READY TO ADVERTISE SPECIFICATIONS (RTA)

AMERICAN RIVER COMMON FEATURES
NATOMAS BASIN - REACH I - CONTRACT 2:
STA 0+00 TO 115+00 AND REACH H - SUBREACH 1

SACRAMENTO COUNTY, CALIFORNIA

TECHNICAL SPECIFICATIONS

VOLUME 1: READY TO ADVERTISE SPECIFICATIONS

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SPECIFICATION NO. 2079
DESIGN FILE NO. 1-04-0641 AND 1-04-0659
P2 #458598

DECEMBER 2025

US Army Corps of Engineers®
Sacramento District

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PROJECT TABLE OF CONTENTS

DIVISION 00 - PROCUREMENT AND CONTRACTING REQUIREMENTS

00 01 15 LIST OF DRAWINGS
00 73 05 SUPPLEMENTARY CONDITION REQUIREMENTS

DIVISION 01 - GENERAL REQUIREMENTS

01 00 00 GENERAL REQUIREMENTS
01 11 00 SUMMARY OF WORK
01 20 00 PRICE AND PAYMENT PROCEDURES
01 32 01 PROJECT SCHEDULE
01 33 00 SUBMITTAL PROCEDURES
01 35 26 GOVERNMENTAL SAFETY REQUIREMENTS
01 42 00 SOURCES FOR REFERENCE PUBLICATIONS
01 45 00 QUALITY CONTROL
01 45 01 RESIDENT MANAGEMENT SYSTEM CONTRACTOR MODE(RMS CM)
01 50 00 TEMPORARY CONSTRUCTION FACILITIES AND CONTROLS
01 57 19 TEMPORARY ENVIRONMENTAL CONTROLS
01 57 23 TEMPORARY STORM WATER POLLUTION CONTROL
01 71 10 MOBILIZATION AND DEMOBILIZATION
01 78 00 CLOSEOUT SUBMITTALS

DIVISION 02 - EXISTING CONDITIONS

02 02 00 SUBSURFACE DATA
02 41 00 DEMOLITION

DIVISION 05 - METALS

05 50 13 MISCELLANEOUS METAL FABRICATIONS

DIVISION 10 - SPECIALTIES

10 14 01 SIGNAGE

DIVISION 31 - EARTHWORK

31 00 00 EARTHWORK
31 05 19 GEOTEXTILE
31 11 00 CLEARING, GRUBBING, AND STRIPPING
31 23 00 BORROW SITE EXCAVATION

DIVISION 32 - EXTERIOR IMPROVEMENTS

32 12 16 HOT-MIX ASPHALT (HMA) FOR ROADS
32 15 00 AGGREGATE SURFACE COURSE AND AGGREGATE BASE
32 17 24 PAVEMENT MARKINGS
32 31 13 CHAIN LINK FENCES AND GATES
32 92 33 GRASS SEEDING AND EROSION CONTROL

DIVISION 33 - UTILITIES

33 11 00 WATER UTILITY DISTRIBUTION PIPING
33 40 00 STORM DRAINAGE UTILITIES

-- End of Project Table of Contents --

DRAFT

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DRAFT

SECTION TABLE OF CONTENTS

DIVISION 00 - PROCUREMENT AND CONTRACTING REQUIREMENTS

SECTION 00 01 15

LIST OF DRAWINGS

PART 1 GENERAL

1.1 SUMMARY
1.2 CONTRACT DRAWINGS

-- End of Section Table of Contents --

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SECTION 00 01 15

LIST OF DRAWINGS

PART 1 GENERAL

1.1 SUMMARY

This section lists the drawings for the project pursuant to contract clause "DFARS 252.236-7001, Contract Drawings, Maps and Specifications."

1.2 CONTRACT DRAWINGS

Contract drawings are as follows:
REACH I CONTRACT 2 STA 0+00 TO 115+00 (VOLUME 2 OF 3)

DRAWING NO.	REVISION NO.	TITLE
G-001	N/A	COVER SHEET
G-002	N/A	SHEET INDEX
G-003	N/A	GENERAL NOTES (1 OF 2)
G-004	N/A	GENERAL NOTES (2 OF 2)
G-005	N/A	GENERAL SYMBOLS
G-006	N/A	GENERAL ABBREVIATIONS
G-101	N/A	LOCATION MAP
G-102	N/A	CONTROL LINE PLAN
G-103	N/A	CONTROL LINE TABLE
G-104	N/A	CONSTRUCTION LIMIT PLAN
G-105	N/A	CONSTRUCTION LIMIT SURVEY DATA
G-106	N/A	SURVEY CONTROL MAP
G-107	N/A	HAUL ROUTES AND STAGING AREAS
G-108	N/A	BORROW PLAN - BROOKFIELD
V-101	N/A	AERIAL PHOTO AND STUMP REMOVAL STA 0+00 TO STA 17+00 (CONTROL LINE A)
V-102	N/A	AERIAL PHOTO AND STUMP REMOVAL STA 28+50 TO STA 37+00 (CONTROL LINE A)
V-103	N/A	AERIAL PHOTO AND STUMP REMOVAL STA 37+00 TO STA 51+50 (CONTROL LINE A)
V-104	N/A	AERIAL PHOTO AND STUMP REMOVAL STA 51+50 TO STA 68+50 (CONTROL LINE A)
V-105	N/A	AERIAL PHOTO AND STUMP REMOVAL STA 68+50 TO STA 85+50 (CONTROL LINE A)
V-106	N/A	AERIAL PHOTO AND STUMP REMOVAL STA 85+50 TO STA 102+00 (CONTROL LINE A)
V-107	N/A	AERIAL PHOTO AND STUMP REMOVAL STA 102+00 TO STA 115+00 (CONTROL LINE A)
V-108	N/A	TREE INVENTORY - STUMPS TO BE REMOVED (1 OF 3)
V-109	N/A	TREE INVENTORY - STUMPS TO BE REMOVED (2 OF 3)
V-110	N/A	TREE INVENTORY - STUMPS TO BE REMOVED (3 OF 3)
V-111	N/A	TREE INVENTORY - TREES TO BE PROTECTED IN PLACE (1 OF 1)
V-112	N/A	TREE INVENTORY - DO NOT DISTURB (1 OF 1)
C-101	N/A	PLAN AND PROFILE - STA 100+00 TO STA 106+50 (CONTROL LINE B)

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DRAWING NO.	REVISION NO.	TITLE
C-102	N/A	PLAN AND PROFILE - STA 106+50 TO STA 112+00 (CONTROL LINE B)
C-103	N/A	PLAN AND PROFILE - STA 200+00 TO STA 208+00 (CONTROL LINE C)
C-104	N/A	PLAN AND PROFILE - STA 300+00 TO STA 305+00 (CONTROL LINE D)
C-105	N/A	PLAN AND PROFILE - STA 305+00 TO STA 311+50 (CONTROL LINE D)
C-106	N/A	PLAN AND PROFILE - STA 400+00 TO STA 407+00 (CONTROL LINE E)
C-107	N/A	PLAN AND PROFILE - STA 407+00 TO STA 415+00 (CONTROL LINE E)
C-108	N/A	PLAN AND PROFILE - STA 415+00 TO STA 424+00 (CONTROL LINE E)
C-109	N/A	PLAN AND PROFILE - STA 424+00 TO STA 433+50 (CONTROL LINE E)
C-110	N/A	PLAN AND PROFILE - STA 433+50 TO STA 441+00 (CONTROL LINE E)
C-111	N/A	PLAN AND PROFILE STA 441+00 TO STA 449+00 (CONTROL LINE E)
C-112	N/A	PLAN AND PROFILE STA 500+00 TO 508+00 (CONTROL LINE F)
C-113	N/A	PLAN AND PROFILE STA 508+00 TO 514+50 (CONTROL LINE F)
C-201	N/A	SITE PLANS - (1 OF 6)
C-202	N/A	SITE PLANS - (2 OF 6)
C-203	N/A	SITE PLANS - (3 OF 6)
C-204	N/A	SITE PLANS - (4 OF 6)
C-205	N/A	SITE PLANS - (5 OF 6)
C-206	N/A	SITE PLANS - (6 OF 6)
C-207	N/A	SPEED LUMP PLAN
C-301	N/A	TYPICAL SECTIONS - (1 OF 2)
C-302	N/A	TYPICAL SECTIONS - (2 OF 2)
C-303	N/A	TYPICAL DETAILS - (1 OF 5)
C-304	N/A	TYPICAL DETAILS - (2 OF 5)
C-305	N/A	TYPICAL DETAILS - (3 OF 5)
C-306	N/A	TYPICAL DETAILS - (4 OF 5)
C-307	N/A	TYPICAL DETAILS - (5 OF 5)
C-501	N/A	LEVEE CROSS SECTIONS STA 101+00 TO STA 106+00 (CONTROL LINE B)
C-502	N/A	LEVEE CROSS SECTIONS STA 107+00 TO STA 110+89 (CONTROL LINE B)
C-503	N/A	LEVEE CROSS SECTIONS STA 201+00 TO STA 206+00 (CONTROL LINE C)
C-504	N/A	LEVEE CROSS SECTIONS STA 207+00 (CONTROL LINE C)
C-505	N/A	LEVEE CROSS SECTIONS STA 300+15 TO STA 305+00 (CONTROL LINE D)
C-506	N/A	LEVEE CROSS SECTIONS STA 306+00 TO STA 310+00 (CONTROL LINE D)
C-507	N/A	LEVEE CROSS SECTIONS STA 400+20 TO STA 405+00 (CONTROL LINE E)
C-508	N/A	LEVEE CROSS SECTIONS STA 406+00 TO STA 411+00 (CONTROL LINE E)
C-509	N/A	LEVEE CROSS SECTIONS STA 412+00 TO STA 417+00 (CONTROL LINE E)

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DRAWING NO.	REVISION NO.	TITLE
C-510	N/A	LEVEE CROSS SECTIONS STA 418+00 TO STA 423+00 (CONTROL LINE E)
C-511	N/A	LEVEE CROSS SECTIONS STA 424+00 TO STA 429+00 (CONTROL LINE E)
C-512	N/A	LEVEE CROSS SECTIONS STA 430+00 TO STA 435+00 (CONTROL LINE E)
C-513	N/A	LEVEE CROSS SECTIONS STA 436+00 TO STA 441+00 (CONTROL LINE E)
C-514	N/A	LEVEE CROSS SECTIONS STA 442+00 TO STA 447+00 (CONTROL LINE E)
C-515	N/A	LEVEE CROSS SECTIONS STA 448+00 (CONTROL LINE E)
C-516	N/A	LEVEE CROSS SECTIONS STA 500+00 TO STA 505+00 (CONTROL LINE F)
C-517	N/A	LEVEE CROSS SECTIONS STA 506+00 TO STA 511+00 (CONTROL LINE F)
C-518	N/A	LEVEE CROSS SECTIONS STA 512+00 TO STA 513+00 (CONTROL LINE F)
CU101	N/A	UTILITY PLAN STA 0+00 TO STA 17+00 (CONTROL LINE A)
CU102	N/A	UTILITY PLAN STA 23+00 TO STA 37+00 (CONTROL LINE A)
CU103	N/A	UTILITY PLAN STA 37+00 TO STA 51+50 (CONTROL LINE A)
CU104	N/A	UTILITY PLAN STA 51+50 TO STA 68+50 (CONTROL LINE A)
CU105	N/A	UTILITY PLAN STA 68+50 TO STA 85+50 (CONTROL LINE A)
CU106	N/A	UTILITY PLAN STA 85+50 TO STA 102+00 (CONTROL LINE A)
CU107	N/A	UTILITY PLAN STA 102+00 TO STA 115+00 (CONTROL LINE A)
CP001	N/A	TRAFFIC HANDLING - GARDEN HIGHWAY BETWEEN GATEWAY OAKS AND INTERSTATE 5
CP002	N/A	TRAFFIC HANDLING - GARDEN HIGHWAY AT NATOMAS PARK DRIVE
CP003	N/A	TRAFFIC HANDLING - GARDEN HIGHWAY BETWEEN NATOMAS PARK DRIVE AND TRUXEL ROAD
CP004	N/A	TRAFFIC HANDLING - GARDEN HIGHWAY BETWEEN TRUXEL AND ARDEN GARDEN CONNECTOR (1 OF 2)
CP005	N/A	TRAFFIC HANDLING - GARDEN HIGHWAY BETWEEN TRUXEL AND ARDEN GARDEN CONNECTOR (2 OF 2)
CP006	N/A	TRAFFIC HANDLING - GARDEN HIGHWAY AT ARDEN GARDEN CONNECTOR
CP101	N/A	TRAFFIC DETOUR PLAN - GARDEN HIGHWAY BETWEEN NATOMAS PARK DRIVE AND TRUXEL ROAD
CP102	N/A	TRAFFIC DETOUR PLAN - GARDEN HIGHWAY BETWEEN TRUXEL ROAD AND ARDEN GARDEN CONNECTOR
CP201	N/A	SIGNAGE ADN STRIPING - GARDEN HIGHWAY AT NATOMAS PARK
E-001	N/A	STREETLIGHT SPECIAL PROVISIONS
E-101	N/A	ELECTRICAL UTILITY PLAN - STA 0+00 TO STA 16+00 (CONTROL LINE A)
E-102	N/A	ELECTRICAL UTILITY PLAN - STA 16+00 TO STA 30+00 (CONTROL LINE A)
E-103	N/A	ELECTRICAL UTILITY PLAN - STA 30+00 TO STA 44+00 (CONTROL LINE A)
E-104	N/A	ELECTRICAL UTILITY PLAN - STA 44+00 TO STA 58+50 (CONTROL LINE A)
E-201	N/A	ELECTRICAL UTILITY PLAN - ONE LINE DIAGRAM
E-501	N/A	STANDARD DETAILS FOR TRAFFIC SIGNALS NO. 1
E-502	N/A	STANDARD DETAILS FOR TRAFFIC SIGNALS NO. 2
E-503	N/A	ELECTRICAL STANDARD DETAILS
E-504	N/A	ELECTRICAL AND TRAFFIC SIGNAL STANDARD DETAILS

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REFERENCE DRAWINGS (DFN 1-04-0570)

CU112	N/A	SUMP 58 DISCHARGE LINES RELOCATION PLAN AND PROFILE STA 1+00 TO STA 3+00

Contract drawings are as follows:
REACH H - SUBREACH 1 (VOLUME 3 OF 3)

DRAWING NO.	REVISION NO.	TITLE
G-001	N/A	TITLE SHEET
G-002	N/A	BASIN MAP
G-003	N/A	VICINITY MAP, DRAWING LIST, LEGEND, AND ABBREVIATIONS
G-004	N/A	GENERAL NOTES
G-005	N/A	SURVEY CONTROL POINTS (1 OF 2)
G-006	N/A	SURVEY CONTROL POINTS (2 OF 2)
V-101	N/A	NEMDC AERIAL PHOTO, REACH H STATIONS 0+00 TO 7+00
V-102	N/A	NEMDC AERIAL PHOTO, REACH H STATIONS 7+00 TO 13+00
V-103	N/A	NEMDC AERIAL PHOTO, REACH H STATIONS 189+00 TO 200+00
C-001	N/A	CONTROL LINE PLAN AND PLAN & PROFILE SHEET LAYOUT (1 OF 2)
C-002	N/A	PLAN SHEET LAYOUT (2 OF 2)
C-003	N/A	CONSTRUCTION LIMIT & FLPE PLAN
C-004	N/A	TREE REMOVAL PLAN AND TABLE (1 OF 2)
C-005	N/A	TREE REMOVAL PLAN AND TABLE (2 OF 2)
C-101	N/A	NEMDC PLAN & PROFILE, STATIONS 0+00 TO 9+00
C-102	N/A	NEMDC PLAN & PROFILE, STATIONS 9+00 TO 13+00 & COLUMBUS AVENUE ACCESS ROAD RAMP PLAN & PROFILE
C-201	N/A	TYPICAL SECTIONS AND DETAILS (1 OF 5)
C-202	N/A	TYPICAL SECTIONS AND DETAILS (2 OF 5)
C-203	N/A	TYPICAL SECTIONS AND DETAILS (3 OF 5)
C-204	N/A	TYPICAL SECTIONS AND DETAILS (4 OF 5)
C-205	N/A	TYPICAL SECTIONS AND DETAILS (5 OF 5)
C-301	N/A	NEMDC CROSS SECTIONS STATIONS 0+00 TO 8+00
C-302	N/A	NEMDC CROSS SECTIONS STATIONS 9+00 TO 13+00

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SECTION TABLE OF CONTENTS

DIVISION 00 - PROCUREMENT AND CONTRACTING REQUIREMENTS

SECTION 00 73 05

SUPPLEMENTARY CONDITION REQUIREMENTS

PART 1 GENERAL

1.1 REFERENCES
1.2 SUBMITTALS
1.3 SUPPLEMENTARY CONDITIONS REQUIREMENTS
1.3.1 SCR-1 Allowable Time, Schedule Constraints and Time of Completion
1.3.2 SCR-2 Site Conditions
1.3.3 SCR-3 Lands and Right-of-Way
1.3.4 SCR-4 Access by Government, and Other Jurisdictional Public Agencies
1.3.5 SCR-5 Borrow Source
1.3.6 SCR-6 Contractor's Tools and Equipment
1.3.7 SCR-7 Locking Gates
1.3.8 SCR-8 Water Source for Construction Operations
1.3.9 SCR-9 Cleaning Up
1.3.10 SCR-10 Protection of Existing Improvements
1.3.11 SCR-11 Record Drawings
1.3.12 SCR-12 Flood Emergency
1.3.13 SCR-13 Permits and Approvals
1.3.14 SCR-14 Dust Control
1.3.15 SCR-15 Fire Control
1.3.16 SCR-16 Air Pollution Control
1.3.17 SCR-17 Noise Control
1.3.18 SCR-18 Allowable Work Hours
1.3.19 SCR-19 Cultural Resources
1.3.20 SCR-20 Protection of Existing Trees
1.3.21 SCR-21 Biological Resources
1.3.22 SCR-22 Raptor and Migratory Birds
1.3.23 SCR-23 Wetlands and Sensitive Habitats
1.3.24 SCR-24 U.S. Fish and Wildlife Service
1.3.25 SCR-25 Speed Limit
1.3.26 SCR-26 Reclamation District 1000 (RD1000) Coordination
1.3.27 SCR-27 Safety and Management of Public and Unhoused Individuals
1.3.28 SCR-28 Provision Regarding Maintaining Minimum Flood Protection During Construction
1.3.29 SCR-29 Coordination with the Contracting Officer and Utilities Relocation
1.3.30 SCR-30 Haul Routes
1.3.31 SCR-31 Resource Coordination
1.3.32 SCR-32 Flood Contingency Plan
1.3.33 SCR-33 Utility Provider Response Plan
1.3.34 SCR-34 Stop Work Authority
1.3.35 SCR-35 Floodway Construction Schedule
1.3.36 SCR-36 High Visibility Fencing, Habitat Preservation and

DRAFT

Buffers
1.3.37 SCR-37 General Safety Requirements
1.3.38 SCR-38 Storm Water Pollution Prevention Plan
1.3.39 SCR-39 Grading (Encroachment) Permit
1.3.40 SCR-40 Staging Areas
1.3.41 SCR-41 Asbestos Cement Waterline Removal
1.3.42 SCR-42 Recreation/Community Mitigation
1.3.43 SCR-43 City Streets
1.3.44 SCR-44 City of Sacramento Mastarm Street Lights
1.3.45 SCR-45 Storage Area
1.3.46 SCR-46 Project Signage
1.3.47 SCR-47 Traffic Control Plan
1.3.48 SCR-48 Streetlights, Electrical, and Fiber Installations

PART 2 PRODUCTS

PART 3 EXECUTION

-- End of Section Table of Contents --

DRAFT

SECTION 00 73 05

SUPPLEMENTARY CONDITION REQUIREMENTS

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	(2024) Safety -- Safety and Occupational Health (SOH) Requirements

1.2 SUBMITTALS

Government approval is required for submittals with a "G" designation. The following must be in accordance with Section 01 33 00 SUBMITTAL PROCEDURES:

SD-01 Preconstruction Submittals; G

Permits and Approvals; G

Construction emission/dust control plan; G

Permit, waiver or other documentation with the mapped haul routes from local jurisdictions to repair or compensate for damage; G

Flood Contingency Plan; G

Utility Provider Response Plan; G

Storm Water Pollution Prevention Plan; G

Grading (Encroachment) Permit; G

Traffic Control Plan; G

Public and Unhoused Population Safety Plan; G

Work Plan; G

1.3 SUPPLEMENTARY CONDITIONS REQUIREMENTS

1.3.1 SCR-1 Allowable Time, Schedule Constraints and Time of Completion

The time of completion for this contract, which includes all segments of work to be completed in their entirety and in accordance with the project plans and these specifications, must be as outlined below and incorporated into the Contractor's schedule.

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TIME OF COMPLETION FOR REACH I - CONTRACT 2 AND REACH H SUBREACH 1

Description of Work	Date of Completion
A. Contracting Officer and Resident Engineer's Office Facility	Installed and ready for occupancy not later than five (5) calendar days prior to start of construction
B. Traffic Control Plan	Traffic Control Plan must be approved and traffic control measures installed prior to the start of construction activities
C. Copies of Permits	Contractor to provide to Contracting Officer within 10 calendar days of receipt and 15 days prior to start of construction
D. Flood contingency plan	Submit to Contracting officer 30 calendar days prior to commencement of construction activities
E. Record Drawings	Submit to Contracting Officer within 10 calendar days after Government approval of working drawings

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Ground disturbance work along Garden Highway must take place between April 15 and November 1.

Construction will initiate at the eastern end of project (Reach H) and progress westerly.

1.3.2 SCR-2 Site Conditions

The Contractor must satisfy himself or herself concerning the nature and location of the work; the general and local conditions, particularly those affecting transportation, disposal, handling and storage facilities; availability of labor, water, power, communications, roads, climatic conditions and seasons; physical conditions at the job sites and Project areas as a whole; job-site topography and ground conditions; permits, equipment, and facilities needed preliminary to, and during, work prosecution; and all other matters which can in any way affect the work, including cost thereof. Failure of the Contractor to become acquainted with all available information regarding any applicable conditions will not relieve the Contractor from the responsibility for properly estimating either the difficulties or the costs of successfully performing the work.

1.3.3 SCR-3 Lands and Right-of-Way

The right-of-way for the construction work, as shown on the Plans, will be provided by the Government. The Contractor is responsible for obtaining land rights and easements for areas to be used for the Contractor's own convenience outside the right of way shown and footprint limits on the Plans and must absorb complete liability for the use, and/or associated activities related to the use of such land. The Contractor is responsible

for all work and costs associated with obtaining land rights and easements.

If the contractor receives land rights and easements outside of the construction limits, these rights must be received in writing and forwarded to the Government for their records. Contractor must also receive release of liability of the Government for any damage to these addition areas in writing.

Compliance with environmental and cultural laws must be followed by the contractor if using lands other than those identified by the Government.

1.3.4 SCR-4 Access by Government, and Other Jurisdictional Public Agencies

The Contractor must allow the following Agencies and Jurisdictional public agencies unrestricted access to the project site at all times:

United States Army Corps of Engineers

California Department of Water Resources

Reclamation District 1000

Sacramento Area Flood Control Agency

County of Sacramento

City of Sacramento

Sacramento Area Sewer District

Central Valley Flood Protection Board

California State Department of Fish and Wildlife

United States Fish and Wild Life Service

National Marine Fishery Service

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All Visitors must comply with the safety requirement in the EM 385-1-1 and contractor safety plans. All Visitors must coordinate with the onsite Government representative prior to visiting the job site.

1.3.5 SCR-5 Borrow Source

A borrow source for the project has been identified and included in the Plans. Borrow material, borrow site, and borrow activities must comply with all applicable local, state, and federal regulations.

1.3.6 SCR-6 Contractor's Tools and Equipment

The Contractor must furnish all equipment, materials, tools, supplies, and manufactured articles required for the completion of the work in accordance with the Contract. The Contractor must take the necessary precautions to secure tools and equipment from theft while on-site. The Government assumes no responsibility for lost, vandalized, or stolen equipment belonging to the Contractor, its subcontractors, or its employees.

1.3.7 SCR-7 Locking Gates

The Contractor must take care to protect and operate any existing gates that control access to the Project right-of-way, in conformance with the Government, RD1000, and the City and County of Sacramento requirements. These requirements include preventing passage through the gates of unauthorized persons and equipment during periods of Contractor use of the gates and locking the gates during non-construction periods, if so directed by the Contracting Officer.

1.3.8 SCR-8 Water Source for Construction Operations

Contractor is responsible for identifying, securing, and obtaining all water needed for the project for both potable uses and for construction purposes. Water must not be pumped from the American River or Steelhead Creek. Construction water should be reused onsite to the extent practical and disposed of in a manner consistent with the environmental permits. Excess water must not be disposed of into any wetland, stream, river, or storm drainage without all applicable local and regulatory permitting.

Contractor is responsible for disposal of all construction water.

1.3.9 SCR-9 Cleaning Up

The Contractor must dispose of all trash items in closed containers, which must be removed at least once per day. Vegetative wastes must be chipped and delivered to waste energy facilities, mulched, composted, or used for firewood and removed at least once per week.

1.3.10 SCR-10 Protection of Existing Improvements

Except as specified herein or as shown on the Plans, existing structures and utility lines are not to be disturbed, damaged, or undermined by the Contractor, except where in the opinion of the Contracting Officer it is essential to relocate such improvements. If relocation of any facility is required, the Contractor must relocate the improvements to be at least equal in condition to the original. The Contractor must take all necessary precautions to prevent any damage to existing facilities. Should damage or injury occur because the Contractor's operations, the Contractor must repair or replace such damaged facilities to the Contracting Officer's satisfaction at the Contractor's expense.

The Contractor must repair any damage to public and private streets resulting from the Contractor's operations, as directed by the Contracting Officer. Repair must be made per industry standards and conform to local jurisdictional requirements. Repairs must be made at no additional cost to the Government.

1.3.11 SCR-11 Record Drawings

The Contractor must maintain a neat and accurate marked set of working record drawings in accordance with Specifications. The record drawings are subject to the inspection of the Contracting Officer at all times and must be kept current weekly with all work instructions, change orders, and construction adjustments shown thereon and initiated by inspection. The Contracting Officer reserves the right to withhold progress payments, or portions thereof, if record drawings are not maintained as stated above.

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1.3.12 SCR-12 Flood Emergency

In the event of a flood emergency requiring action by the jurisdictional flood control agencies prior to completion of the work, the Contracting Officer has the right to suspend the work in accordance with the General Specifications. Such suspension includes the right of the Contracting Officer to take over the Project to conduct flood protection activities. The flood emergency plan will be commenced when the H Street Gauge reads 26 feet NGVD29 and is forecasted to rise.

1.3.13 SCR-13 Permits and Approvals

The Contracting Officer has obtained various permits, agreements, and rights for performance of the work. These permits may be described more fully in other SCRs and these specifications. The Contractor will be required to obtain additional permits or be a signatory on the Contracting Officer obtained permits as noted throughout the specifications. The Contractor is responsible for complying with all conditions of the permits and agreements. Any delays to the Project resulting from the Contractor's failure to follow permit requirements will not be the responsibility of the Contracting Officer and the Contractor will not be granted any extension of time for such delays.

The Contractor is responsible for obtaining all environmental permits or use permits (including CALTRANS Encroachment Permit) required for easements to land being used for the Contractor's own convenience and for work within the State Right of Way. Any delays to the Project resulting from the lack of these additional permits or the Contractor's failure to follow permit requirements will not be the responsibility of the Contracting Officer and the Contractor will not be granted any extension of time or additional compensation for such delays. Copies of all permits obtained by the Contractor must be given to the Contracting Officer within 10 days of receipt of permit. The contractor is responsible for paying all permit fees.

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1.3.14 SCR-14 Dust Control

The Contractor must comply with the provisions of Section 01 57 19 TEMPORARY ENVIRONMENTAL CONTROLS of the Specifications. The Contractor must prepare and submit a construction emission/dust control plan to the Contracting Officer and Sacramento Metropolitan Air Quality Management District (SMAQMD) and must receive approval of the plan before groundbreaking. During the performance of the work, the Contractor must assume all responsibility for dust control and furnish all labor, equipment, and means required, and must carry out proper and efficient measures wherever and as often as necessary to prevent the construction operations from producing dust in amounts harmful to persons, damaging to property, or causing a nuisance to persons living nearby or occupying buildings in the vicinity of the work, or as directed by the Contracting Officer. Dust control will be strictly enforced with particular emphasis on work areas adjacent to residential and agricultural properties. The curtailment of the construction activities as a result of inadequate dust control measures will not be considered an unavoidable delay. The Contractor must suspend all grading operations when fugitive dust levels exceed levels specified by SMAQMD regulations or deemed unacceptable by the Contracting Officer. The Contractor is responsible for paying any fees assessed by SMAQMD.

1.3.15 SCR-15 Fire Control

Burning is not allowed for any activities associated with this project.

Delivering removed vegetative material to compost or waste-to-energy facilities, or repurposing is encouraged. Land filling of material must be minimized.

Smoking is not permitted in areas near flammable materials such as dry grass or in restricted areas as identified by the Contracting Officer. Cigarette butts must be placed in appropriate receptacles.

1.3.16 SCR-16 Air Pollution Control

The Contractor must comply with the air pollution control protocols specified in Section 01 57 19 TEMPORARY ENVIRONMENTAL CONTROLS of the Specifications. To the extent available, the Contractor must use existing power sources for the Contractor provided trailers rather than temporary power generators. If existing power sources are unavailable, clean fuel, low-emission on-site stationary generator equipment must be used. Use low -sulfur fuel for stationary construction equipment. The Contractor is responsible for arranging appropriate consultation with the Air Resources Board and the SMAQMD, to determine registration and permitting requirements before operating portable engines or portable engine-driven equipment at the project site.

1.3.17 SCR-17 Noise Control

The Contractor must comply with Section 01 57 19 TEMPORARY ENVIRONMENTAL CONTROLS of the Specifications to avoid and minimize noise impacts from the construction activities.

Before construction activity begins within 500 feet of one or more residences, the Contractor must provide written notification to the potentially affected residents, identifying the type, duration, and frequency of activities. Notification materials must also identify a mechanism for residents to register complaints with the appropriate jurisdiction if demolition noise levels are overly intrusive.

Before haul truck trips are initiated on roads within 600 feet of one or more residences, the Contractor must provide written notification at least one day before to the potentially affected residents, identifying the hours and frequency of haul truck trips. Notification materials must also identify a mechanism for residents to register complaints with the appropriate jurisdiction if haul truck noise levels are overly intrusive or outside exempt daytime hours.

1.3.18 SCR-18 Allowable Work Hours

The Contractor must limit construction activities to between the following hours on the following days:

Construction work hours are Monday through Saturday 7 AM to 6 PM. Sunday construction work hours are 9 AM to 6 PM with approval from Contracting Officer. Requests for Sunday work must be submitted 72 hours in advance of working on Sunday.

Heavy machinery activity off the levee is restricted to the staging area for one hour prior to 7:00 AM and for one hour after sunset (as posted in

DRAFT

the newspaper or online) or 10:00 PM whichever occurs sooner. No other construction work will be allowed outside the above-mentioned hours. Any extended work hours must be reflected in the Contractor's initially approved schedule for the Project.

The Contractor must be aware of major events taking place at Discovery Park during the construction period of the Project. Contractor to refer to the Sacramento County Regional Parks calendar at http://regionalparks.saccounty.net/pages/parkcalendar.aspx. The Contractor must plan accordingly.

1.3.19 SCR-19 Cultural Resources

The Contractor must comply with protocols in Section 01 57 19, TEMPORARY ENVIRONMENTAL CONTROLS, of the Specifications.

Contractor must conduct Construction Personnel Training for all on-site employees. If cultural resources are discovered during construction activities, Contractor must cease work within 100 feet of the vicinity of the find and immediately contact the archaeologist, through the Contracting Officer, and cooperate with all pertinent mitigation procedures. Construction personnel must participate in a cultural awareness program, which will be provided by the USACE Archeologist at the start of construction. As needed, the Contractor must provide a translator to allow the training to be conducted in Spanish for Spanish language speakers and other languages as needed or necessary.

1.3.20 SCR-20 Protection of Existing Trees

All trees of any kind inside the work limits and designated in the drawings as protect in place are to be protected. Contractor must place protective barrier fencing where possible at the drip line around trees designated as protect in place in the drawings. All trees outside the work limits, of any kind, must not to be disturbed. Contractor must place protective barrier fencing around trees adjacent to construction areas as directed by the Contracting Officer. If damaged by the Contractor, damaged trees and landscaping must be replaced by Contractor or otherwise mitigated as directed by Contracting Officer at the Contractor's expense.

1.3.21 SCR-21 Biological Resources

The Contractor must comply with the Section 01 57 19, TEMPORARY ENVIRONMENTAL CONTROLS, of the Specifications to avoid and minimize effect upon endangered or sensitive species in the Project area. The Contractor must schedule activities to comply with the provisions and provide required notice for surveys to be conducted by the Government's Environmental Representative. Construction personnel must participate in an environmental awareness program, which will be provided by the USACE Biologist at the start of construction. As needed, the Contractor must provide a translator to allow the training to be conducted in Spanish for Spanish language speakers and other languages as needed or necessary.

1.3.22 SCR-22 Raptor and Migratory Birds

The Contractor must comply with the provisions of the Construction Contractor Protocols for Avoiding and Minimizing Impacts to Raptors, Special Status, and Other Nesting Birds, which are included in Section 01 57 19, TEMPORARY ENVIRONMENTAL CONTROLS, of the Specifications. If a nesting bird is found injured on the Project site, the Contracting Officer

DRAFT

must be notified immediately so the animal can be relocated to a either a wildlife care facility or a raptor recovery facility.

1.3.23 SCR-23 Wetlands and Sensitive Habitats

The Contractor must not impact Wetlands and Sensitive Habitats.

1.3.24 SCR-24 U.S. Fish and Wildlife Service

A Biological Opinion has been issued by the U.S. Fish and Wildlife Service. The Contract Documents contain all of the terms and conditions from the Biological Opinion, and the Contractor is responsible for implementing all requirements and obligations sited in the Contract Documents.

1.3.25 SCR-25 Speed Limit

The speed limit in all Project work areas and along levees is 15 m.p.h., except on county roads, city streets and highways. The Contracting Officer may also require that speed limits on project site be reduced further to ensure vibration limits, dust protocols or other criteria are not violated. The Contractor must post, at a minimum, two speed limit signs at each end of the work zone.

1.3.26 SCR-26 Reclamation District 1000 (RD1000) Coordination

RD1000 manages the existing levees throughout the project area. The Contractor must coordinate their work with RD1000 through the Contracting Officer, allowing RD1000 personnel and equipment access to and passage along the existing levees at all times.

1.3.27 SCR-27 Safety and Management of Public and Unhoused Individuals

The project site is accessible to the public including unhoused individuals. Site security is required for the duration of the contract and must be provided by the Contractor. Management of the public including unhoused individuals is required for the duration of the contract and must be provided by the Contractor. The City of Sacramento Police Department is the governing agency for the project site location and must be contacted to provide notification of the project. They can be contacted at the link provided:

https://www.cityofsacramento.gov/police/police-services/hire-supplemental-police-officers

Prior to commencement of construction activities, the Contractor must submit a Public and Unhoused Population Safety Plan that includes the following:

- Proposed construction phasing, signage, fencing, and other protective measures to provide for the safety of the public and unhoused individuals.

- Work zones in which the public and unhoused individuals must be excluded during the various phases of construction.

- Locations within the project limits that must remain open to the public during periods of non-construction activity based on various phases of construction.

DRAFT

- o Identification of public access and path of travel during various phases of construction (coordinate with traffic control plan).

1.3.28 SCR-28 Provision Regarding Maintaining Minimum Flood Protection During Construction

Contractor must have all levee improvements completed by the deadlines outlined and described in paragraph 1.3.1, SCR-1, herein. Contractor must not disturb the existing levee system beyond the limits of construction. Disturbance includes but is not limited to trees, roadways, ramps, pipes and/or utilities crossings, or excavations within the limits of construction. Stockpiling suitable construction materials is acceptable provided written approval is first obtained from the Contracting Officer.

1.3.29 SCR-29 Coordination with the Contracting Officer and Utilities Relocation

Contractor must coordinate and cooperate with the Contracting Officer and all utility providers on relocation of any overhead and underground electrical, sewer, water and storm utilities within the limits of construction. Contractor must lead in coordination and work with the Contracting Officer such that the utilities are relocated in time not to delay and to allow for completion of improvements in accordance with the Time of Completion schedule. The cost of any relocations is the responsibility of the Contractor except where the drawings indicate otherwise.

DRAFT

1.3.30 SCR-30 Haul Routes

All haul and access routes must be existing public roads and maintenance roads, except for restrictions noted on the drawings. Stockpiling of construction materials, including portable equipment, vehicles, and supplies, is restricted to designated construction staging areas and work sites. Movement of heavy equipment to and from the Project site is restricted to load limit approved roadways. The Contractor's construction access points are limited to those shown on the Plans, defined in the Specifications, or as directed in the field by the Contracting Officer. Paved areas at these controlled access points must be swept each day, or more frequently, as required by the Contracting Officer to control dust and clean up material tracked or spilled on said paved areas or roadways. The Contractor must conform to all governing codes, laws, and ordinances.

Contractor must obtain a permit, waiver or other documentation with the mapped haul routes from local jurisdictions to repair or compensate for damage to local roads used in hauling to or from the project site. The permit, waiver or other documentation provided by the local jurisdiction may specify the conditions for repairs to be performed or appropriate compensation to account for the road damage. Contractor must provide a copy of the permit, waiver or other documentation from local jurisdictions with the mapped haul routes to the Contracting Officer and resident engineer prior to commencement of haul operations. All cost associated with permits, haul road repairs, and fees are the responsibility of the Contractor and must not be paid separately from unit prices or lump-sum prices contained in the Bidding Schedule.

1.3.31 SCR-31 Resource Coordination

All contact and coordination with the resource agencies must occur through

the Contracting Officer in coordination with the Government's environmental representative.

1.3.32 SCR-32 Flood Contingency Plan

In the event the water surface elevation of the adjacent river is forecasted by the State-Federal Flood Forecast Center to increase significantly for any reason, the Contracting Officer reserves the right to require the Contractor to stop excavation and to begin continuous operations to complete all partially completed section(s) of the levee embankment. At least 30 days prior to any Levee Excavation, the Contractor must submit a contingency plan outlining the contingency operations in the event the H Street Gauge reads 26 feet NGVD and is forecasted to rise. The contingency plan must include the proposed measure to protect the landside areas which have a reduced level of protection due to construction activities. The plan must include river stage monitoring, river stage at which the plan will be activated, material and equipment to be used in performance of the contingency plan, and location, type and quantity of the stockpiled emergency material. The plan must also include the length of levee, where stockpiled material will be stored, and the method for monitoring river elevations. The Contractor must keep any levee degrade material on the project site for the duration of the construction period, protected from inclement weather, for use as emergency backfill as necessary. The Flood Contingency Plan must be submitted to the Contracting Officer for review.

1.3.33 SCR-33 Utility Provider Response Plan

Contractor must prepare and submit a Utility Response Plan to the Contracting Officer, Sacramento Area Sewer District (SASD), Sacramento Municipal Utility District (SMUD), Comcast, and the City of Sacramento. Plan must detail how utility locations are verified, provide protocol for coordination with Utility Providers, detail process on conducting required worker training for all on-site employees with respect to accidental utility damage, and provide utility provider emergency contact information. Contractor is responsible for coordinating any temporary utility services needs during construction, and will assume all temporary utility services cost.

1.3.34 SCR-34 Stop Work Authority

The Contracting Officer and Administrative Contracting Officer have the authority to immediately stop any activity that is not in compliance with the permits, and/or order any reasonable measure to avoid the unauthorized take of an individual of the Covered Species (e.g., giant garter snake, Swainson's hawk, valley elderberry longhorn beetle, Federally- and State-listed fish).

1.3.35 SCR-35 Floodway Construction Schedule

Contractor must not perform any work within the existing floodway per the date restrictions in Time of Completion requirement herein and must not begin any construction until evaluation of upstream conditions indicate that inundation of these areas is unlikely to occur.

1.3.36 SCR-36 High Visibility Fencing, Habitat Preservation and Buffers

Contractor must provide high visibility fencing that must be placed to prevent encroachment of construction personnel and equipment into areas

DRAFT

outside of or adjacent to the project footprint that contain sensitive habitats, including at least 20 feet from the dripline of elderberry shrubs and up to 200 feet from the edge of aquatic features that are suitable giant garter snake habitat. K-Rails, if used, must be used in areas noted on the drawings. The fencing must be inspected by the Contractor before the start of each workday and must be maintained until completion of the Project. The Contractor must not remove the fencing until construction of the Project is completed. Insecticides, herbicides, or other chemicals that might harm the valley elderberry longhorn beetle or its host plant must not be used within 100 feet of the elderberry shrubs.

1.3.37 SCR-37 General Safety Requirements

The Contractor must conform to all applicable occupational safety and health standards, rules, regulations, and orders established by the State of California or Federal Government. The Contractor must, upon request, submit to the Contracting Officer a copy of their Injury Illness Prevention Program (IIPP) (including Site Safety Plan and Code of Safe Work Practices) for review. The Contractor is required to fulfill the requirements of these programs during the prosecution of the Work, and comply with conditions set forth in the Specifications. The Contractor must comply with all regulations set forth in Consolidated EM 385-1-1.

1.3.38 SCR-38 Storm Water Pollution Prevention Plan

Coverage under the State Water Resources Control Board (SWRCB) General Construction Permit to Discharge Water Associated with Construction Activity must be obtained by the Contractor for this Project prior to initiation of any construction activities as described in Specification 01 57 23 TEMPORARY STORM WATER POLLUTION CONTROL. The Contractor is responsible for preparation and for paying all SWPPP fees.

1.3.39 SCR-39 Grading (Encroachment) Permit

Contractor must obtain an Encroachment Permit from City of Sacramento prior to initializing work. Copy of work permit must be submitted to the Contracting Officer prior to disturbing ground.

1.3.40 SCR-40 Staging Areas

Staging areas available to the Contractor for the project have been identified in the Drawings and permits have been obtained for them by the Government. If additional areas are available for use, they will be the responsibility of the Contractor to obtain.

1.3.41 SCR-41 Asbestos Cement Waterline Removal

Contractor to coordinate the removal of the existing 12-in asbestos cement waterline shown on drawings with SAFCA. Contractor is responsible for exposing the 12-in asbestos cement waterline and providing access for removal. SAFCA is responsible for removal of 12-in asbestos cement waterline, which will require a 2-3 week duration for removal. The asbestos cement waterline must not be stored on site for any duration of time. Contractor to coordinate all asbestos cement waterline removal activities with Contracting Officer.

DRAFT

1.3.42 SCR-42 Recreation/Community Mitigation

A minimum of two weeks prior to start of work Contractor must provide written notification to the City of Sacramento DPW Representatives, City of Sacramento Department of Transportation, City of Sacramento Bike/Pedestrian Coordinator, City Public Information Officers, and Sacramento Regional Transit, as well as outreach to the immediate project neighbors advising of the work, duration, the days of the week work is to take place, and the hours to be worked for each day. Contractor must provide, via posted signage, a USACE project manager name, contact number and e-mail address as well as a Contractor project manager name, contact number and e-mail address, for residents in the vicinity of the Premises should any concern from the immediate project neighbors arise with regard to noise, traffic, or other such disturbance which directly results from Contractor's work. The purpose of USACE and Contractor posting their respective contact information is to avoid Construction Inspection and Survey staff having to field telephone calls and other inquiries related to Contractor's work.

1.3.43 SCR-43 City Streets

The Contractor must ensure that its construction equipment and hauling operations do not damage City streets. Prior to start of construction, Contractor must provide a Pre-Construction Video and Photograph Survey as described in Section 01 00 00 with video and photograph all city streets within the construction area and along all haul routes, including to and from borrow source. Photographs must be submitted to the Contracting Officer and the City Department of Public Works Representative, Jon Liffring, Supervising Construction Inspector, (the "DPW Representative"), (916) 808-7124, and will be used to compare before and after project conditions at the project's end.

The Contractor must notify and submit truck routes for review to the Contracting Officer and the DPW Representative prior to starting work. Furthermore, the Contractor must provide the City Representative with a location for a wash out area to wash and clean Contractor's trucks, equipment and tires before they exit the construction area.

At the completion of work and prior to the Contractor leaving the project, the Contractor must restore to pre-project conditions all such roads as directed by the Contracting Officer at no additional cost to the Government in accordance with the local permits obtained. Repairs will include replacement of base rock and/or surface treatment as required. Repairs are documented with a thorough description of repair made, location, and photographs. Documentation of haul road repairs must be submitted to the Contracting Officer following repair.

1.3.44 SCR-44 City of Sacramento Mastarm Street Lights

Existing City of Sacramento Mastarm Street Lights must be removed and delivered to the City of Sacramento at the address below. Contractor must not damage street lights. Contractor to document conditions of existing street lights prior to removal. Notify the City's Operations Supervisor 48 hours prior to delivery.

Xavier Covarrubias
Operations Supervisor - Signal and Lighting
(916) 808-3719
City of Sacramento North Area Corporation Yard

DRAFT

918 Kenmar Road
Sacramento, CA 95834

1.3.45 SCR-45 Storage Area

Contractor must erect chain link fencing a minimum of eight (8) feet tall around the perimeter of its storage area. The fencing must display post signs no smaller than 3' x 3' in size, with 1" tall lettering, providing the Contractor's company name as well as a name and telephone number for Contractor who may be contacted by the public in the event that any issues arise out of the use of the Premises. Contractor must report any calls received from the public to the Contracting Officer. All material remnants need to be removed from the storage site. Otherwise, a protective barrier must be placed between the ground surface and stockpiled materials. Upon completion of the work, or prior to the time that the use of the staging area must cease, whichever occurs first, Contractor must return the site to a condition equal to or better than the condition it was in at the time the of the Contractor's entry into the site.

1.3.46 SCR-46 Project Signage

The Contractor must provide all signage for the project as shown in the Contract Drawings and as specified by the Contractor's Traffic Control Plan. Costs for such signs are to be paid under CLIN "TRAFFIC CONTROL AND SIGNAGE".

1.3.47 SCR-47 Traffic Control Plan

In lieu of the traffic plan provided for Reach I as a part of these contract documents, the contractor may opt to submit an alternative Traffic Control Plan to USACE (SPK) and City of Sacramento for review and approval prior to commencing construction activities.

Reach H - Subreach 1 Traffic Plan was not provided as part of these contract documents. The Contractor must submit a Traffic Control Plan to USACE (SPK) and City of Sacramento for review and approval prior to commencing construction activities. At a minimum, the Traffic Control Plan must achieve the following objectives:

(1) The northern entrance to Discovery Park at Natomas Park Drive and Garden Highway must not be impacted by construction during scheduled events. During construction, the Discovery Park entrance will remain open.
(2) At least one westbound and one eastbound lane must remain open to traffic on Garden Highway between Gateway Oaks Drive and Natomas Park Drive during construction.
(3) The contractor must implement traffic control measures to ensure vehicles exiting I-5 onto Garden Highway will not impact I-5 mainline operations.
(4) The contractor must provide continuous access to adjacent properties.
(5) All signs must be placed in conformance with the current California Manual on Uniform Traffic Control Devices or as Directed by the Contracting Officer.

1.3.48 SCR-48 Streetlights, Electrical, and Fiber Installations

The Contractor must coordinate with the City of Sacramento, follow City standards, and provide a Work Plan for the street light, electrical, and fiber installations prior to start of work.

DRAFT

The fiber installation must be continuous between Gateway Oaks Drive and Truxel Road, and connected to all traffic signal cabinets throughout this corridor. The plans show limits of joint trench where fiber and copper (for streetlights and traffic loop detectors) must be installed. Furthermore, the City of Sacramento requires the installation of fiber in areas beyond the joint trench. The Contractor must use existing conduits through which the fiber must be pulled, and those alignments are shown schematically on the plans.

The Contractor must submit the Electrical and Fiber Work Plan to the contracting officer for approval. At a minimum, the Work Plan must include:

a. Schedule of activities

1) Durations of outages for streetlights, traffic loop detectors, and traffic signals

2) Timing and duration of work within Caltrans R/W

b. Method of confirming limits of the fiber pull through existing conduits as shown on the plans

PART 2 PRODUCTS

Not used.

PART 3 EXECUTION

Not used.

-- End of Section --

DRAFT

SECTION TABLE OF CONTENTS

DIVISION 01 - GENERAL REQUIREMENTS

SECTION 01 00 00

GENERAL REQUIREMENTS

PART 1 GENERAL

1.1 REFERENCES
1.2 SUBMITTALS
1.3 SCRAP MATERIAL
1.4 UTILITIES
1.5 GENERAL SAFETY REQUIREMENTS
1.5.1 General
1.5.2 The Contractor's Superintendent
1.5.3 Violations
1.5.4 Fire Prevention
1.5.5 Recordkeeping/Reporting Requirements
1.5.6 Accident Reporting
1.6 TIME EXTENSIONS FOR UNUSUALLY SEVERE WEATHER
1.7 PLANNED STREET CLOSURES
1.7.1 Transportation Mitigation
1.8 EQUIPMENT DATA FORM
1.9 SPECIAL CONSTRUCTION PROCEDURES
1.10 GOVERNMENT RETAINED ARCHITECT-ENGINEER (A/E)
1.11 COMMERCIAL DISPOSAL SITE
1.12 HAUL ROUTE PLAN
1.13 PROJECT SECURITY AND PUBLIC SAFETY
1.14 BID ITEM OVERRUN
1.15 NON CONTRACT WORK
1.16 WARRANTY OF CONSTRUCTION
1.17 PAYMENT
1.18 PROJECT SURVEYS
1.18.1 Survey Supervision and Scheduling
1.18.2 Personnel Plan
1.18.3 Special Survey Conditions - Preconstruction Survey Cross Sections
1.18.4 Subsequent-Construction Surveys
1.18.5 Survey Monuments
1.19 PRE-CONSTRUCTION VIDEO AND PHOTOGRAPH SURVEY
1.20 POST-CONSTRUCTION VIDEO AND PHOTOGRAPH SURVEY
1.21 FINAL EXAMINATION AND ACCEPTANCE
1.22 ENVIRONMENTAL LITIGATION
1.23 AFTER AWARD DOCUMENTS (Contractor Prepared)

PART 2 PRODUCTS

PART 3 EXECUTION

-- End of Section Table of Contents --

DRAFT

DRAFT

SECTION 01 00 00

GENERAL REQUIREMENTS

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)

CONSOLIDATED EM 385-1-1	(2024) Safety -- Safety and Occupational Health (SOH) Requirements
EM 385-1-1	(2024) Safety -- Safety and Occupational Health (SOH) Requirements
ER 415-1-15	(1989) Construction Time Extensions for Weather

U.S. ARMY CORPS OF ENGINEERS, SACRAMENTO DISTRICT (CESPK)

EM 1110-1-1005	(2007) Control and Topographic Surveying

U.S. NATIONAL ARCHIVES AND RECORDS ADMINISTRATION (NARA)

29 CFR 1904	Recording and Reporting Occupational Injuries and Illnesses
29 CFR 1926.16	Rules of Construction

U.S. CODE (USC)

USC Title 29	Title 29 Labor

DRAFT

1.2 SUBMITTALS

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

SD-01 Preconstruction Submittals

Utilities; G

Submit utilities encountered that are not noted in the contract documents and will interfere with construction operations.

Haul Route Plan; G

Preconstruction Access Road Survey; G

Pre-Construction Video and Photograph Survey of the access roads and project site; G

Disposal Plan; G

Preconstruction Quality Surveys; G

Video and Photographs of all project adjacent public, private, project access and haul roads.

Preconstruction Quantity Survey Plan; G

Plan stating the names of personnel and license number who will be performing the before construction (B.C.) Survey, plus the procedures to be followed in conducting the B.C. Survey

Traffic Control Plan; G

Hard Copy Drawings

SD-11 Closeout Submittals

Accident Reporting

Post-Construction Video and Photograph Survey

DRAFT

1.3 SCRAP MATERIAL

Materials specified to be removed become the property of the Contractor are designated as scrap, and the Contractor, by signing this contract, hereby acknowledges that he/she has made due allowance for value, if any, of such scrap in the contract price.

All scrap, solid waste, or hazardous materials generated by the Contractor in performance of the work must be disposed of and removed, in accordance with applicable laws and regulations at Contractor's expense, unless otherwise specified in the contract.

1.4 UTILITIES

If the Contractor encounters, within the construction limits of the entire project, utilities not shown on the plans and not visible as to the date of this contract, Contractor must immediately notify the Contracting Officer in writing to enable a determination by the Contracting Officer as to the necessity for removal or relocation. Care must be taken to preserve and protect any such utility from injury or damage during construction operations. The Contractor assumes full responsibility for reimbursing the owners for any damage to the utility or improvements, or interference with their services caused through further construction operations. Should damage be found to have been caused without the Contractor's fault or negligence an equitable adjustment in the amount due under the contract will be made under the applicable CONTRACT CLAUSES.

Contractor must coordinate all utility work and need for utility service disruptions with the utility companies and Contracting Officer a minimum of 14 days in advance of utility disruption date. Contractor must be prudent in contacting utility companies and the Contracting Officer as soon as possible to prevent possible delays to construction and/or

unnecessary or unscheduled disruption of the utility service.

Contractor must conduct a topographic survey to record the location of utilities, including depth, for inclusion in the record drawings. Contractor must also provide photographic records documenting the condition of all utilities prior to backfill.

1.5 GENERAL SAFETY REQUIREMENTS

1.5.1 General

Consolidated EM 385-1-1, USC Title 29, 29 CFR 1926.16, as revised from time to time, Title 29, Part 1910, as revised from time to time, and the Occupational Safety and Health Administration (OSHA) codes are applicable to this contract. In case of conflict the most stringent requirement of the standards is applicable.

1.5.2 The Contractor's Superintendent

The Contractor's superintendent must take an active role in enforcing the safety requirements by participation in safety conferences, hazard analysis (see below), tool box meetings, walk-through inspections, correction of violations, etc., and including that of the subcontractor's work.

1.5.3 Violations

If recurring violations and/or a gross violation indicate that the safety performance is unsatisfactory, corrective action must be taken as directed, and at the discretion of the Contracting Officer the retention or some part thereof will be withheld from the progress payment until corrective action has been completed.

1.5.4 Fire Prevention

Cutting or welding, if required, will be permitted only in areas that are or have been made fire safe. Where possible, all combustibles must be located at least 40 feet horizontally from the work site. Where such location is impracticable, combustibles must be protected with fire blankets and/or protective welding screens to prevent slag from running out of the work area. Other fire prevention precautions must be in accordance with the latest National Fire Codes.

1.5.5 Recordkeeping/Reporting Requirements

On all contract operations, the Contractor is responsible for recording and reporting all accident exposure and experience incident work (this includes exposure and experience of the Contractor and his/her subcontractors). As a minimum these records must include exposure work-hours and a log of occupational injuries and illnesses. (OSHA Form 200 or state equivalent as prescribed by 29 CFR 1904 Reference CONSOLIDATED EM 385-1-1).

1.5.6 Accident Reporting

In addition to the requirements for reporting accidents in accordance with CONSOLIDATED EM 385-1-1, Section 1, the Contractor must submit to the Contracting Officer at the 100% of project completion, a written summary report of worker's compensation claims filed by workers on the project

DRAFT

(see submittal "Workers Compensation Claims"). The report must include all subcontractors. The report must be certified as "correct and true" by the Contractor's and the subcontractors' compensation insurance carrier.

1.6 TIME EXTENSIONS FOR UNUSUALLY SEVERE WEATHER

This provision specifies the procedure for the determination of time extensions for unusually severe weather. For the Contracting Officer to award a time extension under this clause, the following conditions must be satisfied:

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.

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.

Monthly Anticipated Adverse Weather Delay
Work Days Based On Five Day Work Week

JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
7	6	5	4	1	0	0	0	1	2	5	7

Upon acknowledgment of the Notice to Proceed (NTP) and continuing throughout the contract, the Contractor will record on the daily Contractor Quality Control (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 Contractor's scheduled workday. (ER 415-1-15)

1.7 PLANNED STREET CLOSURES

(A) Street, Driveway, Sidewalk, or Parking Lot Access Closure:

The Contractor must obtain approval in writing from the Contracting Officer before requesting permission for closing any street, driveway, sidewalk, or parking lot access. The request for closure must be submitted in writing to the local jurisdiction as required and submit copies to the Contracting Officer seven (7) working days prior to planned closing and must include the section to be closed and length of time of closure.

All street closures must be of as short a duration as possible and must be scheduled as far in advance as possible with the Contracting Officer. The Contractor must obtain in writing from the Contracting Officer a statement or schedule giving the permissible times of closures for particular installations and the maximum time allowed for each. The Contractor must strictly observe such schedules and will be held responsible for any violations. Before any outage or closure is

DRAFT

scheduled, the Contractor will: 1) Have all approved materials necessary for the closure on hand, 2) Have completed, tested and been inspected by the Construction Quality Control Representative all preliminary work, 3) Have all permits and personnel qualifications on hand, 4) Have held a joint inspection with a representative of the Contracting Officer, Construction Quality Control Representative, and the representative from local agency approving closure.

1.7.1 Transportation Mitigation

The Contractor must coordinate all road closures and mitigation with the Contracting Officer, City of Sacramento, County of Sacramento, Caltrans and other responsible agencies. The following measures must be implemented to reduce the adverse affects on traffic and circulation:

- Construction zones along residential roadways must be posted to notify approaching motorists of trucks entering and exiting roadside construction sites and to reduce speeds through the construction zone.

- Before and during construction, signs must be placed at construction areas to notify users of ongoing construction and limits of use.

- Before and during construction, electronic signs must be posted for rerouted routes for motorists and bicyclist.

- Access must be provided for emergency vehicles at all times

- All speed limits, traffic laws, and transportation regulations must be obeyed during construction.

- If there are trucks or equipment needing time to maneuver in residential areas or into or out of construction sites, flaggers must be stationed to slow or stop approaching vehicles to avoid conflicts with construction vehicles or equipment.

- On-street parking for construction workers must only be within the staging areas.

- Off-street parking must be identified and provided to the construction workers and their vehicles and trucks. If possible, parking would be close enough to walk to the site.

A Preconstruction Access Road Survey and a Traffic Control Plan must be submitted in accordance with Section 01 33 00 SUBMITTAL PROCEDURES.

1.8 EQUIPMENT DATA FORM

The Contractor must furnish SPK Form 450 for all necessary equipment to perform work requiring adjustment of contract price and must submit these forms with the modification proposals.

1.9 SPECIAL CONSTRUCTION PROCEDURES

(A) Construction coordination:

Construction coordination through the Contracting Officer will be required to reduce delays and conflicts with projects currently under

DRAFT

construction and other future projects. Construction coordination is required throughout the life of this contract. The Contractor must modify his/her scheduled sequence of work as required to avoid construction conflicts with ongoing construction contracts within his limits of work. Such modifications will be made monthly in a schedule review conference to be held with the Contracting Officer's Representative.

(B) Outage affecting existing facilities:

Outage affecting any existing facilities or operations will be limited and must be planned, requested and submitted to the Contracting Officer not later than the 10th of each month prior to the month during which the outage is to occur. Only approved outages will be permitted. The Contractor must be provided with space for temporary storage of the new equipment within the job site facility, or other assigned location, in order to cut down on the installation time and possible outage time requirements.

(C) Recreation/Community Mitigation

The following measures must be implemented to reduce the short term effects on Recreation and the Community:

- Prior to construction, the Contractor must assist with the USACE Public Affairs Office in providing public outreach through mailings and posting signs to provide information regarding changes to recreation use and access.

- Prior to construction, the Contractor must assist the USACE Public Affairs Office, as necessary, in the coordination with local bike groups and alternative bike routes as the bike path must remain open during construction.

- Before and during construction, the Contractor must place warning and restriction signs at construction areas and levee access points to notify users of ongoing construction and limits of use.

- If there are trucks or equipment needing time to maneuver or access construction areas, or if directed by the Contracting Officer, flaggers must be stationed to slow or stop approaching vehicles, bicyclists, and pedestrians to avoid conflicts with construction vehicles or equipment and to maintain public safety.

- The Contractor must remove and replace the damaged sections of bike trails used for construction access. The existing bike trail with, alignment and profile must be maintained. Centerline striping must be included in the bike trail replacement.

1.10 GOVERNMENT RETAINED ARCHITECT-ENGINEER (A/E)

The Government may retain the services of an A/E to increase the level of confidence that the construction Contractor has complied with the requirements of the construction contract. The A/E's role in observing, monitoring or inspecting the activities of the construction Contractor is not intended in any way to require the A/E to assume any responsibility for the construction methods, means, techniques or procedures, including any health or safety requirements, be subjected to nonmeritorious litigation relating to site accidents or other circumstances associated

DRAFT

with the construction Contractor's activities. The A/E must be named as an additional insured on all comprehensive general liability insurance policies carried by the construction Contractor.

1.11 COMMERCIAL DISPOSAL SITE

It is the Contractor's responsibility to locate a reliable commercial disposal site, and secure a disposal site as needed for the Project. The disposal site must be in compliance with the requirements defined in the plans, specifications, and Contract Documents. Disposal site must be located within 20 miles of the project site; the disposal site may be further as long as total air quality requirements are met in any condition. Disposal site and disposal activities must be in compliance with all applicable local, state, and federal regulations.

Prior to beginning construction work the Contractor must submit a Disposal Plan to the Contracting Officer. The Disposal Plan must include location of disposal site(s), as well as copies of disposal site current and applicable Federal, State and local permits. The Contractor must be responsible for determining and providing certification to the Contracting Officer that the material to be disposed is free from contaminants and is suitable for disposal at a commercial facility. The Disposal Plan must be prepared and submitted at no additional cost to the Government.

1.12 HAUL ROUTE PLAN

The Contractor must submit a Haul Route Plan prior to beginning work. This plan must include offices, material storage areas and structures and the access routes to these areas. Haul routes from the sites to major highways must be indicated. All required traffic signs, special limits, warning devices, lighting and other such safety devices required by CONSOLIDATED EM 385-1-1, OSHA, local cities and Caltrans (on state roads) must be shown. Provisions must be made in the plan for alternate routes when interferences block designated haul routes. The plan must be revised and resubmitted if the haul routes being used are not as shown on the plan.

Work for sections such as Demolition, Grading, Tree Removal and other sections with excavations must be coordinated with this plan.

DRAFT

1.13 PROJECT SECURITY AND PUBLIC SAFETY

The Contractor must require all visitors to abide by all construction site safety requirements. The Contractor must notify the Contracting Officer 48 hours before the commencement of any physical activities on the site.

1.14 BID ITEM OVERRUN

Throughout the contract, (at a minimum, every 5 calendar days) the Contractor is responsible to monitor placement or installation of unit price items with respect to the original estimated quantities shown in the Contract. If placement or installation indicates a possible overrun with respect to the original estimated quantities shown in the Contract, the Contractor must immediately provide written notification to the Contracting Officer with revised total estimated quantities.

1.15 NON CONTRACT WORK

The Contractor and/or his subcontractors must not perform any work or

erect any structure for third parties, landowners or otherwise, within the limits of the rights-of-way or designated construction limits without prior approval of the Contracting Officer.

1.16 WARRANTY OF CONSTRUCTION

(a). Performance Bond.

(1). The Contractor's Performance Bond must remain effective throughout the life of all warranties and warranty extensions.

(2). In the event the Contractor or his designated representative fails to commence and diligently pursue any work required herein within a reasonable time after receipt of written notification pursuant to the requirements thereof, the Contracting Officer has the right to demand that said work be performed under the Performance Bond by making written notice on the surety. If the surety fails or refuses to perform the obligation it assumed under the Performance Bond, the Contracting Officer will have the work performed by others, and after completion of the work, may make demand for reimbursement of any or all expenses incurred by the Government while performing the work, including, but not limited to administrative expenses.

(3). The warranty period for the work performed under this contract is one year from the date of acceptance of the project by the government. Warranty repair work will be handled by the Contractor on an immediate basis as directed verbally by the Contracting Officer or his authorized representative. Written verification will follow verbal instructions. Failure of the Contractor to respond as verbally directed will be cause for the Contracting Officer or his/her authorized representative to have the warranty repair work performed by others and to proceed against the Contractor as outlined in the paragraph (2) above.

In connection with these requirements and at the time of the Contractor's quality control completion inspection, the Contractor will furnish the name, telephone number and address of a licensed and bonded company which is authorized to initiate and pursue warranty work action on behalf of the Contractor. This single point of contact will be located within the local service area of the warranted construction, will be continuously available, and will be responsive to Government inquiry on warranty work action and status.

1.17 PAYMENT

No separate payment will be made for the work covered under this section and all costs in connection therewith will be considered a subsidiary obligation of the Contractor.

1.18 PROJECT SURVEYS

Contractor will perform both a pre-construction, post-stripping, post-excavation, and post-construction work area surveys for the entire length of the project as described in Section 01 20 00. Surveys must provide detailed topographic information including, but not limited to an AutoCAD Civil 3d surface tin, elevations and locations of levee hinge points, edge of pavement, slopes, utilities, structures, and all other surface features. Immediately following surveys, a record of the survey must be submitted to the Contracting Officer. Surveys must be in compliance with procedures, methods, and requirements defined in

DRAFT

EM 1110-1-1005 Topographic Surveying Manual. Contractor must submit both detailed topographic and profile information all surveys by a surveyor who is licensed and certified by the State of California. All surveys must be stamped and signed by the surveyor. Field notes must be kept in accordance with the applicable EM referred above. The accuracy of the survey must be third order or better.

1.18.1 Survey Supervision and Scheduling

Submit a Preconstruction Quantity Survey Plan of the proposed preconstruction quantity survey. All survey services must be performed by and under the direct supervision of a person licensed to practice surveying in the State of California. Prior to commencement of survey work, submit in writing the name and license number of the person who will perform the required surveys. Keep field notes in accordance with EM 1110-1-1005. The accuracy of the survey must be third order or better.

1.18.2 Personnel Plan

Submit a plan stating the specific personnel names, license numbers, and specific tasks of those who will be performing the Preconstruction Survey Cross Sections, plus the procedures to be followed in conducting the Preconstruction Survey Cross Sections.

1.18.3 Special Survey Conditions - Preconstruction Survey Cross Sections

Survey cross sections along the entire length of the construction site and submit Preconstruction Survey Cross Sections before construction begins but in any case, no later than March 15 of the construction season. Use these Preconstruction Survey Cross Sections to reflect existing ground before any construction activities begin and when measuring pay quantities for clearing and grubbing, topsoil stripping, excavation, soil type 1, and erosion control seeding. Use the Preconstruction Survey Cross Sections for measurement of work specified in SECTION 31 00 00 EARTHWORK. Survey the cross sections perpendicular to the Construction Reference Line. Survey the cross sections within 2 feet of the locations specified herein. Take the Preconstruction Survey Cross Sections at 100-foot intervals along the Construction Reference Lines shown on the drawings.

Cross sections must extend at least 25 feet beyond the limits of work or to the right-of-way line.

Elevations must be taken at inflection points but at not more than 10 feet intervals. Horizontal and vertical accuracy is to the nearest 0.1 foot. Horizontal locations must not deviate from the alignment of the cross section line by more than 1 foot. All cross sections must be plotted as viewed in the upstream direction. The survey data must be provided to the Contracting Officer containing survey control and cross section points defined in the form of north and east coordinates and their elevations (i.e. X, Y and Z). Horizontal control must be referenced to the California Zone II, North American Datum (NAD) of 1983. Vertical control must be the North American Vertical Datum 1988 (NAVD88). Survey data must be provided in English units in AutoCAD 2022 or newer format (*.DWG). All data collected as part of the survey and all data used in the generation of digital terrain model surfaces (including, but not limited to point files and landxml files) for comparison to post construction surveys and generation of quantities must be included in the submittal.

DRAFT

Provide electronic survey data files (including, but not limited to, CADD files, point data, etc.), and 2 sets of the cross section data, plotted as viewed in the downstream direction, with a 20 horizontal X 10 vertical grid, on a standard ANSI D size drawing sheet, at a scale of 1:10, horizontal and vertical. Black line prints from PDF files are acceptable.

If the results of the Preconstruction Survey Cross Sections show significant (15 percent or more) erosion than on the contract drawings, meet with the Contracting Officer to resolve the differences and use the Preconstruction Survey Cross Sections results to adjust designs as necessary.

1.18.4 Subsequent-Construction Surveys

Each post-stripping, post-excavation, and post -construction survey must be of the same scope as its corresponding preconstruction survey. Survey cross sections must be taken at the same interval and locations and must cover the same extents as the preconstruction survey cross sections. All data collected as part of each survey, used to generate quantities, and generated in the preparation of a submittal must be provided to the government.

1.18.5 Survey Monuments

It is the Contractor's responsibility to replace and document, in compliance with State Code, any State or Local Monuments that are disturbed, modified or removed as part of contractor's construction operation. The cost for replacing control points or monuments and filing of record documents will be paid for by the contractor. Project closeout does not relieve the contractor of responsibilities for monument replacement in compliance with State code when disturbance can be traced to Project construction operations.

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1.19 PRE-CONSTRUCTION VIDEO AND PHOTOGRAPH SURVEY

A pre-construction survey including video and photographs must be accomplished by the Contractor of all public access or right-of-way roads. Two copies of the survey, the video, and the photographs must be furnished to the Contracting Officer before the start of construction operations. Video must be digital format. Photographs must be 75 x 125 mm (3x5 inch) prints from 35 mm film or digital camera on a CD.

Video and photographs of project site, preconstruction quality surveys and a preconstruction quality survey plan must be submitted in accordance with Section 01 33 00 SUBMITTAL PROCEDURES.

1.20 POST-CONSTRUCTION VIDEO AND PHOTOGRAPH SURVEY

After completion of construction of the project, the Contractor must complete a post-construction survey including video and photographs of the same area where pre-construction video and photographs were taken. Two copies of the survey, the video, and the photographs must be furnished to the Contracting Officer.

Video must be digital format. Photographs must be 75 x 125 mm (3x5 inch) prints from 35 mm film or digital camera on a CD.

Submit Video and photographs of project site, post-construction quality surveys and a post-construction quality survey plan in accordance with Section 01 33 00 SUBMITTAL PROCEDURES.

1.21 FINAL EXAMINATION AND ACCEPTANCE

(A) As soon as practicable after the completion of the entire work or any section thereof as in the opinion of the Contracting Officer will not be subject to damage by further operations under the contract, such work will be thoroughly examined at the cost and expense of the Government, as determined by the Contracting Officer.

(B) Final acceptance of the whole or a part of the work and the deductions or corrections of deductions made thereon will not be reopened after having once been made, except on evidence of collusion, fraud, or obvious error, and the acceptance of a completed section must not change the time of payment of the retained percentages of the whole or any part of the work.

1.22 ENVIRONMENTAL LITIGATION

(A) If the performance of all or any part of the work is suspended, delayed, or interrupted due to an order of a court of competent jurisdiction as a result of environmental litigation, as defined below, the Contracting Officer, at the request of the Contractor, will determine whether the order is due in any part to the acts or omissions of the Contractor or a subcontractor at any tier not required by the terms of this contract. If it is determined that the order is not due in any part to acts or omissions of the Contractor or a subcontractor at any tier other than as required by the terms of this contract, such suspension, delay, or interruption will be considered as if ordered by the Contracting Officer in the administration of this contract. The period of such suspension, delay or interruption will be considered unreasonable, and an adjustment will be made for any increase in the cost of performance of this contract (excluding profit) as provided in that clause, subject to all the provisions thereof.

(B) The term "environmental litigations", as used herein, means a lawsuit alleging that the work will have an adverse effect on the environment or that the Government has not duly considered, either substantively or procedurally, the effect of the work on the environment.

1.23 AFTER AWARD DOCUMENTS (Contractor Prepared)

Provide five (5) conformed hard copy sets reproduced from the PDF Contract Documents provided by the Contracting Officer at the time of award. The hard copy drawings must be two (2) sets of ANSI D (22" x 34") and three (3) sets of half size (11" x 17") 3-hole punched and bound with metal posts or put in a binder. The five (5) sets of specifications must be standard letter (8-1/2" x 11") 3-hold punched and bound with metal posts. Submit these documents within five (5) work days after the receipt of NTP from the Government.

PART 2 PRODUCTS

Not Used

DRAFT

PART 3 EXECUTION

Not Used

-- End of Section --

DRAFT

SECTION TABLE OF CONTENTS

DIVISION 01 - GENERAL REQUIREMENTS

SECTION 01 11 00

SUMMARY OF WORK

PART 1 GENERAL

1.1 WORK COVERED BY CONTRACT DOCUMENTS
1.1.1 Project Description
1.2 SUBMITTALS
1.2.1 Traffic Control Plan(s)
1.3 EXISTING WORK
1.4 LOCATION OF UNDERGROUND UTILITIES
1.4.1 Notification Prior to Excavation
1.5 LOCATION OF OVERHEAD ELECTRICAL FACILITIES

PART 2 PRODUCTS

PART 3 EXECUTION

-- End of Section Table of Contents --

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SECTION 01 11 00

SUMMARY OF WORK

PART 1 GENERAL

1.1 WORK COVERED BY CONTRACT DOCUMENTS

1.1.1 Project Description

Reach I Contract 2 extends along the Garden Highway from Gateway Oaks Drive (Station 0+00) to just west of Northgate Boulevard (Station 115+00) a distance of 11,500 feet. Reach H - Subreach 1 extends along the Arden-Garden Connector from Northgate Boulevard to Columbus Avenue, a distance of 1,300 feet. Levee Improvements will include landside levee slope flattening, construction of a landside access road and utility relocations. An asbestos cement pipe will be removed by others but the Contractor must expose the pipe, provide access for removal, and backfill the trench after removal. Trees will be cleared by others prior to construction. The Contractor must remove remaining tree stumps and root balls.

The levee is between 9 and 25 feet tall. Crown elevations vary between approximately 39 and 44 feet (NAVD 88). Landside toe elevations range from approximately 19 to 36 feet. The landside slope ranges between approximately 1.1 horizontal to 1 vertical (1.1H:1V) and 3.6H:1V.

Access to the construction site will be from Garden Highway, Gateway Oaks Drive, Natomas Park Drive, Truxel Road, Arden Garden Connector, River Plaza Drive, Creekside Oaks Drive, Mossy Bank Drive, Azusa Street, Morell Street, and Columbus Avenue, and will require temporary lane closures on Garden Highway. Staging areas include vacant parcels on Azusa Street and a vacant parcel on Columbus Avenue.

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1.2 SUBMITTALS

Government approval is required for submittals with a "G" designation; submittals not having an "G" designation are for information only. The following must be submitted in accordance with with Section 01 33 00 SUBMITTAL PROCEDURES:

SD-01 Preconstruction Submittals

Traffic Control Plan(s); G

1.2.1 Traffic Control Plan(s)

A Draft Traffic Control Plan for Reach I Contract 2 was developed and is included in the Volume 2 construction drawings. The Contractor my opt to submit a an alternative Traffic Control Plan for Reach I Contract 2 to USACE (SPK) and the City of Sacramento for review and approval prior to the start of construction.

Lane closures are not anticipated along the Arden Garden Connector for Reach H - Subreach 1. Minor traffic control along Columbus Avenue may be required as part of the Reach H - Subreach 1 portion of the Project. The

contractor is responsible for preparing and submitting for approval a traffic control plan for any traffic control required for their construction operations within Reach H - Subreach 1.

Traffic control measures must be approved and installed prior to the start of any construction.

1.3 EXISTING WORK

In addition to "FAR 52.236-9, Protection of Existing Vegetation, Structures, Equipment, Utilities, and Improvements", the Contractor must:

a. Remove or alter existing work in such a manner as to prevent injury or damage to any portions of the existing work which remain.

b. Repair or replace portions of existing work which have been altered or damaged during construction operations to match existing or adjoining work, as approved by the Contracting Officer. At the completion of operations, existing work must be in a condition equal to or better than that which existed before new work started all at Contractor's sole expense.

1.4 LOCATION OF UNDERGROUND UTILITIES

Contractor will be responsible for contacting and coordinating with the utility providers 10 days prior to the start of construction. Locate existing utilities using the standard potholing hand dig method to locate the utilities in order to avoid damage to the pipes during construction.

1.4.1 Notification Prior to Excavation

Notify the Contracting Officer at least 48 hours prior to starting excavation work. Contact Underground Service Alert at 800-642-2444 48 hours prior to excavating. Contractor is responsible for marking and preserving all utilities not marked by Underground Service Alert. Contractor is responsible to renew as needed and keep active the USA ticket throughout the life of the construction contract.

1.5 LOCATION OF OVERHEAD ELECTRICAL FACILITIES

Contractor is responsible for contacting and coordinating with utility providers a minimum of 10 days prior to start of construction. Contractor must take caution while working under these power lines.

PART 2 PRODUCTS

Not used.

PART 3 EXECUTION

Not used.

-- End of Section --

DRAFT

SECTION TABLE OF CONTENTS

DIVISION 01 - GENERAL REQUIREMENTS

SECTION 01 20 00

PRICE AND PAYMENT PROCEDURES

PART 1 GENERAL

1.1 SUBMITTALS
1.2 CONTRACT COST BREAKDOWN
1.3 INVOICE SUBMISSION PROCEDURES
1.3.1 Required Procedure
1.3.2 Required Documents
1.4 JOB PAYMENT ITEMS
1.4.1 Reach I Contract 2
1.4.1.1 Measurement and Payment
1.4.2 Reach H Subreach 1
1.4.2.1 Measurement and Payment
1.5 UNIT PRICE PAYMENT ITEMS
1.5.1 Expose and Backfill 12-inch Asbestos Cement Waterline
1.5.1.1 Measurement
1.5.1.2 Payment
1.5.2 Excavation
1.5.2.1 Measurement
1.5.2.2 Payment
1.5.3 Borrow Site Excavation
1.5.3.1 Measurement
1.5.3.2 Payment
1.5.4 Place and Compact Soil Type 1
1.5.4.1 Measurement
1.5.4.2 Payment
1.5.5 Aggregate Surface Course
1.5.5.1 Measurement
1.5.5.2 Payment
1.5.6 Aggregate Base
1.5.6.1 Measurement
1.5.6.2 Payment
1.5.7 Asphalt Concrete Pavement
1.5.7.1 Measurement
1.5.7.2 Payment
1.6 EXCLUSIONS

PART 2 PRODUCTS

PART 3 EXECUTION

-- End of Section Table of Contents --

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SECTION 01 20 00

PRICE AND PAYMENT PROCEDURES

PART 1 GENERAL

1.1 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.

SD-01 Preconstruction Submittals

Schedule Of Values; G

1.2 CONTRACT COST BREAKDOWN

The Contractor must furnish within 30 days after the date of Notice to Proceed, and prior to the submission of its first partial payment estimate, a Schedule of Values of its single job pay item or items which will be reviewed by the Contracting Officer as to propriety of distribution of the total cost to the various accounts. Any unbalanced items as between early and late payment items or other discrepancies will be revised by the Contracting Officer to agree with a reasonable cost of the work included in the various items. This Contract cost breakdown will then be utilized as the basis for progress payments to the Contractor.

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1.3 INVOICE SUBMISSION PROCEDURES

References include USACE QMS, FAR 52.232-5, Payments under Fixed-Price Construction Contracts, and FAR 52.232-27, Prompt Payment for Construction Contracts.

1.3.1 Required Procedure

a. Contractor must submit supporting documentation (such as surveys, weight tickets for tonnage items, and test results) with the submission of the draft schedule update at least 2 working days prior to the schedule update meeting.

b. The Contractor must print a copy of the Contractor's Pay Request Worksheet from RMS to record the mutually agreed upon quantities and percentages. This form must be signed and dated by the Government Representative and the Contractor. The Government representative will meet with the Contractor to determine if the preliminary pay request and previously turned in corresponding back-up is acceptable. The QA Representative must enter the approved percentages or quantities on the preliminary pay request worksheet, ensuring that consideration has been made to all Contractor action items that have not been completed or corrected. Both parties will sign and date the last page. NOTE: Contractor earnings must not be projected.

c. Contractor must submit the formal pay request package to the Resident Office electronically through RMS, incorporating any changes made on

the preliminary pay request on or before the 10th of the month. This includes providing all supporting information and files in the RMS pay request document package. The Prompt Payment Certificate must be sent to the Resident Office correspondence by the 10th of the month.

d. Contractor must review the current updated as-built drawings in PDF with a representative of the Resident Engineer prior to invoice being sent. An initial review is to be performed on redlines in PDF format.

1.3.2 Required Documents

Pay request packages from Contractors must include the following documents in RMS:

a. Prompt Payment Certification and Requested Earnings electronically signed.

b. Preliminary payment request worksheet, signed and dated by both parties.

c. Required documentation includes surveys (PDF and CAD), cross-sections, QC test results, and weight tickets.

d. Updated approved schedule (NAS with narrative report).

e. Safety Exposure Report (additional file not required, will be verified in RMS).

f. Current Submittal Register (additional file not required, will be verified in RMS).

g. Current QC Test Log (electronic copy provided in document package and all tests entered in RMS).

h. Certified Payrolls (prime and subs at all tiers) entered in RMS and submitted to the Resident Office.

DRAFT

If the progress payment request is missing any of the above items or imports into RMS, the Resident Office will notify the Contractor within 7 days and suspend the processing of the progress payment by returning it for corrections. The invoice will not be considered accepted until a complete pay request package has been received. Upon receipt of an acceptable invoice, the invoice received date is marked in RMS. In accordance with FAR 52.232-27 Prompt Payment for Construction Contracts, the due date for making payment is 14 days after the designated billing office receives a proper complete payment request.

1.4 JOB PAYMENT ITEMS

Payment items for the work of this contract for which contract lump sum payments will be made are listed in the BIDDING SCHEDULE and in Paragraph 1.4 with a unit of JOB. All costs for items of work, which are not specifically mentioned to be included in a particular JOB or unit price payment item, will be included in the listed JOB item most closely associated with the work involved. The JOB price and payment made for each item listed constitutes full compensation for furnishing all plant, labor, materials, and equipment, and performing any associated Contractor quality control, environmental protection, meeting safety requirements, tests and reports, and for performing all work required for which separate

payment is not otherwise provided.

Contractor must provide a schedule of values for all JOB items prior to start of construction. The schedule of values must be a detailed list of items of work including quantities and unit prices. The schedule of values must be part of the submittal for the JOB payment items. JOB payment items will not be accepted without the schedule of values. The schedule of values must be used for progress payments and determining the completeness of the submittal.

1.4.1 Reach I Contract 2

1.4.1.1 Measurement and Payment

Measurement and payment for item REACH I CONTRACT 2 will be paid at the contract JOB price and constitute full compensation for all work, labor, and materials required for the project that are not covered by other Contract Line Items.

1.4.2 Reach H Subreach 1

1.4.2.1 Measurement and Payment

Measurement and payment for item REACH H SUBREACH 1 will be paid at the contract JOB price and constitute full compensation for all work, labor, and materials required for the project that are not covered by other Contract Line Items.

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1.5 UNIT PRICE PAYMENT ITEMS

Payment items for the work of this contract on which the contract unit price payments will be made are listed in the BIDDING SCHEDULE and described below. The unit price and payment made for each item listed constitutes full compensation for furnishing all plant, labor, materials, and equipment, and performing any associated Contractor quality control, environmental protection, meeting safety requirements, tests and reports, and for performing all work required for each of the unit price items.

1.5.1 Expose and Backfill 12-inch Asbestos Cement Waterline

1.5.1.1 Measurement

Expose and backfill 12-inch asbestos cement waterline and related Work must be measured by the linear foot exposed and backfilled as shown or specified in the Contract documents and as directed by the Contracting Officer.

1.5.1.2 Payment

Payment will be made for exposing and backfilling the existing 12-inch asbestos cement waterline at the Contract bid price for item "EXPOSE AND BACKFILL 12-INCH ASBESTOS CEMENT WATERLINE". This price constitutes full compensation for furnishing all labor, materials equipment, transportation, excavation, exposing the existing 12-inch asbestos pipe, backfilling, coordination with the asbestos pipe removal Contractor, and incidentals necessary to complete the work as shown in the plans, or as directed by the Contracting Officer. Removal of existing 12-inch asbestos concrete waterline will be completed by others.

1.5.2 Excavation

1.5.2.1 Measurement

Excavation will be measured for payment by cubic yards and quantities will be determined by the average end area method to the nearest cubic yard. The basis for measurement will be the difference between actual cross sections of the surface taken after stripping operations and the actual cross sections taken after excavation, and to within the specified tolerance. Cross sections must be performed at significant breaks in grade except that the maximum distance between cross sections must not exceed the distance specified in the General Specifications. Excavation in excess of the design grades as indicated on the plans, including allowable tolerance, will not be accepted.

1.5.2.2 Payment

Payment for excavation will be paid at the at the Contract bid price for item "EXCAVATION". This price constitutes full compensation for all equipment, labor, and materials for excavation of the levee slope flattening, overbuilt areas and keyways. No separate payment will be made for benching. Hauling excavated materials to and from temporary stockpile locations, waste sites, or other points of use, and all incidentals necessary to complete the Work as shown or specified in Section 31 00 00, shown in the plans, or as directed by the Contracting Officer will also be included under this line item.

