Final Surveys. Survey work and measurements required for determination of excess volume computations for stone materials shall be performed in the presence of the Contracting Officer. Notify the Contracting Officer not less than 3 days in advance of each survey. Cross section surveys shall be taken perpendicular to the axis of the structures. Elevations shall be taken on lines 25 feet apart measuring along the structure reference line, with the readings at 5-foot intervals and at breaks in the grade along the line. Other survey intervals and readings may be used if deemed appropriate or advisable by the Government's on-site representative. Additional cross sections, elevations, may be taken if determined necessary by the Government's on-site representative. Determination of quantities will be made by the Government's on-site representative and having once been made, will not reopen, except on evidence of collusion, fraud or obvious error. Prior to performing any work under this Section, coordinate all operations with the Government's on-site representative so that excess volume surveys will be made at the appropriate time. The surveys made under paragraph CHECK SURVERYS may be used when deemed appropriate by the Government's on-site representative, as part of the surveys required herein. Stone quantity computations shall be based entirely upon weights of new stone as determined from carrier displacement or certified scale weight tickets.

a. Above Water: The elevation of stone above the water surface shall be determined by the use of a leveling instrument and a rod having a base 12 inches in diameter. If approved by the Contracting Officer other means may also be used.

3.4.3 Gradation Tests for Stone

3.4.3.1 Gradation Test Method for Riprap

Gradation tests shall be performed in accordance with ASTM D 5519, Test Method A.

3.4.3.2 Standard Test Method for Gradation of Imported Riprap

a. Select a representative sample (Note No. 1), weigh and dump on hard stand.

b. Select specific sizes (see example) on which to run "individual weight larger than" test. (See Note No. 2). Procedure is similar to the standard aggregate gradation test for "individual weight retained".

c. Determine the largest size stone in the sample. (100 percent size)

d. Separate by "size larger than" the selected weights, starting with the larger sizes. Use reference stones, with identified weights, for visual comparison in separating the obviously "larger than" stones. Stones that appear close to the specific weight must be individually weighed to determine size grouping. Weigh each size group, either individually or cumulatively.

e. Paragraph d above will result in "individual weight retained" figures. Calculate individual percent retained (heavier than), cumulative percent retained, and cumulative percent passing (lighter than). Plot percent passing, along with the specification curve on ENG Form 4794-R.

NOTE NO. 1: Sample Selection: The most important part of the test and the least precise is the selection of a representative sample. No "standard" can be devised; larger quarry run stone is best sampled at the shot or stockpile by given direction to the loader; small graded stone is best sampled by random selection from the transporting vehicles. If possible, all parties should take part in the sample selection and agree before the sample is run that the sample is representative.

NOTE NO. 2: Selection of Size for Separation: It is quite possible and accurate to run a gradation using any convenient sizes for the separation, without reference to the specifications. After the test is plotted on a curve, then the gradation limits may be plotted. Overlapping gradations with this method are no problem. However, it is usually more convenient to select points from the gradation limits, such as the minimum 50 percent size, the minimum 15 percent size, and one or two others, as separation points.For these types of stone gradations the separation points need to be selected as the smallest size stone at each break in the gradation specified.

F O R

E X A M P L E

O N L Y

EXAMPLE GRADATION SPECIFICATIONS	
PERCENT LIGHTER BY WEIGHT	STONE WEIGHT IN LBS
100	400 - 160
50	160 - 80
15	80-30

EXAMPLE WORKSHEET				
STONE SIZE LBS	INDIVIDUAL WT. RETAINED	INDIVIDUAL PERCENT RETAINED	CUMULATIVE RETAINED	PERCENT PASSING
400	0	0	0	100
160	9600	30	30	70
80	11,200	35	65	35
30	8000	25	90	10
<30	3200	10	100	-
TOTAL	32,000 pounds			
NOTE: Largest stone 251 pounds				

G R A D A T I O N T E S T D A T A S H E E T

Quarry _____ Type of Stone Tested _____

Date of Test _____ Testing Rate _____

T E S T R E P R E S E N T S		
Contract No.	District	Tons
	TOTAL	

G R A D A T I O N					
			Cumulative		
Stone Size (lbs)	Weight Retained	Individual % Retained	% Retained	% Passing	Specification % Finer by Wt
Total Weight					
Max Size Stone					

Remarks:

I certify that the above stone sample is representative of the total tonnage covered by this test report.

