

SF 30 CONTINUATION
SHEET

Herbert Hoover Dike Rehabilitation, Structure Replacement S-288 (HP-1) Reconstruction
Amendment 0003

SUMMARY OF CHANGES

1. SPECIFICATIONS:

The text changes have been updated with additions noted by underlined text and deletions noted by line/cross-outs, and pertain only to changes made by this amendment. The entire section is replaced if there is any change. The Project Table of Contents and Submittal Register are replaced without underlines and cross-outs if there are changes to these documents.

Changes to Specifications:

Volume 1 of 2 - Technical Specifications:

N/A

Volume 2 of 2 - Technical Specifications:

DELETE Section 35 42 00 and **REPLACE** with the attached revised Section 35 42 00.

DELETE Submittal Register in Section 01 33 00 and **REPLACE** with the attached revised Submittal Register.

2. DRAWINGS:

DELETE Drawing No. S-63 and **REPLACE** with the attached revised Drawing No. S-63.

(End of Summary of
Changes)

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DIVISION 35 - WATERWAY AND MARINE CONSTRUCTION

SECTION 35 42 00

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SECTION 35 42 00

SOIL-BENTONITE FILL

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 PETROLEUM INSTITUTE (API)

API Spec 13A (2010; Errata 1 2014; Errata 2-3 2015)
Specification for Drilling-Fluid Materials

ASTM INTERNATIONAL (ASTM)

ASTM D1556 (2007) 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 (2010) Laboratory Determination of Water
(Moisture) Content of Soil and Rock by Mass

ASTM D2487 (2011) Soils for Engineering Purposes
(Unified Soil Classification System)

ASTM D422 (1963; R 2007; E 2014; E 2014)
Particle-Size Analysis of Soils

ASTM D4318 (2010; E 2014) Liquid Limit, Plastic
Limit, and Plasticity Index of Soils

ASTM D4643 (2017) Standard Test Method for
Determination of Water Content of Soil and
Rock by Microwave Oven Heating

ASTM D5084 (2016a) Standard Test Methods for
Measurement of Hydraulic Conductivity of
Saturated Porous Materials Using a
Flexible Wall Permeameter

ASTM D6938 (2017) Standard Test Method for In-Place
Density and Water Content of Soil and
Soil-Aggregate by Nuclear Methods (Shallow
Depth)

1.2 DEFINITIONS

1.2.1 Soil-Bentonite Fill

Soil-Bentonite Fill is a mixture of Select Fill or Embankment Fill, referred to as Base Soil, and dry powdered Bentonite materials uniformly blended and thoroughly compacted to produce a low permeability fill zone which meets the criteria set forth in the drawings and specifications. The Soil-Bentonite Fill shall contain Bentonite by dry weight of the Base Soil, as determined in the table below.

Table 1: Minimum Percent Bentonite of Soil-Bentonite Fill
Based on Percent Fines of the Base Soil

Base Soil Percent Fines	Minimum Percent Bentonite*
< 2	15
> 2 to 5	12
> 5 to 10	9
> 10	6

*Tolerance of -1 percent allowed.

1.2.2 Embankment Fill

Embankment Fill shall meet the properties defined in Section 35 41 00 EMBANKMENT CONSTRUCTION, subparagraph "Embankment Fill" of paragraph DEFINITIONS.

1.2.3 Select Fill

Select Fill shall meet the properties defined in Section 35 41 00 EMBANKMENT CONSTRUCTION, subparagraph "Select Fill" of paragraph DEFINITIONS.

1.2.4 Unsatisfactory Materials

Unsatisfactory Materials are defined in Section 35 41 00, subparagraph "Unsatisfactory Materials" of paragraph DEFINITIONS.

1.2.5 Degree of Compaction

Degree of compaction required is expressed as a percentage of the maximum density obtained by the test procedure in ASTM D1557.

1.2.6 Bentonite

The Bentonite shall be a sodium cation base montmorillonite powder (Premium Grade Wyoming-type Bentonite) that conforms to the standards set forth in API Spec 13A, Section 9.

1.2.7 Water

Clean, potable quality water, free of oils, acids, alkali, chlorides, organic matter, and other deleterious substances.