1.5.3 Borrow Site Excavation

1.5.3.1 Measurement

Borrow site excavation will be measured for payment to the nearest cubic yard and quantities will be determined by the average end area method. The basis of measurement will be a survey of the area after surface layer removal and prior to the excavation, and a second survey of the same area after the completion of the excavation. Slides caused by fault of the Contractor, over excavation, and excavation performed for the convenience of the Contractor must not be measured for payment.

1.5.3.2 Payment

Borrow site excavation will be paid for at the contract bid price for item, "BORROW SITE EXCAVATION". This price constitutes full compensation for furnishing all materials, labor, equipment, tools, and incidentals. Price must include all work necessary to complete the excavations as specified, including excavation, water control, blending, moisture conditioning materials, stockpiling, transporting material to levee fill locations, subgrade preparation (including ripping, discing, sampling and analysis, and addition of soil amendments), field ramp construction, haul road construction and improvements, haul road maintenance, haul road removal and surface restoration of disturbed areas, water supply, construction access associated with borrow sites, farm road construction in the proximity of borrow sites, stabilized entrance construction, dust control, traffic control at borrow site, sediment control at the borrow site, surveys needed for quantity verification, and all incidentals and doing all work as necessary to complete the excavations as specified.

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1.5.4 Place and Compact Soil Type 1

1.5.4.1 Measurement

Materials specified for place and compact Soil Type 1 are measured for payment by the cubic yard and quantities will be determined based on the lines and grades shown on the plans to the nearest cubic yard. The basis for the final quantity will be the difference of finished grade and the limit of excavation shown on the plans. Soil type 1 in excess of the design grades as indicated on the plans, including allowable tolerance, will not be accepted. Soil type 1 not placed to the dimensions shown on the plans will not be included in the measurement for payment. Volumes occupied by structures or stump and root ball removal backfill will not be included in the measurement for payment.

1.5.4.2 Payment

Payment for placing and compacting soil type 1 will be made at the Contract bid price for item "PLACE AND COMPACT SOIL TYPE 1". Payment constitutes full compensation for furnishing all plant, labor, equipment, materials, and performing all operations necessary for foundation preparation, placing and compacting the material, materials testing, surveying, and moisture control. No separate payment will be made for preparing or restoring stockpiling, blending and moisture conditioning, benching for lifts, and all other work involved in placing and compacting material as outlined in the Project Specifications or as directed by the Contracting Officer. Benching quantity for lifts will not be included in the payment.

1.5.5 Aggregate Surface Course

1.5.5.1 Measurement

Aggregate Surface Course will be measured for payment by the ton, to the nearest ton. Quantities for payment will be certified by individual truck weight tickets delivered to the Contracting Officer at the time of delivery of each truckload of material. Moisture content not exceeding six percent by weight will be acceptable in determining payment quantities. Deductions will be made from the certified weight for moisture in excess of this amount and for materials in excess of the allowable thickness or placed outside limits shown on the plans.

1.5.5.2 Payment

Payment for placement of aggregate surface course will be paid for at the Contract bid price for item "AGGREGATE SURFACE COURSE"; which payment constitutes full compensation for the construction and completion of the aggregate surface course including material, subgrade preparation, and furnishing all labor and incidentals necessary to complete the Work required as shown or specified in the Contract documents, or as directed by the Contracting Officer.

1.5.6 Aggregate Base

1.5.6.1 Measurement

Aggregate Base will be measured for payment by the ton, to the nearest ton. Quantities for payment will be certified by individual truck weight tickets delivered to the Contracting Officer at the time of delivery of

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each truckload of material. Moisture content not exceeding six percent by weight will be acceptable in determining payment quantities. Deductions will be made from the certified weight for moisture in excess of this amount and for materials in excess of the allowable thickness or placed outside limits shown on the plans.

1.5.6.2 Payment

Payment for placement of aggregate base will be paid for at the Contract bid price for item "AGGREGATE BASE"; which payment constitutes full compensation for the construction and completion of the aggregate base including material, subgrade preparation, and furnishing all labor and incidentals necessary to complete the Work required as shown or specified in the Contract documents, or as directed by the Contracting Officer.

1.5.7 Asphalt Concrete Pavement

1.5.7.1 Measurement

Asphalt concrete paving will be measured for payment by the ton, to the nearest ton. Quantities for payment will be certified by individual truck weight tickets delivered to the Contracting Officer at the time of delivery of each truckload of material. Moisture content not exceeding six percent by weight will be acceptable in determining payment quantities. Deductions will be made from the certified weight for moisture in excess of this amount and for materials in excess of the allowable thickness or placed outside limits shown on the plans.

1.5.7.2 Payment

Payment for placing asphalt paving will be made at the Contract bid price for item "ASPHALT CONCRETE PAVEMENT". Payment constitutes full compensation for the construction and completion of the pavement, including material and pavement markings, tackifier, and furnishing all labor and incidentals necessary to complete the work required as shown or specified in the Contract documents, or as directed by the Contracting Officer.

DRAFT

1.6 EXCLUSIONS

No separate payment will be made for work associated with Section 01 57 19 TEMPORARY ENVIRONMENTAL CONTROLS. Payment of fees associated with environmental permits, application, and/or notices obtained by the Contractor, and payment of all fines/fees for violation or non-compliance with Federal, State, Regional and local laws and regulations are the Contractor's responsibility. Include all costs associated with this Section 01 57 19 in the Contract price.

No separate payment will be made for work associated with Section 02 02 00 SUBSURFACE DATA.

No separate payment will be made for topographic surveys. The cost to conduct topographic surveys will be included in the bid item associated with the item requiring the survey.

PART 2 PRODUCTS

Not Used

PART 3 EXECUTION

Not Used

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SECTION TABLE OF CONTENTS

DIVISION 01 - GENERAL REQUIREMENTS

SECTION 01 32 01

PROJECT SCHEDULE

PART 1 GENERAL

1.1 REFERENCES
1.2 SUBMITTALS
1.3 PROJECT SCHEDULER QUALIFICATIONS

PART 2 PRODUCTS

2.1 SOFTWARE
2.1.1 Government Default Software
2.1.2 Contractor Software
2.1.2.1 Primavera
2.1.2.2 Other Than Primavera

PART 3 EXECUTION

3.1 GENERAL REQUIREMENTS
3.2 BASIS FOR PAYMENT AND COST LOADING
3.2.1 Activity Cost Loading
3.2.2 Withholdings / Payment Rejection
3.3 PROJECT SCHEDULE DETAILED REQUIREMENTS
3.3.1 Level of Detail Required
3.3.2 Activity Durations
3.3.3 Design and Permit Activities
3.3.4 Procurement Activities
3.3.5 Mandatory Tasks
3.3.6 Government Activities
3.3.7 Standard Activity Coding Dictionary
3.3.7.1 Workers Per Day (WRKP)
3.3.7.2 Responsible Party Coding (RESP)
3.3.7.3 Area of Work Coding (AREA)
3.3.7.4 Modification Number (MODF)
3.3.7.5 Bid Item Coding (BIDI)
3.3.7.6 Phase of Work Coding (PHAS)
3.3.7.7 Category of Work Coding (CATW)
3.3.7.8 Feature of Work Coding (FOW)
3.3.8 Contract Milestones and Constraints
3.3.8.1 Project Start Date Milestone and Constraint
3.3.8.2 End Project Finish Milestone and Constraint
3.3.8.3 Interim Completion Dates and Constraints
3.3.8.3.1 Start Phase
3.3.8.3.2 End Phase
3.3.9 Calendars
3.3.10 Open Ended Logic
3.3.11 Default Progress Data Disallowed
3.3.12 Out-of-Sequence Progress

DRAFT

3.3.13 Added and Deleted Activities
3.3.14 Original Durations
3.3.15 Leads, Lags, and Start to Finish Relationships
3.3.16 Retained Logic
3.3.17 Percent Complete
3.3.18 Remaining Duration
3.3.19 Cost Loading of Closeout Activities
3.3.19.1 As-Built Drawings
3.3.19.2 O & M Manuals
3.3.20 Anticipated Adverse Weather
3.3.21 Early Completion Schedule and the Right to Finish Early
3.4 PROJECT SCHEDULE SUBMISSIONS
3.4.1 Preliminary Project Schedule Submission
3.4.2 Initial Project Schedule Submission
3.4.2.1 Design Package Schedule Submission
3.4.3 Periodic Schedule Updates
3.5 SUBMISSION REQUIREMENTS
3.5.1 Electronic Data
3.5.2 Narrative Report
3.5.3 Schedule Reports
3.5.3.1 Activity Report
3.5.3.2 Logic Report
3.5.3.3 Total Float Report
3.5.3.4 Earnings Report by CLIN
3.5.3.5 Schedule Log
3.5.4 Network Diagram
3.5.4.1 Continuous Flow
3.5.4.2 Project Milestone Dates
3.5.4.3 Critical Path
3.5.4.4 Banding
3.5.4.5 Cash Flow / Schedule Variance Control (SVC) Diagram
3.6 PERIODIC SCHEDULE UPDATE
3.6.1 Periodic Schedule Update Meetings
3.6.2 Update Submission Following Progress Meeting
3.7 WEEKLY PROGRESS MEETINGS
3.8 REQUESTS FOR TIME EXTENSIONS
3.8.1 Justification of Delay
3.8.2 Time Impact Analysis (Prospective Analysis)
3.8.3 Forensic Schedule Analysis (Retrospective Analysis)
3.8.4 Fragmentary Network (Fragnet)
3.8.5 Time Extension
3.8.6 Impact to Early Completion Schedule
3.9 FAILURE TO ACHIEVE PROGRESS
3.9.1 Artificially Improving Progress
3.9.2 Failure to Perform
3.9.3 Recovery Schedule
3.10 OWNERSHIP OF FLOAT
3.11 TRANSFER OF SCHEDULE DATA INTO RMS/QCS
3.12 PRIMAVERA P6 MANDATORY REQUIREMENTS

-- End of Section Table of Contents --

DRAFT

SECTION 01 32 01

PROJECT SCHEDULE

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 Contractor Quality Control approval. 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.

DRAFT

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.

DRAFT

PART 3 EXECUTION

3.1 GENERAL REQUIREMENTS

Prepare for approval a Project Schedule, as specified herein, pursuant to FAR Clause 52.236-15, SCHEDULE 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 design and construction is the responsibility of the Contractor. Contractor management personnel must actively participate in its development. Designers, 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 Design and Permit Activities

Include design and permit activities with the necessary conferences and follow-up actions and design package submission dates. Include the design schedule in the project schedule, showing the sequence of events involved in carrying out the project design tasks within the specific contract period. Provide at a detailed level of scheduling sufficient to identify all major design tasks, including those that control the flow of work. Also include review and correction periods associated with each item.

3.3.4 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.

3.3.5 Mandatory Tasks

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

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

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

c. Long procurement activities

d. Submission and approval of O & M manuals.

e. Submission and approval of as-built drawings.

f. Contractor's pre-final inspection.

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

h. Government's pre-final inspection.

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

j. Final inspection.

3.3.6 Government Activities

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

3.3.7 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)
6	PHAS	2	Phase of work
7	CATW	1	Category of work

DRAFT

Field	Activity Code	Length	Description
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.			

3.3.7.1 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.

3.3.7.2 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).

DRAFT

3.3.7.3 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.

3.3.7.4 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.

3.3.7.5 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.

3.3.7.6 Phase of Work Coding (PHAS)

Assign Phase of Work Code to all activities. Examples of phase of work are design phase, 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.

3.3.7.7 Category of Work Coding (CATW)

Assign a Category of Work Code to all activities. Category of Work Codes include, but are not limited to design, design submittal, design reviews, review conferences, permits, 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.

3.3.7.8 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 QUALITY CONTROL. An activity can have only one Feature of Work Code.

3.3.8 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.

3.3.8.1 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.

DRAFT

3.3.8.2 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.

3.3.8.3 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.

3.3.8.3.1 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.

3.3.8.3.2 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.

3.3.9 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 Seasonal 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 days provided in the contract clause TIME EXTENSIONS FOR UNUSUALLY SEVERE WEATHER. 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.

3.3.10 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.

3.3.11 Default Progress Data Disallowed

Actual Start and Finish dates must not automatically update with default

DRAFT

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.

3.3.12 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.

3.3.13 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.

3.3.14 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.

3.3.15 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.

3.3.16 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.

3.3.17 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.

DRAFT

3.3.18 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.

3.3.19 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).

3.3.19.1 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 one half of 1 percent of the present contract value, whichever is greater, up to $200,000. Activity will be declared 100 percent complete upon the Government's approval.

3.3.19.2 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.

3.3.20 Anticipated Adverse Weather

Paragraph applicable to contracts with clause entitled TIME EXTENSIONS FOR UNUSUALLY SEVERE WEATHER. Reflect the number of anticipated adverse weather delays allocated to a weather sensitive activity in the activity's calendar.

3.3.21 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

DRAFT

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. Include in the design-build schedule detailed design and permitting activities, including but not limited to identification of individual design packages, design submission, reviews and conferences; permit submissions and any required Government actions; and long lead item acquisition prior to design completion. Also cover in the initial design-build schedule the entire construction effort with as much detail as is known at the time but, as a minimum, include all construction start and completion milestones, and detailed construction activities through the dry-in milestone, including all activity coding and cost loading. Include the remaining construction, including cost loading, but it may be scheduled summary in nature. As the design proceeds and design packages are developed, fully detail the remaining construction activities concurrent with the monthly schedule updating process. Constrain construction activities by Government acceptance of associated designs. When the design is complete, incorporate into the then approved schedule update all remaining detailed construction activities that are planned to occur after the dry-in milestone. No payment will be made for work items not fully detailed in the Project Schedule.

3.4.2.1 Design Package Schedule Submission

With each design package submitted to the Government, submit a fragnet schedule extracted from the then current Preliminary, Initial or Updated schedule which covers the activities associated with that Design Package

DRAFT

including construction, procurement and permitting activities.

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. Update the schedule to include detailed construction activities as the design progresses, but not later than the submission of the final un-reviewed design submission for each separate design package. The Contracting Officer may require submission of detailed schedule activities for any distinct construction that is started prior to submission of a final design submission if such activity is authorized.

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 Electronic Data

Provide two sets of data containing the current project schedule and all previously submitted schedules in the format of the scheduling software (e.g. .xer). Also include the Narrative Report and all required Schedule Reports. Name each document 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

DRAFT

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. Provide two sets of hardcopy reports. 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

DRAFT

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

DRAFT

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

DRAFT

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

DRAFT

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.

DRAFT

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DRAFT

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DRAFT

SECTION TABLE OF CONTENTS

DIVISION 01 - GENERAL REQUIREMENTS

SECTION 01 33 00

SUBMITTAL PROCEDURES

PART 1 GENERAL

1.1 SUMMARY
1.1.1 Submittal Information
1.1.2 Project Type
1.1.3 Submission of Submittals
1.2 DEFINITIONS
1.2.1 Submittal Descriptions (SD)
1.2.2 Approving Authority
1.2.3 Work
1.3 SUBMITTALS
1.4 SUBMITTAL CLASSIFICATION
1.4.1 Government Approved (G)
1.4.2 Information Only
1.4.3 Transmittal Form
1.5 INFORMATION ONLY SUBMITTALS
1.6 ELECTRONIC FILE FORMAT
1.7 VARIATIONS
1.7.1 Considering Variations
1.7.2 Proposing Variations
1.7.3 Warranting That Variations Are Compatible
1.7.4 Review Schedule Is Modified
1.8 SUBMITTAL REGISTER AND DATABASE
1.8.1 Use of Submittal Register
1.8.2 Contractor Use of Submittal Register
1.8.3 Approving Authority Use of Submittal Register
1.8.4 Copies Delivered to the Government
1.9 SCHEDULING
1.9.1 Government Reviewed Design
1.10 GOVERNMENT APPROVING AUTHORITY
1.11 DISAPPROVED SUBMITTALS
1.12 APPROVED SUBMITTALS
1.13 APPROVED SAMPLES
1.14 WITHHOLDING OF PAYMENT

PART 2 PRODUCTS

PART 3 EXECUTION

ATTACHMENTS:

Submittal Register

ENG Form 4025-R

DRAFT

-- End of Section Table of Contents --

DRAFT

SECTION 01 33 00

SUBMITTAL PROCEDURES

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.

The Contractor and the Designer of Record (DOR), if applicable, 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, performing work, 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:

DRAFT

SD-01 Preconstruction Submittals

Submittals which are required prior to start of construction (work) or the start of the next major phase of the construction on a multi-phase contract, includes schedules, tabular list of data, or tabular list including location, features, or 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

Construction Progress Schedule

Network Analysis Schedule (NAS)

Submittal register

Schedule of prices

Health and safety plan, G

Work Plan, G

Quality Control (QC) plan, G

Environmental Protection Plan, G

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

DRAFT

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.

Design submittals, design substantiation submittals and extensions of design submittals.

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

DRAFT

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-09 Manufacturer's Field Reports

Documentation of the testing and verification actions taken by manufacturer's representative at the job site, in the vicinity of the job site, or on a sample taken from the job site, on a portion of the work, during or after installation, to confirm compliance with manufacturer's standards or instructions. The documentation must be signed by an authorized official of a testing laboratory or agency and state the test results; and indicate whether the material, product, or system has passed or failed the test.

Factory test reports.

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.

DRAFT

1.3 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

Submittal Register; G

1.4 SUBMITTAL CLASSIFICATION

1.4.1 Government Approved (G)

Government approval is required for extensions of design, critical materials, deviations, equipment whose compatibility with the entire system must be checked, and other items as designated by the Contracting Officer. Government approval is required for any deviations from the Solicitation or Accepted Proposal and other items as designated by the Contracting Officer. Within the terms of the Contract Clause entitled, "Specifications and Drawings for Construction," they are considered to be "shop drawings." Contractor must upload one digital copy to RMS for all submittals requiring Government Approval. Shop drawings also require a digital file to RMS.

1.4.2 Information Only

Submittals not requiring Government approval will be for information only. For Design-build construction all submittals not requiring Designer of Record or Government approval will be for information only. They are not considered to be "shop drawings" within the terms of the Contract Clause referred to above. Contractor must upload one digital copy to RMS for all submittals designated as for Information Only.

1.4.3 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. 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 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

DRAFT

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.

1.6 ELECTRONIC FILE FORMAT

Provide submittals other than material samples in both hard copy (paper) and electronic formats. The electronic submittal file must be compiled as a single, complete document, to include the Transmittal Form described in paragraph Transmittal Form. The electronic submittal file must be named specifically according to its contents (e.g. 01 45 01-1.2_Quality Control Plan.pdf).

Electronic files must be of sufficient quality that all information is legible. Electronic format must be in Adobe.PDF format, unless otherwise specified or directed by the Contracting Officer's Representative (COR). Whenever possible, PDF files must be generated from original documents so that the text included in the PDF file is both searchable and can be copied. If documents are scanned, Optical Character Resolution (OCR) routines are required. Files exceeding 30 pages must be indexed and bookmarked to allow efficient navigation of the file. When required, the electronic file must include a valid electronic signature, or scan of a signature.

All electronic files must be provided to the Government in the correct format on CD and uploaded to RMS. Provide electronic documents over 10 MB on an optical disc or through an electronic file sharing system such as secure FTP site or DoD SAFE located at the following website: safe.apps.mil.

Provide hard copies of submittals as specified in this or other specification sections.

DRAFT

1.7 VARIATIONS

Variations from contract requirements require both Designer of Record (DOR) and Government approval pursuant to contract Clause FAR 52.236-21 and will be considered where advantageous to Government.

1.7.1 Considering Variations

Discussion with Contracting Officer prior to submission, after consulting with the DOR, will help ensure functional and quality requirements are met and minimize rejections and re-submittals. When contemplating a variation which 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 deviations may result in the Government requiring rejection and removal of such work at no additional cost to the Government.

1.7.2 Proposing Variations

When proposing variation, deliver 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, including 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 which include proposed deviations requested by the Contractor. Set forth in writing the reason for any deviations and annotate such deviations on the submittal. The Government reserves the right to rescind inadvertent approval of submittals containing unnoted deviations. ENG Form 4025 can be found at the end of this specification section.

1.7.3 Warranting That Variations Are Compatible

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

1.7.4 Review Schedule Is Modified

In addition to normal 30 day submittal review period, a period of 14 working days will be allowed for consideration by the Government of submittals with variations.

1.8 SUBMITTAL REGISTER AND DATABASE

Prepare and maintain submittal register, as the work progresses. Use electronic submittal register program furnished by the Government or any other format. Do not change data which is output in columns (c), (d), (e), and (f) as delivered by Government; retain data which is output in columns (a), (g), (h), and (i) as approved. A submittal register showing items of equipment and materials for which submittals are required by the specifications is provided as an attachment. 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 01 RESIDENT MANAGEMENT SYSTEM CONTRACTOR MODE(RMS CM)

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

Column (d): Lists each submittal description (SD No. and type, e.g. SD-02 Shop Drawings) required in each specification section.

Column (e): Lists one principal paragraph in 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 project requirements.

Column (f): Indicate approving authority for each submittal.

The submittal register will be uploaded to RMS by the Government and is to be maintained by the Contractor. Additional items may be added either the Contractor of the Government.

Thereafter, the Contractor is to track all submittals by maintaining a complete list, including completion of all data columns, including dates

DRAFT

on which submittals are received and returned by the Government.

1.8.1 Use of Submittal Register

Submit submittal register as an electronic database, using submittals management program furnished to Contractor. Submit with QC plan and project schedule. Verify that all submittals required for project are listed and add missing submittals. Coordinate and complete the following fields on the register database 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 approving authority to receive submittals.

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

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

1.8.2 Contractor Use of Submittal Register

Update the following fields in the Government-furnished submittal register program or equivalent fields in program utilized by Contractor with each submittal throughout contract updated by QCS(QCS) Facilitated Contractors.

Column (b) Transmittal Number: Contractor assigned list of consecutive numbers.

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

Column (l) List date of submittal transmission.

Column (q) List date approval received.

1.8.3 Approving Authority Use of Submittal Register

Update the following fields in the Government-furnished submittal register program or equivalent fields in program utilized by Contractor.

Column (b) Transmittal Number: Contractor assigned list of consecutive numbers.

Column (l) List date of submittal receipt.

Column (m) through (p) List Date related to review actions.

Column (q) List date returned to Contractor.

1.8.4 Copies Delivered to the Government

Deliver one copy of submittal register updated by Contractor to Government with each invoice request. Deliver in electronic format, unless a paper copy is requested by Contracting Officer.

DRAFT

1.9 SCHEDULING

Schedule and submit concurrently submittals covering component items forming a system or items that are interrelated. Include certifications to be submitted with the pertinent drawings 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. Allow for potential resubmittal of requirements. Government has a review period of 30 days.

b. Submittals called for by the contract documents will be listed on the register. If a submittal is called for 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 which have been omitted from the register or marked "N/A."

c. Re-submit register and annotate monthly by the Contractor with actual submission and approval dates. When all items on the register have been fully approved, no further re-submittal is required.

d. Carefully control procurement operations to ensure that each individual submittal is made on or before the Contractor scheduled submittal date shown on the approved "Submittal Register."

1.9.1 Government Reviewed Design

The Government will review design submittals for conformance with the technical requirements of the solicitation. Government review is required for deviation from the completed design. Review will be only for conformance with the contract requirements. Included are only those construction submittals for which the Designer of Record design documents do not include enough detail to ascertain contract compliance. The Government may, but is not required, to review extensions of design such as structural steel or reinforcement shop drawings.

1.10 GOVERNMENT APPROVING AUTHORITY

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

a. Note the date on which the submittal was received from the QC manager.

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.

1.11 DISAPPROVED SUBMITTALS

Make corrections required by the Contracting Officer. Contractor has 14 days to revise and resubmit disapproved submittals. If the Contractor

DRAFT

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.

1.12 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.

DRAFT

1.13 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.

1.14 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.

PART 2 PRODUCTS

Not Used

PART 3 EXECUTION

Not Used

-- End of Section --

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TRANSMITTAL OF SHOP DRAWINGS, EQUIPMENT DATA, MATERIAL SAMPLES, OR MANUFACTURER'S CERTIFICATES OF COMPLIANCE For use of this form, see ER 415-1-10; the proponent agency is CECW-CE.	DATE	TRANSMITTAL NO.

SECTION I - REQUEST FOR APPROVAL OF THE FOLLOWING ITEMS (*This section will be initiated by the contractor*)

TO:	FROM:	CONTRACT NO.	CHECK ONE: ☐ THIS IS A NEW TRANSMITTAL ☐ THIS IS A RESUBMITTAL OF TRANSMITTAL _____

SPECIFICATION SEC. NO. (*Cover only one section with each transmittal*)	PROJECT TITLE AND LOCATION	THIS TRANSMITTAL IS FOR: (*Check one*) ☐ FIO ☐ GA ☐ DA ☐ CR ☐ DA/CR ☐ DA/GA

ITEM NO. (*See Note 3*) a.	DESCRIPTION OF SUBMITTAL ITEM (*Type size, model number/etc.*) b.	SUBMITTAL TYPE CODE (*See Note 8*) c.	NO. OF COPIES d.	CONTRACT DOCUMENT REFERENCE		CONTRACTOR REVIEW CODE g.	VARIATION Enter "Y" if requesting a variation (*See Note 6*) h.	USACE ACTION CODE (*Note 9*) i.
				SPEC. PARA. NO. e.	DRAWING SHEET NO. f.			

REMARKS	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

SECTION II - APPROVAL ACTION

ENCLOSURES RETURNED (*List by item No.*)	NAME AND TITLE OF APPROVING AUTHORITY	SIGNATURE OF APPROVING AUTHORITY	DATE

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INSTRUCTIONS

1. Section I will be initiated by the Contractor in the required number of copies.

2. Each Transmittal shall be numbered consecutively. The Transmittal Number typically includes two parts separated by a dash (-). The first part is the specification section number. The second part is a sequential number for the submittals under that spec section. If the Transmittal is a resubmittal, then add a decimal point to the end of the original Transmittal Number and begin numbering the resubmittal packages sequentially after the decimal.

3. The "Item No." for each entry on this form will be the same "Item No." as indicated on ENG FORM 4288-R.

4. Submittals requiring expeditious handling will be submitted on a separate ENG Form 4025-R.

5. Items transmitted on each transmittal form will be from the same specification section. Do not combine submittal information from different specification sections in a single transmittal.

6. If the data submitted are intentionally in variance with the contract requirements, indicate a variation in column h, and enter a statement in the Remarks block describing he detailed reason for the variation.

7. ENG Form 4025-R is self-transmitting - a letter of transmittal is not required.

8. When submittal items are transmitted, indicate the "Submittal Type" (*SD-01 through SD-11*) in column c of Section I.
   Submittal types are the following:
   SD-01 - Preconstruction SD-02 - Shop Drawings SD-03 - Product Data SD-04 - Samples SD-05 - Design Data SD-06 - Test Reports
   SD-07 - Certificates SD-08 - Manufacturer's Instructions SD-09 - Manufacturer's Field Reports SD-10 - O&M Data SD-11 - Closeout

9. For each submittal item, the Contractor will assign Submittal Action Codes in column g of Section I. The U.S. Army Corps of Engineers approving authority will assign Submittal Action Codes in column i of Section I. The Submittal Action Codes are:

   A -- Approved as submitted.
   B -- Approved, except as noted on drawings. Resubmission not required.
   C -- Approved, except as noted on drawings. Refer to attached comments. Resubmission required.
   D -- Will be returned by separate correspondence.
   E -- Disapproved. Refer to attached comments.
   F -- Receipt acknowledged.
   X -- Receipt acknowledged, does not comply with contract requirements, as noted.
   G -- Other action required *(Specify)*
   K -- Government concurs with intermediate design. (*For D-B contracts*)
   R -- Design submittal is acceptable for release for construction. (*For D-B contracts*)

10. Approval of items does not relieve the contractor from complying with all the requirements of the contract.

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SUBMITTAL REGISTER

CONTRACT NO.

TITLE AND LOCATION
Natomas Basin - Reach I Contract 2 & Reach H

CONTRACTOR

ACTIVITY NO	TRANSMITTAL NO	SPEC SECT	DESCRIPTION ITEM SUBMITTED	PARAGRAPH #	CLASSIFICATION	GOVT OR A/E REVWR	CONTRACTOR: SCHEDULE DATES			CONTRACTOR ACTION			APPROVING AUTHORITY				MAILED TO CONTR/ DATE RCD FRM APPR AUTH	REMARKS
							SUBMIT	APPROVAL NEEDED BY	MATERIAL NEEDED BY	ACTION CODE	DATE OF ACTION	DATE FWD TO APPR AUTH/ DATE RCD FROM CONTR	DATE FWD TO OTHER REVIEWER	DATE RCD FROM OTH REVIEWER	ACTION CODE	DATE OF ACTION		
(a)	(b)	(c)	(d)	(e)	(f)		(g)	(h)	(i)	(j)	(k)	(l)	(m)	(n)	(o)	(p)	(q)	(r)
		00 73 05	SD-01 Preconstruction Submittals															
			Permits and Approvals	1.3.13	G													
			Construction emission/dust	1.3.14	G													
			control plan															
			Permit, waiver or other	1.3.30	G													
			documentation with the mapped															
			haul routes from local jurisdictions															
			to repair or compensate for															
			damage															
			Flood Contingency Plan	1.3.32	G													
			Utility Provider Response Plan	1.3.33	G													
			Storm Water Pollution Prevention	1.3.38	G													
			Plan															
			Grading (Encroachment) Permit	1.3.39	G													
			Traffic Control Plan	1.3.47	G													
			Public and Unhoused Population	1.3.27	G													
			Safety Plan															
			Work Plan	1.3.48	G													
		01 00 00	SD-01 Preconstruction Submittals															
			Utilities	1.4	G													
			Haul Route Plan	1.12	G													
			Preconstruction Access Road	1.7.1	G													
			Survey															
			Pre-Construction Video and	1.19	G													
			Photograph Survey															
			Disposal Plan	1.11	G													

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SUBMITTAL REGISTER

CONTRACT NO.

TITLE AND LOCATION
Natomas Basin - Reach I Contract 2 & Reach H

CONTRACTOR

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(a)	(b)	(c)	(d)	(e)	(f)		(g)	(h)	(i)	(j)	(k)	(l)	(m)	(n)	(o)	(p)	(q)	(r)
		01 00 00	Preconstruction Quality Surveys	1.19	G													
			Preconstruction Quantity Survey	1.18.1	G													
			Plan															
			Traffic Control Plan	1.7.1	G													
			Hard Copy Drawings	1.23														
			SD-11 Closeout Submittals															
			Accident Reporting	1.5.6														
			Post-Construction Video and	1.20														
			Photograph Survey															
		01 11 00	SD-01 Preconstruction Submittals															
			Traffic Control Plan(s)	1.2.1	G													
		01 20 00	SD-01 Preconstruction Submittals															
			Schedule Of Values	1.4	G													
		01 32 01	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															
			Site Demolition Plan	1.6.1	G													
			Work Plan near Overhead Lines	1.6.1	G													
			Accident Prevention Plan (APP)	1.6	G DO													
			Activity Hazard Analysis (AHA)	1.7	G DO													

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SUBMITTAL REGISTER

CONTRACT NO.

TITLE AND LOCATION
Natomas Basin - Reach I Contract 2 & Reach H

CONTRACTOR

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		01 35 26	Critical Lift Plan - Crane or Load	1.6.1	G	DO												
			Handling Equipment															
			Crane Operators	1.5.1.3	G													
			SD-06 Test Reports															
			Monthly Exposure Reports	1.11.3														
			Accident Reports	1.11.2	G													
			Crane Reports	1.11.4														
			Regulatory Citations and	1.11.6														
			Violations															
			SD-07 Certificates															
			Confined Space Entry Permit	1.8.1														
			Hot Work Permit	1.12														
			Certificate of Compliance (Crane)	1.11.5														
			License Certificates	1.13														
		01 45 00	SD-01 Preconstruction Submittals															
			Contractor Quality Control (CQC)	3.2	G													
			Plan															
			SD-05 Design Data															
			Design Quality Control	3.8.1														
			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	3.3.1	G													
			Haul Road Plan	2.2.1	G													
			SD-07 Certificates															

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SUBMITTAL REGISTER

CONTRACT NO.

TITLE AND LOCATION
Natomas Basin - Reach I Contract 2 & Reach H

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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		01 50 00	Backflow Tester	1.4.1														
			Backflow Preventers	1.4														
		01 57 19	SD-01 Preconstruction Submittals															
			Preconstruction Survey	1.6.1	G													
			Solid Waste Management Permit	1.8.6	G													
			Regulatory Notifications	1.6.2	G													
			Environmental Protection Plan	1.7	G													
			Dirt and Dust Control Plan	1.7.10.2	G													
			Environmental Manager	1.6.4	G													
			Qualifications															
			Air Quality Control Plan	1.7.10.1	G													
			Waste Water Management Plan	1.7.11	G													
			Asbestos Dust Mitigation Plan	1.8.2	G DO													
			and Application															
			Historical, Archaeological, and	1.7.12	G													
			Cultural Resources Protection Plan															
			Biological Resources and	1.7.12	G													
			Wetlands Protection Plan															
			Traffic Control Plan	1.7.2.3	G													
			Storm Water Notice of Intent	3.2.1	G													
			Environmental Permit Application	1.8														
			SD-06 Test Reports															
			Solid Waste Management Report	3.12.2.1	G													
			Air Quality Control Plan Reports	3.7.2	G DO													
			PERP Data	3.7.9.1	G DO													
			Solid Waste Disposal Report	1.8.6.1														

DRAFT

SUBMITTAL REGISTER

CONTRACT NO.

TITLE AND LOCATION
Natomas Basin - Reach I Contract 2 & Reach H

CONTRACTOR

ACTIVITY NO	TRANSMITTAL NO	SPEC SECT	DESCRIPTION ITEM SUBMITTED	PARAGRAPH #	CLASSIFICATION	GOVT OR A/E REVWR	CONTRACTOR: SCHEDULE DATES			CONTRACTOR ACTION			APPROVING AUTHORITY				MAILED TO CONTR/ DATE RCD FRM APPR AUTH	REMARKS
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		01 57 19	SD-07 Certificates															
			Employee Training Records	1.6.5	G													
			SD-11 Closeout Submittals															
			Waste Determination	3.12.1	G													
			Documentation															
			Hazardous Waste/Debris	3.12.3.1	G													
			Management															
			Disposal Documentation for	3.12.3.4	G													
			Hazardous and Regulated Waste															
			Assembled Employee Training	1.6.5	G													
			Records															
			Post-Construction Survey	1.7.2.3	G													
			Sales Documentation	3.12.2.1	G													
			Contractor Certification	3.12.2.1														
			Environmental Records Binder	1.6.5														
			Environmental Records Binder	1.9														
			Solid Waste Disposal Closeout	1.8.6.1														
			Report															
		01 57 23	SD-01 Preconstruction Submittals															
			SWPPP	1.5.1	G													
			SWPPP	1.5.1	G													
			PRDs	1.5.2	G													
			PRDs	1.5.2	G													
			PRDs	1.5.2	G													
			SD-03 Product Data															
			BMP Product Data	1.5.1.3														

DRAFT

SUBMITTAL REGISTER

CONTRACT NO.

TITLE AND LOCATION
Natomas Basin - Reach I Contract 2 & Reach H

CONTRACTOR

ACTIVITY NO	TRANSMITTAL NO	SPEC SECT	DESCRIPTION ITEM SUBMITTED	PARAGRAPH #	CLASSIFICATION	GOVT OR A/E REVWR	CONTRACTOR: SCHEDULE DATES			CONTRACTOR ACTION			APPROVING AUTHORITY				MAILED TO CONTR/ DATE RCD FRM APPR AUTH	REMARKS
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		01 57 23	BMP Product Data	3.1.1														
			BMP Product Data	3.1.1														
			BMP Product Data	3.1.1														
			Geotextiles And Mats	2.1.1.7	G													
			SD-06 Test Reports															
			SWPPP Amendment	3.1.1														
			SWPPP Amendment	3.2.1														
			SWPPP Amendment	3.2.1														
			SWPPP Amendment	3.2.1														
			SWPPP Amendment	3.2.1														
			SWPPP Amendment	3.2.1														
			Sampling Results	1.5.2														
			Sampling Results	1.5.2														
			Sampling Results	1.5.2														
			Sampling Results	3.2.5														
			Sampling Results	3.2.6														
			Sampling Results	3.2.6.1														
			Inspection Reports	3.2.3														
			Inspection Reports	3.2.3														
			REAPs and Inspection Reports	3.2.2														
			REAPs and Inspection Reports	3.2.3														
			REAPs and Inspection Reports	3.2.3														
			Exceedance Reports	1.5.2														
			ATS Field Data	2.1.2.5														
			ATS Field Data	2.1.2.5														
			Annual Report	1.5.2														

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SUBMITTAL REGISTER

CONTRACT NO.

TITLE AND LOCATION
Natomas Basin - Reach I Contract 2 & Reach H

CONTRACTOR

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		01 57 23	Annual Report	3.1.2														
			Annual Report	3.1.2														
			SD-10 Operation and Maintenance															
			Data															
			Post-Construction Storm Water	3.1.2	G													
			Management Plan															
			Post-Construction Storm Water	3.1.2	G													
			Management Plan															
			SD-11 Closeout Submittals															
			Final SWPPP	3.1.2	G													
			Final SWPPP	3.2.1	G													
			NOT Application	3.1.2	G													
			NOT Application	3.1.2	G													
			NOT Application	3.1.2	G													
		01 71 10	SD-09 Manufacturer's Field															
			Reports															
			Mobilization/Demobilization Work	1.5.1	G													
			Plan															
			Emergency Levee Reconstruction	1.5.2	G													
			Plan															
		01 78 00	SD-03 Product Data															
			Warranty Management Plan	1.8.1														
			Spare Parts Data	1.6														
			SD-08 Manufacturer's Instructions															
			Instructions	1.8.1														
			SD-11 Closeout Submittals															

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SUBMITTAL REGISTER

CONTRACT NO.

TITLE AND LOCATION
Natomas Basin - Reach I Contract 2 & Reach H

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		01 78 00	As-Built Drawings	3.1	G													
			Record Drawings	3.3	G													
			As-Built Record of Equipment	1.8.1														
			and Materials															
			As-Built Record of Equipment	3.5														
			and Materials															
			Construction Contract	3.4	G													
			Specifications															
		02 41 00	SD-01 Preconstruction Submittals															
			Existing Conditions	1.6.2	G													
			SD-07 Certificates															
			Notification	1.3.1	G													
			SD-11 Closeout Submittals															
			Receipts	1.3.2														
		05 50 13	SD-02 Shop Drawings															
			Fabrication Drawings	1.2.1														
			Installation Drawings	1.2.2														
			SD-04 Samples															
			Certified Mill	2.1	G													
		10 14 01	SD-02 Shop Drawings															
			Approved detail shop drawings	1.2.1	G													
			SD-03 Product Data															
			Modular Exterior Signage System	2.1	G													
			Installation	3.1														
			Exterior signage schedule	1.2.2														
			Protection and Cleaning	3.1.2														

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SUBMITTAL REGISTER

CONTRACT NO.

TITLE AND LOCATION
Natomas Basin - Reach I Contract 2 & Reach H

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		31 00 00	SD-01 Preconstruction Submittals															
			Borrow Site Soil Sampling Work Plan	1.4.1	G													
			Borrow Site Soil Sampling Work Plan	2.3.1	G													
			Borrow Area Chemical Suitability Certification Report	1.4.2	G													
			Borrow Area Chemical Suitability Certification Report	2.3.6	G													
			Survey Data	1.4.3	G													
			Equipment Data	1.4.4	G													
			Material Distribution and Stockpile Plan	1.4.5	G													
			Sheeting and Shoring Plan	1.4.6	G													
			Geotechnical Engineer	1.4.7	G													
			Plan of Operations	1.4.8	G													
			Flood Contingency Plan	1.4.9	G													
			Borrow Excavation and Utilization Plan	1.4.14	G													
			Borrow Excavation and Utilization Plan	1.4.14	G													
			Borrow Source Drawings	1.4.15	G													
			Borrow Site Laboratory Test Results	1.4.16	G													
			SD-07 Certificates															
			Testing Qualifications	1.4.10														

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SUBMITTAL REGISTER

CONTRACT NO.

TITLE AND LOCATION
Natomas Basin - Reach I Contract 2 & Reach H

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		31 00 00	SD-09 Manufacturer's Field															
			Reports															
			Quality Control Testing	1.4.11	G													
			Test Data Summaries	1.4.12														
			Construction Verification Survey	1.4.13	G													
			Report															
		31 05 19	SD-03 Product Data															
			Thread	2.1.2														
			Manufacturing Quality Control	2.2	G													
			Sampling and Testing															
			SD-04 Samples															
			Quality Assurance Samples and	3.1	G													
			Tests															
			SD-07 Certificates															
			Geotextile	2.1.1	G													
		31 11 00	SD-01 Preconstruction Submittals															
			Work Plan	1.1.1	G													
			Work Plan	1.1.1	G													
			SD-03 Product Data															
			Herbicide	2.1														
		31 23 00	SD-01 Preconstruction Submittals															
			Survey Data	3.8.4														
			Equipment Data	3.8.5														
			Material Distribution and	3.8.6														
			Stockpile Plan															
			Borrow Source Excavation Plan	3.8.7														

DRAFT

SUBMITTAL REGISTER

CONTRACT NO.

TITLE AND LOCATION
Natomas Basin - Reach I Contract 2 & Reach H

CONTRACTOR

ACTIVITY NO	TRANSMITTAL NO	SPEC SECT	DESCRIPTION ITEM SUBMITTED	PARAGRAPH #	CLASSIFICATION	GOVT OR A/E REVWR	CONTRACTOR: SCHEDULE DATES			CONTRACTOR ACTION			APPROVING AUTHORITY				MAILED TO CONTR/ DATE RCD FRM APPR AUTH	REMARKS
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		31 23 00	SD-06 Test Reports															
			Quality Control Testing	3.8.8														
		32 12 16	SD-03 Product Data															
			Mix Design	2.4	G	DO												
			Mix Design	2.4.1	G	DO												
			Quality Control	3.10	G													
			Material Acceptance	3.11	G													
			SD-04 Samples															
			Asphalt Binder	2.3														
			Aggregates	2.2														
			SD-06 Test Reports															
			Aggregates tests	3.10.3.3	G													
			QC Monitoring	3.10.3.12														
			SD-07 Certificates															
			Asphalt Binder	2.3	G													
			Testing Laboratory	3.6														
		32 15 00	SD-03 Product Data															
			Equipment	1.3.1	G													
			Equipment	1.4	G													
			Aggregate Source	1.3.2	G													
			Aggregate	1.3.3	G													
			SD-06 Test Reports															
			Sampling and Testing	1.3.4	G													
			Sampling and Testing	1.5	G													
			Density Tests	1.3.5	G													
			Density Tests	3.9	G													

DRAFT

SUBMITTAL REGISTER

CONTRACT NO.

TITLE AND LOCATION
Natomas Basin - Reach I Contract 2 & Reach H

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 17 24	SD-03 Product Data															
			Equipment	1.3	G													
			Composition Requirements	2.2.1														
			Qualifications	1.5.1														
			SD-06 Test Reports															
			Sampling and Testing	2.4														
			SD-07 Certificates															
			Volatile Organic Compound	2.2.3														
			(VOC)															
		32 31 13	SD-02 Shop Drawings															
			Fence Assembly	2.1	G													
			Location of Gate, Corner, End,	3.2.1.1	G													
			and Pull Posts															
			Gate Assembly	2.1	G													
			Erection/Installation Drawings	Part 3	G													
			SD-03 Product Data															
			Fence Assembly	2.1	G													
			Zinc Coating	2.1	G													
			PVC Coating	2.1	G													
			Fabric	2.2.1	G													
			Concrete	2.3.2	G													
			SD-04 Samples															
			Fabric	2.2.1	G													
			Posts	2.2.2	G													
			Braces	2.2.2	G													
			Top Rail	2.2.2	G													

DRAFT

SUBMITTAL REGISTER

CONTRACT NO.

TITLE AND LOCATION
Natomas Basin - Reach I Contract 2 & Reach H

CONTRACTOR

ACTIVITY NO	TRANSMITTAL NO	SPEC SECT	DESCRIPTION ITEM SUBMITTED	PARAGRAPH #	CLASSIFICATION	GOVT OR A/E REVWR	CONTRACTOR: SCHEDULE DATES			CONTRACTOR ACTION			APPROVING AUTHORITY				MAILED TO CONTR/ DATE RCD FRM APPR AUTH	REMARKS
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		32 31 13	Tension Wire	2.3.1	G													
			Wire Ties	2.2.5	G													
			SD-07 Certificates															
			Certificates of Compliance	1.3.1														
			SD-08 Manufacturer's Instructions															
			Fence Assembly	2.1														
			Hardware Assembly	2.1														
			Accessories	2.1														
			SD-11 Closeout Submittals															
			Recycled Material Content	3.3														
		32 92 33	SD-01 Preconstruction Submittals															
			Erosion and sediment control plan	1.6.1	G													
			Seed Establishment Period	3.10.1														
			SD-02 Shop Drawings															
			Layout	3.2	G													
			Erosion and Sediment Control Scale Drawings	1.6.1	G													
			SD-03 Product Data															
			Straw Mulch	2.6	G													
			Tackifier	2.5	G													
			Grass Seed	2.2	G													
			Wood Fiber	1.4.5	G													
			Wood Fiber	2.3	G													
			Straw Wattles	2.8	G													
			Straw Wattles	2.12.2	G													

DRAFT

SUBMITTAL REGISTER

CONTRACT NO.

TITLE AND LOCATION
Natomas Basin - Reach I Contract 2 & Reach H

CONTRACTOR

ACTIVITY NO	TRANSMITTAL NO	SPEC SECT	DESCRIPTION ITEM SUBMITTED	PARAGRAPH #	CLASSIFICATION	GOVT OR A/E REVWR	CONTRACTOR: SCHEDULE DATES			CONTRACTOR ACTION			APPROVING AUTHORITY				MAILED TO CONTR/ DATE RCD FRM APPR AUTH	REMARKS
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		32 92 33	Equipment	1.4.1														
			SD-04 Samples															
			Straw Mulch	2.6														
			Tackifier	2.5														
			Seed Samples	1.4.2														
			Seed Materials	1.4.2														
			Wood Fiber	1.4.5														
			Wood Fiber	2.3														
			Straw Wattles Samples	2.8														
			SD-06 Test Reports															
			Straw Mulch	2.6														
			Tackifier	2.5														
			Wood Fiber	1.4.5														
			Wood Fiber	2.3														
			Straw Wattles Reports	2.8.1														
			Maintenance Record	3.11														
			SD-07 Certificates															
			Invoices	1.4.3														
			Straw Mulch	2.6														
			Tackifier	2.5														
			State-Certified Seed Mix	2.2.1														
			Wood Fiber	1.4.5														
			Wood Fiber	1.4.5														
			Wood Fiber	2.3														
			Wood Fiber	2.3														
			Straw Wattle Certificates	2.8														

DRAFT

SUBMITTAL REGISTER

CONTRACT NO.

TITLE AND LOCATION
Natomas Basin - Reach I Contract 2 & Reach H

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 92 33	Installer's Qualification	1.4.4														
			SD-09 Manufacturer's Field															
			Reports															
			Survey of Area Hydroseeded	1.4.6														
		33 11 00	SD-01 Preconstruction Submittals															
			Connections	3.1.1	G													
			SD-03 Product Data															
			Pipe, Fittings, Joints and	2.1.1	G													
			Couplings															
			Valves	2.1.2	G													
			Pipe Restraint	2.2.1	G													
			Disinfection Procedures	3.2.2	G													
			SD-06 Test Reports															
			Bacteriological Samples	3.3.1.3	G													
			Hydrostatic Sewer Test	3.2.1.1.5														
			Leakage Test	3.3.1.2														
			Hydrostatic Test	3.3.1.1	G													
			SD-07 Certificates															
			Pipe, Fittings, Joints and	2.1.1														
			Couplings															
			Lining	2.1.1.1.1														
			Lining	2.1.1.1.1														
			Valves	2.1.2														
			SD-08 Manufacturer's Instructions															
			Ductile Iron Piping	2.1.1.1														
		33 40 00	SD-04 Samples															

DRAFT

SUBMITTAL REGISTER

CONTRACT NO.

TITLE AND LOCATION
Natomas Basin - Reach I Contract 2 & Reach H

CONTRACTOR

ACTIVITY NO	TRANSMITTAL NO	SPEC SECT	DESCRIPTION ITEM SUBMITTED	PARAGRAPH #	CLASSIFICATION	GOVT OR A/E REVWR	CONTRACTOR: SCHEDULE DATES			CONTRACTOR ACTION			APPROVING AUTHORITY				MAILED TO CONTR/ DATE RCD FRM APPR AUTH	REMARKS
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		33 40 00	Pipe for Culverts and Storm	2.1														
			Drains															
			SD-07 Certificates															
			Resin Certification	2.1.2	G													
			Oil Resistant Gasket	2.3.4.1	G													
			Leakage Test	3.8.1.2	G													
			Hydrostatic Test on Watertight	3.8.1.1	G													
			Joints															
			Determination of Density	3.8.1.3	G													
			Frame and Cover for Gratings	2.3.3	G													
			SD-09 Manufacturer's Field															
			Reports															
			Post-Installation Inspection	3.8.2.1.3	G													
			Report															
			Placing Pipe	3.3	G													

DRAFT

SECTION TABLE OF CONTENTS

DIVISION 01 - GENERAL REQUIREMENTS

SECTION 01 35 26

GOVERNMENTAL SAFETY REQUIREMENTS

PART 1 GENERAL

1.1 REFERENCES
1.2 DEFINITIONS
1.2.1 Competent Person (CP)
1.2.2 Competent Person, Confined Space
1.2.3 Competent Person, Cranes and Rigging
1.2.4 Competent Person, Excavation/Trenching
1.2.5 Competent Person, Fall Protection
1.2.6 Competent Person (CP) Trainer
1.2.7 High Visibility Accident
1.2.8 Load Handling Equipment (LHE)
1.2.9 Medical Treatment
1.2.10 Near Miss
1.2.11 Operating Envelope
1.2.12 Qualified Person (QP)
1.2.13 Qualified Person, Fall Protection (QP for FP)
1.2.14 Recordable Injuries or Illnesses
1.2.15 USACE Property and Equipment
1.2.16 Load Handling Equipment (LHE) Accident or Load Handling Equipment Mishap
1.3 SUBMITTALS
1.4 REGULATORY REQUIREMENTS
1.5 SITE QUALIFICATIONS, DUTIES, AND MEETINGS
1.5.1 Personnel Qualifications
1.5.1.1 Site Safety and Health Officer (SSHO)
1.5.1.2 Competent Person Qualifications
1.5.1.2.1 Competent Person for Confined Space Entry
1.5.1.3 Crane Operators
1.5.2 Personnel Duties
1.5.2.1 Duties of the Site Safety and Health Officer (SSHO)
1.5.3 Meetings
1.5.3.1 Preconstruction Conference
1.5.3.2 Safety Meetings
1.6 ACCIDENT PREVENTION PLAN (APP)
1.6.1 EM 385-1-1 Contents
1.7 ACTIVITY HAZARD ANALYSIS (AHA)
1.8 DISPLAY OF SAFETY INFORMATION
1.8.1 Safety Bulletin Board
1.8.2 Safety and Occupational Health (SOH) Deficiency Tracking System
1.9 SITE SAFETY REFERENCE MATERIALS
1.10 EMERGENCY MEDICAL TREATMENT
1.11 NOTIFICATIONS and REPORTS
1.11.1 Mishap Notification
1.11.2 Accident Reports
1.11.3 Monthly Exposure Reports

DRAFT

1.11.4 Crane Reports
1.11.5 Certificate of Compliance (Crane)
1.11.6 Regulatory Citations and Violations
1.12 HOT WORK PERMIT
1.12.1 Permit and Personnel Requirements
1.13 RADIATION SAFETY REQUIREMENTS
1.14 FACILITY OCCUPANCY CLOSURE
1.15 PERSONAL PROTECTIVE EQUIPMENT (PPE)
1.15.1 Site Specific PPE Program
1.15.2 Levels of Protection
1.15.3 Respiratory Protection Program
1.16 SEVERE STORM PLAN
1.17 CONFINED SPACE ENTRY REQUIREMENTS
1.17.1 Rescue Procedures and Coordination with Local Emergency Responders
1.18 SAFETY DATA SHEETS
1.18.1 Proposition 65
1.19 PROTECTION OF EXISTING AREAS

PART 2 PRODUCTS

PART 3 EXECUTION

3.1 CONSTRUCTION AND OTHER WORK
3.1.1 Hazardous Material Exclusions
3.1.2 Unforeseen Hazardous Material
3.2 PRE-OUTAGE COORDINATION MEETING
3.3 CONTROL OF HAZARDOUS ENERGY (LOCKOUT/TAGOUT)
3.4 FALL PROTECTION PROGRAM
3.4.1 Training
3.4.2 Fall Protection Equipment and Systems
3.4.2.1 Personal Fall Protection Equipment
3.4.3 Horizontal Lifelines (HLL)
3.4.4 Guardrails and Safety Nets
3.4.5 Rescue and Evacuation Plan and Procedures
3.5 EQUIPMENT
3.5.1 Material Handling Equipment (MHE)
3.5.2 Load Handling Equipment (LHE)
3.5.3 Use of Explosives
3.6 EXCAVATIONS
3.6.1 Utility Locations
3.6.2 Utility Location Verification
3.6.3 Utilities Within and Under Concrete, Bituminous Asphalt, and Other Impervious Surfaces
3.6.4 Shoring Systems
3.6.5 Trenching Machinery
3.7 ELECTRICAL
3.7.1 Conduct of Electrical Work
3.7.2 Portable Extension Cords
3.8 WORK IN CONFINED SPACES
3.9 CRYSTALLINE SILICA
3.10 HOUSEKEEPING

-- End of Section Table of Contents --

DRAFT

SECTION 01 35 26

GOVERNMENTAL SAFETY REQUIREMENTS

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 SAFETY ENGINEERS (ASSE/SAFE)

ASSE/SAFE A10.34	(2021) Protection of the Public on or Adjacent to Construction Sites
ASSE/SAFE Z359.1	(2020) Safety Requirements for Personal Fall Arrest Systems, Subsystems and Components

AMERICAN INDUSTRIAL HYGIENE ASSOCIATION (AIHA)

AIHA Z88.6	(2006) Respiratory Protection - Respirator Use-Physical Qualifications for Personnel

AMERICAN SOCIETY OF MECHANICAL ENGINEERS (ASME)

ASME B30.3	(2020) Tower Cranes
ASME B30.5	(2018) Mobile and Locomotive Cranes
ASME B30.8	(2015) Floating Cranes and Floating Derricks
ASME B30.22	(2016) Articulating Boom Cranes

AMERICAN SOCIETY OF SAFETY PROFESSIONALS (ASSP)

ASSP Z359.0	(2018) Definitions and Nomenclature Used for Fall Protection and Fall Arrest
ASSP Z359.2	(2017) Minimum Requirements for a Comprehensive Managed Fall Protection Program
ASSP Z359.4	(2013) Safety Requirements for Assisted-Rescue and Self-Rescue Systems, Subsystems and Components

NATIONAL FIRE PROTECTION ASSOCIATION (NFPA)

NFPA 10	(2018; ERTA 1-2 2018) Standard for Portable Fire Extinguishers
NFPA 51B	(2019) Standard for Fire Prevention During

DRAFT

	Welding, Cutting, and Other Hot Work
NFPA 70E	(2021) Standard for Electrical Safety in the Workplace

STATE OF CALIFORNIA CODE OF REGULATIONS (CCR)

Title 8	Industrial Relations
Title 19	Public Safety
Title 21	Public Works
Title 22	Public Health
Title 24	Building Standards

U.S. ARMY CORPS OF ENGINEERS (USACE)

EM 385-1-1	(2024) Safety -- Safety and Occupational Health (SOH) Requirements

U.S. NATIONAL ARCHIVES AND RECORDS ADMINISTRATION (NARA)

10 CFR 20	Standards for Protection Against Radiation
29 CFR 1910	Occupational Safety and Health Standards
29 CFR 1910.134	Respiratory Protection
29 CFR 1910.146	Permit-required Confined Spaces
29 CFR 1926	Safety and Health Regulations for Construction
29 CFR 1926.16	Rules of Construction
29 CFR 1926.500	Fall Protection
29 CFR 1926.1153	Respirable Crystalline Silica
29 CFR 1926.1400	Cranes and Derricks in Construction
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.

DRAFT

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 (CP) Trainer

A competent person trainer as defined in EM 385-1-1 Appendix Q, who is qualified in the training 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.

DRAFT

1.2.7 High Visibility Accident

A High Visibility Accident is any mishap which may generate publicity or high visibility.

1.2.8 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).

1.2.9 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.

1.2.10 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).

1.2.11 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.

1.2.12 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.

1.2.13 Qualified Person, Fall Protection (QP for FP)

A QP for FP is a person meeting the definition requirements of EM 385-1-1 Appendix Q, and ASSP Z359.2 standard, having 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.

1.2.14 Recordable Injuries or Illnesses

Recordable Injuries or Illnesses are any work-related injury or illness that results in:

a. Death, regardless of the time between the injury and death, or the length of the illness;

DRAFT

b. Days away from work (any time lost after day of injury/illness onset);

c. Restricted work;

d. Transfer to another job;

e. Medical treatment beyond first aid;

f. Loss of consciousness; or

g. A significant injury or illness diagnosed by a physician or other licensed health care professional, even if it did not result in (a) through (f) above

1.2.15 USACE Property and Equipment

Interpret "USACE" property and equipment specified in USACE EM 385-1-1 as Government property and equipment.

1.2.16 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 any mishap that meets the criteria described in the Contractor Significant Incident Report (CSIR) using the Crane High Hazard working group mishap reporting form.

DRAFT

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-01 Preconstruction Submittals

Site Demolition Plan; G

Work Plan near Overhead Lines; G

Accident Prevention Plan (APP); G, DO

Activity Hazard Analysis (AHA); G, DO

Critical Lift Plan - Crane or Load Handling Equipment; G, DO

Proof of qualification for Crane Operators; G

SD-06 Test Reports

Monthly Exposure Reports

Accident Reports; G

Crane Reports

Regulatory Citations and Violations

SD-07 Certificates

Confined Space Entry Permit

Hot Work Permit

Certificate of Compliance (Crane)

License Certificates

Submit one copy of each permit/certificate attached to each Daily Production, Quality Control Report.

1.4 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 all applicable state and local laws, ordinances, criteria, rules and regulations. Included in the state laws to be adhered to are the California Code of Regulations are: Title 8, Title 19, Title 21, Title 22, and Title 24. 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.

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1.5 SITE QUALIFICATIONS, DUTIES, AND MEETINGS

1.5.1 Personnel Qualifications

1.5.1.1 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 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 and have no other duties other than safety. Full time SSHO is required for this project unless a waiver is approved as part of this contract. SSHO must have no other duties except safety.

A Competent Person must be provided for all of the hazards identified in the Contractor's Safety and Health Program in accordance with the accepted Accident Prevention Plan, and 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 Contracting Officer for acceptance in consultation with the Safety Office.

1.5.1.2 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 Contracting Officer for information in consultation with the Safety Office.

1.5.1.2.1 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.

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1.5.1.3 Crane Operators

Provide Operators, Signal Persons, and Riggers meeting the requirements in EM 385-1-1, Section 16.B for Crane Operators. In addition, for mobile cranes with Original Equipment Manufacturer (OEM) rated capacities of 50,000 pounds or greater, designate crane operators qualified by a source that qualifies crane operators (i.e., union, a Government agency, or an organization that tests and qualifies crane operators). Provide proof of current qualification.

1.5.2 Personnel Duties

1.5.2.1 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. Perform safety and occupational health management, surveillance, inspections, and safety enforcement for the project.

k. Perform as the safety and occupational health "competent person" as defined by USACE EM 385-1-1.

l. Be on-site at all times whenever work or testing is being performed.

m. Conduct and document safety inspections.

n. Have no other duties other than safety and occupational health management, inspections, and enforcement on this contract.

Failure to perform the above duties will result in dismissal of the superintendent, QC Manager, and/or SSHO, and a project work stoppage. The project work stoppage will remain in effect pending approval of a suitable replacement

DRAFT

1.5.3 Meetings

1.5.3.1 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 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.

d. The functions of a Preconstruction conference may take place at the Post-Award Kickoff meeting for Design Build Contracts.

1.5.3.2 Safety Meetings

Must be conducted and documented as required by the EM 385-1-1. Minutes showing the Contract title, signature of attendees and list of topics discussed must be attached to the Contractor's daily production/quality control report and submitted to the Government.

1.6 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.

The Contractor must submit the APP to the Contracting Officer for review and approval 15 calendar days prior to the date of the preconstruction meeting. 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.

Once work begins, 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

DRAFT

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 ASSE/SAFE A10.34), and the environment.

Copies of the accepted plan will be maintained at the resident engineer's office and at the job site.

Continuously review and amend the APP, as necessary, throughout the life of the contract. Incorporate unusual or high-hazard activities not identified in the original APP as they are discovered.

1.6.1 EM 385-1-1 Contents

In addition to the requirements outlined in Appendix A of USACE EM 385-1-1, the following is required:

a. 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. 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.

In addition to the requirements of EM 385-1-1, Section 16.H.02, the critical lift plan must include the following:

(1) For lifts of personnel, demonstrate compliance with the requirements of 29 CFR 1926.1400 and EM 385-1-1, Section 16.T.

(2) Site Demolition Plan. The safety and health aspects prepared in accordance with CRF 29 1926.850.

(3) Excavation Plan. The safety and health aspects prepared in accordance with Section 31 00 00 EARTHWORK.

(4) Work Plan near Overhead Lines. The Contractor will be performing work under several overhead lines. Field surveys indicate that the clearance from top of levee to the lowest wire is less than 20 feet. Contractor must prepare a plan for safely working under these lines to complete the work.

1.7 ACTIVITY HAZARD ANALYSIS (AHA)

The Activity Hazard Analysis (AHA) format must be in accordance with USACE EM 385-1-1, Section 1. Submit the AHA for review at least 15 calendar days prior to the start of each phase. Format subsequent AHAs as amendments to the APP. The analysis should be used during daily inspections to ensure the implementation and effectiveness of the activity's safety and health controls.

The AHA list will be reviewed periodically (at least monthly) at the Contractor supervisory safety meeting and updated as necessary when

DRAFT

procedures, scheduling, or hazards change.

Develop the activity hazard analyses using the project schedule as the basis for the activities performed. Any activities listed on the project schedule will require an AHA. The AHAs will be developed by the contractor, supplier or subcontractor and provided to the prime contractor for submittal to the Contracting Officer.

1.8 DISPLAY OF SAFETY INFORMATION

1.8.1 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 must be submitted and posted.

c. OSHA 300 Form

d. OSHA Safety and Health Protection-On-The-Job Poster

e. A sign indicating the number of hours worked since the last lost workday accident, Prop 65 Notification, Code of Safety Practices.

1.8.2 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.

1.9 SITE SAFETY REFERENCE MATERIALS

Maintain safety-related references applicable to the project, including those listed in paragraph REFERENCES. Maintain applicable equipment manufacturer's manuals.

DRAFT

1.10 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.

1.11 NOTIFICATIONS and REPORTS

1.11.1 Mishap Notification

Notify the Contracting Officer as soon as practical, but no more than four hours after any accident meeting the definition of Recordable Injuries or Illnesses or High Visibility Accidents, property damage equal to or greater than $2,000, or any load handling equipment accident. 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 (to include type of construction equipment used, PPE used, etc.). Preserve the conditions and evidence on the accident site until the Government investigation team arrives on-site and Government investigation is conducted.

Report near miss/close calls to the GDA as soon as practical. Complete SPK Accident Report Form 3394 for Immediate Mishap Notifications.

1.11.2 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. For any load handling equipment accident (including rigging gear accidents) the Prime Contractor must conduct an accident investigation to establish the root cause(s) of the accident, complete the Accident Report (Crane and Rigging Gear) form and provide the report to the Contracting Officer within 30 calendar days of the accident. Crane operations may not proceed 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.

c. In addition to the above, mishaps occurring in any of the High Hazard Areas need to be reported per EM 385-1-1 par 01.D.05.

1.11.3 Monthly Exposure Reports

Monthly exposure reporting to the Contracting Officer is required to be attached to the monthly billing request. This report is a compilation of employee-hours worked each month for all site workers, both prime and subcontractor. The Contracting Officer will provide copies of any special forms.

DRAFT

1.11.4 Crane Reports

Submit crane inspection reports required in accordance with USACE EM 385-1-1 and as specified herein with Daily Reports of Inspections.

1.11.5 Certificate of Compliance (Crane)

Provide a Certificate of Compliance for each crane entering an activity under this contract (see Contracting Officer for a blank certificate). State within the certificate that the crane and rigging gear meet applicable OSHA regulations (with the Contractor citing which OSHA regulations are applicable, e.g., cranes used in construction, demolition, or maintenance comply with 29 CFR 1926 and USACE EM 385-1-1 Section 16. Certify on the Certificate of Compliance that the crane operator(s) is qualified and trained in the operation of the crane to be used. Also certify that all of its crane operators working on the DOD activity have been trained in the proper use of all safety devices (e.g., anti-two block devices). Post certifications on the crane. Submit Crane Operator's Medical Exam Certificate (must be signed by a MD or DO) to the Contracting Officer.

1.11.6 Regulatory Citations and Violations

Contact the Contracting Officer immediately of any OSHA or other regulatory agency inspection or visit, and provide the Contracting Officer with a copy of each citation, report, and Contractor response. Correct violations and citations promptly and provide corrective actions to the Contracting Officer.

DRAFT

1.12 HOT WORK PERMIT

1.12.1 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 Fire Division. 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 Division phone number. REPORT ANY FIRE, NO MATTER HOW SMALL, TO THE RESPONSIBLE FIRE DIVISION IMMEDIATELY.

1.13 RADIATION SAFETY REQUIREMENTS

Submit License Certificates, employee training records, and Leak Test Reports for radiation materials and equipment to the Contracting Officer and Radiation Safety Office (RSO) for all specialized and licensed material and equipment proposed for use on the construction project.

Workers must be protected from radiation exposure in accordance with

10 CFR 20, ensuring any personnel exposures are maintained As Low As Reasonably Achievable.

1.14 FACILITY OCCUPANCY CLOSURE

Streets, walks, and other facilities occupied and used by the Government must not be closed or obstructed without written permission from the Contracting Officer.

1.15 PERSONAL PROTECTIVE EQUIPMENT (PPE)

1.15.1 Site Specific PPE Program

Ensure onsite personnel exposed to contaminants and safety hazards are provided with appropriate PPE. Ensure PPE is relevant to site-specific conditions, including heat and cold stress potential and safety hazards. Only respirators approved by NIOSH can be used. Ensure protective equipment and clothing is clean and well maintained. Ensure the PPE section of the APP includes site-specific procedures for onsite fit testing of respirators, cleaning, maintenance, inspection, and storage. PPE includes:

a. Hard Hats. IAW EM 385-1-1, ensure persons working in or visiting hard hat areas are provided with and required to wear Type I or Type II, Class G (General - not to exceed 2,200 volts) or Class E (Electrical-not to exceed 20,000 volts) headgear as appropriate. The selection of the type of hardhat shall be based on the activity and identified in the AHA.

b. Protective Footwear. IAW EM 385-1-1, personnel to wear safety-toed boots meeting ASTM Standard F2413 while working on construction sites unless it can be demonstrated by a PHA/AHA to the GDA's satisfaction that a different type of foot protection is required.

c. High-visibility vests. IAW EM 385-1-1, wear high-visibility apparel meeting ANSI/ISEA 107, Performance Class 2 requirements.

d. Other PPE (such as safety glasses and hearing protection) as required.

DRAFT

1.15.2 Levels of Protection

Ensure the SSHO establishes and evaluates the levels of protection for each work activity as the work progresses. Ensure the SSHO establishes action levels for upgrade or downgrade in the levels of PPE. Ensure protocols and the communication network for changing the level of protection are described in the APP. Ensure the PPE evaluation protocol addresses air monitoring results, potential for exposure, changes in site conditions, work phases, job tasks, weather, temperature extremes, and individual medical considerations, IAW EM 385-1-1.

1.15.3 Respiratory Protection Program

Establish in writing, and implement a respiratory protection program in accordance with 29 CFR 1910.134, 8 CCR 5144 and AIHA Z88.6. Establish minimum respiratory protection requirements based on measured or anticipated levels of chemical and biological hazards encountered during the performance of the work.

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.

1.17 CONFINED SPACE ENTRY REQUIREMENTS

Contractors entering and working in confined spaces while performing general industry work are required to follow the requirements of OSHA 29 CFR 1926 and comply with the requirements in Section 34 of EM 385-1-1, OSHA 29 CFR 1910, and OSHA 29 CFR 1910.146.

1.17.1 Rescue Procedures and Coordination with Local Emergency Responders

Develop and implement an on-site rescue and recovery plan and procedures. The rescue plan cannot rely on local emergency responders for rescue from a confined space.

1.18 SAFETY DATA SHEETS

Ensure Safety Data Sheet (SDS) for each known or anticipated chemical brought to the site in support of the construction activities is available to each worker on site and is available for review by the Government Designated Authority.

1.18.1 Proposition 65

Provide a warning to the employees in compliance with 22 CCR 12000, Chemicals known to the State of California to Cause Cancer or Reproductive Toxicity (Safe Drinking Water and Toxic Enforcement Act, Proposition 65)

1.19 PROTECTION OF EXISTING AREAS

Perform project-associated activities without damaging or contaminating adjacent work and areas. Where such work or areas are damaged or contaminated, restore work and areas to the original condition at no additional cost to the Government.

PART 2 PRODUCTS

Not Used

PART 3 EXECUTION

3.1 CONSTRUCTION AND OTHER WORK

3.1.1 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

DRAFT

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.

3.1.2 Unforeseen Hazardous Material

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 PRE-OUTAGE COORDINATION MEETING

Apply for utility outages at least 14 days in advance. As a minimum, the request must include the location of the outage, utilities being affected, duration of outage and any necessary sketches. Special requirements for electrical outage requests are contained elsewhere in this specification section. Once approved, and prior to beginning work on the utility system requiring shut down, attend a pre-outage coordination meeting with the Contracting Officer Public Utilities representative to review the scope of work and the lock-out/tag-out procedures for worker protection. No work will be performed on energized electrical circuits unless proof is provided that no other means exist.

3.3 CONTROL OF HAZARDOUS ENERGY (LOCKOUT/TAGOUT)

Provide and operate a Hazardous Energy Control Program (HECP) in accordance with EM 385-1-1 Section 12, , Control of Hazardous Energy.

3.4 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.

3.4.1 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 and using personal fall protection equipment. Provide training by a competent person for fall protection in accordance with EM 385-1-1, Section 21.C.

DRAFT

3.4.2 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.

Personal fall restraint systems are required when working from articulating or extendible boom, swing stages, or suspended platform. In addition, personal fall restraint systems are required when operating other equipment such as scissor lifts if the work platform is capable of being positioned outside the wheelbase. The need for tying-off in such equipment is to prevent ejection of the employee from the equipment during raising, lowering, or travel. Fall protection must comply with 29 CFR 1926.500, Subpart M, USACE EM 385-1-1 21.K.04, .05, and .06.

3.4.2.1 Personal Fall Protection Equipment

Personal fall arrest equipment, systems, subsystems, and components must meet ASSE/SAFE Z359.1. Only a full-body harness with a shock-absorbing lanyard or self-retracting lanyard is an acceptable personal fall arrest body support device. Body belts may only be used as a positioning device system (for uses such as steel reinforcing assembly and in addition to an approved fall arrest system). 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. Only locking snap hooks and carabiners can be used. Webbing, straps, and ropes must be made of synthetic fiber. The maximum free fall distance when using fall arrest equipment must not exceed 6 feet. The total fall distance and any swinging of the worker (pendulum-like motion) that can occur during a fall must always be taken into consideration when attaching a person to a fall arrest system.

DRAFT

3.4.3 Horizontal Lifelines (HLL)

Design, install, certify and use under the supervision of a qualified person horizontal lifelines for fall protection as part of a complete fall arrest system which maintains a safety factor of 2 (29 CFR 1926.500).

3.4.4 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.

3.4.5 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 be in accordance with the requirements of EM 385-1-1, ASSP Z359.2, and ASSP Z359.4.

3.5 EQUIPMENT

3.5.1 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.

b. The use of hooks on equipment for lifting of material must be in accordance with manufacturer's printed instructions.

3.5.2 Load Handling Equipment (LHE)

a. Equip cranes and derricks as specified in EM 385-1-1, Section 16.

b. Comply with the crane 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.

c. 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.

d. Under no circumstance must a Contractor make a lift at or above 90 percent of the cranes rated capacity in any configuration.

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.

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.

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 from entering the counterweight swing (tail swing) area of the crane.

l. Certification records which include the date of inspection, signature of the person performing the inspection, and the serial number or other identifier of the crane that was inspected must always be available for review by Contracting Officer personnel.

DRAFT

m. Written reports listing the load test procedures used along with any repairs or alterations performed on the crane must be available for review by Contracting Officer personnel.

n. Certify that all crane operators have been trained in proper use of all safety devices (e.g. anti-two block devices).

3.5.3 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.

3.6 EXCAVATIONS

Soil classification must be performed by a competent person in accordance with 29 CFR 1926 and EM 385-1-1.

3.6.1 Utility Locations

Prior to digging, the appropriate digging permit must be obtained. All underground utilities in the work area must be positively identified by a third party, independent, private utility locating company in addition to any station locating service and coordinated with the station utility department. Any markings made during the utility investigation must be maintained throughout the contract.

3.6.2 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 three feet of the underground system. Digging within 2 feet of a known utility must not be performed by means of mechanical equipment; hand digging must be used. If construction is parallel to an existing utility, the utility must be exposed by hand digging every 100 feet; if parallel within 5 feet of the excavation.

3.6.3 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.

3.6.4 Shoring Systems

Trench and shoring systems must be identified in the accepted safety plan

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and AHA. Manufacture tabulated data and specifications or registered engineer tabulated data for shoring or benching systems must be readily available on-site for review. Job-made shoring or shielding must have the registered professional engineer stamp, specifications, and tabulated data. Extreme care must be used when excavating near direct burial electric underground cables.

3.6.5 Trenching Machinery

Trenching machines with digging chain drives may be operated only when the spotters/laborers are in plain view of the operator. Operator and spotters/laborers must be provided training on the hazards of the digging chain drives with emphasis on the distance that needs to be maintained when the digging chain is operating. Documentation of the training must be kept on file at the project site.

3.7 ELECTRICAL

Perform electrical work in accordance with EM 385-1-1, Sections 11 and 12.

3.7.1 Conduct of Electrical Work

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. Positive cable identification must be made prior to submitting any outage request for electrical systems. Arrangements are to be coordinated with the Contracting Officer and Station Utilities for identification. The Contracting Officer will not accept an outage request until the Contractor satisfactorily documents that the circuits have been clearly identified. 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 will be 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 may be permitted to enter. When work requires Contractor to work near energized circuits as defined by the NFPA 70, high voltage personnel must use personal protective equipment that includes, as a minimum, electrical hard hat, safety shoes, insulating gloves with leather protective sleeves, fire retarding shirts, coveralls, face shields, and safety glasses. In addition, provide 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.

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3.7.2 Portable Extension Cords

Size portable extension cords in accordance with manufacturer ratings for the tool to be powered and protected from damage. Immediately remove from service all damaged extension cords. Portable extension cords must meet the requirements of EM 385-1-1, NFPA 70E, and OSHA electrical standards.

3.8 WORK IN CONFINED SPACES

Comply with the requirements in Section 34 of USACE EM 385-1-1, OSHA 29 CFR 1910, OSHA 29 CFR 1910.146, OSHA Directive CPL 2.100 and OSHA

29 CFR 1926. Any potential for a hazard in the confined space requires a permit system to be used.

3.9 CRYSTALLINE SILICA

Ensure construction operations encountering materials containing crystalline silica comply with OSHA regulations, EM 385-1-1 and 29 CFR 1926.1153. Develop and implement effective exposure control and elimination procedures to include dust control systems, engineering controls, and establishment of work area boundaries, as well as medical surveillance, training, air monitoring, and personal protective equipment.

3.10 HOUSEKEEPING

Clean debris in work areas daily or more frequently if necessary. Construction debris may be temporarily located in an approved location. Ensure garbage accumulation is removed each day.

-- End of Section --

DRAFT

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DRAFT

SECTION TABLE OF CONTENTS

DIVISION 01 - GENERAL REQUIREMENTS

SECTION 01 42 00

SOURCES FOR REFERENCE PUBLICATIONS

PART 1 GENERAL

1.1 REFERENCES
1.2 ORDERING INFORMATION

PART 2 PRODUCTS

PART 3 EXECUTION

-- End of Section Table of Contents --

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DRAFT

SECTION 01 42 00

SOURCES FOR REFERENCE PUBLICATIONS

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 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. Documents listed in the specifications with numbers which were not assigned by the standards producing organization should be ordered from the source by title rather than by number.

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AACE INTERNATIONAL (AACE)
1265 Suncrest Towne Centre Drive
Morgantown, WV 26505-1876 USA
Ph: 304-296-8444
Fax: 304-291-5728
E-mail: info@aacei.org
Internet: http://www.aacei.org

AMERICAN CONCRETE INSTITUTE INTERNATIONAL (ACI)
38800 Country Club Drive
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Ph: 248-848-3700
Fax: 248-848-3701
E-mail: bkstore@concrete.org
Internet: http://www.concrete.org

ALUMINUM ASSOCIATION (AA)
National Headquarters
1525 Wilson Boulevard, Suite 600
Arlington, VA 22209
Ph: 703-358-2960
Fax: 703-358-2961
Internet: http://www.aluminum.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: http://www.aashto.org

AMERICAN INDUSTRIAL HYGIENE ASSOCIATION (AIHA)
2700 Prosperity Ave., Suite 250
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Fax: 703-207-3561
E-mail: infonet@aiha.org
Internet http://www.aiha.org

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Internet: http://www.aisc.org

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Fax: 973-882-1717
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Ph: 847-699-2929
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Internet: https://www.assp.org/

AMERICAN WATER WORKS ASSOCIATION (AWWA)
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Ph: 800-926-7337
Fax: 303-347-0804
E-mail: smorrison@awwa.org
Internet: http://www.awwa.org

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Fax: 305-443-7559
E-mail: info@aws.org or customerservice@awspubs.com

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Internet: http://www.aws.org

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New York, NY 10016-5990
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Fax: 212-591-7674
E-mail: infocentral@asme.org
Internet: http://www.asme.org

ASPHALT INSTITUTE (AI)
Research Park Drive
P.O. Box 14052
Lexington, KY 40512-4052
Ph: 859-288-4960
Fax: 859-288-4999
E-mail: info@asphaltinstitute.org
Internet: http://www.asphaltinstitute.org

ASTM INTERNATIONAL (ASTM)
100 Barr Harbor Drive, P.O. Box C700
West Conshohocken, PA 19428-2959
Ph: 610-832-9585
Fax: 610-832-9555
E-mail: service@astm.org
Internet: http://www.astm.org

CALIFORNIA AIR RESOURCES BOARD (CARB)
1001 I Street
Sacramento, CA 95814
Ph: 800-242-445-
Internet: http://www.arb.ca.gov

CALIFORNIA DEPARTMENT OF FOOD AND AGRICULTURE (CDFA)
1220 N Street
Sacramento, CA 95814
Ph: 916-654-0466
Internet: https://cdfa.ca.gov

CALIFORNIA STATE WATER RESOURCES CONTROL BOARD (CSWRCB)
1001 I Street
Sacramento, CA 95814
Ph: 916-341-5455
Internet: https://waterboards.ca.gov

CALIFORNIA STORMWATER QUALITY ASSOCIATION (CASQA)
PO Box 2105
Menlo Park, CA 94026-2105
Ph: 650-366-1042
email: info@casqa.org

CENTRAL VALLEY REGIONAL WATER QUALITY CONTROL BOARD (CVRWQCB)
11020 Sun Center Drive, Suite 200
Rancho Cordova, CA 95670
Ph: 916-464-3291
Internet: https://www.waterboards.ca.gov/centralvalley/

CITY OF SACRAMENTO (COS)
915 I Street

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Sacramento, CA 95814
Ph: 916-264-5011
Internet: http://www.cityofsacramento.org/

FOUNDATION FOR CROSS-CONNECTION CONTROL AND HYDRAULIC RESEARCH (FCCCHR)
University of South California
Kaprielian Hall 200
Los Angeles, CA 90089-2531
Ph: 213-740-2032 or 866-545-6340
Fax: 213-740-8399
E-mail: fccchr@usc.edu
Internet: http://www.usc.edu/dept/fccchr

MASTER PAINTERS INSTITUTE (MPI)
2800 Engleton Avenue
Burnaby, BC CANADA V5C 6G7
Ph: 604-298-7578
Fax: 604-298-7571
E-mail: info@paintinfo.com,jody@mpi.net,bgl@mpi.net
Internet: http://www.paintinfo.com/mpi

NATIONAL FIRE PROTECTION ASSOCIATION (NFPA)
1 Batterymarch Park
Quincy, MA 02169-7471
Ph: 617-770-3000 or 800-344-3555
Fax: 617-770-0700
E-mail: webmaster@nfpa.org
Internet: http://www.nfpa.org

NSF INTERNATIONAL (NSF)
789 North Dixboro Road
P.O. Box 130140
Ann Arbor, MI 48113-0140
Ph: 734-769-8010 or 800-NSF-MARK
Fax: 734-769-0109
E-mail: info@nsf.org
Internet: http://www.nsf.org

SACRAMENTO METROPOLITAN AIR QUALITY MANAGEMENT DISTRICT (SMAQMD)
777 12th Street, Suite 300
Sacramento, CA 95814
Ph:(916) 874-4800 or (877) 662-8765
E-mail: sparetheair@sbcglobal.net
Internet: http://airquality.org/

SOCIETY OF AUTOMOTIVE ENGINEERS INTERNATIONAL (SAE)
400 Commonwealth Drive
Warrendale, PA 15096-0001
Ph: 724-776-4970
Fax: 724-776-0790
E-mail: customerservice@sae.org
Internet: http://www.sae.org

STANDARD METHODS (SM)
Ph: 800-633-4931
E-mail: standardmethods@subscriptionoffice.com
Internet: https://standardmethods.org

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STATE OF CALIFORNIA CODE OF REGULATIONS (CCR)
Ph: 800-888-3600
E-mail: staff@oal.ca.gov
Internet: https://oal.ca.gov

STATE OF CALIFORNIA DEPARTMENT OF TRANSPORTATION (CALTRANS)
Publication Distribution Unit
1900 Royal Oaks Dr.
Sacramento, CA 95815-3800
Ph: 916-263-0822 or 916-263-0865
Fax: 916-263-0469
E-mail: publications@dot.ca.gov
Internet: www.//caltrans-opac.ca.gov/publicathtm

TECHNICAL ASSOCIATION OF THE PULP AND PAPER INDUSTRY (TAPPI)
15 Technology Parkway South
Norcross, GA 30092
Ph: 800-322-8686 or 770-446-1400
Fax: 770-446-6947
E-mail: memberconnection@tappi.org
Internet: http://www.tappi.org

UNDERWRITERS LABORATORIES (UL)
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E-mail: CEC.us@us.ul.com
Internet: http://www.ul.com/

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Internet: http://www.wes.army.mil/SL/MTC/handbook.htm
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Internet: http://www.usace.army.mil/publications
or http://www.hnd.usace.army.mil/techinfo/engpubs.htm

U.S. ARMY CORPS OF ENGINEERS, SACRAMENTO DISTRICT (CESPK)
1325 J Street
Sacramento, CA 95814
Ph: 916-557-5100
Internet: https://spk.usace.army.mil

U.S. Code (USC)
Office of the Law Revision Counsel
Internet: http://uscode.house.gov/lawrevisioncounsel.shtml

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U.S. DEPARTMENT OF AGRICULTURE (USDA)
Order AMS Publications from:
AGRICULTURAL MARKETING SERVICE (AMS)
Seed Regulatory and Testing Branch
801 Summit Crossing Place, Suite C
Gastonia, NC 28054-2193
Ph: 704-810-8871
Fax: 704-852-4189
E-mail: seed.ams@usda.gov
Internet: http://www.ams.usda.gov/lsg/seed.htm
Order Other Publications from:
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14th and Independence Avenue, SW, Room 4028-S
Washington, DC 20250
Ph: 202-720-2791
Fax: 202-720-2166
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Internet: http://www.dod.gov
Obtain Military Specifications, Standards and Related Publications from:
Acquisition Streamlining and Standardization Information System (ASSIST)
Department of Defense Single Stock Point (DODSSP)
Document Automation and Production Service (DAPS)
Building 4/D
700 Robbins Avenue
Philadelphia, PA 19111-5094
Ph: 215-697-6396 - for account/password issues
Internet: http://assist.daps.dla.mil/online/start/; account registration required
Obtain Unified Facilities Criteria (UFC) from:
Whole Building Design Guide (WBDG)
National Institute of Building Sciences (NIBS)
1090 Vermont Avenue NW, Suite 700
Washington, CD 20005
Ph: 202-289-7800
Fax: 202-289-1092
Internet: http://www.wbdg.org/references/docs_refs.php

U.S. ENVIRONMENTAL PROTECTION AGENCY (EPA)
Ariel Rios Building
1200 Pennsylvania Avenue, N.W.
Washington, DC 20004
Ph: 202-272-0167
for Fax and E-mail see below
Internet: http://www.epa.gov

--- Some EPA documents are available only from:
National Technical Information Service (NTIS)
5301 Shawnee Road

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Alexandria, VA 22312
Ph: 703-605-6050 or 1-688-584-8332
Fax: 703-605-6900
E-mail: info@ntis.gov
Internet: http://www.ntis.gov

U.S. FEDERAL HIGHWAY ADMINISTRATION (FHWA)
FHWA, Office of Safety
1200 New Jersey Ave., SE
Washington, DC 20590-
Ph: 202-366-0411
Fax: 202-366-2249
E-mail: contactcenter@gpo.gov
Internet: http://www.safety.fhwa.dot.gov
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Internet: http://www.gpoaccess.gov

U.S. GENERAL SERVICES ADMINISTRATION (GSA)
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1800 F Street, NW
Washington, DC 20405
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Ph: 215-697-6396 - for account/password issues
Internet: http://assist.daps.dla.mil/online/start/; account registration required

U.S. NATIONAL ARCHIVES AND RECORDS ADMINISTRATION (NARA)
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DRAFT

Internet: http://www.gpoaccess.gov

PART 2 PRODUCTS

Not Used

PART 3 EXECUTION

Not used

-- End of Section --

DRAFT

SECTION TABLE OF CONTENTS

DIVISION 01 - GENERAL REQUIREMENTS

SECTION 01 45 00

QUALITY CONTROL

PART 1 GENERAL

1.1 REFERENCES
1.2 SUBMITTALS

PART 2 PRODUCTS

PART 3 EXECUTION

3.1 GENERAL REQUIREMENTS
3.2 CONTRACTOR QUALITY CONTROL (CQC) PLAN
3.2.1 Content of the CQC Plan
3.2.2 Acceptance of Plan
3.2.3 Notification of Changes
3.3 COORDINATION MEETING
3.4 QUALITY CONTROL ORGANIZATION
3.4.1 Personnel Requirements
3.4.2 CQC System Manager
3.4.3 CQC Personnel
3.4.4 Additional Requirement
3.4.5 Organizational Changes
3.5 CONTROL
3.5.1 Preparatory Phase
3.5.2 Initial Phase
3.5.3 Follow-up Phase
3.5.4 Additional Preparatory and Initial Phases
3.6 TESTS
3.6.1 Testing Procedure
3.6.2 Testing Laboratories
3.6.2.1 Capability Check
3.6.3 Onsite Laboratory
3.7 COMPLETION INSPECTION
3.7.1 Punch-Out Inspection
3.7.2 Pre-Final Inspection
3.7.3 Final Acceptance Inspection
3.8 DOCUMENTATION
3.8.1 Quality Control Activities
3.8.2 Verification Statement
3.9 SAMPLE FORMS
3.10 NOTIFICATION OF NONCOMPLIANCE

ATTACHMENTS:

Sample forms

DRAFT

-- End of Section Table of Contents --

DRAFT

SECTION 01 45 00

QUALITY CONTROL

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.