Contractor Representative _____
Government Representative _____

STONE SOURCES		
LATITUDE/LONGITUDE	QUARRY LOCATION, ADDRESS, & TELEPHONE	MAIN OFFICE ADDRESS & TELEPHONE NUMBER
STATE		
STATE		

-- End of Section --

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DIVISION 35 - WATERWAY AND MARINE CONSTRUCTION

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IN-STREAM AND FLOODPLAIN HABITAT CONSTRUCTION

01/08

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IN-STREAM AND FLOODPLAIN HABITAT CONSTRUCTION
01/08

PART 1 GENERAL

1.1 REFERENCES

The publications listed below form a part of this specification to the extent referenced. The publications are referred to within the text by the basic designation only.

U.S. ARMY CORPS OF ENGINEERS (USACE)

EM 385-1-1	(2014) Safety and Health Requirements Manual

1.2 DEFINITIONS

1.2.1 Clearing

Clearing consists of the removal and satisfactory disposal of all trees, downed timber, snags, slash, brush, garbage, trash, debris, fencing, and other items occurring in the designated areas to be cleared.

1.2.2 Grubbing

Grubbing consists of the removal and satisfactory disposal of stumps, roots larger than 4 inches in diameter, and matted roots from the designated grubbing areas. Grubbing also includes filling of holes from the grubbing operation.

1.2.3 Stripping

Stripping consists of the removal and satisfactory disposal of crops, weeds, grass, and other vegetative materials on the ground surface and topsoil to a depth of 4 inches.

1.2.4 Backfill

Backfill as used in this section is defined as the fill material that cannot be placed around or adjacent to a structure until the structure is completed or until a specified time interval has elapsed after completion. Backfill is synomous with ballast. Backfill for log structures consists of River Cobble unless otherwise specified or indicated. River Cobble is 50% or greater by mass retained (or number) of particles greater than 4-inches with a maximum particle in the boulder size class. General backfill material is all other unspecified materials of natural origin excavated on site from the river or floodplain. Backfill used to stabilize habitat structures is also referred to as ballast.

1.2.5 Excavation

Excavation consists of removal of material to the lines and grades shown on the drawings , or as otherwise directed or approved by the Contracting

Officer and as described in the specifications herein.

1.2.6 LWD Placements

LWD (large woody debris)refers to woody material consisting of logs with rootwads, logs, tree stumps, and large branches in excess of 12-inches in diameter. Onsite cottonwood trees cleared to construct the Sportsman Island side channels cut to the sizes indicated on the drawings shall be used unless otherwise specified on the drawings. Cottonwood trees are mature and may exceed 6-ft in diameter and 100-feet in height. Materials shall meet the requirements shown in the drawings and the specifications herein. Dimensions of LWD are as indicated the detail drawings. If not indicated, LWD used for large wood structures shall not be less than 2-feet in diameter or in excess of 4-feet in diameter unless placed as racking material or in the Newland Ponds area. Lengths of LWD pieces will be as indicated in the drawings unless approved by the COR. Submit shop drawing of LWD placement for each of the typical configurations shown in the drawings, including dimensions or LWD and boulders. Provide installation sequence and proposed equipment and temporary staging areas.

1.2.7 LWD Cabling

Cabling refers to the method of connection between materials such as, though not limited to, two or more pieces of LWD, LWD and anchors with the use of hardware, chain, and mechanical soil anchors. All hardware used for anchoring LWD will be galvanized, sized to connect together as indicated, and able to meet or exceed the working load limits shown below: Wire Rope (6x19 IWRC) WLL = 5,300 lb; Chain/Shackle/Anchor Bolt: WLL = 6,900 lb. Chain can be substituted for cable connections where indicated, but cable cannot be substituted for chain. Provide details (cut sheets) of anchoring/anchor installation and chaining/shackling by specified methods demonstrating that the proposed elements fit together and meet WLL requirements.