1.3 SUBMITTALS

Government approval is required for submittals with a "G" designation;

submittals not having a "G" designation are for information only. When used, a designation following the "G" designation identifies the office that will review the submittal for the Government. The following shall be submitted in accordance with Section 01 33 00 SUBMITTAL PROCEDURES:

SD-02 Shop Drawings

Soil-Bentonite Fill Mix Design and Laboratory Test Results; G, DO

At least 30 days prior to Soil-Bentonite Fill construction, submit a report summarizing the procedures and results of the preconstruction Soil-Bentonite Fill mix design and tests, including sieve analysis, moisture-density relationship, liquid limit, plasticity index, and permeability.

SD-03 Product Data

Equipment and Plans; G, DO

At least 30 days prior to plant assembly, submit details, plans (including the location of mixing plant and material storage areas), and data on the pugmill mixing plant, including the manufacturer's literature on feed equipment used to deliver the Bentonite and Base Soil, water controls, stockpiling procedures, and monitoring procedures. Prior to mobilization to the site, submit details on compaction equipment and placement procedures.

SD-06 Test Reports

~~Soil-Bentonite Fill Mix Design and Laboratory Test Results; G, DO~~

~~At least 30 days prior to Soil-Bentonite Fill construction, submit a report summarizing the procedures and results of the preconstruction Soil-Bentonite Fill mix design and tests, including sieve analysis, moisture density relationship, liquid limit, plasticity index, and permeability.~~

Calibration Curves; G, RO

Calibration curves and related test results, prior to using any device or equipment being calibrated.

Soil Classification Test; G, DO

At least 30 days prior to delivery of any Contractor-furnished material to the site of the work, submit soil classification test results, moisture-density curves, gradation curves, and laboratory results of the required tests of the proposed material.

Field Density; G, RO
Laboratory Density; G, RO
Nuclear Density; G, RO

Use nuclear density testing equipment in accordance with ASTM D6938. In addition, the following condition shall apply:

- a. Prior to using the nuclear density testing equipment on the site, submit to the Contracting Officer a certification that the operator has completed a training course approved by the nuclear

density testing equipment manufacturer, the most recent data sheet from the manufacturer's calibration, and a copy of the most recent statistical check of the standard count precision.

b. The nuclear density testing equipment shall be capable of extending a probe a minimum of 12 inches down into a hole.

SD-07 Certificates

Certificates of Compliance; G, RO

The Contractor shall furnish to the Contracting Officer a certificate of compliance and a copy of the test reports from the Bentonite manufacturer for each lot of Bentonite shipped to the site stating that the Bentonite complies with all applicable standards. All Bentonite will be subject to inspection, sampling, and verification of quality by Contractor Quality Control testing and Government Quality Assurance testing. No Bentonite from the Bentonite manufacturer shall be used prior to acceptance by the Contracting Officer. Bentonite not meeting the specifications shall be promptly removed from the site and replaced with Bentonite conforming to specification requirements at the Contractor's expense. Bentonite shall be protected from moisture during transit and storage

PART 2 PRODUCTS

2.1 PLANT, EQUIPMENT, MACHINES, AND TOOLS

Plant, equipment, machines, and tools used in the work shall be subject to approval and shall be maintained in a satisfactory working condition at all times. The equipment shall have the capability of producing the required mix proportions, compaction, meeting grade controls, and thickness.

The central plant (pugmill operation) shall be capable of producing a uniform mixture of Soil-Bentonite Fill at the required Bentonite percentage and moisture content. Note that a volumetric mixer in lieu of a pugmill mixer will not be accepted under this contract. Soil and Bentonite shall be dry-mixed sufficiently to prevent Bentonite lumps from forming when water is added. Blending and mixing of Bentonite and Base Soil on a lift at the site (in-place mixing) will not be allowed.

PART 3 EXECUTION

3.1 MIXING

Embankment Fill and dry powdered Bentonite shall be fed into a pugmill mixer at a uniform rate. The feed rate shall be predetermined by the Contractor prior to mixing Soil-Bentonite Fill for placement in the embankment. The mixture of Soil-Bentonite Fill produced by the central mixing process shall meet the requirements of Table 1. The mixing process shall be continuously monitored as part of the Contractor's quality control process. Hoppers delivering ingredients to the pugmill shall have features that prevent clogging of the hoppers.

Soil-Bentonite Fill not meeting the above prescribed tolerance will be rejected. Water shall be added to the mixture of Soil-Bentonite Fill such that the moisture content of the mixture produced by the central mixing

process will be in the range of -2 to +2 percent of the optimum moisture content as determined by ASTM D1557. The Embankment Fill, Bentonite, and Water shall be thoroughly mixed in the pugmill mixer such that each component of the mixture is uniformly distributed and the mixture is homogeneous.