ASTM INTERNATIONAL (ASTM)

ASTM D3740	(2019) Minimum Requirements for Agencies Engaged in the Testing and/or Inspection of Soil and Rock as Used in Engineering Design and Construction
ASTM E329	(2021) Standard Specification for Agencies Engaged in Construction Inspection, Testing, or Special Inspection

DRAFT

1.2 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

Contractor Quality Control (CQC) Plan; G

SD-05 Design Data

Design Quality Control

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 design and construction operations, both onsite and offsite, and be keyed

to the proposed design and 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 design and 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 an individual other than the project superintendent. The individual should be outside of the project superintendent's chain of command and must be shown as at least one level above the project superintendent in the chain of command.

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

DRAFT

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 design and 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 design and construction. Acceptance is conditional and will be predicated on satisfactory performance during the design and 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 design or 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 14 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, design activities, 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.

DRAFT

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, a Design Quality 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 for maintaining 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 with a minimum of 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 CQC Personnel

In addition to CQC personnel specified elsewhere in the contract, provide as part of the CQC organization specialized personnel to assist the CQC System Manager for the following areas: civil and environmental. These individuals or specialized technical companies are employees of the prime or subcontractor; be responsible to the CQC System Manager; be physically present at the construction site during work on the specialized personnel's areas of responsibility; have the necessary education or experience in accordance with the experience matrix listed herein. These individuals can perform other duties but need to be allowed sufficient time to perform the specialized personnel's assigned quality control duties as described in the Quality Control Plan.

DRAFT

Experience Matrix	
Area	Qualifications
Civil	Graduate Civil Engineer or Construction Manager with 2 years experience in the type of work being performed on this project or technician with 5 yrs related experience
Environmental	Graduate Environmental Engineer with 3 years experience

3.4.4 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 Sacramento District. 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.

3.4.5 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.

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3.5 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:

3.5.1 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 48 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.

DRAFT

3.5.2 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 48 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.

3.5.3 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.

3.5.4 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.

3.6 TESTS

3.6.1 Testing Procedure

Perform specified or required tests to verify that control measures are adequate to provide a product which conforms to contract requirements. Upon request, furnish to the Government duplicate samples of test specimens for possible testing by the Government. Testing includes operation and acceptance tests when specified. Procure the services of a Corps of Engineers approved testing laboratory or establish an approved testing laboratory at the project site. Perform the following activities and record and provide the following data:

a. Verify that testing procedures comply with contract requirements.

b. Verify that facilities and testing equipment are available and comply with testing standards.

c. Check test instrument calibration data against certified standards.

d. Verify that recording forms and test identification control number system, including all of the test documentation requirements, have been prepared.

e. Record results of all tests taken, both passing and failing on the CQC report for the date taken. Specification paragraph reference, location where tests were taken, and the sequential control number identifying the test. If approved by the Contracting Officer, actual test reports are submitted later with a reference to the test number and date taken. Provide an information copy of tests performed by an

DRAFT

offsite or commercial test facility directly to the Contracting Officer. Failure to submit timely test reports as stated results in nonpayment for related work performed and disapproval of the test facility for this Contract.

3.6.2 Testing Laboratories

All testing laboratories must be validated by the USACE Material Testing Center (MTC) for the tests to be performed. Information on the USACE MTC with web-links to both a list of validated testing laboratories and for the laboratory inspection request for can be found at: https://mtc.erdc.dren.mil/.

3.6.2.1 Capability Check

The Government reserves the right to check laboratory equipment in the proposed laboratory for compliance with the standards set forth in the contract specifications and to check the laboratory technician's testing procedures and techniques. Laboratories utilized for testing soils, concrete, asphalt, and steel is required to meet criteria detailed in ASTM D3740 and ASTM E329.

3.6.3 Onsite Laboratory

The Government reserves the right to utilize the Contractor's control testing laboratory and equipment to make assurance tests, and to check the Contractor's testing procedures, techniques, and test results at no additional cost to the Government.

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. The CQC System Manager or staff make a second inspection 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.

DRAFT

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.

j. Provide documentation of design quality control activities. For independent design reviews, provide, as a minimum, identification of the Independent Technical Review (ITR) team, the ITR review comments,

DRAFT

responses and the record of resolution of the comments.

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.

-- End of Section --

DRAFT

(Sample of typical Contractor's Test Report)

TEST REPORT

STRUCTURAL OR BUILDING _____

CONTRACT NO. _____

DESCRIPTION OF ITEM, SYSTEM OR PART OF SYSTEM TESTED: _____

_____

_____

_____

DESCRIPTION OF TEST: _____

_____

_____

_____

_____

NAME AND TITLE OF PERSON IN CHARGE OF PERFORMING TESTS FOR CONTRACTOR:

NAME _____

TITLE _____

SIGNATURE _____

I HEREBY CERTIFY THAT THE ABOVE DESCRIBED ITEM, SYSTEM OR PART OF SYSTEM HAS BEEN TESTED AS INDICATED ABOVE AND FOUND TO BE ENTIRELY SATISFACTORY AS REQUIRED IN THE CONTRACT SPECIFICATIONS.

DRAFT

_____

SIGNATURE OF CONTRACTOR QUALITY CONTROL INSPECTOR

DATE _____

REMARKS: _____

_____

_____

_____

_____

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(Sample of Typical DAILY CONSTRUCTION QUALITY CONTROL REPORT)

CONTRACTOR'S NAME
(Address)

DAILY CONSTRUCTION QUALITY CONTROL REPORT

Date: _____ Report No. _____

Contract No.: _____

Name and Location of Project: _____

WEATHER: (Clear) (P. Cloudy) (Cloudy) Temperature: _____

Rainfall _____ Inches Min., _____ Max., _____

Contractor/Subcontractors	Area of Responsibility
a. _____	_____
b. _____	_____
c. _____	_____
d. _____	_____
e. _____	_____
f. _____	_____
g. _____	_____

1. WORK PERFORMED TODAY: (Indicate location and description of work performed. Refer to work performed by prime and/or subcontractors by letter in Table above.)

DRAFT

2. PREPARATORY INSPECTION FOR NEXT ITEM OF WORK: (Materials/shop drawings approved, required control testing arranged, all preliminary work has been accomplished as per plans and specifications.)

3. INITIAL INSPECTION: (Address quality of workmanship, assure control testing and materials being used in all work are in compliance with plans and specifications).

---

4. FOLLOW-UP INSPECTIONS: (Assure control testing performed as required and all work performed continues to be in compliance with plans and specifications).

---

5. VERBAL INSTRUCTIONS RECEIVED: (List any instructions given by Government personnel on construction deficiencies, retesting required, etc., with action to be taken.)

---

6. REMARKS: (Cover any conflicts in plans, specifications, or instructions or any delay to the job attributable to weather conditions.)

DRAFT

7. RESULTS OF SAFETY INSPECTION: (Note safety violations and corrective action taken. Indicate phase of work where violations occurred.)

---

8. UPCOMING WORK: (Indicate next major phase of work anticipated and approximate date of Preparatory Inspection meeting to cover this work.)

EQUIPMENT DATA: (Indicate items of construction equipment, other than hand tools, at the job site and whether or not used.)

DRAFT

CONTRACTOR'S VERIFICATION: The above report is complete and correct and all material and equipment used and work performed during this reporting period area in compliance with the contract plans and specifications except as noted above.

_____

Contractor's Approved/Authorized Representative

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DRAFT

(Sample of Typical Form)

PREPARATORY INSPECTION OUTLINE
(PART-I)

Contract No.: _____ Date: _____

Title and No. of Technical Section: _____

_____

Reference Contract Drawings: _____

A. PLANNED ATTENDANTS:

	NAME	POSITION	COMPANY
1.			
2.			
3.			
4.			

B. SUBMITTALS REQUIRED TO BEGIN WORK:

	ITEM	SUBMITTAL NO.	ACTION CODE
a.			
b.			
c.			
d.			

I HEREBY DECLARE THAT THE ABOVE REQUIRED MATERIALS DELIVERED TO THE JOBSITE ARE CERTIFIED TO BE THE SAME AS THOSE SUBMITTED AND APPROVED.

_____
QUALITY CONTROL REPRESENTATIVE

C. EQUIPMENT TO BE USED IN EXECUTING WORK:

a. _____
b. _____
c. _____

D. WORK AREAS EXAMINED TO ASCERTAIN THAT ALL PRELIMINARY WORK HAS BEEN COMPLETED:

_____
_____

E. METHODS AND PROCEDURES FOR PERFORMING QUALITY CONTROL - INCLUDING SPECIFIC TESTING REQUIREMENTS:

_____
_____

F. COMPLIANCE WITH AND UPGRADING OF THE SAFETY PLAN AND ACTIVITY HAZARD ANALYSIS INCLUDING REVIEW OF THE ACTIVITY ANALYSIS WITH EACH WORKER:

_____
_____

THE ABOVE METHODS AND PROCEDURES OUTLINED ARE CERTIFIED TO COMPLY WITH THE CONTRACT REQUIREMENTS AND WILL BE PERFORMED AS PLANNED AND SPECIFIED.

_____
QUALITY CONTROL REPRESENTATIVE

DRAFT

(Sample of Typical Form)

PREPARATORY INSPECTION OUTLINE
(PART - II)

A. PERSONS IN ATTENDANCE:

	NAME	POSITION	COMPANY
1.			
2.			
3.			
4.			
5.			
6.			

B. ITEMS OF MUTUAL UNDERSTANDING DEVELOPED DURING REVIEW OF PREPARATORY OUTLINE AND CONTRACT REQUIREMENTS: (Contract items not specifically covered during the preparatory inspection conference are assumed to be in strict conformance with the contract requirements.)

1. _____

2. _____

3. _____

4. _____

5. _____

6. _____

7. _____

8. _____

DRAFT

THE ITEMS NOTED ABOVE CONSTITUTE A MEMORANDUM OF MUTUAL UNDERSTANDING AND WILL BE PERFORMED AS PLANNED AND SPECIFIED.

_____
CONTRACTOR'S APPROVED/AUTHORIZED REPRESENTATIVE

(Sample of Typical Form)

INITIAL PHASE CHECK LIST

Contract No.: _____ Date: _____

Specification Paragraph or Section: _____

Description and Location of Work Inspected: _____

_____

REFERENCE CONTRACT DRAWINGS: _____

A. PERSONNEL PRESENT:

	NAME	POSITION	COMPANY
1.			
2.			
3.			
4.			

B. MATERIALS BEING USED ARE IN STRICT COMPLIANCE WITH THE CONTRACT PLANS AND SPECIFICATIONS: YES_____ NO_____

IF NOT, EXPLAIN: _____

_____

_____

C. PROCEDURES AND/OR WORK METHODS WITNESSED ARE IN STRICT COMPLIANCE WITH THE CONTRACT SPECIFICATIONS: YES_____ NO_____

IF NOT, EXPLAIN: _____

_____

_____

D. WORKMANSHIP IS ACCEPTABLE: YES_____ NO_____

STATE AREAS WHERE IMPROVEMENT IS NEEDED: _____

_____

_____

E. SAFETY VIOLATIONS NOTED: YES_____ NO_____

IF YES, CORRECTIVE ACTION TAKEN: _____

_____

_____

_____

QUALITY CONTROL REPRESENTATIVE

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DRAFT

MATERIALS TEST SUMMARY

(See reverse for instructions)

CONTRACT NUMBER	PROJECT	DATE

SECTION/TITLE	TEST	MINIMUM TESTS *(Estimated)*		TOTAL TESTS			
				CQC		QA	
		CQC	CQC	PASS	FAIL	PASS	FAIL
2 _____ GRADING	A. LAB-MOISTURE DENSITY W/GRADATION						
	& ATTERBERG LIMITS						
	B. FIELD DENSITY*						
	** (Select materials with gradation)*						
2 _____ BUILDINGS	A. LAB-MOISTURE DENSITY W/GRADATION						
	& ATTERBERG LIMITS						
	B. FIELD DENSITY*						
	** (Select materials with gradation)*						
2 _____ UTILITIES SYSTEM	A. LAB-MOISTURE DENSITY W/GRADATION						
	& ATTERBERG LIMITS						
	B. FIELD DENSITY*						
	** (Select materials with gradation)*						
2 _____ DRAINAGE SYSTEM	A. LAB-MOISTURE DENSITY W/GRADATION						
	& ATTERBERG LIMITS						
	B. FIELD DENSITY*						
	** (Select materials with gradation)*						

DRAFT

MATERIALS TEST SUMMARY

CONTRACT NUMBER	PROJECT	DATE

SECTION/TITLE	TEST	MINIMUM TESTS *(Estimated)*		TOTAL TESTS			
				CQC		QA	
		CQC	CQC	PASS	FAIL	PASS	FAIL
2 _____ SUBGRADE ROADWAYS	A. LAB-MOISTURE DENSITY W/GRADATION						
	& ATTERBERG LIMITS						
	B. FIELD DENSITY						
2 _____ SUBBASE COURSE	A. LAB-MOISTURE DENSITY W/GRADATION						
	& ATTERBERG LIMITS						
	B. FIELD DENSITY						
2 _____ BASE COURSE	A. LAB-MOISTURE DENSITY W/GRADATION						
	& ATTERBERG LIMITS						
	B. FIELD DENSITY						
2 _____ BITUMINOUS COURSE	A. MARSHALL METHOD						
	B. EXTRACTION (HOT MIX)						
	C. GRADATION (HOT MIX)						
	D. GRADATION (HOT BINS)						
	E. FIELD COMPACTION (CORES)						

DRAFT

MATERIALS TEST SUMMARY

(See reverse for instructions)

CONTRACT NUMBER	PROJECT	DATE

SECTION/TITLE	TEST	MINIMUM TESTS *(Estimated)*		TOTAL TESTS			
				CQC		QA	
		CQC	CQC	PASS	FAIL	PASS	FAIL
2 _____ CONCRETE-PAVEMENT *(Compressive) *(Flexural)	A. *STRENGTH						
	B. SLUMP						
	C. ENTRAINED AIR						
	D. GRADATION						
2 _____ SIDEWALK, CURB, & GUTTER	A. COMPRESSIVE STRENGTH						
	B. SLUMP						
	C. ENTRAINED AIR						
	D. GRADATION						
2 _____							
2 _____							

DRAFT

MATERIALS TEST SUMMARY

(See reverse for instructions)

CONTRACT NUMBER	PROJECT	DATE

SECTION/TITLE	TEST	MINIMUM TESTS *(Estimated)*		TOTAL TESTS			
				CQC		QA	
		CQC	CQC	PASS	FAIL	PASS	FAIL
3 _____ CONCRETE-BUILDING	A. COMPRESSIVE STRENGTH						
	B. SLUMP						
	C. ENTRAINED AIR						
	D. GRADATION						
3 _____ CONCRETE - LITEWEIGHT	A. COMPRESSIVE STRENGTH						
	B. SLUMP						
	C. ENTRAINED AIR						
	D. UNIT WEIGHT (PLASTIC)						
	E. UNIT WEIGHT (28-DAY DRY)						
	F GRADATION						
3 _____ CONCRETE - TILT UP	A. COMPRESSIVE STRENGTH						
	B. SLUMP						
	C. ENTRAINED AIR						
	D. GRADATION						
3 _____							

DRAFT

MATERIALS TEST SUMMARY

(See reverse for instructions)

CONTRACT NUMBER	PROJECT	DATE

SECTION/TITLE	TEST	MINIMUM TESTS *(Estimated)*		TOTAL TESTS			
				CQC		QA	
		CQC	CQC	PASS	FAIL	PASS	FAIL
4 _____ MASONRY	A. MORTAR COMPRESSIVE STRENGTH						
	B. GROUT COMPRESSIVE STRENGTH						
	C. GRADATION						
	D. CMU - SHRINKAGE, AIR DRY						
	CONDITION, UNIT WEIGHT &						
	COMPRESSIVE STRENGTH						

DRAFT

INSTRUCTIONS FOR COMPLETION OF CESPK FORM 437

1. ***ALL ENTRIES MUST BE MADE WITH PEN***.

2. SECTION/TITLE: Sections which require contractor quality control testing during the placement of construction materials are listed. The titles are condensed versions of the full specification title. Review the technical specifications and complete as follows:

A. Insert after a number the applicable letter to complete the section designation. For example, 2 ___ grading to 2 __A_ grading.

B. If a section is not a part of the technical specifications, insert "N/A" (not applicable) after a number. For example, 2 ___ grading to 2 _N/A_ grading.

C. Blank spaces are provided to permit the addition of other sections as required by the specifications.

3. TEST: Tests that are specified to be performed by the technical specifications are listed for each section. Blank spaces are provided for additional tests as required by the specifications. An asterisk indicates that action should be taken as noted. For example, gradation must be taken when testing field density for select materials in **SECTION: GRADING**.

4. MINIMUM TESTS (ESTIMATED): Under the Contractor Quality Control (CQC) column, enter the minimum number of tests required to accomplish the specified work. For the prelisted selections, the test frequencies are specified in the Construction Control Manual (CCM). For an additive section, the CCM may not indicate the test frequency. In this case, check the technical specifications or the contract drawings for requirements. Quality Assurance (DQA) column will be completed by the Contracting Officer Representative (COR).

DRAFT

SECTION TABLE OF CONTENTS

DIVISION 01 - GENERAL REQUIREMENTS

SECTION 01 45 01

RESIDENT MANAGEMENT SYSTEM CONTRACTOR MODE(RMS CM)

PART 1 GENERAL

1.1 REFERENCES
1.2 MEASUREMENT AND PAYMENT
1.3 CONTRACT ADMINISTRATION
1.3.1 Correspondence and Electronic Communications
1.3.2 Other Factors
1.4 RMS SOFTWARE
1.5 SYSTEM REQUIREMENTS
1.6 CONTRACT DATABASE - GOVERNMENT
1.7 CONTRACT DATABASE - CONTRACTOR
1.7.1 Administration
1.7.1.1 Contractor Information
1.7.1.2 Subcontractor Information
1.7.1.3 Correspondence
1.7.1.4 Equipment
1.7.1.5 Reports
1.7.1.6 Request For Information (RFI)
1.7.2 Finances
1.7.2.1 Pay Activity Data
1.7.2.2 Payment Requests
1.7.3 Quality Control (QC)
1.7.3.1 Quality Control (QC) Reports
1.7.3.2 Deficiency Tracking.
1.7.3.3 Three-Phase Control Meetings
1.7.3.4 Labor and Equipment Hours
1.7.3.5 Accident/Safety Reporting
1.7.3.6 Definable Features of Work
1.7.3.7 Activity Hazard Analysis
1.7.4 Submittal Management
1.7.5 Schedule
1.7.6 Closeout
1.7.7 Help
1.8 IMPLEMENTATION
1.9 NOTIFICATION OF NONCOMPLIANCE

PART 2 PRODUCTS

PART 3 EXECUTION

-- End of Section Table of Contents --

DRAFT

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DRAFT

SECTION 01 45 01

RESIDENT MANAGEMENT SYSTEM CONTRACTOR MODE(RMS CM)

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	(2024) Safety -- Safety and Occupational Health (SOH) Requirements

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

The Contractor must be prepared to transition from the Resident Management System (RMS) to the new Construction Management Platform (CMP) at any time during the period of performance of this contract, once the USACE enterprise implements this change. The Contractor's obligation to transition from RMS to the CMP system is a requirement of this contract. Therefore, additional time or cost increase to complete this transition will not be considered. In the event of the transition, RMS project information will be migrated to CMP by the government and available in the CMP system. After the transition, the Contractor must utilize the CMP system to perform all contract administration functions previously required in RMS, including all areas listed above. After the transition,

DRAFT

"RMS" and "CMP" will be synonymous for all "Resident Management System" and "RMS" references in this contract's specification. To facilitate the transition from RMS to CMP, online training for the CMP system will be made available to the Contractor with enough time to train staff, prior to the transition occurring.

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 Contract Clause, 52.236-15 "Schedules for Construction Contracts"; Contract Clause, 52.232-27 "Prompt Payment for Construction Contracts"; Contract Clause, 52.232-15 "Payments Under Fixed-Priced Construction Contracts"; Section 01 32 01 PROJECT SCHEDULE; Section 01 33 00 SUBMITTAL PROCEDURES; Section 01 35 26 GOVERNMENTAL SAFETY REQUIREMENTS; and Section 01 45 00 QUALITY CONTROL

1.4 RMS SOFTWARE

RMS is a Windows-based program that can be run on a Windows-based PC meeting the requirements as specified in Paragraph: SYSTEM REQUIREMENTS. Download, install and be able to utilize the latest version of the RMS software 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 (http://rmsdocumentation.com). 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. RMS Helpdesk phone numbers (800) 452-7919 and (442) 333-1011.

1.5 SYSTEM REQUIREMENTS

The following is the recommended system configuration to run the Contractor Mode RMS for full utilization of all features for all types and sizes of contracts. Smaller, less complicated, projects may not require the configuration levels described below. Required configuration also noted below.

Recommended RMS System Requirements	
Hardware	
Windows-based PC	1.7 GHz i3; AMD A6 3650 GHz or higher processor (REQUIRED)
RAM	8 GB
Hard drive disk	100 GB space for sole use by RMS system

DRAFT

Recommended RMS System Requirements	
Monitor	Screen resolution 1366 x 768
Mouse or other pointing device	
Windows compatible printer	Laser printer must have 4 MB+ of RAM
Connection to the Internet	minimum 4 Mbs per user
Software	
MS Windows	Windows 7 x 64 bit (RMS requires 64 bit O/S) or newer (REQUIRED)
Word Processing software	Viewer for MS Word 2013, MS Excel 2013 or newer (REQUIRED)
E-mail	MAPI compatible (REQUIRED)
Virus protection software	Regularly upgraded with all issued Manufacturer's updates and is able to detect most zero day viruses (REQUIRED)

DRAFT

1.6 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.

1.7 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:

1.7.1 Administration

1.7.1.1 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.

1.7.1.2 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.

1.7.1.3 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".

1.7.1.4 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.

1.7.1.5 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.

1.7.1.6 Request For Information (RFI)

Create and track all Requests For Information (RFI) in the RMS Administration Module for Government review and response.

1.7.2 Finances

1.7.2.1 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.

1.7.2.2 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.

1.7.3 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

DRAFT

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.

1.7.3.1 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 of the date covered by the report. Provide the Government a printed signed copy of the QC Daily Report, unless waived by the Contracting Officer.

1.7.3.2 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.

1.7.3.3 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.

1.7.3.4 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.

1.7.3.5 Accident/Safety Reporting

Both the Contractor and the Government enter safety related comments in RMS as a deficiency. The Contractor will 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.

1.7.3.6 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.

1.7.3.7 Activity Hazard Analysis

Import activity hazard analysis electronic document files into the RMS QC Module utilizing the document package manager.

DRAFT

1.7.4 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.

1.7.5 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 PROJECT SCHEDULE.

1.7.6 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.

1.7.7 Help

For help in using RMS, contact the 24 Hour RMS Helpdesk at (210) 473-8658.

1.8 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.

1.9 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 --

DRAFT

SECTION TABLE OF CONTENTS

DIVISION 01 - GENERAL REQUIREMENTS

SECTION 01 50 00

TEMPORARY CONSTRUCTION FACILITIES AND CONTROLS

PART 1 GENERAL

1.1 REFERENCES
1.2 SUBMITTALS
1.3 CONSTRUCTION SITE PLAN
1.4 BACKFLOW PREVENTERS CERTIFICATE
1.4.1 Backflow Tester Certificate
1.4.2 Backflow Prevention Training Certificate
1.5 DOD CONDITION OF READINESS (COR)

PART 2 PRODUCTS

2.1 TEMPORARY SIGNAGE
2.1.1 Bulletin Board
2.1.2 Project Identification Signs
2.1.3 Warning Signs
2.2 TEMPORARY TRAFFIC CONTROL
2.2.1 Haul Roads
2.2.2 Barricades
2.3 FENCING
2.3.1 Polyethylene Mesh Safety Fencing
2.3.2 Chain Link Panel Fencing
2.3.3 Post-Driven Chain Link Fencing
2.4 TEMPORARY WIRING
2.5 BACKFLOW PREVENTERS

PART 3 EXECUTION

3.1 EMPLOYEE PARKING
3.2 AVAILABILITY AND USE OF UTILITY SERVICES
3.2.1 Temporary Utilities
3.2.2 Advance Deposit
3.2.3 Final Meter Reading
3.2.4 Water
3.2.5 Sanitation
3.2.6 Telephone
3.2.7 Fire Protection
3.3 TRAFFIC PROVISIONS
3.3.1 Maintenance of Traffic
3.3.2 Protection of Traffic
3.3.3 Dust Control
3.4 CONTRACTOR'S TEMPORARY FACILITIES
3.4.1 Administrative Field Offices
3.4.2 Storage Area
3.4.3 Supplemental Storage Area
3.4.4 Appearance of Trailers

DRAFT

3.4.5 Weather Protection of Temporary Facilities and Stored Materials
3.4.5.1 Building and Site Storm Protection
3.5 GOVERNMENT FIELD OFFICE
3.5.1 Resident Engineer's Office
3.6 TEMPORARY PROJECT SAFETY FENCING
3.7 CLEANUP
3.8 RESTORATION OF STORAGE AREA

-- End of Section Table of Contents --

DRAFT

SECTION 01 50 00

TEMPORARY CONSTRUCTION FACILITIES AND CONTROLS

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; R 2021) Reduced-Pressure Principle Backflow Prevention Assembly

NATIONAL FIRE PROTECTION ASSOCIATION (NFPA)

NFPA 70	(2023) National Electrical Code
NFPA 241	(2022) Standard for Safeguarding Construction, Alteration, and Demolition Operations

U.S. ARMY CORPS OF ENGINEERS (USACE)

ECB 2020-1	(2020) USACE Construction Project Signs and Use of the Army Star
EM 385-1-1	(2024) Safety -- Safety and Occupational Health (SOH) Requirements
EP 310-1-6a	(2006; 2019 Change 2) Project Operation -- Sign Standards Manual, VOL 1

U.S. FEDERAL HIGHWAY ADMINISTRATION (FHWA)

MUTCD	(2009; Rev 2012) Manual on Uniform Traffic Control Devices

1.2 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

Construction Site Plan; G

Traffic Control Plan; G

Haul Road Plan; G

DRAFT

SD-07 Certificates

Backflow Tester Certification

Backflow Preventers Certificate of Full Approval

1.3 CONSTRUCTION SITE PLAN

Prior to the start of work, submit for Government approval 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

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 a company participating in other phases 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.

DRAFT

1.5 DOD CONDITION OF READINESS (COR)

DOD will set the Condition of Readiness (COR) based on the weather forecast for sustained winds 50 knots (58 mph) or greater. Contact the Contracting Officer for the current COR setting.

Monitor weather conditions a minimum of twice a day and take appropriate actions according to the approved Emergency Plan in the accepted Accident Prevention Plan, EM 385-1-1 Section 01 Emergency Planning and the instructions below.

Unless otherwise directed by the Contracting Officer, comply with:

a. Condition FOUR (Sustained winds of 58 mph or greater expected within 72 hours): Normal daily jobsite cleanup and good housekeeping practices. Collect and store in piles or containers scrap lumber, waste material, and rubbish for removal and disposal at the close of each work day. Maintain the construction site including storage areas, free of accumulation of debris. Stack form lumber in neat piles less than 3.3 feet high. Remove all debris, trash, or objects that could become missile hazards. Review requirements pertaining to "Condition THREE" and continue action as necessary to attain "Condition FOUR" readiness. Contact Contracting Officer for weather and COR updates and completion of required actions.

b. Condition THREE (Sustained winds of 58 mph or greater expected within 48 hours): Maintain "Condition FOUR" requirements and commence securing operations necessary for "Condition ONE" which cannot be completed within 18 hours. Cease all routine activities which might interfere with securing operations. Commence securing and stow all gear and portable equipment. Make preparations for securing buildings. Reinforce or remove formwork and scaffolding. Secure machinery, tools, equipment, materials, or remove from the jobsite. Expend every effort to clear all missile hazards and loose equipment from general base areas. Contact Contracting Officer for weather and COR updates and completion of required actions. Review requirements pertaining to "Condition TWO" and continue action as necessary to attain "Condition THREE" readiness.

c. Condition TWO (Sustained winds of 58 mph or greater expected within 24 hours): Secure the jobsite, and leave Government premises.

d. Condition ONE. (Sustained winds of 58 mph or greater expected within 12 hours): Contractor access to the jobsite and Government premises is prohibited.

DRAFT

PART 2 PRODUCTS

2.1 TEMPORARY SIGNAGE

All project signage must be in accordance with EP 310-1-6a and ECB 2020-1.

2.1.1 Bulletin Board

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. 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.

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 construction hazards. Signs must require unauthorized persons to keep out of the construction site. Correct the data required by safety signs daily. Post signs at all points of entry designating the construction site as a hard hat area.

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; avoid sharp curves, blind corners, and dangerous cross traffic. 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 haul 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. Barricades are required 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. 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. All fencing must meet the requirements of EM 385-1-1. Remove the fence upon completion and acceptance of the work.

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 to form long spans 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 8 feet high supported by an tightly secured to galvanized steel posts driven below grade. Fence posts must be located on minimum 10 foot centers.

DRAFT

Posts may be set in various surfaces such as sand, soil, asphalt 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. Completely remove fencing and posts at the completion of construction and restore surfaces disturbed or damaged to its original condition. Locate and identify underground utilities prior to setting fence posts. Equip fence 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, brass mounted gate valve and strainer, 304 stainless steel or bronze, internal parts.

PART 3 EXECUTION

3.1 EMPLOYEE PARKING

Construction Contract employees must park privately owned vehicles in an area designated by the Contracting Officer. Employee parking must not interfere with existing and established parking requirements of the Government installation.

3.2 AVAILABILITY AND USE OF UTILITY SERVICES

3.2.1 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.

3.2.2 Advance Deposit

An advance deposit for utilities consisting of an estimated month's usage or a minimum of $50.00 will be required. The last monthly bills for the fiscal year will normally be offset by the deposit and adjustments will be billed or returned as appropriate. Services to be rendered for the next fiscal year, beginning 1 October, will require a new deposit. Notification of the due date for this deposit will be mailed prior to the end of the current fiscal year.

3.2.3 Final Meter Reading

Before completion of the work and final acceptance of the work by the Government, notify the Contracting Officer, in writing, 5 working days before termination is desired. The Government will take a final meter reading, disconnect service, and remove the meters. Then remove all the temporary distribution lines, meter bases, and associated appurtenances. Pay all outstanding utility bills before final acceptance of the work by the Government.

DRAFT

3.2.4 Water

Make connections to existing facilities to provide water for construction purposes. Water used will not be furnished by the Government.

3.2.5 Sanitation

Provide and maintain within the construction area minimum field-type sanitary facilities in accordance with EM 385-1-1 Section 02. Locate the facilities behind the construction fence or out of the public view. Clean units and empty wastes at least once a week or more frequently 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 a municipal, district, or commercial sanitary sewer system. 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.

3.2.6 Telephone

Make arrangements and pay all costs for telephone facilities desired.

3.2.7 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.

DRAFT

3.3 TRAFFIC PROVISIONS

3.3.1 Maintenance of Traffic

a. Conduct operations in a manner that will not close a thoroughfare or interfere 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 for Government approval 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. Make all notifications and obtain all permits required for modification to traffic movements outside Station's jurisdiction. 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 Contractor's expense, lights, barriers, signals, passageways, detours, and other items, that may be required by the Life Safety Signage, overhead protection authority having jurisdiction.

3.3.2 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. Provide self-illuminated (lighted) barricades during hours of darkness. Brightly-colored (orange) vests are required for all personnel working in roadways. 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 damage to roads caused by construction operations.

3.3.3 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.

3.4 CONTRACTOR'S TEMPORARY FACILITIES

Contractor-owned or -leased trailers must be identified by Government assigned numbers. Size and location of the number will comply with Contracting Officer. Apply the number to the trailer within 14 calendar days of notification, or sooner, if directed by the Government. Temporary facilities must meet requirements as identified in EM 385-1-1 Section 04.

Contractor is responsible for security of their property. Provide adequate outside security lighting at the temporary facilities. Trailers must be anchored to resist high winds and meet applicable state or local standards for anchoring mobile trailers. Coordinate anchoring with EM 385-1-1 Section 04. The Contract Clause entitled "FAR 52.236-10, Operations and Storage Areas" and the following apply:

3.4.1 Administrative Field Offices

Provide and maintain administrative field office facilities within the construction area at the designated site. Government office and warehouse facilities will not be available to the Contractor's personnel.

3.4.2 Storage Area

Construct a temporary 6 foot high chain link fence around trailers and materials. Include plastic strip inserts, colored green, so that visibility through the fence is obstructed. Fence posts may be driven, in lieu of concrete bases, where soil conditions permit. Do not place or store trailers, materials, or equipment outside the fenced area unless such trailers, materials, or equipment are assigned a separate and distinct storage area by the Contracting Officer away from the vicinity of the construction site but within the installation boundaries. Trailers, equipment, or materials must not be open to public view with the exception of those items which are in support of ongoing work on the current day. Do not stockpile materials outside the fence in preparation for the next day's work. Park mobile equipment, such as tractors, wheeled lifting equipment, cranes, trucks, and like equipment within the fenced area at

DRAFT

the end of each work day.

Keep fencing in a state of good repair and proper alignment. If the Contractor elects to traverse grassed or unpaved areas which are not established roadways with construction equipment or other vehicles, cover the grassed or unpaved areas with a layer of gravel as necessary to prevent rutting and the tracking of mud onto paved or established roadways; gravel gradation must be at the Contractor's discretion. Mow and maintain grass located within the boundaries of the construction site for the duration of the project. Grass and vegetation along fences, structures, under trailers, and in areas not accessible to mowers must be edged or trimmed neatly.

3.4.3 Supplemental Storage Area

Upon request, and pending availability, the Contracting Officer will designate another or supplemental area for the use and storage of trailers, equipment, and materials. This area may not be in close proximity of the construction site but will be within the installation boundaries. Maintain the area in a clean and orderly fashion and secured if needed to protect supplies and equipment. Utilities will not be provided to this area by the Government.

3.4.4 Appearance of Trailers

a. Trailers must be roadworthy and comply with all appropriate state and local vehicle requirements. Trailers which are rusted, have peeling paint or are otherwise in need of repair will not be allowed on Installation property. Trailers must present a clean and neat exterior appearance and be in a state of good repair.

b. Maintain the temporary facilities. Failure to do so will be sufficient reason to require their removal at the Contractor's expense.

3.4.5 Weather Protection of Temporary Facilities and Stored Materials

Take necessary precautions to ensure that roof openings and other critical openings in the building are monitored carefully. Take immediate actions required to seal off such openings when rain or other detrimental weather is imminent, and at the end of each workday. Ensure that the openings are completely sealed off to protect materials and equipment in the building from damage.

3.4.5.1 Building and Site Storm Protection

When a warning of gale force winds is issued, take precautions to minimize danger to persons, and protect the work and nearby Government property. Precautions must include, but are not limited to, closing openings; removing loose materials, tools and equipment from exposed locations; and removing or securing scaffolding and other temporary work. Close openings in the work when storms of lesser intensity pose a threat to the work or any nearby Government property.

3.5 GOVERNMENT FIELD OFFICE

3.5.1 Resident Engineer's Office

Furnish and maintain a trailer-type mobile office and trailer type conference room acceptable to and for the use of the Resident Engineer and

DRAFT

Contracting Officer or their designee. The trailers must be co-located within the project boundary. The trailers must be securely anchored to the ground at all four corners to guard against movement during high winds. Appropriate access ramps must be installed at each trailer. Doors must be lockable, and keys must be provided to the Government. Condition of the trailers must be clean and acceptable to the Government. At completion of the Project, the trailers must remain the property of the Contractor and must be removed from the site. Utilities must be connected and disconnected in accordance with local codes and to the satisfaction of the Government.

The furniture, equipment, and incidentals listed below must be provided, set up and maintained by the Contractor for the Resident Engineer's and Contracting Officer's office and conference area. The furniture, equipment, and incidentals listed below must remain the property of the Contractor and must be removed from the office after the Project is complete.

1. Office trailer, minimum 1200 square feet. Trailer must have:
   3 - 100 square foot minimum offices
   1 - 100 square foot minimum server/copier room Minimum of 1 restroom

2. Conference trailer, minimum 400 square feet.

3. Utilities and services: Continuous reliable power
   Continuous reliable potable water
   High speed Internet service (cable, DSL, etc.)
   Telephone service capable of 3 separate phone lines (2 to main trailer, 1 to conference trailer)
   Regular garbage service
   Minimum of 1 field-type sanitary facility adjacent to the trailer
   Waste disposal service or sanitary sewer connection
   Bottled Water Service
   Heating and cooling for trailers. Equipment must maintain an ambient air temperature of 70 degrees Fahrenheit
   Weekly cleaning service (including supplies)

4. Furniture and Appliances
   6 desks with drawers
   6 office chairs
   6 waste baskets
   10 folding tables, 6' long
   40 stackable chairs
   10 bookshelves, 3 feet by 5 feet
   4 - 2 drawer file cabinets
   1 refrigerator approximately 20 cubic feet.
   1 microwave.
   1 - 2 line desk phone
   2 "conference" type phones with 2 remote microphones each
   3 - 5 1b, non-toxic, dry chemical fire extinguishers
   2 - Dry erase boards

5. Network and Connectivity:
   Office trailer data network with server and wired connections to the 3 offices, the copier/scanner and 3 connections to the main part of the office trailer.

   Office trailer wi-fi router capable of being accessed from all parts

DRAFT

of the office trailer.

Conference trailer wi-fi router capable of being accessed from all parts of the conference trailer.

6. Adequate security of all facilities and furnished equipment.

7. Trailers must be cleaned weekly.

8. Parking - Suitable all weather parking must be provided in the immediate vicinity of the trailers. Surface must meet SWPPP requirements.

9. Grass & weeds must be cut or sprayed a minimum of once per month.

10. Temporary 8 foot high chain link fence with gate around trailers.

11. Temporary lighting for parking area.

The Contractor may, at its option, furnish and maintain a building-type mobile office or a permanent building acceptable to USACE and providing, as a minimum, the facilities specified above.

3.6 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, remove from the work site.

3.7 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 all 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.

3.8 RESTORATION OF STORAGE AREA

Upon completion of the project remove the bulletin board, signs, barricades, haul roads, and all 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 --

DRAFT

SECTION TABLE OF CONTENTS

DIVISION 01 - GENERAL REQUIREMENTS

SECTION 01 57 19

TEMPORARY ENVIRONMENTAL CONTROLS

PART 1 GENERAL

1.1 REFERENCES
1.2 DEFINITIONS
1.2.1 Active Nest
1.2.2 Class I and II Ozone Depleting Substance (ODS)
1.2.3 Contractor Generated Hazardous Waste
1.2.4 Electronics Waste
1.2.5 Environmental Pollution and Damage
1.2.6 Environmental Protection
1.2.7 Hazardous Debris
1.2.8 Hazardous Materials
1.2.9 Hazardous Waste
1.2.10 Inactive Nest
1.2.11 Land Application for Discharge Water
1.2.12 Listed Bird Species
1.2.13 Non-Nesting Season
1.2.14 Municipal Separate Storm Sewer System (MS4) Permit
1.2.15 National Pollutant Discharge Elimination System (NPDES)
1.2.16 Oily Waste
1.2.17 Pesticide
1.2.18 Pesticide Treatment Plan
1.2.19 Pests
1.2.20 Regulated Waste
1.2.21 Sediment
1.2.22 Solid Waste
1.2.22.1 Debris
1.2.22.2 Green Waste
1.2.22.3 Material Not Regulated as Solid Waste
1.2.22.4 Non-Hazardous Waste
1.2.22.5 Recyclables
1.2.22.6 Surplus Soil
1.2.22.7 Scrap Metal
1.2.22.8 Wood
1.2.23 Surface Discharge
1.2.24 Wastewater
1.2.24.1 Storm Water
1.2.25 Waters of the United States
1.2.26 Wetlands
1.2.27 Universal Waste
1.3 GENERAL REQUIREMENTS
1.4 SUBMITTALS
1.5 ENVIRONMENTAL PROTECTION REQUIREMENTS
1.5.1 Protection Features
1.6 QUALITY CONTROL
1.6.1 Preconstruction Survey and Protection of Features

DRAFT

1.6.2 Regulatory Notifications
1.6.3 Environmental Brief
1.6.4 Environmental Manager
1.6.5 Employee Training Records
1.6.6 Non-Compliance Notifications
1.7 ENVIRONMENTAL PROTECTION PLAN
1.7.1 General Overview and Purpose
1.7.1.1 Descriptions
1.7.1.2 Duties
1.7.1.3 Procedures
1.7.1.4 Communications
1.7.1.5 Contact Information
1.7.2 General Site Information
1.7.2.1 Drawings
1.7.2.2 Work Area
1.7.2.3 Traffic Control Plan
1.7.2.4 Appointment Letter
1.7.3 Management of Natural Resources
1.7.4 Protection of Historical and Archaeological Resources
1.7.5 Stormwater Management and Control
1.7.6 Protection of the Environment from Waste Derived from Contractor Operations
1.7.7 Non-Hazardous Solid Waste Disposal Plan
1.7.8 Regulatory Notification and Permits
1.7.9 Contaminant Prevention Plan
1.7.10 Clean Air Act Compliance
1.7.10.1 Air Quality Control Plan
1.7.10.2 Haul Route
1.7.10.3 Pollution Generating Equipment
1.7.10.4 Stationary Internal Combustion Engines
1.7.10.5 Refrigerants
1.7.10.6 Air Pollution-engineering Processes
1.7.11 Waste Water Management Plan
1.7.12 Historical, Archaeological, Cultural Resources Biological Resources and Wetlands Protection Plans
1.7.13 Compliance
1.7.14 Appendix
1.8 LICENSES AND PERMITS
1.8.1 Air Quality
1.8.2 Asbestos Dust Mitigation
1.8.3 Portable Equipment Registration Program (PERP)
1.8.4 Dewatering Permit
1.8.5 Construction General Permit (NPDES Permit)
1.8.6 Solid Waste Management Permit
1.8.6.1 Solid Waste Management Report
1.9 ENVIRONMENTAL RECORDS BINDER
1.10 ENVIRONMENTAL ASSESSMENT OF CONTRACT DEVIATIONS
1.11 NOTIFICATION

PART 2 PRODUCTS

2.1 COMPLIANT MATERIALS
2.2 PREVIOUSLY USED EQUIPMENT

PART 3 EXECUTION

3.1 PROTECTION OF NATURAL RESOURCES
3.1.1 Flow Ways
3.1.2 Vegetation

DRAFT

3.2 STORM WATER
3.2.1 Construction General Permit
3.2.1.1 Stormwater Pollution Prevention Plan
3.3 LAND RESOURCES
3.3.1 Work Area Limits
3.3.2 Contractor Facilities and Work Areas
3.3.3 Landscape
3.3.4 Tree Protection
3.3.4.1 Existing Tree Preservation
3.3.4.2 Fencing Existing Trees for Preservation
3.3.5 Erosion and Sediment Controls
3.4 WATER RESOURCES
3.4.1 Wetlands
3.5 ARCHAELOGICAL AND TRIBAL MONITORING AND SUPPORT SERVICES
3.5.1 Archaeological Monitor Qualifications
3.5.2 Archaeological Monitor Responsibilities
3.5.3 Tribal Monitors
3.5.4 Post Review Discoveries
3.5.5 Human Remains
3.5.6 Recovery of Human Remains
3.5.7 Storage Trailer for Archaeological and Tribal Monitoring
3.6 BIOLOGICAL RESOURCES
3.6.1 State Listed Birds
3.6.2 Migratory Birds
3.6.3 Western Yellow Billed Cuckoo
3.6.4 Elderberry Shrubs
3.6.5 Fish and Wildlife
3.6.5.1 Wildlife Encounters During Construction
3.7 AIR RESOURCES
3.7.1 Preconstruction Air Permits
3.7.2 Air Quality Control
3.7.3 Rule 201 Authority to Construct/Permit to Operate
3.7.4 Asbestos Dust Mitigation Plan and Application
3.7.5 Dust Control
3.7.5.1 Particulates
3.7.6 Odors
3.7.7 Burning
3.7.8 On-Road Equipment
3.7.9 Off-Road Diesel-Powered Equipment
3.7.9.1 NOx and PM Emissions
3.7.9.2 Visible Emissions
3.7.9.3 PM10 Dust
3.7.9.4 Naturally Occurring Asbestos (NOA)
3.7.10 Diesel Generators
3.8 SOUND INTRUSION
3.8.1 Heavy Truck Delivery Restrictions
3.9 CHEMICAL MATERIALS MANAGEMENT AND WASTE DISPOSAL
3.9.1 Solid Wastes
3.9.2 Chemicals and Chemical Wastes
3.9.3 Contractor Generated Hazardous Wastes/Excess Hazardous Materials
3.9.4 Fuel and Lubricants
3.10 RECYCLING AND WASTE MINIMIZATION
3.11 NON-HAZARDOUS SOLID WASTE DIVERSION REPORT
3.12 WASTE MANAGEMENT AND DISPOSAL
3.12.1 Waste Determination Documentation
3.12.2 Solid Waste Management
3.12.2.1 Solid Waste Management Report
3.12.2.2 Control and Management of Solid Wastes

DRAFT

3.12.3 Control and Management of Hazardous Waste
3.12.3.1 Hazardous Waste/Debris Management
3.12.3.2 Universal Waste Management
3.12.3.3 Electronics End-of-Life Management
3.12.3.4 Disposal Documentation for Hazardous and Regulated Waste
3.12.4 Releases/Spills of Oil and Hazardous Substances
3.12.4.1 Response and Notifications
3.12.4.2 Clean Up
3.12.5 Mercury Materials
3.12.6 Wastewater
3.12.6.1 Treatment
3.12.6.2 Surface Discharge
3.12.6.3 Land Application
3.13 HAZARDOUS MATERIAL MANAGEMENT
3.13.1 Control and Management of Asbestos-Containing Material (ACM)
3.13.2 Control and Management of Lead-Based Paint (LBP)
3.13.3 Control and Management of Polychlorinated Biphenyls (PCBS)
3.13.4 Control and Management of Lighting Ballast And Lamps Containing PCBS
3.14 PREVIOUSLY USED EQUIPMENT
3.15 MAINTENANCE OF POLLUTION FACILITIES
3.16 MILITARY MUNITIONS
3.17 OIL
3.17.1 Used Oil Management
3.17.2 Oil Storage Including Fuel Tanks
3.18 INADVERTENT DISCOVERY OF PETROLEUM-CONTAMINATED SOIL OR HAZARDOUS WASTES
3.19 TRAINING OF CONTRACTOR PERSONNEL
3.20 POST CONSTRUCTION CLEANUP

-- End of Section Table of Contents --

DRAFT

SECTION 01 57 19

TEMPORARY ENVIRONMENTAL CONTROLS

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.

CALIFORNIA AIR RESOURCES BOARD (CARB)

CARB 13 CCR 2450-2466	Portable Equipment and Engine Registration
CARB 17 CCR 93105	(2001) Asbestos ATCM for Construction, Grading, Quarrying, and Surface Mining Operations

CENTRAL VALLEY REGIONAL WATER QUALITY CONTROL BOARD (CVRWQCB)

GO R5-2013-0073-01	(2013) Waste Discharge Requirements for Limited Threat Discharges of Treated/Untreated Groundwater from Cleanup Sites, Wastewater from Superchlorination Projects, and Other Limited Threat Wastewaters to Surface Water
GO R5-2013-0074	(2013) Waste Discharge Requirements For Dewatering and Other Low Threat Discharges to Surface Waters

SACRAMENTO METROPOLITAN AIR QUALITY MANAGEMENT DISTRICT (SMAQMD)

NOx Mitigation	SMAQMD Construction Emissions Mitigation
PERP Registration	SMAQMD Portable Equipment Registration Program (PERP)
PM10 Plan	SMAQMD Particulate Matter (PM) 10 Attainment Redesignation and Maintenance Plan
PM2.5 SIP	SMAQMD Particulate Matter (PM) 2.5 State Implementation Plan
SMAQMD Rule 201	(2006) General Permit Requirements

U.S. ARMY CORPS OF ENGINEERS (USACE)

EM 385-1-1	(2024) Safety -- Safety and Occupational Health (SOH) Requirements
ERDC/EL TR-08-28	(2008) Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Arid

DRAFT

	West Region (Version 2.0)
TR Y-87-1	(1987) Corps of Engineers Wetlands Delineation Manual
U.S. Code (USC)	
16 USC 703-712	Endangered Species Act
U.S. NATIONAL ARCHIVES AND RECORDS ADMINISTRATION (NARA)	
29 CFR 1910.120	Hazardous Waste Operations and Emergency Response
33 CFR 328	Definition of Waters of the United States
40 CFR 50	National Primary and Secondary Ambient Air Quality Standards
40 CFR 60	Standards of Performance for New Stationary Sources
40 CFR 61	National Emission Standards for Hazardous Air Pollutants
40 CFR 63	National Emission Standards for Hazardous Air Pollutants for Source Categories
40 CFR 112	Oil Pollution Prevention
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 260	Hazardous Waste Management System: General
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

DRAFT

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 273.2	Standards for Universal Waste Management - Batteries
40 CFR 273.4	Standards for Universal Waste Management - Mercury Containing Equipment
40 CFR 273.5	Standards for Universal Waste Management - Lamps
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
40 CFR 403	General Pretreatment Regulations for Existing and New Sources of Pollution
40 CFR 745	Lead-Based Paint Poisoning Prevention in Certain Residential Structures
40 CFR 761	Polychlorinated Biphenyls (PCBs) Manufacturing, Processing, Distribution in Commerce, and Use Prohibitions
40 CFR 82	Protection of Stratospheric Ozone
49 CFR 171 - 178	Hazardous Materials Regulations
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

1.2 DEFINITIONS

1.2.1 Active Nest

Active nest refers to any bird nest with eggs or chicks present.

DRAFT

1.2.2 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.

1.2.3 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.

1.2.4 Electronics Waste

Electronics waste is discarded electronic devices intended for salvage, recycling, or disposal.

1.2.5 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.

1.2.6 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.

1.2.7 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.

1.2.8 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

DRAFT

(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).

1.2.9 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.

1.2.10 Inactive Nest

Inactive nest refers to any bird nest without eggs or chicks present.

1.2.11 Land Application for Discharge Water

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" is allowed. Comply with federal, state, and local laws and regulations.

1.2.12 Listed Bird Species

Listed bird species or "listed species" refers to any species of bird classified as threatened or endangered by the Federal Government or by the State of California. It also refers to any species of bird classified as a Species of Special Concern by the State of California.

1.2.13 Non-Nesting Season

Non-nesting season refers to the period beginning on September 2 and continuing through February 14.

1.2.14 Municipal Separate Storm Sewer System (MS4) Permit

MS4 permits are those held by projects to obtain NPDES permit coverage for their stormwater discharges.

1.2.15 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. Note: the U.S. EPA delegates NPDES permitting authority to the State of California See SECTION 01 57 23 TEMPORARY STORM WATER POLLUTION CONTROL.

DRAFT

1.2.16 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.

1.2.17 Pesticide

Pesticide is any substance or mixture of substances intended for preventing, destroying, repelling, or mitigating any pest, or intended for use as a plant regulator, defoliant or desiccant.

1.2.18 Pesticide Treatment Plan

A plan for the prevention, monitoring, and control to eliminate pest infestation.

1.2.19 Pests

Pests are arthropods, birds, rodents, nematodes, fungi, bacteria, viruses, algae, snails, marine borers, snakes, weeds and other organisms (except for human or animal disease-causing organisms) that adversely affect readiness, military operations, or the well-being of personnel and animals; attack or damage real property, supplies, equipment, or vegetation; or are otherwise undesirable.

1.2.20 Regulated Waste

Regulated waste are solid wastes that have specific additional federal, state, or local controls for handling, storage, or disposal.

1.2.21 Sediment

Sediment is soil and other debris that have eroded and have been transported by runoff water or wind.

1.2.22 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:

DRAFT

1.2.22.1 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 not 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.

1.2.22.2 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.

1.2.22.3 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.

1.2.22.4 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.

1.2.22.5 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 not 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.

1.2.22.6 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

DRAFT

must be managed in accordance with paragraph HAZARDOUS MATERIAL MANAGEMENT.

1.2.22.7 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.

1.2.22.8 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.

1.2.23 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.

1.2.24 Wastewater

Wastewater is the used water and solids from a community that flow to a treatment plant.

1.2.24.1 Storm Water

Storm Water 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. See SECTION 01 57 23 TEMPORARY STORM WATER POLLUTION CONTROL for construction storm water management requirements.

1.2.25 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 and 33 CFR 328.

1.2.26 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. Wetlands generally include swamps, seasonal, semi-permanent, and permanent marshes, and bogs, and thereby, are considered as waters of the United States. Official determination of whether or not an area is classified as a wetland must be done in accordance with TR Y-87-1 and the ERDC/EL TR-08-28. Use these documents to determine the limits or boundaries of jurisdictional Waters of the United States (which include wetlands).

DRAFT

1.2.27 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.

1.3 GENERAL REQUIREMENTS

Minimize environmental pollution and damage that may occur as the result of construction operations. 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 all applicable environmental Federal, State, local laws, regulations, and mitigation requirements. Any delays resulting from failure to comply with environmental laws and regulations will be the Contractor's responsibility.

1.4 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-01 Preconstruction Submittals

Preconstruction Survey; G

Solid Waste Management Permit; G

Regulatory Notifications; G

Environmental Protection Plan; G

Dirt and Dust Control Plan; G

Environmental Manager Qualifications; G

Air Quality Control Plan; G

Waste Water Management Plan; G

Asbestos Dust Mitigation Plan and Application; G, DO

Historical, Archaeological, and Cultural Resources Protection Plan; G

Biological Resources and Wetlands Protection Plan; G

Traffic Control Plan; G

Storm Water Notice of Intent; G

DRAFT

Environmental Permit Application

SD-06 Test Reports

Solid Waste Management Report; G

Air Quality Control Plan Reports; G, DO

PERP Data; G, DO

Non-Hazardous Solid Waste Diversion Report

Solid Waste Disposal Report

SD-07 Certificates

Employee Training Records; G

SD-11 Closeout Submittals

Waste Determination Documentation; G

Hazardous Waste/Debris Management; G

Disposal Documentation for Hazardous and Regulated Waste; G

Assembled Employee Training Records; G

Post-Construction Survey; G

Sales Documentation; G

Contractor Certification

Environmental Records Binder

Solid Waste Disposal Closeout Report

DRAFT

1.5 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.

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.

1.5.1 Protection Features

This paragraph supplements the Contract Clause PROTECTION OF EXISTING VEGETATION, STRUCTURES, EQUIPMENT, UTILITIES, AND IMPROVEMENTS. Prior to start of any onsite construction activities, the Contractor and the Contracting Officer will make a joint condition survey. Immediately following the survey, prepare a brief report including 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 assigned storage areas and access routes) as applicable. Both the Contractor and the Contracting Officer will sign this survey report upon mutual agreement as to its accuracy and completeness. Protect those environmental features included in the survey report and any indicated on the drawings, regardless of interference which their preservation may cause to the work under the contract.

1.6 QUALITY CONTROL

1.6.1 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 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.

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1.6.2 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 within 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).

1.6.3 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 onto the installation; 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 installation Environmental Office 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.

1.6.4 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, local, and installation 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.

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1.6.5 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 federal, state, and local 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 Certification as required by California.

1.6.6 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. No time extensions will be granted or equitable adjustments allowed for any such suspensions. This is in addition to any other actions the Contracting Officer may take under the Contract, or in accordance with the Federal Acquisition Regulation or Federal Law.

1.7 ENVIRONMENTAL PROTECTION PLAN

The purpose of the Environmental Protection Plan (EPP) is to present an overview of known or potential environmental issues that must be considered and addressed during construction. Incorporate construction related objectives and targets into the EPP. Include in the EPP measures for protecting natural and cultural resources, required reports, and other measures to be taken. Meet with the Contracting Officer or Contracting Officer Representative 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 execution of the notice to proceed and not less than 10 days before the preconstruction meeting. Define issues of concern within the EPP as outlined in this section. Address each topic at a level of detail commensurate with the environmental issue and required construction task(s). Identify and discuss topics or issues which are not identified in this section but are considered necessary after those items formally identified in this section. The Environmental Engineer must meet the respective Experience Matrix requirements of SECTION 01 45 00 CONTRACTOR QUALITY CONTROL. Develop, enforce, and 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.

DRAFT

Conduct an EPP meeting one week after NTP is executed by the Contracting Officer. Request and schedule the meeting to be held at the Resident Office. The following Contractor representatives must be present: the Project Manager (or appropriate technical person), and the environmental staff. Prepare to discuss implementation of the initial EPP; the process for future subsequent additions and revisions to the plan as necessary, including any reporting requirements; and methods for administration of the Environmental Plans. This meeting is required prior to Government approval of the EPP submittal.

The EPP includes, but is not limited to, the following elements:

a. list of Federal, State, and local laws, regulations, and permits concerning environmental protection, pollution control and abatement that are applicable to the Contractor's proposed operations and the requirements imposed by those laws, regulations, and permits.

b. Methods for protection of features to be preserved within authorized work areas such as trees, shrubs, vines, grasses and ground cover, landscape features, air and water quality, fish and wildlife, soil, historical, archaeological, and cultural resources.

c. Procedures to be implemented to provide the required environmental

protection, to comply with the applicable laws and regulations, and to correct pollution due to accident, natural causes, or failure to follow the procedures of the environmental protection plan.

d. A contamination prevention section listing all potentially hazardous petroleum products and toxic materials to be used on the job site and corresponding provisions to be taken to prevent accidental or intentional introduction of such materials into any waterway, the air, or the ground. This section must include plans for preventing polluted runoff from plant, equipment parking, and maintenance areas from entering directly into local water bodies.

e. A contaminant cleanup section including the procedures, instructions, and reports to be used. This section must include as a minimum: the name of the individual who will report any spills, be responsible for implementing and supervising containment and cleanup, and will follow-up with complete documentation for methods and procedures to be used for expeditious cleanup.

f. Indicate the location and type of solid waste disposal area. List wastes to be disposed.

g. Drawings showing locations of any proposed temporary excavations or embankments for haul roads, material storage areas, structures, sanitary facilities, and stockpiles of excess or spoil materials. Deviation from drawings will require approval.

h. The traffic control plan must include all intended haul routes, location of signage, location of flaggers, approved permits, documentation of coordination with local and state agencies, location of potential traffic delays to vehicle and pedestrian traffic.

i. Methods of protecting surface and ground water during construction activities.

j. Plan showing the proposed activity in each portion of the work area and identifying the areas of limited use or nonuse. Plan should include measures for marking the limits of use areas. The plan must also include details on where construction fencing will be placed.

k. Drawing of borrow area location. Protection measures required at the work site must apply to the borrow areas including final restoration for subsequent beneficial use of the land.

l. A recycling and waste prevention plan with a list of measures to reduce consumption of energy and natural resources; for example, the possibility to shred fallen trees and use them as mulch must be considered as an alternative to landfill disposal. Burning onsite will not be allowed.

m. A wind and water erosion control section for any construction which will disturb the earth's surface and could introduce turbidity into water courses or dust into the air. This section must include the Contractor's plan for controlling erosion and disposing of wastes including surface drainage from cuts, fills, and waste disposal areas. Temporary erosion and sediment control measures such as seeding, mulching, sprinkling, and installing temporary ditches, dikes, drains, or sedimentation basins must be identified. Elements of this plan must include provisions for responding to increases in river stage and

DRAFT

local precipitation during construction.

n. Environmental monitoring plans for the job site, including land, water, air, and noise monitoring.

o. A time schedule specifying the approximate time of expected or possible turbidity generating activities.

p. Description of the Contractor's Environmental Protection Personnel training program.

q. Name(s) of person(s) within the Contractor's organization who is(are) responsible for ensuring adherence to the Environmental Protection Plan.

r. Name(s) and qualifications of person(s) responsible for training the Contractor's environmental protection personnel.

s. Traffic control plans including measures to reduce erosion of temporary roadbeds by construction traffic, especially during wet weather. Plan must include measures to minimize the amount of mud transported onto paved public roads by vehicles or runoff.

t. A historical, archaeological, cultural resources biological resources, and wetlands plan that defines procedures for identifying and protecting historical, archaeological, cultural resources, biological resources, and wetlands known to be on the project site and/or identifies procedures to be followed if historical archaeological, cultural resources, biological resources and wetlands not previously known to be onsite or in the area are discovered during construction. Include in the plan methods to assure the protection of known or discovered resources, identifying lines of communication between Contractor personnel and the Contracting Officer.

u. A plan to identify and safely remove any contaminants within the capped 4-inch diameter Sewer Force Main.

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1.7.1 General Overview and Purpose

1.7.1.1 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, and borrowing material plan.

1.7.1.2 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.

a. Name(s) and qualifications of person(s) within the Contractor's organization who is(are) responsible for ensuring adherence to the EPP.

b. Name(s) and qualifications of person(s) responsible for manifesting hazardous waste to be removed from the site, if applicable.

c. Name(s) and qualifications of person(s) responsible for training the Contractor's environmental protection personnel.

d. Description of the Contractor's environmental protection personnel training program.

1.7.1.3 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.

1.7.1.4 Communications

Communication and training procedures that will be used to convey environmental management requirements to Contractor employees and subcontractors.

1.7.1.5 Contact Information

Emergency contact information (office phone number, cell phone number, and e-mail address).

1.7.2 General Site Information

1.7.2.1 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 or spoil materials including methods to control runoff and to contain materials on the site. Drawings showing in-water structures, equipment locations, and material placement and disposal sites.

1.7.2.2 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.

1.7.2.3 Traffic Control Plan

Develop a Traffic Control Plan before start of construction activities and submit for approval. Include measures to reduce erosion of temporary roadbeds by construction traffic, especially during wet weather. Also include measures to minimize the amount of mud transported onto paved public roads by vehicles or runoff. Provide temporary traffic control devices as required with the CDT MUTCD in accordance with Section 01 50 00

DRAFT

TEMPORARY CONSTRUCTION FACILITIES AND CONTROLS. As appropriate, include slow-moving-vehicle warning signs, barriers for separating construction and non-construction traffic, use of traffic-control flagmen, and any additional measures required for the sole convenience of non-construction traffic to safely pass through and around construction areas and access points thereto. The Traffic Control Plan must include recreational traffic such as bicycles and pedestrians.

Implement the following measures:

a. Control traffic during mobilization, de-mobilization, and hauling activities, leading from the primary access road(s) and extending beyond the ingress and egress locations to the construction area. This includes the use of flagmen, signs, and/or limiting speeds to 15 m.p.h. as best management practices.

b. Schedule heavy truck traffic, unloading and hauling during non-peak periods. Schedule worker shift changes so as not to coincide with existing background traffic peak periods. Commence required bulk hauling of construction materials as soon as on-site storage and staging areas are developed. Spread out the required bulk hauling over a longer period of time to minimize impacts to the existing facilities. Include video or photos of the private and public roads used for construction access and hauling in the Preconstruction Survey and Protection of Features. Document the same features and submit post-construction survey after completion of construction. Repair all roads damaged during construction activities and daily sweep clean any mud or dirt it leaves on paved roads.

c. Coordinate emergency response vehicle routes with local emergency response agencies regarding any routes affected by construction traffic or closures. If additional haul routes are proposed, utilize routes where existing roadways would result in the least amount of impact to existing background traffic.

d. Expand existing intersections used for project access as required by Caltrans, the Contracting Officer, and County and City to reduce traffic conflicts and congestions and increase road safety for project and background traffic.

e. Encourage or facilitate ride-sharing among construction personnel to reduce worker commute trips entering and exiting the project area.

1.7.2.4 Appointment Letter

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.

1.7.3 Management of Natural Resources

a. Land resources

b. Tree protection

c. Replacement of damaged landscape features

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d. Temporary construction

e. Fish and wildlife resources

f. Wetland areas

1.7.4 Protection of Historical and Archaeological Resources

Known historical, archaeological, and cultural resources within or adjacent the construction footprint will be protected from construction activities. Install exclusionary fencing around the known resource. If vehicular traffic must be maintained in the discovery area, the Contractor must work with the Government to develop a protective measure appropriate for the specific discovery, to the extent practicable. The exemption would be resources identified has having impacts from construction activities. USACE Archaeologist will provide a map of know resources requiring protection.

It is possible for ground disturbing activity to expose prehistoric or historic archeological features and deposits. Should archeological features or deposits be discovered during any construction, demolition, excavation, grading, or related actions, the Contractor must suspend all activity that would affect the discovered archeology and must immediately notify the Contracting Officer. The exception to this is that work will not stop during the actual construction of the cutoff wall because of deep trenching methods employed and safety concerns. In the event of a discovery, all work in the vicinity of the discovery must stop until the site may be evaluated by an archaeologist that individually meets the standards of the Secretary of the Interior and required consultation/coordination can be completed with the State Historic Preservation Officer and, when American Indian archeology is included in the discovery, representatives of the Native American Indian community. Install exclusionary fencing around the area of the discovery. If vehicular traffic must be maintained in the discovery area, the Contractor must work with the Government to develop a protective measure appropriate for the specific discovery, to the extent practicable.

If during excavation or other construction activities, any previously unidentified or unanticipated historical, archaeological, and cultural resources are discovered or found, all activities that may damage or alter such resources will be temporarily 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, paving, wall, concrete foundations, tin cans, nails, wood fragments, glass, ceramic, or other ephemeral and transient materials, 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 final significance and what, if any, special disposition of the finds should be made. Cease all activities that may result in impacts to or the destruction of these resources and move activities to another area a minimum of 100 feet from the resource. Secure the area and prevent employees or other persons from trespassing on, removing, or otherwise disturbing such resources.

In the event that any human remains are uncovered/discovered the Archaeological Monitor must immediately notify the Contractor, who must immediately notify the Contracting Officer. The Archaeological Monitor

DRAFT

must comply with California Health and Safety Code (CHSC) Section 7050.5 requirements. Do not continue work within the exclusion area until notified to proceed by the Contracting Officer. For the period of time between the discovery of Native American human remains, notification of the coroner, identification of the Most Likely Descendant (MLD), and consultation with the Landowner, install exclusionary fencing around the area of the discovery. If vehicular traffic must be maintained in the discovery area, the Contractor must work with the Government to develop a protective measure appropriate for the specific discovery, to the extent practicable. Install protective measures and cover intact remains as appropriate. If remains are displaced and unable to be secured in place, store the remains in a locked, secure, and climate-controlled location within the construction site.

1.7.5 Stormwater Management and Control

A copy of the approved project SWPPP submittal per Section 01 57 23 TEMPORARY STORM WATER POLLUTION CONTROL.

1.7.6 Protection of the Environment from Waste Derived from Contractor Operations

Control and disposal of solid and sanitary waste. Control and disposal of hazardous waste. Take sufficient measures to prevent spillage of hazardous and toxic materials during dispensing. Segregate hazardous waste from other materials and wastes, protect it from the weather by placing it in a safe covered location, and take precautionary measures such as berming or other appropriate measures against accidental spillage.

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. Hazardous wastes are defined in 40 CFR 261, or are as defined by applicable State and local regulations. Hazardous materials are defined in 49 CFR 171 - 178.

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). At a minimum, manage and store hazardous waste in compliance with 40 CFR 262 in accordance with the Project Office hazardous waste management plan.

e. Management procedures for storage, labeling, transportation, and disposal of waste (treatment of waste is not allowed unless specifically noted). Storage, describing, packaging, labeling, marking, and placarding of hazardous waste and hazardous material in accordance with 49 CFR 171 - 178, State, and local laws and regulations is the Contractor's responsibility.

f. Management procedures and regulatory documentation ensuring disposal of hazardous waste complies with Land Disposal Restrictions (40 CFR 268)

DRAFT

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.

1.7.7 Non-Hazardous Solid Waste Disposal Plan

Non-hazardous solid waste disposal plan identifying methods and locations for solid waste disposal including clearing debris and schedules for disposal.

a. Identify any subcontractors responsible for the transportation and disposal of solid waste. Submit licenses or permits for solid waste disposal sites that are not a commercial operating facility.

b. Attach evidence of the disposal facility's acceptance of the solid waste to this plan during the construction.

c. A recycling and solid waste minimization plan with a list of measures to reduce consumption of energy and natural resources. Detail in the plan the Contractor's actions to comply with and to participate in Federal, State, Regional, and local Government sponsored recycling programs to reduce the volume of solid waste at the source.

1.7.8 Regulatory Notification and Permits

List the Federal, State and local laws, regulations, notifications, permit applications, mitigation requirements concerning environmental protection, pollution control and abatement that must be made. Obtain those permits and include copies of applicable environmental permits. The EPP will not be approved until the permits have been obtained.

1.7.9 Contaminant Prevention Plan

A contaminant prevention plan that: identifies potentially hazardous substances to be used on the job site; identifies the intended actions to prevent introduction of such materials into the air, water, or ground; and details provisions for compliance with Federal, State, and local laws and regulations for storage and handling of these materials. In accordance with EM 385-1-1, a copy of the SDS and the maximum quantity of each hazardous material to be onsite at any given time must be included in the contaminant prevention plan. Update the plan as new hazardous materials are brought onsite or removed from the site.

1.7.10 Clean Air Act Compliance

1.7.10.1 Air Quality Control Plan

Prior to construction, coordinate with SMAQMD and CARB to comply with the PERP Registration requirements. Develop and submit an Air Quality Control Plan to demonstrate compliance with local and state air quality laws and regulations, as required by SMAQMD and CARB. PERP Registration must indicate how the requirements would, or would not meet agency standards,

DRAFT

and a list of equipment, including on-road, off-road, marine, stationary and portable equipment, to be used on the project. The Air Quality Control Plan includes detailed provisions to assure that air pollutant emissions are kept below SMAQMD's current, listed threshold levels, with the exception of SMAQMD's recommended threshold level for carbon dioxide. If the project air emissions calculations indicate that the project does not meet SMAQMD thresholds, for NOx, the Contractor is required to coordinate with and follow the requirements of SMAQMD's standard NOx Mitigation program. If the project air emissions calculations indicate that the project does not meet SMAQMD thresholds for particulate matter (PM; includes PM10 and PM2.5), coordinate with and follow the requirements of PM Mitigation program. Pay mitigation fees to SMAQMD as required. At a minimum, the Air Quality Control Plan must include:

a. Detailed measures to insure that dust, debris, materials, trash, etc.,do not become airborne and travel off site.

b. A comprehensive inventory of all off-road construction equipment. The inventory must include horsepower rating, engine production year, and projected hours of use or fuel throughout the project for each piece of equipment.

c. A comprehensive inventory of all on-road construction equipment. The inventory includes model year of truck engines, vehicle miles traveled per day and number of days of operation

d. An air quality analysis of equipment to be utilized for the project.

e. A description of all procedures.

f. A description of the construction schedule.

g. Names and phone numbers of the Contractor's project manager and onsite foreman.

DRAFT

1.7.10.2 Haul Route

Submit truck and material haul routes along with a Dirt and Dust Control Plan for controlling dirt, debris, and dust on Installation 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.

1.7.10.3 Pollution Generating Equipment

Identify air pollution generating equipment or processes that may require federal, state, or local permits under the Clean Air Act. Determine requirements based on any current installation permits and the impacts of the project. Provide a list of all fixed or mobile equipment, machinery or operations that could generate air emissions during the project to the Government's Environmental Office and SMAQMD.

1.7.10.4 Stationary Internal Combustion Engines

Identify portable and stationary internal combustion engines that will be supplied, used or serviced. Comply with 40 CFR 60 Subpart IIII, 40 CFR 60 Subpart JJJJ, 40 CFR 63 Subpart ZZZZ, and local regulations as applicable. At minimum, include the make, model, serial number, manufacture date, size (engine brake horsepower), and EPA emission

certification status of each engine. Maintain applicable records and log hours of operation and fuel use. Logs must include reasons for operation and delineate between emergency and non-emergency operation.

1.7.10.5 Refrigerants

Identify management practices to ensure that heating, ventilation, and air conditioning (HVAC) work involving refrigerants complies with 40 CFR 82 requirements. Technicians must be certified, maintain copies of certification on site, use certified equipment and log work that requires the addition or removal of refrigerant. Any refrigerant reclaimed is the property of the Government, coordinate with the Government's Environmental Office to determine the appropriate turn in location.

1.7.10.6 Air Pollution-engineering Processes

Identify planned air pollution-generating processes and management control measures (including, but not limited to, spray painting, abrasive blasting, demolition, material handling, fugitive dust, and fugitive emissions). Log hours of operations and track quantities of materials used.

1.7.11 Waste Water Management Plan

The Waste Water Management Plan must identify all waste water management methods and procedures details of waste water discharges which are directly derived from construction activities, including concrete curing water, clean-up water, dewatering of ground water, disinfection water, hydrostatic test water, and water used in flushing of lines. No retention basins will be permitted. If land application will be the method of waste water disposal, the plan must include a permit for such activity and a sketch showing the location for land application along with a description of the pretreatment methods to be implemented. If surface discharge will be the method of disposal, include a copy of the permit and associated documents as an attachment prior to discharging the waste water. If disposal is to a sanitary sewer, the plan must include documentation that the Waste Water Treatment Plant Operator has approved the flow rate, volume, and type of discharge.

DRAFT

Disposal of waste water will be as specified below.

a. Waste water from construction activities must not enter water ways or be discharged without treatment to remove pollutants. Dispose of the construction related waste water off-Government property in accordance with all Federal, State, Regional and Local laws and regulations.

b. For discharge of ground water, surface discharge in accordance with the requirements of the NPDES or State STORM WATER DISCHARGES FROM CONSTRUCTION SITES permit. land apply on the project site in accordance with all Federal, State, Regional, and/or Local laws and regulation for pumping and land applying ground water.

c. Water generated from the flushing of lines after disinfection or disinfection in conjunction with hydrostatic testing and/or hydrostatic testing will be discharged into the sanitary sewer with prior approval and/or notification to the Waste Water Treatment Plant's Operator.

1.7.12 Historical, Archaeological, Cultural Resources Biological Resources and Wetlands Protection Plans

Submit Historical, Archaeological, and Cultural Resources Protection Plan, Biological Resources and Wetlands Protection Plan that defines procedures for demarcation and protecting historical, archaeological, cultural resources, biological resources and wetlands known to be on the project site. The plans must also define procedures to follow if historical, archaeological, cultural resources, biological resources, and wetlands not previously known to be onsite or in the area are discovered during construction. Include in the plans methods to assure the protection of known or discovered resources, identifying lines of communication between Contractor personnel and the Contracting Officer. Include in this plan, the details of environmental monitoring requirements under the laws and regulations and a description of how this monitoring will be accomplished. Monitoring must include impacts to terrestrial, aquatic and air resources.

1.7.13 Compliance

All construction activity is subject to Federal environmental laws including, but not limited to: The National Environmental Policy Act (NEPA); The National Historic Preservation Act (NHPA); Endangered Species Act (ESA); Resource Conservation and Recovery Act (RCRA); Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA); Clean Water Act (CWA); Clean Air Act (CAA); Safe Drinking Water Act (SDWA); 16 USC 703-712 Migratory Bird Treaty Act (MBTA); and applicable state, regional, and local equivalents. The Contractor is responsible for compliance with these laws. No requirement in this Section will relieve the Contractor of any applicable Federal, State, and local environmental protection laws, regulations, and mitigation. During Construction, identify, implement, and submit for approval any additional requirements to be included in the EPP. Maintain the current version onsite.

1.7.14 Appendix

Attach to the EPP, as an appendix, copies of all environmental permits, permit application packages, approvals to construct, notifications, certifications, reports, and termination documents.

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1.8 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.

Dually submit each Environmental Permit Application to the Government and appropriate agencies to obtain the necessary permits. The EPP must include copies of all environmental licenses, permits, permit application packages, plan applications, approvals to construct, notifications, certifications, reports, and termination documents.

Obtain and pay for all environmental licenses, permits required for the construction of the project and in accordance with FAR 52.236-7. 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.

Comply with all environmental licenses, permits, plans, mitigation, and commitments required by Federal, State, Regional and local laws, and regulations.

1.8.1 Air Quality

Obtain a Rule 201 Authority to Construct/Permit to Operate approval from the SMAQMD. Provide the application and pay all applicable fees.

1.8.2 Asbestos Dust Mitigation

Provide the Asbestos Dust Mitigation Plan and Application to SMAQMD for approval 30 days prior to commencement of ground disturbance activities. Provide the application and pay all applicable fees.

1.8.3 Portable Equipment Registration Program (PERP)

Provide the Air Quality Control Plan to SMAQMD and CARB as needed to comply with the Portable Equipment Registration Program (PERP) for construction vehicle emissions and mitigation requirements as necessary. Provide the application and pay all applicable fees.

1.8.4 Dewatering Permit

Obtain the Low Threat Dewatering Permit, GO R5-2013-0074, or Limited Threat Dewatering Permit, GO R5-2013-0073-01, if groundwater, surface water, or seepage waters are to be directly discharged into any water body. See paragraph titled Dewatering, for additional dewatering management options.

1.8.5 Construction General Permit (NPDES Permit)

Obtain an NPDES General Permit No. CAS00002 from DWQ for discharge of stormwater runoff associated with construction and land disturbance activities from the RWQCB (e.g. a Construction General Permit). The application and applicable fees must be provided by the Contractor. See SECTION 01 57 23 TEMPORARY STORM WATER POLLUTION CONTROL for additional requirements and information.

1.8.6 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.

1.8.6.1 Solid Waste Management 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. Submit a solid waste disposal closeout report at completion.

DRAFT

1.9 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.

1.10 ENVIRONMENTAL ASSESSMENT OF CONTRACT DEVIATIONS

Any deviations from the drawings and specifications, requested by the Contractor and which may have an environmental impact, will be subject to approval by the Contracting Officer and may require an extended review, processing, and approval time. The Contracting Officer reserves the right to disapprove alternate methods, even if they are more cost effective, if the Contracting Officer determines that the proposed alternate method will have an adverse environmental impact.

1.11 NOTIFICATION

Notify the Contracting Officer in writing of any observed noncompliance with Federal, State or local environmental laws or regulations, permits, and other elements of the EPP within 24 hours or immediately upon discovery if direct action is needed to protect environmental resources before construction activities resume. In particular, immediately report exceedance of CVRWQCB turbidity thresholds to the Contracting Officer. Immediately address noncompliance issues brought to the Contractor's attention by the Contracting Officer. After receipt of such notice, the Contractor must 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. No time extensions will be granted or equitable adjustments allowed for any such suspensions. This is in addition to any other actions the Contracting Officer may take under the Contract, or in accordance with the Federal Acquisition Regulation or Federal Law.

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PART 2 PRODUCTS

2.1 COMPLIANT MATERIALS

Provide the Government a list of all hazardous materials proposed for use on site and the associated SDS. 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. The Government may alter or limit use of specific materials as needed to meet Installation permit requirements for emissions.

2.2 PREVIOUSLY USED EQUIPMENT

Clean all previously used construction equipment prior to bringing onto the project site. Ensure that the equipment is free from soil residuals, egg deposits from plant pests, noxious weeds, and plant seeds. Consult with the USDA jurisdictional office for additional cleaning requirements. Decontaminate aquatic construction equipment and boats of invasive species (animal and vegetative) prior to placement in any water body per approval by California Department of Fish and Wildlife (CDFW). Report the presence of quagga and zebra mussels or any other invasive species to the CDFW hotline at (866) 440-9530, open from 8 AM to 5 PM PST. One month prior to

placement of construction vessels in any water body, coordinate with CDFW to discuss inspections for invasive species, particularly quagga and zebra mussels. A decontamination period of one month is required on vessels originating from infested water bodies. Any vessel traveling from Lake Mead, Lake Mohave, Lake Havasu, the Colorado River or lakes that receive water from the Colorado Aqueduct, including: Lake Skinner (Riverside County), Lake Mathews (Riverside County), San Vicente Reservoir (San Diego County), Dixon Lake (San Diego County), Lower Otay Reservoir (San Diego County), and Lake Murray (San Diego County) should remain dry and out of the water for a minimum of five days. All vessels and vessel accessories must be inspected prior to entering the Sacramento River or other water body. Once on trailer, run engine for five to ten seconds to blow out excess water, mussels, and plants. Before leaving water access, inspect and remove any mussels or plants from intake, steering nozzle, hull, and trailer. Clean all vessels and marine equipment with a high-pressure wash of hot water. Inspect and remove aquatic plants from boat, motor, trailer, underwater fittings and equipment, such as rollers, axle, bilge, and anchors. Drain water from equipment including motor, bilges, heat exchangers and coolers. Ensure all drained areas are dry. Ensure the watercraft's lower outboard unit is drained and dry.

PART 3 EXECUTION

3.1 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 Installation Environmental Office, 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. The following species are known and could be affected within the construction area: the Valley Elderberry Longhorn Beetle and Migratory Birds.

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 Installation Environmental Office or as otherwise specified. Confine construction activities to within the limits of the work indicated or specified.

3.1.1 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.

3.1.2 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.

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3.2 STORM WATER

See SECTION 01 57 23 TEMPORARY STORM WATER POLLUTION CONTROL for construction storm water management requirements.

3.2.1 Construction General Permit

Submit a Storm Water Notice of Intent (NOI) for NPDES coverage under the general permit for construction activities as required by 40 CFR 122.26 and in accordance with Section 01 57 23 TEMPORARY STORM WATER POLLUTION CONTROL. 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 in accordance with Section 01 57 23 TEMPORARY STORM WATER POLLUTION CONTROL. Maintain construction operations and management in compliance with the terms and conditions of the general permit for stormwater discharges from construction activities.

3.2.1.1 Stormwater Pollution Prevention Plan

Submit a project-specific Stormwater Pollution Prevention Plan (SWPPP) to the Contracting Officer for approval, prior to the commencement of work, and in accordance with Section 01 57 23 TEMPORARY STORM WATER POLLUTION CONTROL.