1.2.8 Anchor boulders

Anchor boulders refer to large heavy stone boulders connected to LWD for the purpose of stabilizing the LWD against fluid uplift and drag. Anchor boulders are connected to LWD with the use of hardware including epoxied anchor bolts, shackles, chain, or cable. The average stone weight for anchor boulders attached to LWD will not be less than 10,500 lb (dry). Boulders will be free of cracks. Any boulders suspected of structural weakness will be subjected to a drop test from a height of 48-inches. Structurally sound boulders with an average diameter of 48 inches or greater are acceptable if weight measurements are unavailable. Drilled anchor bolts will be cleaned thoroughly and anchor bolts epoxied and cured per manufacturer guidelines before tensioning chain. Provide photos showing measurements and conditions of proposed anchor boulders prior to delivering to the project site. Provide cut sheets showing proposed epoxy and anchor hardware for securing LWD to logs.

1.2.9 Logging slash and racking LWD

Logging slash and racking LWD refer to pieces of wood and vegetation originating from felled trees placed on and within log structures to naturalize the appearance, fill voids and improve habitat. Racking LWD refers to larger pieces (greater than 4-inches in diameter and 6-feet in length) consisting of branches, stumps, logs that are interweaved randomly between LWD to resemble naturally racked woody debris. Logging slash

primarily refers to smaller tree branches with leaves attached, placed in clumps to fill voids and naturalize the appearance of the log structure. Logging slash shall be free of large quantities of soil and free of trash or other manmade debris. Live woody shrub clumps (willows) is highly effective slash material.

1.2.10 Large Wood Structures

Large wood structures refer to assemblages of logs, rootwads, logging slash, anchors and backfill which is engineered to withstand a design flood condition. Large wood structures are used in critical locations, have detail sheets and shall be constructed as indicated and specified.

1.3 SYSTEM DESCRIPTION

The work covered by this section consists of furnishing all equipment, labor, materials, and incidentals, and performing all operations necessary to the completed construction of in-stream and floodplain habitat elements and structures where LWD is the primary habitat component. Necessary operations may include clearing, grubbing, and stripping of the areas specified herein or indicated on the drawings, and for the hauling and sorting and placement of cleared, grubbed, and stripped materials, earthwork (excavation, fill, and compaction) for the installation of in-stream and floodplain habitat elements and structures, placement of LWD, cabling LWD, installation of mechanical soil anchors, and for all other incidental work. All work under this section shall comply with the requirements of EM 385-1-1.

1.4 SUBMITTALS

Government approval is required for submittals with a "G" designation; submittals not having a "G" designation are for information only. When used, a designation following the "G" designation identifies the office that will review the submittal for the Government. The following shall be submitted in accordance with Section 01 33 00 SUBMITTAL PROCEDURES:

SD-01 Preconstruction Submittals

Anchor Boulders; G

SD-02 Shop Drawings

Dewatering; G, DO

LWD Placements; G, DO

LWD Cabling; G, DO

1.5 PERMITS

Comply with the requirements of Section 01 57 19 TEMPORARY ENVIRONMENTAL CONTROLS, and this section.

1.6 PROJECT SITE CONDITIONS

1.6.1 Protection of Cultural and Natural Resources

All work and operations shall comply with the requirements of Section 01 57 19 TEMPORARY ENVIRONMENTAL CONTROLS and with the requirements of this section.

1.6.2 Protection of Man-Made Facilities and Natural Features

Trees within the clearing area shall be felled in such a manner as to avoid damage to trees left standing and trees outside the clearing area, existing buildings, man-made facilities and natural features, with due regard to the safety of employees and others, and in compliance with EM 385-1-1. Excavation shall follow the same requirements specified above for felling trees and shall be in compliance with EM 385-1-1. Existing utility lines that are shown on the drawings or the locations of which are made known to the Contractor prior to excavation and that are to be retained shall be protected from damage during excavation. When utility lines that are to be removed are encountered within the area of operations, notify the applicable utility companies in sufficient time for measures to be taken to prevent interruption of the services.

1.6.3 Historical, Archeological, and Cultural Resources

Historical, archeological, and cultural resources within the Contractor's work limits may exist. If, during construction activities, the Contractor observes items that may have historical or archeological value, such observations shall be reported immediately to the Contracting Officer so that appropriate authorities may be notified and a determination made as to their significance and what, if any, special disposition of the finds should be made. Cease all activities that may result in the destruction of these resources and prevent the workers from trespassing on or otherwise damaging such resources.

1.7 SEQUENCING

1.7.1 Clearing and Grubbing

All clearing and grubbing work shall be in accordance with Section 31 11 00 CLEARING AND GRUBBING. Mark large cottonwood trees in good condition that will be cleared to construct the Sportsman Island side channels and reused as LWD. All other LWD will be used where indicated in the drawings.

1.7.2 Stripping

After inspection and acceptance of cleared and grubbed areas, stripping may proceed.

PART 2 PRODUCTS

2.1 LWD USED IN STRUCTURES

LWD used in construction of in-stream and floodplain habitat elements and structures shall be on-site cottonwood (or conifer if available) from channel clearing or levee degrade activities, to the dimension and condition as indicated in the drawings and the specifications herein. The term LWD is interchangeable with the term logs on all detail and plan sheets. LWD placements shall be in a manner to achieve the tightest, most

stable fit, and a stable surface for overlaying LWD layers. Provide all necessary personnel, materials, and equipment to construct LWD structures. Perform all work required for final assembly shown on the drawings. Sort and deck logs and LWD in staging areas by like size and condition to facilitate inspection and construction.

2.1.1 LWD Condition

Logs, trunks, and brush shall be of the size and quality specified. Place materials in organized manner in stockpiles near the work site ensuring they were not damaged during delivery, storage, or installation. LWD used in structures and as piles shall be from straight, sound timber harvested less than six months prior to the start of construction, free of infestation, fire damage, splitting, breaks, rot, and other types of damage that may cause premature degradation of the natural material. Other types of physical condition that are not allowed include excessively dry timber, major crooks, forks, and bulges exceeding 1-1/4 times the log diameter. All LWD shall be furnished with its bark intact and logs used in structures shall have a full rootwads fan a minimum of eight feet in diameter or to the size requirements indicated in the drawings. Rootwad logs not meeting the criteria shown in the drawings and these specifications may be rejected. Reorient or remove and substitute LWD pieces to resolve issues of fit. Cutting or trimming of logs is only acceptable if there is no other remedy available to the contractor and approved by the COR. The Contractor shall be responsible for replacing those LWD rejected to meet project quantities.

2.1.2 Log Length and Diameter

Log length for shall be measured from cut end to point of flare (as bole transitions to rootwad) Diameter will be measured as the average dimension of each end of the log with bark attached. For logs with attached rootwad measure the diameter at point of flare and tip.

2.2 ANCHORS

Each anchor boulder will be attached to LWD and shall be used where shown on the plans. Generally the anchors are placed underneath or to the side of the LWD and buried with onsite gravel to conceal the anchor hardware.

PART 3 EXECUTION

3.1 SITE PREPARATION

Coordinate, through the work schedule, the timing of land disturbing activities with the provision of erosion control measures. Perform erosion control operations under favorable weather conditions. When excessive moisture, frozen ground, or other unsatisfactory conditions prevail, Contracting Officer may direct work to be stopped. When special conditions warrant a variance to earthwork operations, a revised construction schedule shall be submitted for approval. Complete all tasks necessary for the required submittals. Also see Section 01 57 19 TEMPORARY ENVIRONMENTAL CONTROLS for additional requirements.

3.1.1 Temporary Construction Facilities

Establish access routes to the construction site prior to the start of work and show them on the drawings. All temporary construction facilities shall be in accordance with Section 01 50 00 TEMPORARY CONSTRUCTION

FACILITIES AND CONTROLS. Provide access to the work site by temporary paths designed for motorized vehicles if acceptable and in accordance with regulations and property owner restrictions and permission. Select access methods that have the least impact on existing site conditions and that may be easily removed and restored upon the completion of work. Provide strict access control to the work sites to prevent access by non-authorized personnel. Install barricades at the entrances of temporary paths to the sites.

3.1.2 Dewatering

Prepare and implement a Dewatering plan that details methods for care of surface water and for controlling the surface and groundwater levels, and de-watering during construction of habitat features. Show locations and dimensions of proposed cofferdams, temporaracy channels, dewatering pumps, discharge locations, etc. Manage stormwater, surface water, and groundwater with approved BMPs in accordance with the 01 56 00 CARE AND DIVERION OF WATER and 01 57 19 TEMPORARY ENVIRONMNETAL CONTROLS.