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3.3 LAND RESOURCES

Confine all activities to areas defined by the drawings and specifications. Identify any land resources to be preserved within the work area prior to the beginning of any construction. Do not remove, cut, deface, injure, or destroy land resources including trees, shrubs, vines, grasses, topsoil, and land forms without approval, except in areas indicated on the drawings or specified to be cleared or altered. Ropes, cables, or guys will not be fastened to or attached to any trees for anchorage unless specifically authorized. Provide effective protection for land and vegetation resources at all times, as defined in the following subparagraphs. Remove stone, soil, or other materials displaced into uncleared areas.

3.3.1 Work Area Limits

Mark the areas that need not be disturbed under this Contract prior to commencing construction activities. Mark or fence isolated areas within the general work area which are not to be disturbed. Provide readily visible markings at the work site. 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.

3.3.2 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. Temporary movement or relocation of Contractor facilities will be made only when approved. Provide erosion and sediment controls for spoil areas to prevent sediment from entering nearby waters. Control temporary excavation and embankments for plant and/or work areas to protect adjacent areas.

3.3.3 Landscape

Trees, shrubs, vines, grasses, land forms and other landscape features indicated and defined on the drawings to be preserved must be clearly identified by marking, fencing, or wrapping with boards, or any other approved techniques. Protect trees, vegetation and other designated features by erecting high-visibility fencing. Locate fence no closer to trees than the drip line. Drip line is defined as either A) Width of tree crown as measured by the lateral extent of foliage or B) Width of tree as defined as outermost leaves. The fenced area is off limits to material and equipment storage and vehicle and pedestrian traffic. Upon completion of construction, materials used to mark, fence, or wrap landscape features for protection during construction must be removed. Restore landscape features damaged or destroyed during construction operations outside the limits of the approved work area. Any native tress that must be trimmed, rather than removed, must be trimmed by or under the direct supervision of a certified arborist.

3.3.4 Tree Protection

Protect existing trees that are to remain to ensure they are not injured, bruised, defaced, or otherwise damaged by construction operations. Coordinate with the Contracting Officer and Government's Environmental Office to determine appropriate action for trees and other landscape features scarred or damaged by equipment operations.

3.3.4.1 Existing Tree Preservation

Locate all cut, fill and/or building foundations a minimum of 3.0 times the diameter of the tree away from the outside edge of the trunk of all trees scheduled for preservation. The minimum distance must be 6'-0" away from the outside edge of the trunk for all trees to be preserved in place. The diameter of all trees must be measured at 4'-6" above the surrounding grade (Diameter at Breast Height (DBH))

3.3.4.2 Fencing Existing Trees for Preservation

Provide temporary fencing for all trees scheduled for preservation during construction. Install fencing prior to any ground disturbance activities at the site and approved by the Contracting Officer. Locate fencing at the edge of the root health zone or outer most edge of visual dripline. The root health zone is determined to be that area located out a distance of 5 times the trunk diameter in all directions. At no time must the fencing be located closer than 5'-0" away from the outside edge of the trunk or further than 5'-0" away from the approved building wall line, foundation, retaining wall, or grade cut, whichever provides the greater distance from the tree trunk. Fencing fabric must be 48" high density orange polyethylene safety fence. Fencing must be rigidly supported and maintained during all construction periods at a minimum height of 4'-0", above grade. Fenced areas must not be used for material stockpile, storage or vehicle parking. Dumping of materials, chemicals, or garbage must be prohibited within the fenced area. Fenced area must be maintained in a natural condition and not compacted.

3.3.5 Erosion and Sediment Controls

Provide erosion and sediment control measures in accordance with Federal, State, and local laws and regulations. Select and maintain the erosion and

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sediment controls such that water quality standards are not violated as a result of construction activities. The area of bare soil exposed at any one time by construction operations should be kept to a minimum. Construct or install temporary and permanent erosion and sediment control best management practices (BMPs) as indicated on the drawings as specified in Section 01 57 23 TEMPORARY STORM WATER POLLUTION CONTROL and 32 92 33 GRASS SEEDING AND EROSION CONTROL. BMPs may include, but not be 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 also be in accordance with the National Pollutant Discharge Elimination System (NPDES) Storm Water Pollution Prevention Plan (SWPPP) which may be reviewed at the Environmental Office. Remove any temporary measures after the area has been stabilized.

3.4 WATER RESOURCES

Monitor all water areas affected by construction activities to prevent pollution of surface and ground waters to be in compliance with the EPP, permits, and these specifications. Do not apply toxic or hazardous chemicals to soil or vegetation unless otherwise indicated by the Contracting Officer.

Do not allow construction water to run off the work site. Locate and maintain equipment storage, cleaning, fueling and maintenance areas in a manner to prevent any contaminants from adversely affecting storm water runoff. Place absorbent pads to catch all leaks from equipment parked overnight. Do not conduct major equipment cleaning and maintenance within the construction area. Store construction equipment in areas outside the natural surface drainage patterns and away from areas where storm water could pool and percolate to ground water.

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3.4.1 Wetlands

Do not enter, disturb, destroy, or allow discharge of contaminants into any wetlands

3.5 ARCHAELOGICAL AND TRIBAL MONITORING AND SUPPORT SERVICES

The Contractor must adhere to the requirements of the Natomas Basin elements of the Historic Properties Management Plan (HPMP) which has been prepared for the American River Common Features General Reevaluation Project and is included in the project Supplemental Information Package (SIP).

The Contractor must retain the services of a qualified Archaeological Monitor.

3.5.1 Archaeological Monitor Qualifications

The Archaeological Monitor must have demonstrated staff capabilities including osteologists, historian(s), and other specialists as necessary; excavation and testing equipment; and laboratory and storage facilities sufficient to accomplish all tasks specified in this section. Subject matter specialists such as osteologists and historians must be available to consult as needed to assist in identification of post-review discoveries. The Archaeological Monitor must demonstrate experience conducting archaeological monitoring, archaeological site testing, site

recordation, National Register of Historical Places evaluations, data recovery and
analysis, and all aspects of report preparation, to include GIS mapping and analysis. The Archaeological Monitor will provide Field Monitors to observe all project-related ground disturbing activities.

The Archaeological Monitor must designate one or more Lead Field Monitors. A Lead Field Monitor must be present whenever archaeological monitoring is required. Lead Field Monitors must have a graduate degree in archaeology, anthropology, or closely related field and meet the Secretary of the Interior's Professional Qualifications Standards for Archaeology, and additional requirements, as follows:

1. At least one year of full-time professional archaeological experience;

2. At least four months of supervised field and analytic experience in general North American archaeology;

3. Demonstrated ability to identify and assess subsurface and surface archaeological deposits;

4. Demonstrated ability to complete National Register of Historic Place (NRHP) evaluations for cultural resources;

5. Demonstrated ability to carry archaeological research to completion.

Other Field Monitors must have an undergraduate degree in archaeology, anthropology, or closely related field and at least four months of supervised field experience in general North American archaeology.

The Contractor must submit evidence of the Archaeological Monitor qualifications, including the individual qualifications of all Field Monitor(s), to the Contracting Officer for approval, no less than thirty days prior to starting work.

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3.5.2 Archaeological Monitor Responsibilities

The purpose of archaeological monitoring is to inspect excavated soil and other construction materials as work proceeds to determine if potentially significant cultural resources or human remains are present. A Lead Field Monitor must be on-site during all ground disturbing activities. All ground disturbing activities must be observed by a Field Monitor. Field Monitor coverage must be adequate to directly observe all ground disturbing work at all times. Unless directed by the Contracting Officer, archaeological monitoring is not required for hydro seeding, removal of silt fence, paving, or placement of imported fill/gravel/rock. In addition to monitoring ground disturbing work, the Archaeological Monitor is responsible for the following:

a. Understand and implement post-review discovery procedures.

b. Record and maintain daily archaeological monitoring logs, which include written descriptions of the areas monitored, project activities in those areas, and photographs, as appropriate. Include descriptions of any find(s) and the response to the find(s).

c. Submit the daily Archaeological Monitoring Logs electronically on a weekly basis to the Contracting Officer. Logs should be submitted no later than 48 hours after the close of the monitoring work week.

d. Produce a Summary Monitoring Report that describes the Archaeological Monitors' activities and observations, construction work completed, areas monitored, descriptions of all finds, and response processes.

e. Submit the Summary Monitoring Report electronically to the Contracting Officer and USACE Archaeologist within 3 months after the end of on-site construction.

f. Coordinate between the Contractor and Tribal Monitors to communicate construction activities and monitoring needs. Tribal Monitors must be informed in writing no later than close of business of monitoring needs for the following work day.

g. Conduct on-site cultural resource sensitivity training for all Contractor personnel. All personnel must receive this training prior to beginning work. Training must cover cultural resource laws, how to identify resources of concern, and what to do in case of a discovery.

h. Participate in a preconstruction coordination meeting. This meeting will be conducted either in-person or by conference call and may include Tribal Representatives and other stakeholders. Topics will include communication protocol, post-review discovery procedures, specific cultural resource concerns, and other topics as necessary.

i. Determine appropriate protective measures for any cultural resources exposed by construction activities that can be protected in place. Measures may include exclusionary fencing, redirecting construction traffic, covering resources in sterile material, or other methods as appropriate. Coordinate with the Contractor to install such measures.

3.5.3 Tribal Monitors

Tribal Monitors may voluntarily participate in the project and may be present on-site during all construction activities to observe work activities and assist in ensuring that sensitive tribal resources are not impacted, provided such monitoring does not interfere with normal construction activities, and if any such monitoring can be conducted safely. State or local agencies conducting environmental review under CEQA, or otherwise supporting project planning and construction, may engage interested Native Americans for the purposes of construction monitoring. The terms, extent of monitoring, documentation standards, and monitoring procedures must be determined through negotiation between the interested Native Americans and the State or local agency.

Provide the opportunity for Tribal Monitors to inspect soil and other material as work proceeds to assist in determining presence of resources significant to the Tribes. This includes buried resources, as well as the construction material, metal, debris and other landfill material. If potential Tribal or archaeological resources are discovered, Tribal Monitors can request through the Archaeological Monitor and/or the Contracting Officer a reasonable work pause or redirection of work performed by the Contractor. Tribal Monitors may provide information and expertise to the Archaeological Monitor to aid in evaluation of discoveries.

3.5.4 Post Review Discoveries

If during excavation or other construction activities, any previously

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unidentified archaeological, historical, or cultural resources are discovered or found, all activities that may damage or alter such resources must be temporarily suspended. Cease all activities within 100 feet of that find 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 Archaeological Monitor must make an assessment of the find in order to determine if it is a potential Historic Property. The Archaeological Monitor may conduct testing to delineate site boundaries and to identify if a deposit is intact or redeposited. Information from Tribal Monitors will also be taken into account when assessing finds.

If the USACE Archaeologist determines the discovery or find requires further documentation, analysis, and/or treatment under Federal law, and that rapid recovery is appropriate, the Archaeological Monitor must implement rapid recovery of materials, to the greatest extent practicable under project constraints, as directed by the USACE Contracting Officer. Rapid recovery constitutes the expeditious removal of potentially diagnostic artifacts, soil samples, and other cultural materials. The Contracting Officer may also direct the Archaeological Monitor to transport, temporarily store, conduct laboratory analysis, and report on the materials recovered through rapid recovery methods.

3.5.5 Human Remains

If human remains of Native American origin are discovered during ground disturbing activities, comply with state laws relating to the disposition of Native American burials, which falls within the jurisdiction of the Native American Heritage Commission (NAHC) (PRC 5097.98). If human remains of any origin are discovered or identified by the Archaeological Monitor in any area on the project site, stop further excavation or disturbance within 100 feet of the discovery or any nearby area reasonably suspected to overlie adjacent human remains and conduct the following steps:

Inform the Contracting Officer or COR. Inform the county coroner. If the coroner has determined that no investigation of the cause of death is required, and if the remains are of Native American origin, further excavation or disturbance of the site of nearby area suspected to overlie adjacent human remains must be suspended until: The descendants from the deceased Native Americans have made a recommendation to the landowner or the person responsible for the excavation work for means of treating or disposing of, with appropriate dignity, the human remains and any associated grave goods as provided in PRC 5097.98, or; if the NAHC was unable to identify a descendant, or the descendant failed to make a recommendation or re-inter the remains within 48 hours after being notified by the NAHC, further treatment will conform to PRC 5097.98 et seq. and other appropriate authorities. Further treatment will be determined by the Contracting Officer and qualified appropriate Government personnel.

For the period of time between the discovery of Native American human remains, notification of the coroner, identification of the Most Likely Descendant (MLD), and consultation with the Landowner, install exclusionary fencing around the area of the discovery. If vehicular traffic must be maintained in the discovery area, the Contractor must work with the Government to develop a protective measure appropriate for the specific discovery, to the extent practicable. Install protective measures and cover intact remains as appropriate. If remains are displaced and unable to be secured in place, store the remains in a locked, secure, and

DRAFT

climate controlled location within the construction site.

3.5.6 Recovery of Human Remains

The Archaeological Monitor will implement recovery in coordination with the MLD, according to the methods defined below. The MLD may also choose to recover remains and associated items without assistance from the Archaeological Monitor. This task consists of recovering Native American human remains and associated items that are discovered within the project limits.

The Archaeological Monitor may recover human remains, including associated materials, according to the following conditions: (a) Less than 1.0 cubic yard of excavated soils: The Archaeological Monitor must recover Native American human remains and cultural materials that are exposed and discovered within the project limits during construction and require excavation of 1.0 cubic yard or less of soils. Any excavation completed under this category must use hand tools. The excavated soils recovered under this task may be sifted through 1/4-inch gauge or smaller hardware cloth by the Archaeological Monitor.

(b) Greater than 1.0 cubic yard of excavated soils: The Archaeological Monitor must recover Native American human remains and cultural materials that are exposed and discovered within the project limits during construction and require excavation of greater than 1.0 cubic yard of soils. Excavation under this task may be completed by hand or mechanical means (e.g., backhoe use for bulk recovery, etc.). The excavated soils recovered under this task may be sifted through ¼-inch gauge or smaller hardware cloth by the Archaeological Monitor.

Screened soils under conditions (a) and (b) must not exceed 10 cubic yards cumulatively over the construction period. The Archaeological Monitor will package and transport human remains and other cultural materials in a manner that is acceptable to the MLD, and will transport the recovered items to a location determined by the MLD. Transfer of the remains and materials to the control of the MLD must be documented on a chain of custody form developed by the Archaeological Monitor. The chain of custody form must be made available to the MLD upon request. The MLD may choose to package and transport remains without assistance from the Archaeological Monitor.

Photographs of the remains, associated items, or features by non-Tribal Monitors or non-Tribal Representatives are forbidden.

3.5.7 Storage Trailer for Archaeological and Tribal Monitoring

Prior to the start of and throughout the duration of earthwork activities, provide a lockable climate-controlled storage trailer for temporary storage during construction. This storage trailer must be located within the staging area, and have the minimum dimensions of 8.5-ft H x 8-ft W x 20-ft L.

3.6 BIOLOGICAL RESOURCES

Minimize interference with, disturbance to, and damage to fish, wildlife, and plants including their habitat. Protect threatened and endangered animal and plant species, including their habitat in accordance with Federal, State, Regional, and local laws and regulations. Protect migratory birds in accordance with 16 USC 703-712.

DRAFT

3.6.1 State Listed Birds

Swainson's hawk, Cooper's hawk, and white-tailed kite are state listed bird species that may occur in the project area. The Government will perform surveys for these species and active nests of these species prior to initiation of construction activities. If these surveys find active nests within approximately 0.25 mile of the project boundaries, project construction activities could potentially be precluded within nest buffer zones until the nest(s) are determined to be inactive by the Government.

Contact the Contracting Officer prior to initiating construction activities, to ensure that the Government surveys are complete and determine if any protective buffers near active nests must be established. Construction activities must not proceed until the surveys have been completed. Adhere to any nest protection buffer requirements determined necessary by the Government.

3.6.2 Migratory Birds

Migratory birds may establish nests in trees and shrubs located within or immediately adjacent to the project boundaries. Notify the Contracting Officer if any bird nests are found and halt any construction activities within approximately 50 feet of an observed nest (e.g. temporary nest buffer area).

A Government biologist will inspect the nest(s) to determine if the nest(s) are active. If a nest is inactive, the Government may relocate or otherwise remove the nest and allow construction to continue within the temporary nest buffer area established around the nest. If a nest is active, the Government will further coordinate regarding nest protection measures necessary. No impacts to active bird nests are allowed unless otherwise approved in writing by the Government.

DRAFT

3.6.3 Western Yellow Billed Cuckoo

The following measures will be implemented to minimize effects on western yellow billed cuckoo habitat:

a. To the maximum extent practicable, the Government will avoid construction in areas within 300 feet of potential nesting habitat during the period from June 01 through September 30.

b. The Government will provide a USFWS approved 10(a)1(a) permitted monitor when any construction activity is within 300 feet of designated potential nesting habitat during the period from June 01 through September 30.

c. If the monitor detects nesting activity within 300 feet of construction activities, construction will halt within that buffer until fledglings leave the nest.

3.6.4 Elderberry Shrubs

Elderberry shrubs provide habitat for the federally listed threatened species, the Valley Elderberry Longhorn Beetle. Elderberry shrubs are located throughout the vicinity of the site and some are located adjacent to the construction limits and may be adjacent to access roads to be approved by the Contracting Officer. Avoid all elderberry shrubs with stem

diameters of 1-inch or greater, measured at ground level. A biologist must determine the locations of Elderberry plants with a stem diameter of 1" or greater within 165 feet (50 meters) of marked and approved limits of construction. Flag these shrubs and fence with preservation fencing under the supervision of said biologist, subject to approval of the Contracting Officer. Do not spray pesticides and herbicides within 100 feet of any elderberries. Comply with all applicable regulations regarding the Valley Elderberry Longhorn Beetle. The core areas surrounding elderberry shrubs are defined as all area within 20 feet outside of the dripline of any elderberry plant with a stem measuring 1.0 inch or greater in diameter at the ground level.

a. Place signs at 50 feet intervals along the edge of the fenced core areas with the following information:

> NOTICE: Grading or any damage committed beyond this fence could result in a violation of the Endangered Species Act of 1973, as amended (16 USC 1531-1544) and could result in a civil penalty of up to $25,000 for each violation or a criminal penalty of up to $50,000 and/or up to one year in prison.

b. Minimize construction activities in the buffer zone adjacent to any elderberry shrubs. The buffer zone is defined as the area outside the core area up to 165 feet (50 meters) away of any elderberry plant with a stem measuring 1.0 inches or greater in diameter at the ground level. Promptly restore any disturbance in this area following construction.

DRAFT

3.6.5 Fish and Wildlife

Minimize interference with, disturbance to, and damage of fish and wildlife. Species that require specific attention along with measures for their protection must be listed by the Contractor prior to beginning of construction operations.

3.6.5.1 Wildlife Encounters During Construction

Should the Contractor discover animals living within the construction boundaries, suspend operations at the site of discovery and continue in other areas. Notify the Contracting Officer and Biological Monitor immediately of the finding. Include a brief statement to the Contracting Officer and Biological Monitor of the location and the findings with the notification. How to identify sensitive animals that may be discovered will be provided at the Preconstruction Conference.

3.7 AIR RESOURCES

Equipment operation, activities, or processes will be in accordance with all Federal, State and Local air emission and performance environmental mitigation measures, laws and standards.

3.7.1 Preconstruction Air Permits

Prior to bringing equipment, assembled or unassembled, onto the project site, the Contractor must submit to SMAQMD and the Contracting Officer a full equipment list, including proposed hours of use as well as model year and horsepower for each piece of equipment. Submit with their pre-construction submittal an air quality analysis of the above for the project and apply for the Application for Authority to Construct Permit,

Form G100 as available online at www.airquality.org.

Submit the completed equipment list, Air Quality Analysis, and Application to:

cmplan@airquality.org

Comply with all requirements provided in the CARB 13 CCR 2450-2466, and CARB 17 CCR 93105.

3.7.2 Air Quality Control

If the project air emissions calculations indicate that the project does not meet SMAQMD thresholds for particulate matter (PM; includes PM10 and PM2.5), coordinate with and follow the requirements of SMAQMD's PM Mitigation program. Pay mitigation fees to SMAQMD prior to starting construction.

Dually submit monthly Air Quality Control Plan Reports to include a current equipment inventory to the Government and to SMAQMD throughout the duration of the project. The monthly Air Quality Control Plan Reports submittal includes all site equipment including generators and marine equipment. An inventory is not required for any 30-day period in which no construction activity occurs.

If SMAQMD's PM10 Plan or PM2.5 SIP thresholds are exceeded, produce a plan to implement sufficient mitigation to eliminate any significant PM10 or PM2.5 impacts.

3.7.3 Rule 201 Authority to Construct/Permit to Operate

Prior to construction, apply for a SMAQMD Rule 201 Authority to Construct/Permit to Operate for stationary and portable equipment with SMAQMD. Apply for the Authority to Construct/Permit to Operate from SMAQMD to obtain coverage and submit approved permit to the Government. Portable construction equipment (e.g. generators, compressors, pile drivers, lighting equipment, etc.) with an internal combustion engine over 50 horsepower are required to be registered under SMAQMD or CARB's PERP Registration. Dually submit PERP Data with all portable equipment specifications and hours of use to the Government and to SMAQMD (or CARB, as needed) once per month.

3.7.4 Asbestos Dust Mitigation Plan and Application

Dually submit the Asbestos Dust Mitigation Plan and Application to the Government and to SMAQMD a minimum of 30 days prior to commencement of any grading, excavation, or land disturbance activities. Pay the appropriate fee with the Asbestos Dust Control Plan submittal to SMAQMD. The plan must include a description of procedures to be taken and best management practices to be used to mitigate for Naturally Occurring Asbestos (NOA). Comply with the CARB 17 CCR 93105, Asbestos ATCM. Monitor the project area for the presence of NOA during all construction activities. The Asbestos Dust Mitigation Plan and Application must be approved by prior to construction. Include a copy of the plan in the EPP.

3.7.5 Dust Control

Keep dust down at all times, including during nonworking periods. Sprinkle the soil at the site, haul roads, and other areas disturbed by operations

DRAFT

with water at levels to reduce dust but not create runoff. 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.

3.7.5.1 Particulates

Control dust particles; aerosols and gaseous by-products from construction activities; and processing and preparation of materials, such as from concrete batch plants; 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, and other work areas within or outside the project boundaries free from particulates which would exceed 40 CFR 50, State, and local air quality standards or would cause a hazard or a nuisance. Sprinkling, baghouse, scrubbers, electrostatic precipitators or other methods will be permitted to control particulates in the work area. Cover and maintain onsite stock piles consisting of dirt or debris that have a potential to become airborne and travel offsite at all times. Sprinkling, to be efficient, is repeated to keep the disturbed area damp at all times. Use wet power vacuum street sweepers to remove any visible track out mud or dirt from adjacent public roads at least once a day. Use of dry power sweeping is prohibited. 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 all State and local visibility regulations. Perform routine tuning and maintenance of construction equipment to ensure that equipment is in proper running order.

DRAFT

3.7.6 Odors

Control odors from construction activities in compliance with State regulations and/or local ordinances and must not constitute a health hazard.

3.7.7 Burning

Burning will not be allowed on the project site.

3.7.8 On-Road Equipment

Trucks or equipment hauling material such as debris, or any fill material or raw materials to be used for concrete production must be fully covered while operating at, to and from the construction project. Idling must be restricted to a maximum of 5 minutes, except as provided in the CARB 13 CCR 2450-2466 exceptions.

Maintain schedule performance despite availability and/or selection of equipment. Do not cumulatively exceed NOx emissions thresholds established below in paragraph 3.8.9.1 NOx and PM Emissions. Pay any mitigation fees associated with equipment selection.

3.7.9 Off-Road Diesel-Powered Equipment

Comply with allowable NOx and PM emission thresholds per SMAQMD's permitting program, CARB's PERP Registration, PM, and NOx Mitigation

requirements. Perform a CARB Portable Diesel Engine ATCM-Fleet calculation http://www.arb.ca.gov/msprog/ordiesel/documents/documents.htm to determine the levels of PM and NOx Mitigation required. NOx emissions increased in one category of equipment may be decreased in another category to achieve thresholds. Changes in equipment, marine vessels, mileage, and imported and exported material must be reassessed once per year to demonstrate continuous compliance. NOx emission and PM calculations, and annual recalculations must be performed by a qualified air quality specialist. A recalculation must be performed if any of the following occurs:

a. Marine equipment hours or number of vessels increases.

b. Off or on-road truck travel miles increase

c. Portable construction equipment changes or quantity increase

d. Increased import (over 250,000 cy) or export (over 250,000 cy) material quantities.

Incorporate the emission rate thresholds referenced in paragraph NOx and PM Emission Thresholds to minimize the generation of NOx emissions and PM10 dust during project construction. They are based on recommendations from the SMAQMD.

3.7.9.1 NOx and PM Emissions

Table 1. Standard Air Emission Thresholds for Federal and Local Criteria Pollutants.

Criteria Pollutant	Federal Standard (tons/year)	SMAQMD Threshold (tons/year)
Nitrogen Oxides (NOx)	25	25
Carbon Monoxide (CO)	100	100
Sulfur Oxides (SO)	100	*
PM10	100	15
PM2.5	100	15
Reactive Organic Gases (ROG)	25	25
SMAQMD = Sacramento Metropolitan Air Quality Management District * = default to Federal standard PM = Particulate Matter		

Update and dually submit the PERP Data equipment inventory (on-road, off-road, portable and stationary vehicles and equipment) to the Government and to CARB once per month throughout the duration of the project, except that an inventory would not be required for any 30-day

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period in which no construction activity occurs. At least 48 hours prior to heavy-duty off-road equipment use, provide SMAQMD and the Government with a report containing the anticipated construction timeline, including start date and names and phone numbers of the project manager and onsite foreman.

Regarding additional measures for NOx emissions reduction for reporting levels of greenhouse gases for this project, employ the following measures:

a. Use electric equipment when possible. Use electric generators when possible, if not possible, coordinate usage of diesel operated generators with SMAQMD prior to operating the generator onsite.

b. Shut off construction equipment when not in use or reduce the idling time to a maximum of 5 minutes. Provide clear signage that posts this requirement for workers at the site entrances.

c. Use the most efficient equipment size for the job.

d. Use equipment with new efficient technologies as applicable.

e. Perform on-site hauling with trucks equipped with on-road engines (if determined to be less emissive than the off-road engines).

f. Encourage and provide carpools, shuttle vans, transit passes and/or secure bicycle parking for construction worker commutes.

g. Recycle or salvage non-hazardous construction and demolition debris (goal of at least 75 percent by weight) when possible.

h. Use local source or recycled materials for construction materials (goal of at least 20 percent based on costs for building materials, and based on volume for roadway, and parking lot materials) when possible.

i. Efficiently use water for adequate dust control.

j. Maintain all construction equipment in proper working condition according to the manufacturer's specifications.

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3.7.9.2 Visible Emissions

Ensure that exhaust emissions from all off-road diesel-powered equipment used on the project site does not exceed 40 percent opacity for more than 3 minutes in any 1 hour. Repair any equipment found to exceed 40 percent opacity (or Ringelmann 2.0) immediately, and notify the lead agency and SMAQMD within 48 hours of identification of non-compliant equipment. Perform a visual survey of all in-operation equipment at least weekly, and dually submit a monthly summary report of the visual survey results to the Government and to SMAQMD throughout the duration of the project, except that the monthly summary would not be required for any 30-day period in which no construction activity occurs. The monthly summary must include the quantity and type of vehicles surveyed as well as the dates of each survey. The SMAQMD and/or other officials may conduct periodic site inspections to determine compliance. Nothing in this section would supersede other SMAQMD or State rules or regulations.

3.7.9.3 PM10 Dust

Minimize the generation of PM10 dust during construction. Water areas of exposed soil at least every two hours or as needed to minimize generation of dust. Exposed soil surfaces include, but are not limited to: haul roads, soil piles, graded areas, unpaved parking areas, staging areas, and access roads. Implement one or more of the following measures for stockpiles that remain inactive for more than seven days: cover with a tarp(s) or vegetation; wet suppression; or install adequate wind barriers around the storage pile to prevent PM10 dust generation.

Wet suppression controls are required for cut and fill activities which included pre-wetting the ground to depth of anticipated cuts. Suspend operation when wind speeds are high enough to result in dust emissions, despite the application of dust mitigation measures, across the property line. To mitigate fugitive dust emissions from the batch plant operations, implement one or more of the following measures: apply water sprays, set up enclosures, hoods, curtains, shrouds, movable and telescoping chutes, or install a central dust collection system.

Cover or maintain at least 2 feet of freeboard space on all haul trucks. Other measures to reduce or prevent PM10 Dust generation onsite is allowed as necessary (e.g. installation of wind fencing). Coordinate such measures with SMAQMD and the Contracting Officer.

3.7.9.4 Naturally Occurring Asbestos (NOA)

The PM10 dust suppression mitigation measures listed above PM10 Dust will reduce dust formation and thus, also minimize the likelihood of NOA impacts. However, should the SMAQMD require further NOA avoidance/minimization protocols as part of the Asbestos Dust Mitigation Plan and Application, comply and take all appropriate actions necessary in order to avoid or offset NOA. Install rumble strips and wash tires prior to exiting the site. Implement Tracking Control BMPs required in SECTION 01 57 23 TEMPORARY STORM WATER POLLUTION PREVENTION to prevent the tracking of sediment off-site by vehicles leaving the construction area.

3.7.10 Diesel Generators

Ensure that all portable and support equipment comply with applicable Federal, State and local laws and regulations and be properly permitted. Specifically, coordinate and comply with the SMAQMD for approval of diesel generator operation.

Proof of appropriate permits through the state registration program or local air district operating permit program must be provided to the Contracting Officer. Utilize grid-based electric power where feasible. Where access to the power grid is not available, use on-site generators that meet a 0.01 gram per brake-horsepower standard for Particulate Matter (PM) or are equipped with Best Available Control Technology (BACT) for PM emission reductions, per CARB 13 CCR 2450-2466.

3.8 SOUND INTRUSION

Make the maximum use of low-noise emission products, as certified by the EPA. Confine pile-driving operations to the period between 8 a.m. and 4 p.m., Monday through Friday, exclusive of holidays, unless otherwise specified.

DRAFT

Keep construction activities under surveillance and control to minimize effects to wildlife and environment damage by noise. Comply with the provisions of the State of California. Obtain the necessary local permits to cover any activities being conducted outside of construction noise exempt hours. Institute a noise monitoring program when non-exempt construction noise exceeds established county and city thresholds.

Monitor noise generated from construction activities around the perimeter of the work area near noise sensitive receptors. Mitigation measures to reduce noise levels must include at a minimum:

a. Fit each piece of construction equipment and vehicle with efficient, well-maintained mufflers that reduce equipment noise emission levels at the project site. Equip all internal combustion powered equipment with properly operating mufflers and keep properly maintained and tuned to minimize noise.

b. Locate all portable and support equipment as far as possible from nearby noise-sensitive receptors.

c. Situate construction equipment so that natural berms or aggregate stockpiles are located in between the equipment and noise-sensitive receptors.

d. Enclose pumps that are not submerged and enclose above-ground conveyor systems in acoustically treated enclosures.

e. Line or cover hoppers, conveyor transfer points, storage bins and chutes with sound-deadening material. Use acoustically attenuating shielding (barriers) and shrouds when possible. For aquatic drilling activities, the use of down-the-hole hammers are recommended to produce less noise than top-hammer drills.

f. Conduct the loudest construction activities only during noise exempt hours when possible.

g. Maintain a standard 24-hour hotline for noise complaints.

DRAFT

3.8.1 Heavy Truck Delivery Restrictions

Schedule truck loading, unloading, and hauling operations during exempt construction hours. In addition to the details specified, space haul trucks apart when operating near noise sensitive receptor sites to avoid noise effects from simultaneous operation.

3.9 CHEMICAL MATERIALS MANAGEMENT AND WASTE DISPOSAL

Disposal of wastes must be as directed below, unless otherwise specified in other sections and/or shown on the drawings.

3.9.1 Solid Wastes

Place solid wastes (excluding clearing debris) in containers which are emptied on a regular schedule. Handling, storage, and disposal must be conducted to prevent contamination. Employ segregation measures so that no hazardous or toxic waste become co-mingled with solid waste. Transport solid waste off Government property and dispose of it in compliance with Federal, State, and local requirements for solid waste disposal. A Subtitle D RCRA permitted landfill will be the minimum acceptable offsite

solid waste disposal option. Verify that the selected transporters and disposal facilities have the necessary permits and licenses to operate. Comply with Federal, State, and local laws and regulations pertaining to the use of landfill areas.

3.9.2 Chemicals and Chemical Wastes

Dispense chemicals ensuring no spillage to the ground or water. Perform and document periodic inspections of dispensing areas to identify leakage and initiate corrective action. This documentation will be periodically reviewed by the Government. Collect chemical waste in corrosion resistant, compatible containers. Collection drums must be monitored and removed to a staging or storage area when contents are within 6 inches of the top. Wastes will be classified, managed, stored, and disposed of in accordance with Federal, State, and local laws and regulations.

3.9.3 Contractor Generated Hazardous Wastes/Excess Hazardous Materials

Transport Contractor generated hazardous waste off Government property within 60 days in accordance with the Environmental Protection Agency and the Department of Transportation laws and regulations. Dispose of hazardous waste in compliance with Federal, State and local laws and regulations. Spills of hazardous or toxic materials must be immediately reported to the Contracting Officer. Cleanup and cleanup costs due to spills are the Contractor's responsibility. The disposition of Contractor generated hazardous waste and excess hazardous materials are the Contractor's responsibility. Coordinate the disposition of hazardous waste with the Project Office's Hazardous Waste Manager and the Contracting Officer.

3.9.4 Fuel and Lubricants

Conduct storage, fueling and lubrication of equipment and motor vehicles in a manner that affords the maximum protection against spill and evaporation. Manage and store fuel, lubricants and oil in accordance with all Federal, State, Regional, and local laws and regulations. Store used lubricants and used oil to be discarded in marked corrosion-resistant containers and recycle or dispose in accordance with 40 CFR 279, State, and local laws and regulations. Storage of fuel on the project site must be in accordance with all Federal, State, and local laws and regulations.

3.10 RECYCLING AND WASTE MINIMIZATION

Minimize the use of hazardous materials and the generation of waste. Describe the anticipated types of the hazardous materials to be used in the construction when requesting information. Participate in State and local Government sponsored recycling programs. Minimize solid waste generation throughout the duration of the project.

3.11 NON-HAZARDOUS SOLID WASTE DIVERSION REPORT

Maintain an inventory of non-hazardous 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 non-hazardous solid waste has been generated. Include the following in the report:

DRAFT

Construction and Demolition (C&D) Debris Disposed	_____ cubic yards or tons, as appropriate
Construction and Demolition (C&D) Debris Recycled	_____ 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

The Non-Hazardous Solid Waste Diversion Report in the EPP Submittal must include the following:

a.) Identify any subcontractors responsible for the transportation and disposal of solid waste. Submit licenses or permits for solid waste disposal sites that are not a commercial operating facility.

b. Attach a copy of each of the Non-hazardous Solid Waste Diversion Reports to the disposal plan. Submit the report for the previous quarter on the first working day after the first quarter that non-hazardous solid waste has been disposed and/or diverted (e.g. the first working day of January, April, July, and October).

c. Indicate in the report the total amount of waste generated and total amount of waste diverted in cubic yards or tons along with the percent that was diverted.

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3.12 WASTE MANAGEMENT AND DISPOSAL

3.12.1 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 Installation environmental staff 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.

3.12.2 Solid Waste Management

3.12.2.1 Solid Waste Management 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 Contractor certification 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.

3.12.2.2 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. Transport solid waste off Government property and dispose of it in compliance with 40 CFR 260, state, and local requirements for solid waste disposal. 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.

3.12.3 Control and Management of Hazardous Waste

Transport Contractor generated hazardous waste off Government property within 60 days in accordance with the Environmental Protection Agency and the Department of Transportation laws and regulations. Dispose of hazardous waste in compliance with Federal, State and local laws and regulations. Spills of hazardous or toxic materials must be immediately reported to the Contracting Officer and the Environmental Office. Cleanup and cleanup costs due to spills are the Contractor's responsibility. Coordinate the disposition of hazardous waste with the Contracting Officer.

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.

3.12.3.1 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.

3.12.3.2 Universal Waste Management

Manage the following categories of universal waste in accordance with federal, state, and local requirements and installation instructions:

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a. Batteries as described in 40 CFR 273.2

b. Lamps as described in 40 CFR 273.5

c. Mercury-containing equipment as described in 40 CFR 273.4

Dumping of mercury-containing materials and devices such as mercury vapor lamps, fluorescent lamps, and mercury switches, in rubbish containers is prohibited. Remove without breaking, pack to prevent breakage, and transport out of the activity in an unbroken condition for disposal as directed.

3.12.3.3 Electronics End-of-Life Management

Recycle or dispose of electronics waste, including, but not limited to, used electronic devices such computers, monitors, hard-copy devices, televisions, mobile devices, in accordance with 40 CFR 260-262, state, and local requirements, and installation instructions.

3.12.3.4 Disposal Documentation for Hazardous and Regulated Waste

Contact the Contracting Officer for the facility RCRA identification number that is to be used on each manifest.

3.12.4 Releases/Spills of Oil and Hazardous Substances

3.12.4.1 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 Installation Fire Department, the Installation Command Duty Officer, the Installation Environmental Office, 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.

3.12.4.2 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.

DRAFT

3.12.5 Mercury Materials

Immediately report to the Environmental Office and the Contracting Officer instances of breakage or mercury spillage. Clean mercury spill area to the satisfaction of the Contracting Officer.

Do not recycle a mercury spill cleanup; manage it as a hazardous waste for disposal.

3.12.6 Wastewater

3.12.6.1 Treatment

Disposal of wastewater must be as specified below.

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 off-Government property in accordance with 40 CFR 403, state, regional, and local laws and regulations.

3.12.6.2 Surface Discharge

For discharge of ground water, surface discharge in accordance with federal, state, and local laws and regulations.

3.12.6.3 Land Application

Water generated from the flushing of lines after disinfection or disinfection in conjunction with hydrostatic testing and/or hydrostatic testing will be discharged into the sanitary sewer with prior approval and notification to the Wastewater Treatment Plant's Operator.

3.13 HAZARDOUS MATERIAL MANAGEMENT

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.

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.

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3.13.1 Control and Management of Asbestos-Containing Material (ACM)

Manage and dispose of asbestos- containing waste in accordance with 40 CFR 61. Manifest asbestos-containing waste and provide the manifest to the Contracting Officer. Notifications to the state and Program Manager are required before starting any asbestos work.

3.13.2 Control and Management of Lead-Based Paint (LBP)

Manage and dispose of lead-contaminated waste in accordance with 40 CFR 745. Manifest any lead-contaminated waste and provide the manifest to the Contracting Officer.

3.13.3 Control and Management of Polychlorinated Biphenyls (PCBS)

Manage and dispose of PCB-contaminated waste in accordance with 40 CFR 761.

3.13.4 Control and Management of Lighting Ballast And Lamps Containing PCBS

Manage and dispose of contaminated waste in accordance with 40 CFR 761.

3.14 PREVIOUSLY USED EQUIPMENT

Clean all previously used construction equipment prior to bringing it onto the project site. Ensure that the equipment is free from soil residuals, egg deposits from plant pests, noxious weeds, and plant seeds. Consult with the USDA jurisdictional office for additional cleaning requirements.

3.15 MAINTENANCE OF POLLUTION FACILITIES

Maintain permanent and temporary pollution control facilities and devices for the duration of the Contract or for that length of time construction activities create the particular pollutant.

3.16 MILITARY MUNITIONS

In the event military munitions, as defined in 40 CFR 260, are discovered or uncovered, the Contractor will immediately stop work in that area and immediately inform the Contracting Officer.

3.17 OIL

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.

DRAFT

3.17.1 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. Dispose in accordance with paragraph HAZARDOUS WASTE DISPOSAL.

3.17.2 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.

DRAFT

3.18 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.

3.19 TRAINING OF CONTRACTOR PERSONNEL

Train personnel in all phases of environmental protection and pollution control. Conduct environmental protection/pollution control meetings for all personnel prior to commencing construction activities. Conduct additional meetings for new personnel and when site conditions change. Include in the training and meeting agenda: qualifications of personnel responsible for overseeing groundwater dewatering operations, waste water management, and the Storm Water Pollution Prevention Plan (SWPPP); methods of detecting and avoiding pollution; 401 Certification Conditions; 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, wetlands, and endangered species and their habitat that are known to be in the area.

3.20 POST CONSTRUCTION CLEANUP

Clean up all areas used for construction in accordance with Contract Clause: "Cleaning Up". Unless otherwise instructed in writing by the Contracting Officer, prior to final acceptance of the work and at no additional expense to the Government, obliterate all signs 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 that were not a pre-existing site condition at the time of contract NTP execution. Establish a vegetative cover, place at least 12 inches of non-asbestos-containing material, or implement other measures to prevent wind speeds of 10 miles per hour or greater from causing visible dust emissions. See specification 32 92 33 GRASS SEEDING AND EROSION CONTROL for long-term erosion control requirements.

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SECTION TABLE OF CONTENTS

DIVISION 01 - GENERAL REQUIREMENTS

SECTION 01 57 23

TEMPORARY STORM WATER POLLUTION CONTROL

PART 1 GENERAL

1.1 SUMMARY
1.2 REFERENCES
1.3 SUBMITTALS
1.4 GENERAL REQUIREMENTS
1.4.1 Required Stormwater Meetings
1.4.2 Training Requirements
1.4.2.1 Qualified SWPPP Developer (QSD)
1.4.2.2 Qualified SWPPP Practitioner (QSP)
1.4.3 Additional Requirements
1.5 DEVELOPMENT AND DESIGN
1.5.1 SWPPP Development
1.5.1.1 Construction Site Management Plan (CSMP)
1.5.1.2 Non-Visible Pollutants
1.5.1.3 Best Management Practices (BMPs)
1.5.1.4 Temporary High Visibility Fencing
1.5.2 Permit Registration Documents (PRDs)

PART 2 PRODUCTS

2.1 REQUIRED BEST MANAGEMENT PRACTICES
2.1.1 Erosion Control BMPs
2.1.1.1 Scheduling
2.1.1.2 Preservation Of Existing Vegetation
2.1.1.3 Hydraulic Mulch
2.1.1.4 Hydroseeding
2.1.1.5 Soil Binders
2.1.1.6 Straw Mulch
2.1.1.7 Geotextiles And Mats
2.1.1.8 Soil Preparation/Roughening
2.1.2 Sediment Control BMPs
2.1.2.1 Silt Fence
2.1.2.2 Fiber Rolls
2.1.2.3 Street Sweeping And Vacuuming
2.1.2.4 Storm Drain Inlet Protection
2.1.2.5 Active Treatment System (ATS)
2.1.3 Wind Erosion Control BMP
2.1.4 Tracking Control BMPs
2.1.4.1 Stabilized Construction Entrance/Exit
2.1.5 Non-Stormwater Management BMPs
2.1.5.1 Illicit Connection/Illegal Discharge Detection And Reporting
2.1.5.2 Vehicle And Equipment Cleaning
2.1.5.3 Vehicle And Equipment Fueling
2.1.5.4 Vehicle And Equipment Maintenance

DRAFT

2.1.6 Waste Management And Materials Pollution Control BMPs
2.1.6.1 Material Delivery And Storage
2.1.6.2 Material Use
2.1.6.3 Stockpile Management
2.1.6.4 Spill Prevention And Control
2.1.6.5 Sanitary/Septic Waste Management
2.2 On-Site Rain Gauge
2.2.1 Rain Gauge Installation
2.2.2 Rain Gauge Reading Procedures

PART 3 EXECUTION

3.1 MOBILIZATION AND DEMOBILIZATION
3.1.1 BMP Installation And Removal
3.1.2 Termination Of SWPPP And CSMP Responsibilities
3.1.3 Records
3.2 MAINTENANCE, MONITORING AND INSPECTIONS
3.2.1 SWPPP And Amendments
3.2.2 Rain Event Action Plans (REAPs)
3.2.3 Monitoring And Inspections
3.2.3.1 Inactive Construction Inspections
3.2.4 Correcting Deficiencies
3.2.5 Non-Storm Water Discharge Sampling
3.2.6 Rain Event Sampling
3.2.6.1 Exceedance Report
3.2.6.2 Receiving Water Monitoring Triggers

-- End of Section Table of Contents --

DRAFT

SECTION 01 57 23

TEMPORARY STORM WATER POLLUTION CONTROL

PART 1 GENERAL

1.1 SUMMARY

The work consists of implementing the storm water pollution prevention measures to prevent sediment from entering streams or water bodies as specified in this Section in conformance with the requirements of Section 01 57 19 TEMPORARY ENVIRONMENTAL CONTROLS, and the requirements of the National Pollutant Discharge Elimination System (NPDES).

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.

DRAFT

ASTM INTERNATIONAL (ASTM)

ASTM D3977	(1997; R 2007; E 2014) Standard Test Methods for Determining Sediment Concentration in Water Samples

CALIFORNIA STATE WATER RESOURCES CONTROL BOARD (CSWRCB)

CSWRCB CGP	(2012) National Pollutant Discharge Elimination System General Permit for Storm Water Discharges Associated with Construction and Land Disturbance Activities. Construction General Permit (CGP) Order No. 2009-0009-DWQ as amended by 2010-0014-DWQ and 2012-0006-DWQ, NPDES No. CAS000002.
SMARTS	California State Water Resource Control Board's Storm Water Multi-Application and Report Tracking System (SMARTS).
CSWRCB GCM	(2001) Guidelines for Citizen Monitors. SWRCB No. 8-099-250-0

CALIFORNIA STORMWATER QUALITY ASSOCIATION (CASQA)

CASQA CABMPHB	(2024) California Stormwater Best Management Practice Handbook for Construction

STANDARD METHODS (SM)

SM 2130	(2001) Turbidity

U.S. ENVIRONMENTAL PROTECTION AGENCY (EPA)

EPA Method 160.2	(1999) Residue, Non-Filterable (Gravimetric, Dried at 103-105°C)
EPA Method 160.5	(1983) Settleable Matter (Volumetric, Imhoff Cone)
EPA Method 180.1	(1993; R2) Determination Of Turbidity By Nephelometry
NPDES	(1972; R 2005) National Pollutant Discharge Elimination System

U.S. NATIONAL ARCHIVES AND RECORDS ADMINISTRATION (NARA)

40 CFR 136	Guidelines Establishing Test Procedures For The Analysis Of Pollutants

1.3 SUBMITTALS

Government approval is required for submittals with a "G" designation; submittals not having a "G" designation are for information only or as otherwise designated. When used, a designation following the "G" designation identifies the office that will review the submittal for the Government.

Submit all submittals with sufficient lead-time in electronic Portable Document Format (PDF) to allow for government review and contractor revisions to ensure the project schedule is not delayed. Unless otherwise noted, USACE will require a minimum of 30 calendar days to review documents. Submit all storm water related submittals to USACE When necessary, enter submittals into the California State Water Resource Control Board's (CSWRCB) Storm Water Multi-Application and Report Tracking System (SMARTS).

Submit the following in accordance with Section 01 33 00 SUBMITTAL PROCEDURES:

SD-01 Preconstruction Submittals

SWPPP; G

A site-specific Storm Water Pollution Prevention Plan (SWPPP) and Active Treatment System (ATS) Plan.

PRDs; G

Permit Registration Documents (PRDs) to obtain or update permit coverage.

SD-03 Product Data

BMP Product Data

Manufacturer's installation instructions of Best Management Practices (BMPs) to be used.

Geotextiles And Mats; G

DRAFT

SD-06 Test Reports

SWPPP Amendment

Amend the SWPPP as needed to reflect current site conditions.

Sampling Results

Inspection Reports

REAPs and Inspection Reports

Rain Event Action Plans (REAPs) and Inspection Reports

Exceedance Reports

Exceedance Reports for Numeric Action Level (NAL) exceedances.

ATS Field Data

Annual Report

SD-10 Operation and Maintenance Data

Post-Construction Storm Water Management Plan; G

Operation and maintenance data to support the long-term maintenance plan designated for a minimum of five years.

SD-11 Closeout Submittals

Final SWPPP; G

NOT Application; G

Notice of Termination (NOT) Application.

DRAFT

1.4 GENERAL REQUIREMENTS

Use this specification in conjunction with SECTION 01 57 19 TEMPORARY ENVIRONMENTAL CONTROLS that addresses the project's environmental requirements and SECTION 32 92 33 GRASS SEEDING AND EROSION CONTROL that addresses the project's long-term BMPs.

Ensure all project activities are in accordance with The National Pollutant Discharge Elimination System (NPDES) General Permit No. CAS000002 for Waste Discharge Requirements for Discharge of Storm Water Runoff Associated with Construction and Land Disturbance Activities, CSWRCB CGP, Order No. 2009-0009-DWQ as amended by 2010-0014-DWQ and 2012-0006-DWQ. Compliance to this permit and subsequent requirements/updates is mandatory. Any permit noncompliance constitutes a violation of the Clean Water Act and the Porter-Cologne Water Quality Control Act and is grounds for enforcement action and/or removal from General Permit coverage. CSWRCB CGP, can be found at http://www.swrcb.ca.gov/water_issues/programs/stormwater/constpermits.shtml.

In accordance with the CGP's Legally Responsible Person (LRP) definition, the Contractor is the LRP for this project. As the project's LRP, obtain

CSWRCB CGP permit coverage and ensure full permit compliance throughout the life of the permit. Ensure all Permit Registration Documents (PRDs) and Notice of Termination (NOT) are electronically signed, certified, and submitted via the SMARTS to the CSWRCB. Set up an account as a data submitter in SMARTS. Unless otherwise directed, enter all required data into SMARTS including but not limited to the NOI, annual report(s), SWPPP, sampling results, post construction water balance worksheets, and NOT. The LRP will be responsible for the final certification and submittal to the water board in SMARTS. See the paragraph titled "Permit Registration Documents" for additional requirements. Pay all permit fees, and fines/penalties for violation or non-compliance with Federal, State and local laws and regulations.

The CSWRCB CGP does not preempt or supersede the authority of local storm water management agencies to prohibit, restrict, or control storm water discharges to municipal separate storm sewer systems (MS4) or other watercourses within their jurisdictions. Obtain and include the required local permits and/or agency's approval(s) in the SWPPP.

The CSWRCB CGP does not authorize discharges of fill or dredged material regulated by the U.S. Army Corps of Engineers under CWA § 404 and does not constitute a waiver of water quality certification under CWA § 401.

1.4.1 Required Stormwater Meetings

Conduct required stormwater meeting the week after execution of the NTP. Conduct the meeting at the USACE Resident Office. At a minimum, the Contractor's Project Manager, or appropriate technical person, a LRP representative, the Qualified SWPPP Practitioner (QSP) and the Qualified SWPPP Developer (QSD) are required to be present. (See paragraph titled TRAINING REQUIREMENTS for position details.)

This meeting is the equivalent of a preparatory meeting for the SWPPP submittal. The QSD and QSP must discuss the proposed stormwater management plan for this project. This meeting is required prior to government approval of the SWPPP submittal.

Hold additional meetings for completion of the SWPPP or other required information as needed, including but not limited to the required meetings detailed in 01 45 00 QUALITY CONTROL. The QSD must attend all stormwater related 3-phase process meetings.

1.4.2 Training Requirements

This contract requires that all personnel responsible for the writing and implementation of the SWPPP be specifically trained in the subject of storm water permitting and erosion and sedimentation controls. Provide requirements for training based on the level of responsibility in the SWPPP. Below are the requirements for the position(s) of the QSD and the QSP, which must be in place for the entire duration of the project, until meeting the termination requirements as detailed in paragraph "Termination Of SWPPP And CSMP Responsibilities."

1.4.2.1 Qualified SWPPP Developer (QSD)

SWPPPs must be written, amended and certified by a QSD. A QSD must have one of the following registrations or certifications, and appropriate experience, as required for:

DRAFT

a. A California registered professional civil engineer;
b. A California registered professional geologist or engineering geologist;
c. A California registered landscape architect;
d. A professional hydrologist registered through the American Institute of Hydrology;
e. A Certified Professional in Erosion and Sediment Control (CPESC) (TM) registered through Enviro Cert International, Inc.;
f. A Certified Professional in Storm Water Quality (CPSWQ) (TM) registered through Enviro Cert International, Inc.; or
g. A professional in erosion and sediment control registered through the National Institute for Certification in Engineering Technologies (NICET);

The QSD must be available throughout the life of the project to review and amend the SWPPP when necessary. Provide a copy of the QSD's certification within the SWPPP. Obtain the QSD Certification through CSWRCB-sponsored training (from California Stormwater Quality Association (CASQA)) or through CSWRCB-approved training (from the State Water Board's Storm Water Monitoring and Report Tracking System SMARTS). Only professional civil engineers, geologist, and engineering geologists licensed and in good standing with the California Board of Professional Engineers, Land Surveyors and Geologist may obtain their required QSD license through SMARTS.

The QSD must be actively involved in the project throughout the life of the contract. The QSD must inspect the site in person prior to SWPPP development to aid in the creation of the site specific SWPPP. At a minimum, the QSD must perform one inspection per month to ensure the SWPPP and BMPs are properly implemented and assess the SWPPP and amend it as needed during active construction periods. Perform monthly SWPPP assessments during inactive construction periods. Document verification of the QSD's inspections and SWPPP assessments in the SWPPP. The QSD must inspect the site in person prior to certification/submittal of the Notice of Termination (NOT).

Ensure the QSD has a minimum of five years experience in developing SWPPPs for construction sites in compliance with NPDES permits. Provide the QSD's resume in the SWPPP to demonstrate proof of experience.

1.4.2.2 Qualified SWPPP Practitioner (QSP)

Ensure that all BMPs required by the CSWRCB CGP are implemented by a Qualified SWPPP Practitioner (QSP). A QSP is a person responsible for non-storm water and storm water visual observations, sampling and analysis. A QSP must either be a QSD or have one of the following certifications:

a. A certified erosion, sediment and storm water inspector registered through Enviro Cert International, Inc.; or

b. A certified inspector of sediment and erosion control registered through Certified Inspector of Sediment and Erosion Control, Inc.

The QSP must be available throughout the life of the project to address and implement the SWPPP when necessary. Provide a copy of the QSP's certification in the SWPPP. Obtain the Certification from the California Stormwater Quality Association (CASQA) to be valid.

DRAFT

The QSP must be readily available and located within a reasonable distance from the project site in order to respond quickly to any stormwater related emergencies. The QSP must be able to respond and be physically present onsite within one hour of notification from the Contracting Officer.

1.4.3 Additional Requirements

CSWRCB CGP establishes three levels of risk possible for a construction site. The Government has determined this project site's sediment and receiving water risk falls under Risk Level 123 requirements. The Contractor is responsible for meeting all Risk Level 123 requirements detailed in CSWRCB CGP to be in compliance. Attachment CDE of the CSWRCB CGP details additional Risk Level 123 requirements. When Risk Level 123 requirements conflict with requirements within this specification, the more stringent requirement must be followed.

1.5 DEVELOPMENT AND DESIGN

1.5.1 SWPPP Development

The SWPPP is a requirement of the CSWRCB CGP permit and compliance is mandatory. Guidance for creating a SWPPP can be found at the California Stormwater Quality Association website http://www.cabmphandbooks.com. Include a complete CSMP and an initial REAP. Once the SWPPP has been completed, submit it to USACE for government approval no later than 15 days upon execution of the NTP. Government approval will be based on the document meeting these specifications, and the CSWRCB CGP permit and CASQA CABMPHB requirements. Resubmit the SWPPP to the government within 21 days of receiving government review comments until an acceptable action code is issued.

After government approval, submit the SWPPP to the CSWRCB's SMARTS, as detailed in the paragraph titled, "Permit Registration Documents."

Include a narrative section as well as figures in the Site Maps. At a minimum, include the locations of all BMPs (temporary and post-construction), discharge points, sampling collection points, drainage patterns across the project area, storm drain inlets and temporary concentrated flow drainage patterns in the Site Maps. Due to the nature of the project where footprints are separated, include individual storm water site maps for each project footprint and associated staging area.

1.5.1.1 Construction Site Management Plan (CSMP)

Develop a written site-specific CSMP in accordance with the Risk Level 123 requirements in the CSWRCB CGP. Include all monitoring procedures and instructions, location maps, forms, and checklists as required to be in compliance. Develop the CSMP prior to the commencement of construction activities, and revised as necessary to reflect project revisions. Include the CSMP as part of the SWPPP, an appendix or separate chapter.

Develop and Implement the CSMP to address the following objectives:

a. To demonstrate that the site is in compliance with the Discharge Prohibitions and applicable Numeric Action Levels (NALs) of the CSWRCB CGP;

b. To determine whether non-visible pollutants are present at the

DRAFT

construction site and are causing or contributing to exceedance of water quality objectives;

c. To determine whether immediate corrective actions, additional BMP implementation, or SWPPP revisions are necessary to reduce pollutants in storm water discharges and authorized non-storm water discharges; and

d. To determine whether BMPs included in the SWPPP are effective in preventing or reducing pollutants in storm water discharges and authorized non-storm water discharges.

Include a description of the following items:

1. Visual observation locations, visual observation procedures, and visual observation follow-up and tracking procedures;

2. Sampling locations, and sample collection and handling procedures. Include detailed procedures for sample collection, storage, preservation, and shipping to the testing lab to assure that consistent quality control and quality assurance is maintained. Attach an example Chain of Custody form used when handling and shipping samples to the monitoring program; and

3. Identification of the analytical methods and related method detection limits (if applicable) for each required parameter.

1.5.1.2 Non-Visible Pollutants

Designate trained personnel to collect water quality samples. Document the personnel and training in the CSMP. Training must consist of the following elements:

1. SWPPP and CSMP review,

2. Health and safety review, and

3. Sampling simulations.

The CSMP must describe the following water quality sampling procedures:

a. Sampling preparation,

b. Collection,

c. Quality assurance and quality control,

d. Sample labeling,

e. Collection documentation,

f. Sample shipping,

g. Chain of custody,

h. Sample numbering, and

i. Precautions from the construction site health and safety plan.

DRAFT

For discharges into bodies of water listed as impaired due to sedimentation/siltation, samples will be analyzed for both settleable solids in accordance with the requirements of EPA Method 160.5, and total suspended solids in accordance with EPA Method 160.2; or for suspended sediment concentration in accordance with the requirements in ASTM D3977.

The SWPPP must identify the locations where runoff sources on the construction site discharge directly into the listed body of water. Also, identify the locations where water flows onto the project with the potential to combine with runoff that discharges directly into the listed body of water. Show these locations on the Site Maps.

Identify locations for sampling and analysis of storm water discharges to characterize discharges associated with construction activity from the entire project disturbed area and the reason for their selection. Show sampling locations on the Site Maps. The point of compliance for samples is at the project boundary. The sampling locations must include:

a. Upstream/up-gradient from direct discharges from the construction site from a representative and accessible location as close as possible and upstream from the effluent discharge point;

b. Immediately downstream/down-gradient from the last point of direct discharge from the construction site from a representative and accessible location as close as possible and downstream from the effluent discharge point;

c. Immediately downhill from the locations where water flows into the water body.

This project has the potential to discharge non-visible pollutants in storm water from the construction site. Include a description of the sampling and analysis strategy and implement monitoring of non-visible pollutants in the CSMP.

Identify potential non-visible pollutants that will be present on the construction site associated with the following:

a. Construction materials and wastes;

b. Existing contamination due to historical site usage; or

c. Application of soil amendments, including soil stabilization products, with the potential to alter pH or contribute toxic pollutants to storm water.

Show the locations planned for storage and use of the potential non-visible pollutants on the Site Maps. It is encouraged to store large surpluses of potential non-visible pollutants in low activity areas away from bare soil and water sources within a secondary containment.

Describe the schedule for collecting effluent samples from all discharge points where non-visible pollutants are discharged off-site in the CSMP. The following list of conditions requires sampling when observed during inspections:

a. Materials or wastes containing potential non-visible pollutants are not stored under watertight conditions.

DRAFT

b. Materials or wastes containing potential non-visible pollutants are stored under watertight conditions, but:

   1. A breach, leakage, malfunction, or spill is observed;

   2. The leak or spill has not been cleaned up before precipitation; and

   3. There is the potential for discharge of non-visible pollutants to surface waters or drainage system.

c. Construction activities; such as application of fertilizer, pesticide, herbicide, fungicides, insecticide, methyl methacrylate (MMA) concrete sealant, or non-pigmented curing compound; have occurred during precipitation or within 24 hours preceding precipitation, and have the potential to discharge pollutants to surface waters or drainage system.

d. Soil amendments, including soil stabilization products, with the potential to alter pH levels or contribute toxic pollutants to storm water runoff have been applied, and have the potential to discharge pollutants to surface waters or drainage system (unless independent test data are available that demonstrate acceptable concentrations of non-visible pollutants in the soil amendment).

e. Stormwater runoff from an area contaminated by historical usage of the site has the potential to discharge pollutants to surface waters or drainage system.

Identify water flow paths, sampling locations for collecting downstream and control samples, and the reason for their selection. Select the control sampling location so the sample does not come into contact with materials, wastes or areas associated with potential non-visible pollutants or disturbed soil areas. Show non-visible pollutant sampling locations on the Site Maps. Identify the analytical method to be used for downhill and control samples for potential non-visible pollutants on the project.

Samples to be analyzed by a laboratory must be sampled, preserved, and analyzed by a State-certified laboratory in conformance with the requirements in 40 CFR 136, "Guidelines Establishing Test Procedures for the Analysis of Pollutants." Identify the laboratory, sample containers, preservation requirements, holding times, and analysis method in the CSMP.

Ensure that the analyzing laboratories will receive samples within 48 hours of the physical sampling (unless otherwise required by the laboratory), and must use only the sample containers provided by the laboratory to collect and store samples. Keep water quality analytical results, and quality assurance and quality control data for a period of three years, and retained on-site while construction is ongoing. Also, provide an evaluation of whether the downhill or downstream samples show levels of the tested parameter higher than in the control sample. If downhill or downstream samples show increased levels, assess the water pollution control measures, site conditions, and surrounding influences to determine the probable cause for the increase. As determined by the assessment, repair or modify water pollution control measures to address increases and amend the SWPPP as necessary. Electronic results (in one of the following file formats: .xls, .txt) must have the following information:

a. Sample identification number.

DRAFT

b. Contract number.

c. Constituent.

d. Reported value.

e. Analytical method.

f. Method detection limit.

g. Reported limit.

h. Data Qualifiers.

Maintain the water quality sampling documentation and analytical results with the SWPPP on the project site. If construction activities or knowledge of site conditions change such that discharges or sampling locations change, amend the CSMP as necessary.

1.5.1.3 Best Management Practices (BMPs)

The QSD must select BMPs to include in the SWPPP in accordance with these specifications and the minimum Risk Level 123 BMPs defined in the CSWRCB CGP. Include the BMP's installation and maintenance schedule and on-site location in the SWPPP. Installation, maintenance and inspection details are listed in the appropriate CASQA CABMPHB BMP fact sheet as defined in Part 2: paragraph 2.1, Required BMPs. Install BMPs year-round, even when no rain event is forecasted. Include the following water pollution control practices in the SWPPP as needed for compliance with CSWRCB CGP:

Erosion Control
Sediment Control
Wind Erosion Control
Tracking Control
Non-Storm Water Management
Waste Management and Materials Pollution Control
Active Treatment System Plan (if needed)

Implement erosion control practices for all disturbed soil on the project site. Select a variety of erosion control measures to protect the soil surface and prevent soil particles from being detached by rainfall, flowing water, or wind. The minimum required erosion control BMPs to be implemented onsite are listed in paragraph 2.1.1, Erosion Control BMPs.

Implement sediment control BMPs to capture any soil that becomes eroded. Implement these BMPs to divert flows from exposed soils, temporarily store flows, or otherwise limit runoff and the discharge of pollutants from exposed areas of the site. Establish effective perimeter controls; consider installing silt fences or placing straw wattles below slopes. The minimum required sediment control BMPs to be implemented onsite are listed in paragraph 2.1.2, Sediment Control BMPs.

Include the Wind Erosion Control BMP in the SWPPP, BMP details are listed in the appropriate CASQA CABMPHB BMP fact sheet as defined in paragraph 2.1.3 Wind Erosion Control.

Implement proper tracking control BMPs to reduce the tracking of sediments

DRAFT

off-site. The minimum required tracking control BMPs to be implemented onsite are listed in paragraph 2.1.4, Tracking Control BMPs.

The discharge of materials other than storm water and authorized non-storm water discharges is prohibited. The minimum required Non-Stormwater control BMPs and waste management and pollution control BMPs to be implemented onsite are listed in paragraph 2.1.5 Non-Stormwater Management BMPs, and paragraph 2.1.6, Waste Management and Materials Pollution Control BMPs, respectively.

Include the BMP fact sheets found at the CASQA website as an appendix of the SWPPP. Include BMP Product Data, see paragraph titled "BMP Installation and Removal" for submittal details. Implement, maintain, inspect, and remove BMPs in accordance with the fact sheets, product data sheets, and the CSWRCB CGP requirements.

Document each BMP in both a narrative section and site map in the SWPPP. Indicate all BMPs to be implemented, where they will be located, and when they will be installed in the SWPPP. In cases where information about BMP installation, implementation, and management are not available on the CASQA website or in CSWRCB CGP, include the BMP specifications and manufacture instructions in the SWPPP, or in a SWPPP amendment, for approval prior to installation.

Include a discussion of the inspection and maintenance program for all BMPs as identified to be utilized throughout the entire duration of the project in the SWPPP. A qualified person (QSP, or persons appropriately trained by the QSP) will be assigned the responsibility to conduct inspections. List the name and telephone number of that person in the SWPPP.

Select temporary stabilization methods with a minimum longevity period to meet the duration of the project and replace as needed. The guidelines for required longevity for temporary stabilization methods are detailed in Appendix F of the CASQA CABMPHB. Select the temporary stabilization methods which are habitat sensitive, including, but not limited to: biodegradable or photodegradable materials and materials compatible with existing vegetation.

DRAFT

1.5.1.4 Temporary High Visibility Fencing

Not later than 5 days after the date established for commencement of work and prior to the start of ground disturbing activities, the Contractor must furnish and erect temporary protective fencing at the work site at the locations identified by the Contract Documents and by the Agency. Fencing type must be as noted on the Plans. The fencing must be maintained by the Contractor during the life of the contract. Upon completion and acceptance of the work, the fencing will become the property of the Contractor and must be removed from the work site.

1.5.2 Permit Registration Documents (PRDs)

Submit PRDs for Government Approval prior to submitting to CSWRCB's SMARTS to obtain permit coverage. Submit PRDs in electronic PDF form for approval. PRDs include the following:

a. Site Maps

b. Storm Water Pollution Prevention Plan (SWPPP)

c. Signed Certification Statement by the LRP

d. Notice of Intent (NOI)

e. Annual Fee

f. Risk Assessment

g. Annual Report(s)

h. Post-Construction Water Balance or watershed process-based model

Upon approval of the PRDs submittal, electronically file and certify PRDs in SMARTS. The Contractor is the LRP and must create a LRP account in SMARTS and link the project account to the USACE data submitter SMARTS account, username: CESPKdatasubmit. Ensure all PRDs, annual reports, ATS field data, sampling results and NOTs are electronically signed, certified, and submitted to the CSWRCB via SMARTS. Create a Data Submitter Account in SMARTS and link the account to the LRP's project account. Ensure all PRDs are electronically inputted in the SMARTS program for USACE and LRP approval.

Electronically file and certify all PRDs prior to construction commencement. Send the initial NOI fee to the CSWRCB after the NOI has been completed and certified by the LRP no later than seven days prior to the start of construction activities. Do not commence Land Disturbance activities until the PRDs and the annual fee are received by the CSWRCB, and a Waste Discharge Identification (WDID) number is assigned. Provide annual permitting fees to the CSWRCB each year until the NOT submittal has been approved by the Government and the CSWRCB. Obtain the WDID in SMARTS and include it in the SWPPP prior to construction commencement.

Attachment B in the CSWRCB CGP details the requirements needed for each PRD submittal. If the requirements listed in Attachment B are not met, the PRD will be considered incomplete and the NOI will be rejected.

Submit the Post Construction Water Balance Performance Standard Spreadsheet or watershed process-based model with the NOI as described in Appendix 2 of CSWRCB CGP. Perform an evaluation to determine if the area is subject to post-construction standards of an active Phase I or II Municipal Separate Storm Sewer System (MS4) permit that has an approved Storm Water Management Plan to determine applicability of this requirement.

Dually submit each Annual Report to the Government and to the CSWRCB's SMARTS no later than 1-August of each year, and at the end of the project in electronic PDF form. Certify the annual report in SMARTS as the LRP no later than 1-September of each year. Submit an annual report at the end of the project to cover the beginning of the compliance year to the end of the project in order to apply for permit termination. The reporting year is 1-July through 30-June. An annual report is to be submitted for sites that are active for three months or more in each reporting period. Each annual report must be in accordance with the special provisions within the CSWRCB CGP requirements. The Annual report must document all training for: individuals responsible for any activity associated with compliance with the CSWRCB CGP requirements; individuals responsible for BMP installation, inspection, maintenance and repair; and individuals responsible for overseeing, revising, and amending the SWPPP. Each annual report must consist of, but is not limited to, the following:

DRAFT

a. a summary and evaluation of all sampling and analysis results, including copies of laboratory reports;

b. the analytical method(s), method reporting unit(s), and method detection limit(s) of each analytical parameter (analytical results that are less than the method detection limit must be reported as "less than the method detection limit");

c. a summary of all corrective actions taken during the compliance year;

d. identification of any compliance activities or corrective actions that were not implemented;

e. a summary of all violations of the CSWRCB CGP;

f. the names of individual(s) who performed the facility inspections, sampling, visual observation (inspections), and/or measurements;

g. the date, place, time of facility inspections, sampling, visual observation (inspections), and/or measurements, including precipitation (rain gauge); and

h. the visual observation and sample collection exception records and reports specified in Attachments CDE: Risk Level 123 Requirements.

i. Ad hoc reports with individual sample results that are not shown in the daily averages (if used). Ad hoc reports are to be uploaded into SMARTS as a Word document.

Electronically file all required sampling results and NAL exceedance reports. If any effluent sample exceeds an applicable NAL, dually submit a LRP certified NAL Exceedance Reports to the Government and to SMARTS no later than 10 days after the conclusion of the storm event. Provide the Government submittal in both electronic PDF and paper form. See the paragraph titled NAL Exceedance Reports for additional requirements.

Submit sampling results for all non-visible pollutant samples collected during any breach, malfunction, leakage, or spill observed which could result in the discharge of pollutants to surface waters that would not be visually detectable in stormwater. Sampling Results submittals must also include storm event sampling results to include data collected three times per day during qualifying rain events that accurately represents the active flow off site, per paragraph titled "Rain Event Sampling". Dually submit Sampling Results to the Government and to SMARTS no later than 5 days after the conclusion of each storm event. Submit sampling results in electronic PDF form.

PART 2 PRODUCTS

SWPPP and CSMP development information are provided in Part 1 of this specification. This section defined which BMPs are required to be utilized and included in the SWPPP, as well as a list of additional BMPs that are available for use. All BMPs must follow their specified CASQA CABMPHB BMP fact sheet except where more stringent requirements are stated in these specifications or in the BMPs' manufacturer's recommendations. Additional design requirements for particular BMPs are stated in Part 1: GENERAL of this specification. Additional mobilization/demobilization, maintenance, and inspection requirements are

DRAFT

stated in Part 3: EXECUTION of this specification.

2.1 REQUIRED BEST MANAGEMENT PRACTICES

2.1.1 Erosion Control BMPs

Install and maintain all of the following required erosion control BMPs. Use a combination of two or more of the following five erosion control BMPs for soil protection in each area: hydraulic mulch, hydroseeding, soil binders, straw mulch, or geotextile and mats. Follow the additional recommendations as provided in Section 32 92 33 GRASS SEEDING AND EROSION CONTROL to be in compliance for seeding or other long-term BMPs. Choose the following BMPs with minimum longevity to meet the duration of the project, and those which offer habitat sensitive, biodegradable or photodegradable features, when allowed by site conditions.

2.1.1.1 Scheduling

Utilize scheduling as an erosion control BMP in accordance with the CASQA CABMPHB "Scheduling, EC-1" fact sheet. Schedule work to eliminate soil disturbance activities during rain events. If work is to be done when rainfall is predicted, adjust the construction schedule to allow the implementation of erosion and sedimentation controls on all disturbed area prior to rainfall.

2.1.1.2 Preservation Of Existing Vegetation

Utilize this BMP as an erosion control BMP in accordance with the CASQA CABMPHB "Preservation of Existing Vegetation, EC-2" fact sheet. Identify and protect vegetation that provides erosion and sedimentation control benefits when possible. Provide temporary fencing prior to the commencement of soil disturbing activities to protect existing vegetation, especially on areas designated as Environmentally Sensitive Areas (ESAs) as described in Section 01 57 19 TEMPORARY ENVIRONMENTAL CONTROLS.

2.1.1.3 Hydraulic Mulch

This BMP must meet the CASQA CABMPHB "Hydraulic Mulch, EC-3" fact sheet standards.

2.1.1.4 Hydroseeding

This BMP must meet the CASQA CABMPHB "Hydroseeding, EC-4" fact sheet standards.

Hydroseeding requires sufficient time in the season to ensure adequate vegetation establishment and erosion control prior to rainfall. If conditions for seeding (per specifications, BMP factsheet , and manufacturers recommendations) cannot be met within 14-days of the area becoming inactive, install Geotextiles or mats to ensure soil cover until the optimum seeding time is available. Follow the paragraph titled, "Geotextiles and Mats" and specification section 32 92 33 GRASS SEEDING AND EROSION CONTROL for product and installation requirements.

2.1.1.5 Soil Binders

This BMP must meet the CASQA CABMPHB "Soil Binders, EC-5" fact sheet standards.

DRAFT

2.1.1.6 Straw Mulch

This BMP must meet the CASQA CABMPHB "Straw Mulch, EC-6" fact sheet standards.

2.1.1.7 Geotextiles And Mats

The use of plastic liners are prohibited; use plastic material only where deemed necessary. The Contracting Officer must approve the use of plastic liners prior to use. Material selection, site preparation, seeding, anchoring, and installation requirements are detailed in the CASQA CABMPHB fact sheet. This BMP must meet the CASQA CABMPHB "Geotextiles and Mats, EC-7" fact sheet standards.

When seed is placed in combination with Rolled Erosion Control Products, seed the area before blanket installation. Re-seed all areas disturbed during blanket installation. Ensure blankets are anchored and are uniformly in contact with the soil. If direct contact with the soil cannot be maintained (such as on rocky slopes) use alternate erosion control methods rather than rolled erosion control products.

2.1.1.8 Soil Preparation/Roughening

Prepare/roughen surface soils prior to applying hydraulically applied stabilization methods, compost blankets, or straw mulch. Surface soils must not be roughened in combination with Erosion Control Blankets. The QSD must consider the type of erosion controls BMPs to be utilized and detail the soil preparation/roughening requirements for each BMP in the SWPPP. Use this BMP to meet the CASQA CABMPHB "Soil Preparation/Roughening, EC-15" fact sheet standards. See SECTION 32 92 33 GRASS SEEDING AND EROSION CONTROL for additional final soil preparation requirements.

DRAFT

2.1.2 Sediment Control BMPs

Install and maintain the following sediment control BMPs. Choose the following BMPs with the minimum longevity to meet the duration of the project, and offers habitat sensitive, biodegradable or photodegradable features, when allowed by site conditions. Do not use sandbags and straw bales unless otherwise directed by the Contracting Officer.

2.1.2.1 Silt Fence

Install and maintain silt fences as a sediment control BMP in accordance with the CASQA CABMPHB "Silt Fence, SE-1" fact sheet. Secondary to fiber rolls, silt fences are temporary linear sediment barriers of permeable fabric designed to intercept and slow the flow of sediment-laden sheet flow runoff. Properly trench and key in silt fences for full effectiveness. Remove and properly dispose damaged silt fences and replace with new ones. Remove sediment when the sediment accumulation reaches 1/3 of the barrier height. Design and layout, materials and installation requirements are detailed in the CASQA CABMPHB fact sheets, which must be adhered to.

2.1.2.2 Fiber Rolls

Install and maintain fiber rolls as a sediment control BMP in accordance with the CASQA CABMPHB "Fiber Rolls, SE-5" fact sheet. Preferred over silt fences, fiber rolls (or straw wattles) consists of straw, flax, or

other similar materials bound into a tight tubular roll. Use fiber rolls containing biodegradable materials with photodegradable netting. Properly trench, stake, and overlap fiber rolls for full effectiveness. Repair split, torn, unraveling or slumping fiber rolls within 48 hours of identification. Remove sediment when sediment accumulation reaches 1/3 the designed sediment storage depth. When installing on a slope, the slope inclination controls the required spacing as detailed in the CASQA CABMPHB fact sheet, and the Risk Level 123 requirements in the CSWRCB CGP (see paragraph MAINTENANCE, MONITORING AND INSPECTIONS).

2.1.2.3 Street Sweeping And Vacuuming

Utilize this BMP as a sediment control BMP in accordance with the CASQA CABMPHB "Street Sweeping and Vacuuming, SE-7" fact sheet. Implement this BMP anywhere sediment is tracked from the project site onto public or private paved roads, especially at points of ingress/egress. Use self-propelled or walk-behind equipment to remove sediment and clean paved areas. Kick brooms or sweeper attachments are not allowed. Sweep and/or vacuum visible sediment tracking to eliminate unauthorized non-storm water discharge from reaching surface water or drainage systems. When tracked or spilled sediment is observed outside the construction limits, remove it immediately; continuous removal may be required. Keep a mechanical street sweeper onsite and available at all times. If sediment is wet or when tracked soil is caked, scrape the soil loose.

The discharge of any debris (litter, rubble, discarded refuse, and remains of destroyed inorganic anthropogenic waste) is prohibited. After sweeping is finished, properly dispose of sweeper wastes at an approved dumpsite.

2.1.2.4 Storm Drain Inlet Protection

Install and maintain this BMP as a sediment control BMP in accordance with the CASQA CABMPHB "Storm Drain Inlet Protection, SE-10" fact sheet. Every storm drain inlet potentially receiving sediment-laden runoff from any construction related areas must be protected against permitting the transmission of polluted waters. Chose one of the three following types of storm drain inlet protection devices based on site conditions. Specify the type in the SWPPP detailing maintenance and installation, and locations shown on the Site Maps.

a. Excavated Drop Inlet Sediment Trap: An excavated area around the inlet to trap sediment.

b. Gravel bag barrier: Used to create small sediment trap upstream of inlets on sloped paved streets. Appropriate for sheet flow or when concentrated flow may exceed 0.5 cfs, and where overtopping is required to prevent flooding.

c. Block and Gravel Filter: Appropriate for flows greater than 0.5 cfs.

2.1.2.5 Active Treatment System (ATS)

An ATS is required to address the CSWRCB CGP requirements. Design the system to meet the effluent standards, and include it as part of the ATS Plan within the SWPPP. The design must, at a minimum, address the following topics: chemicals to be used, chemical quantities, sizing, outflow velocity, pH and turbidity of discharge, type of filtration, retention time, and location.

DRAFT

Submit an ATS Plan for approval as part of the SWPPP. Upon approval, submit the ATS Plan electronically to the CSWRCB in SMARTS at least 14 days prior to the planned operation of the ATS. A paper copy of the ATS Plan must be available onsite during ATS operation. At a minimum, the ATS Plan must include:

a. ATS Design Calculations,
b. ATS Operation and Maintenance Manual for All Equipment,
c. ATS Monitoring, Sampling & Reporting Plan, including Quality Assurance/Quality Control (QA/QC),
d. ATS Health and Safety Plan,
e. ATS Spill Prevention Plant, and
f. Proof of training specific to using the ATS and its liquid coagulants for storm water discharges. The training must include a minimum of 8-hours of classroom and 32-hours of field training.

Comply with the details of each of these parameters as indicated in Attachment F of the CSWRCB CGP and in accordance with the CASQA CABMPHB "Active Treatment System, SE-11" fact sheet. Design the ATS to capture and treat a volume equivalent to the runoff from a 10-year, 24-hour storm event using a watershed runoff coefficient of 1.0. Design the ATS to treat the collected water within a 72-hour period.

Remove sediment from the storage or treatment cells as necessary to ensure that the cells maintain their required water storage (volume) capability. Handle and dispose of all solids generated during the ATS operations in accordance with all local, state, and federal laws and regulations. Obtain permission from the Contracting Officer to dispose of the ATS solids onsite; provide proof of safe chemical disposal to the Contracting Officer if requested.

Dually submit ATS Field Data a minimum of once every 30 days to the Government and in SMARTS. The ATS's data recording system must collect the following measurements on a frequency no longer than once every 15 minutes: Turbidity and pH for influent and effluent, residual chemical, and effluent rates and volumes. Include all collected data in the ATS Field Data submittal in electronic PDF form.

DRAFT

2.1.3 Wind Erosion Control BMP

Utilize the wind erosion control BMP as a minimum BMP requirement. Utilize the wind erosion control BMP in accordance with the CASQA CABMPHB "Wind Erosion Control, WE-1" fact sheet. Apply water or other dust palliatives as necessary to prevent or alleviate dust nuisance. Provide covers for haul trucks transporting materials. Provide rapid clean up of sediments deposited on paved roads.

Use of oil, or oil treated subgrade, and chemical dust suppression agents with potential environmental impacts is prohibited. Chemical dust suppression agents should be environmentally benign and naturally degrade. Use within 100 feet of wetlands or water bodies is prohibited.

2.1.4 Tracking Control BMPs

Tracking control BMPs consists of preventing or reducing vehicle tracking from entering a storm drain or watercourse. Tracking control BMPs include: stabilized construction entrance/exit, stabilized construction roadway, and entrance/outlet tire wash. Utilize these BMPS to preclude dirt or mud from being tracked onto public roads or to adjacent water

bodies. Utilize Tracking Control BMPs in accordance with the CASQA CABMPHB Tracking Control, TC-1 through TC-3, fact sheets, as detailed below.

2.1.4.1 Stabilized Construction Entrance/Exit

Utilize this BMP in accordance with the CASQA CABMPHB "Stabilized Construction Entrance/Exit, TC-1" fact sheet. Design the stabilized entrance/exit to support the heaviest vehicles and equipment that will use it. Use of constructed/manufactured steel plates with ribs must be detailed in the SWPPP for approval. If the aggregate method is selected, it must follow the size and depth as detailed in the fact sheet and must be detailed in the SWPPP for approval.

Require all employees, subcontractors, and suppliers to utilize the stabilized construction access. It is recommended to install side barriers and/or use natural barriers to prevent bypassing construction entrance/exit.

2.1.5 Non-Stormwater Management BMPs

Provide source control BMPs to prevent or reduce pollution of stormwater. These BMPs are referred to as "good housekeeping practices" which involve keeping a clean, orderly construction site. The discharge of any debris (litter, rubble, discarded refuse, and remains of destroyed inorganic anthropogenic waste) is prohibited.

2.1.5.1 Illicit Connection/Illegal Discharge Detection And Reporting

Utilize this BMP in accordance with the CASQA CABMPHB "Illicit Connection/Discharge, NS-6" fact sheet. Illicit connection/illegal discharge detection and reporting is applicable anytime an illicit connection or discharge is discovered or illegally dumped material is found on the construction site. Notify the Contracting Officer of any illicit connections and illegal dumping or discharge incidents at the time of discovery. The Contracting Officer will notify the appropriate organizations for reporting.

2.1.5.2 Vehicle And Equipment Cleaning

Utilize this BMP in accordance with the CASQA CABMPHB "Vehicle and Equipment Cleaning, NS-8" fact sheet. On-site vehicle and equipment washing is discouraged; however, when it must occur onsite, locate the wash area away from storm drain inlets, drainage facilities or watercourses. Pave (with concrete or asphalt) and berm the area to contain wash waters to prevent run-on and runoff. Configure with a sump to allow collection and disposal of wash water. Do not discharge wash waters to storm drains or watercourses. See specification 01 57 19 TEMPORARY ENVIRONMENTAL CONTROLS for additional vehicle cleaning requirements.

2.1.5.3 Vehicle And Equipment Fueling

Utilize this BMP in accordance with the CASQA CABMPHB "Vehicle and Equipment Fueling, NS-9" fact sheet. Follow the standards and specifications as described in the CASQA CABMPHB fact sheet. Immediately clean up spills up and properly dispose of contaminated cleanup materials. Conduct fueling on level-grade areas, 50 ft away from downstream drainage facilities and watercourses, and with vapor recovery nozzles to control drips as well as air pollution where required by Air Quality Management Districts (AQMD).

DRAFT

2.1.5.4 Vehicle And Equipment Maintenance

Utilize this BMP in accordance with the CASQA CABMPHB "Vehicle and Equipment Maintenance, NS-10" fact sheet. Use drip pads or absorbent pads during vehicle and equipment maintenance work that involves fluids, unless the maintenance work is performed over an impermeable surface in a dedicated maintenance area. Inspect vehicles and equipment on each day of use; repair leaks immediately or remove the problem vehicle or equipment from the project site.

2.1.6 Waste Management And Materials Pollution Control BMPs

Provide source control BMPs to prevent or reduce pollution of stormwater. These BMPs involve day-to-day operations of the construction site and are under the control of the Contractor. They are additional "good housekeeping practices".

2.1.6.1 Material Delivery And Storage

Utilize this BMP in accordance with the CASQA CABMPHB "Material Delivery and Storage, WM-1" fact sheet. The products requiring BMP implementation with delivery and storage are the following: hazardous chemicals, soil stabilizers and binders, fertilizers, detergents, plaster, petroleum products, asphalt and concrete components, pesticides, fungicides, and herbicides, or any other materials that may be detrimental if released to the environment. Include Safety Data Sheets (SDS) in the SWPPP and supplied to the Contracting Officer for all stored materials. Store hazardous materials with secondary containment, away from high activity areas, and not exposed to the atmosphere when not actively in use.

2.1.6.2 Material Use

Utilize this BMP in accordance with the CASQA CABMPHB "Material Use, WM-2" fact sheet. These procedures apply when the following materials are used or prepared on site: hazardous chemicals, soil stabilizers and binders, fertilizers, detergents, plaster, petroleum products, asphalt and concrete components, pesticides, fungicides and herbicides, or any other materials that may be detrimental if released to the environment. Provide Safety Data Sheets (SDS)to the Contracting Officer for all materials and included in the SWPPP.

2.1.6.3 Stockpile Management

Utilize this BMP in accordance with the CASQA CABMPHB "Stockpile Management, WM-3" fact sheet. Protect any stockpile on site from wind and erosion caused by storm water. Cover and protect stockpiles with a temporary linear and sediment barrier prior to the onset of precipitation. The use of plastic liners are discouraged. Use plastic material only where deemed necessary and approved by the Contracting Officer prior to use. Securely protect all stockpiled waste materials from wind and rain at all times unless actively being used. Divert runoff around or away from the stockpile on the upstream perimeter. Repair and/or replace perimeter control and covers as needed, or as directed by the Contracting Officer, to keep them functioning properly. Remove sediment when sediment accumulation reaches one-third (1/3) of the barrier height.

DRAFT

2.1.6.4 Spill Prevention And Control

Utilize this BMP in accordance with the CASQA CABMPHB "Spill Prevention and Control, WM-4" fact sheet. Implement spill control procedures anytime chemicals and/or hazardous substances are stored. Substances may include, but are not limited to: soil stabilizers/binders, dust palliatives, pesticides, fungicides, herbicides, growth inhibitors, fertilizers, deicing/anti-icing chemicals, fuels, lubricants, or other petroleum distillates.

Include a Spill Control Plan as part of the Environmental Protection Plan, as detailed in specification SECTION 01 57 19 TEMPORARY ENVIRONMENTAL CONTROLS, paragraph ENVIRONMENTAL PROTECTION PLAN, Contents. Educate employees on how to meet cleanup and storage procedures, as well as any other information provided in the fact sheet.

2.1.6.5 Sanitary/Septic Waste Management

Utilize this BMP in accordance with the CASQA CABMPHB "Sanitary/Septic Waste Management, WM-9" fact sheet. The QSP must monitor onsite sanitary/septic waste storage and disposal procedures. Provide proper containment for each temporary sanitary facility to prevent discharge of pollutants to the stormwater drainage system. The Contractor is responsible for the education, storage and disposal procedures as detailed in the fact sheet.

2.2 On-Site Rain Gauge

Install at least one rain gauge on site. The QSD may determine that additional rain gauge(s) are required to quantify precipitation at the project site. Install rain gauge in accordance with CSWRCB GCM rainfall monitoring protocol.

2.2.1 Rain Gauge Installation

Install a rain gauge with a minimum 0.1 inch increments or finer. Secure the gauge to a post or object that will not bend in high winds. Install the rain gauge at least four feet from the ground surface. Install the rain gauge in a location with safe access and that is free from obstructions at an angle of 45 degrees from vertical in all directions.

2.2.2 Rain Gauge Reading Procedures

Read rain gauges during business hours and during safe conditions only. During precipitation events, record readings and empty rain gauge once per 24 hours. Include all rain gauge readings in on-site SWPPP.

PART 3 EXECUTION

3.1 MOBILIZATION AND DEMOBILIZATION

All mobilization and demobilization efforts must follow the requirements detailed in SECTION 01 71 10 MOBILIZATION AND DEMOBILIZATION.

3.1.1 BMP Installation And Removal

Appropriate BMPs must be installed year-round, even when no rain event is forecasted. Install and remove all BMPs per their specific manufacturers' recommendations and their specific CASQA CABMPHB BMP fact sheet. Submit

DRAFT

all BMP Product Data no later than 72 hours prior to installing BMPs listed in the approved SWPPP. Submit a SWPPP Amendment and BMP Product Data sheets to add new BMPs to the SWPPP prior to installation. BMP product data sheets must contain product specifications and manufacturer's recommendations to include the following: application, limitations, longevity, replacement frequency, installation instructions, inspections, ecological information and removal instructions. Include all installation and removal details for each BMP in the SWPPP. Design details are available in PART 1: GENERAL of this specification. BMP product information details are available in PART 2: PRODUCTS of this specification.

Through the duration of the project, the QSP must certify that all BMPs are installed properly, and document certification in the inspection reports no later than 48 hours after installation.

3.1.2 Termination Of SWPPP And CSMP Responsibilities

Upon completion of construction activities, submit the Post-Construction Storm Water Management Plan, Final SWPPP, Final Annual Report and NOT Application before the contractor's stormwater management obligation for the site is terminated. Continue to implement permit and specification requirements until the NOT submittal has been first approved by the Government, then approved by the CSWRCB. The Final SWPPP submittal details can be found in the paragraph titled "SWPPP And Amendments."

The Post-Construction Storm Water Management Plan submittal must provide information required for the long-term maintenance plan designated for a minimum of five years. Identify the parties responsible for the site's short and long-term maintenance plan. It must describe the procedures to ensure that the post-construction storm water management measures are adequately maintained. It must also provide product data information for each post-construction BMP to be left onsite after the permit is terminated, including BMP warranty information, design and operation information, and manufacturer's maintenance and removal instructions. Long-term measures must be in accordance with specification section 32 92 33 GRASS SEEDING AND EROSION CONTROL.

Submit the NOT Application and final Annual Report for government approval prior to submitting it to the CSWRCB's SMARTS. As LRP, it is the contractor's responsibility to comply with the NOT requirements in the CSWRCB CGP. Filing a NOT certifies that all CSWRCB CGP requirements have been met. The NOT Application will be approved only when the QSD certifies that all of the following site conditions have been met:

a. For purposes of "final stabilization," the site will not pose any additional sediment discharge risk than it did prior to the commencement of construction activity;

b. There is no potential for construction-related storm water pollutants to be discharged into site runoff;

c. Final stabilization has been reached;

d. Construction materials and wastes have been disposed of properly;

e. Compliance with the Post-Construction Standards as listed in Section XIII in the CSWRCB CGP requirements has been demonstrated;

DRAFT

f. Post-construction storm water management measures have been installed (per SECTION 32 92 33 GRASS SEEDING AND EROSION CONTROL) and a long-term maintenance plan (minimum of five years designation to describe the procedures to ensure that the post-construction measures are adequately maintained) has been established; and

g. All construction-related equipment, materials and any temporary BMPs no longer needed have been removed from the site and properly disposed of.

At a minimum, final stabilization is to be demonstrated with photographs. Final stabilization demonstration methods using RUSLE, RUSLE2, or a custom method must include computation support and/or all testing and analysis results. Only one of the following methods is to be used to demonstrate the site's final stabilization criteria:

1. 70% final cover method. No computational proof required. 70% final cover refers to the percent of exposed soil that is covered by vegetation or any other non-vegetative means of stabilization.

2. RUSLE or RUSLE2 method. Computation proof required to demonstrate that the pre-development erosion potential matches the post-construction erosion potential showing that the site will not pose any additional sediment discharge risk that it did prior to the commencement of construction activity.

3. Custom Method. Demonstrate that the site complies with the final stabilization requirements. This method must be technically accepted by the larger, scientific and academic community and must relate to the concepts of final stabilization in the other methods. The proposed custom method is subject to disapproval by the Contracting Officer and/or RWQCB in which an alternative method is to be re-submitted.

DRAFT

3.1.3 Records

Retain records of all storm water monitoring information and copies of all reports (including Annual Reports) for a period of at least three years, and provided to the government at the contract termination. Retain all records on-site while construction is ongoing. These records include:

a. The date, place, time of facility inspections, sampling, visual observation (inspections), and/or measurements, including precipitation;

b. The individual(s) who performed the facility inspections, sampling, visual observation (inspections), and or measurements;

c. The date and approximate time of analyses;

d. The individual(s) who performed the analyses;

e. A summary of all analytical results from the last three years, the method detection limits and reporting units, the analytical techniques or methods used, and the chain of custody forms;

f. Rain gauge readings from site inspections;

g. Quality assurance/quality control records and results;

h. Non-storm water discharge inspections and visual observation (inspections) and storm water discharge visual observation records;

i. Visual observation and sample collection exception records; and

j. The records of any corrective actions and follow-up activities that resulted from analytical results, visual observation (inspections), or inspections.

3.2 MAINTENANCE, MONITORING AND INSPECTIONS

Noncompliance with the SWPPP or this specification may trigger enforcement action by the RWQCB for violating the Clean Water Act. The Contracting Officer will notify the Contractor in writing of any observed noncompliance with the Federal, State or local laws or regulations, permits, and other elements of the SWPPP. Upon receipt of this notice, inform the Contracting Officer of proposed corrective actions and take such action when approved. If the Contractor fails to begin correcting deficiencies within 24 hours of the Contracting Officer's notification, the Contracting Officer may issue an order stopping all or part of the work until satisfactory corrective action has been taken. No time extensions will be granted or costs or damages allowed for any such suspensions. If a Notice of Violation, Cease and Desist Order, or an Administrative Civil Liability is issued for non-compliance with the CSWRCB CGP, the Corps of Engineers will withhold partial payment for the amount of fines (up to $37,500 per day of non-compliance) until the fines are paid and the contractor's overall performance will be rated as unsatisfactory.

Initiate stabilization practices no more than 14 days where construction activities have ceased, in any portion of the site. It is prohibited to keep construction activities active to prevent start of stabilization. In areas requiring seeding, seed all grasses at the earliest available time after completion of final grade and complete by the interim and final completion dates listed elsewhere in the contract. No variance to the start date will be allowed unless given in writing by the Contracting Officer. Complete all seeding in accordance with specification Section 32 92 33 GRASS SEEDING AND EROSION CONTROL. The SWPPP must identify the responsible party for seeding establishment and long-term maintenance.

Implement good site management (i.e., "housekeeping") measures that could potentially be a threat to water quality if discharged. These measures include, but are not limited to: construction materials, waste management, vehicle storage and maintenance, landscape materials, potential pollutant sources, and air deposition of site materials and from site operations. The discharge of any debris (litter, rubble, discarded refuse, and remains of destroyed inorganic anthropogenic waste) is prohibited. Document all housekeeping BMPs in the SWPPP in accordance with the nature and phase of the construction project.

Provide 100% soil cover for inactive areas and all finished slopes, open spaces, utility backfill, and completed lots to eliminate sediment transportation. Inactive areas of construction are areas of construction activity that have been disturbed and are not scheduled to be re-disturbed for at least 14 days. Inactive areas must not be deliberately kept active for the sole purpose of avoiding stabilization requirements. Use sustainable and environmentally friendly materials; use plastic material only where deemed necessary and approved by the Contracting Officer.

DRAFT

Cover waste disposal containers at the end of every business day and during rain events.

Establish and maintain effective perimeter controls. Implement appropriate erosion control BMPs (runoff control and soil stabilization) in conjunction with sediment control BMPs for areas under active construction. Active areas of construction are areas undergoing land surface disturbance. Install linear sediment controls along the toe of the slope, face of the slope, and at the grade breaks of exposed slopes in compliance with the minimum sheet flow lengths (length that shallow, low velocity flow travels across the site) in the following table:

Minimum Sheet Flow Lengths	
Slope Percentage	Sheet Flow Length not to exceed
0 - 25 %	20 feet
25 - 50 %	15 feet
Over 50 %	10 feet

Ensure that all storm drain inlets and perimeter controls, runoff control BMPs, and pollutant controls at entrances and exits (e.g. tire wash off locations) are maintained and protected from activities that reduce their effectiveness. The CSWRCB will require the Contractor to conduct all required sampling, inspections, and reports as well as implement additional site specific sediment control requirements if the implementation of the requirements in this section is not adequately protecting the receiving waters. Inspect all immediate access roads daily, remove sediment or other construction activity related materials deposited on the roads immediately by vacuuming or sweeping.

DRAFT

3.2.1 SWPPP And Amendments

The Contractor is responsible for complete, year-round, implementation and modification of the SWPPP throughout the duration of this contract. The SWPPP must remain onsite and available until the Contractor is released specifically from the storm water management responsibilities, obtained through an approved NOT from the CSWRCB as detailed in paragraph Termination Of SWPPP And CSMP Responsibilities.

An accurate copy of the SWPPP must be available onsite during working hours while construction is occurring and must be made available upon request by USACE, State or Municipal inspectors. When the original SWPPP is retained by a crew member in a construction vehicle and is not currently at the construction site, current copies of the BMPs and map/drawing will be left with the field crew and the original SWPPP must be available via a request by radio/telephone.

The SWPPP is to be considered a "living" document, and amended as often as needed comply with the CSWRCB CGP. SWPPP Amendment include, but are not limited to: inspection and maintenance sheets, REAPs, BMP design changes/updates, exceedance reports, sampling reports, Change of Informations (COIs), and any change of authorization. Submit SWPPP

Amendment as often as needed to ensure the SWPPP reflects current site conditions in electronic PDF form. Provide updated project schedules as SWPPP Amendment submittals as often as available. The SWPPP must be continuously updated to include all amendments. Additionally, the CSMP may require periodic amendments to capture regulatory requirements and unforeseen problems. The QSD or QSP must immediately notify the Contracting Officer when the SWPPP has been updated/amended. The QSD must certify and submit BMP design changes including deletion or addition of BMPs in the pre-approved SWPPP submittal as a SWPPP Amendment.

The Change of Information (COI) form can be used to reduce or add acreage to the permit coverage. Submit this form as a SWPPP amendment for review prior to submitting in SMARTS. If a reduction of acreage is requested, the areas to be removed from permit coverage must meet the stabilization requirements detailed in the paragraph titled "Termination Of SWPPP And CSMP Responsibilities."

Submit the Final SWPPP upon completion of all construction activities. The final SWPPP must provide the records of all storm water monitoring information throughout the life of the project. It must include all amendments, inspection and maintenance sheets, BMP design changes and updates, exceedance reports, sampling reports, annual reports and any change of authorization.

3.2.2 Rain Event Action Plans (REAPs)

Include an initial REAP in the SWPPP submittal for government approval.

The QSP must develop a REAP 48 hours prior to any likely precipitation event. A likely precipitation event is any weather pattern that is forecast to have a 50 percent or greater probability of producing precipitation in the project area. The QSP must obtain a printed copy of precipitation forecast information from the National Weather Service Forecast Office (e.g., by entering the zip code of the project’s location at http://www.srh.noaa.gov/forecast). Develop the REAPs for all phases of construction (i.e., Excavation and embankment construction, material processing, hauling and stockpiling, concrete operations, structural steel fabrication, installation and coating, utility installation, and site stabilization). Bundle the REAPs with storm event inspection reports and submit the REAPs and Inspection Reports a minimum of once per storm event, no later than 2 days after the conclusion of each storm event as described in paragraph "Monitoring And Inspections".

REAPs must be unique to each site included in this contract. Develop and submit one REAP for each site, it is not permitted to document multiple sites on a single REAP. The sites incorporated in this project will be identified by the Contracting Officer.

Ensure that all REAPs for both active and inactive construction activities, include, at a minimum, the following site information:

1. Site Address;

2. Calculated Risk Level (Risk Level 23);

3. Site Storm Water Manager Information including the name, company, and 24-hour emergency telephone number;

4. Erosion and Sediment Control Provider information including the name,

DRAFT

company, and 24-hour emergency telephone number; and

5. Storm Water Sampling Agent information including the name, company, and 24-hour emergency telephone number.

6. The NOAA weather report for that storm event.

7. Verification that the REAP is developed by the certified QSP.

Inactive construction activities are defined as construction activities which are indefinitely halted or postponed.

Ensure that all REAPs include, at a minimum, the following project phase information:

a. Activities associated with each construction phase;

b. Trades active on the construction site during each construction phase;

c. Trade contractor information; and

d. Suggested actions for each project phase.

Ensure that REAPs for construction activities which are indefinitely halted or postponed (inactive construction) include, at a minimum, the following information:

a. Trades active on site during inactive construction;

b. Trade contractor information; and

c. Suggested actions for inactive construction sites.

The QSP must make the REAP available onsite and begin implementation no later than 24 hours prior to the likely precipitation event. The QSP must maintain onsite paper copies of each REAP in compliance with the record retention requirements of the Special Provisions in the CSWRCB CGP.

DRAFT

3.2.3 Monitoring And Inspections

Ensure that all inspection, maintenance, repair and sampling activities at the project site are performed or supervised by the QSP. The QSP may delegate any or all of these activities to an employee appropriately trained to do the task(s). Keep training records in the SWPPP.

Visually observe (inspect) storm water discharges at all discharge locations within 48-hours after each qualifying rain event. A qualifying rain event is an event that produces 1/2 inch or more precipitation at the time of discharge. Any events with a 48 hour or greater period between them (both producing 1/2 inch or more of discharge) are separate qualifying rain events. Also, inspect the discharge of stored or contained storm water that is derived from and discharged subsequent to a qualifying rain event. Stored or contained storm water that will likely discharge after operating hours due to anticipated precipitation must be observed prior to the discharge during daylight hours.

For each inspection, complete an inspection checklist, using a form provided by the CSWRCB or Regional-WQCB on their website, or an alternative format listing the same mandatory information. The checklist

must remain onsite with the SWPPP, and at a minimum, must include:

a. Inspection date and date the inspection report was written;

b. Weather information, including presence or absence of precipitation, estimate of beginning of qualifying storm event, duration of event, time elapsed since last storm, and approximate amount of rainfall in inches from on-site rain gauge reading;

c. Site information, including stage of construction, activities completed, and approximate area of the site exposed;

d. A description of any BMPs evaluated and any deficiencies noted;

e. If the construction site is safely accessible during inclement weather, list the observations of all BMPs: erosion controls, sediment controls, tracking controls, non-storm water controls, and waste management and materials pollution controls. Otherwise, list the results of visual inspections at all relevant outfalls, discharge points, downstream locations and any projected maintenance activities;

f. Report the presence of noticeable odors, any visible sheen on the surface of any discharges;

g. Any corrective actions required, including any necessary changes to the SWPPP and the associated implementation dates;

h. Photographs taken during the inspection, if any; and

i. Inspector’s name, title, contact phone number, and signature.

j. QSP signature verification that all BMPs have been properly installed.

k. Rain gauge readings from the contractor's maintained onsite rain gauge.

l. Weather forecast details from the National Weather Service Forecast Office (e.g., by entering the zip code of the project’s location at http://www.srh.noaa.gov/forecast).

DRAFT

Inspection checklists must be unique to each site included in this contract. Develop and submit one inspection checklist for each site, it is not permitted to document multiple sites on a single checklist.

Conduct inspections during business hours only. Record the time, date, and rain gauge reading of all qualifying rain events.

Weekly, inspect parking lot areas, onsite motorized equipment, and roadways for petroleum based lubricants, fluids, and fuels. All spots, drips, and leaks must be clean up immediately. Equipment known to leak, drip or spot is prohibited from operating or being stored on this construction site.

Within 2 business days (48 hours) prior to each likely rain event, inspect the following:

a. All storm water drainage areas to identify any spills, leaks, or uncontrolled pollutant sources. If needed, implement appropriate corrective actions. Observe the presence or absence of floating and suspended materials, sheen on the surface, discolorations, turbidity,

odors, and source(s) of any observed pollutants;

b. All BMPs to identify whether they have been properly implemented in accordance with the SWPPP. If needed, implement appropriate corrective actions; and

c. Any storm water storage and containment areas to detect leaks and ensure maintenance of adequate freeboard. Observe the presence or absence of floating and suspended materials, sheen on the surface, discolorations, turbidity, odors, and source(s) of any observed pollutants.

Within two business days (48 hours) after each qualifying rain event, conduct post rain event visual observations (inspections) to:

(1) Identify whether BMPs were adequately designed, implemented, and determine their effectiveness, and

(2) Identify additional necessary BMPs and revise the SWPPP accordingly.

Inspect each drainage area for the presence of (or indications of prior) unauthorized and authorized non-storm water discharges and their sources. Conduct a minimum of one visual observation each week. Visual observation are only required during daylight hours (sunrise to sunset). Visual observations must document the presence or evidence of any non-storm water discharge (authorized or unauthorized), pollutant characteristics (floating and suspended material, sheen, discoloration, turbidity, odor, etc.), and source, and must be recorded on the inspection checklist and kept available in the SWPPP.

Maintain on-site records of all visual observations (inspections), personnel performing the observations, observation dates, weather conditions, locations observed, and corrective actions taken in response to the observations.

Do not conduct inspections during dangerous weather conditions such as flooding and electrical storms. If no visual observations are collected due to dangerous weather conditions, include an explanation in their SWPPP and in the Annual Report documenting why the inspections were not conducted.

For each inspection conducted, prepare a report summarizing the scope of the inspection. Insert the completed checklist above in the inspection report. Submit the report to the Contracting Officer within 24 hours of the inspection as a part of the Contractor's daily Contractor Quality Control (CQC) Report. Maintain a copy of the inspection reports on the job site and keep in the SWPPP. Summarize the frequency of inspections in a table within the SWPPP and at a minimum be carried out using the following guidelines:

a. A minimum of once per week when likely precipitation events are not predicted

b. Before a likely precipitation event (any weather pattern that is forecast to have a 50% or greater probability of producing precipitation in the project area)

c. At 24-hour intervals during extended precipitation events

DRAFT

d. Within 48-hours after each qualifying rain event (producing 1/2 inch or more at time of discharge)

The Contractor's daily CQC Report and SWPPP must include the following:

a. The dates when the major grading activities occur, (e.g., clearing and grubbing, excavation, embankment, and grading);

b. When construction activities temporarily or permanently cease on a portion of the site; and

c. When stabilization practices are initiated.

d. When SWPPP Inspections identify the need for a SWPPP Amendment.

Submit inspection reports with the REAPs and Inspection ReportsInspection Reports submittal a minimum of once per week or once per rain event, whichever occurs first. REAPs and inspection reports may be bundled to form one submittal per qualifying rain event. Submit REAPs and Inspection ReportsInspection Reports no later than 2 days after the conclusion of each storm event, or a minimum of one week when likely precipitation events are not predicted. Keep a copy of all REAPs and Inspection Reports in the onsite SWPPP.

3.2.3.1 Inactive Construction Inspections

Provide 100 percent soil cover for inactive areas and all finished slopes, open space, utility backfill, and completed lots. Inactive areas of construction are areas of construction activity that have been disturbed and are not scheduled to be re-disturbed for at least 14 days. In addition to all CSWRCB CGP and Water Board requirements, conduct weekly inspections during inactive construction periods throughout the life of the contract. All inspections and inspection reports must follow the requirements described in these specifications.

3.2.4 Correcting Deficiencies

The QSP/QSD is responsible for correcting deficiencies found after the SWPPP has been approved as soon as possible. The QSP must notify the government field representative of any corrective actions taken to repair the deficiencies found during construction activities. In general, adding a new BMP to comply with the CSWRCB CGP requirements does not require specific government approval since compliance is mandatory. However, deleting or removing an existing BMP that is already documented in the SWPPP or the Site Maps will require government approval. In addition, replacing an existing BMP that is documented in the SWPPP or Site Maps with a BMP that is more appropriate will require government approval. The SWPPP is considered a "living" document and ongoing changes to accurately reflect site conditions are required at no additional cost.

Upon identifying failures or other shortcomings, the QSP and/or QSD must begin implementing repairs or design changes to BMPs within 48-hours of identification. Complete repairs depending upon field conditions, preferably before the next likely storm event. Equipment, materials, and workers must be available for rapid response to failures and storm water management emergencies. See the paragraph titled "Training Requirements" for specific QSP and QSD availability requirements. Upon identifying failure that requires a design change, the QSD must submit a SWPPP

DRAFT

amendment no later than one week after the failure has been identified. Failures may be identified by the RWQCB or USACE inspectors, which will be brought to the attention of, and must be immediately addressed by, the QSP.

3.2.5 Non-Storm Water Discharge Sampling

Sample effluent at all discharge points where authorized non-storm water is discharged off-site. Send all non-storm water samples to a State-certified laboratory in conformance with the requirements in 40 CFR 136 and the State Department of Health Services. Monitor and report run-on from surrounding areas if there is reason to believe run-on may contribute to stormwater pollution or an exceedance of NALs.

Collect one or more samples during any breach, malfunction, leakage, or spill observed which could result in the discharge of pollutants to surface waters that would not be visually detectable in storm water. The water samples must be large enough to characterize the site conditions, and must be taken at all discharge locations that can be safely accessed. Collect samples during the first two hours of discharge from rain events occurring during daylight hours that generate runoff. Collect a sample of storm water that has not come in contact with the disturbed soil or the materials stored or used on-site (uncontaminated sample) for comparison with the discharge sample. Compare the uncontaminated sample to the samples of discharge using the field analysis, or through laboratory analysis. Analyze the samples for all non-visible pollutant parameters indicating the presence of pollutants identified in the pollutant source assessment. Modify the CSMP to address these additional parameters in accordance with any updated SWPPP pollutant source assessment. Submit Sampling Results as described in the paragraph titled "Permit Registration Documents (PRDs)."

3.2.6 Rain Event Sampling

The CSMP must monitor the effectiveness of the water pollution control practices and non-storm water discharge. Effluent limits, sampling locations, and other CSMP requirements are detailed in paragraph "SWPPP Development" which must be adhered to.

Ensure that all sampling and sample preservation are in accordance with the current edition of "Standard Methods for the Examination of Water and Wastewater" (American Public Health Association). All monitoring instruments and equipment (including the Contractor’s own field instruments for measuring pH and turbidity) should be calibrated, maintained, and properly stored in accordance with manufacturers' specifications to ensure accurate measurements. Ensure that all laboratory analyses are conducted according to test procedures under 40 CFR 136, unless other test procedures have been specified in the CSWRCB CGP requirements or by the Regional Water Quality Control Board. With the exception of field analysis conducted by the contractor for turbidity and pH, all analyses should be sent to, and conducted at, a laboratory certified for such analyses by the State Department of Health Services. Conduct field analysis of pH and optionally conduct field analysis of turbidity if the discharger has sufficient capability (qualified and trained employees, properly calibrated and maintained field instruments, etc.) to adequately perform the field analysis.

Calibrate field meters and equipment within one week of sampling, or per the field meter's manufacturer's recommendations. Calibration standards must be purchased per manufactures recommendations, and should not be used

DRAFT

beyond the expiration date. Document calibration date/times on the effluent sampling field log sheets, and retained as part of the SWPPP.

Collect at least three stormwater grab samples per day and at every discharge point at least once daily for each qualifying rain event. A rain event cannot conclude until there are 48 hours without rainfall, therefore collect samples each day it rains until 48 hours without precipitation passes to determine if a qualifying rain event occurred. Dually submit all Sampling Results to the Government and to SMARTS no later than 5 days after the conclusion of the storm event. The grab samples collected of stored or contained storm water must be from discharges subsequent to a qualifying rain event (producing precipitation of 1/2 inch or more at the time of discharge). The storm water grab samples must be representative of the flow and characteristics of the discharge. If daily averages are utilized, provide an explanation on how the daily average is calculated. Calculate the daily average using a discharge-weighted average or an area-weighted average to accurately characterize the discharge. Analyze the effluent samples for pH and turbidity, as well as any additional parameters as required by the Regional Water Board.

Refer to the following for test methods, detection limits, and reporting units:

a. pH: pH analysis is required to be performed onsite with a calibrated pH meter or pH test kit, pH paper is not allowed. Fully immerse the pH probe and wait one minute for the pH readings to stabilize before recording the value. Record the pH on paper and retained in accordance with the CSWRCB CGP. Calibration details (date, time, standards used, standard expiration dates, etc.) are to be documented and retained in the SWPPP;

b. Turbidity: Perform turbidity analysis using a calibrated turbidity meter (turbidimeter) either on-site or at an accredited lab. Acceptable test methods include SM 2130 or EPA Method 180.1. The results will be recorded in the site log book in Nephelometric Turbidity Units (NTU). Calibration details (date, time, standards used, standard expiration date, etc.) are to be documented and retained in the SWPPP;

DRAFT

EFFLUENT MONITORING				
Parameter	Test Method/ Protocol	Units	Minimum Detection Limit	Numeric Action Level (NAL)
pH	Field test with calibrated portable instrument	units	0.2	lower NAL = 6.5 upper NAL = 8.5

EFFLUENT MONITORING				
Parameter	Test Method/ Protocol	Units	Minimum Detection Limit	Numeric Action Level (NAL)
Turbidity	EPA 0180.1 and/or field test with calibrated portable instrument	NTU	1	250

c. Suspended Sediment Concentration (SSC): Perform the SSC using ASTM D3977 (as required by the Water Board); and

e. Bioassessment: The Bioassessment sampling will be the responsibility of the government.

Effluent Test Methods, Detection Limits, Reporting Units and applicable NALs						
Parameter	Test Method/ Protocol	Units	Minimum Detection Limit	Numeric Action Level (NAL)	Numeric Effluent Limitation (NEL)	Receiving Water Monitoring Trigger
pH	Field test with calibrated portable instrument	units	0.2	lower NAL = 6.5 upper NAL = 8.5	N/A	lower limit = 6.0 upper limit = 9.0
Turbidity	EPA 0180.1 and/or field test with calibrated portable instrument	NTU	1	250 NTU	N/A	500 NTU

DRAFT

Effluent Test Methods, Detection Limits, Reporting Units and applicable NALs						
Parameter	Test Method/ Protocol	Units	Minimum Detection Limit	Numeric Action Level (NAL)	Numeric Effluent Limitation (NEL)	Receiving Water Monitoring Trigger
Turbidity for ATS Discharge	EPA 0180.1 and/or field test with calibrated portable instrument	NTU	1	N/A	10 NTU for daily weighted average and 20 NTU for any single sample	10 NTU for Daily Weighted Average & 20 NTU for any single sample
SSC	ASTM D3977	mg/L	5	N/A	N/A	N/A

Collect and document all effluent samples at all discharge points where storm water is discharged off-site. Samples to be analyzed in the field must be taken by the Contractor's designated sampling personnel using collection and analysis methods, and equipment calibration specified by the manufacturer of the sampling equipment.

DRAFT

3.2.6.1 Exceedance Report

In the event that any effluent sample exceeds an applicable NAL, dually submit the storm event sampling results to the Government and to SMARTS no later than 10 days after the conclusion of the storm event. Government submittals must be electronic PDF form. The following information must be included:

a. The analytical method(s), method reporting unit(s), and method detection limit(s) of each analytical parameter (analytical results that are less than the method detection limit must be reported as “less than the method detection limit”);

b. The date, place, time of sampling, visual observation (inspections), and/or measurements, including precipitation; and

c. A description of the current BMPs associated with the effluent sample that exceeded the NAL or ATS NEL and the proposed corrective actions taken.

In the event that the Contractor has violated an applicable ATS NEL, electronically submit the storm event sampling results and an Exceedance Report to the Government and to SMARTS no later than 24 hours after the NEL exceedance has been identified.

The ATS NEL Exceedance Report submittal must include a Compliance Storm Exemption in the event that an ATS NEL has been exceeded during a storm event equal to or larger than the Compliance Storm Event of 10 year-24 hours. Submit the on-site rain gauge reading and nearby governmental rain

gauge readings for verification in the Exceedance Report submittal and to SMARTS.

In the event that an ATS NEL is exceeded, the receiving water must be subsequently sampled for turbidity, pH, and SSC for the duration of permit coverage under CSWRCB CGP.

3.2.6.2 Receiving Water Monitoring Triggers

In order to ensure that receiving water limitations are met, receiving water monitoring triggers must be monitored downstream of receiving water(s) for turbidity, SSC and pH when a receiving water monitoring trigger is exceeded. CSWRCB CGP establishes a 5 year, 24 hour (expressed as inches of rainfall) as an exemption to the receiving water monitoring requirements. Verification of the 5-year 24-hour storm event must be done by reporting on-site rain gauge readings as well as nearby governmental rain gauge readings. If run-on is caused by a natural disaster, then receiving water monitoring triggers do not apply.

The receiving water monitoring triggers are triggered when the daily average effluent pH values during any site phase when there is a high risk of pH discharge fall outside the range of 6.0 and 9.0 pH units, or when the daily average effluent turbidity exceeds 500 NTU. If the pH trigger is exceeded, monitor the receiving water for pH for the duration of coverage under CSWRCB CGP. If the turbidity trigger is exceeded, monitor the receiving water for turbidity and SSC for the duration of coverage under CSWRCB CGP.

-- End of Section --

DRAFT

SECTION TABLE OF CONTENTS

DIVISION 01 - GENERAL REQUIREMENTS

SECTION 01 71 10

MOBILIZATION AND DEMOBILIZATION

PART 1 GENERAL

1.1 REFERENCES
1.2 SCOPE
1.2.1 Temporary Construction Facilities
1.3 STAGING AREAS
1.3.1 Alternative Staging Areas
1.4 SPECIAL REQUIREMENTS
1.4.1 Flooding
1.4.2 Site Grading
1.5 SUBMITTALS
1.5.1 Mobilization/Demobilization Work Plan
1.5.2 Emergency Levee Reconstruction Plan

PART 2 PRODUCTS

2.1 DRINKING WATER
2.2 WATER FOR CONSTRUCTION PURPOSES
2.3 TEMPORARY TOILETS
2.4 ELECTRICAL LIGHT AND POWER
2.5 SITE CLEANUP AND DISPOSAL OF RUBBISH
2.6 BARRICADES AND PROTECTION
2.7 TEMPORARY PROTECTIVE FENCING
2.8 TEMPORARY FACILITIES COMMUNICATION

PART 3 EXECUTION

3.1 REQUIREMENTS
3.1.1 Codes
3.2 UTILITIES FOR ADMINISTRATIVE GOVERNMENT'S FIELD OFFICES

-- End of Section Table of Contents --

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DRAFT

SECTION 01 71 10

MOBILIZATION AND DEMOBILIZATION

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	(2024) Safety -- Safety and Occupational Health (SOH) Requirements

1.2 SCOPE

Mobilization consists of preparatory work and operations including, but not limited to, those necessary for the movement of personnel, equipment, supplies, and incidentals to the project site, for the establishment of all facilities necessary for work on the project, and for all other work and operations which must be performed, or costs incurred prior to beginning work on the various Contract items on the project site. Demobilization consists of work and operations necessary to disband all mobilized items.

1.2.1 Temporary Construction Facilities

See Section 01 50 00 TEMPORARY CONSTRUCTION FACILITIES AND CONTROLS for requirements for temporary offices for the Contractor and the Agency.

1.3 STAGING AREAS

It is the intent of this Contract to utilize the areas shown on the Plans for staging and project administration offices. By making the sites available to the Contractor, the Contracting Officer, the property owner, and any other person or Contracting Officer connected with the properties is in no way be responsible or liable for any activity of the Contractor, Subcontractors, or any individual or organization connected with the work of the Contractor. If Contractor chooses an alternate staging area, Contractor must receive written approval from the landowner to use the alternate staging area and submit landowner approval to the Contracting Officer. The Contractor must hold the Government whole harmless of any damage caused by contractor activity in the alternative staging area.

1.3.1 Alternative Staging Areas

The Contractor is required to use the proposed staging areas shown on the Plans for offices and staging. If alternative sites are determined to be necessary, they must be near the project and the Contractor must make all arrangements including but not limited to clearance of non-sensitive archeological and environmental sites for their use at the Contractor's expense and must be approved by the Contracting Officer prior to use. The Contractor must receive written approval from the landowner to use the

DRAFT

alternate staging area and submit landowner approval to the Contracting Officer. The Contractor must hold the Government whole harmless of any damage caused by contractor activity in the alternative staging area.

1.4 SPECIAL REQUIREMENTS

Contractor must restore landscape to original conditions unless specified in the plans and specifications. Unless specifically designated for removal, no existing trees in the staging area may be removed. The Contractor is responsible for the import and disposal of such material and the restoration of the site to its original condition.

1.4.1 Flooding

In the event of potential flooding of the site or at the direction of the Contracting Officer, the Contractor must remove all vehicles and other mobile equipment, fuels and soluble materials within four (4) hours of notification.

1.4.2 Site Grading

If site grading is performed at the staging area, the site must be restored to a natural vegetated condition at completion of work in accordance with one of the following:

a. Restored to original grade.

b. Restored in accordance with guidance from the Contracting Officer.

DRAFT

1.5 SUBMITTALS

The following must be submitted in accordance with Section 01 33 00 SUBMITTAL PROCEDURES:

SD-09 Manufacturer's Field Reports

Mobilization/Demobilization Work Plan; G

Emergency Levee Reconstruction Plan; G

1.5.1 Mobilization/Demobilization Work Plan

Before starting the work, the Contractor must submit to the Contracting Officer a plan identifying his requirements for space for temporary structures, location and approximate size of mobile and stationary equipment, and storage of materials. The Contractor must submit to the Contracting Officer a proposed plan and layout for all temporary offices, sanitary facilities, storage buildings, storage yards, temporary water service and distribution, and temporary power service and distribution.

The Contractor must prepare a site plan indicating the proposed location and dimensions of any area to be fenced and used by the Contractor, the number of trailers to be used, avenues of ingress/egress to the fenced area, details of the fence installation, location of personal vehicle parking, porta potties, material stockpiles and equipment or batch plants and drying ponds. Any areas which may have to be graveled to prevent the tracking of mud must also be identified. The Contractor must also indicate if the use of a supplemental or other staging area is desired.

Should the Contractor require space in addition to that available on-site, the Contractor must make arrangements for storage of materials and equipment in locations off the construction site at the Contractor's own expense. The Contractor must submit a plan for the alternate staging area and obtain the Contracting Officer's approval prior to their use.

1.5.2 Emergency Levee Reconstruction Plan

An Emergency Levee Reconstruction Plan must be submitted. Contractor must provide the Contracting Officer a plan detailing the equipment and methods to be used in case of hydraulic fracture or other levee failure; in which case the levee must be degraded/rebuilt and/or buttressed as necessary and as approved by the Contracting Officer.

PART 2 PRODUCTS

2.1 DRINKING WATER

Provide drinking water for all personnel connected with the work. Transport water in such a manner as to keep it clean and fresh. Serve from single service containers with paper cups, bottled water, or sanitary drinking fountains.

2.2 WATER FOR CONSTRUCTION PURPOSES

Reference Section 01 50 00 TEMPORARY CONSTRUCTION FACILITIES AND CONTROLS.

2.3 TEMPORARY TOILETS

Provide adequate chemical toilet facilities for all individuals connected with the work, in number as required by Federal and State Safety and Occupational Standards, EM 385-1-1, and at locations convenient for use. Keep in sanitary condition. Remove at completion of construction and disinfect premises. Toilets must be regularly maintained, cleaned and drained.

2.4 ELECTRICAL LIGHT AND POWER

Provide temporary electrical service as required for the work and to inhibit vandalism. Provide safety switches and wiring into buildings and all required extension cords, lighting outlets, power outlets (grounded type), lamps and other equipment and accessories necessary for adequate temporary lighting and power for construction purposes. Remove temporary lighting and power and their connections at completion of the work.

2.5 SITE CLEANUP AND DISPOSAL OF RUBBISH

Maintain the construction site and building areas in a neat, orderly condition throughout the duration of this Contract. Remove daily from the site all rubbish, debris, and materials not to be incorporated into the work and all other accumulations that may result from work under this Contract on a weekly basis.

2.6 BARRICADES AND PROTECTION

Provide barricades, temporary fencing, handrails, shoring and other devices required by law, per the drawings, and as necessary to protect new construction and materials and to protect all persons on the Job site.

DRAFT

The Contractor must erect and maintain temporary barricades to limit public access to hazardous areas. Such barricades are required 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 must be securely placed, clearly visible with adequate illumination to provide sufficient visual warning of the hazard during both day and night.

Protect all workers and equipment from power lines and maintain safe distances and protective devices as required by Industrial Safety Commission, CAL-OSHA, and EM 385-1-1.

2.7 TEMPORARY PROTECTIVE FENCING

No later than 5 days after the date established for commencement of work and prior to the start of ground disturbing activities, the Contractor must furnish and erect temporary 6-foot chain-link fencing around the staging areas at locations as shown on the drawings and/or identified by the Contracting Officer. The fencing must be maintained by the Contractor during the life of the contract and, upon completion and acceptance of the work, become the property of the Contractor and must be removed from the work site. Reference Section 01 50 00 TEMPORARY CONSTRUCTION FACILITIES AND CONTROLS and EM 385-1-1.

2.8 TEMPORARY FACILITIES COMMUNICATION

If the Contractor's individual elements of the temporary facilities operation is not satisfactory by normal voice between these elements, the Contractor must install a satisfactory means of communication, such as telephone and Internet connection or other suitable devices. The devices must be made available for use by Government personnel and the Government's environmental personnel.

DRAFT

PART 3 EXECUTION

3.1 REQUIREMENTS

The Contractor must furnish, install, service and maintain for the duration of the project the personnel, material and equipment as described in this section.

3.1.1 Codes

All facilities installed under this section must meet the requirements of the applicable codes and regulations.

3.2 UTILITIES FOR ADMINISTRATIVE GOVERNMENT'S FIELD OFFICES

The Contractor is responsible for obtaining, coordinating, and incurring a cost associated with providing utilities (water, sanitation, telephone, electric, etc.) to the Administrative and Government Field Offices in accordance with the requirements of paragraph 1.8.1, Government Field Office. Contractor must ensure that all temporary utilities are not in conflict with project construction activities. Contractor is responsible for coordinating all utility disconnections and removal of temporary utilities.

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DRAFT

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DRAFT

SECTION TABLE OF CONTENTS

DIVISION 01 - GENERAL REQUIREMENTS

SECTION 01 78 00

CLOSEOUT SUBMITTALS

PART 1 GENERAL

1.1 REFERENCES
1.2 DEFINITIONS
1.2.1 As-Built Drawings
1.2.2 Record Drawings
1.3 SOURCE DRAWING FILES
1.3.1 Terms and Conditions
1.4 RECORD DRAWINGS
1.4.1 Variation with Contract Drawings
1.4.2 Data Loss, Corruption, and Error
1.5 SUBMITTALS
1.6 SPARE PARTS DATA
1.7 QUALITY CONTROL
1.8 WARRANTY MANAGEMENT
1.8.1 Warranty Management Plan

PART 2 PRODUCTS

2.1 RECORD DRAWINGS
2.1.1 Additional Drawings
2.1.1.1 Sheet Numbers and File Names
2.2 PDF AS-BUILT FILES
2.3 REDLINES AND MARKUPS
2.4 AS-BUILT OR ADVANCED MODELING RE-SUBMISSION REQUIREMENTS

PART 3 EXECUTION

3.1 AS-BUILT DRAWINGS
3.1.1 Markup Guidelines
3.1.2 As-Built Drawings Content
3.2 RECORD DRAWING FILES
3.3 RECORD DRAWINGS
3.4 CONSTRUCTION CONTRACT SPECIFICATIONS
3.5 AS-BUILT RECORD OF EQUIPMENT AND MATERIALS
3.6 CLEANUP

-- End of Section Table of Contents --

DRAFT

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DRAFT

SECTION 01 78 00

CLOSEOUT SUBMITTALS

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-19-6	(2019) A/E/C Graphics Standard, Release 2.1
ERDC/ITL TR-19-7	(2019) A/E/C CAD Standard - Release 6.1

U.S. DEPARTMENT OF DEFENSE (DOD)

FC 1-300-09N	(2014; with Change 6, 2021) Navy and Marine Corps Design

DRAFT

1.2 DEFINITIONS

1.2.1 As-Built Drawings

As-built drawings are the marked-up drawings, maintained by the Contractor on-site, that depict actual conditions and deviations from the Contract Documents. These deviations and additions may result from coordination required by, but not limited to: contract modifications; official responses to submitted Requests for Information (RFI's); direction from the Contracting Officer; design that is the responsibility of the Contractor, and differing site conditions. Maintain the as-builts throughout construction as red-lined hard copies on site or 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 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 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 RECORD DRAWINGS

The Government will provide pdf and or program files at the preconstruction conference that contains 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.

1.4.1 Variation with Contract Drawings

The electronic files provided are not part of the contract documents. If there is any discrepancy between the electronic files and the contract drawings, the contract drawings govern. The Government has no responsibility to modify any GFM due to changes in the design that occur after award.

Evaluate the content and quality of the GFM upon receipt. If major discrepancies or omissions occur in the GFM, notify the Contracting Officer and indicate the nature of such variations.

1.4.2 Data Loss, Corruption, and Error

Transfer of GFM files may result in corrupted files resulting in data loss and errors. Use of GFM files at own risk. Verify data integrity upon receipt and request a replacement if necessary. Make any adjustment in file structure, format, or software version as needed to make GFM compatible with computer systems and/or software to meet the requirements of the contract.

DRAFT

1.5 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-03 Product Data

Warranty Management Plan

Spare Parts Data

SD-08 Manufacturer's Instructions

Posted Instructions

SD-11 Closeout Submittals

As-Built Drawings; G

Record Drawings; G

As-Built Record of Equipment and Materials

Construction Contract Specifications; G

DRAFT

1.6 SPARE PARTS DATA

Submit two copies of the Spare Parts Data list.

a. Indicate manufacturer's name, part number, and stock level required for test and balance, pre-commissioning, maintenance and repair activities. List those items that may be standard to the normal maintenance of the system.

b. At acceptance of commissioning, ensure the required stock level is supplied as indicated in subparagraph a for maintenance and repair activities through the facilities warranty period. Provision of spare parts does not relieve the Contractor of responsibilities listed under the contract guarantee provisions.

1.7 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-19-7.

1.8 WARRANTY MANAGEMENT

1.8.1 Warranty Management Plan

Develop a warranty management plan which contains information relevant to FAR 52.246-21 Warranty of Construction. At least 30 days before the planned pre-warranty conference, submit one set 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 narrative must 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. Submit warranty information, made available during the construction phase, 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 must begin on the date of project acceptance and continue for the full product warranty period. Conduct a joint 4 month and 9 month warranty inspection, measured from time of acceptance; with the Contractor, Contracting Officer and the Customer Representative. The warranty management plan must include, but is not limited to, the following:

a. Roles and responsibilities of 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. For each warranty, the name, address, telephone number, and e-mail of each of the guarantor's representatives nearest to the project location.

c. A list and status of delivery of Certificates of Warranty for extended warranty items, including roofs, HVAC balancing, pumps, motors, transformers, and for commissioned systems, such as fire protection and alarm systems, sprinkler systems, and lightning protection systems.

d. As-Built Record of Equipment and Materials list for each warranted equipment, item, feature of construction or system indicating:

(1) Name of item.
(2) Model and serial numbers.
(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 warranties longer than one year 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.

f. Procedure and status of tagging of equipment covered by warranties longer than one year.

g. Copies of instructions to be posted near selected pieces of equipment

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where operation is critical for warranty or safety reasons.

PART 2 PRODUCTS

2.1 RECORD DRAWINGS

Prepare the CAD drawing files in AutoCAD Release 2020 format compatible with a Windows 10 operating system.

2.1.1 Additional Drawings

If additional drawings are required, prepare them using the specified electronic file format applying ERDC/ITL TR-19-7 and ERDC/ITL TR-19-6. 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.

2.1.1.1 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-19-7 Adding a drawing sheet, and ERDC/ITL TR-19-6 Adding or deleting drawing sheets and index sheet procedures.

2.2 PDF AS-BUILT FILES

Provide electronic PDF "plots" of all contract drawings sheets associated with the as-built drawing submittal. Compile and organize the PDF set to match the contract drawings. Bookmark and label the pages of the PDF file.

2.3 REDLINES AND MARKUPS

Provide PDFs of the current working redlines and/or markups complying with the as-builts drawing and markup requirements contained in this specification.

2.4 AS-BUILT OR ADVANCED MODELING RE-SUBMISSION REQUIREMENTS

If elements of an as-built submittal or advanced modeling package are rejected, provide the following for each re-submission, in addition to any information required in Section 01 33 00 SUBMITTAL PROCEDURES:

a. Re-submit all components required under paragraph As-Builts or Advanced Modeling Package, including a new Advanced Modeling Submittal Checklist and updated content in response to Government comments.

b. Provide a copy of all Government review comments.

c. Provide a disposition/response to each Government review comment for a back-check of the re-submission deliverable.

PART 3 EXECUTION

3.1 AS-BUILT DRAWINGS

Provide and maintain two black line print copies of the PDF contract drawings for As-Built Drawings. Maintain the as-builts throughout construction as red-lined hard copies on site or red-lined PDF files. Submit As-Built Drawings 30 days prior to Beneficial Occupancy Date (BOD).

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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 markup prints 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 changes on the drawing.

   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

Show on the as-built drawings, but not limited to, the following information:

DRAFT

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 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, and foundations.

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.

l. Modifications and compliance with FC 1-300-09N procedures.

m. Actual location of anchors, construction and control joints, etc., in concrete.

n. Unusual or uncharted obstructions that are encountered in the contract work area during construction.

o. 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-19-7 and ERDC/ITL TR-19-6.

DRAFT

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.

3.3 RECORD DRAWINGS

Prepare and provide Record Drawings and Source Documents in accordance with FC 1-300-09N. Provide four copies of Record Drawings and Documents on separate CDs or DVDs 30 days after BOD.

3.4 CONSTRUCTION CONTRACT SPECIFICATIONS

Submit final PDF file record construction contract specifications, including revisions thereto, 15 days after transfer of the completed facility.

3.5 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 5 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

DRAFT

3.6 CLEANUP

Remove waste and surplus materials, rubbish and construction facilities from the site. Recycle, salvage, and return construction and demolition waste from project in accordance with Section 01 57 19 TEMPORARY ENVIRONMENTAL CONTROLS.

-- End of Section --

SECTION TABLE OF CONTENTS

DIVISION 02 - EXISTING CONDITIONS

SECTION 02 02 00

SUBSURFACE DATA

PART 1 GENERAL

PART 2 PRODUCTS

PART 3 EXECUTION

3.1 AVAILABLE SUBSURFACE SOIL DATA
3.1.1 Geotechnical Reports
3.1.2 Subsurface Explorations and Laboratory Testing
3.1.3 Subsurface Conditions
3.2 ADDITIONAL INVESTIGATION
3.2.1 Subsurface Materials
3.2.2 Submission of a Bid

-- End of Section Table of Contents --

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SECTION 02 02 00

SUBSURFACE DATA

PART 1 GENERAL

Not Used

PART 2 PRODUCTS

Not Used

PART 3 EXECUTION

3.1 AVAILABLE SUBSURFACE SOIL DATA

3.1.1 Geotechnical Reports

A Geotechnical Data Report (GDR) has been prepared for this project and is included in electronic format in the reference section of these specifications for information only.

3.1.2 Subsurface Explorations and Laboratory Testing

Subsurface explorations along the project are included in the Plans. Explorations provided are included for general site assessment purposes. Stick logs are inclusive of explorations performed for this project and those from previous studies may not be representative of the general conditions, since they are based on discrete locations. Requests for additional information must be made to the Contracting Officer or Contracting Officer's representative.

3.1.3 Subsurface Conditions

Any data on subsurface conditions shown in the drawings or specifications may not be representative of the General Conditions, since they are based on discrete locations. The water levels shown on the logs of explorations are those measured at the time of drilling. As the water table is related to the river stage, the water table is expected to change during the construction period.

3.2 ADDITIONAL INVESTIGATION

3.2.1 Subsurface Materials

It is the Contractor's responsibility to become acquainted and satisfied as to the character, quality, and quantity of surface and subsurface materials to be encountered, by inspecting the site and by evaluating information derived from exploratory work that may have been accomplished by others or included in these Contract Documents. Any failure to become acquainted with all the available information will not relieve the Contractor from responsibility for properly estimating the difficulty or cost of successfully performing the work.

DRAFT

3.2.2 Submission of a Bid

The submission of a bid is conclusive evidence that the prospective bidder has reviewed the site conditions, and is satisfied as to the character, quality, and quantities of work to be performed and materials to be furnished, and as to the requirements of the Contract Documents.

-- End of Section --

DRAFT

SECTION TABLE OF CONTENTS

DIVISION 02 - EXISTING CONDITIONS

SECTION 02 41 00

DEMOLITION

PART 1 GENERAL

1.1 REFERENCES
1.2 GENERAL REQUIREMENTS
1.3 SUBMITTALS
1.3.1 Notification
1.3.2 Receipts
1.4 REGULATORY AND SAFETY REQUIREMENTS
1.4.1 Notifications
1.4.1.1 General Requirements
1.5 DUST AND DEBRIS CONTROL
1.6 PROTECTION
1.6.1 Traffic Control Signs
1.6.2 Existing Conditions Documentation
1.6.3 Items to Remain in Place
1.6.4 Existing Construction Limits and Protection
1.6.5 Trees
1.6.6 Utility Service
1.6.7 Protection of Personnel
1.7 RELOCATIONS
1.8 USE OF EXPLOSIVES

PART 2 PRODUCTS

PART 3 EXECUTION

3.1 EXISTING FACILITIES TO BE REMOVED
3.1.1 Utilities and Related Equipment
3.1.1.1 General Requirements
3.1.1.2 Disconnecting Existing Utilities
3.2 CONCURRENT EARTH-MOVING OPERATIONS
3.3 DISPOSITION OF MATERIAL
3.3.1 Title to Materials
3.4 DISPOSAL OF REMOVED MATERIALS
3.4.1 Regulation of Removed Materials
3.4.2 Removal from Government Property

-- End of Section Table of Contents --

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SECTION 02 41 00

DEMOLITION

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 SAFETY ENGINEERS (ASSE/SAFE)

ASSE/SAFE A10.6	(2006) Safety Requirements for Demolition Operations

U.S. ARMY CORPS OF ENGINEERS (USACE)

CONSOLIDATED EM 385-1-1	(2024) Safety -- Safety and Occupational Health (SOH) Requirements

U.S. NATIONAL ARCHIVES AND RECORDS ADMINISTRATION (NARA)

40 CFR 61	National Emission Standards for Hazardous Air Pollutants

DRAFT

1.2 GENERAL REQUIREMENTS

Do not begin demolition or deconstruction until authorization is received from the Contracting Officer. The work of this section is to be performed in a manner that maximizes salvage and recycling of materials. The work includes demolition, and removal of resulting rubbish and debris. Remove rubbish and debris from Government property daily, unless otherwise directed. Store materials that cannot be removed daily in areas specified by the Contracting Officer. In the interest of occupational safety and health, perform the work in accordance with CONSOLIDATED EM 385-1-1, Section 23, Demolition, and other applicable Sections.

1.3 SUBMITTALS

Government approval is required for submittals with a "G" designation; submittals not having a "G" designation are for information only. The following must be submitted in accordance with Section 01 33 00 SUBMITTAL PROCEDURES:

SD-01 Preconstruction Submittals

Existing Conditions; G

SD-07 Certificates

Notification; G

SD-11 Closeout Submittals

Receipts

1.3.1 Notification

Proposed demolition and removal procedures for approval before work is started.

1.3.2 Receipts

Receipts or bills of lading, as specified.

1.4 REGULATORY AND SAFETY REQUIREMENTS

Comply with federal, state, and local hauling and disposal regulations. In addition to the requirements of the "Contract Clauses," conform to the safety requirements contained in ASSE/SAFE A10.6.

1.4.1 Notifications

1.4.1.1 General Requirements

Furnish timely notification of demolition projects to Federal, State, regional, and local authorities in accordance with 40 CFR 61, Subpart M. Notify the Regional Office of the United States Environmental Protection Agency (USEPA), California environmental protection agency and the Contracting Officer in writing 10 working days prior to the commencement of work in accordance with 40 CFR 61, Subpart M.

1.5 DUST AND DEBRIS CONTROL

Prevent the spread of dust and debris and avoid the creation of a nuisance or hazard in the surrounding area. Do not use water if it results in hazardous or objectionable conditions such as, but not limited to, ice, flooding, or pollution.

1.6 PROTECTION

1.6.1 Traffic Control Signs

Where pedestrian and driver safety is endangered in the area of removal work, use traffic barricades with flashing lights. Anchor barricades in a manner to prevent displacement by wind. Notify the Contracting Officer prior to beginning such work.

1.6.2 Existing Conditions Documentation

Before beginning any demolition, survey the site and examine the drawings and specifications to determine the extent of the work. Record existing conditions in the presence of the Contracting Officer showing the condition of structures and other facilities adjacent to areas of alteration or removal. Photographs sized 4 inch will be acceptable as a record of existing conditions. It is the Contractor's responsibility to verify and document all required outages which will be required during the course of work, and to note these outages on the record document.

1.6.3 Items to Remain in Place

Take necessary precautions to avoid damage to existing items to remain in

DRAFT

place, to be reused, or to remain the property of the Government. Repair or replace damaged items as approved by the Contracting Officer. Coordinate the work of this section with all other work indicated. Do not overload pavements to remain.

1.6.4 Existing Construction Limits and Protection

Do not disturb existing construction beyond the extent indicated or necessary for installation of new construction. Provide protective measures to control accumulation and migration of dust and dirt in all work areas. Remove dust, dirt, and debris from work areas daily.

1.6.5 Trees

Protect trees within the project site which might be damaged during demolition, and which are indicated to be left in place, by a 6 foot high fence. Erect and secure fence a minimum of 5 feet from the trunk of individual trees or follow the outer perimeter of branches or clumps of trees. Replace any tree designated to remain that is damaged during the work under this contract with like-kind or as approved by the Contracting Officer.

1.6.6 Utility Service

Maintain existing utilities indicated to stay in service and protect against damage during demolition operations. Prior to start of work, utilities serving each area of alteration or removal will be shut off by the Government and disconnected and sealed by the Contractor.

1.6.7 Protection of Personnel

Before, during and after the demolition work the Contractor must continuously evaluate the condition of the pavement being demolished and take immediate action to protect all personnel working in and around the project site.

DRAFT

1.7 RELOCATIONS

Perform the removal and reinstallation of relocated items as indicated with workmen skilled in the trades involved. Repair or replace items to be relocated which are damaged by the Contractor with new undamaged items as approved by the Contracting Officer.

1.8 USE OF EXPLOSIVES

Use of explosives will not be permitted.

PART 2 PRODUCTS

NOT USED.

PART 3 EXECUTION

3.1 EXISTING FACILITIES TO BE REMOVED

Inspect and evaluate existing structures onsite for reuse. Removed materials are to be separated, prepared as required, and stored or delivered to a collection point for reuse, or other disposal, as specified.

3.1.1 Utilities and Related Equipment

3.1.1.1 General Requirements

Do not interrupt existing utilities except when authorized in writing by the Contracting Officer. Do not interrupt existing utilities used by the Government except when approved in writing and then only after temporary utility services have been approved and provided. Do not begin demolition work until all utility disconnections have been made. Shut off and cap utilities for future use, as indicated.

3.1.1.2 Disconnecting Existing Utilities

Remove existing utilities, as indicated and terminate in a manner conforming to the nationally recognized code covering the specific utility and approved by the Contracting Officer. When utility lines are encountered but are not indicated on the drawings, notify the Contracting Officer prior to further work in that area. Remove meters and related equipment and deliver to a location in accordance with instructions of the Contracting Officer.

3.2 CONCURRENT EARTH-MOVING OPERATIONS

Do not begin excavation, filling, and other earth-moving operations that are sequential to demolition until all demolition in the area has been completed and debris removed.

3.3 DISPOSITION OF MATERIAL

3.3.1 Title to Materials

All materials and equipment removed and not reused or salvaged, must become the property of the Contractor and must be removed from Government property. Title to materials resulting from demolition and materials to be removed, is vested in the Contractor upon approval by the Contracting Officer of the Contractor's demolition, and removal procedures, and authorization by the Contracting Officer to begin demolition. The Government will not be responsible for the condition or loss of, or damage to, such property after contract award. Showing for sale or selling materials and equipment on site is prohibited. Materials and equipment, including woody material from removed trees, must be salvaged or reused to the extent practicable.

3.4 DISPOSAL OF REMOVED MATERIALS

3.4.1 Regulation of Removed Materials

Dispose of debris, rubbish, scrap, and other non-salvageable materials resulting from removal operations in accordance with all applicable federal, state and local regulations as contractually specified.

3.4.2 Removal from Government Property

Transport waste materials removed from demolished structures, except waste soil, from Government property for legal disposal. Dispose of waste soil as directed.

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DRAFT

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DRAFT

SECTION TABLE OF CONTENTS

DIVISION 05 - METALS

SECTION 05 50 13

MISCELLANEOUS METAL FABRICATIONS

PART 1 GENERAL

1.1 REFERENCES
1.2 SUBMITTALS
1.2.1 Fabrication Drawings
1.2.2 Installation Drawings
1.3 QUALIFICATION OF WELDERS
1.4 DELIVERY, STORAGE, AND PROTECTION

PART 2 PRODUCTS

2.1 MATERIALS
2.1.1 Structural Carbon Steel
2.1.2 Structural Tubing
2.1.3 Steel Pipe
2.1.4 Fittings for Steel Pipe
2.1.5 Anchor Bolts
2.1.5.1 Lag Screws and Bolts
2.1.5.2 Toggle Bolts
2.1.5.3 Bolts, Nuts, Studs and Rivets
2.1.5.4 Powder Actuated Fasteners
2.1.5.5 Screws
2.1.5.6 Washers
2.1.5.7 Welded Headed Shear Studs
2.1.6 Aluminum Alloy Products
2.2 FABRICATION FINISHES
2.2.1 Nonferrous Metal Surfaces
2.2.2 Aluminum Surfaces
2.2.2.1 Surface Condition
2.2.2.2 Aluminum Finishes
2.3 GUY CABLES

PART 3 EXECUTION

3.1 GENERAL INSTALLATION REQUIREMENTS
3.2 WORKMANSHIP
3.3 ANCHORAGE, FASTENINGS, AND CONNECTIONS
3.4 BUILT-IN WORK
3.5 WELDING
3.6 DISSIMILAR METALS
3.7 PREPARATION
3.7.1 Material Coatings and Surfaces
3.7.2 Environmental Conditions
3.8 EXPANSION JOINT COVERS
3.9 COVER PLATES AND FRAMES

DRAFT

-- End of Section Table of Contents --

DRAFT

SECTION 05 50 13

MISCELLANEOUS METAL FABRICATIONS

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.

ALUMINUM ASSOCIATION (AA)

AA DAF45	(2003; Reaffirmed 2009) Designation System for Aluminum Finishes

AMERICAN INSTITUTE OF STEEL CONSTRUCTION (AISC)

AISC 303	(2016) Code of Standard Practice for Steel Buildings and Bridges

AMERICAN SOCIETY OF SAFETY ENGINEERS (ASSE/SAFE)

ASSE/SAFE A10.3	(2013) Operations - Safety Requirements for Powder Actuated Fastening Systems

AMERICAN WELDING SOCIETY (AWS)

AWS D1.1/D1.1M	(2015; Errata 1 2015; Errata 2 2016) Structural Welding Code - Steel

ASME INTERNATIONAL (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 B18.21.1	(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
ASME B18.6.2	(1998; R 2010) Slotted Head Cap Screws, Square Head Set Screws, and Slotted Headless Set Screws: Inch Series
ASME B18.6.3	(2013) Machine Screws, Tapping Screws, and Machine Drive Screws (Inch Series)

DRAFT

ASTM INTERNATIONAL (ASTM)

ASTM A108	(2013) Standard Specification for Steel Bar, Carbon and Alloy, Cold-Finished
ASTM A307	(2014; E 2017) Standard Specification for Carbon Steel Bolts, Studs, and Threaded Rod 60 000 PSI Tensile Strength
ASTM A36/A36M	(2014) Standard Specification for Carbon Structural Steel
ASTM A47/A47M	(1999; R 2014) Standard Specification for Ferritic Malleable Iron Castings
ASTM A475	(2003; R 2014) Standard Specification for Zinc-Coated Steel Wire Strand
ASTM A500/A500M	(2013) Standard Specification for Cold-Formed Welded and Seamless Carbon Steel Structural Tubing in Rounds and Shapes
ASTM A53/A53M	(2012) Standard Specification for Pipe, Steel, Black and Hot-Dipped, Zinc-Coated, Welded and Seamless
ASTM B108/B108M	(2015) Standard Specification for Aluminum-Alloy Permanent Mold Castings
ASTM B209	(2014) Standard Specification for Aluminum and Aluminum-Alloy Sheet and Plate
ASTM B209M	(2014) Standard Specification for Aluminum and Aluminum-Alloy Sheet and Plate (Metric)
ASTM B221	(2014) Standard Specification for Aluminum and Aluminum-Alloy Extruded Bars, Rods, Wire, Profiles, and Tubes
ASTM B221M	(2013) Standard Specification for Aluminum and Aluminum-Alloy Extruded Bars, Rods, Wire, Profiles, and Tubes (Metric)
ASTM B26/B26M	(2014; E 2015) Standard Specification for Aluminum-Alloy Sand Castings
ASTM C1513	(2013) 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

MASTER PAINTERS INSTITUTE (MPI)

MPI 79	(Oct 2009) Alkyd Anti-Corrosive Metal Primer

DRAFT

U.S. ARMY CORPS OF ENGINEERS (USACE)

EM 385-1-1	(2024) Safety -- Safety and Occupational Health (SOH) Requirements

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-02 Shop Drawings

Fabrication Drawings

Installation Drawings

SD-04 Samples

Certified Mill; G

1.2.1 Fabrication Drawings

Submit fabrication drawings showing layout(s), connections to structural system, and anchoring details as specified in AISC 303.

1.2.2 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.

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.

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.

DRAFT

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 A307. Where exposed, provide anchor bolts of the same material, color, and finish as the metal to which they are applied.

2.1.5.1 Lag Screws and Bolts

Provide in accordance with ASME B18.2.1, type and grade best suited for the purpose.

2.1.5.2 Toggle Bolts

Provide in accordance with ASME B18.2.1.

2.1.5.3 Bolts, Nuts, Studs and Rivets

Provide in accordance with ASME B18.2.2 or ASTM A307.

2.1.5.4 Powder Actuated Fasteners

Follow safety provisions in accordance with ASSE/SAFE A10.3.

2.1.5.5 Screws

Provide in accordance with ASME B18.2.1, ASME B18.6.2, ASME B18.6.3 and ASTM C1513.

2.1.5.6 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.

2.1.5.7 Welded Headed Shear Studs

Provide in accordance with ASTM A108.

2.1.6 Aluminum Alloy Products

Provide in accordance with ASTM B209M, ASTM B209 for sheet plate, ASTM B221M, ASTM B221M, ASTM B221 for extrusions and ASTM B26/B26M or

DRAFT

ASTM B108/B108M for castings. Provide aluminum extrusions at least 1/8 inch thick and aluminum plate or sheet at least 0.050 inch thick.

2.2 FABRICATION FINISHES

2.2.1 Nonferrous Metal Surfaces

Protect by plating, anodic, or organic coatings.

2.2.2 Aluminum Surfaces

2.2.2.1 Surface Condition

Before finishes are applied, remove roll marks, scratches, rolled-in scratches, kinks, stains, pits, orange peel, die marks, structural streaks, and other defects which will affect uniform appearance of finished surfaces.

2.2.2.2 Aluminum Finishes

Unexposed sheet, plate and extrusions may have mill finish as fabricated. Sandblast castings' finish, medium, AA DAF45. Unless otherwise specified, provide all other aluminum items with a standard mill finish. Provide a coating thickness not less than that specified for protective and decorative type finishes for items used in interior locations or architectural Class I type finish for items used in exterior locations. Provide in accordance with AA DAF45. Provide a polished satin finish on items to be anodized.

2.3 GUY CABLES

Provide guy cables as pre-stretched, galvanized wire rope of sizes indicated. Provide wire rope in accordance with ASTM A475, high strength grade with Class A coating. Guys must have a factory attached clevis top-end fitting, a factory attached open-bridge strand socket bottom-end fitting, and must be complete with oval eye, threaded anchor rods. Provide hot-dip galvanized fittings and accessories.

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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 countersunk 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, powder-driven fasteners, toggle bolts (when approved for concrete), 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. Test a minimum of 2 bolt, nut, and washer assemblies from each certified mill batch in a tension measuring device at the job site prior to the beginning of bolting start-up.

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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3.8 EXPANSION JOINT COVERS

Provide in accordance with manufacturer's written instructions and with seismic requirements indicated. Verify installation allows specified movement prior to completion of work

3.9 COVER PLATES AND FRAMES

Provide tops of cover plates and frames flush with finished surface. Test for trip hazards and adjust for any encountered lippage.

-- End of Section --

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DRAFT

SECTION TABLE OF CONTENTS

DIVISION 10 - SPECIALTIES

SECTION 10 14 01

SIGNAGE

PART 1 GENERAL

1.1 REFERENCES
1.2 SUBMITTALS
1.2.1 Approved detail shop drawings
1.2.2 Exterior signage schedule
1.3 GENERAL
1.4 QUALIFICATIONS
1.5 DELIVERY AND STORAGE
1.6 WARRANTY

PART 2 PRODUCTS

2.1 MODULAR EXTERIOR SIGNAGE SYSTEM
2.1.1 Free-Standing Base Mount Pylon/Monolith Type Signs
2.1.1.1 Mounting
2.1.1.2 Finishes
2.1.2 Panel And Post/Panel Type Signs
2.1.2.1 Posts
2.1.2.2 Panel Framing System
2.1.2.3 Panels
2.1.2.4 Finishes
2.1.2.5 Mounting
2.1.3 Changeable Letter Directories
2.1.3.1 Finishes
2.1.3.2 Lettering
2.2 POLYCARBONATE SHEET
2.3 ANCHORS AND FASTENERS
2.4 SHOP FABRICATION AND MANUFACTURE
2.4.1 Factory Workmanship
2.4.2 Dissimilar Materials
2.4.3 Shop Painting
2.5 COLOR, FINISH, AND CONTRAST

PART 3 EXECUTION

3.1 INSTALLATION
3.1.1 Anchorage
3.1.2 Protection and Cleaning

-- End of Section Table of Contents --

DRAFT

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DRAFT

SECTION 10 14 01

SIGNAGE

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 WELDING SOCIETY (AWS)

AWS D1.1/D1.1M	(2015; Errata 1 2015; Errata 2 2016) Structural Welding Code - Steel

ASTM INTERNATIONAL (ASTM)

ASTM A123/A123M	(2015) Standard Specification for Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products
ASTM A653/A653M	(2015; E 2016) Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process
ASTM A924/A924M	(2016a) Standard Specification for General Requirements for Steel Sheet, Metallic-Coated by the Hot-Dip Process

SOCIETY OF AUTOMOTIVE ENGINEERS INTERNATIONAL (SAE)

SAE AMS3611	(2011; Rev E; Stabilized (S) 2011) Plastic Sheet, Polycarbonate General Purpose

1.2 SUBMITTALS

Submit the following in accordance with Section 01 33 00 SUBMITTAL PROCEDURES:

SD-02 Shop Drawings

Approved detail shop drawings; G

SD-03 Product Data

Modular Exterior Signage System; G

Manufacturer's descriptive data and catalog cuts.

Installation

Manufacturer's installation instructions and cleaning

DRAFT

instructions.

Exterior signage schedule

Protection and Cleaning

1.2.1 Approved detail shop drawings

Shop Drawings: Drawings showing elevations of each type of sign; dimensions, details, and methods of mounting or anchoring; shape and thickness of materials; and details of construction. A schedule showing the location, each sign type, and message must be included.

1.2.2 Exterior signage schedule

Exterior signage schedule in spread sheet format. Spread sheet must include sign location, sign type, and message.

1.3 GENERAL

All exterior signage must be provided by a single manufacturer. Exterior signage must be of the design, detail, sizes, types, and message content shown on the drawings, must conform to the requirements specified, and must be provided at the locations indicated. Signs must be complete with lettering, framing as detailed, and related components for a complete installation.

1.4 QUALIFICATIONS

Signs, plaques, and dimensional letters must be the standard product of a manufacturer regularly engaged in the manufacture of the products and in conformance with industry standards and all applicable regulatory requirements.

1.5 DELIVERY AND STORAGE

Materials must be wrapped for shipment and storage, delivered to the jobsite in manufacturer's original packaging, and stored in a clean, dry area in accordance with manufacturer's instructions.

1.6 WARRANTY

Manufacturer's standard performance guarantees or warranties that extend beyond a one year period must be provided.

PART 2 PRODUCTS

2.1 MODULAR EXTERIOR SIGNAGE SYSTEM

2.1.1 Free-Standing Base Mount Pylon/Monolith Type Signs

2.1.1.1 Mounting

Provide mounting by securing to concrete foundation as shown.

2.1.1.2 Finishes

Base finish must be two-component acrylic polyurethane. Metal panel system finish must be baked enamel or two-component acrylic polyurethane ,

DRAFT

as shown.

2.1.2 Panel And Post/Panel Type Signs

2.1.2.1 Posts

One-piece galvanized steel posts must be provided with minimum 0.125 inch wall thickness. Posts must be designed to accept panel framing system described. The post must be designed to permit attachment of panel framing system without exposed fasteners. Provide caps for each post.

2.1.2.2 Panel Framing System

Panel framing consisting of aluminum sections and interlocking track components must be designed to interlock with posts with concealed fasteners.

2.1.2.3 Panels

Panels must be fabricated per Caltrans standard. Panels must be designed to be interchangeable. Panels with metal return sheeting must have welded corners, ground smooth.

2.1.2.4 Finishes

Post finish must be two-component acrylic polyurethane. Metal panel system finish must be baked enamel or two-component acrylic polyurethane.

2.1.2.5 Mounting

Permanent mounting must be provided by embedding posts in concrete foundation. Removable mounting must be provided by a steel sleeve embedded in concrete as shown.

2.1.3 Changeable Letter Directories

2.1.3.1 Finishes

Post finish must be semi-gloss baked enamel or two-component acrylic polyurethane. Metal panel system finish must be baked enamel or two-component acrylic polyurethane.

2.1.3.2 Lettering

Lettering and text size must conform to industry standards and be in conformance with MUTCD or CA MUTCD requirements as applicable requirements.

2.2 POLYCARBONATE SHEET

Polycarbonate sheet must conform to SAE AMS3611.

2.3 ANCHORS AND FASTENERS

Exposed anchor and fastener materials must be compatible with metal to which applied and must match in color and finish and must be non-rusting, non-corroding, and non-staining. Exposed fasteners must be tamper-proof.

DRAFT

2.4 SHOP FABRICATION AND MANUFACTURE

2.4.1 Factory Workmanship

Work must be assembled in the shop, as far as practical, ready for installation at the site. Work that cannot be shop assembled must be given a trial fit in the shop to ensure proper field assembly. Holes for bolts and screws must be drilled or punched. Drilling and punching must produce clean, true lines and surfaces. Welding to or on structural steel must be in accordance with AWS D1.1/D1.1M. Welding must be continuous along the entire area of contact. Exposed welds must be ground smooth. Exposed surfaces of work must have a smooth finish and exposed riveting must be flush. Fastenings must be concealed where practical. Items specified to be galvanized must be by hot-dip process after fabrication if practical. Galvanization must be in accordance with ASTM A123/A123M and ASTM A653/A653M, as applicable. Other metallic coatings of steel sheet must be in accordance with ASTM A924/A924M. Joints exposed to the weather must be formed to exclude water. Drainage and weep holes must be included as required to prevent condensation buildup.

2.4.2 Dissimilar Materials

Where dissimilar metals are in contact, or where aluminum is in contact with concrete, mortar, masonry, wet or pressure-treated wood, or absorptive materials subject to wetting, the surfaces must be protected with a coat of asphalt varnish or a coat of zinc-molybdate primer to prevent galvanic or corrosive action.

2.4.3 Shop Painting

Surfaces of miscellaneous metal work, except nonferrous metal, corrosion resisting steel, and zinc-coated work, must be given one coat of zinc-molybdate primer or an approved rust-resisting treatment and metallic primer in accordance with manufacturer's standard practice. Surfaces of items to be embedded in concrete must not be painted. Upon completion of work, damaged surfaces must be recoated.

2.5 COLOR, FINISH, AND CONTRAST

Color must be in conformance with Caltrans standards per sign type. Characters and symbols must conform to Caltrans standard per sign type.

PART 3 EXECUTION

3.1 INSTALLATION

Signs, plaques, or dimensional letters must be installed in accordance with approved manufacturer's instructions at locations shown on the approved detail drawings. Install signs plumb and true at mounting heights indicated, and by method shown or specified. Signs mounted on other surfaces must not be installed until finishes on such surfaces have been completed.

3.1.1 Anchorage

Anchorage and fastener materials must be in accordance with approved manufacturer's instructions for the indicated substrate. Anchorage not otherwise specified or indicated must include slotted inserts, expansion shields, and powder-driven fasteners when approved for concrete; toggle

DRAFT

bolts and through bolts for masonry; machine carriage bolts for steel; lag bolts and screws for wood.

3.1.2 Protection and Cleaning

Protect the work against damage during construction. Hardware and electrical equipment must be adjusted for proper operation. Glass, frames, and other sign surfaces must be cleaned in accordance with manufacturer's instructions. After signs are completed and inspected, the Contractor must cover all project identification, directional, and other signs which may mislead the public. Maintain covering until instructed to be removed by the Contracting Officer or until the facility is to be opened for business. Signs must be cleaned, as required, at time of cover removal.

-- End of Section --

DRAFT

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DRAFT

SECTION TABLE OF CONTENTS

DIVISION 31 - EARTHWORK

SECTION 31 00 00

EARTHWORK

PART 1 GENERAL

1.1 REFERENCES
1.2 DEFINITIONS
1.2.1 Suitable Materials
1.2.2 Unsuitable Materials
1.2.3 Fill Materials
1.2.4 Structural Backfill
1.2.5 Degree of Compaction
1.2.6 Relative Density
1.3 QUALIFICATIONS
1.4 SUBMITTALS
1.4.1 Borrow Site Soil Sampling Work Plan
1.4.2 Borrow Area Chemical Suitability Certification Report
1.4.3 Survey Data
1.4.4 Equipment Data
1.4.5 Material Distribution and Stockpile Plan
1.4.6 Sheeting and Shoring Plan
1.4.7 Geotechnical Engineer
1.4.8 Plan of Operations
1.4.9 Flood Contingency Plan
1.4.10 Testing Qualifications
1.4.11 Quality Control Testing
1.4.12 Test Data Summaries
1.4.13 Construction Verification Survey Report
1.4.14 Borrow Excavation and Utilization Plan
1.4.15 Borrow Source Drawings
1.4.16 Borrow Site Laboratory Test Results
1.5 GENERAL CONDITIONS
1.5.1 Lines and Grades
1.5.2 Conduct of the Work
1.5.3 Haul Roads
1.5.4 Slides and Foundation Failures
1.5.5 Drainage Requirements
1.5.6 Utilities
1.5.7 Protection of Existing Man-Made Facilities and Natural Features

PART 2 PRODUCTS

2.1 MATERIALS
2.1.1 Fill Materials
2.2 TYPES OF FILL MATERIALS
2.2.1 Soil Type 1 Material Requirements
2.2.2 Drain Rock
2.3 REQUIREMENTS FOR OFFSITE SOILS
2.3.1 General Chemical Testing Requirements

DRAFT

2.3.2 Sample Collection
2.3.3 Chemical Testing
2.3.3.1 Solids Analysis
2.3.3.2 Soluble Constituent Testing
2.3.4 Potential Contaminants of Concern and Screening Criteria
2.3.5 Sampling Cost
2.3.6 Borrow Area Chemical Suitability Certification Report

PART 3 EXECUTION

3.1 TOLERANCES
3.2 PREPARATION OF FOUNDATION AND PARTIAL FILL SURFACES
3.2.1 Foundation Preparation
3.2.2 Benching
3.3 EXCAVATION
3.3.1 Over-Excavation
3.3.1.1 Within Limits of Levee Foundations or Structures
3.3.1.2 Slopes and Surcharges
3.3.2 Utilities
3.4 PLACEMENT AND SPREADING
3.4.1 General
3.4.1.1 Foundations and Partial Embankment Fills
3.4.1.2 Equipment Traffic
3.4.2 Placement of Embankment and Structural Backfill
3.4.3 Fill Materials
3.4.4 Topsoil
3.5 MOISTURE CONTROL
3.5.1 General
3.5.1.1 Insufficient Moisture for Suitable Bond
3.5.1.2 Excessive Moisture for Suitable Bond
3.5.1.3 Drying Wet Material
3.5.1.4 Increasing Moisture in Dry Material
3.5.2 Moisture Content Requirements
3.6 COMPACTION
3.6.1 Compaction Equipment
3.6.1.1 Tamping Rollers
3.6.1.2 Vibratory Rollers
3.6.1.3 Rubber-Tired Rollers
3.6.1.4 Hand Operated Compactors
3.6.1.5 Crawler-Type Tractors
3.6.1.6 Sprinkling Equipment
3.6.1.7 Miscellaneous Equipment
3.6.2 Compaction of Fill
3.7 FIELD QUALITY CONTROL
3.7.1 General
3.7.2 Embankment and Fill Testing
3.7.3 Reporting

ATTACHMENTS:

Imported Fill Chemical Screening Limits for the Natomas Reach I Project

-- End of Section Table of Contents --

DRAFT

SECTION 31 00 00

EARTHWORK

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.

ASTM INTERNATIONAL (ASTM)

ASTM D1556	(2015) Density and Unit Weight of Soil in Place by the 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 D2216	(2019) Standard Test Methods for Laboratory Determination of Water (Moisture) Content of Soil and Rock by Mass
ASTM D2487	(2017; E 2020) Standard Practice for Classification of Soils for Engineering Purposes (Unified Soil Classification System)
ASTM D2974	(2014) Moisture, Ash, and Organic Matter of Peat and Other Organic Soils
ASTM D3740	(2019) Minimum Requirements for Agencies Engaged in the Testing and/or Inspection of Soil and Rock as Used in Engineering Design and Construction
ASTM D4253	(2016) Maximum Index Density and Unit Weight of Soils Using a Vibratory Table
ASTM D4254	(2016) Minimum Index Density and Unit Weight of Soils and Calculation of Relative Density
ASTM D4318	(2017; E 2018) Standard Test Methods for Liquid Limit, Plastic Limit, and Plasticity Index of Soils
ASTM D4643	(2008) Determination of Water (Moisture) Content of Soil by the Microwave Oven Method
ASTM D6913/D6913M	(2017) Standard Test Methods for

DRAFT

	Particle-Size Distribution (Gradation) of Soils Using Sieve Analysis
ASTM D6938	(2017a) Standard Test Method for In-Place Density and Water Content of Soil and Soil-Aggregate by Nuclear Methods (Shallow Depth)
ASTM D698	(2012; E 2014; E 2015) Laboratory Compaction Characteristics of Soil Using Standard Effort (12,400 ft-lbf/cu. ft. (600 kN-m/cu. m.))

U.S. ARMY CORPS OF ENGINEERS (USACE)

ER 1110-1-261	(1999) Quality Assurance of Laboratory Testing Procedures

U.S. ENVIRONMENTAL PROTECTION AGENCY (EPA)

EPA SW-846.3-3	(1999, Third Edition, Update III-A) Test Methods for Evaluating Solid Waste: Physical/Chemical Methods

1.2 DEFINITIONS

1.2.1 Suitable Materials

Suitable materials must consist of materials classified in accordance with ASTM D2487 as CL, SC, ML, and SM meeting the additional requirements of paragraph 2.2, TYPES OF FILL MATERIALS. Suitable materials must be free from roots (no visible organic matter remaining), debris, rubble, trash, or other deleterious or hazardous items or substances, or other organic material exceeding allowable limits. Suitable materials must have a maximum particle size of 2-inches and must be free from debris and organic material as defined herein. Materials are not be classified as unsuitable based solely on moisture content.

1.2.2 Unsuitable Materials

Unsuitable materials include all other materials that are not defined as suitable materials in paragraph 1.2.1 herein. Unsuitable materials include all other materials that do not meet the requirements of paragraph 2.2, TYPES OF FILL MATERIALS. Materials are not be classified as unsuitable based solely on moisture content. Materials containing any visible organic matter, debris, rubble, trash, or other deleterious or hazardous items of substances must be classified as unsuitable materials. Unsuitable materials must be disposed of in accordance with Section 02 41 00 DEMOLITION.

Soils containing visible concentrations of organics or classified as organic clay or organic silt (OH or OL) are unsuitable, except for strippings.

1.2.3 Fill Materials

The terms "fill" or "embankment" or "backfill" as used in these specifications are defined as the earth fill portions of the levee embankment structure, or other fills related to the levee, and all other

DRAFT

fills within the limits of the project and meeting the additional requirements of paragraph 2.2 TYPES OF FILL MATERIALS.

1.2.4 Structural Backfill

Earthen fill to be placed within 4-feet of completed or partially completed structures.

1.2.5 Degree of Compaction

Degree of compaction must be expressed as a percentage of the maximum density obtained by the test procedure presented in ASTM D698 or ASTM D1557, dependent on the material and location as defined in these Specifications.