3.1.3 Clearing and Grubbing

The access route and construction site shall be cleared of vegetation necessary for the construction of the structure or staging area in accordance with Section 31 11 00 CLEARING AND GRUBBING.

3.1.4 Erosion and Sediment Control

Install erosion and sediment control measures prior to active construction efforts to prevent erosion of soil and off-site releases of sediment. See Section 01 57 19 TEMPORARY ENVIRONMENTAL CONTROLS.

3.1.5 Earthwork

Earthwork performed along the stream bank and in the channel shall be in accordance to Section 31 00 00 EARTHWORK and as shown on the drawings.

3.1.5.1 Trenches

Trenches shall be to the orientation and size necessary for installation of LWD and other habitat features shown on the plans. Log structures require clearing of a level subgrade prior to log installation. Side slopes, unless otherwise indicated, shall be at the angle of repose. Material removed from the trench shall be used as backfill unless otherwise indicated in the drawings or as directed by the COR. Riparian vegetation disturbance along the bank shall be minimized; where removal of vegetation is necessary for the placement of the structure, segregate excavation spoils from vegetation and endeavor to replace the removed vegetation after placement, backfill, and compaction of the logs, where applicable. Place backfill in vertical lifts not to exceed twelve inches compacted sufficiently to improve soil density but not impede vegetation root growth. Backfill to be dry and compacted with excavator bucket, or by other means necessary, to eliminate voids around LWD. Shoring shall be installed as required by regulations. The Contractor is responsible for dewatering of trenches for construction purposes.

3.1.5.2 Finished Grade

Finish grade shall be smooth and as shown on the drawings and in accordance with Section 31 00 00 EARTHWORK.

3.2 FIRE PREVENTION

All efforts possible shall be taken to prevent fire at the work site as a direct result of work efforts. Fire prevention or suppression equipment shall be provided to personnel at the work and harvest sites. All equipment shall be in compliance with applicable regulations and shall be kept in working condition at all times and within no more than 15 feet of distance from the active work areas.

3.3 SANITATION

Provide adequate portable sanitation facilities for persons at the construction and harvest sites that are in compliance with all federal, state, and local requirements.

3.4 LWD PLACEMENTS

3.4.1 General Requirements

Place LWD pieces to the orientation and location as shown in the drawings and as specified in the following paragraphs. Placement of floodplain LWD involves work within the floodplain and/or the ordinary high water level (OHWL) and shall follow all local, state, and federal laws and regulations. Placement of in-stream LWD may involve work within the OHWL and shall follow all local, state, and federal laws and regulations. The COR or designee will inspect the first completed LWD placement of each structure type for conformance to plans and specs. Any work found deficient shall be remedied before proceeding to additional placements. In the event that field conditions or specified materials prevent adherence to plans and specs, notify COR to request technical assistance from the Government Engineer to develop alternate installation plan or methods.

3.4.2 Sportsman Island Large Wood Structures

For placement of large wood structures into the bed or bank of a channel, excavate a subgrade trench to the extents and elevation indicated into the stream bank/bed as described in Paragraph TRENCHES above. Excavate a scour pool where indicated. Install vertical rootwads and boulder anchors as described below in section 3.4.3. Place LWD members as indicated on drawings and attach chain from boulders to logs, securing tightly with shackles after the eye bolt epoxy has fully cured. Predrilling anchor holes and/or securing eye bolts with epoxy prior to boulder placement may aid installation. Orient and place the logs as shown on the drawings, on suitable level substrate so that the rootwad end of the log protrudes into the channel a distance as shown in the drawings. The bottom logs (including rootwads) shall have full contact with the bottom of the channel/subgrade trench. Details regarding the angle of LWD placement relative to the stream and the length the LWD should protrude, if not shown on the plans, shall be at the discretion of the COR. Ensure that the top of each layer forms a stable platform for remaining LWD layers. Knots or checks may need to be removed, or logs rotated or swapped, to create a stable platform. Unless otherwise indicated, the connection to the log shall include a length of chain sufficient to wrap the circumference of the log a minimum of 1-1/4 times prior to the hardware connection point. Vertical rootwads should extend a minimum of 2 feet above finished log structure (ballast) height. Place racking LWD pieces and logging slash between, under and on anchored LWD pieces to naturalize

the appearance of the structure to full extents and elevations indicated. Backfill the log structure to the lines and grades indicated using compacted onsite conserved excavated streambed materials. Consult the assembly plans and carefully backfill after one or two log layers are placed to create a stable work platform provided that the backfill does not interfere with slash, racking material or LWD placements. Blend the backfill (ballast) into adjacent slopes. Preferentially place the coarsest materials along the outer face of the backfill where erosive forces are greatest. Also see Paragraph TRENCHES above.