1.2.6 Relative Density

Relative density must be expressed as a percentage of the maximum index density in accordance with ASTM D4253 and ASTM D4254.

1.3 QUALIFICATIONS

The earthwork contractor performing levee construction and reconstruction must have experience in projects of similar size and scope completed in the last ten (10) years. The project experience must have been performed by the entity proposing to perform the work as defined below. An individual's experience from former companies qualifies as contractor experience provided that the individual is the Contractor's designated Project Manager or Site Superintendent. Qualifying experience in levee construction and reconstruction must consist of the following: Satisfactorily performed the work and completed the construction of at least three levee projects including either (1) levee construction, or (2) levee degrading and reconstruction for the purpose of cutoff wall construction. The projects must have included a minimum levee embankment quantity of 30,000 cubic yards.

Refer to the proposal forms for additional information.

DRAFT

1.4 SUBMITTALS

Government approval is required for submittals with a "GA" 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 must be submitted in accordance with Section 01 33 00 SUBMITTAL PROCEDURES:

SD-01 Preconstruction Submittals

Borrow Site Soil Sampling Work Plan; G

Borrow Area Chemical Suitability Certification Report; G;

Survey Data; G

Equipment Data; G

Material Distribution and Stockpile Plan; G

Sheeting and Shoring Plan; G

Geotechnical Engineer; G

Plan of Operations; G

Flood Contingency Plan; G

Borrow Excavation and Utilization Plan; G

Borrow Source Drawings; G

Borrow Site Laboratory Test Results; G

SD-07 Certificates

Testing Qualifications;

SD-09 Manufacturer's Field Reports

Quality Control Testing; G

Test Data Summaries;

Construction Verification Survey Report; G

1.4.1 Borrow Site Soil Sampling Work Plan

Within 14 days after the notice to proceed and at least 30 days prior to the sampling activities at any borrow site, a plan including, but is not limited to the following: number of samples, sample methods and analysis, sample procedures, laboratory who is performing the analysis, and quality control and quality assurances, is to be provided to the Contracting Officer for approval. The Contractor must not collect any samples at the borrow site before government's approval. The work plan must be certified by California-licensed professional engineer or geologist."

1.4.2 Borrow Area Chemical Suitability Certification Report

A report detailing the chemical testing performed and confirming the chemical suitability of the borrow site is to be provided to the Contracting Officer within 14 calendar days after sample collection and at least 30 days prior to the first scheduled date for importing borrow material. The report must include, but is not limited to the following: all chemical testing results with a section describing how the results compare to the screening limits, a map of sample locations, a brief summary of sampling activities, sample composite details, and any other pertinent information. This report must be certified by a California-licensed professional engineer or geologist. The Contracting Officer must approve the report findings prior to any borrow material reaching the project site. The report will include all laboratory chemical results and outlined in this specification.

1.4.3 Survey Data

Copies of survey data in the form of cross sections of the levee prior to construction must be submitted. Cross Sections must be surveyed at 100 foot intervals in the areas of slope flattening. See C-500 series drawings for the locations where cross sections should be surveyed. The Contractor must submit written certification that the data is accurate, and surveying was performed by a surveyor authorized to practice land surveying in the

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State of California. Submit all data within 24 hours of performing field surveys per these Contract Documents.

1.4.4 Equipment Data

Equipment data used for hauling, fill placement, compaction, and sprinkling equipment must be submitted and include weights, size, and contact pressures.

1.4.5 Material Distribution and Stockpile Plan

Earth material distribution and stockpile plan that describes where material will be obtained, placed, stockpiled and blended for usage or for temporary disposal. This information must be provided within fourteen (14) days after the notice to proceed.

Description of how materials excavated from the borrow area for different zones of the reconstructed embankment must be identified to allow field personnel to determine the appropriate end use of the material.

1.4.6 Sheeting and Shoring Plan

Submit drawings and calculations, certified by a registered civil engineer authorized to practice in the State of California, describing the methods for shoring and sheeting of excavations if required. Drawings must include material sizes and types, arrangement of members, and the sequence and method of installation and removal. Calculations must include data and references used.

DRAFT

1.4.7 Geotechnical Engineer

The Contractor must provide a Professional Geotechnical Engineer licensed in the State of California to provide inspection of excavations and soil/groundwater conditions throughout construction. The Geotechnical Engineer is responsible for performing pre-construction and periodic site visits throughout construction to assess site conditions. The Geotechnical Engineer must update the excavation, sheeting and dewatering plans as construction progresses to reflect changing conditions and must submit an updated plan as necessary. A written report must be submitted, at least monthly, informing the Contracting Officer and Construction Manager of the status of the plan and an accounting of the Contractor's adherence to the plan addressing any present or potential problems. The Geotechnical Engineer must be available to meet with the Contracting Officer and Construction Manager at any time throughout the contract duration.

The Professional Geotechnical Engineer must have experience in performing levee construction and reconstruction projects of similar size and scope completed in the last 5 years and be a professional licensed in the State of California. Qualifying experience in levee construction and reconstruction must consist of the following:

Satisfactorily performed the work and completed the construction of at least three earthen levee or earth fill dam projects. The projects must have included a minimum earthen levee or earth fill dam embankment or berm quantity of 30,000 cubic yards. The Qualifications Geotechnical Engineer must be submitted prior to construction.

1.4.8 Plan of Operations

Thirty (30) days prior to commencement of haul road construction or placing embankment and backfill, whichever is earlier, the Contractor must submit for review a Plan of Operations for accomplishing all embankment and backfill construction and for the location and construction of haul roads. The plan must be submitted to the Contracting Officer prior to the start of work for government review and approval. This plan must include, but not be limited to, the Contractor's proposed sequence of construction for embankment and backfill items, and methods and types of equipment to be utilized for all embankment and backfill operations, including transporting, placing, and compaction. Proposed methods for preventing interference with or damage to existing utilities, trees to remain, and man-made features. Stockpile locations. Contractor's sequence of work. This plan must also include the names and addresses of the commercial testing labs which will perform the soil testing and inspection and describe how all required soils testing will be performed and reported. The requirements for independent testing laboratories must meet requirements of Section 01 45 00 QUALITY CONTROL.

1.4.9 Flood Contingency Plan

In the event the water surface elevation of the Sacramento River or American River is forecasted by the State-Federal Flood Forecast Center to increase significantly for any reason, the Contracting Officer reserves the right to require the Contractor to stop excavation and to begin continuous operations to complete all partially completed section(s) of the levee embankment. At least 30 days prior to any levee excavation, the Contractor must submit a contingency plan outlining the contingency operations in the event that river waters reach elevation 26 feet NGVD29 as reported by the H Street Gauge and is forecasted to rise. The contingency plan must include the proposed measures to protect the landside areas which have a reduced level of protection due to construction activities. The plan must include river stage monitoring, river stage at which the plan will be activated, material and equipment to be used in performance of the contingency plan, and the existing location, type and quantity of the stockpiled emergency material. The plan must also include where stockpiled materials will be stored, and the method for monitoring river elevations.

DRAFT

1.4.10 Testing Qualifications

The Contractor must submit testing qualifications of the USACE-validated commercial testing laboratory or the Contractor's validated testing facilities.

1.4.11 Quality Control Testing

The Contractor must submit all quality control test results. Testing laboratories must meet the requirement of ASTM D3740 and ER 1110-1-261. Supervision of tests and report preparation must be by a professional civil or geotechnical engineer licensed in the State of California. All reports must bear said professional engineer's signature and stamp. Distribution of the copies to the Contracting Officer must be within 24 hours after sampling or initiating the test, except for test requirements that exceed 24 hours. For tests exceeding 24 hours, distribution must be within 24 hours after completion of the test. Also refer to 01 45 00 QUALITY CONTROL.

All test reports must be provided electronically and hard copy.

1.4.12 Test Data Summaries

Summaries comparing test results with Contract requirements must be provided in electronic format and hard copy, demonstrate contract compliance, and be submitted with all requests for progress payments.

1.4.13 Construction Verification Survey Report

The Contractor must complete post-construction verification surveys and submit a "Construction Verification Survey Report" which will include the description of equipment used, a description of methodology used, copies of the field notes, final topographic survey in Auto CAD Civil 3D format, and the final data submitted. This report must contain the certificate below and be stamped and signed by the Professional Land Surveyor (or Civil Engineer, if legally allowed to practice surveying in the State of California) responsible for the survey work performed.

Surveyor's Levee Elevation Certificate:

I, the undersigned, do hereby state that I am licensed to perform surveying in the State of California, and I do hereby certify that the pre-construction and post-construction surveys for measuring the levee(s) and related berm(s) were performed by me or by qualified staff under my supervision. I further certify that the technologies and methods used for these surveys are in compliance with the specifications for this project and that the data from said surveys comply with tolerances specified for this project.

_____ _____
Surveyor's Name Date

CA PLS/CE No.:_____

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1.4.14 Borrow Excavation and Utilization Plan

Submit Borrow Excavation and Utilization Plan at least 30 days prior to the beginning of any excavation. Review and approval of the detailed plan must be obtained from the Contracting Officer prior to starting the work. If necessary, the plan must be modified as required to meet field conditions. Modifications must be reviewed prior to use. At a minimum, the plan must contain, the following:

a. Proposed methods for preventing interference with, or damage to, existing underground or overhead utility lines, trees designated to remain, and other man-made facilities or natural features designated to remain within or adjacent to the construction rights-of-way.

b. Method to ensure only material meeting specification requirements are transported to the levee. Describe how the required soil testing will be performed during excavation and utilization of borrow and how the materials meeting specification will be separated and prepared for transportation to the levee.

c. Describing means and methods for thoroughly blending material to ensure compliance with the material requirements. Show temporary stockpile locations, heights, slopes, limits, and drainage around the stockpile areas.

d. The Contractor's proposed sequence of work for excavating in the stockpile with plan and cross-sectional views showing starting and final work locations and surface layer removal limits.

e. The Contractor's proposed road locations, traffic pattern, and plan for implementing dust control measures.

f. Names and addresses of the commercial testing labs which will perform the geotechnical and environmental soil testing and inspection.

g. Qualifications for California Licensed Professional Geologist or Geotechnical Engineer and of their designated on-site representative demonstrating compliance with paragraph QUALIFICATIONS.

DRAFT

1.4.15 Borrow Source Drawings

A borrow source drawing is included in the project documents. If the Contractor deviates from the approved drawing, the Contractor must submit the change to the Contracting Officer for review and approval prior to any borrow source excavation.

1.4.16 Borrow Site Laboratory Test Results

The Contractor must submit all borrow site laboratory test results used for quality control for each borrow site at least 30 days before use of borrow site as a source for fill soils. Laboratory testing must comply with approved Borrow Site Soil Sampling Work Plan.

Quality control test results must comply with Section 01 45 00 QUALITY CONTROL paragraph TESTS.

All borrow site laboratory test result reports must be signed and stamped by the supervising State-licensed Civil Engineer.

The Civil Engineer must provide certification to the Contracting Officer that the borrow material is free from contaminants and is suitable for use on the project. The certification must include specific reference to implementation of methods of segregation or processing of usable materials outlined in the borrow site excavation and utilization plan including reference to which portions of the borrow site will be used as source(s) for which material(s). It also must indicate any failing tests, whether material will be blended or modified to meet project requirements, procedures for blending or modification, and indicate which portions of stockpile are considered unsuitable for use if any. Must include reference to sub-area number as required by paragraph BORROW SOURCE DRAWINGS.

1.5 GENERAL CONDITIONS

1.5.1 Lines and Grades

Unless otherwise noted on the Plans, the levee landside slope must be restored to pre-construction lines and grades as determined by pre-construction surveys noted in the Contract Documents. Where variations are noted on the Plans, the embankments and backfills must be constructed to the lines, grades, and cross sections indicated on the Plans, unless otherwise directed by the Contracting Officer.

1.5.2 Conduct of the Work

The Contractor must maintain and protect the embankment and backfill in a satisfactory condition at all times until final completion and acceptance of all work under the Contract. If the hauling equipment causes damage to the roadway surfacing or embankment, the Contractor must limit the type, load, or travel speed of the hauling equipment on the embankment or backfill. The Contractor may be required to remove, at his own expense, any embankment material placed outside of prescribed slope lines. Any approved embankment or backfill material which is lost in transit or rendered unsuitable after being placed in the embankment or backfill and before final acceptance of the work must be replaced by the Contractor in a satisfactory manner at no additional cost to the Government. The Contractor must excavate and remove from the embankment or backfill any material which is unsatisfactory and must also dispose of such material and refill the excavated area as directed, all at no cost to the federal government.

1.5.3 Haul Roads

Haul roads and ramps must be located and constructed within the construction limits shown on the Plans. Prior to the commencement of construction the Contractor must submit for review and approval a site plan detailing the location of all haul roads and ramps within the construction limits. Haul roads and ramps must be constructed to maintain the intended traffic, be free draining, and be maintained in good condition throughout the contract period. Haul roads and ramps which cross any creek or drainage channel must be constructed and maintained by the Contractor so as to not flood either upstream areas by restricting stream flows or flood downstream areas by the release of any stored water in the event that the crossing fails for any cause. Haul roads and ramps constructed during the contract duration must 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 must be cleaned daily and

DRAFT

maintained in the preconstruction condition. All costs associated with these haul roads and ramps must be at no additional cost to the Government.

1.5.4 Slides and Foundation Failures

The Contractor must repair any sliding that occurs in any part of the embankment and backfills prescribed in this section prior to final acceptance of the work. When the slide is caused through the fault of the Contractor, the repair must be made at no cost to the Government. The Contractor must submit a plan detailing how the repair will be completed. The plan must be reviewed and approved by the Contracting Officer prior to the start of repair work. When the slide is not the fault of the Contractor, an extension of the unit prices for excavation and embankment must be made to cover the cost of the repairs.

1.5.5 Drainage Requirements

The Contractor must not block or restrict the flow in a natural drain, existing culvert, ditch or channel at any time without obtaining prior written approval. This approval must not relieve the Contractor from responsibility for any damage caused by his operation. The Contractor must monitor the channel flow and provide sufficient free discharge areas so that conditions are not worsened upstream or downstream by possible floods during construction. Surface water must be directed away from excavations and construction sites so as to prevent erosion and undermining of foundations. Diversion ditches, dikes, and grading must be provided and maintained as necessary during construction. Excavated slopes and backfill surfaces must be protected to prevent erosion and sloughing. Excavation must be performed so that the site and the area immediately surrounding the site and affecting operations at the site must be continually and effectively drained. If private property is to be used for drainage, the Contractor must submit written evidence that the right has been obtained from the property owner for drainage on his property.

DRAFT

1.5.6 Utilities

Movement of construction machinery and equipment over pipes and utilities during construction is at the Contractor's risk. Utility lines damaged during construction must be immediately reported to the Contracting Officer. Any damage caused by the Contractor's operations must be repaired at the Contractor's expense.

1.5.7 Protection of Existing Man-Made Facilities and Natural Features

Embankment excavation must be conducted in such a manner as to avoid damage to trees left standing and trees outside the excavation areas, existing buildings, man-made facilities and natural features, with due regard to the safety of employees and others.

PART 2 PRODUCTS

2.1 MATERIALS

2.1.1 Fill Materials

Project fills must be obtained from project excavations and the borrow source identified in the drawings. Excavated material meeting the requirements of 2.2.1 SOIL TYPE 1 MATERIAL REQUIREMENTS must be re-used for earthwork construction to the maximum extent possible. Material from

project excavations should be blended to the maximum extent possible to obtain a blended fill material that meets the requirements of Paragraphs 1.2 DEFINITIONS and 2.2 TYPES OF FILL MATERIALS. Materials must be blended at the approved staging/stockpile area. Materials must be tested for suitability prior to placement. Materials not meeting the specified requirements must be hauled off site and disposed in a legal manner. Soil classification tests must be completed for all blended material in accordance with ASTM D2487.

Soils classified as organic clay or organic silt (OH or OL) are unsuitable and must not be blended for use in the levee embankment or access road. These materials must be hauled off-site.

If a disagreement between the Contractor and the Contracting Officer occurs over the suitability of materials the Contractor must perform laboratory testing to demonstrate compliance with the specifications at no additional costs to the Government. The testing by the Contractor must comply with Paragraph 3.8 FIELD QUALITY CONTROL. The failure of the Contractor to perform the testing does not relieve the Contractor from the obligation to provide suitable materials.

2.2 TYPES OF FILL MATERIALS

2.2.1 Soil Type 1 Material Requirements

Soil Type 1 fill material must be obtained from project excavations or the government approved permitted borrow site(s) obtained by the Contractor and must be suitable as embankment fill as outlined below, defined in Paragraph 1.2 DEFINITIONS, and as shown on the Plans. Soil Type 1 material must consist of low to moderate plasticity soils classified in accordance with ASTM D2487 as lean clay (CL), clayey sand (SC), or silt (ML). Fill material must have an organic content less than 2 percent per ASTM D2974.

Soil Type 1 fill must meet the following requirements:

GRADATION		**ASTM TEST PROCEDURE**
Sieve Size	**Percent Passing**	
2-inch	100	D6913
No. 200	=>30	D6913
Liquid Limit =<45		D4318
Plasticity Index: 8-30		D4318

2.2.2 Drain Rock

Submit drain rock sources and Sampling and Testing results prior to field use of the drain rock. Drain rock consists of washed rock or crushed stone. Drain rock must not contain corrosive agents, soil, organic matter, or soft, friable, thin, or elongated particles and must be evenly graded between the limits specified below. The gradation curve of the drain rock will exhibit no abrupt changes in slope denoting skip or gap gradation.

DRAFT

Drain rock must be free from soil and foreign materials. Drain rock found to be dirty or otherwise contaminated must be removed and replaced with rock meeting the specific requirements, at no additional cost to the government.

Drain Rock material must meet the requirements of Caltrans Class 1 permeable material (Type A) per Section 68-2.02F with the following gradation requirements:

Sieve Openings	**Percent Passing**
3/4 in.	100
1/2 in.	95 - 100
3/8 in.	70 - 100
No. 4	0 - 55
No. 8	0 - 10
No. 200 (.075mm)	0 - 3

DRAFT

2.3 REQUIREMENTS FOR OFFSITE SOILS

2.3.1 General Chemical Testing Requirements

Offsite soils must be chemically tested prior to being considered as fill material onsite. Submit a Borrow Site Soil Sampling Work Plan to the contracting officer for approval in accordance with Section 01 33 00 SUBMITTAL PROCEDURES. The plan must include, but is not limited to the followings: number of samples, sample methods and analysis, sampling procedures, laboratory that is performing the analysis, and quality control and quality assurance procedures. The work plan must be stamped and certified by a California licensed professional engineer or geologist. Conduct the sampling activities according to the approved plan. The sample results must then be compared against the "Imported Fill Chemical Screening Limits for the Natomas Reach I Project" values attached to this specification. The Contractor is responsible for ensuring that the testing is performed and the results are submitted as part of the Borrow Area Chemical Suitability Report. The Borrow Site Chemical Suitability Report must meet the requirements outlined in Paragraph Borrow Area Chemical Suitability Certification Report. Material from a borrow area can be brought onsite only after the contracting officer has provided approval confirming that the material meets the soil screening criteria.

2.3.2 Sample Collection

The soil samples must consist of evenly distributed locations across the borrow site so that the analytical results are as close as possible to being representative of each overall site. Samples will be preserved, transported and analyzed in accordance with EPA SW-846.3-3. The discrete soil samples from the borrow will normally be composited into one sample by the analytical laboratory for analyses; individual site conditions,

however, may also dictate that the discrete samples be analyzed separately. The Contractor must ensure the samples collected from the borrow site represent the material imported to the site. Sample collection locations should be noted in the field, and recorded in latitude-longitude and/or California State Plane coordinate formats.

2.3.3 Chemical Testing

All borrow site soil must undergo a solids analysis for undesirable constituents. The soil constituent concentrations will then be compared against the values in the attached "Imported Fill Chemical Screening Limits for the Natomas Reach I Project". In the event any of those limits are exceeded, perform testing to determine the potential soluble concentration of the constituent(s). All analysis must be performed at a facility that is ELAP/NELAP certified for the methods used.

2.3.3.1 Solids Analysis

All imported soils must be tested for all of the chemical constituents listed in the attached "Imported Fill Chemical Screening Limits for the Natomas Reach I Project."

2.3.3.2 Soluble Constituent Testing

Soluble constituent testing is only required if the constituent concentration was above the Maximum Concentration for Solids Analysis value provided on the "Imported Fill Chemical Screening Limits for the Natomas Reach I Project." The soluble analyses is conducted using the Waste Extraction Test procedure to generate an extractant that can be tested. Analysis on the extractant includes ONLY the constituents listed as having a Soluble Threshold Limit Concentration (STLC) on the attached "Imported Fill Chemical Screening Limits for the Natomas Reach I Project."

2.3.4 Potential Contaminants of Concern and Screening Criteria

Due to the growing concern over the suitability of borrow material increased testing requirements have been initiated. The soil must be tested for total concentrations of screening constituents. Attached to this specification is a list of constituents, "Imported Fill Chemical Screening Limits for the Natomas Reach I Project," that are to be included in the analysis. The tested borrow site soil is to be compared against the Maximum Concentration for Solids Analysis in mg/kg. In the event that the concentration of a constituent is above the 'Maximum Concentration for Solids Analysis' established for this project, then the soluble extractible levels of that constituent must be analyzed. To perform the soluble testing, the soil will undergo a Waste Extraction Test and the extractant will be tested and compared against the Soluble Threshold Limit Concentration (STLC) value(s). In the event that the screening limits are exceeded (or there is no STLC value to compare against), the contractor can choose to determine natural background concentrations of the constituent(s) in the region of the project site. This background level can be determined through composite testing of the new placement site. If the background value is found higher than limits provided, the contractor can use the information as justification of potentially exceeding the limit(s). This justification must be submitted to the contracting officer for review and final determination of acceptability will be provided to the contractor.

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2.3.5 Sampling Cost

All costs associated with the chemical sampling to be included in the Borrow Area Chemical Suitability Certification Report will be coordinated and paid for by the contractor.

2.3.6 Borrow Area Chemical Suitability Certification Report

The Borrow Area Chemical Suitability Certification Report includes all chemical testing results with a section describing how the results meet the screening limits. The results must be compared against the values provided in the, "Imported Fill Chemical Screening Limits for the Natomas Reach I Project." The report must include a map of sample locations with GPS coordinates, sample composite details, a brief summary of sampling activities, and any other pertinent information. This report must be certified by a California-licensed professional engineer or geologist. The report is then submitted to the government for approval in accordance with Section 1.4 Submittals. In addition to the chemical result comparison, additional location information (e.g. soil history, date of sampling, etc.) and commercial contact information (e.g. company name, laboratory used for testing, etc.) must be provided in the report. Material from a borrow area can be brought onsite only after the Contracting Officer has provided approval to the report. It is the Contractor's responsibility to allow ample time for the Contracting Officer to review and approve the report and avoid any project delays

PART 3 EXECUTION

3.1 TOLERANCES

Construct all embankments (prior to placement of surfacing), access roads, and backfills to the grades, lines, and cross-sections shown on the Plans and as determined by Contractors government-reviewed pre-construction surveys. The levee and access road slopes must have a tolerance of 0 to plus 4 inches for final dressing (measured perpendicular to the slope). This tolerance will be allowed provided that any excess material is so distributed that the slopes of the levee drain and that there are no abrupt humps or depressions in any surfaces.

A tolerance of 0.2 feet above or below the prescribed grade will be allowed for finished surfaces outside the levee embankment provided that the surface drains away from the levee in the direction as indicated on the Plans with no abrupt humps or depressions.

3.2 PREPARATION OF FOUNDATION AND PARTIAL FILL SURFACES

3.2.1 Foundation Preparation

After excavation or stripping (as described in Section 31 11 00 CLEARING, GRUBBING, AND STRIPPING) of the embankment and foundation area to the extent indicated or otherwise required, the sides of stump holes, test pits, and other similar cavities or depressions must be broken down so as to flatten out the slopes to no steeper than 1H:1V, and the sides of the cut or hole must be scarified to provide bond between the foundation material and the fill. Unless otherwise directed, each depression must be filled with the same material type that is to be placed immediately above the foundation. The fill must be benched or keyed, placed in loose lifts not exceeding 6 inches in uncompacted thickness layers, moisture conditioned, and compacted in accordance with the applicable provisions of

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these Specifications for the specific material type. Materials which cannot be compacted by roller equipment because of inadequate clearances must be compacted with hand operated compactors in accordance with Paragraph 3.6 COMPACTION for the specific material type.

After filling of depressions and immediately prior to placement of compacted fill in any section of the embankment, the foundation of such section must be loosened thoroughly by scarifying, plowing, discing or harrowing to a minimum depth of 6 inches, and the moisture content must be adjusted to the amount specified in Paragraph 3.5 MOISTURE CONTROL for the appropriate type of material. After removal of roots or other debris turned up in the process of loosening, the entire surface of the foundation area must be compacted to the minimum specified percentage of the maximum dry density. Immediately prior to placement of compacted fill on or against the surfaces of any partially filled section, all soft or loose material, all material containing cracks or gullies, and all material that does not conform with the specified zoning of the embankment must be removed. The remaining surface of the partially filled section must be loosened by scarifying, plowing, discing or harrowing to a minimum depth of 6 inches, and the moisture content must be adjusted as specified in Paragraph 3.5 MOISTURE CONTROL for the appropriate type of material. The surface of the partially filled section upon which fill is to be placed, must then be compacted as hereinafter specified for the appropriate type of fill. No separate payment will be made for loosening and rolling the foundation area or the surfaces of partially filled sections, but the entire cost thereof must be included in the applicable contract price.

All surfaces must be firm and unyielding and no rutting or pumping must be observed on subgrade to receive fill. If the Contracting Officer determines the subgrade to be unsuitable, the material will be rejected and the Contractor must rework the area to meet the requirements of these specifications at no additional cost to the Government.

DRAFT

3.2.2 Benching

Benching into the existing levee embankment or existing side slopes is required in order to place and compact the material in horizontal layers. The vertical and horizontal faces cut into the existing surface resulting from the benching operation must be as shown on the plans.

A Government geotechnical engineer representative must be present during the excavation of the 1:1 (horizontal to vertical) bench slope, as shown in the plans, to observe these activities and ensure the stability of the excavated slope. The Contractor must provide the Government 48 hours advance notice of this work to confirm a Government representative will be on site.

The Contracting Officer reserves the right to increase or decrease the foundation width, excavation geometry, embankment slopes, or make such other changes in the embankment sections as may be deemed necessary to produce and maintain a safe structure.

3.3 EXCAVATION

Excavation consists of the removal of the existing levee embankment, excavation of roadways, excavation as necessary to key and bench fills, and removal of objectionable and unsuitable materials, and excavation for

pipe crossings.

3.3.1 Over-Excavation

3.3.1.1 Within Limits of Levee Foundations or Structures

Over-excavation within the limits of the foundations of levees and structures must be backfilled to grade with the same material type that is to be placed immediately above the excavation, respectively, keyed into adjacent ground, placed in loose lifts not exceeding six inches and compacted in accordance with this Specification. Keying of fill must be in accordance with the details shown on the Plans.

3.3.1.2 Slopes and Surcharges

Temporary excavation slopes must not be steeper than the specified finished slope or the specified construction slope, as shown on the plans. This may be accomplished by benching the temporary slope so that the average slope is not steeper than the specified amount.

Temporary, permanent, or construction slope cannot be surcharged with excavated or stockpiled material or with heavy construction equipment which would have the same effect as the surcharge material. The toe of stockpiled material must be maintained a minimum distance back from the top of the finished excavation equal to the depth of the excavation. The maximum height of such stockpile without causing instability of the excavation slope must be determined by the Contractor. Any slide or other adverse conditions caused by failure of the Contractor to maintain these conditions is considered the responsibility of the Contractor and remedial measures must be at the Contractor's expense.

DRAFT

3.3.2 Utilities

Excavate to the dimensions indicated or to safe limits if dimensions are not provided. Grade bottom of trenches to provide uniform support for each section of pipe or structure after bedding material placement, as shown on the Plans. Compact subgrade in accordance with these Specifications per the material type and location. Pipes must be uniformly supported for the entire length. Any obstruction, including rock, where encountered, must be excavated to a depth of at least 6 inches below the bottom of the pipe or structure.

Pipe bed must be uniform and cleared of any loose material prior to placement of pipe.

3.4 PLACEMENT AND SPREADING

3.4.1 General

Fill cannot be placed on any part of the embankment foundation or levee slope until such areas have been inspected by the Contracting Officer.

3.4.1.1 Foundations and Partial Embankment Fills

The foundations and all partial embankments receiving fill must be kept thoroughly drained. Properly blend foundation soil and fill materials.

3.4.1.2 Equipment Traffic

Equipment traffic on any embankment zone must be routed to minimize rutting of placed fill and to distribute the compactive effort as much as practicable. Ruts formed in the surface of any layer of spread material must be filled before that material is compacted. If the compacted surface of any layer of material is too smooth to bond properly with the succeeding layer, the surface must be loosened in accordance with these specifications before material for the succeeding layer is placed.

3.4.2 Placement of Embankment and Structural Backfill

Embankment or backfill cannot be placed on or against concrete less than 7 days after placement or 70 percent of the design strength, without prior review and approval by the Contracting Officer. Crawler-type tractors, vibratory equipment and other similar compaction equipment cannot be used within 4 feet of any completed or partially completed structure. Compaction within 4 feet of completed or partially completed structures is accomplished by the use of mechanical hand tampers, vibrating plates, or other approved methods and equipment. The Contractor will ensure that compaction operations do not damage any existing utilities. Any damage caused by the Contractor's operation must be repaired at the Contractor's expense.

3.4.3 Fill Materials

Soil Type 1 must be placed and spread in layers not more than 6 inches in uncompacted thickness, except within four (4) feet of structure, the uncompacted layer thickness must be reduced to four (4) inches unless otherwise indicated on the plans or these specifications.

DRAFT

3.4.4 Topsoil

Before topsoil application, the final grade of the embankment fill must be uniformly scarified on contour to a surface depth of 2 inches. The purpose of scarification is to prevent the formation of an erosion-prone slip plane between the levee material surface and the topsoil layer by mixing the interface of the two layers. Scarification can be accomplished by track walking the slopes perpendicular to the levee creating at least a 2-inch depression.

Dress levee embankment slopes with a minimum of four inches of topsoil (measured perpendicular to the levee slopes) obtained from the stripping operations. Topsoil must be uniformly blended in stockpile areas and have sufficient moisture before spreading to ensure proper placement.

Harvested topsoil must be respread evenly across levee surfaces and uniformly blended and compacted on the final grade of the embankment slope as shown on the Drawings. Unnecessary vehicle operation or hauling on the levee slopes following topsoil placement will not be allowed. Refer to 32 92 33 GRASS SEEDING AND EROSION CONTROL for further topsoil material and application requirements.

3.5 MOISTURE CONTROL

3.5.1 General

The materials in each layer of the fill must contain moisture within the

limits specified below. Material that is not within these limits after compaction must be reworked to obtain the specified moisture content, regardless of density.

3.5.1.1 Insufficient Moisture for Suitable Bond

If the top or contact surfaces of partially filled sections do not meet the specified moisture range, the Contractor must loosen the dried materials by scarifying or discing to a minimum depth of six inches, moisture condition the loosened material to an acceptable moisture content, and re-compact in accordance with the applicable requirements of Paragraph 3.6 COMPACTION.

3.5.1.2 Excessive Moisture for Suitable Bond

If the top or contact surfaces of partially filled sections do not meet the specified moisture range, the wet material must be scarified and permitted to dry, assisted by discing or harrowing, if necessary, to a minimum depth of six inches. The material must be dried to an acceptable moisture range, and compacted in accordance with the applicable requirements of Paragraph 3.6 COMPACTION.

3.5.1.3 Drying Wet Material

Material that is too wet must be substantially dried in the stockpile area prior to bringing to the levee embankment. Assist drying by discing or harrowing, if necessary, until the moisture content is reduced to an amount that will require minimal processing once the material is placed.

3.5.1.4 Increasing Moisture in Dry Material

The moisture content of material that is too dry must be adjusted in the stockpile area, berm site or the borrow area prior to bringing to the levee embankment or final placement of the berm. Add water to the fill material and by harrowing, or other approved methods, work the moisture into the material until a uniform distribution of moisture is obtained that will require minimal processing once the material is placed. Water applied on a layer of fill must be accurately controlled in amount so that free water will not appear on the surface during or subsequent to rolling. Should too much water be added to any part of the embankment, the rolling on that section of the embankment must be delayed until the moisture content of the materials is reduced to an amount within the specified limits.

3.5.2 Moisture Content Requirements

The moisture content at time of compaction must be within the limits of 3 percentage points above optimum to 1 percentage point below optimum moisture content as determined by ASTM D698 for subgrade to receive fill, levee embankment, berm, ramps and roadways, structural backfill, and utility backfill.

The moisture content at time of compaction for roadway subgrade must be within the limits of 0 to 3 percentage points above optimum as described by ASTM D698.

Drain material must be sufficiently moisture conditioned prior to placement to ensure the material is dense and stable and compacted to the minimum relative density with minimal deformation in accordance with these

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Specifications.

3.6 COMPACTION

3.6.1 Compaction Equipment

Compaction equipment must conform to the following requirements and must be used as prescribed in subsequent paragraphs.

3.6.1.1 Tamping Rollers

Tamping rollers must be as follows:

a. Towed -Tamping rollers must consist of a heavy duty double drum unit, with a drum diameter not less than 60 inches, and an individual drum length of not less than 60 inches. The drums must be capable of being ballasted with water or a combination of sand and water. Each drum must have staggered feet uniformly spaced over the cylindrical surface such as to provide approximately three tamping feet for each 2 square feet of drum surface. The tamping feet must be 7 to 9 inches in clear projection from the cylindrical surface of the roller and must have a face area of not less than 5 square inches nor more than 7 square inches. The roller must be equipped with cleaning fingers, so designed and attached as to prevent the accumulation of material between the tamping feet, and these cleaning fingers must be maintained at their full length throughout the periods of use of the roller. The weight of the roller must not be less than 3500 psf of linear drum length weighted, and must not be more than 2000 psf of drum length empty. The two drums comprising one roller unit must be yoked such that they will oscillate when traversing uneven surfaces. The design and operation of the tamping roller must be subject to the review and approval by the Contracting Officer who has the right at any time during the prosecution of the work to direct such repairs to the tamping feet, minor alterations in the roller and variations in the weight as may be found necessary to secure optimum compaction of the earth fill materials. The Contractor may be required to add ballast to the roller to the maximum capacity specified by the manufacturer of the roller. The roller must be drawn by a crawler-type or a rubber-tired tractor at a speed not to exceed 5 miles per hour. The use of the rubber-tired tractor must be discontinued if the tires leave ruts that prevent uniform compaction by the tamping roller. If tamping rollers are used in tandem, not more than two rollers in tandem will be permitted and in such case, one trip of the tandem rollers over any surface will be considered as two passes. When tamping rollers are used in tandem, the tamper foot spacing must be offset so that the circumferential rows on the rear drums are in line with the mid-point of the circumferential rows on the forward drums.

b. Self-propelled - Self-propelled tamping rollers may be used in lieu of tractor drawn tamping rollers provided the foot pressure on the tamping feet of the self-propelled roller are approximately the same as the foot pressure on the towed roller. For self-propelled rollers steered with rubber-tired wheels, the tire pressure cannot exceed 40 psi. Self-propelled rollers must be operated at speeds not exceeding 5miles per hour. The Contracting Officer has the authority to limit or eliminate the use of self-propelled rollers if they are found to cause shearing or laminations of the compacted fill.

DRAFT

3.6.1.2 Vibratory Rollers

Vibratory rollers for compacting pervious sand and gravel fills, or filter and transition drainage layers, must be equipped with a smooth steel compaction drum and must be operated at a frequency of vibration during compaction operations between 1100 and 1500 vpm. Vibratory rollers may be either towed or self-propelled and must have an unsprung drum weight that is a minimum of 60 percent of the rollers' static weight. Towed rollers must have at least 90 percent of their weight transmitted to the ground through the compaction drum when the roller is standing in a level position hitched to the towing vehicle. Rollers for compacting rockfill, sand and gravel fills, or filter and drainage layers must have a minimum static weight of 20,000 pounds, a minimum dynamic force of 40,000 pounds when operating at 1400 vpm, and an applied force not less than 9,000 pounds per foot of compaction drum length. The level of amplitude and vibration frequency during compaction will be maintained uniform throughout the fill zone within which it is operating. Rollers must be operated at speeds not to exceed 1.5 mph. The equipment manufacturer must furnish sufficient data, Plans, and computation for verification of the above specifications, and the character and efficiency of this equipment is subject to review. Vibratory rollers cannot be used within 200 feet of vibration-sensitive areas, including residences. Reference Specification Section 01 57 19 TEMPORARY ENVIRONMENTAL CONTROLS, Ground Vibration Monitoring and Control Program for details

3.6.1.3 Rubber-Tired Rollers

Rubber-tired rollers must have a minimum of four wheels equipped with pneumatic tires. The tires must be of such size and ply as to be capable of being operated at tire pressures between 80 and 100 psi at an 25,000 pound wheel load. The roller wheels must be located abreast and so designed that each wheel will carry approximately equal load in traversing uneven ground. The spacing of the wheels must be such that the distance between the nearest edges of adjacent tires will not be greater than 50 percent of the rated tire width of a single tire at the operating pressure for an 25,000 pound wheel load. The roller must be provided with a body suitable for ballast loading such that the load per wheel may be varied, as directed by the Contracting Officer, from 18,000 to 25,000 pounds. The roller must be towed at a speed not to exceed 5 miles per hour. The character and efficiency of this equipment is subject to review and approval by the Contracting Officer.

3.6.1.4 Hand Operated Compactors

Compaction of material in areas where it is impracticable to use a roller or tractor compaction must be performed using approved hand operated power compactors.

a. Power Tampers: Power tampers must be hand operated equipment capable of compacting material in confined areas. The compactors must be either an internal combustion or pneumatic activated tamper. Tampers must have sufficient weight and striking power to produce the specified compaction. The character and efficiency of this equipment is subject to the review and approval by the Contracting Officer.

b. Vibratory Plate Compactor: Vibratory compactors operated by hand in confined areas must utilize the oscillating cam principle and must deliver an impact of not less than 2000 lbf at a rate of approximately 2000 impulses per minute. For compacting rockfill, sand and gravel

DRAFT

fills, or filter and drainage layers, vibratory compactors operated by hand in confined areas must utilize the oscillating cam principle and must deliver an impact of not less than 500 lbf at a rate of approximately 2000 impulses per minute. The character and efficiency of this equipment is subject to the review and approval by the Contracting Officer.

3.6.1.5 Crawler-Type Tractors

Crawler-type tractors used for spreading or compaction must weigh more than 20,000 pounds, exert a unit tread pressure of not less than 6 psi, and be operated at a speed less than 3.5 miles per hour.

3.6.1.6 Sprinkling Equipment

Sprinkling equipment must consist of tank trucks, pressure distributors or other equipment designed to apply water uniformly and in controlled quantities to variable width of surface.

3.6.1.7 Miscellaneous Equipment

Scarifiers, disks, spring-tooth or spike-tooth harrows, spreaders, and other equipment must be suitable for use in embankment construction and approved by the Contracting Officer. Equipment used for processing fill material must be capable of penetrating the full loose lift thickness of the specific material type. If disks/blades/teeth exhibit more than 10 percent wear, the Contracting Officer has the option to require the blades be replaced to ensure full penetration into the specified lift thickness.

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3.6.2 Compaction of Fill

After a layer of material has been dumped and spread, it must be harrowed to break up the fill materials to eliminate all clods and to obtain uniform moisture distribution. Harrowing must be performed with a heavy disk plow, or other approved harrow, a minimum of four passes, to the full depth of the layer. If four passes of the harrow does not accomplish the breaking up of the materials, additional passes of the harrow are required or material will be evaluated for removal. When the moisture content and condition of the layer are satisfactory, the lift must be compacted to the requirements stated below.

Fill compaction must comply with the following minimum requirements:

LOCATION	PERCENT OF THE MAXIMUM DRY DENSITY - ASTM D698
Subgrade to Receive Engineered Fill	95
Roadway Subgrade (subgrade within 12-inches of aggregate base of aggregate surfacing)	100

LOCATION	PERCENT OF THE MAXIMUM DRY DENSITY - ASTM D698
Type 1 Fill including embankments, ramps, trenches, utility trench and trench backfill	97

Roadway subgrade is defined as the upper 6 inches of fill below the roadway base.

In areas which are not accessible by roller, the fill must be compacted with an approved hand operated compactor to a density equal to that obtained in other areas which are accessible to rollers. Dumping, spreading, sprinkling, and compacting may be performed at the same time at different points along a section when there is sufficient area to permit these operations to proceed simultaneously. Compaction equipment must be operated such that the strip being traversed by the roller must overlap the rolled adjacent strip by not less than 3 feet.

3.7 FIELD QUALITY CONTROL

3.7.1 General

As a part of the Contractor Quality Control (CQC) system required by Section 01 45 00 QUALITY CONTROL, the Contractor must establish and maintain field quality control for foundation preparation, embankment and backfill operations to assure compliance with contract requirements and maintain detailed records of field quality control for all operations. Approximately 20 percent of tested locations may be selected for quality assurance by the Contracting Officer.

3.7.2 Embankment and Fill Testing

The Contractor must perform sufficient inspection and testing to ensure that the embankment is being constructed as specified. The testing program specified below must be considered the minimum acceptable frequency of testing. This does not relieve the Contractor from the responsibility of performing additional testing if required to ensure compliance with these Specifications. Testing must be performed by a Corps-validated laboratory. If the Contractor elects to establish testing facilities, no work requiring testing will be permitted until the Contractor's facilities have been inspected, Corps validated, and approved by the Contracting Officer. Field in-place density must be determined in accordance with ASTM D 1556. Contractor can use nuclear method tests in accordance with ASTM D 2922 to provide a rapid check of the on-going work, however nuclear method tests must not form the basis for acceptance of work. When test results indicate, as determined by the Contracting Officer, that compaction is not as specified, the material must be removed, replaced, and re-compacted to meet specification requirements. Tests on re-compacted areas must be performed to determine conformance with specification requirements. Inspections and test results must be certified by a registered professional civil engineer. These certifications must 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.

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a. Fill Material Testing

(1) Moisture Density Relationships. The moisture-density relations for each different classification of fill material or source of fill material utilized must be determined in accordance with ASTM D698, Method A (a minimum of five (5) five-point compaction tests). The moisture-density curves will be compiled to form a family of curves which will be utilized to estimate optimum properties (maximum dry density and optimum moisture content) to be used with field density tests.

TEST METHOD	FREQUENCY
Moisture Density Relationship (ASTM D698)	Minimum of five (5) test or representative samples of each type of fill material used. One test for every 2,500 cubic yards fill placed with a minimum of one test per shift.
Soil Gradation (ASTM D6913/D6913M), Atterberg Limit(ASTM D4318), and SoilClassification (ASTM D2487)	One test for each moisture density relationship.

(2) Water (Moisture) Content Tests. Determination of water content will be performed in accordance with ASTM D2216. ASTM D4643 may be used when rapid moisture content results are needed. If ASTM D4643 test method is used, a correlation between this method and D2216 test method must be established and reviewed by the Contracting Officer. One water content test will be performed for each in-place density test at the location of the in-place density test. Backfill and fills not meeting the required specifications for water content must be retested after corrective measures have been applied.

(3) In-place Density Testing. The minimum in-place density testing is shown in the table below. The horizontal locations of tests must be randomly staggered in the fill. At each field density test location, soil samples must be obtained for two-point compaction test, moisture content, grain size analysis, and Atterberg limits test. For two-point compaction tests, one moisture content must be at the in situ moisture content and one moisture content must be between 3 and 5% below optimum. Fill not meeting the required specifications for in-place density must be retested after additional compaction has been completed.

TEST METHOD	FREQUENCY
Nuclear Method (ASTM D6938) or Sand Cone (ASTM D1556)	One (1) In-Place Density Test for every 500 cubic yards of completed fill unless otherwise specified. One In-Place Density Test for every 100 square yards of subgrade to receive fill. Additionally, at least one (1) test for each lift of fill placed and material type.

DRAFT

TEST METHOD	FREQUENCY
Sand Cone (ASTM D1556)	One test for every ten (10) nuclear method tests and a minimum of one (1) test per shift and material type.
Two-Point Compaction Tests	At the location of each In-Place Density Test. One point must be performed at the in-situ moisture content and one point must be performed with a moisture content approximately 1% dry of optimum.
Soil Gradation and Atterberg Limit Tests	One (1) test for every sand cone test. Minimum of one (1) test per shift and material type.

When the nuclear method is used for in-place density testing, according to ASTM D6938, the first test and every tenth test thereafter for each material type must include a sand cone correlation test in accordance with ASTM D1556.

Sand cone tests must be performed adjacent to the location of the nuclear test, must include a nominal 6 inch diameter sand cone, and must include a minimum wet soil weight of 6 pounds extracted from the hole. Nuclear density testing equipment cannot be used during rain. The density correlations must be submitted with test results within 24 hours after completing the test. Each transmittal including density test data must include a summary of all density correlations for the job neatly prepared on a summary sheet including at a minimum:

(i) Meter serial number and operators initials.
(ii) Standard count for each test.
(iii) Material type.
(iv) Probe depth.
(v) Moisture content by each test method and the deviation.
(vi) Wet density by each test method and the deviation.
(vii) Density sand calibration
(viii) Station and elevation
(ix) Description of location (centerline, landside, waterside)

If soil appears to contain organics based on color or smell, the Contracting Officer will require the Contractor to test the material in accordance with ASTM D2487 to classify organic clay or organic silt (OH or OL).

3.7.3 Reporting

On a daily basis, the Contractor must furnish the inspection records and all material testing results, the quantity of fill placed, as well as the records of corrective action taken, in accordance with Section 01 45 00 QUALITY CONTROL.

-- End of Section --

DRAFT

IMPORTED FILL CHEMICAL SCREENING LIMITS FOR THE NATOMAS REACH I PROJECT

(Values updated January 2022)

Constituent	USEPA[e] Method No.	Maximum Concentration for Soil Analysis (mg/kg)	Reference	Maximum Concentration for STLC Extractible Analysis (mg/L)	Reference
Metals					
Arsenic	6010D	0.36	a	5	c
Cadmium	6010D	1.9	d	1	c
Total Chromium	6010D	160	d	5	c
Copper	6010D	180	d	25	c
Lead	6010D	320	a	5	c
Mercury (solid)	7471B	4.4	a	0.2	c
Nickel	6010D	86	d	20	c
Selenium	6010D	2.4	d	1	c
Silver	6010D	2.5	d	5	c
Zinc	6010D	340	a	250	c
pH	9045	2≤pH≤12.5	c		
Chromium (VI)	7196	6.2	a	5	c
Total Petroleum Hydrocarbons (TPHs)					
TPH-GRO (Gasoline range: C6-C10)	8015D	100	d		
TPH-DRO (Diesel range: C10-C20)	8015D	260	d		
TPH-ORO (Oil rainge: C20-C35)	8015D	1600	d		
Polynuclear Aromatic Hydrocarbons (PAHs)					
Acenaphthene	8270E* or 8310	6.4	d		
Anthracene	8270E* or 8310	1.9			
Benzo(a)anthracene	8270E* or 8310	0.63			
Benzo(b)fluoranthene	8270E* or 8310	1.1			
Benzo(k)fluoranthene	8270E* or 8310	2.8			
Benzo(a)pyrene	8270E* or 8310	0.11			
Chrysene	8270E* or 8310	2.2			
Dibenz(a,h)anthracene	8270E* or 8310	0.11			
Fluoranthene	8270E* or 8310	0.69			
Fluorene	8270E* or 8310	6			
Indeno(1,2,3-cd)pyrene	8270E* or 8310	0.48			
Naphthalene	8270E* or 8310	0.042			
Pyrene	8270E* or 8310	45			
Polychlorinated Biphenyls (PCBs)					
Aroclor 1016	8082A	17	a	5 for sum of all listed PCBs	c
Aroclor 1221	8082A	0.53			
Aroclor 1232	8082A	0.49			
Aroclor 1242	8082A	0.58			
Aroclor 1248	8082A	0.58			
Aroclor 1254	8082A	0.59			
Aroclor 1260	8082A	0.6			
Organochlorine Pesticides					
Aldrin	8081B	0.18	b	0.14	c
Alpha - Hexachlorocyclohexane (Alpha BHC)	8081B	0.36	b		
Beta - Hexachlorocyclohexane (Beta BHC)	8081B	1.3	b		
Gamma - Hexachlorocyclohexane (Gamma BHC) (Lindane)	8081B	2.5	b	0.4	c
Chlordane	8081B	7.7	b	0.25	c
4,4-DDD	8081B	6.2	a	0.1 SUM of DDD+DDE+DDT	c
4,4-DDE	8081B	9.3	a		
4,4-DDT	8081B	7.1	a		
Dieldrin	8081B	0.093	a	0.8	c
Endosulfan	8081B	6000	a		
Endrin	8081B	160	a	0.02	c
Heptachlor	8081B	0.63	b	0.47	c
Heptachlor epoxide	8081B	0.33	b		
Methoxychlor	8081B	2600	a	10	c
Toxaphene	8081B	1.2	a	0.5	c
Chlorinated Herbicides					
2,4-D (2,4-Dichlorophenoxyacetic acid)	8151A	7300	a	10	c
Dalapon	8151A	16000	a		
2,4-DB(4-[2,4-Dichlorophenoxy]butyric Acid)	8151A	16000	a		
Dicamba	8151A	16000	a		
Dinoseb	8151A	530	a		
2,4,5-T(2,4,5-Trichlorpheoxyacetic Acid) (Silvex)	8151A	4200	a		

DRAFT

IMPORTED FILL CHEMICAL SCREENING LIMITS FOR THE NATOMAS REACH I PROJECT

(Values updated January 2022)

Selected Volatile Organic Compounds (VOCs) including BTEX and MTBE					
Benzene	8260D	1.4	a		
Bromodichlormethane	8260D	1.3	b		
Bromoform	8260D	86	b		
Carbon Tetrachloride	8260D	2.9	b		
Chlorobenzene	8260D	1300	b		
Chloroethane (Ethyl Chloride)	8260D	23000	b		
Chloroform	8260D	1.4	b		
Dibromochloromethane	8260D	390	b		
1,2-Dibromo-3-chloropropane	8260D	0.057	a		
1,2-Dichlorobenzene	8260D	9300	b		
1,4-Dichlorobenzene	8260D	11	b		
1,1-Dichloroethane	8260D	1.6	b		
1,2-Dichloroethane	8260D	2	b		
Dichloroethylene, 1,2-cis-	8260D	2300	b		
Dichloroethylene, 1,2-trans-	8260D	300	b		
1,2-Dichloropropane	8260D	11	b		
1,3-Dichloropropene(total)	8260D	2200	a		
Ethyl benzene	8260D	25	b		
Methyl tert-butyl alcohol (MTBE)	8260D	210	b		
Tetrachloroethylene (PCE)	8260D	100	b		
Toluene	8260D	5300	a		
Trichloroethylene (TCE)	8260D	6	b	204	c
Vinyl Chloride	8260D	1.7	b		
Xylenes (total)	8260D	2500	b		

References:

a - California Department of Toxic Substances Control (DTSC), Human and Ecological Risk Office (HERO), 2020, Human Health Risk Assessment (HHRA) Note Number 3, DTSC-modified Screening Levels (DTSC-SL); dated June 2020. (Table 1).

b - Unites States Environmental Protection Agency (USEPA), 2021, Regional Screening Levels (RSL) Resident Soil Table; dated November 2021.

c - California Code of Regulations, Title 22 Division 4.5 Chapter 11 Article 3, 2014 (Table I, II, and III).

d - California Regional Water Quality Control Board - San Francisco Bay Region, 2019, Environmental Screening Levels - Tier 1 ESLs (Rev. 2); dated January 2019.

e - US EPA's Test Methods for Evaluating Solid Waste (SW-846)

* Prefered method

DRAFT

SECTION TABLE OF CONTENTS

DIVISION 31 - EARTHWORK

SECTION 31 05 19

GEOTEXTILE

PART 1 GENERAL

1.1 REFERENCES
1.2 SUBMITTALS
1.3 DELIVERY, STORAGE, AND HANDLING
1.3.1 Delivery
1.3.2 Storage
1.3.3 Handling

PART 2 PRODUCTS

2.1 RAW MATERIALS
2.1.1 Geotextile
2.1.2 Thread
2.2 MANUFACTURING QUALITY CONTROL SAMPLING AND TESTING

PART 3 EXECUTION

3.1 QUALITY ASSURANCE SAMPLES AND TESTS
3.1.1 Quality Assurance Samples
3.1.2 Quality Assurance Tests
3.2 INSTALLATION
3.2.1 Subgrade Preparation
3.2.2 Placement
3.3 SEAMS
3.3.1 Overlap Seams
3.3.2 Sewn Seams
3.4 PROTECTION
3.5 REPAIRS
3.6 PENETRATIONS
3.7 COVERING

-- End of Section Table of Contents --

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DRAFT

SECTION 31 05 19

GEOTEXTILE

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 M 228	(2021) Standard Specification for Geosynthetic Specification for Highway Applications

ASTM INTERNATIONAL (ASTM)

ASTM D3884	(2009; R 2013; E 2014) Abrasion Resistance of Textile Fabrics (Rotary Platform, Double-Head Method)
ASTM D4354	(2012) Sampling of Geosynthetics for Testing
ASTM D4355	(2007) Deterioration of Geotextiles from Exposure to Light, Moisture and Heat in a Xenon-Arc Type Apparatus
ASTM D4355/D4355M	(2014) Deterioration of Geotextiles from Exposure to Light, Moisture and Heat in a Xenon-Arc Type Apparatus
ASTM D4491/D4491M	(2015) Standard Test Methods for Water Permeability of Geotextiles by Permittivity
ASTM D4533	(2011) Trapezoid Tearing Strength of Geotextiles
ASTM D4632/D4632M	(2015a) Grab Breaking Load and Elongation of Geotextiles
ASTM D4751	(2016) Standard Test Method for Determining Apparent Opening Size of a Geotextile
ASTM D4759	(2011) Determining the Specification Conformance of Geosynthetics
ASTM D4873	(2002; R 2009) Identification, Storage, and Handling of Geosynthetic Rolls and Samples

DRAFT

ASTM D6241 (2014) Standard Test Method for the Static Puncture Strength of Geotextiles and Geotextile-Related Products Using a 50-mm Probe

U.S. ARMY CORPS OF ENGINEERS (USACE)

COE CW-02215 MOD (2012) Equivalent Opening Size (EOS)

1.2 SUBMITTALS

Submit the following in accordance with Section 01 33 00 SUBMITTAL PROCEDURES:

SD-03 Product Data

Thread
Manufacturing Quality Control Sampling and Testing; G

SD-04 Samples

Quality Assurance Samples and Tests; G

SD-07 Certificates

Geotextile; G

1.3 DELIVERY, STORAGE, AND HANDLING

Deliver, store, and handle geotextile in accordance with ASTM D4873.

1.3.1 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 must 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 must 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.

1.3.2 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.

1.3.3 Handling

Handle and unload geotextile rolls with load carrying straps, a fork lift with a stinger bar, or an axial bar assembly. Rolls must not be dragged along the ground, lifted by one end, or dropped to the ground.

DRAFT

PART 2 PRODUCTS

2.1 RAW MATERIALS

A minimum of 7 days 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 must 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 must be attested to by a person having legal authority to bind the geotextile manufacturer.

2.1.1 Geotextile

Provide a nonwoven geotextile conforming to AASHTO M 228AASHTO M228-21 and is a 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 must not be used. Geotextile must be formed into a network such that the filaments or yarns retain dimensional stability relative to each other, including the edges. Geotextiles must meet the requirements specified in the tables below and as indicated on the plans. Where applicable, the property values specified in the tables below represent minimum average roll values (MARV) in the weakest principal direction. Values for AOS represent maximum average roll values.

DRAFT

TABLE 1
PHYSICAL REQUIREMENTS FOR GEOTEXTILE

PROPERTY	UNITS	ACCEPTABLE VALUES	TEST METHOD
GRAB STRENGTH	LBS	>160	ASTM D4632/D4632M
ABRASION	LBS	N/A	ASTM D3884
SEAM STRENGTH	LBS	>140	ASTM D4632/D4632M
PUNCTURE	LBS	>90	ASTM D6241
TRAPEZOID TEAR	LBS	>90	ASTM D4533
PERMEABILITY	CM/SEC	N/A	ASTM D4491/D4491M
APPARENT OPENING SIZE	U.S. SIEVE	#70	ASTM D4751
PERMITTIVITY	SEC^{-1}	>0.28	ASTM D4491/D4491M

TABLE 1 PHYSICAL REQUIREMENTS FOR GEOTEXTILE			
ULTRAVIOLET DEGRADATION	% AFTER 500 HRS	>50	ASTM D4355/D4355M
PERCENT OPEN AREA	PERCENT	≥4	COE CW-02215 MOD

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 must have ultraviolet light stability equivalent to the geotextile and the color must 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 must 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 must be randomly sampled for testing in accordance with ASTM D4354, Procedure A. Acceptance of geotextile must be in accordance with ASTM D4759. Tests not meeting the specified requirements will result in the rejection of applicable rolls.

DRAFT

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 2 days in the schedule to allow for testing. Collect samples upon delivery to the site at the request of the Contracting Officer. in accordance with ASTM D4354, Procedure B. Lot size for quality assurance sampling must be the shipment quantity of the product or a truckload of the product, whichever is smaller. The unit size must 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 must also be noted on the sample. Discard the outer layer of the geotextile roll prior to sampling a roll. Samples must 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 must be immediately resealed in their protective covering.

3.1.2 Quality Assurance Tests

The Contractor must provide quality assurance samples to an Independent Laboratory when directed by the Contracting Officer. Samples will be tested to verify that geotextile meets the requirements specified in Section 2.1.1. Test method ASTM D4355 cannot be performed on the collected samples. Geotextile product acceptance must 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 must be smooth and free of ruts or protrusions which could damage the geotextile. Subgrade materials and compaction requirements must be in accordance with 31 00 00 EARTHWORK, using equipment that will not damage the subgrade or cause excessive ruts.

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 must be repaired or replaced as directed. The geotextile must be laid flat and smooth so that it is in direct contact with the subgrade. The geotextile must 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 18 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.

3.3.2 Sewn Seams

Factory and field seams must be continuously sewn on all slopes steeper than 1 vertical on 4 horizontal. The stitch type used must be a 401 locking chain stitch or as recommended by the manufacturer. Seam strength must meet the minimum requirements specified in Section 2.1.1. The thread at the end of each seam run must be tied off to prevent unraveling. Skipped stitches or discontinuities must be sewn with an extra line of stitching with a minimum of 18 inches of overlap.

3.4 PROTECTION

Protect the geotextile during installation from clogging, tears, and other damage. Damaged geotextile must be repaired or replaced as directed. Use adequate ballast (e.g. sand bags) to prevent uplift by wind. The geotextile may not be left uncovered for more than 14 days after installation.

3.5 REPAIRS

Repair torn or damaged geotextile. Clogged areas of geotextile must be removed. Perform repairs by placing a patch of the same type of geotextile over the damaged area. The patch must extend a minimum of 18 inches beyond the edge of the damaged area. Patches must be continuously fastened using reviewed methods. The machine direction of the patch must be aligned with the machine direction of the geotextile being repaired. Remove and replace geotextile rolls which cannot be repaired. Repairs

DRAFT

must 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 reviewal by the Contracting Officer. Place cover soil 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, soil backfill must be placed from the bottom of the slope upward. Cover soil must not be dropped onto the geotextile from a height greater than 3 feet. Equipment cannot be operated directly on top of the geotextile without reviewal of the Contracting Officer. Use equipment with ground pressures less than 7 psi to place the first lift over the geotextile. A minimum of 12 inches of soil must be maintained between full-scale construction equipment and the geotextile. Cover soil material type, compaction, and testing requirements are described in Section 31 00 00 EARTHWORK. Equipment placing cover soil must not stop abruptly, make sharp turns, spin their wheels, or travel at speeds exceeding 5 mph.

-- End of Section --

DRAFT

SECTION TABLE OF CONTENTS

DIVISION 31 - EARTHWORK

SECTION 31 11 00

CLEARING, GRUBBING, AND STRIPPING

PART 1 GENERAL

1.1 SUBMITTALS
1.1.1 Work Plan
1.2 DELIVERY, STORAGE, AND HANDLING

PART 2 PRODUCTS

2.1 HERBICIDE

PART 3 EXECUTION

3.1 PROTECTION
3.1.1 Existing Conditions
3.1.2 Roads and Walks
3.1.3 Trees, Shrubs, and Existing Facilities
3.1.4 Utility Lines
3.2 CLEARING
3.2.1 REMOVAL OF UTILITIES
3.3 PRUNING
3.4 GRUBBING
3.5 STRIPPING
3.5.1 General
3.5.2 Description of Work
3.6 DISPOSAL OF MATERIALS
3.6.1 Nonsaleable Materials

-- End of Section Table of Contents --

DRAFT

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DRAFT

SECTION 31 11 00

CLEARING, GRUBBING, AND STRIPPING

PART 1 GENERAL

1.1 SUBMITTALS

Submit the following in accordance with Section 01 33 00 SUBMITTAL PROCEDURES:

SD-01 Preconstruction Submittals

Work Plan; G

SD-03 Product Data

Herbicide
Samples in cans with manufacturer's label.

1.1.1 Work Plan

Submit Work Plan within 15 calendar days after notice to proceed. No work at the site, with the exception of site inspections and surveys, is allowed until the Work Plan is approved. The Contractor must allow 30 calendar days in the schedule for the Government's review. No adjustment for time or money will be made if resubmittal of the Work Plan is required due to deficiencies in the plan. At a minimum, the Work Plan must include:

a. Schedule of activities.

b. Method of clearing and grubbing and equipment to be used.

c. Method of removing asphalt and concrete removal and equipment to be used.

d. Disposal or recycle site for asphalt and concrete roadway material to be removed.

1.2 DELIVERY, STORAGE, AND HANDLING

Deliver materials to store at 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 HERBICIDE

Comply with Federal Insecticide, Fungicide, and Rodenticide Act (Title 7 U.S.C. Section 136) for requirements on Contractor's licensing, certification and record keeping. Contact the command Pest Control Coordinator prior to starting work.

DRAFT

PART 3 EXECUTION

3.1 PROTECTION

3.1.1 Existing Conditions

Contractor must conduct a preconstruction survey as defined in Section 01 57 19 to confirm that existing field conditions match the contract documents and report any discrepancies to the Contracting Officer prior to any clearing operations.

3.1.2 Roads and Walks

Keep roads and walks free of dirt and debris at all times.

3.1.3 Trees, Shrubs, and Existing Facilities

Protection must be in accordance with Section 01 57 19 TEMPORARY ENVIRONMENTAL CONTROLS. Trees and vegetation to be left standing must be protected from damage incident to clearing, grubbing, and construction operations by the erection of barriers per the Plans.

3.1.4 Utility Lines

Protect existing utility lines from damage. Notify the Contracting Officer immediately of damage to or an encounter with an existing utility line. The Contractor is responsible for the repairs 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 within 24 hours to minimize interruption of the service.

Before tree stump removal, pothole to determine the location of the existing 12-inch diameter asbestos cement water pipe from A-Line STA 0+85 to 13+50. Ensure that tree removal operations do not disturb the existing asbestos cement water pipe and that the line remains operational until deemed ready for removal. Avoid contact with any dust that could be produced by accidental damage to the pipe.

3.2 CLEARING

Clearing consists of the trimming, trees and other vegetation designated for removal, including downed timber, snags, brush, and rubbish occurring within the areas to be cleared. Clearing also includes the removal and disposal of structures that obtrude, encroach upon, or otherwise obstruct the work as noted on the Plans or as directed by the Contracting Officer. Tree stumps, roots, brush, and other vegetation in areas to be cleared must be excavated with or below the original ground surface, except such trees and vegetation as may be indicated or directed to be protected in place.

3.2.1 REMOVAL OF UTILITIES

Remove any abandoned utility lines, utility poles, and irrigation lines and stand pipes and backfill the remaining voids per section 31 00 00 EARTHWORK.

DRAFT

3.3 PRUNING

Trim trees designated to be left standing within the cleared areas of dead branches 1 1/2 inches or more in diameter; only trim branches as necessary for construction clearance. Neatly cut limbs and branches to be trimmed close to the bole of the tree or main branches. All pruning work is to be completed outside of the nesting season and by a certified arborist.

3.4 GRUBBING

Grubbing consists of the removal and disposal of tree stumps, root balls, roots larger than 0.5 inches in diameter, and matted roots, encountered in project excavations, to a minimum of three feet below the surface. Material to be grubbed, together with logs and other organic or non-organic debris not suitable as project fill, must be removed. Fill depressions made by grubbing with soil type 1 per the Plans and compacted to make the surface conform with the original adjacent surface of the ground.

3.5 STRIPPING

3.5.1 General

After inspection and approval of cleared and grubbed areas, stripping may proceed.

3.5.2 Description of Work

Strip surfaces of excavations and fill foundations of heavy growth of crops, grass weeds and other vegetation to the limits and depth as specified below. Greater depths of stripping may be necessary as specified below and as determined by the Contracting Officer.

a. Unless otherwise specified, the entire area within the limits of existing ground that is to be excavated or to receive fill or structures, together with strips 5 feet wide beyond and contiguous thereto (except in restricted habitat areas), must be stripped to a depth of 6 inches to remove surface vegetation and soils. Stripped material must be stockpiled and respread on levee slopes in accordance with Section 31 00 00 EARTHWORK.

b. Strip all stockpile areas to a depth of 6 inches before material is stockpiled.

c. Do not stockpile stripped or excavated material on existing levee slopes.

3.6 DISPOSAL OF MATERIALS

3.6.1 Nonsaleable Materials

Logs, stumps, wood chips, roots, brush, rotten wood, and other refuse from the clearing and grubbing operations, except for salable timber, must be disposed of outside the limits of Government-controlled land at the Contractor's responsibility, except when otherwise directed by the Contracting Officer in writing.

-- End of Section --

DRAFT

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DRAFT

SECTION TABLE OF CONTENTS

DIVISION 31 - EARTHWORK

SECTION 31 23 00

BORROW SITE EXCAVATION

PART 1 GENERAL

1.1 REFERENCES
1.2 DEFINITIONS
1.2.1 Unsuitable Debris
1.2.2 Surface Layer Removal and Stockpile
1.2.3 Excavation
1.3 SUBMITTALS
1.4 GENERAL CONDITIONS
1.4.1 Description of Work
1.4.2 Materials
1.4.3 Haul Roads
1.4.4 Stockpiling
1.4.5 Protection of Existing Man-Made Facilities and Natural Features
1.4.6 Drainage

PART 2 PRODUCTS

2.1 MATERIALS
2.1.1 Rice Straw
2.1.2 Stabilization Emulsion (Tackifier)

PART 3 EXECUTION

3.1 GENERAL
3.2 BORROW SITE
3.2.1 General
3.2.2 Requirements at Borrow Sites
3.3 EXCAVATION
3.3.1 General
3.3.2 Clearing and Grubbing
3.3.3 Removal of Existing Facilities
3.3.4 Surface Layer Removal and Stockpile
3.3.5 Processing Suitable Materials
3.3.6 Blending
3.3.7 Unsuitable Organic Material and Unsuitable Debris
3.3.8 Finish Subgrade Preparation
3.3.9 Surface Layer Respread
3.4 EROSION CONTROL
3.4.1 General
3.4.2 Application
3.4.3 Protection
3.4.4 Repair
3.5 DEWATERING AND DIVERSION
3.6 RAMPS
3.7 SURFACE DRAINAGE OF COMPLETED AREAS
3.8 FIELD QUALITY CONTROL
3.8.1 General

DRAFT

3.8.1.1 Excavation Equipment
3.8.1.2 Borrow Soil Preparation
3.8.2 Materials Testing
3.8.2.1 Soil Classification Tests
3.8.2.2 Water (Moisture) Content Tests
3.8.3 Testing by the Government
3.8.4 Survey Data
3.8.5 Equipment Data
3.8.6 Material Distribution and Stockpile Plan
3.8.7 Borrow Source Excavation Plan
3.8.8 Quality Control Testing
3.8.9 Reporting

-- End of Section Table of Contents --

DRAFT

SECTION 31 23 00

BORROW SITE EXCAVATION

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.

ASTM INTERNATIONAL (ASTM)

ASTM D2216	(2019) Standard Test Methods for Laboratory Determination of Water (Moisture) Content of Soil and Rock by Mass
ASTM D2487	(2017; E 2020) Standard Practice for Classification of Soils for Engineering Purposes (Unified Soil Classification System)
ASTM D4318	(2017; E 2018) Standard Test Methods for Liquid Limit, Plastic Limit, and Plasticity Index of Soils
ASTM D6913/D6913M	(2017) Standard Test Methods for Particle-Size Distribution (Gradation) of Soils Using Sieve Analysis

U.S. ARMY CORPS OF ENGINEERS (USACE)

EM 385-1-1	(2024) Safety -- Safety and Occupational Health (SOH) Requirements

DRAFT

1.2 DEFINITIONS

1.2.1 Unsuitable Debris

Material containing roots greater than 1/2 inch in diameter and six (6) inches in length (e.g.: debris, rubble, trash or other deleterious items) must be classified as unsuitable debris.

1.2.2 Surface Layer Removal and Stockpile

Surface layer removal and stockpile must consist of the discing of crops, weeds, grasses and other vegetative material into surface layer and the removal, segregation, and stockpiling of the surface layer.

1.2.3 Excavation

Excavation must consist of removal of material to the lines and grades shown on the Plans, or as otherwise directed or reviewed by the Contracting Officer and as described in Paragraph EXCAVATION herein.

1.3 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 must be submitted in accordance with Section 01 33 00 SUBMITTAL PROCEDURES:

SD-01 Preconstruction Submittals

Survey Data; G

Equipment Data

Material Distribution and Stockpile Plan; G

Borrow Source Excavation Plan; G

SD-06 Test Reports

Quality Control Testing; G

1.4 GENERAL CONDITIONS

1.4.1 Description of Work

Work covered by this section consists of furnishing all plant, labor, equipment and materials, and performing all operations necessary for demolition, clearing and grubbing at borrow sites; clearing and grubbing the limits of surface layer to be removed; discing of vegetative material into surface layer; the excavation and removal of the surface layer and all unsuitable soil, and stockpiling the soils and stripped material; dewatering and control of water within borrow excavation; excavation of designated borrow sources; processing of materials; hauling materials to their point of use or disposal; disposal of unsuitable debris; compacting the stockpiled soils and unsuitable materials, stabilized entrance; erosion and sediment control at the borrow site; respread and finish grading of the surface layer after borrow excavation; compacting of the spoil areas and unsuitable materials as specified herein and as shown on the Plans. All work under this section must comply with the requirements of EM 385-1-1.

1.4.2 Materials

Materials excavated from the Project excavations which meet or which can be processed to meet the requirements for each embankment material, or any other material required for this Project, as specified herein, must be utilized in the appropriate portion of the embankment or as backfill, unless otherwise noted. Fill materials must meet the requirements of Section 31 00 00 EARTHWORK.

1.4.3 Haul Roads

Haul roads must be located and constructed as shown on the Plans and as reviewed by the Contracting Officer. Prior to the commencement of excavation the Contractor must submit for review a site plan detailing the location of all haul roads within the site limits. Haul roads must be constructed to maintain the intended traffic, be free draining, and be maintained in good condition throughout the contract period. Haul roads constructed during the Contract duration must be removed after work is

DRAFT

completed and the impacted area restored to its preconstruction conditions.

1.4.4 Stockpiling

On-site stockpiles must be kept neat and weed-free.

1.4.5 Protection of Existing Man-Made Facilities and Natural Features

Borrow site excavation must be conducted in such a manner as to avoid damage to trees left standing and trees outside the excavation areas, existing buildings, man-made facilities and natural features, with due regard to the safety of employees and others.

1.4.6 Drainage

Unless otherwise noted on the Plans, the Contractor must not block or restrict the flow in a natural drain, existing culvert, ditch or channel at any time and must bear full responsibility for any damage caused by this operation. Surface water must be directed away from excavations and construction sites so as to prevent erosion and undermining of foundations. Diversion ditches, dikes, and grading must be provided and maintained as necessary during construction. Excavated slopes and backfill surfaces must be protected to prevent erosion and sloughing. Excavation must be performed so that the site and the area immediately surrounding the site and affecting operations at the site must be continually and effectively drained.

DRAFT

PART 2 PRODUCTS

2.1 MATERIALS

2.1.1 Rice Straw

Straw must be derived from rice. furnish evidence that clearance has been obtained from the County Agricultural Commissioner, as required by law, before straw obtained from outside the county in which it is to be used is delivered to the site of the work. Straw that has been used for stable bedding must not be used. Straw must be free of mold. Straw must be cured and dry with no water added after baling.

2.1.2 Stabilization Emulsion (Tackifier)

Stabilizing emulsion must be in a dry powder form, may be re-emulsifier and must be a processed organic derivative of Plantago insularis used as a soil binder.

PART 3 EXECUTION

3.1 GENERAL

Except as specified herein and in Section 31 00 00 EARTHWORK, the Contractor must obtain the borrow materials for the levee embankment and Project fills from the identified borrow source. Borrow material must be used for levee and Project fills construction as indicated on the Plans, specified herein, or as otherwise directed by the Contracting Officer.

3.2 BORROW SITE

3.2.1 General

The Borrow Area indicated on the Plans will be furnished without cost to the Contractor and must be utilized for constructing this Project. The logs of borings and test pits included in the Geotechnical Data Report represent information which the Government has obtained at the borrow site and are included in the Reference Section of these specifications. The Contractor should make their own interpretation of the data. The Government assumes no responsibility for interpretations, conclusions, or deductions made by the Contractor from the data in the Geotechnical Data Report. Not all materials at the furnished borrow sites may meet the requirements for fill as outlined in Section 31 00 00 EARTHWORK.

3.2.2 Requirements at Borrow Sites

The Contractor's operations at the borrow site must conform to requirements prescribed herein and as shown on the Plans. The estimated permissible depth of borrow site excavation is indicated on the Plans, but the Contracting Officer reserves the right to modify the permissible depth in accordance with subsurface conditions determined as work proceeds. Any excavation below the depths and slopes specified herein, except as shown on the Plans or directed by the Contracting Officer, must be deemed a violation of these Specifications and the resulting cavity must be immediately filled and compacted to the specified grade.

3.3 EXCAVATION

3.3.1 General

Excavation of each borrow site must be in accordance with the Borrow Site Grading Plan shown on the Plans. The Contractor must maximize the use of available, suitable soils from mandatory excavations before using soils from the borrow area.

3.3.2 Clearing and Grubbing

Clearing operations must consist of complete removal of all obstructions above the ground surface in accordance with Section 31 11 00 CLEARING, GRUBBING AND STRIPPING. Grubbing operations must consist of the removal of stumps, roots larger than 1/2 inch in diameter and six (6) inches in length and all buried logs, old piling, old paving, and other objectionable matter within the areas to be used for borrow operations. Dispose of cleared and grubbed materials off-site.

3.3.3 Removal of Existing Facilities

Within the areas to be used for the borrow operation and prior to the removal of the surface layer of native soils, the Contractor must remove any structures, foundations, pipes, septic systems, culverts, fencing, abandoned wooden utility poles, irrigation stand pipes, debris and other materials unsuitable for use in the levee embankment.

3.3.4 Surface Layer Removal and Stockpile

After inspection and review of cleared and grubbed areas, removal of surface layer may proceed. Perform surveys in accordance with these Specifications prior to and after surface layer removal. Disc the

DRAFT

vegetation remaining after clearing and grubbing operations into upper portion of surface layer. Remove the top 1 foot, unless otherwise indicated on the Plans, of surface layer to the limits of the area to be excavated and stockpiled for respread. Deeper stripping may be required in areas where concentrations of organic soils or tree roots are encountered.

3.3.5 Processing Suitable Materials

The Contractor must survey the surface upon completion of the surface layer removal as specified herein and in the General Specifications. Depending on the time of year, excavated borrow soils may be either greater than or less than the optimum moisture content. Addition of water during processing may be required to uniformly moisture condition the borrow soil to meet the moisture content specifications for compaction. Conversely, wet soils may need to be dried by aeration or other suitable means.

3.3.6 Blending

Some earthen materials are present within the borrow sites that do not meet the requirements for fill. These excavated materials must not be classified as unsuitable or wasted, but must be uniformly blended with suitable borrow materials so that the blended material meets the requirements for the appropriate fill type in accordance with Section 31 00 00 EARTHWORK. All blending of borrow materials must be performed at the borrow site or at the stockpile areas. No blending is allowed on the levee embankment. Blended material used within the levee embankment must meet the material requirements in Section 31 00 00 EARTHWORK prior to spreading and compacting.

DRAFT

3.3.7 Unsuitable Organic Material and Unsuitable Debris

Materials which are classified as unsuitable as described herein must be wasted. Unsuitable organic material must be placed in the designated stockpile area. Unsuitable debris must be removed and disposed of at an authorized disposal facility.

3.3.8 Finish Subgrade Preparation

Upon completion of excavation, the Contractor must perform quantity surveys as specified in the General Specifications. Surfaces must then be graded in accordance with the Plans and as directed by the Contracting Officer.

3.3.9 Surface Layer Respread

Upon completion of subgrade preparation, respread surface layer and any stockpiled unsuitable organic material uniformly over the excavated area. Finish grade site in accordance with the Plans, and as directed by the Contracting Officer. Site must be leveled to remove surface depressions and positively drain entire site in accordance with the slopes shown on the Plans or as otherwise directed by the Contracting Officer.

Upon completion of the topsoil respread, the borrow site must be rolled with a rubber-tired roller. Rubber-tired rollers must have a minimum of four wheels equipped with pneumatic tires. The tires must be of such size and ply as to be capable of being operated at tire pressures between 80 and 100 pounds per square inch at a 25,000-pound wheel load. The roller wheels must be located abreast and designed to ensure that each wheel will

carry approximately equal loads in traversing uneven ground. The spacing of the wheels must be such that the distance between the nearest edges of adjacent tires will not be greater than 5 percent of the rated tire width of a single tire at the operating pressure for a 25,000-pound wheel load. The roller must be provided with a body suitable for ballast loading so that the load per wheel may be varied, as directed by the Contracting Officer, from 18,000 to 25,000 pounds. The roller must be towed at a speed not to exceed five miles per hour.

A minimum of two passes with approved equipment must be performed over topsoil respread. Each pass of the roller must overlap the preceding or adjacent pass by not less than one foot. The portions of the borrow site that the roller cannot reach for any reason must be compacted by the Contracting Officer-reviewed method.

3.4 EROSION CONTROL

3.4.1 General

Place rice straw and stabilization emulsion on all disturbed areas of the borrow site, including bottom of excavation, excavation side slopes, staging and temporary stockpile areas, or as otherwise indicated in the storm water pollution prevention plan.

3.4.2 Application

Rice straw must be pneumatically applied to the area seeded, at a rate of 3,000 pounds per acre.

Following the application of rice straw, stabilizing emulsion must be hydraulically applied to the area strawed, at a rate of 100 pounds per acre.

3.4.3 Protection

Protect areas susceptible to vehicular or heavy foot traffic by erecting suitable barricades immediately after seeding is completed and/or by placing warning signs of a type reviewed by the Government.

3.4.4 Repair

Slopes of 3:1 or steeper where erosion has occurred, or where straw has blown or washed away within the period of Contractor's responsibility must have straw and tackifier reapplied at the rate and method described in Section 3.4.2 at no additional cost to the Government.

3.5 DEWATERING AND DIVERSION

Surface and groundwater control must be accomplished in coordination with the required excavation and embankment construction activities. Seepage of water from adjacent irrigated agricultural operations and irrigation ditches should be anticipated. Such seepage must be intercepted at the perimeter of the excavation area and rerouted to drainage ditches adjacent to the borrow site. Excavations at depth may encounter saturated soil conditions from perched groundwater and must be moisture conditioned for use. 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 must be the responsibility of the

DRAFT

Contractor and must comply with all federal, state and local regulations.

3.6 RAMPS

Temporary ramps, constructed for the convenience of the Contractor, must be removed prior to completing the finish grading of the borrow site.

3.7 SURFACE DRAINAGE OF COMPLETED AREAS

The finished surface must be free of sharp ridges, gullies, potholes, sinkholes, and any other surface irregularities and must drain in the direction as shown on the Plans.

3.8 FIELD QUALITY CONTROL

3.8.1 General

As a part of the Contractor Quality Control (CQC) system required by Section 01 45 00 QUALITY CONTROL, the Contractor must establish and maintain field quality control for borrow excavation, borrow soil testing, and borrow soil preparation to assure compliance with contract requirements and maintain detailed records of field quality control for all operations including but not limited to the following.

3.8.1.1 Excavation Equipment

Type, size, number of units and suitability for the construction of the prescribed work.

3.8.1.2 Borrow Soil Preparation

Methods of preparing the soils and soil testing program to confirm soils meet the requirement of Section 31 00 00 EARTHWORK.

3.8.2 Materials Testing

The Contractor must perform sufficient testing to ensure that the borrow soils meet the requirements of Section 31 00 00 EARTHWORK. The testing program specified below must be considered the minimum acceptable frequency of testing. This does not relieve the Contractor from the responsibility of performing additional testing if required to ensure compliance with the Specifications.

3.8.2.1 Soil Classification Tests

Soil classification tests must be performed consistent with the requirements of Section 31 00 00 EARTHWORK. One (1) initial classification test must be required for each different classification of material to be utilized as fill or backfill. One (1) soil classification test must be performed for each 1,000 cubic yards of borrow material. As prescribed in ASTM D2487, grain size analyses in accordance with ASTM D6913/D6913M and Atterberg limits in accordance with ASTM D4318 must be performed on each soil sample. The Contractor must submit additional tests on materials that were blended to meet the requirement of Section 31 00 00 EARTHWORK. The test results must be submitted to the Contracting Officer at least 48 hours prior to placement of the fill. Test results must include the borrow Sub Area Number as defined in Part 3.8.7.

DRAFT

3.8.2.2 Water (Moisture) Content Tests

Determination of water content must be performed in accordance with ASTM D2216. One (1) water content test must be performed for each soil sample. Backfill and fills not meeting the required specifications for water content in Section 31 00 00 EARTHWORK must be retested after corrective measures have been applied.

3.8.3 Testing by the Government

During the life of this contract, the Government may perform quality assurance tests. Approximately 20 percent of quality control testing may be selected by the Government for quality control.

3.8.4 Survey Data

Submit copies of survey data in cross section and electronic forms of the borrow site after surface layer removal (prior to excavation of borrow site), and after excavation. Submit written certification that the data is accurate and surveying was performed by a licensed surveyor authorized to practice land surveying in the State of California. Submit electronic data within 24 hours. Submit cross sections within ten calendar days of performing field surveys.

3.8.5 Equipment Data

Equipment data used for excavation, hauling, fill placement, compaction, and sprinkling equipment must be submitted and include weights, size, and contact pressures.

3.8.6 Material Distribution and Stockpile Plan

Submit an Earth Material Distribution and Stockpile Plan that describes where material will be obtained, placed, and stockpiled for usage or for temporary disposal. This information must be provided within 15 calendar days after the Notice To Proceed.

3.8.7 Borrow Source Excavation Plan

Submit a written Borrow Source Excavation Plan a minimum of 20 calendar days prior to the beginning of any excavation. Review of the detailed plan must be obtained from the Contracting Officer prior to starting the work. If necessary, the plan must be modified as required to meet field conditions. Modifications must be reviewed prior to use. As a minimum, the plan must contain the following:

a. Proposed methods for preventing interference with, or damage to, existing underground or overhead utility lines, trees designated to remain, and other man-made facilities or natural features designated to remain within or adjacent to the construction rights-of-way.

b. The proposed methods for controlling surface and ground water in the borrow areas and required excavations.

c. A plan of the borrow area subdivided into areas equivalent to approximately 1,000 cubic yards of borrow. Each sub-area must be numbered and this number must be included on the Laboratory Test Reports and Daily Field Reports. The plan must be resubmitted during construction if borrow sub-areas are modified.

DRAFT

d. A stockpiling and blending plan for embankment material before it is transported to the Project site showing locations, stockpile heights, slopes, limits, and drainage around the stockpile areas.

e. The Contractor's proposed sequence of work for excavating the borrow sites with plan and cross sectional views showing starting and final work locations and clearing, grubbing and surface layer removal limits.

f. The Contractor's proposed road pattern and plan for implementing dust control measures.

g. The plan must outline procedures for placing/hauling different materials encountered in the borrow site to the levee, and other fill locations.

3.8.8 Quality Control Testing

Submit all Quality Control Testing results. Testing laboratories must be Corps certified. Supervision of tests and report preparation must be by a professional civil engineer licensed in the state of California. Reports must bear said professional engineer's signature and stamp. Distribution of the copies to the Contracting Officer must be a maximum of 24 hours after completion of the test and at least 48 hours prior to placement of the fill.

3.8.9 Reporting

On a daily basis, the Contractor must furnish all material testing results, the quantity of borrow excavated as well as the records of corrective action taken, in accordance with Section 01 45 00 QUALITY CONTROL.