3.4.3 Vertical Rootwad Stabilization of LWD Structures

Prior to placement of LWD for large wood structures excavate trenches for placement of vertical rootwads to elevations indicated. Dimensions of holes/trenches can vary to meet requirements of TRENCHES. Logs used for vertical rootwads to be straight and structurally sound, have a length not shorter than 20-ft from the point of rootwad flare to the tip and an average stem diameter of 28-inches, +/- 4-inches. Trim rootwads so that they lay flush when placed rootwad side down in the excavated trench and have a fan diameter of 8 to 10 feet. Do not backfill until the Government approves the installation.

3.4.4 Newland Pond LWD Placements

Place LWD to the orientation and location as shown in the drawings and as specified in the following paragraphs, or as directed by the Contracting Officer during construction. Placement of floodplain LWD may involve work within the floodplain and/or the OHWL and shall follow all local, state, and federal laws and regulations. The COR or designee will inspect the first completed LWD placements at each site for conformance to plans and specs. Any work found deficient shall be remedied before proceeding to additional placements. In the event that field conditions or specified materials prevent adherence to plans and specs, notify COR to request technical assistance from Government Engineer to develop alternate installation plan or methods.

3.4.4.1 Fill Site LWD placements

Place LWD where indicated in orientation and size indicated. If indicated clear and grub a hole for the rootwad so that the log lies flat along the slope and backfill. Where logs are embedded into fills, the log should not protrude more than 1/3 of the log lenth from the fill, and the rootwad should be fully exposed unless shown otherwise. Logs are generally placed in two layers, with logging slash to be interwoven between the first and second layer prior to placement of the second layer and backfill with earthen material. Where indicated randomly interlock clumps of smaller logging slash between and underneath LWD pieces and larger slash pieces to the full height of the LWD at minimum. Backfill and compact LWD as indicated on the drawings with suitable materials. Carefully place and compact coarse conserved granular materials (gravel, cobble, boulders) along the outermost portion of the fills adjoining the protruding LWD to serve as armor material for the embankment.

3.4.4.2 Excess Woody Debris Placement

If excess LWD and slash is generated during construction of work shown in the base contract but not placed as part of that phase of work, store LWD and other woody materials in approved locations as indicated in the Vegetation Management Plan near/in/on locations where LWD will be utilized

to complete remaining work provided that the placements do not interfere with future grading work. 3.5 DEWATERING AND DIVERSION

Do not block or restrict the flow in a natural drain, existing culvert, ditch, or channel at any time without obtaining prior written approval from the Contracting Officer. This approval will not relieve the Contractor from responsibility for any damage caused by the operation. Monitor the stream flow and provide sufficient free discharge areas so that conditions are not worsened upstream or downstream by possible floods during construction. Direct surface water away from excavations and construction sites to prevent erosion and undermining of foundations. Diversion ditches, dikes, and grading shall be provided and maintained as necessary during construction. Excavated slopes and backfill surfaces shall be protected to prevent erosion and sloughing. Excavation shall be performed so that the site and the area immediately surrounding the site and affecting operations at the site shall be continually and effectively drained. If private property is to be used for drainage, submit written evidence that the right has been obtained from the property owner for drainage on their property.Surface and groundwater control shall be accomplished in coordination with the required excavation construction. Surface and/or groundwater control may necessitate the use of temporary diversion ditches, cofferdams and/or dewatering by the use of pumping. Methods for care of surface water and for controlling the surface and groundwater levels shall be subject to approval of the Contracting Officer.

Also see Sections 01 57 19 TEMPORARY ENVIRONMENTAL CONTROLS, 01 56 00 CARE AND DIVERSION OF WATER, and 31 00 00 EARTHWORK for additional related requirements.

-- End of Section --