-- End of Section --

DRAFT

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DRAFT

SECTION TABLE OF CONTENTS

DIVISION 32 - EXTERIOR IMPROVEMENTS

SECTION 32 12 16

HOT-MIX ASPHALT (HMA) FOR ROADS

PART 1 GENERAL

1.1 REFERENCES
1.1.1 STATE SPECIFICATIONS
1.2 SUBMITTALS
1.3 ENVIRONMENTAL REQUIREMENTS
1.4 PAVEMENT DELINEATION

PART 2 PRODUCTS

2.1 SYSTEM DESCRIPTION
2.1.1 Asphalt Mixing Plant
2.1.1.1 Truck Scales
2.1.1.2 Testing Facilities
2.1.1.3 Inspection of Plant
2.1.1.4 Storage bins
2.1.2 Hauling Equipment
2.1.3 Asphalt Pavers
2.1.3.1 Receiving Hopper
2.1.3.2 Automatic Grade Controls
2.1.4 Rollers
2.2 AGGREGATES
2.2.1 Coarse Aggregate
2.2.2 Fine Aggregate
2.2.3 Mineral Filler
2.2.4 Aggregate Gradation
2.3 ASPHALT BINDER
2.4 MIX DESIGN
2.4.1 JMF Requirements
2.4.2 Adjustments to Field JMF

PART 3 EXECUTION

3.1 PREPARATION OF ASPHALT BINDER MATERIAL
3.2 PREPARATION OF MINERAL AGGREGATE
3.3 PREPARATION OF HOT-MIX ASPHALT MIXTURE
3.4 PREPARATION OF THE UNDERLYING SURFACE
3.5 SPRAYING OF CONTACT SURFACES
3.6 TESTING LABORATORY
3.7 TRANSPORTING AND PLACING
3.7.1 Transporting
3.7.2 Placing
3.8 COMPACTION OF MIXTURE
3.9 JOINTS
3.9.1 Transverse Joints
3.9.2 Longitudinal Joints

DRAFT

3.10 QUALITY CONTROL
3.10.1 General Quality Control Requirements
3.10.2 Testing Laboratory
3.10.3 Quality Control Testing
3.10.3.1 Asphalt Content
3.10.3.2 Gradation
3.10.3.3 Aggregates Tests
3.10.3.4 Temperatures
3.10.3.5 Aggregate Moisture
3.10.3.6 Moisture Content of Mixture
3.10.3.7 Laboratory Air Voids, Marshall Stability and Flow
3.10.3.8 In-Place Density
3.10.3.9 Thickness
3.10.3.10 Grade and Smoothness
3.10.3.11 Additional Testing
3.10.3.12 QC Monitoring
3.10.4 Sampling
3.10.5 Control Charts
3.11 MATERIAL ACCEPTANCE
3.11.1 Sublot Sampling
3.11.2 Additional Sampling and Testing
3.11.3 Grade
3.11.4 Surface Smoothness
3.11.4.1 Smoothness Requirements
3.11.4.1.1 Straightedge Testing
3.11.4.2 Testing Method
3.11.4.2.1 Straightedge Testing
3.12 VEHICLE PAVING REPAIR
3.13 PROTECTION

-- End of Section Table of Contents --

DRAFT

SECTION 32 12 16

HOT-MIX ASPHALT (HMA) FOR ROADS

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 M 156	(2013; R 2017) Standard Specification for Requirements for Mixing Plants for Hot-Mixed, Hot-Laid Bituminous Paving Mixtures
AASHTO T 209	(2020) Standard Method of Test for Theoretical Maximum Specific Gravity and Density of Asphalt Mixtures
AASHTO M 320	(2017) Standard Specification for Performance-Graded Asphalt Binder
AASHTO T 304	(2011; R 2015) Standard Method of Test for Uncompacted Void Content of Fine Aggregate

ASPHALT INSTITUTE (AI)

AI MS-2	(2015) Asphalt Mix Design Methods

ASTM INTERNATIONAL (ASTM)

ASTM C117	(2017) Standard Test Method for Materials Finer than 75-um (No. 200) Sieve in Mineral Aggregates by Washing
ASTM C127	(2015) Standard Test Method for Density, Relative Density (Specific Gravity), and Absorption of Coarse Aggregate
ASTM C128	(2015) Standard Test Method for Density, Relative Density (Specific Gravity), and Absorption of Fine Aggregate
ASTM C131/C131M	(2020) Standard Test Method for Resistance to Degradation of Small-Size Coarse Aggregate by Abrasion and Impact in the Los Angeles Machine
ASTM C136/C136M	(2019) Standard Test Method for Sieve Analysis of Fine and Coarse Aggregates

DRAFT

ASTM C142/C142M	(2017) Standard Test Method for Clay Lumps and Friable Particles in Aggregates
ASTM C29/C29M	(2017a) Standard Test Method for Bulk Density ("Unit Weight") and Voids in Aggregate
ASTM C566	(2013) Standard Test Method for Total Evaporable Moisture Content of Aggregate by Drying
ASTM C88	(2018) Standard Test Method for Soundness of Aggregates by Use of Sodium Sulfate or Magnesium Sulfate
ASTM D140/D140M	(2016) Standard Practice for Sampling Asphalt Materials
ASTM D1461	(2017) Standard Test Method for Moisture or Volatile Distillates in Asphalt Mixtures
ASTM D2172/D2172M	(2017; E 2018) Standard Test Methods for Quantitative Extraction of Asphalt Binder from Asphalt Mixtures
ASTM D2419	(2014) Sand Equivalent Value of Soils and Fine Aggregate
ASTM D242/D242M	(2009; R 2014) Mineral Filler for Bituminous Paving Mixtures
ASTM D2489/D2489M	(2016) Standard Test Method for Estimating Degree of Particle Coating of Asphalt Mixtures
ASTM D2950/D2950M	(2014) Density of Bituminous Concrete in Place by Nuclear Methods
ASTM D3665	(2012; R 2017) Standard Practice for Random Sampling of Construction Materials
ASTM D3666	(2016) Standard Specification for Minimum Requirements for Agencies Testing and Inspecting Road and Paving Materials
ASTM D4125/D4125M	(2010) Asphalt Content of Bituminous Mixtures by the Nuclear Method
ASTM D4791	(2019) Flat Particles, Elongated Particles, or Flat and Elongated Particles in Coarse Aggregate
ASTM D4867/D4867M	(2009; R 2014) Effect of Moisture on Asphalt Concrete Paving Mixtures
ASTM D5444	(2015) Mechanical Size Analysis of Extracted Aggregate

DRAFT

ASTM D546	(2017) Standard Test Method for Sieve Analysis of Mineral Filler for Asphalt Paving Mixtures
ASTM D6307	(2019) Standard Test Method for Asphalt Content of Asphalt Mixture by Ignition Method
ASTM D6926	(2016) Standard Practice for Preparation of Asphalt Mixture Specimens Using Marshall Apparatus
ASTM D6927	(2015) Standard Test Method for Marshall Stability and Flow of Bituminous Mixtures

STATE OF CALIFORNIA DEPARTMENT OF TRANSPORTATION (CALTRANS)

CDT SS 39	(2023) Standard Specifications, SECTION 39: HOT MIX ASPHALT
CT 309	(2011) Method of Test for Determining Theoretical Maximum Specific Gravity and Density of Hot Mix Asphalt

CITY OF SACRAMENTO (COS)

SAC STD SPEC	Standard Specifications for Public Construction, June 2007, Incl. Addenda No. 1 and 2, April 2012

U.S. ARMY CORPS OF ENGINEERS (USACE)

COE CRD-C 171	(1995) Standard Test Method for Determining Percentage of Crushed Particles in Aggregate

DRAFT

1.1.1 STATE SPECIFICATIONS

CALIFORNIA DEPARTMENT OF TRANSPORTATION (Caltrans), STANDARD SPECIFICATIONS, 2023 edition (including all subsequent supplements and updates), are referred to herein as State Specifications. Paragraphs pertaining to measurement and payment in the State Specifications cannot be used. References to State or Engineer must be understood to be the Contracting Officer. The State Specifications form a part of this specification only to the extent referenced.

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-03 Product Data

Mix Design; G, DO

Quality Control; G

Material Acceptance; G

SD-04 Samples

Asphalt Binder

Aggregates

SD-06 Test Reports

Aggregates tests; G

QC Monitoring

SD-07 Certificates

Asphalt Binder; G

Testing Laboratory

1.3 ENVIRONMENTAL REQUIREMENTS

Do not place the hot-mix asphalt upon a wet surface or when the surface temperature of the underlying course is less than specified in Table 3. The temperature requirements may be waived by the Contracting Officer, if requested; however, meet all other requirements, including compaction.

Table 3. Surface Temperature Limitations of Underlying Course

Mat Thickness, inches	Degrees F
3 or greater	40
Less than 3	45

DRAFT

1.4 PAVEMENT DELINEATION

The existing pavement delineation and pavement markings must be replaced with paint traffic stripe and two (2) coat pavement markings in accordance with the California Department of Transportation Standard Specifications and Standard Plans, dated 2015, and these Specifications. The new pavement delineation and pavement markings must match the existing delineation unless otherwise indicated on the plans. Temporary pavement delineation must be in accordance with the California Department of Transportation Standard Specifications for temporary pavement delineation. Permanent pavement delineation and pavement markings must be considered to be included in the payment for asphalt concrete and no additional payment will be allowed.

PART 2 PRODUCTS

2.1 SYSTEM DESCRIPTION

Perform the work consisting of pavement courses composed of mineral aggregate and asphalt material heated and mixed in a central mixing plant and placed on a prepared course. HMA designed and constructed in

accordance with this section must conform to the lines, grades, thicknesses, and typical cross sections indicated. Construct each course to the depth, section, or elevation required by the drawings and roll, finish, and approve it before the placement of the next course.

2.1.1 Asphalt Mixing Plant

Plants used for the preparation of hot-mix asphalt must conform to the requirements of AASHTO M 156, including additional plant requirements specified herein. The plant must be a batch type, continuous mix type or drum-dryer mixer type, and must have sufficient capacity to handle the new bituminous construction. Minimum plant capacity must be 100 tons per hour. The mixing plant and equipment must remain accessible at all times for inspecting operation, verifying weights, proportions and character of materials, and checking mixture temperatures.

2.1.1.1 Truck Scales

Weigh the asphalt mixture on approved, certified scales at the Contractor's expense. Inspect and seal scales at least quarterly by an approved calibration laboratory.

2.1.1.2 Testing Facilities

Provide laboratory facilities at the plant for the use of the Government's acceptance testing and the Contractor's quality control testing.

2.1.1.3 Inspection of Plant

Provide the Contracting Officer with access at all times, to all areas of the plant for checking adequacy of equipment; inspecting operation of the plant; verifying weights, proportions, and material properties; checking the temperatures maintained in the preparation of the mixtures and for taking samples. Provide assistance as requested, for the Government to procure any desired samples.

DRAFT

2.1.1.4 Storage bins

Use of storage bins for temporary storage of hot-mix asphalt will be permitted as follows:

a. The asphalt mixture may be stored in non-insulated storage bins for a period of time not exceeding 3 hours.

b. The asphalt mixture may be stored in insulated storage bins for a period of time not exceeding 8 hours. The mix drawn from bins must meet the same requirements as mix loaded directly into trucks.

2.1.2 Hauling Equipment

Provide trucks for hauling hot-mix asphalt having tight, clean, and smooth metal beds. To prevent the mixture from adhering to them, the truck beds must be lightly coated with a minimum amount of paraffin oil, lime solution, or other approved material. Petroleum based products cannot be used as a release agent. Each truck must have a suitable cover to protect the mixture from adverse weather. When necessary to ensure that the mixture will be delivered to the site at the specified temperature, truck beds must be insulated or heated and covers (tarps) must be securely fastened.

2.1.3 Asphalt Pavers

Provide asphalt pavers which are self-propelled, with an activated screed, heated as necessary, and capable of spreading and finishing courses of hot-mix asphalt which will meet the specified thickness, smoothness, and grade. The paver must have sufficient power to propel itself and the hauling equipment without adversely affecting the finished surface.

2.1.3.1 Receiving Hopper

Provide paver with a receiving hopper of sufficient capacity to permit a uniform spreading operation and equipped with a distribution system to place the mixture uniformly in front of the screed without segregation. The screed must effectively produce a finished surface of the required evenness and texture without tearing, shoving, or gouging the mixture.

2.1.3.2 Automatic Grade Controls

Equip the paver with a control system capable of automatically maintaining the specified screed elevation. The control system must be automatically actuated from either a reference line and/or through a system of mechanical sensors or sensor-directed mechanisms or devices which will maintain the paver screed at a predetermined transverse slope and at the proper elevation to obtain the required surface. The transverse slope controller must be capable of maintaining the screed at the desired slope within plus or minus 0.1 percent. A transverse slope controller cannot be used to control grade. Provide controls capable of working in conjunction with any of the following attachments:

a. Ski-type device of not less than 30 feet in length.

b. Taut stringline set to grade.

c. Short ski or shoe for joint matching.

d. Laser control.

DRAFT

2.1.4 Rollers

Rollers must be in good condition and must be operated at slow speeds to avoid displacement of the asphalt mixture. The number, type, and weight of rollers must be sufficient to compact the mixture to the required density while it is still in a workable condition. Do not use equipment which causes excessive crushing of the aggregate.

2.2 AGGREGATES

Provide aggregates consisting of crushed stone, crushed gravel, crushed slag, screenings, natural sand, and mineral filler, as required. If directed by the Contracting Officer, Contractor must submit sufficient materials to produce 200 lb of blended mixture for mix design verification. The portion of material retained on the No. 4 sieve is coarse aggregate. The portion of material passing the No. 4 sieve and retained on the No. 200 sieve is fine aggregate. The portion passing the No. 200 sieve is defined as mineral filler. Submit all aggregate test results and samples to the Contracting Officer as/when requested or directed by the Contracting Officer.

2.2.1 Coarse Aggregate

Provide coarse aggregate consisting of sound, tough, durable particles, free from films of material that would prevent thorough coating and bonding with the asphalt material and free from organic matter and other deleterious substances. All individual coarse aggregate sources must meet the following requirements:

a. The percentage of loss cannot be greater than 40 percent after 500 revolutions when tested in accordance with ASTM C131/C131M.

b. The percentage of loss cannot be greater than 18 percent after five cycles when tested in accordance with ASTM C88 using magnesium sulfate or 12 percent when using sodium sulfate.

c. At least 75 percent by weight of coarse aggregate must have at least two or more fractured faces when tested in accordance with COE CRD-C 171. Fractured faces must be produced by crushing.

d. The particle shape must be essentially cubical and the aggregate cannot contain more than 20 percent, by weight, of flat and elongated particles (3:1 ratio of maximum to minimum) when tested in accordance with ASTM D4791.

e. Slag, if used, must be air-cooled, blast furnace slag, with a compacted weight of not less than 75 lb/cu ft when tested in accordance with ASTM C29/C29M.

f. Clay lumps and friable particles cannot exceed 0.3 percent, by weight, when tested in accordance with ASTM C142/C142M.

2.2.2 Fine Aggregate

Fine aggregate must consist of clean, sound, tough, durable particles free from coatings of clay, silt, or any objectionable material and containing no clay balls.

a. All individual fine aggregate sources must have a sand equivalent value not less than 45 when tested in accordance with ASTM D2419.

b. The fine aggregate portion of the blended aggregate must have an uncompacted void content not less than 45.0 percent when tested in accordance with AASHTO T 304 Method A.

c. The quantity of natural sand (non-crushed material) added to the aggregate blend cannot exceed 25 percent by weight of total aggregate.

d. Clay lumps and friable particles cannot exceed 0.3 percent, by weight, when tested in accordance with ASTM C142/C142M

2.2.3 Mineral Filler

Mineral filler must be non-plastic material meeting the requirements of ASTM D242/D242M.

2.2.4 Aggregate Gradation

The combined aggregate gradation must conform to gradations specified in Table 4, when tested in accordance with ASTM C136/C136M and ASTM C117, and

DRAFT

cannot vary from the low limit on one sieve to the high limit on the adjacent sieve or vice versa, but grade uniformly from coarse to fine.

Table 4. Aggregate Gradations

Sieve Size, inch	Intermediate Course Gradation 2, Percent Passing by Mass	Surface Course Gradation 3, Percent Passing by Mass
1	---	---
3/4	100	---
1/2	76-96	100
3/8	69-89	76-96
No. 4	53-73	58-78
No. 8	38-60	40-60
No. 16	26-48	28-48
No. 30	18-38	18-38
No. 50	11-27	11-27
No. 100	6-18	6-18
No. 200	3-6	3-6

DRAFT

2.3 ASPHALT BINDER

If directed by the Contracting Officer, Contractor must submit a 5 gallon sample for mix design verification. Asphalt binder must conform to AASHTO M 320 Performance Grade (PG) 64-10. Test data indicating grade certification must be provided by the supplier at the time of delivery of each load to the mix plant. Submit copies of these certifications to the Contracting Officer. The supplier is defined as the last source of any modification to the binder. The Contracting Officer may sample and test the binder at the mix plant at any time before or during mix production. Obtain samples for this verification testing in accordance with ASTM D140/D140M and in the presence of the Contracting Officer. Furnish these samples to the Contracting Officer for the verification testing, which is at no cost to the Contractor. Submit samples of the asphalt binder specified for approval not less than 14 days before start of the test section. Submit copies of certified test data, amount, type and description of any modifiers blended into the asphalt binder.

2.4 MIX DESIGN

a. Develop the mix design. The asphalt mix must be composed of a mixture of well-graded aggregate, mineral filler if required, and asphalt material. The aggregate fractions must be sized, handled in separate size groups, and combined in such proportions that the resulting

mixture meets the grading requirements of the job mix formula (JMF). Submit proposed JMF; do not produce hot-mix asphalt for payment until a JMF has been approved. The hot-mix asphalt must be designed in accordance with Marshall (MS-02) procedures and the criteria shown in Table 5. Use the hand-held hammer to compact the specimens for Marshall mix design. If the Tensile Strength Ratio (TSR) of the composite mixture, as determined by ASTM D4867/D4867M is less than 75, the aggregates will be rejected or the asphalt mixture treated with an approved anti-stripping agent. The amount of anti-stripping agent added must be sufficient to produce a TSR of not less than 75. Provide an anti-strip agent, if required, at no additional cost. If and as requested by the Contracting Officer, sufficient materials to produce 200 pound of blended mixture must be provided to the Contracting Officer for verification of mix design at least 14 days prior to construction of test section.

b. At the Contractor's election, a currently used DOT hot mix design as specified herein may be used. Asphalt concrete must conform to State Specification CDT SS 39 HOT MIX ASPHALT, Type A.

c. In lieu of Table 4 Gradation, aggregate for asphalt concrete may conform to State Specification CDT SS 39 HOT MIX ASPHALT, aggregates for surface course must be per Caltrans Section 39-2.02B(4)(b) Type A ½" Mix, and that intermediate course must be ¾" Mix or ½" Mix.

2.4.1 JMF Requirements

Submit in writing the mix design for approval at least 14 days prior to the start of the test section including as a minimum:

a. Percent passing each sieve size.

b. Percent of asphalt binder.

c. Percent of each aggregate and mineral filler to be used.

d. Asphalt viscosity grade, penetration grade, or performance grade.

e. Number of blows of hand-held hammer per side of molded specimen for Marshall mix or number of gyrations of Superpave gyratory compactor for Superpave mix.

f. Laboratory mixing temperature.

g. Lab compaction temperature.

h. Temperature-viscosity relationship of the asphalt binder.

i. Plot of the combined gradation on the 0.45 power gradation chart, stating the nominal maximum size.

j. Graphical plots of stability and flow for Marshall mix designs along with air voids, voids in the mineral aggregate, and unit weight versus asphalt content as shown in AI MS-2. Plots for stability and flow are NA for Superpave.

k. Specific gravity and absorption of each aggregate.

l. Percent natural sand.

DRAFT

m. Percent particles with 2 or more fractured faces (in coarse aggregate).

n. Fine aggregate angularity.

o. Percent flat or elongated particles (in coarse aggregate).

p. Tensile Strength Ratio (TSR).

q. Antistrip agent (if required) and amount.

r. List of all modifiers and amount.

s. Correlation of hand-held hammer with mechanical hammer (NA for Superpave).

Table 5. Mix Design Criteria

Test Property	50 Blows
Stability, pounds, minimum (NA for Superpave)	*1350
Flow, 0.01 inch, (NA for Superpave)	8-18
Air voids, percent	3-5
Percent Voids in mineral aggregate (VMA),(minimum)	
Gradation 2	14.0
Gradation 3	15.0
Gyration Requirement	**50
TSR, minimum percent	75

* This is a minimum requirement. The average during construction must be significantly higher than this number to ensure compliance with the specifications.

** When DOT mix is used

*** Calculate VMA in accordance with AI MS-2, based on ASTM C127 and ASTM C128 bulk specific gravity for the aggregate.

DRAFT

2.4.2 Adjustments to Field JMF

Keep the Laboratory JMF for each mixture in effect until a new formula is approved in writing by the Contracting Officer. Should a change in sources of any materials be made, perform a new laboratory JMF design and a new JMF approved before the new material is used. The Contractor will be allowed to adjust the Laboratory JMF within the limits specified below to optimize mix volumetric properties with the approval of the Contracting

Officer. Adjustments to the Laboratory JMF must be applied to the field (plant) established JMF and limited to those values as shown. Adjustments must be targeted to produce or nearly produce 4 percent voids total mix (VTM).

Table 6. Field (Plant) Established JMF Tolerances

Sieves	Adjustments (plus or minus), percent
1/2 inch	3
No. 4	3
No. 8	3
No. 200	1
Binder Content	0.4

If adjustments are needed that exceed these limits, develop a new mix design. Tolerances given above may permit the aggregate grading to be outside the limits shown in Table 4; while not desirable, this is acceptable, except for the No. 200 sieve, which must remain within the aggregate grading of Table 4.

DRAFT

PART 3 EXECUTION

3.1 PREPARATION OF ASPHALT BINDER MATERIAL

Heat the asphalt binder material avoiding local overheating and providing a continuous supply of the asphalt material to the mixer at a uniform temperature. The temperature of unmodified asphalts must be no more than 325 degrees F when added to the aggregates. Performance-Graded (PG) asphalts must be within the temperature range of 265 - 320 degrees F when added to the aggregate.

3.2 PREPARATION OF MINERAL AGGREGATE

Heat and dry the aggregate for the mixture prior to mixing. No damage can occur to the aggregates due to the maximum temperature and rate of heating used. The temperature of the aggregate and mineral filler cannot exceed 350 degrees F when the asphalt binder is added. The temperature cannot be lower than is required to obtain complete coating and uniform distribution on the aggregate particles and to provide a mixture of satisfactory workability.

3.3 PREPARATION OF HOT-MIX ASPHALT MIXTURE

The aggregates and the asphalt binder must be weighed or metered and introduced into the mixer in the amount specified by the JMF. Mix the combined materials until the aggregate obtains a uniform coating of asphalt binder and is thoroughly distributed throughout the mixture. Wet mixing time must be the shortest time that will produce a satisfactory mixture, but no less than 25 seconds for batch plants. Establish the wet mixing time for all plants based on the procedure for determining the percentage of coated particles described in ASTM D2489/D2489M, for each individual plant and for each type of aggregate used. The wet mixing time

will be set to at least achieve 95 percent of coated particles. The moisture content of all hot-mix asphalt upon discharge from the plant cannot exceed 0.5 percent by total weight of mixture as measured by ASTM D1461.

3.4 PREPARATION OF THE UNDERLYING SURFACE

Immediately before placing the hot mix asphalt, clean the underlying course of dust and debris. Apply a tack coat in accordance with City of Sacramento Standard Specifications (SAC STD SPEC), Section 22-7.

3.5 SPRAYING OF CONTACT SURFACES

Spray contact surfaces of previously constructed pavement with a thin coat of bituminous materials to act as an anti-stripping agent. Paint contact surfaces of structures with a thin coat of emulsion or other approved bituminous material prior to placing the bituminous mixture.

3.6 TESTING LABORATORY

Submit certification of compliance and Plant Scale Calibration Certification. Use a laboratory to develop the JMF that meets the requirements of ASTM D3666. The Government will inspect the laboratory equipment and test procedures prior to the start of hot mix operations for conformance to ASTM D3666. The laboratory must maintain the Corps certification for the duration of the project. A statement signed by the manager of the laboratory stating that it meets these requirements or clearly listing all deficiencies must be submitted to the Contracting Officer prior to the start of construction. The statement must contain as a minimum:

a. Qualifications of personnel; laboratory manager, supervising technician, and testing technicians.

b. A listing of equipment to be used in developing the job mix.

c. A copy of the laboratory's quality control system.

d. Evidence of participation in the AASHTO Materials Reference Laboratory (AMRL) program.

3.7 TRANSPORTING AND PLACING

3.7.1 Transporting

Transport the hot-mix asphalt from the mixing plant to the site in clean, tight vehicles. Schedule deliveries so that placing and compacting of mixture is uniform with minimum stopping and starting of the paver. Provide adequate artificial lighting for night placements. Hauling over freshly placed material will not be permitted until the material has been compacted as specified, and allowed to cool to 140 degrees F. To deliver mix to the paver, use a material transfer vehicle operated to produce continuous forward motion of the paver.

3.7.2 Placing

Street preparatory activities for paving must be in accordance with City of Sacramento Standard Specifications Section 22-4. Pavement keycutting, conforms and planning must be in accordance with City of Sacramento

DRAFT

Standard Specifications, Section 22-5. Place and compact the mix at a temperature suitable for obtaining density, surface smoothness, and other specified requirements. The temperature of the mix must not be less than 250 degrees F nor exceed 320 degrees F when asphalt is moved from the delivery truck to the asphalt paver. Upon arrival, place the mixture to the full width by an asphalt paver; it must be struck off in a uniform layer of such depth that, when the work is completed, it will have the required thickness and conform to the grade and contour indicated. The maximum paving course (lift) must not exceed three (3) inches. The minimum paving course (lift) must be one and half (1.5) inches. Regulate the speed of the paver to eliminate pulling and tearing of the asphalt mat. Unless otherwise permitted, placement of the mixture must begin along the centerline of a crowned section or on the high side of areas with a one-way slope. Place the mixture in consecutive adjacent strips having a minimum width of 10 feet. The longitudinal joint in one course must offset the longitudinal joint in the course immediately below by at least 1 foot; however, the joint in the surface course must be at the centerline of the pavement. Transverse joints in one course must be offset by at least 10 feet from transverse joints in the previous course. Transverse joints in adjacent lanes must be offset a minimum of 10 feet. On isolated areas where irregularities or unavoidable obstacles make the use of mechanical spreading and finishing equipment impractical, the mixture may be spread and luted by hand tools.

3.8 COMPACTION OF MIXTURE

After placing, the mixture must be thoroughly and uniformly compacted by rolling. Compact the surface as soon as possible without causing displacement, cracking or shoving. The sequence of rolling operations and the type of rollers used must be at the discretion of the Contractor. The speed of the roller must, at all times, be sufficiently slow to avoid displacement of the hot mixture and be effective in compaction. Any displacement occurring as a result of reversing the direction of the roller, or from any other cause, will be corrected at once. Furnish sufficient rollers to handle the output of the plant. Continue rolling until roller marks are eliminated and course has a density of at least 94 percent but not more than 98 percent of the Theoretical Maximum Density (TMD) of the same mixture prepared in accordance with CT 309/AASHTO T 209. To prevent adhesion of the mixture to the roller, keep the wheels properly moistened but excessive water will not be permitted. In areas not accessible to the roller, the mixture must be thoroughly compacted with hand tampers. Any mixture that becomes loose and broken, mixed with dirt, contains check-cracking, or is in any way defective must be removed full depth, replaced with fresh hot mixture and immediately compacted to conform to the surrounding area. This work must be done at the Contractor's expense. Skin patching will not be allowed.

3.9 JOINTS

The formation of joints must be performed ensuring a continuous bond between the courses and to obtain the required density. Carefully make joints between old and new pavement or within new pavements in a manner to ensure a thorough and continuous bond between old and new sections of the course. Vertical contact surfaces of previously constructed sections that are coated with dust, sand, or other objectionable material must be painted with a thin uniform coat of emulsion or other approved bituminous material just before placing fresh mixture. All joints must have the same texture as other sections of the course and meet the requirements for smoothness and grade.

DRAFT

3.9.1 Transverse Joints

Do not pass the roller over the unprotected end of the freshly laid mixture, except when necessary to form a transverse joint. When necessary to form a transverse joint, it must be made by means of placing a bulkhead or by tapering the course. The tapered edge must be cut back to its full depth and width on a straight line to expose a vertical face prior to placing material at the joint. Remove the cutback material from the project. In both methods, all contact surfaces must be given a light tack coat of asphalt material before placing any fresh mixture against the joint.

3.9.2 Longitudinal Joints

Longitudinal joints which are irregular, damaged, uncompacted, cold (less than 175 degrees F at the time of placing adjacent lanes), or otherwise defective, must be cut back a maximum of 3 inches from the top of the course with a cutting wheel to expose a clean, sound vertical surface for the full depth of the course. All cutback material must be removed from the project. All contact surfaces must be given a light tack coat of asphalt material prior to placing any fresh mixture against the joint. The Contractor will be allowed to use an alternate method if it can be demonstrated that density, smoothness, and texture can be met.

3.10 QUALITY CONTROL

3.10.1 General Quality Control Requirements

Develop and submit an approved Quality Control Plan. Submit aggregate and QC test results. Do not produce hot-mix asphalt for payment until the quality control plan has been approved addressing all elements which affect the quality of the pavement including, but not limited to:

a. Mix Design

b. Aggregate Grading

c. Quality of Materials

d. Stockpile Management

e. Proportioning

f. Mixing and Transportation

g. Mixture Volumetrics

h. Moisture Content of Mixtures

i. Placing and Finishing

j. Joints

k. Compaction

l. Surface Smoothness

DRAFT

3.10.2 Testing Laboratory

Provide a fully equipped asphalt laboratory located at the plant or job site and meeting the pertinent requirements in ASTM D3666. Laboratory facilities must be kept clean and all equipment maintained in proper working condition. The Contracting Officer is permitted unrestricted access to inspect the Contractor's laboratory facility, to witness quality control activities, and to perform any check testing desired. The Contracting Officer will advise the Contractor in writing of any noted deficiencies concerning the laboratory facility, equipment, supplies, or testing personnel and procedures. When the deficiencies are serious enough to adversely affect test results, the incorporation of the materials into the work must be suspended immediately and will not be permitted to resume until the deficiencies are corrected.

3.10.3 Quality Control Testing

Perform all quality control tests applicable to these specifications and as set forth in the Quality Control Program. The testing program must include, and not limited to, tests for the control of asphalt content, aggregate gradation, temperatures, aggregate moisture, moisture in the asphalt mixture, laboratory air voids, stability (NA for Superpave), flow (NA for Superpave), in-place density, grade and smoothness. Develop a Quality Control Testing Plan as part of the Quality Control Program. The Quality Control Testing Plan must include at least one cored sample per 5,000 square feet of pavement to confirm the thickness of asphalt and confirm nuclear gauge density readings. Cores are to be provided to the resident engineer for confirmation. Core holes are to be backfilled with hot mix asphalt.

DRAFT

3.10.3.1 Asphalt Content

A minimum of two tests to determine asphalt content will be performed per lot (a lot is defined in paragraph MATERIAL ACCEPTANCE) by one of the following methods: the extraction method in accordance with ASTM D2172/D2172M, Method A or B, the ignition method in accordance with ASTM D6307, or the nuclear method in accordance with ASTM D4125/D4125M. Calibrate the ignition oven or the nuclear gauge for the specific mix being used. For the extraction method, determine the weight of ash, as described in ASTM D2172/D2172M, as part of the first extraction test performed at the beginning of plant production; and as part of every tenth extraction test performed thereafter, for the duration of plant production. The last weight of ash value obtained must be used in the calculation of the asphalt content for the mixture.

3.10.3.2 Gradation

Determine aggregate gradations a minimum of twice per lot from mechanical analysis of recovered aggregate in accordance with ASTM D5444. When asphalt content is determined by the ignition oven or nuclear method, aggregate gradation must be determined from hot bin samples on batch plants, or from the cold feed on drum mix plants. For batch plants, test aggregates in accordance with ASTM C136/C136M using actual batch weights to determine the combined aggregate gradation of the mixture.

3.10.3.3 Aggregates Tests

a. Gradation: ASTM C136/C136M.

b. Mineral Filler Content: ASTM D546.

c. Abrasion: ASTM C131/C131M for wear (Los Angeles test). Perform one test initially prior to incorporation into the work and each time the source is changed.

3.10.3.4 Temperatures

Check temperatures at least four times per lot, at necessary locations, to determine the temperature at the dryer, the asphalt binder in the storage tank, the asphalt mixture at the plant, and the asphalt mixture at the job site.

3.10.3.5 Aggregate Moisture

Determine the moisture content of aggregate used for production a minimum of once per lot in accordance with ASTM C566.

3.10.3.6 Moisture Content of Mixture

Determine the moisture content of the mixture at least once per lot in accordance with ASTM D1461 or an approved alternate procedure.

3.10.3.7 Laboratory Air Voids, Marshall Stability and Flow

Take mixture samples at least four times per lot compacted into specimens, using 50 blows per side with the hand-held Marshall hammer as described in ASTM D6926. After compaction, determine the laboratory air voids of each specimen. Stability and flow must be determined for the Marshall-compacted specimens, in accordance with ASTM D6927.

3.10.3.8 In-Place Density

Contractor is required to perform both nuclear gauge backscatter testing and coring to monitor pavement density and ensure the specified density is achieved. Nuclear gauge testing must be in accordance with ASTM D2950/D2950M. Coring must be used to confirm the backscatter readings at a minimum rate of one cored sample per 5,000 square feet of pavement. Cored holes must be backfilled with hot mix asphalt.

3.10.3.9 Thickness

Determine thickness of intermediate and surface courses from core samples taken for the field density tests. The maximum allowable deficiency at any point cannot be more than 1/4 inch less than the thickness for the indicated course. Average thickness of course or of combined courses cannot be less than the indicated thickness. Where a deficiency exceeds the specified tolerances, correct each such representative area or areas by removing the deficient pavement and replacing with new pavement.

3.10.3.10 Grade and Smoothness

Conduct the necessary checks to ensure the grade and smoothness requirements are met in accordance with paragraph MATERIAL ACCEPTANCE.

3.10.3.11 Additional Testing

Any additional testing, which the Contractor deems necessary to control the process, may be performed at the Contractor's option.

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3.10.3.12 QC Monitoring

Submit all QC test results to the Contracting Officer on a daily basis as the tests are performed. The Contracting Officer reserves the right to monitor any of the Contractor's quality control testing and to perform duplicate testing as a check to the Contractor's quality control testing.

3.10.4 Sampling

When directed by the Contracting Officer, sample and test any material which appears inconsistent with similar material being produced, unless such material is voluntarily removed and replaced or deficiencies corrected by the Contractor. All sampling must be in accordance with standard procedures specified.

3.10.5 Control Charts

For process control, establish and maintain linear control charts on both individual samples and the running average of last four samples for the parameters listed in Table 8, as a minimum. These control charts must be posted as directed by the Contracting Officer and kept current at all times. The control charts must identify the project number, the test parameter being plotted, the individual sample numbers, the Action and Suspension Limits listed in Table 8 applicable to the test parameter being plotted, and the Contractor's test results. Target values from the JMF must also be shown on the control charts as indicators of central tendency for the cumulative percent passing, asphalt content, and laboratory air voids parameters. When the test results exceed either applicable Action Limit, take immediate steps to bring the process back in control. When the test results exceed either applicable Suspension Limit, halt production until the problem is solved. Use the control charts as part of the process control system for identifying trends so that potential problems can be corrected before they occur. Make decisions concerning mix modifications based on analysis of the results provided in the control charts. The Quality Control Plan must indicate the appropriate action to be taken to bring the process into control when certain parameters exceed their Action Limits.

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Table 8. Action and Suspension Limits for the Parameters to be Plotted on Individual and Running Average Control Charts

	Individual Samples		Running Average of Last Four Samples	
Parameter to be Plotted	Action Limit	Suspension Limit	Action Limit	Suspension Limit
No. 4 sieve, Cumulative percent passing, deviation for JMF target; plus or minus values	6	8	4	5
No. 30 sieve, Cumulative percent passing, deviation for JMF target; plus or minus values	4	6	3	4
No. 200 sieve, Cumulative percent passing, deviation for JMF target; plus or minus values	1.4	2.0	1.1	1.5

Table 8. Action and Suspension Limits for the Parameters to be Plotted on Individual and Running Average Control Charts

	Individual Samples		Running Average of Last Four Samples	
Parameter to be Plotted	Action Limit	Suspension Limit	Action Limit	Suspension Limit
Stability, newtons pounds (minimum)				
50 Blow JMF	1000	900	1100	1000
Flow, 0.01 inch (NA for Superpave)				
50 Blow JMF	8 min.	7 min.	9 min.	8 min.
	18 max.	19 max.	17 max.	18 max.
Asphalt content, percent deviation from JMF target; plus or minus value	0.4	0.5	0.2	0.3
Laboratory Air Voids, percent deviation from JMF target value	No specific action and suspension limits set			
In-place Mat Density, percent of TMD	No specific action and suspension limits set			
In-place Joint Density, percent of TMD	No specific action and suspension limits set			

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3.11 MATERIAL ACCEPTANCE

Testing for acceptability of work will be performed by an independent laboratory hired by the Contractor. Forward test results daily to the Contracting Officer. Acceptance of the plant produced mix and in-place requirements will be on a lot to lot basis. A standard lot for all requirements will be equal to 8 hours of production. Where appropriate, adjustment in payment for individual lots of hot-mix asphalt will be made based on in-place density, laboratory air voids, grade and smoothness in accordance with the following paragraphs. Grade and surface smoothness determinations will be made on the lot as a whole. Exceptions or adjustments to this will be made in situations where the mix within one lot is placed as part of both the intermediate and surface courses, thus grade and smoothness measurements for the entire lot cannot be made. In order to evaluate laboratory air voids and in-place (field) density, each lot will be divided into four equal sublots.

3.11.1 Sublot Sampling

One random mixture sample for determining laboratory air voids, theoretical maximum density, percent binder burnoff, gradation, and for any additional testing the Contracting Officer desires, will be taken from a loaded truck delivering mixture to each sublot, or other appropriate location for each sublot. All samples will be selected randomly, using commonly recognized methods of assuring randomness conforming to ASTM D3665 and employing tables of random numbers or computer programs. Laboratory

air voids will be determined from three laboratory compacted specimens of each sublot sample in accordance with ASTM D6926. The specimens will be compacted within 2 hours of the time the mixture was loaded into trucks at the asphalt plant. Samples will not be reheated prior to compaction and insulated containers will be used as necessary to maintain the temperature.

3.11.2 Additional Sampling and Testing

The Contracting Officer reserves the right to direct additional samples and tests for any area which appears to deviate from the specification requirements. The cost of any additional testing will be paid for by the Contractor. Testing in these areas will be in addition to the lot testing, and the requirements for these areas will be the same as those for a lot.

3.11.3 Grade

Finish grades of each course placed cannot vary from the finish elevations, profiles, and cross sections indicated by more than 1/2 inch. Finished surface of the final surface course will be tested by the Contractor, and report submitted to the Contracting Officer, by running lines of levels at intervals of 25 feet longitudinally and transversely to determine elevations of completed pavement. Within 5 working days, after the completion of a particular lot incorporating the final wearing surface course, test the final wearing surface course of the pavement for conformance with the specified plan grade and perform a level survey at the specified grid spacing. Elevations not in conformance with the specified tolerance must be noted on the plan in an approved manner. The survey must be performed by a registered land surveyor. The Contracting Officer will inform the Contractor in writing of paved areas that fail to meet the final grades indicated within the specified tolerances. Correct deficient paved areas by removing existing work and replacing with new materials that meet the specifications. Skin patching for correcting low areas is prohibited. Diamond grinding may be used to remove high spots to meet grade requirements. Skin patching for correcting low areas or planing or milling for correcting high areas will not be permitted.

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3.11.4 Surface Smoothness

Use one of the following methods to test and evaluate surface smoothness of the pavement. Perform all testing in the presence of the Contracting Officer. Keep detailed notes of the results of the testing and furnish a copy to the Government immediately after each day's testing. Use the straight edge for all longitudinal testing. Where drawings show required deviations from a plane surface (crowns, drainage inlets, etc.), the surface must be finished to meet the approval of the Contracting Officer.

3.11.4.1 Smoothness Requirements

3.11.4.1.1 Straightedge Testing

The finished surfaces of the pavements must have no abrupt change of 1/4 inch or more, and all pavements must be within the tolerances of 1/4 inch in both the longitudinal and transverse directions, when tested with an approved 12 feet straightedge.

3.11.4.2 Testing Method

After the final rolling, but not later than 24 hours after placement, test

the surface of the pavement in each entire lot in such a manner as to reveal all surface irregularities exceeding the tolerances specified above. Separate testing of individual sublots is not required. If any pavement areas are ground, these areas must be retested immediately after grinding. Test each lot of the pavement in both a longitudinal and a transverse direction on parallel lines. Set the transverse lines 15 feet or less apart, as directed. The longitudinal lines must be at the centerline of each paving lane for lanes less than 20 feet wide and at the third points for lanes 20 feet or wider. Also test other areas having obvious deviations. Longitudinal testing lines must be continuous across all joints.

3.11.4.2.1 Straightedge Testing

Hold the straightedge in contact with the surface and move it ahead one-half the length of the straightedge for each successive measurement. Determine the amount of surface irregularity by placing the freestanding (unleveled) straightedge on the pavement surface and allowing it to rest upon the two highest spots covered by its length, and measuring the maximum gap between the straightedge and the pavement surface in the area between these two high points.

3.12 VEHICLE PAVING REPAIR

Repair paving that has been damaged by construction traffic as directed by the Contracting Officer. Sawcut and remove paving to 1-foot outside of the damaged area to full depth of paving section, and in neat straight lines. Saw cutting must extend as deep as necessary to remove all existing asphalt concrete at the required locations. Replace removed paving in accordance with this specification for new pavement. Perform repairs after completion of other construction activities.

3.13 PROTECTION

Do not permit vehicular traffic, including heavy equipment, on pavement until surface temperature has cooled to no more than 120 degrees F. Measure surface temperature by approved surface thermometers or other satisfactory methods.

-- End of Section --

DRAFT

SECTION TABLE OF CONTENTS

DIVISION 32 - EXTERIOR IMPROVEMENTS

SECTION 32 15 00

AGGREGATE SURFACE COURSE AND AGGREGATE BASE

PART 1 GENERAL

1.1 REFERENCES
1.2 DEGREE OF COMPACTION
1.3 SUBMITTALS
1.3.1 Equipment
1.3.2 Aggregate Source
1.3.3 Aggregate
1.3.4 Sampling and Testing
1.3.5 Density Tests
1.4 EQUIPMENT
1.5 SAMPLING AND TESTING
1.6 APPROVAL OF MATERIALS
1.7 WEATHER LIMITATIONS

PART 2 PRODUCTS

2.1 AGGREGATES
2.2 AGGREGATE SURFACING

PART 3 EXECUTION

3.1 STOCKPILING MATERIALS
3.2 SUBGRADE PREPARATION
3.3 GRADE CONTROL
3.4 MIXING AND PLACING MATERIALS
3.5 LAYER THICKNESS
3.6 COMPACTION
3.7 SMOOTHNESS TEST
3.8 THICKNESS CONTROL
3.9 DENSITY TESTS
3.10 MAINTENANCE

-- End of Section Table of Contents --

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SECTION 32 15 00

AGGREGATE SURFACE COURSE AND AGGREGATE BASE

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.

ASTM INTERNATIONAL (ASTM)

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 D3740	(2019) Minimum Requirements for Agencies Engaged in the Testing and/or Inspection of Soil and Rock as Used in Engineering Design and Construction
ASTM D6938	(2017a) Standard Test Method for In-Place Density and Water Content of Soil and Soil-Aggregate by Nuclear Methods (Shallow Depth)

STATE OF CALIFORNIA DEPARTMENT OF TRANSPORTATION (CALTRANS)

CALTRANS	State of California Department of Transportation (CALTRANS) Standard Specifications 2023
CDT SS26	(2023) Standard Specifications, SECTION 26: AGGREGATE BASES
CDT Std Specs	(2023) State of California Department of Transportation (CALTRANS) Standard Specifications

1.2 DEGREE OF COMPACTION

Degree of compaction is a percentage of the maximum density obtained by the test procedure presented in ASTM D1557 abbreviated herein as present laboratory maximum density.

1.3 SUBMITTALS

Submit the following in accordance with Section 01 33 00 SUBMITTAL PROCEDURES:

SD-03 Product Data

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Equipment; G

Aggregate Source; G

Aggregate; G

SD-06 Test Reports

Sampling and Testing; G

Density Tests; G

1.3.1 Equipment

Submit list of proposed equipment to be used in performance of construction work including descriptive data.

1.3.2 Aggregate Source

Proposed source of aggregate base with test results showing conformance to these specifications.

1.3.3 Aggregate

Provide report summarizing required testing to verify that aggregate base and aggregate surface course are in compliance with CALTRANS Standard Specifications, Class 2 Aggregate Base (3/4 inch maximum).

1.3.4 Sampling and Testing

Submit a list of proposed equipment to be used in performance of construction work including descriptive data.

1.3.5 Density Tests

The Contractor must provide the following:

1. Calibration curves and related test results prior to using the device or equipment being calibrated.

2. Copies of field test results within 24 hours after the tests are performed.

3. Test results from samples, not less than 30 days before material is required for the work.

4. Results of laboratory tests for quality control purposes, for review, prior to using the material.

1.4 EQUIPMENT

All plant, equipment, and tools used in the performance of the work covered by this section will be subject to review by the Agency before the work is started and must be maintained in satisfactory working condition at all times. The equipment must be adequate and must have the capability of producing the required compaction, and meeting the grade controls, thickness controls, and smoothness requirements set forth herein.

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1.5 SAMPLING AND TESTING

Sampling and testing are the responsibility of the Contractor. Sampling and testing must be performed by an approved commercial testing laboratory or by the Contractor, subject to review by the Agency. If the Contractor elects to establish its own testing facilities, approval of such facilities will be based on compliance with ASTM D3740. No work requiring testing will be permitted until the Contractor's facilities have been inspected and reviewed.

1.6 APPROVAL OF MATERIALS

The source of the material to be used for producing aggregates must be selected 14 calendar days prior to the time the material will be required in the Work. Review of sources not already reviewed will be based on an inspection by the Agency.

1.7 WEATHER LIMITATIONS

It is the responsibility of the Contractor to protect, by reviewed method or methods, all areas of surfacing that have not been accepted by the Agency. Surfaces damaged by freeze, rainfall, or other weather conditions must be brought to a satisfactory condition by the Contractor.

PART 2 PRODUCTS

2.1 AGGREGATES

Provide aggregate base and aggregate surface course in compliance with CALTRANS Standard Specifications, Class 2 Aggregate Base (3/4 inch maximum).

2.2 AGGREGATE SURFACING

Aggregate Surfacing course must conform to CDT Std Specs, CDT SS26 AGGREGATE BASES, Class 2, 3/4 inch maximum. The following exceptions to the requirements are allowed: (1) the operating range for the Minus No. 200 screen is allowed to vary from 3 to 15 percent, (2) the contract compliance range for the Minus No. 200 screen is allowed to vary from 0 to 19 percent, (3) the contract compliance range for the Resistance (R-value) CT 301 (min) is allowed to be 50, (4) the operating range for the Sand Equivalent CT 127 (min) is allowed to be 21, and (5) the contract compliance range, for the Sand Equivalent CT 127 (min) is allowed to be 18. Submit laboratory test report demonstrating that the aggregate surfacing course material meet specified requirements. Perform a laboratory moisture density test in accordance with ASTM D1557 initially prior to use of the material in work.

PART 3 EXECUTION

3.1 STOCKPILING MATERIALS

Prior to stockpiling salvaged material, the storage sites must be cleared and leveled by the Contractor. All materials, including reviewed material available from the salvage operation, must be stockpiled in the manner and at the locations designated. Aggregates must be stockpiled in such a manner that will prevent segregation. Aggregates and binders obtained from different sources must be stockpiled separately.

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3.2 SUBGRADE PREPARATION

Prior to placement of aggregate base or aggregate surface course, the top 12 inches of the subgrade must be compacted as specified in Section 31 00 00 EARTHWORK, Paragraph 3.6.2 COMPACTION OF FILL.

3.3 GRADE CONTROL

During construction, the lines and grades including crown and cross slope indicated for the class 2 aggregate base and aggregate surface course must be maintained by means of line and grade stakes placed by the Contractor in accordance with the GENERAL SPECIFICATIONS.

3.4 MIXING AND PLACING MATERIALS

The materials must be mixed and placed to obtain uniformity of the material and a uniform water content for compaction. The Contractor must make adjustments in mixing, placing procedures, or in equipment to obtain the true grades, to minimize segregation and degradation, to obtain the desired water content, and to ensure a satisfactory aggregate surface.

When the class 2 aggregate base or aggregate surface course is constructed in more than one layer, clean the previously constructed layer of loose and foreign matter by sweeping with power sweepers or power brooms, except that hand brooms may be used in areas where power cleaning is not practicable. Provide adequate drainage during the entire period of construction to prevent water from collecting or standing on the working area.

DRAFT

3.5 LAYER THICKNESS

No individual layer may be thicker than 6 inches nor be thinner than 3 inches in compacted thickness.

3.6 COMPACTION

Each layer of class 2 aggregate base or aggregate surface course must be compacted with approved compaction equipment. The water content during the compaction procedure must be maintained at optimum or at the percentage specified by the Agency. In locations not accessible to the rollers, the mixture must be compacted with mechanical tampers. Compaction must continue until each layer through the full depth is compacted to at least 95 percent of laboratory maximum density in accordance with ASTM D1557. Any materials that are found to be unsatisfactory must be removed and replaced with satisfactory material or reworked to produce a satisfactory material.

3.7 SMOOTHNESS TEST

The surface of each layer cannot show any deviations in excess of 3/8 inch when tested with a 10 foot straightedge applied both parallel with and at right angles to the centerline of the area. Deviations exceeding this amount must be corrected by removing material, replacing with new material, or reworking existing material and compacting.

Take measurements in successive positions parallel to the centerline of the area. Also take measurements at 50 foot intervals as measured along the centerline or at least 2 measurements within any area less than 50 feet long.

3.8 THICKNESS CONTROL

The completed thickness of class 2 aggregate base or aggregate surface course must be within 1/2 inch, plus or minus, of the thickness indicated on Plans. Measure the thickness of class 2 aggregate base or aggregate surface course surface at intervals in such manner that there will be a thickness measurement for at least each 500 square yards of the aggregate surface. Make the thickness measurement by test holes at least 3 inches in diameter through the class 2 aggregate base or aggregate surface course.

When the measured thickness of the aggregate surface is more than 1/2 inch deficient in thickness, the Contractor, at no additional expense to the Agency, must correct such areas by scarifying, adding mixture of proper gradation, reblading, and recompacting. Where the measured thickness of the aggregate surface is more than 1/2 inch thicker than that indicated, it must be considered as conforming with the specified thickness requirements plus 1/2 inch. The average job thickness must be the average of the job measurements determined as specified above, but must be within 1/4 inch of the thickness indicated. When the average job thickness fails to meet this criterion, the Contractor, at no additional expense to the Agency, must make corrections by scarifying, adding or removing mixture of proper gradation, and reblading and recompacting.

3.9 DENSITY TESTS

Density is measured in the field in accordance with ASTM D6938. The calibration curves furnished with the moisture gauges must also be checked along with density calibration checks as described in ASTM D6938. The calibration checks of both the density and moisture gauges must be made by the prepared containers of material method, as described in ASTM D6938, on each different type of material being tested at the beginning of a job and at intervals, as directed.

Perform density tests on every lift of material placed and at a frequency of one set of tests for every 250 square yards, or portion thereof, of completed area.

3.10 MAINTENANCE

Maintain the class 2 aggregate base and aggregate surface course in a condition that will meet all specification requirements until accepted.

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DRAFT

SECTION TABLE OF CONTENTS

DIVISION 32 - EXTERIOR IMPROVEMENTS

SECTION 32 17 24

PAVEMENT MARKINGS

PART 1 GENERAL

1.1 SCOPE
1.2 REFERENCES
1.3 SYSTEM DESCRIPTION
1.3.1 Thermoplastic Application Equipment
1.3.1.1 Thermoplastic Material
1.3.1.2 Application Equipment
1.3.1.3 Mobile and Maneuverable
1.3.2 Surface Preparation Equipment
1.3.2.1 Sandblasting Equipment
1.3.2.2 Waterblast Equipment
1.4 SUBMITTALS
1.5 QUALITY ASSURANCE
1.5.1 Qualifications
1.5.2 Traffic Controls
1.5.3 Maintenance of Traffic
1.5.3.1 Roads, Streets, and Parking Areas
1.6 DELIVERY, STORAGE, AND HANDLING
1.7 ENVIRONMENTAL REQUIREMENTS

PART 2 PRODUCTS

2.1 PAINT
2.2 THERMOPLASTIC COMPOUNDS
2.2.1 Composition Requirements
2.2.2 Physical Properties
2.2.2.1 Color
2.2.2.2 Drying Time
2.2.2.3 Softening Point
2.2.2.4 Specific Gravity
2.2.3 Asphalt Concrete Primer
2.2.4 Portland Cement Concrete Primer
2.3 REFLECTIVE MEDIA
2.4 SAMPLING AND TESTING

PART 3 EXECUTION

3.1 SURFACE PREPARATION
3.1.1 Pretreatment for Early Painting
3.1.2 Cleaning Existing Pavement Markings
3.1.3 Cleaning Concrete Curing Compounds
3.2 APPLICATION
3.2.1 Thermoplastic Compounds
3.2.1.1 Longitudinal Markings
3.2.1.2 Primer

DRAFT

3.2.1.3 Markings

-- End of Section Table of Contents --

DRAFT

SECTION 32 17 24

PAVEMENT MARKINGS

PART 1 GENERAL

1.1 SCOPE

Perform striping as specified herein, as shown on the drawings, and as otherwise directed by the Contracting Officer.

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 ASSOCIATION OF STATE HIGHWAY AND TRANSPORTATION OFFICIALS (AASHTO)

AASHTO M 247	(2011) Standard Specification for Glass Beads Used in Pavement Markings

ASTM INTERNATIONAL (ASTM)

ASTM D792	(2013) Density and Specific Gravity (Relative Density) of Plastics by Displacement
ASTM E28	(2014) Softening Point of Resins Derived from Naval Stores by Ring and Ball Apparatus

U.S. GENERAL SERVICES ADMINISTRATION (GSA)

FS TT-B-1325	(Rev D) Beads (Glass Spheres) Retro-Reflective (Metric)
FS TT-P-1952	(Rev E) Paint, Traffic and Airfield Markings, Waterborne

1.3 SYSTEM DESCRIPTION

All machines, tools and equipment used in the performance of the work must be approved and maintained in satisfactory operating condition. Submit lists of proposed equipment, including descriptive data, and notifications of proposed Contractor actions as specified in this section. List of removal equipment must include descriptive data indicating area of coverage per pass, pressure adjustment range, tank and flow capacities, and safety precautions required for the equipment operation. Equipment operating on roads and runways must display low speed traffic markings and traffic warning lights.

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1.3.1 Thermoplastic Application Equipment

1.3.1.1 Thermoplastic Material

Thermoplastic material must be applied to the primed pavement surface by spray techniques or by the extrusion method, wherein one side of the shaping die is the pavement and the other three sides are contained by, or are part of, suitable equipment for heating and controlling the flow of material. By either method, the markings must be applied with equipment that is capable of providing continuous uniformity in the dimensions of the stripe.

1.3.1.2 Application Equipment

a. Application equipment must provide continuous mixing and agitation of the material. Conveying parts of the equipment between the main material reservoir and the extrusion shoe or spray gun must prevent accumulation and clogging. All parts of the equipment which come into contact with the material must be easily accessible and exposable for cleaning and maintenance. All mixing and conveying parts up to and including the extrusion shoes and spray guns must maintain the material at the required temperature with heat-transfer oil or electrical-element-controlled heat.

b. Construct the application equipment to ensure continuous uniformity in the dimensions of the stripe. The applicator must provide a means for cleanly cutting off stripe ends squarely and must provide a method of applying "skiplines". The equipment must be capable of applying varying widths of traffic markings.

c. The applicator must be equipped with a drop-on type bead dispenser capable of uniformly dispensing reflective glass spheres at controlled rates of flow. The bead dispenser must be automatically operated and must begin flow prior to the flow of composition to assure that the strip is fully reflectorized.

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1.3.1.3 Mobile and Maneuverable

Application equipment must be mobile and maneuverable to the extent that straight lines can be followed and normal curves can be made in a true arc. The equipment used for the placement of thermoplastic pavement markings must be of two general types: mobile applicator and portable applicator.

a. Mobile Application Equipment: The mobile applicator must be defined as a truck-mounted, self-contained pavement marking machine that is capable of hot applying thermoplastic by either the extrusion or spray method. The unit must be equipped to apply the thermoplastic marking material at temperatures exceeding 375 degrees F, at widths varying from 3 to 12 inches and in thicknesses varying from 0.020 to 0.190 inch and must have an automatic drop-on bead system. The mobile unit must be capable of operating continuously and of installing a minimum of 20,000 lineal feet of longitudinal markings in an 8-hour day.

(1) The mobile unit must be equipped with a melting kettle which holds a minimum of 6000 pounds of molten thermoplastic material. The kettle must be capable of heating the thermoplastic composition to temperatures of 375 to 425 degrees F. A thermostatically controlled heat transfer liquid must be used.

Heating of the composition by direct flame will not be allowed. Oil and material temperature gauges must be visible at both ends of the kettle.

(2) The mobile unit must be equipped with an electronic programmable line pattern control system. The control system must be capable of applying skip or solid lines in any sequence, through any and all of the extrusion shoes, or the spray guns, and in programmable cycle lengths. In addition, the mobile unit must be equipped with an automatic counting mechanism capable of recording the number of lineal feet of thermoplastic markings applied to the pavement surface with an accuracy of 0.5 percent.

b. Portable Application Equipment: The portable applicator must be defined as hand-operated equipment, specifically designed for placing special markings such as crosswalks, stopbars, legends, arrows, and short lengths of lane, edge and centerlines. The portable applicator must be capable of applying thermoplastic pavement markings by the extrusion method. The portable applicator must be loaded with hot thermoplastic composition from the melting kettles on the mobile applicator. The portable applicator must be equipped with all the necessary components, including a materials storage reservoir, bead dispenser, extrusion shoe, and heating accessories, so as to be capable of holding the molten thermoplastic at a temperature of 375 to 425 degrees F, of extruding a line of 3 to 12 inches in width, and in thicknesses of not less than 0.125 inch nor more than 0.190 inch and of generally uniform cross section.

1.3.2 Surface Preparation Equipment

1.3.2.1 Sandblasting Equipment

Sandblasting equipment must include an air compressor, hoses, and nozzles of proper size and capacity as required for cleaning surfaces to be painted. The compressor must be capable of furnishing not less than 150 cfm of air at a pressure of not less than 90 psi at each nozzle used, and must be equipped with traps that will maintain the compressed air free of oil and water.

1.3.2.2 Waterblast Equipment

Specify the water pressure at 2600 psi at 140 degrees F to adequately clean the surfaces to be marked.

1.4 SUBMITTALS

Government approval is required for submittals with a "G" designation; submittals not having a "G" designation are for information only. Submit the following in accordance with Section 01 33 00 SUBMITTAL PROCEDURES:

SD-03 Product Data

Equipment; G
Composition Requirements
Qualifications

SD-06 Test Reports

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Sampling and Testing

SD-07 Certificates

Volatile Organic Compound (VOC)

1.5 QUALITY ASSURANCE

1.5.1 Qualifications

Submit documentation certifying that pertinent personnel are qualified for equipment operation and handling of chemicals.

1.5.2 Traffic Controls

Place suitable warning signs near the beginning of the worksite and well ahead of the worksite for alerting approaching traffic from both directions. Place small markers along newly painted lines or freshly placed raised markers to control traffic and prevent damage to newly painted surfaces or displacement of raised pavement markers. Mark painting equipment with large warning signs indicating slow-moving painting equipment in operation.

1.5.3 Maintenance of Traffic

1.5.3.1 Roads, Streets, and Parking Areas

When traffic must be rerouted or controlled to accomplish the work, the necessary warning signs, flagpersons, and related equipment for the safe passage of vehicles must be provided.

1.6 DELIVERY, STORAGE, AND HANDLING

Deliver and store all materials in sealed containers that plainly show the designated name, formula or specification number, batch number, color, date of manufacture, manufacturer's name, and directions, all of which must be plainly legible at time of use.

1.7 ENVIRONMENTAL REQUIREMENTS

Pavement surface must be free of snow, ice, or slush. Surface temperature must be at least 40 degrees F and rising at the beginning of operations, except those involving shot or sand blasting. Cease operations during thunderstorms. Cease operations during rainfall, except for waterblasting and removal of previously applied chemicals. Cease waterblasting where surface water accumulation alters the effectiveness of material removal.

PART 2 PRODUCTS

2.1 PAINT

The paint must be homogeneous, easily stirred to smooth consistency, and show no hard settlement or other objectionable characteristics during a storage period of 6 months. Paints for airfields, roads, parking areas, and streets must conform to FS TT-P-1952, color as indicated. Pavement marking paints must comply with applicable state and local laws enacted to ensure compliance with Federal Clean Air Standards. Paint materials must conform to the restrictions of the local Air Pollution Control District.

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2.2 THERMOPLASTIC COMPOUNDS

The thermoplastic reflectorized pavement marking compound must be extruded or sprayed in a molten state onto a primed pavement surface. Following a surface application of glass beads and upon cooling to normal pavement temperatures, the marking must be an adherent reflectorized strip of the specified thickness and width that is capable of resisting deformation by traffic.

2.2.1 Composition Requirements

Submit Manufacturer's current printed product description and Material Safety Data Sheets (MSDS) for each type paint/color proposed for use. The binder component must be formulated as a hydrocarbon resin. The pigment, beads and filler must be uniformly dispersed in the binder resin. The thermoplastic composition must be free from all skins, dirt, and foreign objects and must comply with the following requirements:

Component	Percent by Weight	
	White	Yellow
Binder	17 min.	17 min.
Titanium dioxide	10 min.	-
Glass beads	20 min.	20 min.
Calcium carbonate and inert fillers	49 max.	*
Yellow pigments	-	*
*Amount and type of yellow pigment, calcium carbonate and inert fillers must be at the option of the manufacturer, providing the other composition requirements of this specification are met.		

DRAFT

2.2.2 Physical Properties

2.2.2.1 Color

The color must be as indicated.

2.2.2.2 Drying Time

When installed at 70 degrees F and in thicknesses between 1/8 and 3/16 inch, after curing 15 minutes.

2.2.2.3 Softening Point

The composition must have a softening point of not less than 194 degrees F when tested in accordance with ASTM E28.

2.2.2.4 Specific Gravity

The specific gravity of the composition must be between 1.9 and 2.2 as determined in accordance with ASTM D792.

2.2.3 Asphalt Concrete Primer

The primer for asphalt concrete pavements must be a thermosetting adhesive with a solids content of pigment reinforced synthetic rubber and synthetic plastic resin dissolved and/or dispersed in a volatile organic compound (VOC). Submit certificate stating that the proposed pavement marking paint meets the VOC regulations of the local Air Pollution Control District having jurisdiction over the geographical area in which the project is located. Solids content must not be less than 10 percent by weight at 70 degrees F and 60 percent relative humidity. A wet film thickness of 0.005 inch plus or minus 0.001 inch, must dry to a tack-free condition in less than 5 minutes.

2.2.4 Portland Cement Concrete Primer

The primer for Portland cement concrete pavements must be an epoxy resin primer. The primer must be of the type recommended by the manufacturer of the thermoplastic composition. Epoxy primers recommended by the manufacturer must be approved by the Contracting Officer prior to use. Requests for approval must be accompanied with technical data, instructions for use, and a 1 quart sample of the primer material.

2.3 REFLECTIVE MEDIA

Reflective media for airfields must conform to FS TT-B-1325, Type I, Gradation A. Reflective media for roads and streets must conform to FS TT-B-1325, Type I, Gradation A or AASHTO M 247, Type I.

2.4 SAMPLING AND TESTING

Store materials proposed for use on the project site in sealed and labeled containers, or segregated at source of supply, sufficiently in advance of needs to allow 60 days for testing. Submit certified copies of the test reports, prior to the use of the materials at the jobsite. Testing must be performed in an approved independent laboratory. Upon notification by the Contractor that the material is at the site or source of supply, a sample must be taken by random selection from sealed containers in the presence of the Contracting Officer. Samples must be clearly identified by designated name, specification number, batch number, manufacturer's formulation number, project contract number, intended use, and quantity involved. Testing must be performed in an approved independent laboratory. If materials are approved based on reports furnished by the Contractor, samples will be retained by the Government for possible future testing should the material appear defective during or after application.

PART 3 EXECUTION

3.1 SURFACE PREPARATION

Thoroughly clean surfaces to be marked before application of the pavement marking material. Dust, dirt, sand blasting,and other granular surface deposits must be removed by sweeping, blowing with compressed air, rinsing with water or a combination of these methods as required. Rubber deposits, surface laitance, existing paint markings, and other coatings adhering to the pavement must be completely removed with scrapers, wire brushes, sandblasting, approved chemicals, or mechanical abrasion as directed. Areas of old pavement affected with oil or grease must be scrubbed with several applications of trisodium phosphate solution or other approved detergent or degreaser, and rinsed thoroughly after each

DRAFT

application. After cleaning, oil-soaked areas must be sealed with cut shellac to prevent bleeding through the new paint. Allow pavement surfaces to dry, when water is used for cleaning, prior to striping or marking. Surfaces must be recleaned, when work has been stopped due to rain.

3.1.1 Pretreatment for Early Painting

Where early painting is required on rigid pavements, apply a pretreatment with an aqueous solution, containing 3 percent phosphoric acid and 2 percent zinc chloride, to prepared pavement areas prior to painting.

3.1.2 Cleaning Existing Pavement Markings

In general, markings must not be placed over existing pavement marking patterns. Remove existing pavement markings, which are in good condition but interfere or conflict with the newly applied marking patterns. Deteriorated or obscured markings that are not misleading or confusing or interfere with the adhesion of the new marking material do not require removal. New preformed and thermoplastic pavement markings must not be applied over existing preformed or thermoplastic markings. Whenever grinding, scraping, sandblasting or other operations are performed the work must be conducted in such a manner that the finished pavement surface is not damaged or left in a pattern that is misleading or confusing. When these operations are completed, blow off the pavement surface with compressed air to remove residue and debris resulting from the cleaning work.

3.1.3 Cleaning Concrete Curing Compounds

On new portland cement concrete pavements, cleaning operations must not begin until a minimum of 30 days after the placement of concrete. All new concrete pavements must be cleaned by either sandblasting or water blasting. When water blasting is performed, thermoplastic and preformed markings must be applied no sooner than 24 hours after the blasting has been completed. The extent of the blasting work must be to clean and prepare the concrete surface as follows:

a. There is no visible evidence of curing compound on the peaks of the textured concrete surface.

b. There are no heavy puddled deposits of curing compound in the valleys of the textured concrete surface.

c. All remaining curing compound is intact; all loose and flaking material is removed.

d. The peaks of the textured pavement surface are rounded in profile and free of sharp edges and irregularities.

e. The surface to be marked is dry.

3.2 APPLICATION

All pavement markings and patterns must be placed as shown on the plans.

3.2.1 Thermoplastic Compounds

Place thermoplastic pavement markings upon dry pavement; surface dry only

DRAFT

will not be considered an acceptable condition. At the time of installation, the pavement surface temperature must be a minimum of 40 degrees F and rising. Thermoplastics, as placed, must be free from dirt or tint.

3.2.1.1 Longitudinal Markings

All centerline, skipline, edgeline, and other longitudinal type markings must be applied with a mobile applicator. All special markings, crosswalks, stop bars, legends, arrows, and similar patterns must be placed with a portable applicator, using the extrusion method.

3.2.1.2 Primer

After surface preparation has been completed the asphalt and/or concrete pavement surface must be primed. The primer must be applied with spray equipment. Allow primer materials to "set-up" prior to applying the thermoplastic composition. Allow the asphalt concrete primer to dry to a tack-free condition, usually occurring in less than 10 minutes. Allow the Portland cement concrete primer to dry in accordance with the thermoplastic manufacturer's recommendations. To shorten the curing time of the epoxy resins an infrared heating device may be used on the concrete primer.

a. Asphalt Concrete Primer: Primer must be applied to all asphalt concrete pavements at a wet film thickness of 0.005 inch, plus or minus 0.001 inch (265-400 square feet/gallon).

b. Portland Cement Concrete Primer: Primer must be applied to all concrete pavements (including concrete bridge decks) at a wet film thickness of between 0.04 to 0.05 inch (320-400 square feet/gallon).

3.2.1.3 Markings

After the primer has "set-up", the thermoplastic must be applied at temperatures no lower than 375 degrees F nor higher than 425 degrees F at the point of deposition. Immediately after installation of the marking, drop-on glass spheres must be mechanically applied so that the spheres are held by and imbedded in the surface of the molten material.

a. Extruded Markings: All extruded thermoplastic markings must be applied at the specified width and at a thickness of not less than 0.125 inch nor more than 0.190 inch.

b. Sprayed Markings: All sprayed thermoplastic markings must be applied at the specified width and the thicknesses designated in the contract plans. If the plans do not specify a thickness, centerline markings must be applied at a wet thickness of 0.090 inch, plus or minus 0.005 inch, and edgeline markings at a wet thickness of 0.060 inch plus or minus 0.005 inch.

c. Reflective Glass Spheres: Immediately following application, drop reflective glass spheresonto the molten thermoplastic marking at the rate of 1 pound/20 square feet of compound.

-- End of Section --

DRAFT

SECTION TABLE OF CONTENTS

DIVISION 32 - EXTERIOR IMPROVEMENTS

SECTION 32 31 13

CHAIN LINK FENCES AND GATES

PART 1 GENERAL

1.1 REFERENCES
1.2 SUBMITTALS
1.3 QUALITY CONTROL
1.3.1 Certificates of Compliance
1.4 DELIVERY, STORAGE, AND HANDLING

PART 2 PRODUCTS

2.1 SYSTEM DESCRIPTION
2.2 COMPONENTS
2.2.1 Fabric
2.2.1.1 Top and Bottom Selvages
2.2.2 Posts, Top Rail, and Braces
2.2.3 Corner Posts
2.2.4 Post Tops
2.2.5 Wire Ties
2.3 MATERIALS
2.3.1 Tension Wire
2.3.2 Concrete
2.3.3 Grout

PART 3 EXECUTION

3.1 PREPARATION
3.1.1 Clearing and Grading
3.2 INSTALLATION
3.2.1 Fence Installation
3.2.1.1 Post Spacing
3.2.1.2 Top and Bottom Tension Wire
3.2.2 Excavation
3.2.3 Setting Posts
3.2.3.1 Bracing
3.2.4 Concrete Strength
3.2.5 Top Rails
3.2.6 Tension Wire Installation
3.2.7 Fabric Installation
3.2.8 Tie Wires
3.2.9 Fasteners
3.2.10 Zinc-Coating Repair
3.2.11 Accessories Installation
3.2.11.1 Post Caps
3.2.11.2 Fence Slats
3.3 CLOSEOUT ACTIVITIES

DRAFT

-- End of Section Table of Contents --

DRAFT

SECTION 32 31 13

CHAIN LINK FENCES AND GATES

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.

ASTM INTERNATIONAL (ASTM)

ASTM A116	(2011) Standard Specification for Metallic-Coated, Steel Woven Wire Fence Fabric
ASTM A392	(2011a; R 2017) Standard Specification for Zinc-Coated Steel Chain-Link Fence Fabric
ASTM A702	(2013) Standard Specification for Steel Fence Posts and Assemblies, Hot Wrought
ASTM C94/C94M	(2020) Standard Specification for Ready-Mixed Concrete
ASTM F567	(2014a) Standard Practice for Installation of Chain Link Fence
ASTM F626	(2014) Standard Specification for Fence Fittings
ASTM D1238	(2013) Melt Flow Rates of Thermoplastics by Extrusion Plastometer
ASTM D1505	(2018) Standard Test Method for Density of Plastics by the Density-Gradient Technique
ASTM D638	(2014) Standard Test Method for Tensile Properties of Plastics
ASTM F1043	(2018) Standard Specification for Strength and Protective Coatings on Steel Industrial Fence Framework
ASTM F1083	(2018) Standard Specification for Pipe, Steel, Hot-Dipped Zinc Coated (Galvanized) Welded, for Fence Structures

U.S. GENERAL SERVICES ADMINISTRATION (GSA)

FS RR-F-191/4	(Rev F) Fencing, Wire and Post, Metal (Chain-Link Fence Accessories)

DRAFT

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

Fence Assembly; G

Location of Gate, Corner, End, and Pull Posts; G

Gate Assembly; G

Erection/Installation Drawings; G

SD-03 Product Data

Fence Assembly; G

Zinc Coating; G

PVC Coating; G

Fabric; G

Concrete; G

SD-04 Samples

Fabric; G

Posts; G

Braces; G

Top Rail; G

Tension Wire; G

Wire Ties; G

SD-07 Certificates

Certificates of Compliance

SD-08 Manufacturer's Instructions

Fence Assembly

Hardware Assembly

Accessories

SD-11 Closeout Submittals

DRAFT

Recycled Material Content

1.3 QUALITY CONTROL

1.3.1 Certificates of Compliance

Submit certificates of compliance in accordance with the applicable reference standards and descriptions of this section for the following:

a. Zinc coating

b. PVC coating

c. Aluminum alloy coating

d. Fabric

e. Stretcher bars

f. Gate hardware and accessories

g. Concrete

1.4 DELIVERY, STORAGE, AND HANDLING

Deliver materials to site in an undamaged condition. Store materials off the ground to provide protection against oxidation caused by ground contact.

DRAFT

PART 2 PRODUCTS

2.1 SYSTEM DESCRIPTION

Provide fencing materials conforming to the requirements of ASTM A116, ASTM A702, ASTM F626.

Submit reports of listing chain-link fencing and accessories regarding weight in ounces for zinc coating, thickness of PVC coating.

Submit manufacturer's catalog data for complete fence assembly, gate assembly, hardware assembly and accessories.

2.2 COMPONENTS

2.2.1 Fabric

Provide fabric consisting of No. 9-gage wires woven into a 2 inch diamond mesh, and be galvanized after weaving conforming to ASTM A392, Class 1.

Provide one-piece fabric widths for fence heights up to 8 feet.

Fabric for 6 foot tall fence to be coated with black vinyl.

2.2.1.1 Top and Bottom Selvages

Provide knuckled selvages at top and bottom for fabric with 2 inch mesh and up to 60 inches high, and if over 60 inches high, provide twisted and barbed top selvage and knuckled bottom selvage.

2.2.2 Posts, Top Rail, and Braces

Fence line and corner posts must be 5 inch Nominal Pipe Size (NPS) round steel pipe, schedule 40 in accordance with ASTM F1083, and meeting the strength and stiffness requirements of ASTM F1043.

2.2.3 Corner Posts

Posts, Top Rail, and Braces for 6 foot tall fence to be coated with black vinyl.

Corner posts must be braced in accordance with Caltrans Standard Drawing A-85.

2.2.4 Post Tops

Provide tops that are steel, wrought iron, or malleable iron designed as a weathertight closure cap. Provide one cap for each post, unless equal protection is provided by a combination post-cap and wire supporting arm. Provide caps with an opening to permit through passage of the top rail.

2.2.5 Wire Ties

Provide 9-gage galvanized steel wire for tying fabric to line posts, spaced 12 inches on center. For tying fabric to rails and braces, space wire ties 24 inches on center. For tying fabric to tension wire, space 0.105-inch hog rings 24 inches on center.

Manufacturer's standard procedure will be accepted if of equal strength and durability.

FS RR-F-191/4. Provide wire ties constructed of the same material as the fencing fabric.

DRAFT

2.3 MATERIALS

2.3.1 Tension Wire

Provide galvanized, coiled spring wire, No. 7-gage. Provide zinc coating that weighs not less than 2.0 ounces per square foot.

2.3.2 Concrete

Provide concrete conforming to ASTM C94/C94M and obtaining a minimum 28-day compressive strength of 3,000 psi.

2.3.3 Grout

Provide grout of proportions one-part portland cement to three parts clean, well-graded sand and a minimum amount of water to produce a workable mix.

PART 3 EXECUTION

Submit manufacturer's erection/installation drawings and instructions that detail proper assembly and materials in the design for fence, gate, hardware and accessories.

Provide complete installation conforming to ASTM F567.

3.1 PREPARATION

Ensure final grading and established elevations are complete prior to commencing fence installation.

3.1.1 Clearing and Grading

Clear fence line of trees, brush, and other obstacles to install fencing for a distance of 3 feet inside; and 3 feet outside the fence. Establish a graded, compacted fence line prior to fencing installation.

3.2 INSTALLATION

3.2.1 Fence Installation

Install fence on prepared surfaces to line and grade indicated. Install fence in accordance with fence manufacturer's written installation instructions except as modified herein.

3.2.1.1 Post Spacing

Provide line posts spaced equidistantly apart, not exceeding 10 feet on center for 6-foot tall fence. Not exceeding 5-feet on center for 8-foot tall fence. Provide gate posts spaced as necessary for size of gate openings. Do not exceed 500 feet on straight runs between braced posts. Provide corner or pull posts, with bracing in both directions, for changes in direction of 15 degrees or more, or for abrupt changes in grade. Submit drawings showing location of gate, corner, end, and pull posts.

3.2.1.2 Top and Bottom Tension Wire

Install top and bottom tension wires before installing chain-link fabric, and pull wires taut. Place top and bottom tension wires within 8 inches of respective fabric line.

DRAFT

3.2.2 Excavation

Provide excavations for post footings which are in virgin or compacted soil, of minimum sizes as indicated.

Space footings for line posts 10 feet on center maximum and at closer intervals when indicated, with bottoms of the holes approximately 3 inches below the bottoms of the posts. Set bottom of each post not less than 36 inches below finished grade when in firm, undisturbed soil. Set posts deeper, as required, in soft and problem soils and for heavy, lateral loads.

3.2.3 Setting Posts

Remove loose and foreign materials from holes and moisten the soil prior to placing concrete.

Provide tops of footings that are trowel finished and sloped or domed to shed water away from posts. Set hold-open devices, sleeves, and other accessories in concrete.

Keep exposed concrete moist for at least 7 calendar days after placement or cured with a membrane curing material, as approved.

Maintain vertical alignment of posts in concrete construction until concrete has set.

3.2.3.1 Bracing

Brace gate, corner, end, and pull posts to nearest post with a horizontal brace used as a compression member, placed at least 12 inches below top of fence, and a diagonal tension rod.

3.2.4 Concrete Strength

Provide concrete that has attained at least 75 percent of its minimum 28-day compressive strength, but in no case sooner than 7 calendar days after placement, before rails, tension wire, or fabric are installed. Do not stretch fabric and wires or hang gates until the concrete has attained its full design strength.

3.2.5 Top Rails

Provide top rails that run continuously through post caps or extension arms, bending to radius for curved runs. Provide expansion couplings as recommended by the fencing manufacturer.

3.2.6 Tension Wire Installation

Install tension wire by weaving them through the fabric and tying them to each post with not less than 7-gage galvanized wire or by securing the wire to the fabric with 10-gage ties or clips spaced 24 inches on center.

3.2.7 Fabric Installation

Provide fabric in single lengths between stretch bars with bottom barbs placed approximately 1-1/2 inches above the ground line. Pull fabric taut and tied to posts, rails, and tension wire with wire ties and bands.

3.2.8 Tie Wires

Provide tie wires that are U-shaped to the pipe diameters to which attached. Twist ends of tie wires not less than two full turns and bent so as not to present a hazard.

3.2.9 Fasteners

Install nuts for tension bands and hardware on the side of the fence opposite the fabric side. Peen ends of bolts to prevent removal of nuts.

3.2.10 Zinc-Coating Repair

Clean and repair galvanized surfaces damaged by welding or abrasion, and cut ends of fabric, or other cut sections with specified galvanizing repair material applied in strict conformance with the manufacturer's printed instructions.

DRAFT

3.2.11 Accessories Installation

3.2.11.1 Post Caps

Install post caps as recommended by the manufacturer.

3.2.11.2 Fence Slats

The slatted chain link fence must be 8 feet tall with posts spaced at 5 feet on center. Fence slats must consist of HDPE material with UV inhibitors, with a melt index of 0.08 minimum (ASTM D1238), density of 0.95 minimum (ASTM D1505), and tensile strength of 3,700 psi minimum (ASTM D638), and provide a 85% minimum privacy factor. Slat color to be determined by the property owner.

3.3 CLOSEOUT ACTIVITIES

Remove waste fencing materials and other debris from the work site.

Submit manufacturer's data indicating percentage of recycled material content in protective fence materials, including chain link fence, fabric, and gates to verify affirmative procurement compliance.

-- End of Section --

DRAFT

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DRAFT

SECTION TABLE OF CONTENTS

DIVISION 32 - EXTERIOR IMPROVEMENTS

SECTION 32 92 33

GRASS SEEDING AND EROSION CONTROL

PART 1 GENERAL

1.1 DESCRIPTION
1.2 REFERENCES
1.3 PERFORMANCE STANDARDS
1.3.1 Grass Performance Standards
1.4 SUBMITTALS
1.4.1 Equipment
1.4.2 Seed Samples and Seed Materials
1.4.3 Invoices
1.4.4 Installer's Qualification
1.4.5 Wood Fiber
1.4.6 Survey of Area Hydroseeded
1.5 DELIVERY, STORAGE, AND HANDLING
1.5.1 Delivery
1.5.2 Storage
1.5.3 Handling
1.6 TIMES AND CONDITIONS
1.6.1 Grass Seeding Times
1.6.2 Grass Seeding Conditions
1.7 WARRANTY
1.8 QUALITY ASSURANCE

PART 2 PRODUCTS

2.1 BACKFILL SOIL AND TOPSOIL
2.1.1 Topsoil
2.2 GRASS SEED
2.2.1 Seed Classification
2.2.2 Seed Quality
2.2.3 Seed Species and Seeding Rate
2.2.4 Seed Mixing
2.2.5 Substitutions
2.3 WOOD FIBER MULCH
2.4 FERTILIZER
2.5 TACKIFIER
2.6 STRAW MULCH
2.7 BONDED FIBER MATRIX
2.8 STRAW WATTLES
2.8.1 Straw Wattles Reports
2.9 WOODEN WEDGE STAKES
2.10 EROSION CONTROL BLANKETS
2.10.1 ECTC Type 2.D Erosion Control Blankets
2.10.2 ECTC Type 3.B Erosion Control Blankets
2.10.3 ECTC Type 4 Erosion Control Blankets
2.11 COIR FIBER ROLLS

DRAFT

2.12 TESTS, INSPECTIONS, AND VERIFICATIONS
2.12.1 Seeding Operations
2.12.1.1 Inspection of Seed, Equipment and Quantities
2.12.1.2 Inspection of Seeding Operation
2.12.1.3 Inspection of Seed Growth and Establishment
2.12.1.4 Seeding Acceptance
2.12.2 Straw Wattle Operations
2.12.3 Straw Mulching Operations

PART 3 EXECUTION

3.1 APPLICATIONS
3.1.1 Slope Applications
3.1.2 Channels and Ditch Applications
3.2 LAYOUT
3.3 SOIL PREPARATION
3.4 TRENCHING
3.5 SEEDING AND MULCHING
3.5.1 Seed Application Method
3.5.1.1 Hydroseeding with Wood Fiber Mulch
3.5.2 Applying Straw Mulch
3.5.3 Applying Tackifier
3.5.4 Hydroseeding with Bonded Fiber Matrix
3.6 INSTALLING STRAW WATTLES AND COIR ROLLS
3.7 INSTALLING EROSION CONTROL BLANKETS
3.8 INSTALLING CHECK DAMS
3.9 REPAIRING OF DAMAGED OR UNSUCCESSFUL GRASS STANDS
3.10 ESTABLISHMENT
3.10.1 Seed Establishment Period
3.10.2 Protection
3.11 MAINTENANCE RECORD
3.12 REPAIR
3.12.1 General
3.12.2 Reseeding
3.13 FIELD QUALITY CONTROL
3.14 CLEANUP

-- End of Section Table of Contents --

DRAFT

SECTION 32 92 33

GRASS SEEDING AND EROSION CONTROL

PART 1 GENERAL

1.1 DESCRIPTION

The work covered in this section consists of furnishing all material, equipment and labor for the seeding of grass and installation of erosion control material for long-term soil stability. This specification addresses the work required to provide grass seed on all bare and disturbed soil within the project limits of work. It is the intent of this specification to protect all bare and disturbed soil with mature grass. Where establishing grass is not possible or cannot be achieved, provide long-term erosion and sediment control.

Provide long-term erosion control measures and materials to ensure soil does not erode during inclement weather and migrate during grass establishment. Provide soil protection for a period of time from contract award until grass is established. If grass is not established by 1 October, provide erosion and sediment control materials until grass has successfully established. In addition to the temporary storm water pollution control measures required in specification Section 01 57 23 TEMPORARY STORM WATER POLLUTION CONTROL, provide long-term protection using grass seeding and erosion and sediment control measures and materials.

DRAFT

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.

CALIFORNIA DEPARTMENT OF FOOD AND AGRICULTURE (CDFA)

CDFA Guide 5101 and 5205	Guidelines under California Food and Agriculture Code Section 5101 and 5205 For The Certification Of Weed Free Forage, Hay, Straw And Mulch

TECHNICAL ASSOCIATION OF THE PULP AND PAPER INDUSTRY (TAPPI)

TAPPI T413 OM	(2002) Ash in Wood, Pulp, Paper and Paperboard: Combustion at 900 Degrees Celsius

U.S. DEPARTMENT OF AGRICULTURE (USDA)

AMS Seed Act	(1940; R 1988; R 1998) Federal Seed Act

1.3 PERFORMANCE STANDARDS

1.3.1 Grass Performance Standards

The successful establishment of grass on all bare, disturbed, or damaged soil is the ultimate long-term goal of the requirements indicated herein. If at the end of the contract, and the grass performance standard has not been met, complete the installation of appropriate long-term erosion control materials that protect and stabilize the soil.

The successful establishment of grass is defined as having a minimum of 81 grass plants per square foot. The total bare soil areas (those areas with less than 81 grass plants per square foot) must not exceed one percent of the total seeded project area. Provide erosion control so that no erosive characteristics exists on site. If there are erosion reels, ruts, gullies, or other types of erosion occurring, repair these areas, reseed them, and provide appropriate long-term erosion control materials, such as, blankets, wattles, etc. to correct the problem.

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

Erosion and sediment control plan; G

Seed Establishment Period

SD-02 Shop Drawings

Layout; G

Erosion and Sediment Control Scale Drawings; G

SD-03 Product Data

Straw Mulch; G

Tackifier; G

Grass Seed; G

Wood Fiber; G

Straw Wattles; G

Equipment

SD-04 Samples

Straw Mulch

Tackifier

DRAFT

Seed Samples

Seed Materials

Wood Fiber

Straw Wattles Samples

SD-06 Test Reports

Straw Mulch

Tackifier

Wood Fiber

Straw Wattles Reports

Maintenance Record

SD-07 Certificates

Invoices

Straw Mulch

Tackifier

State-Certified Seed Mix

Wood Fiber

Straw Wattle Certificates

Installer's Qualification

Wood Fiber

SD-09 Manufacturer's Field Reports

Survey of Area Hydroseeded

DRAFT

1.4.1 Equipment

A listing of equipment to be used for the application of erosion control materials.

1.4.2 Seed Samples and Seed Materials

The Contracting Officer may at any time, request, test, and analyze seed materials including the seed mix or mulch to ensure their conformance to these Specifications. The Contractor must furnish, at no additional cost, the requested materials for the Government's use. Seed materials not meeting the Government's approval must immediately be removed from the project site at the Contractor's expense. The Contractor must incur any additional expenses required because of materials not meeting the requirements of these Specifications. The following must be submitted by the Contractor according to submittal procedures included in the Contract. The Contractor must furnish, at no additional cost, the requested

materials for the Contracting Officer's approval.

1. Seed mix verification by way of certified mix labels from supplier in sealed seed mix bags. In addition, the Contractor must submit a 5 pound bag of the seed mix for approval before any seeding operations.

2. Before delivery of mulch material to the project site, the Contractor must provide the material order and the name, address and telephone number of the material supplier. In addition, the Contractor must submit mulch material samples in 5 pound bags, each, for approval before any seeding operations.

1.4.3 Invoices

Duplicate copies of invoices for all materials.

1.4.4 Installer's Qualification

The installer's company name and address; training and experience and/or certification.

1.4.5 Wood Fiber

Certification stating that wood components of 100 percent wood fiber and obtained from managed forests.

1.4.6 Survey of Area Hydroseeded

Provide the Survey of Area Hydroseeded performed by a registered land surveyor.

1.5 DELIVERY, STORAGE, AND HANDLING

1.5.1 Delivery

Perform preparation for shipment in a manner that will not damage seeds, pesticides and all other material. Protect seeds, pesticides and all other material from weather and contamination during delivery. Furnish erosion control blankets and fiber rolls in rolls with suitable wrapping to protect against moisture and extended ultraviolet exposure prior to placement. Label erosion control blankets and fiber rolls to provide identification sufficient for inventory and quality control purposes.

1.5.2 Storage

Store material in areas approved by the Contracting Officer. Store in cool, dry locations out of direct sunlight and away from contaminants. Do not store chemical and pesticide material with other landscape materials and store in a spillage contained area. Keep mulch covered and protected from rain.

1.5.3 Handling

Except for bulk deliveries, do not drop our dump material from trucks.

DRAFT

1.6 TIMES AND CONDITIONS

1.6.1 Grass Seeding Times

Submit an erosion and sediment control plan for approval. Provide grass seed to all bare and disturbed soil for long-term stability. All contractor performed seeding must be completed between November 1st and November 30th. Seeding after November 30 requires prior approval of the Contracting Officer and may require adjustment to seeding process. All areas not immediately affected by continuing construction operations must be seeded as soon as possible within the time period specified. The seeding operation must be halted when, in the opinion of the Government, conditions of high winds, excessive moisture, or other factors are not conducive to satisfactory results.

A desirable stand of grass is as indicated herein in the paragraph titled Grass Performance Standards. No variance to the start date will be allowed unless given in writing by the Contracting Officer.

Provide all long-term erosion and sediment control measures in-place. Long-term erosion control is defined as having an established stand of grass that meets the performance standards and is capable of protecting the soil against an average yearly rainfall. Where the grass is not yet established by the end of the contract, provide long-term erosion and sediment control blankets and wattles. Submit erosion and sediment control scale drawings defining areas to receive recommended materials as required by federal, state or local regulations.

1.6.2 Grass Seeding Conditions

Perform seeding operations only during periods when beneficial results can be obtained. Stop work when excessive moisture, winds or other unsatisfactory conditions prevail, when directed by the Contracting Officer. Schedule planting in the mornings to avoid stressing plants during seeding, if the planting schedule calls for installation when the temperature is expected to be 90 degrees Fahrenheit or greater. When special conditions warrant a variance to the planting operations, submit a proposed seeding time in writing for approval by the Contracting Officer. Prepare to seed at the earliest time when all conditions (weather, moisture, temperature, tides and river flows, etc.) are acceptable.

1.7 WARRANTY

All equipment and material used must meet all State and local codes and regulations and guaranteed to function properly for the duration of the contract period.

1.8 QUALITY ASSURANCE

There are no substitutions of seed species or variety as shown in seed mix table unless authorized by the Contracting Officer.

Seed materials, including the seed mix and mulch, must be delivered by the Contractor to the job site with durable, waterproof labels indicating the correct species, variety, percent live seed (PLS) and other certifications, and the supplier's name, in conformance to these Specifications. The Government will observe the seed mix and mulch material as it is being delivered to the site for conformity to these Specifications. Such approvals must not impair the right of additional

DRAFT

observations during further progress of the work.

The Contractor is responsible for storing and maintaining the seed mix and mulch as delivered throughout the Construction Period.

PART 2 PRODUCTS

2.1 BACKFILL SOIL AND TOPSOIL

All fill must be free of rubbish, organic material (except topsoil), frozen soil, muck, other perishable compressible debris which would prevent dense, uniform compaction or any substance that can be harmful to plant growth; no woody material cleared from the site must be allowed in the fill. Limit rock and other hard, durable fragments to particles with a maximum dimension of four inches. The rock fragments must not exceed 10 percent of the total volume and must be uniformly distributed throughout the material.

Muddy over-saturated soils, which otherwise meet these requirements must not be considered suitable materials until they have been dried to workable moisture content. Waste off-site any excess soil, and soil found to be unsuitable, and any work activity debris. Acceptability of materials used as fill must be based on visual inspection by the Contracting Officer. Any questionable materials may require testing to check for conformance.

2.1.1 Topsoil

Topsoil material must meet the U.S. Department of Agriculture (USDA) definition of soil taxonomy for topsoil. Topsoil must consist of loose, friable, partly organic soil capable of supporting plant growth that has a textural classification of sandy clay loam, sandy loam, or loam soil as defined by the USDA, and as defined therein. Unless it is classified as a balanced loam, the sand content must range from 60-80 percent; and the silt-clay content must range from 20-40 percent. It must have a chemical balance pH from 6.0 to 7.5.

For topsoil, rock and other hard, durable fragments must be limited to particles displaying a maximum dimension of two inches. The rock fragments must not exceed 10 percent of the total volume and must be uniformly distributed throughout the material. Topsoil may be obtained from any source that meets the referenced characteristics, including onsite.

2.2 GRASS SEED

Provide seed for the species, at the quantity, and rate as specified below.

2.2.1 Seed Classification

Provide State-certified seed mix of the latest season's crop in original sealed packages bearing the producer's guaranteed analysis for percentages of mixture, purity, germination, hard seed, weed seed content, and inert material. All labels must conform to the AMS Seed Act and applicable state seed laws. Include classification, botanical name, common name, percent pure live seed, minimum percent germination and hard seed, maximum percent weed seed content, and date tested.

DRAFT

2.2.2 Seed Quality

Weed seed must not exceed 1 percent by weight of the total of each species. Reject and remove wet, moldy, insect infested or otherwise damaged seed from project site. Reject and remove open containers of seed or improperly tagged containers from project site.

2.2.3 Seed Species and Seeding Rate

The following seed mix must be applied to disturbed areas as indicated in the execution of this Contract. There are no substitutions of seed species or variety as shown in the mix table unless approved by Contracting Officer. Material other than seed of the designated species may contain weed seed not exceeding 0.5 percent of the aggregate weight of pure live seed (PLS) and other material. PLS is typically a percentage of Bulk pounds per acre and varies with the purity of each seed batch. Therefore Contractor must apply seed in Bulk pounds per acre sufficient to match the PLS application rates shown in the table.

TABLE A1 GRASS SEED MIXTURE		
Botanical Name	Common Name	Pounds PLS per Acre
		Hydro-seeding and Broadcast Seeding
Elymus glaucus	Blue wildrye	8
Elymus trachycaulis	Slender wheatgrass	8
Elymus triticoides	Creeping wildrye	10
Hordeum brachyantherum ssp. Californicum	California barley	3
Poa secunda ssp. secunda	Pine bluegrass	3
Stipa pulchra	Purple needlegrass	12
Vulpia Microstachys	Small fescue	8
Trifolium Wildenovii	Tomcat clover	2
Eschsholzia Californica	California poppy	2
TOTAL SEED MIXTURE		56
PLS = "Pure Live Seed"; PLS seeding rates account for variation in purity and germination rates of bulk seed between seed lots, and PLS is a certified rating by seed suppliers.		

DRAFT

2.2.4 Seed Mixing

Perform seed mixing in the presence of the Contracting Officer.

2.2.5 Substitutions

No substitutions without a written request and approval from the Contracting Officer.

2.3 WOOD FIBER MULCH

Use commercially available wood fiber mulch produced from 100 percent virgin wood fiber. Use fiber that disperses uniformly into the slurry when mixed with water. The water content of the fiber before mixing into the slurry must not exceed 15 percent of the dry weight of the fiber. Provide a clearly marked fiber moisture content on the package. Do not use corrugated cardboard, recycled newspaper, or a combination of recycled newspaper and wood fiber.

Provide fiber that does not contain more than 7 percent ash as determined by TAPPI T413 OM, and is nontoxic to plant or animal life.

Provide fiber must have a water-holding capacity by weight of not less than 1,100 percent. Water-holding capacity of the fiber must be clearly marked on the package.

Provide a colored fiber to contrast the area on which the fiber is to be applied, and is nontoxic to plant and animal life and does not stain concrete or painted surfaces.

2.4 FERTILIZER

Fertilizer is not required.

2.5 TACKIFIER

Provide a concentrated, biodegradable and organic derivative tackifier of the Plantago plant (Plantago insularis) that is non-toxic to plant and animal life, non-corrosive, and non-crystalline and be non-staining to concrete or painted surfaces. Stabilizing emulsion must be in a dry powder form, may be re-emulsifiable.

2.6 STRAW MULCH

Use straw stalks from, in order of preference: native grasses or rice furnished in air-dry condition and with a consistency for placing with commercial mulch blowing equipment. Do not use wheat or barley straw. Certify all straw as weed-free. The Contractor must obtain evidence that clearance has been obtained from the County Agricultural Commissioner, as required by law, before straw obtained from outside the county in which it is to be used is delivered to the site of the work. Straw that has been used for stable bedding cannot be used. Straw must be free of mold. Straw must be cured and dry with no water added after baling.

2.7 BONDED FIBER MATRIX

Provide Bonded Fiber Matrix (BFM) manufactured to be hydraulically applied, and upon drying, adheres to the soil in the form of a continuous, 100 percent coverage, biodegradable, erosion control blanket. It must not negatively affect the germination and development of grass seed. Provide a BFM that is comprised of long strand, thermally produced wood fibers passing a freeness test. Conform to the following standards and minimum values.

Provide a BFM that has the following properties and characteristics:

- Mass per unit area: 12.0 ounces/sq yard

DRAFT

- Thickness: 0.19 inches
- Ground cover: 99 percent
- Water holding capacity: 1,500 percent
- Cure time: less than 2 hours.
- Functional longevity: 18 months
- Effectiveness: greater than 99 percent
- Vegetation establishment: 800 percent

2.8 STRAW WATTLES

Provide manufacturers literature with current factual information as to the manufacturers and suppliers classifications, including physical characteristics, application and installation instructions. Certify Straw wattles are machine-produced tube 9 inch diameter, plus or minus 1 inch, and 100 percent rice straw-filled tube of flexible netting. Provide straw wattles of compacted rice straw that is Certified Weed Free Forage under CDFA Guide 5101 and 5205. Provide netting must be of 100 percent natural fiber biodegradable netting. Nine inch diameter, 100 percent coir fiber rolls, with natural fiber biodegradable netting, may be substituted in place of straw rolls. Photodegradable plastic netting is not acceptable. Provide wattles or rolls that have a functional longevity of a minimum of 12 months. Submit Straw Wattles Samples for approval.

Provide straw wattle certificates of compliance attesting that straw wattles materials meet the specified requirements prior to delivery. Include the following in the copies of the material certificates:

a) Certification of recycled content,

b) Statement of recycled content,

c) Certification of origin including the name, address and telephone number of manufacturer.

2.8.1 Straw Wattles Reports

Certified reports of inspections and laboratory tests, prepared by an independent testing agency, including analysis and interpretation of test results. Properly identify each report. Describe test methods used and compliance with recognized test standards.

2.9 WOODEN WEDGE STAKES

Provide wooden wedge stakes of Douglas fir or pine, 2 inch x 4 inch tops cut to a point at the base. Provide one 2 inch x 4 inch piece of lumber that produce two identical stakes when cut diagonal from opposite corners along the broad surface of the material. Provide stakes that are 18-inches when placed in cut slopes and 24-inches when used in fill slopes. Drive the stakes in until refusal and capable of securely holding material in place. Do not pound stakes so that the wood splits.

2.10 EROSION CONTROL BLANKETS

Provide erosion control blankets of the following types and as designated by the Erosion Control Technology Council (ECTC). Blankets with single side netting are not acceptable or permitted for use on this project. Use 100 percent natural biodegradable netting or woven fabrics in all areas requiring stitched blankets within 100 feet of a wetland or sensitive habitat. Photodegradable polypropylene nettings are not permitted.

DRAFT

2.10.1 ECTC Type 2.D Erosion Control Blankets

Provide ECTC Type 2.D straw blankets manufactured from 100 percent biodegradable, natural fiber top and bottom netting. Provide blankets that have a functional longevity of 12 months for providing erosion protection and mulching. Conform to the following standards and values.

- Manufacturer's slope recommendation: 3H:1V
- C Factor: less or equal to 0.20 @ 2:1
- Tensile strength: 75 lbs/ft
- Shear stress: 1.75 lbs/sq ft., min

2.10.2 ECTC Type 3.B Erosion Control Blankets

Provide ECTC Type 3.B straw-coir blankets manufactured from 70 percent straw and 30 percent coconut fiber matrix sewn between two 100 percent biodegradable natural fiber top and bottom netting with a functional longevity of 18-24 months. Conform to the following standards and minimum values.

- Manufacturer's slope recommendation: 2H:1V
- C Factor: less or equal to 0.25 @ 1.5:1
- Tensile strength: 100 lbs/ft
- Shear stress: 2.00 lbs/sq ft., min

2.10.3 ECTC Type 4 Erosion Control Blankets

Provide ECTC Type 4 coir blankets must be manufactured from 100 percent coconut fiber matrix sewn between two 100 percent biodegradable natural fiber top and bottom netting. Provide blankets that have a functional longevity of 36 months. Conform to the following standards and minimum values.

- Manufacturer's slope recommendation: 1H:1V
- C Factor: less or equal to 0.25 @ 1:1
- Tensile strength: 125 lbs/ft
- Shear stress: 2.25 lbs/sq ft., min

DRAFT

2.11 COIR FIBER ROLLS

Provide coir fiber rolls made from 100 percent coconut (coir) fiber and bound by 100 percent high-strength coir natural fiber netting. Provide rolls that have a diameter of 12 inches (plus or minus one inch), or as indicated on the drawings. Conform to the following standards and minimum values. Provide netting mesh opening that is 2 inch x 2 inch. For 12 inch diameter rolls, certify the netting strength at 90 lbs with its density at 3.5 lbs per cubic feet. Provide rolls that have a mass per unit area of 2.6 lbs per foot, with a functional longevity of 24 months.

2.12 TESTS, INSPECTIONS, AND VERIFICATIONS

Notify the Contracting Officer at least 5 days prior to each anticipated inspection. The Contracting Officer may at anytime inspect work without notification. The following are key inspection events:

2.12.1 Seeding Operations

2.12.1.1 Inspection of Seed, Equipment and Quantities

Seed suppliers are subject to inspection of methods, materials, and processing. Provide supplier names and addresses upon award of contract. Seed will be inspected upon arrival at the job site by the Contracting Officer for conformity to species and quality in accordance with paragraph 2.2 GRASS SEED.

- Upon Arrival at the Site: Provide receipts of the seed purchased and delivered to the site. Provide name of company on the receipts from which the seed was purchased, seed species, composition, quantity, germination rate, and pure-live-seed percentage. Inspect other material to ensure it meets specified requirements. Remove unacceptable materials from the job site and replace.

- Calibration Test: Adjust and calibrate equipment as per manufacturer's specifications and field test in the presence of the Contracting Officer, immediately prior to commencement of seeding operations.

2.12.1.2 Inspection of Seeding Operation

The Contracting Officer will inspect the seeding operation during equipment calibration, material loading and seed application.

2.12.1.3 Inspection of Seed Growth and Establishment

Regularly observe the progress of seed growth between 1 October and 1 May of each year of the contract period, and take steps to reseed and protect all bare, disturbed and damaged soil areas that do not meet the grass performance standards or that exhibit erosion. Observe for signs of nutrient deficiency, or other signs of poor growth. Report areas with poor growth and signs of nutrient deficiency to the Contracting Officer's Representative for concurrence, and with approval of Contracting Officer, apply fertilizer to these areas. Repair, reseed and protect all areas, without active construction activities, that do not meet the standards within 5 working days of discovery.

2.12.1.4 Seeding Acceptance

The Contracting Officer will hold a final inspection to determine any deficiencies in work after completion of seeding operations.

Preliminary Seeding Inspection: The Contracting Officer will hold a preliminary seeding inspection prior to the completion of the seeding. Request time for the inspection in writing at least 5 working days prior to the desired date. The quantity and type of species seeded, clean up requirements and the acceptability of the seeding operation, in accordance with the requirements stated herein, will be determined and noted in writing.

Final Seeding Inspection: Request time for the final inspection in writing at least 5 working days prior to the desired date. At the final seeding inspection, the Contracting Officer will evaluate the deficiencies noted in the preliminary seeding inspection, to ensure they have been corrected.

DRAFT

2.12.2 Straw Wattle Operations

Request time for an inspection in writing at least 5 working days prior to the desired date. Request the inspection after trenching, and after straw wattles have been installed.

2.12.3 Straw Mulching Operations

Request time for an inspection in writing at least 5 working days prior to the desired date. Request the inspection after straw mulch has been applied, tackified or crimped.

PART 3 EXECUTION

3.1 APPLICATIONS

Perform grass seeding, mulching and erosion and sediment control as indicated herein. Apply seeding and mulching to all disturbed and bare soil within the project boundary. Reseed and protect any disturbed or impacted soil outside of the project boundary. Where the requirements indicated herein conflict with specification Section 01 57 23 TEMPORARY STORM WATER POLLUTION CONTROL, apply the greater requirement.

3.1.1 Slope Applications

In addition to the requirements indicated in specification Section 01 57 23 TEMPORARY STORM WATER POLLUTION CONTROL, provide the appropriate designated ECTC (Erosion Control Technology Council) Type erosion control blankets and straw wattles on all slopes; spaced in accordance with the slope requirements that follows.

Provide straw wattles along the top of all slopes where water point sources develop and flows onto the slope as a concentrated flow. Identify and protect all point sources and diffuse the runoff before it flows over the slope causing erosion. If water cannot be safely passed over a slope without causing erosion, direct the flow around the slope, by grading ditches and downspouts; armoring them with erosion control materials, check dams, etc. and deliver the water below the slope without causing erosion.

Provide straw wattles at the base of all slopes that are directly above an open water structure, water feature, inlet, wetland, or other sensitive habitat; even if they are located outside of the project area. Provide all erosion control blankets and fabrics as indicated herein or per manufacturer's recommendations, whichever is more stringent.

- On downspouts (water flow areas designed to direct and control water around or through sensitive and/or erosive areas) and on slopes greater than 1:1, provide ECTC Type 4 erosion control blankets. Where the ECTC Type 4 erosion control blankets are not adequate to provide erosion control, provide a permanent erosion control material consisting of a composite fiber matrix or 3-D monofilament TRM over the entire face of the downspout and/or slope. Provide straw wattles continuously across downspout/slope, spaced 5' on center (o.c.), as measured from the top of the slope downward along the flow line.

- On all slopes above 2:1 and up to 1:1, provide straw wattles continuously across slope and on those slopes, spaced 10 feet o.c., as measured from the top of the slope downward along the flow line. On

DRAFT

those slopes within 100 feet from a water feature provide ECTC Type 4 erosion control blankets over the entire face of slope. Apply bonded fiber matrix on slopes where blankets cannot be properly and effectively installed.

- On all slopes above 3:1 and up to 2:1 provide straw wattles continuously across slope, spaced 15 feet o.c., as measured from the top of the slope downward along the flow line to the bottom of the slope. On those slopes that are within 100 feet from a water feature or outlet or on slopes with a slope flow length of 100 feet or greater, install ECTC Type 3.B erosion control blankets over the entire face of slope, and straw wattles continuously across slope, spaced 15 feet o.c., as measured from the top of the slope downward along the flow line.

- On all slopes above 4:1 and up to 3:1, provide straw wattles continuously across slope, spaced 20 feet o.c., as measured from the top of the slope downward along the flow line to the bottom of the slope. On those slopes that are within 100 feet from a water feature or outlet or on slopes with a slope flow length of 150 feet or greater, install ECTC Type 2.D erosion control blankets over entire face of slope.

- On all slopes up to 4:1 provide straw wattles continuously across slope, spaced 25 feet o.c., as measured from the top of the slope downward along the flow line to the bottom of the slope. On those slopes that are within 100 feet from a water feature or outlet or on slopes with a slope flow length of 200 feet or greater, install ECTC Type 2.D erosion control blankets over entire face of slope.

- On those relatively short variable irregular slopes, that are not classified under any of the above, provide a sufficient level of erosion control protection to keep soil in place until the grass is mature and established.

DRAFT

3.1.2 Channels and Ditch Applications

Protect channels and ditches with grass seeding. If the grass is not established by 1 October, provide erosion control blankets on channel and ditch surfaces. Provide check dams as indicated herein.

Space check dams in all channels and ditches at the following distances, as measured in the direction of flow:

- On 2:1 gradients: 15 feet o.c.
- On 3:1 gradients: 20 feet o.c.
- On 4:1 gradients: 25 feet o.c.
- On 6:1 gradients: 40 feet o.c.
- On 10:1 gradients: 60 feet o.c.
- On 20:1 gradients: 100 feet o.c.

3.2 LAYOUT

Define the boundaries and location of all areas which require grass seeding, as per specifications and drawings.

3.3 SOIL PREPARATION

Perform finish grading to ensure the designated areas and slopes are

configured as per grades and drawings. Prepare soil surface by grading and raking to remove all surface obstructions. Remove any obstruction which prohibits the application of seed, straw wattles, or blankets from direct continuous contact with the soil surface. Do not compact to more than 85 percent density.

Apply topsoil on all areas that are disturbed during construction and where grass seeding is required. Remove topsoil where it exists in these areas, it by scraping the top 6 inches of surface material, stockpile until rough grading is complete, and return it to the affected areas and placed to a depth of twelve inches. Where topsoil does not exist, import and spread topsoil over the areas to be seeded to a minimum depth of twelve inches. Place, spread and uniformly compact soil to 85 percent density.

For all areas that are seeded, vertically track-walk the finished grade with a tracked bulldozer; forming horizontal troughs and ridges that are perpendicular to the water flow line and are capable of trapping seed and water.

Surfaces that are too hard and smooth to accept the seeding, as determined by the Contracting Officer, must be broken up by methods approved by the Contracting Officer until the condition of the soil is acceptable. When conditions are such, by reason of excessive moisture or other factors, that satisfactory results are not likely to be obtained, the work must be stopped and must resume only when directed.

3.4 TRENCHING

Where straw wattles are to be placed, dig a 3 inch deep trench sized to insure the wattles are in continuous contact with the soil along its entire length. Where erosion control blankets, fabrics and TRMs are to be placed, trench all upper, lower and side edges as per manufacturer's recommendations.

3.5 SEEDING AND MULCHING

Seed all designated, bare and disturbed soil with grass seed after soil preparation and trenching have been performed and prior to placement of erosion control blankets, straw wattles, fiber rolls, TRMs, 3-D monofilament matrixes, or other erosion or sediment control materials. Prior to seeding, rework any previously prepared seedbed areas compacted or damaged by interim rain, traffic or other cause, to restore the ground for optimum seedbed conditions.

3.5.1 Seed Application Method

Seed using hydroseed method. Upon arrival at the site, and prior to seeding, provide the Contracting Officer with receipts of the seed purchased and delivered to the site. Provide name of company on the receipts from which the seed was purchased, seed species, composition, quantity, germination rate, and pure-live-seed in pounds.

3.5.1.1 Hydroseeding with Wood Fiber Mulch

Hydroseed seed species by thoroughly mixing to ensure a seeding rate as specified under paragraph SEED SPECIES AND SEEDING RATES. Add wood fiber mulch to the mixture after the water and other mixture components have been thoroughly provided and mixed to produce a homogeneous slurry.

DRAFT

Provide slurry with proper consistency to adhere to the earth slopes without lumping or running. The maximum time period for the seed to be held in the slurry is 24 hours. Uniformly apply slurry under pressure over the entire designated area. Do not roll the hydroseeded area.

When hydroseeding slopes, apply the seed from both above and below the slopes to ensure 100 percent of the soil surface has been seeded. Employ the following two-step process when hydroseeding:

Step 1: Apply the first step as a complete mixture, 1/2 of the mixture from one direction and the second half from the opposite direction, as indicated below:
- Wood Fiber Mulch, at a rate of 1,000 lbs per acre
- Seed Mix, as specified for species and seeding rate

Step 2: Apply the second step from two directions, at least 90 degrees from the first half. Apply as a complete mixture as indicated below:
- Wood Fiber Mulch, at a rate of 1,000 lbs per acre
- Tackifier, at a rate of 100 lbs per acre.

3.5.2 Applying Straw Mulch

Apply straw mulch over all broadcast-applied and drill seeded areas upon completion and approval by the Contracting Officer of the seeding application. Straw mulch is not required on those slopes that have been hydroseeded with wood fiber or are installed with erosion control blankets or open woven fabrics.

Spread mulch by hand, blower type mulch spreader or other approved method. Start mulching on the windward side of relatively flat areas or on the upper part of a steep slope and continued uniformly until the area is covered. Apply the mulch loose and not bunched. Spread mulch evenly so that it completely covers the soil, with no visual soil being seen. Mulch all seeded areas within 48 hours of seeding.

Apply straw mulch at the following application rates:

- Apply straw mulch at 2,500 lbs per acre on slopes greater than 3:1.
- Apply straw mulch at 2,000 lbs per acre on level areas and slopes 3:1 and less.

3.5.3 Applying Tackifier

Tackify straw mulch with a commercially available dyed organic tackifier. Apply at a rate of 100 pounds per acre.

3.5.4 Hydroseeding with Bonded Fiber Matrix

Apply the Bonded Fiber Matrix (BFM) to all areas that are greater than a 1:1 slope that have erosive soils and where seeding with wood fiber mulch, straw mulch, or erosion control blankets cannot be successfully installed. Provide the BFM by a contractor certified by the manufacturer to be trained in the proper procedures for mixing and application of the product.

Mix the BFM according to the manufacturer's recommendations and demonstrate "free liquid" test to the Contracting Officer upon request. Spray-apply Bonded Fiber Matrix utilizing standard hydraulically seeding equipment in successive layers as to achieve 100 percent coverage of all exposed soil. Do not apply the BFM immediately before, during or after

DRAFT

rainfall, such that the matrix will have opportunity to dry for up to 24 hours after installation.

Employ the following one-step hydroseeding process when using BFMs. Apply as a complete mixture as indicated below:

- Bonded Fiber Matrix, at a rate of 4,000 lbs per acre
- Seed Mix, as specified for species and seeding rate

3.6 INSTALLING STRAW WATTLES AND COIR ROLLS

After all soil treatment has been installed, including: seeding, straw mulch, erosion control blankets, fabric, TRMs or BFMs; place and secure straw wattles in pre-dug trenches. Extend the straw wattles continuously across the treatment area and provide continuous contact with the soil surface along its entire length. Place the straw wattle so that it is on contour along its entire length and anchored using wooden wedge stakes spaced along its length at 48 inch intervals, maximum, and within 12 inches of both ends. Tightly overlap the ends of wattles by 24 inches. Abutting the wattles ends to each other is not acceptable.

Place straw wattles along the top of each slope where water congregates and flows as a point source over the slope below. Redirect and diffuse all above slope water flows so that it does not flow over the slope as a point-source or concentrated flow. Place and space straw wattles according to paragraph APPLICATIONS.

Where coir rolls are required, follow all trenching, overlapping and staking as per straw wattle requirement.

3.7 INSTALLING EROSION CONTROL BLANKETS

On slopes, place blanket by unrolling down slope. Anchor the terminal ends of the material in a 6 inch x 6 inch deep trench; backfill and compact. Overlap side edges by 3 inches. Anchor edges down the entire length of material with staples using a 12 inch interval. Ensure "uphill" end of the overlap is placed over the "downhill" end. At the top and bottom of each overlap, use a double row spaced 6 inches apart, with staples spaced at 6 inch intervals along each row to secure overlaps.

In channels and ditches use ECTC Type 3.B or Type 4 blankets. Place blanket by unrolling at top of channel in the direction of flow along bottom centerline of channel. Ensure "uphill" end of the overlap is placed over the "downhill" end. At the top and bottom of each overlap, use a double row of staples spaced 6 inches apart, with staples spaced at 6 inch intervals, to secure overlaps. Overlap side edges by 3 inches. Anchor the terminal end of the material in a 6 inch square deep trench; backfill and compact. Place subsequent material end over end with a 6 inch overlap. Anchor edges down the entire length of material with staples using a 12 inch interval.

Anchor material edges as indicated above. In addition to the end and edge staples, anchor the entire material surface to the soil using staples applied in an off-set pattern as recommended by the manufacturer. Where the requirements herein conflict with specification Section 01 57 23 TEMPORARY STORM WATER POLLUTION CONTROL, provide the more stringent requirement.

DRAFT

3.8 INSTALLING CHECK DAMS

In ditches and channels, provide 12 inch diameter coir fiber roll check dams completely across ditch or channel and perpendicular to water flows. Extend fiber roll ends up the side slopes a minimum of 24 inches above the channel/ditch expected flow line. Anchor rolls using 24 inch long wooden wedge stakes within 12 inches of both ends and spaced continuously at 24 inches on center, maximum, along its entire length and at all grade breaks. Set fiber rolls into a pre-dug 3 inch deep trench, and ensure contact with the soil along its entire length. Place and space check dams according to paragraph APPLICATIONS.

3.9 REPAIRING OF DAMAGED OR UNSUCCESSFUL GRASS STANDS

For the duration of the contract perform active grass maintenance that will give the grass seed the best opportunity to mature. In those areas that are without active construction activities, or that have reels, ruts, gullies, or have not met the performance standards, re-grade, repair, reseed within 5 working days of discovery, and maintain and protect it for the duration of the contract. See paragraph PERFORMANCE STANDARDS.

Protect the newly seeded areas as per the requirements indicated herein and as per specification Section 01 57 23 TEMPORARY STORM WATER POLLUTION CONTROL, whichever is more stringent. Also provide BMPs where it is observed where water concentrates and flows over slopes causing erosion. The project will not be accepted without the performance standards being met.

DRAFT

3.10 ESTABLISHMENT

3.10.1 Seed Establishment Period

The Contractor is responsible for the proper care of the seeded areas until May 1 of the year following the seeding, or until the desired stand of vegetation is established. The desired stand of vegetation is defined as a minimum of 85 percent coverage of the area seeded. The need for repairing and reseeding (as described herein) within the establishment period must be determined by the Contracting Officer.

3.10.2 Protection

Protect areas susceptible to vehicular or heavy foot traffic by erecting suitable barricades immediately after seeding is completed and/or by placing warning signs of a type approved by the Contracting Officer.

3.11 MAINTENANCE RECORD

Record of maintenance work performed, of measurements and findings for product failure, recommendations for repair, and products replaced.

3.12 REPAIR

3.12.1 General

When any portion of the ground surface becomes gullied or otherwise damaged following seeding within the period of Contractor's responsibility, repair the affected portion to re-establish the condition and grade of the soil prior to planting and then reseed as specified for initial planting, all at no cost to the Contracting Officer.

3.12.2 Reseeding

When it becomes evident that the seeding has been unsuccessful, the Contracting Officer will require that these areas be reseeded with the same seed and quantity as specified for the initial seeding. Complete reseeding within fifteen (15) days following notification of these areas must be maintained by watering, as specified above, until the successful grass is established. Prepare the area to be reseeded as directed by the Contracting Officer, to receive the reseeding. Reseeding due to damaged or deficient seed material or improper application will be completed at no additional cost to the Contracting Officer.

3.13 FIELD QUALITY CONTROL

During the course of work or upon completion of the Project, a check of the quantities of materials will be made against the areas treated, and if the minimum rates of application have not been met, the Contracting Officer will require the distribution of additional quantities of those materials to make up the minimum applications specified.

3.14 CLEANUP

Remove and dispose of excess and waste erosion control material off-site in accordance with State and local agency codes and regulations.

-- End of Section --

DRAFT

SECTION TABLE OF CONTENTS

DIVISION 33 - UTILITIES

SECTION 33 11 00

WATER UTILITY DISTRIBUTION PIPING

PART 1 GENERAL

1.1 REFERENCES
1.2 DEFINITIONS
1.2.1 Water Service Lines
1.2.2 Additional Definitions
1.3 SUBMITTALS
1.4 QUALITY CONTROL
1.4.1 Regulatory Requirements
1.5 DELIVERY, STORAGE, AND HANDLING
1.5.1 Delivery and Storage
1.5.2 Handling

PART 2 PRODUCTS

2.1 MATERIALS
2.1.1 Pipe, Fittings, Joints And Couplings
2.1.1.1 Ductile-Iron Piping
2.1.1.1.1 Pipe and Fittings
2.1.1.1.2 Joints and Jointing Material
2.1.2 Valves
2.1.2.1 Gate Valves 3 Inch Size and Larger on Buried Piping
2.2 ACCESSORIES
2.2.1 Pipe Restraint
2.2.1.1 Thrust Blocks
2.2.2 Insulating Joints

PART 3 EXECUTION

3.1 PREPARATION
3.1.1 Connections to Existing System
3.1.2 Operation of Existing Valves
3.1.3 Earthwork
3.2 INSTALLATION
3.2.1 Piping
3.2.1.1 General Requirements
3.2.1.1.1 Termination of Water Lines
3.2.1.1.2 Pipe Laying and Jointing
3.2.1.1.3 Tracer Wire
3.2.1.1.4 Connections to Existing Water Lines
3.2.1.1.5 Water Piping Crossing Sewer Piping
3.2.1.1.6 Flanged Pipe
3.2.1.2 Ductile-Iron Piping
3.2.2 Disinfection
3.2.3 Flushing
3.2.4 Pipe Restraint

DRAFT

3.2.4.1 Concrete Thrust Blocks
3.2.4.2 Restrained Joints
3.2.5 Valves
3.2.5.1 Gate Valves
3.3 FIELD QUALITY CONTROL
3.3.1 Tests
3.3.1.1 Hydrostatic Test
3.3.1.2 Leakage Test
3.3.1.3 Bacteriological Testing
3.3.1.4 Backflow Preventer Tests
3.3.1.5 Special Testing Requirements for Fire Service
3.3.1.6 Tracer Wire Continuity Test
3.4 SYSTEM STARTUP
3.5 CLEANUP

-- End of Section Table of Contents --

DRAFT

SECTION 33 11 00

WATER UTILITY DISTRIBUTION PIPING

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 B16.1	(2020) Gray Iron Pipe Flanges and Flanged Fittings Classes 25, 125, and 250

AMERICAN WATER WORKS ASSOCIATION (AWWA)

AWWA C104/A21.4	(2016) Cement-Mortar Lining for Ductile-Iron Pipe and Fittings for Water
AWWA C110/A21.10	(2012) Ductile-Iron and Gray-Iron Fittings for Water
AWWA C111/A21.11	(2017) Rubber-Gasket Joints for Ductile-Iron Pressure Pipe and Fittings
AWWA C115/A21.15	(2020) Flanged Ductile-Iron Pipe With Ductile-Iron or Gray-Iron Threaded Flanges
AWWA C151/A21.51	(2017) Ductile-Iron Pipe, Centrifugally Cast
AWWA C153/A21.53	(2019) Ductile-Iron Compact Fittings for Water Service
AWWA C500	(20019) Metal-Seated Gate Valves for Water Supply Service
AWWA C509	(2015) Resilient-Seated Gate Valves for Water Supply Service
AWWA C515	(2015) Reduced-Wall, Resilient-Seated Gate Valves for Water Supply Service
AWWA C550	(2017) Protective Interior Coatings for Valves and Hydrants
AWWA C600	(2017) Installation of Ductile-Iron Mains and Their Appurtenances
AWWA C604	(2011) Installation of Buried Steel Water Pipe—4 In. (100 mm) and Larger
AWWA C605	(2014) Underground Installation of Polyvinyl Chloride (PVC) and Molecularly

DRAFT

	Oriented Polyvinyl Chloride (PVCO) Pressure Pipe and Fittings
AWWA C651	(2014) Standard for Disinfecting Water Mains
AWWA C655	(2009) Field Dechlorination
AWWA C800	(2014) Underground Service Line Valves and Fittings
AWWA M9	(2008; Errata 2013) Manual: Concrete Pressure Pipe
AWWA M23	(2020) Manual: PVC Pipe - Design and Installation - Third Edition
AWWA M41	(2009; 3rd Ed) Ductile-Iron Pipe and Fittings
AWWA M55	(2020; 2nd Ed) PE Pipe - Design and Installation

ASTM INTERNATIONAL (ASTM)

ASTM C94/C94M	(2020) Standard Specification for Ready-Mixed Concrete

FOUNDATION FOR CROSS-CONNECTION CONTROL AND HYDRAULIC RESEARCH (FCCCHR)

FCCCHR Manual	(10th Edition) Manual of Cross-Connection Control

NATIONAL FIRE PROTECTION ASSOCIATION (NFPA)

NFPA 24	(2019; TIA 19-1) Standard for the Installation of Private Fire Service Mains and Their Appurtenances

NSF INTERNATIONAL (NSF)

NSF 372	(2016) Drinking Water System Components - Lead Content
NSF/ANSI 14	(2020) Plastics Piping System Components and Related Materials
NSF/ANSI 61	(2020) Drinking Water System Components - Health Effects

UNDERWRITERS LABORATORIES (UL)

UL 262	(2004; Reprint Oct 2011) Gate Valves for Fire-Protection Service

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1.2 DEFINITIONS

1.2.1 Water Service Lines

Water service lines include water piping from a water main to a building service at a point approximately 5 feet from building or the point indicated on the drawings, specific materials, methods of joining and any appurtenances deemed necessary for a satisfactory system.

1.2.2 Additional Definitions

For additional definitions refer to the definitions in the applicable referenced standard.

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-01 Preconstruction Submittals

Connections; G

SD-03 Product Data

Pipe, Fittings, Joints and Couplings; G

Valves; G

Pipe Restraint; G

Disinfection Procedures; G

SD-06 Test Reports

Bacteriological Samples; G

Hydrostatic Sewer Test

Leakage Test

Hydrostatic Test; G

SD-07 Certificates

Pipe, Fittings, Joints and Couplings

Shop-Applied Lining

Lining

Valves

SD-08 Manufacturer's Instructions

DRAFT

1.4 QUALITY CONTROL

1.4.1 Regulatory Requirements

Comply with NSF/ANSI 14 or NSF/ANSI 61 and NSF 372 for materials for potable water systems; comply with lead content requirements for "lead-free" plumbing as defined by the U.S. Safe Drinking Water Act effective January 2014. Provide materials bearing the seal of the National Sanitation Foundation (NSF) for potable water service.

Comply with NFPA 24 for materials, installation, and testing of fire main piping and components.

1.5 DELIVERY, STORAGE, AND HANDLING

1.5.1 Delivery and Storage

Inspect materials delivered to site for damage. Unload and store with minimum handling and in accordance with manufacturer's instructions. Store materials on site in enclosures or under protective covering. Store plastic piping, jointing materials and rubber gaskets under cover out of direct sunlight. Do not store materials directly on the ground. Keep inside of pipes, fittings, valves, fire hydrants, and other accessories free of dirt and debris.

1.5.2 Handling

Handle pipe, fittings, valves, fire hydrants, and other accessories in accordance with manufacturer's instructions and in a manner to ensure delivery to the trench in sound undamaged condition. Avoid injury to coatings and linings on pipe and fittings; make repairs if coatings or linings are damaged. Do not place other material, hooks, or pipe inside a pipe or fitting after the coating has been applied. Inspect the pipe for defects before installation. Carry, do not drag pipe to the trench. Use of pinch bars and tongs for aligning or turning pipe will be permitted only on the bare ends of the pipe. Clean the interior of pipe and accessories of foreign matter before being lowered into the trench and keep them clean during laying operations by plugging. Replace defective material without additional expense to the Government. Store rubber gaskets, not immediately installed, under cover or out of direct sunlight.

Handle ductile iron pipe, fittings, and accessories in accordance with AWWA C600 and AWWA M41. Handle PVC and PVCO pipe, fittings, and accessories in accordance with AWWA C605. Handle PE pipe, fittings, and accessories in accordance with AWWA M55. Handle steel pipe, fittings and accessories in accordance with AWWA C604.

PART 2 PRODUCTS

2.1 MATERIALS

Provide all materials in accordance with AWWA C800 and as indicated herein. Provide valves and fittings with pressure ratings equivalent to the pressure ratings of the pipe.

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2.1.1 Pipe, Fittings, Joints And Couplings

Submit manufacturer's standard drawings or catalog cuts, except submit both drawings and cuts for push-on and rubber-gasketed bell-and-spigot joints. Include information concerning gaskets with submittal for joints and couplings.

2.1.1.1 Ductile-Iron Piping

2.1.1.1.1 Pipe and Fittings

Pipe, AWWA C151/A21.51, Pressure Class 250 Thickness Class 50. Flanged pipe, AWWA C115/A21.15. Fittings, AWWA C110/A21.10 or AWWA C153/A21.53; fittings with push-on joint ends are to meet the same requirements as fittings with mechanical-joint ends, except for the factory modified bell design. Provide fittings with pressure ratings equivalent to that of the pipe. Provide compatible pipe ends and fittings for the specified joints. Provide cement-mortar lining, AWWA C104/A21.4, twice the standard thickness on pipe and fittings.

2.1.1.1.2 Joints and Jointing Material

Provide mechanical joints where indicated. Provide flanged joints where indicated.

a. Mechanical Joints: Dimensional and material requirements for pipe ends, glands, bolts and nuts, and gaskets as recommended in AWWA C111/A21.11.

b. Flanged Joints: Bolts, nuts, and gaskets for flanged connections as recommended in Appendix A of AWWA C115/A21.15. Provide AWWA C115/A21.15 ductile iron flanges and conform to ASME B16.1, Class 125.

c. Insulating Joints: Designed to prevent metal-to-metal contact at the joint between adjacent sections of piping. Provide flanged type joint with insulating gasket, insulating bolt sleeves, and insulating washers. Provide full face dielectric type gaskets, as recommended in the Appendix to AWWA C115/A21.15. Bolts and nuts, as recommended in the Appendix to AWWA C115/A21.15.

d. Sleeve-Type Mechanical Coupled Joints: As specified in the paragraph SLEEVE-TYPE MECHANICAL COUPLINGS.

2.1.2 Valves

Provide a protective interior coating in accordance with AWWA C550.

2.1.2.1 Gate Valves 3 Inch Size and Larger on Buried Piping

AWWA C500, AWWA C509, AWWA C515, or UL 262 and:

a. AWWA C500: nonrising stem type with double-disc gate and mechanical-joint ends or push-on joint ends compatible for the adjoining pipe

b. AWWA C509 or AWWA C515: nonrising stem type with mechanical-joint ends or resilient-seated gate valves 3 to 12 inches in size

DRAFT

c. UL 262: inside-screw type with operating nut, double-disc or split-wedge type gate, designed for a hydraulic working pressure of 175 psi, and have mechanical-joint ends or push-on joint ends as appropriate for the pipe to which it is joined.

Match materials for UL 262 gate valves to the reference standards specified in AWWA C500. Gate valves open by counterclockwise rotation of the valve stem. Stuffing boxes have 0-ring stem seals, except for those valves for which gearing is specified, in which case use conventional packing in place of 0-ring seal. Stuffing boxes are bolted and constructed so as to permit easy removal of parts for repair. Use gate valves with special ends for connection to cement piping or sleeve-type mechanical coupling in lieu of mechanical-joint ends and push-on joint ends. Provide valve ends and gaskets for connection to sleeve-type mechanical couplings that conform to the requirements specified for the coupling. Provide all valves from one manufacturer.

2.2 ACCESSORIES

2.2.1 Pipe Restraint

2.2.1.1 Thrust Blocks

Use ASTM C94/C94M concrete having a minimum compressive strength of 2,500 psi at 28 days.

2.2.2 Insulating Joints

Provide a rubber-gasketed insulating joint or dielectric coupling between pipe of dissimilar metals which will effectively prevent metal-to-metal contact between adjacent sections of piping.

DRAFT

PART 3 EXECUTION

3.1 PREPARATION

3.1.1 Connections to Existing System

Perform all connections to the existing water system in the presence of the Contracting Officer.

3.1.2 Operation of Existing Valves

Do not operate valves within or directly connected to the existing water system unless expressly directed to do so by the Contracting Officer.

3.1.3 Earthwork

Perform earthwork operations in accordance with Section 31 00 00 EARTHWORK.

3.2 INSTALLATION

Install all materials in accordance with the applicable reference standard, manufacturers instructions and as indicated herein.

3.2.1 Piping

3.2.1.1 General Requirements

Install pipe, fittings, joints and couplings in accordance with the applicable referenced standard, the manufacturer's instructions and as specified herein.

3.2.1.1.1 Termination of Water Lines

Terminate the work covered by this section at a point approximately 5 feet from the building, unless otherwise indicated.

Do not lay water lines in the same trench with gas lines, fuel lines, electric wiring, or any other utility. Do not install copper tubing in the same trench with ferrous piping materials. Where nonferrous metallic pipe (i.e., copper tubing) crosses any ferrous piping, provide a minimum vertical separation of 12 inches between pipes.

3.2.1.1.2 Pipe Laying and Jointing

Remove fins and burrs from pipe and fittings. Before placing in position, clean pipe, fittings, valves, and accessories, and maintain in a clean condition. Provide proper facilities for lowering sections of pipe into trenches. Under no circumstances is it permissible to drop or dump pipe, fittings, valves, or other water line material into trenches. Cut pipe cleanly, squarely, and accurately to the length established at the site and work into place without springing or forcing. Replace a pipe or fitting that does not allow sufficient space for installation of jointing material. Blocking or wedging between bells and spigots is not permitted. Lay bell-and-spigot pipe with the bell end pointing in the direction of laying. Grade the pipeline in straight lines; avoid the formation of dips and low points. Support pipe at the design elevation and grade. Secure firm, uniform support. Wood support blocking is not permitted. Lay pipe so that the full length of each section of pipe and each fitting rests solidly on the pipe bedding; excavate recesses to accommodate bells, joints, and couplings. Provide anchors and supports for fastening work into place. Make provision for expansion and contraction of pipelines. Keep trenches free of water until joints have been assembled. At the end of each work day, close open ends of pipe temporarily with wood blocks or bulkheads. Do not lay pipe when conditions of trench or weather prevent installation. Provide a minimum of 2 1/2 feet depth of cover over top of pipe.

DRAFT

3.2.1.1.3 Tracer Wire

Install a continuous length of tracer wire for the full length of each run of nonmetallic pipe. Attach wire to top of pipe in such manner that it will not be displaced during construction operations.

3.2.1.1.4 Connections to Existing Water Lines

Make connections to existing water lines after coordination with the facility and with a minimum interruption of service on the existing line. Make connections to existing lines under pressure in accordance with the recommended procedures of the manufacturer of the pipe being tapped and as indicated, except as otherwise specified, tap concrete pipe in accordance with AWWA M9 for tapping concrete pressure pipe.

3.2.1.1.5 Water Piping Crossing Sewer Piping

Provide at least 18 inches above the top (crown) of the sewer piping and the bottom (invert) of the water piping whenever possible. Measure the distance edge-to-edge. Where water lines cross under gravity sewer lines, construct sewer line of AWWA compliant ductile iron water piping with rubber-gasketed joints and no joint located within 10 feet, horizontally, of the crossing.

a. Normal Conditions: Provide a separation of at least 18 inches between the bottom of the water piping and the top of the sewer piping in cases where water piping crosses above sewer piping.

b. Unusual Conditions: When local conditions prevent a vertical separation described above, construct sewer piping passing over or under water piping of AWWA compliant ductile iron water piping and perform hydrostatic sewer test, without leakage, prior to backfilling. Construct sewer crossing with a minimum 20 feet length of the AWWA compliant ductile iron water piping, centered at the point of the crossing so that joints are equidistant and as far as possible from the water piping. Protect water piping passing under sewer piping by providing a vertical separation of at least 18 inches between the bottom of the sewer piping and the top of the water piping; adequate structural support for the sewer piping to prevent excessive deflection of the joints and the settling on or damage to the water piping.

3.2.1.1.6 Flanged Pipe

Only install flanged pipe aboveground or with the flanges in valve pits.

3.2.1.2 Ductile-Iron Piping

Unless otherwise specified, install pipe and fittings in accordance with the paragraph GENERAL REQUIREMENTS and with the requirements of AWWA C600 for pipe installation, joint assembly, valve-and-fitting installation, and thrust restraint.

a. Jointing: Make flanged joints with the gaskets, bolts, and nuts specified for this type joint. Make flanged joints up tight; avoid undue strain on flanges, fittings, valves, and other equipment and accessories. Align bolt holes for each flanged joint. Use full size bolts for the bolt holes; use of undersized bolts will not be permitted. Do not allow adjoining flange faces to be out of parallel to such degree that the flanged joint cannot be made watertight without overstraining the flange. When flanged pipe or fitting has dimensions that do not allow the making of a flanged joint as specified, replace it. Assemble joints made with sleeve-type mechanical couplings in accordance with the recommendations of the coupling manufacturer. Make groovedtype joints with the couplings previously specified for this type joint connecting pipe with the ends specified for this type joint; assemble in accordance with the recommendations of the coupling manufacturer. Groove pipe in the field only with groove cutting equipment designed especially for the purpose and produced by a manufacturer of grooved joint couplings; secure approval for field-cut grooves before assembling the joint. Make insulating joints with the gaskets, sleeves, washers, bolts, and nuts previously specified for this type joint. Assemble insulating joints as specified for flanged joints, except that bolts with

DRAFT

insulating sleeves are to be full size for the bolt holes. Ensure that there is no metal-to-metal contact between dissimilar metals after the joint has been assembled.

b. Allowable Deflection: Maximum allowable deflection is 3 degrees or manufacturer's recommendation, whichever is less. If the alignment requires deflection in excess of the above limitations, provide special bends or a sufficient number of shorter lengths of pipe to achieve angular deflections within the limit set forth.

3.2.2 Disinfection

Prior to disinfection, provide disinfection procedures, proposed neutralization and disposal methods of waste water from disinfection as part of the disinfection submittal. Disinfect new water piping and existing water piping affected by Contractor's operations in accordance with AWWA C651. Disinfect new water piping using the AWWA C651 continuous-feed method of chlorination.

3.2.3 Flushing

Perform bacteriological tests prior to flushing. Flush solution from the systems with domestic water until maximum residual chlorine content is within the range of 0.2 to 0.5 parts per million, the residual chlorine content of the distribution system, or acceptable for domestic use. Use AWWA C655 neutralizing chemicals.

3.2.4 Pipe Restraint

3.2.4.1 Concrete Thrust Blocks

Install concrete thrust blocks where indicated.

3.2.4.2 Restrained Joints

Install restrained joints in accordance with the manufacturer's instructions where indicated.

3.2.5 Valves

3.2.5.1 Gate Valves

Install gate valves, AWWA C500 and UL 262, in accordance with the requirements of AWWA C600 for valve-and-fitting installation and with the recommendations of the Appendix ("Installation, Operation, and Maintenance of Gate Valves") to AWWA C500. Install gate valves, AWWA C509 or AWWA C515, in accordance with the requirements of AWWA C600 for valve-and-fitting installation and with the recommendations of the Appendix ("Installation, Operation, and Maintenance of Gate Valves") to AWWA C509 or AWWA C515. Install gate valves on PVC and PVCO water mains in accordance with the recommendations for appurtenance installation in AWWA M23, Chapter 7, "Installation." Make and assemble joints to gate valves as specified for making and assembling the same type joints between pipe and fittings.

3.3 FIELD QUALITY CONTROL

3.3.1 Tests

Notify the Contracting Officer a minimum of five days in advance of

DRAFT

hydrostatic testing. Coordinate the proposed method for disposal of waste water from hydrostatic testing. Perform field tests, and provide labor, equipment, and incidentals required for testing. Provide documentation that all items of work have been constructed in accordance with the Contract documents.

3.3.1.1 Hydrostatic Test

Test the water system in accordance with the applicable AWWA standard specified below. Test ductile-iron water mains in accordance with the requirements of AWWA C600 for hydrostatic testing. The amount of leakage on ductile-iron pipelines with mechanical-joints is not to exceed the amounts given in AWWA C600; no leakage will be allowed at joints made by any other methods.

3.3.1.2 Leakage Test

For leakage test, use a hydrostatic pressure not less than the maximum working pressure of the system. Leakage test may be performed at the same time and at the same test pressure as the pressure test.

3.3.1.3 Bacteriological Testing

Perform bacteriological tests in accordance with AWWA C651 Option A. For new water mains use Option A and obtain two sets of samples for coliform analysis, each sample being collected at least 16 hours apart. Take samples every 1,200 ft plus one set from the end of the line and at least one from each branch greater than one pipe length. Analyze samples by a certified laboratory, and submit the results of the bacteriological samples.

3.3.1.4 Backflow Preventer Tests

After installation conduct Backflow Preventer Tests and provide test reports verifying that the installation meets the FCCCHR Manual Standards.

3.3.1.5 Special Testing Requirements for Fire Service

Test water mains and water service lines providing fire service or water and fire service in accordance with NFPA 24. The additional water added to the system must not exceed the limits given in NFPA 24

3.3.1.6 Tracer Wire Continuity Test

Test tracer wire for continuity after service connections have been completed and prior to final pavement or restoration. Verify that tracer wire is locatable with electronic utility locating equipment. Repair breaks or separations and re-test for continuity.

3.4 SYSTEM STARTUP

Water mains and appurtenances must be completely installed, disinfected, flushed, and satisfactory bacteriological sample results received prior to permanent connections being made to the active distribution system. Obtain approval by the Contracting Officer prior to the new water piping being placed into service.

DRAFT

3.5 CLEANUP

Upon completion of the installation of water lines and appurtenances, remove all debris and surplus materials resulting from the work.

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DRAFT

SECTION TABLE OF CONTENTS

DIVISION 33 - UTILITIES

SECTION 33 40 00

STORM DRAINAGE UTILITIES

PART 1 GENERAL

1.1 REFERENCES
1.2 SUBMITTALS
1.3 DELIVERY, STORAGE, AND HANDLING
1.3.1 Delivery and Storage
1.3.2 Handling

PART 2 PRODUCTS

2.1 PIPE FOR CULVERTS AND STORM DRAINS
2.1.1 Concrete Pipe
2.1.1.1 Reinforced Elliptical Culvert and Storm Drainpipe
2.1.1.2 Nonreinforced Pipe
2.1.1.3 Cast-In-Place Nonreinforced Conduit
2.1.2 Polyethylene (PE) Pipe
2.1.2.1 Smooth Wall PE Pipe
2.2 DRAINAGE STRUCTURES
2.2.1 Flared End Sections
2.2.2 Precast Reinforced Concrete Box
2.3 MISCELLANEOUS MATERIALS
2.3.1 Concrete
2.3.2 Precast Reinforced Concrete Manholes
2.3.3 Frame and Cover for Gratings
2.3.4 Joints
2.3.4.1 Flexible Watertight Joints
2.3.4.2 External Sealing Bands
2.3.4.3 Flexible Watertight, Gasketed Joints
2.4 RESILIENT CONNECTORS
2.5 EROSION CONTROL RIPRAP

PART 3 EXECUTION

3.1 EXCAVATION FOR PIPE CULVERTS, STORM DRAINS, AND DRAINAGE STRUCTURES
3.1.1 Trenching
3.1.2 Removal of Rock
3.1.3 Removal of Unstable Material
3.2 BEDDING
3.2.1 Concrete Pipe Requirements
3.3 PLACING PIPE
3.3.1 Concrete Pipe
3.4 JOINTING
3.4.1 Concrete Pipe
3.4.1.1 Cement-Mortar Bell-and-Spigot Joint
3.4.1.2 Cement-Mortar Oakum Joint for Bell-and-Spigot Pipe
3.4.1.3 Cement-Mortar Diaper Joint for Bell-and-Spigot Pipe

DRAFT

3.4.1.4 Cement-Mortar Tongue-and-Groove Joint
3.4.1.5 Cement-Mortar Diaper Joint for Tongue-and-Groove Pipe
3.4.1.6 Plastic Sealing Compound Joints for Tongue-and-Grooved Pipe
3.4.1.7 Flexible Watertight Joints
3.4.1.8 External Sealing Band Joint for Noncircular Pipe
3.4.2 Corrugated Metal Pipe
3.5 DRAINAGE STRUCTURES
3.5.1 Manholes and Inlets
3.6 BACKFILLING
3.6.1 Backfilling Pipe in Trenches
3.6.2 Backfilling Pipe in Fill Sections
3.6.3 Movement of Construction Machinery
3.6.4 Compaction
3.6.4.1 General Requirements
3.6.4.2 Minimum Density
3.7 FIELD PAINTING
3.7.1 Cast-Iron Covers, Frames, Gratings, And Steps
3.7.2 Steel Covers and Frames or Concrete Frames
3.8 FIELD QUALITY CONTROL
3.8.1 Tests
3.8.1.1 Hydrostatic Test on Watertight Joints
3.8.1.1.1 Concrete, PE, and SRPE Pipe
3.8.1.2 Leakage Test
3.8.1.3 Determination of Density
3.8.2 Inspection
3.8.2.1 Post-Installation Inspection
3.8.2.1.1 Concrete
3.8.2.1.2 Flexible Pipe
3.8.2.1.3 Post-Installation Inspection Report
3.8.3 Repair Of Defects
3.8.3.1 Leakage Test
3.8.3.2 Deflection Testing
3.8.3.3 Inspection
3.8.3.3.1 Concrete
3.8.3.3.2 Flexible Pipe
3.9 PROTECTION
3.10 WARRANTY PERIOD

-- End of Section Table of Contents --

DRAFT

SECTION 33 40 00

STORM DRAINAGE UTILITIES

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 M 198	(2010) Standard Specification for Joints for Concrete Pipe, Manholes, and Precast Box Sections Using Preformed Flexible Joint Sealants

AMERICAN CONCRETE INSTITUTE INTERNATIONAL (ACI)

ACI 346	(2009) Specification for Cast-in-Place Concrete Pipe

ASTM INTERNATIONAL (ASTM)

ASTM A48/A48M	(2003; R 2012) Standard Specification for Gray Iron Castings
ASTM A536	(1984; R 2014) Standard Specification for Ductile Iron Castings
ASTM B26/B26M	(2014; E 2015) Standard Specification for Aluminum-Alloy Sand Castings
ASTM C1103	(2019) Standard Practice for Joint Acceptance Testing of Installed Precast Concrete Pipe Sewer Lines
ASTM C14	(2015) Standard Specification for Concrete Sewer, Storm Drain, and Culvert Pipe
ASTM C1433	(2016b) Standard Specification for Precast Reinforced Concrete Monolithic Box Sections for Culverts, Storm Drains, and Sewers
ASTM C231/C231M	(2014) Standard Test Method for Air Content of Freshly Mixed Concrete by the Pressure Method
ASTM C425	(2004; R 2013) Standard Specification for Compression Joints for Vitrified Clay Pipe and Fittings

DRAFT

ASTM C443	(2020) Standard Specification for Joints for Concrete Pipe and Manholes, Using Rubber Gaskets
ASTM C478	(2015a) Standard Specification for Precast Reinforced Concrete Manhole Sections
ASTM C507	(2015) Standard Specification for Reinforced Concrete Elliptical Culvert, Storm Drain, and Sewer Pipe
ASTM C655	(2014) Reinforced Concrete D-Load Culvert, Storm Drain, and Sewer Pipe
ASTM C76	(2020) Standard Specification for Reinforced Concrete Culvert, Storm Drain, and Sewer Pipe
ASTM C877	(2008) 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 C969	(2019) Standard Practice for Infiltration and Exfiltration Acceptance Testing of Installed Precast Concrete Pipe Sewer Lines
ASTM C990	(2009; R 2014) 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 D1751	(2004; E 2013; R 2013) Standard Specification for Preformed Expansion Joint Filler for Concrete Paving and Structural Construction (Nonextruding and Resilient Bituminous Types)
ASTM D1752	(2004a; R 2013) Standard Specification for Preformed Sponge Rubber Cork and Recycled PVC Expansion

DRAFT

ASTM D2167	(2015) Density and Unit Weight of Soil in Place by the Rubber Balloon Method
ASTM D3212	(2007; R 2013) 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 F1417	(2011a; E 2020) Standard Practice for Installation Acceptance of Plastic Non-pressure Sewer Lines Using Low-Pressure Air
ASTM F714	(2013) Polyethylene (PE) Plastic Pipe (SDR-PR) Based on Outside Diameter

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-04 Samples

Pipe for Culverts and Storm Drains

SD-07 Certificates

Resin Certification; G

Oil Resistant Gasket; G

Leakage Test; G

Hydrostatic Test on Watertight Joints; G

Determination of Density; G

Frame and Cover for Gratings; G

SD-09 Manufacturer's Field Reports

Post-Installation Inspection Report; G

Placing Pipe; G

DRAFT

1.3 DELIVERY, STORAGE, AND HANDLING

1.3.1 Delivery and Storage

Inspect materials delivered to site for damage, unloaded, and stored with a minimum of handling. Materials may not be stored directly on the ground. Keep the inside of pipes and fittings free of dirt and debris. Before, during, and after installation, plastic pipe and fittings must 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 must be stored in accordance with the manufacturer's recommendations and must be discarded if the storage period exceeds the recommended shelf life. Solvents in use must be discarded when the recommended pot life is exceeded.

1.3.2 Handling

Materials must be handled in a manner that ensures delivery to the trench in sound, undamaged condition. Pipe must be carried to the trench, not dragged.

PART 2 PRODUCTS

2.1 PIPE FOR CULVERTS AND STORM DRAINS

Pipe for culverts and storm drains must be of the sizes indicated and must conform to the requirements specified.

2.1.1 Concrete Pipe

Manufactured in accordance with and conforming to ASTM C76, Class III or ASTM C655, D-Load.

2.1.1.1 Reinforced Elliptical Culvert and Storm Drainpipe

Manufactured in accordance with and conforming to ASTM C507. Horizontal elliptical pipe must be Class HE-III. Vertical elliptical pipe must be Class VE-VI.

2.1.1.2 Nonreinforced Pipe

Manufactured in accordance with and conforming to ASTM C14, Class 3.

2.1.1.3 Cast-In-Place Nonreinforced Conduit

ACI 346, except that testing must be the responsibility of and at the expense of the Contractor. In the case of other conflicts between ACI 346 and project specifications, requirements of ACI 346 must govern.

2.1.2 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 must apply to each of the seven primary properties of the cell classification limits in accordance with ASTM D3350.

DRAFT

2.1.2.1 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 must be produced from PE certified by the resin producer as meeting the requirements of ASTM D3350, minimum cell class 335434C.

2.2 DRAINAGE STRUCTURES

2.2.1 Flared End Sections

Sections must be of a standard design fabricated from zinc coated steel sheets meeting requirements of ASTM A929/A929M or must be of standard design reinforced concrete pipe meeting requirements of AASHTO M 198, ASTM C76, and ASTM C443 as shown on the plans.

2.2.2 Precast Reinforced Concrete Box

Manufactured in accordance with and conforming to ASTM C1433.

2.3 MISCELLANEOUS MATERIALS

2.3.1 Concrete

Unless otherwise specified, concrete and reinforced concrete must conform to the requirements for 4,000 psi concrete. The concrete mixture must have air content by volume of concrete, based on measurements made immediately after discharge from the mixer, of 5 to 7 percent when maximum size of coarse aggregate exceeds 1-1/2 inches. Determine air content in accordance with ASTM C231/C231M. The concrete covering over steel reinforcing cannot be less than 1 inch thick for covers and not less than 1-1/2 inches thick for walls and flooring. Concrete covering deposited directly against the ground must have a thickness of at least 3 inches between steel and ground. Expansion-joint filler material must conform to ASTM D1751, or ASTM D1752, or must be resin-impregnated fiberboard conforming to the physical requirements of ASTM D1752.

DRAFT

2.3.2 Precast Reinforced Concrete Manholes

Conform to ASTM C478. Joints between precast concrete risers and tops must be full-bedded in cement mortar and must be smoothed to a uniform surface on both interior and exterior of the structure.

2.3.3 Frame and Cover for Gratings

Submit certification on the ability of frame and cover or gratings to carry the imposed live load. Frame and cover for gratings must be cast gray iron, ASTM A48/A48M, Class 35B; cast ductile iron, ASTM A536, Grade 65-45-12; or cast aluminum, ASTM B26/B26M, Alloy 356.0T6. Weight, shape, size, and waterway openings for grates and curb inlets must be as indicated on the plans. The word "Storm Sewer" must be stamped or cast into covers so that it is plainly visible.

2.3.4 Joints

2.3.4.1 Flexible Watertight Joints

a. Materials: Flexible watertight joints must be made with plastic or

rubber-type gaskets for concrete. The design of joints and the physical requirements for preformed flexible joint sealants must conform to ASTM C990, and rubber-type gaskets must conform to ASTM C443. Factory-fabricated resilient joint materials must conform to ASTM C425. Gaskets must not have 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 must comply with the oil resistant gasket requirements of ASTM C443. Certified copies of test results must be delivered to the Contracting Officer before gaskets or jointing materials are installed. Alternate types of watertight joint may be furnished, if specifically approved.

2.3.4.2 External Sealing Bands

Requirements for external sealing bands must conform to ASTM C877.

2.3.4.3 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 must be a continuous band approximately 7 inches wide and approximately 3/8 inch thick, meeting the requirements of ASTM D1056, Type 2 B3, and must 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 must 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 must be 1-3/8 inches in diameter for pipe having 1 inch deep end corrugations. O-rings must meet the requirements of ASTM C990 or ASTM C443. Preformed flexible joint sealants must conform to ASTM C990, Type B.

b. Connecting Bands: Connecting bands must 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 must be countersunk or the rivets must be omitted and the seam welded. Watertight joints must be tested and must meet the test requirements of paragraph HYDROSTATIC TEST ON WATERTIGHT JOINTS.

2.4 RESILIENT CONNECTORS

Flexible, watertight connectors used for connecting pipe to manholes and inlets must conform to ASTM C923.

2.5 EROSION CONTROL RIPRAP

Provide nonerodible 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 8 inches.

DRAFT

PART 3 EXECUTION

3.1 EXCAVATION FOR PIPE CULVERTS, STORM DRAINS, AND DRAINAGE STRUCTURES

Excavation of trenches, and for appurtenances and backfilling for culverts and storm drains, must 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 cannot greater than the outside diameter of the pipe plus 12 inches to permit satisfactory jointing and thorough tamping of the bedding material under and around the pipe. Sheeting and bracing, where required, must be placed within the trench width as specified, without any over excavation. 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 must be borne by the Contractor without additional cost to the Government.

3.1.2 Removal of Rock

Rock in either ledge or boulder formation must 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 must be maintained under the bell as well as under the straight portion of the pipe. Rock excavation must 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 must 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 must be performed at no additional cost to the Government.

3.2 BEDDING

The bedding surface for the pipe must provide a firm foundation of uniform density throughout the entire length of the pipe.

3.2.1 Concrete Pipe Requirements

When no bedding class is specified or detailed on the drawings, concrete pipe must be bedded in granular material minimum 4 inch in depth in trenches with soil foundation. Depth of granular bedding in trenches with rock foundation must be 1/2 inch in depth per foot of depth of fill, minimum depth of bedding must be 8 inch up to maximum depth of 24 inches. The middle third of the granular bedding must be loosely placed. Bell holes and depressions for joints must be removed and formed so entire barrel of pipe is uniformly supported. The bell hole and depressions for the joints must be not more than the length, depth, and width required for

DRAFT

properly making the particular type of joint.

3.3 PLACING PIPE

Each pipe must be thoroughly examined before being laid; defective or damaged pipe must not be used. Plastic pipe, excluding SRPE pipe must be protected from exposure to direct sunlight prior to laying, if necessary to maintain adequate pipe stiffness and meet installation deflection requirements. Pipelines must be laid to the grades and alignment indicated. Proper facilities must be provided for lowering sections of pipe into trenches. Lifting lugs in vertically elongated metal pipe must be placed in the same vertical plane as the major axis of the pipe. Pipe must not be laid in water, and pipe cannot be laid when trench conditions or weather are unsuitable for such work. Diversion of drainage or dewatering of trenches during construction must be provided as necessary. Deflection of installed flexible pipe must not exceed the following limits:

TYPE OF PIPE	MAXIMUM ALLOWABLE DEFLECTION (percent)
Plastic (PE and SRPE)	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 Concrete Pipe

Laying must proceed with spigot ends of bell-and-spigot pipe and tongue ends of tongue-and-groove pipe pointing in the direction of the flow.

3.4 JOINTING

3.4.1 Concrete Pipe

3.4.1.1 Cement-Mortar Bell-and-Spigot Joint

The first pipe must be bedded to the established grade line, with the bell end placed upstream. The interior surface of the bell must be thoroughly cleaned with a wet brush and the lower portion of the bell filled with mortar as required to bring inner surfaces of abutting pipes flush and even. The spigot end of each subsequent pipe must be cleaned with a wet brush and uniformly matched into a bell so that sections are closely fitted. After each section is laid, the remainder of the joint must be filled with mortar, and a bead must be formed around the outside of the joint with sufficient additional mortar. If mortar is not sufficiently stiff to prevent appreciable slump before setting, the outside of the joint must be wrapped or bandaged with cheesecloth to hold mortar in place.

3.4.1.2 Cement-Mortar Oakum Joint for Bell-and-Spigot Pipe

A closely twisted gasket must be made of jute or oakum of the diameter required to support the spigot end of the pipe at the proper grade and to make the joint concentric. Joint packing must be in one piece of sufficient length to pass around the pipe and lap at top. This gasket must be thoroughly saturated with neat cement grout. The bell of the pipe must be thoroughly cleaned with a wet brush, and the gasket must be laid in the bell for the lower third of the circumference and covered with mortar. The spigot of the pipe must be thoroughly cleaned with a wet

DRAFT

brush, inserted in the bell, and carefully driven home. A small amount of mortar must be inserted in the annular space for the upper two-thirds of the circumference. The gasket must be lapped at the top of the pipe and driven home in the annular space with a caulking tool. The remainder of the annular space must be filled completely with mortar and beveled at an angle of approximately 45 degrees with the outside of the bell. If mortar is not sufficiently stiff to prevent appreciable slump before setting, the outside of the joint thus made must be wrapped with cheesecloth. Placing of this type of joint must be kept at least five joints behind laying operations.

3.4.1.3 Cement-Mortar Diaper Joint for Bell-and-Spigot Pipe

The pipe must be centered so that the annular space is uniform. The annular space must be caulked with jute or oakum. Before caulking, the inside of the bell and the outside of the spigot must be cleaned.

a. Diaper Bands: Diaper bands must consist of heavy cloth fabric to hold grout in place at joints and must be cut in lengths that extend one-eighth of the circumference of pipe above the spring line on one side of the pipe and up to the spring line on the other side of the pipe. Longitudinal edges of fabric bands must be rolled and stitched around two pieces of wire. Width of fabric bands must be such that after fabric has been securely stitched around both edges on wires, the wires will be uniformly spaced not less than 8 inches apart. Wires must be cut into lengths to pass around pipe with sufficient extra length for the ends to be twisted at top of pipe to hold the band securely in place; bands must be accurately centered around lower portion of joint.

b. Grout: Grout must be poured between band and pipe from the high side of band only, until grout rises to the top of band at the spring line of pipe, or as nearly so as possible, on the opposite side of pipe, to ensure a thorough sealing of joint around the portion of pipe covered by the band. Silt, slush, water, or polluted mortar grout forced up on the lower side must be forced out by pouring, and removed.

c. Remainder of Joint: The remaining unfilled upper portion of the joint must be filled with mortar and a bead formed around the outside of this upper portion of the joint with a sufficient amount of additional mortar. The diaper must be left in place. Placing of this type of joint must be kept at least five joints behind actual laying of pipe. No backfilling around joints until joints have been fully inspected and approved.

3.4.1.4 Cement-Mortar Tongue-and-Groove Joint

The first pipe must be bedded carefully to the established grade line with the groove upstream. A shallow excavation must be made underneath the pipe at the joint and filled with mortar to provide a bed for the pipe. The grooved end of the first pipe must be thoroughly cleaned with a wet brush, and a layer of soft mortar applied to the lower half of the groove. The tongue of the second pipe must be cleaned with a wet brush; while in horizontal position, a layer of soft mortar must be applied to the upper half of the tongue. The tongue end of the second pipe must be inserted in the grooved end of the first pipe until mortar is squeezed out on interior and exterior surfaces. Sufficient mortar must be used to fill the joint completely and to form a bead on the outside.

DRAFT

3.4.1.5 Cement-Mortar Diaper Joint for Tongue-and-Groove Pipe

The joint must be of the type described for cement-mortar tongue-and-groove joint in this paragraph, except that the shallow excavation directly beneath the joint must not be filled with mortar until after a gauze or cheesecloth band dipped in cement mortar has been wrapped around the outside of the joint. The cement-mortar bead at the joint must be at least 1/2 inch, thick and the width of the diaper band must be at least 8 inches. The diaper must be left in place. Placing of this type of joint must be kept at least five joints behind the actual laying of the pipe. Backfilling around the joints must not be done until the joints have been fully inspected and approved.

3.4.1.6 Plastic Sealing Compound Joints for Tongue-and-Grooved Pipe

Sealing compounds must follow the recommendation of the particular manufacturer in regard to special installation requirements. Surfaces to receive lubricants, primers, or adhesives must be dry and clean. Sealing compounds must be affixed to the pipe not more than 3 hours prior to installation of the pipe, and must be protected from the sun, blowing dust, and other deleterious agents at all times. Sealing compounds must be inspected before installation of the pipe, and any loose or improperly affixed sealing compound must be removed and replaced. The pipe must be aligned with the previously installed pipe, and the joint pulled together. If, while making the joint with mastic-type sealant, a slight protrusion of the material is not visible along the entire inner and outer circumference of the joint when the joint is pulled up, the pipe must be removed and the joint remade. After the joint is made, all inner protrusions must be cut off flush with the inner surface of the pipe. If non-mastic-type sealant material is used, the "Squeeze-Out" requirement above will be waived.

DRAFT

3.4.1.7 Flexible Watertight Joints

Gaskets and jointing materials must be as recommended by the particular manufacturer in regard to use of lubricants, cements, adhesives, and other special installation requirements. Surfaces to receive lubricants, cements, or adhesives must be clean and dry. Gaskets and jointing materials must be affixed to the pipe not more than 24 hours prior to the installation of the pipe, and must be protected from the sun, blowing dust, and other deleterious agents at all times. Gaskets and jointing materials must be inspected before installing the pipe; any loose or improperly affixed gaskets and jointing materials must be removed and replaced. The pipe must be aligned with the previously installed pipe, and the joint pushed home. If, while the joint is being made the gasket becomes visibly dislocated the pipe must be removed and the joint remade.

3.4.1.8 External Sealing Band Joint for Noncircular Pipe

Surfaces to receive sealing bands must be dry and clean. Install bands in accordance with manufacturer's recommendations.

3.4.2 Corrugated Metal Pipe

3.5 DRAINAGE STRUCTURES

3.5.1 Manholes and Inlets

Construction must be of reinforced concrete, plain concrete, brick,

precast reinforced concrete, precast concrete segmental blocks, prefabricated corrugated metal, or bituminous coated corrugated metal; complete with frames and covers or gratings; and with fixed galvanized steel ladders where indicated. Pipe studs and junction chambers of prefabricated corrugated metal manholes must be fully bituminous-coated and paved when the connecting branch lines are so treated. Pipe connections to concrete manholes and inlets must be made with flexible, watertight connectors.

3.6 BACKFILLING

3.6.1 Backfilling Pipe in Trenches

After the pipe has been properly bedded, Soil Type 1, at a moisture content that will facilitate compaction, must be placed along both sides of pipe in layers not exceeding 6 inches in compacted depth. The backfill must be brought up evenly on both sides of pipe for the full length of pipe. The fill must be thoroughly compacted under the haunches of the pipe. Each layer must be thoroughly compacted with mechanical tampers or rammers. This method of filling and compacting must continue until the fill has reached an elevation equal to the midpoint (spring line) of RCP or has reached an elevation of at least 12 inches above the top of the pipe for flexible pipe. The remainder of the trench must be backfilled and compacted by spreading and rolling or compacted by mechanical rammers or tampers in layers not exceeding 8 inches. Tests for density must 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 cannot be left in place beneath structures or pavements.

3.6.2 Backfilling Pipe in Fill Sections

For pipe placed in fill sections, backfill material and the placement and compaction procedures must be as specified below. The fill material must be uniformly spread in layers longitudinally on both sides of the pipe, not exceeding 6 inches in compacted depth, and must 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 must 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 must be placed and thoroughly compacted in layers not exceeding 6 inches. Use select granular material for this entire region of backfill for flexible pipe installations.

3.6.3 Movement of Construction Machinery

When compacting by rolling or operating heavy equipment parallel with the pipe, displacement of or injury to the pipe must be avoided. Movement of construction machinery over a culvert or storm drain at any stage of construction is at the Contractor's risk. Any damaged pipe must be repaired or replaced.

DRAFT

3.6.4 Compaction

3.6.4.1 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.

3.6.4.2 Minimum Density

Backfill over and around the pipe and backfill around and adjacent to drainage structures must be compacted at the approved moisture content to the following applicable minimum density, which will be determined as specified below.

a. Under airfield and heliport pavements, paved roads, streets, parking areas, and similar-use pavements including adjacent shoulder areas, the density cannot be 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 must control.

b. Under unpaved or turfed traffic areas, density must not be less than 90 percent of maximum density for cohesive material and 95 percent of maximum density for cohesionless material.

c. Under nontraffic areas, density must be not less than that of the surrounding material.

DRAFT

3.7 FIELD PAINTING

3.7.1 Cast-Iron Covers, Frames, Gratings, And Steps

After installation, clean cast-iron, not buried in masonry or concrete, of mortar, rust, grease, dirt, and other deleterious materials to bare metal and apply a coat of bituminous paint.

3.7.2 Steel Covers and Frames or Concrete Frames

After installation, clean steel or concrete, not buried in concrete, of mortar, dirt, grease, and other deleterious materials to bare metal. Apply a coat of epoxy primer, to a minimum dry film thickness of 20 mil; and apply a top coat, to a minimum dry film thickness of 20 mils, color optional. Do not paint surfaces subject to abrasion.

3.8 FIELD QUALITY CONTROL

3.8.1 Tests

Testing is the responsibility of the Contractor. Perform all testing and retesting at no additional cost to the Government.

3.8.1.1 Hydrostatic Test on Watertight Joints

Watertight joints must be tested and must meet test requirements of paragraph HYDROSTATIC TEST ON WATERTIGHT JOINTS. Rubber gaskets must comply with the oil resistant gasket requirements of ASTM C443. Certified copies of test results must be delivered to the Contracting Officer before gaskets or jointing materials are installed.

3.8.1.1.1 Concrete, PE, and SRPE Pipe

A hydrostatic test must 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 must be protected from extreme temperatures which might adversely affect the performance of such materials. Performance requirements for joints in reinforced and nonreinforced concrete pipe must conform to ASTM C990 or ASTM C443. Test requirements for joints in PE plastic pipe must conform to ASTM D3212.

3.8.1.2 Leakage Test

Lines must be tested for leakage by low pressure air or water testing or exfiltration tests, as appropriate, prior to completing backfill. Low pressure air testing for concrete pipes must conform to ASTM C969. Low pressure air testing for plastic pipe must conform to ASTM F1417. Testing of individual joints for leakage by low pressure air or water must conform to ASTM C1103. Prior to exfiltration tests, the trench must be backfilled up to at least the lower half of the pipe. If required, sufficient additional backfill must be placed to prevent pipe movement during testing, leaving the joints uncovered to permit inspection. Visible leaks encountered must be corrected regardless of leakage test results. When the water table is 2 feet or more above the top of the pipe at the upper end of the pipeline section to be tested, infiltration must be measured using a suitable weir or other device acceptable to the Contracting Officer. An exfiltration test must be made by filling the line to be tested with water so that a head of at least 2 feet is provided above both the water table and the top of the pipe at the upper end of the pipeline to be tested. The filled line must be allowed to stand until the pipe has reached its maximum absorption, but not less than 4 hours. After absorption, the head must be reestablished. The amount of water required to maintain this water level during a 2-hour test period must be measured. Leakage as measured by the exfiltration test must not exceed 0.2 gallons per inch in diameter per 100 feet of pipeline per hour.

3.8.1.3 Determination of Density

Testing must be performed by an approved commercial testing laboratory or by the Contractor subject to approval. Tests must be performed in sufficient number to ensure that specified density is being obtained. Laboratory tests for moisture-density relations must 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 must be determined in accordance with ASTM D2167 or ASTM D6938. When ASTM D6938 is used, the calibration curves must 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 must be used to determine the moisture content of the soil. The calibration curves

DRAFT

furnished with the moisture gauges must be checked along with density calibration checks as described in ASTM D6938. Test results must be furnished the Contracting Officer. The calibration checks of both the density and moisture gauges must be made at the beginning of a job on each different type of material encountered and at intervals as directed.

3.8.2 Inspection

3.8.2.1 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.

3.8.2.1.1 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.

3.8.2.1.2 Flexible Pipe

Check each flexible pipe (PE) for rips, tears, joint separations, soil migration through the joint, cracks, localized bucking, bulges, settlement and alignment.

3.8.2.1.3 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.).

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3.8.3 Repair Of Defects

3.8.3.1 Leakage Test

When leakage exceeds the maximum amount specified, correct source of excess leakage by replacing damaged pipe and gaskets and retest.

3.8.3.2 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.

3.8.3.3 Inspection

Replace pipe or repair defects indicated in the Post-Installation Inspection Report.

3.8.3.3.1 Concrete

Replace pipes having cracks with a width greater than 0.1 inches.

3.8.3.3.2 Flexible Pipe

Replace pipes having cracks or splits.

3.9 PROTECTION

Protect storm drainage piping and adjacent areas from superimposed and external loads during construction.

3.10 WARRANTY PERIOD

Pipe segments found to have defects during the warranty period must be replaced with new pipe and retested.

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