3.2 STOCKPILING MATERIALS

Base Soil, including approved material available from excavation and grading, shall be stockpiled in a manner that does not result in segregation of these materials (such as by conveyor or by chute) and at the locations designated. Before stockpiling of material, the storage sites shall be cleared, drained, and leveled. When Base Soil is provided from more than one source, material from each source shall meet the specified requirements and shall be stockpiled separately.

3.3 PREPARATION OF AREA TO BE FILLED

Adequate drainage shall be provided during the entire construction period to prevent water from collecting or ponding on the areas to be filled. No Soil-Bentonite Fill shall be placed in any area of the embankment until the foundation has been dewatered, compacted, and approved by the Contracting Officer. Line and grade stakes shall be located and placed by the Contractor as necessary for control. The area to be filled shall be prepared as described in Section 35 41 00.

3.4 INSTALLATION

3.4.1 Lift Thickness

The Soil-Bentonite Fill shall be placed in maximum 9-inch thick loose lifts.

3.4.2 Tolerances

A horizontal tolerance of 0 inches inside to 12 inches outside and a vertical tolerance of 3 inches above and 0 inches below the lines and grades shown will be allowed.

3.4.3 Compaction

After placing each lift of Soil-Bentonite Fill, compaction shall be started within a maximum of 30 minutes. Density of compacted Soil-Bentonite Fill shall be at least 95 percent of the Modified Proctor maximum dry density, determined in accordance with ASTM D1557. Loose lifts shall be uniformly and continuously compacted until the entire depth and width of the area are compacted to the density specified. Each pass of the compaction equipment shall overlap previous passes by at least one-half the width of the roller. A sheep's foot or pneumatic roller may be required. Alternate trips of the roller shall be slightly different lengths. Displacement of the mixture shall not occur due to the speed of the roller. The Soil-Bentonite Fill shall be placed such that the surface of the fill slopes downward away from the culvert barrels on a 6 horizontal to 1 vertical (6:1) slope; once fill reaches an elevation above the top of the barrels, the Soil-Bentonite Fill shall be brought to a level plane before receiving additional lifts. Each lift shall be compacted such that no slicken sides are found between compacted lifts. Scarify foundation and previously placed lifts to remove smooth surfaces prior to placement of additional lifts.

3.5 MOISTURE CONTROL

The moisture content at the surface shall be maintained within the prescribed percent range of the optimum moisture content (discussed in MIXING) at all times throughout the compaction operations. If any in-place lift of Soil-Bentonite Fill is too wet prior to placing the next lift, the non-compliant material shall be allowed to dry to within moisture tolerance by disking, aerating, or other methods. If any in-place lift of Soil-Bentonite Fill is too dry prior to placing the next lift, the non-compliant material shall be loosened by scarifying or disking to depths directed by the Contracting Officer, dampened to within moisture tolerance, thoroughly mixed in-place to a homogenous mixture, and compacted in accordance with paragraph "Compaction". Alternately, the wet or dry material can be removed and replaced at the Contractor's expense.

3.6 FIELD QUALITY CONTROL

3.6.1 Test Reports

Field and laboratory tests shall be performed in sufficient numbers to assure that the specifications are being met. Testing shall be the responsibility of the Contractor and shall be performed by a USACE validated commercial laboratory. Work requiring testing will not be permitted until the testing laboratory has been inspected and approved. The Contracting Officer may specify the time and location of the test. Testing reports shall be furnished to the Contracting Officer within 24 hours of conclusion of all field and laboratory test, as well as on a monthly basis.

3.6.2 Test Results

Results shall verify that materials comply with the specification. When a material source is changed, the new material shall be tested for compliance. When deficiencies are found, the initial analysis shall be repeated and the material already placed shall be retested to determine the extent of unacceptable material. All in-place material deemed unacceptable shall be replaced or repaired to conform to the contract requirements at no additional cost to the Government.

3.6.3 Permeability Test

One permeability test shall be performed in accordance with [ASTM D5084](#) Method C for every 100 cubic yards of Soil Bentonite Fill produced, or at least three tests shall be performed overall, one from near the bottom of the core, one from near the center and one from near the top, whichever is more stringent. The test sample shall be collected in the field from the same batch as the GRAIN SIZE ANALYSIS mixed soil sample, prior to its compaction so that the samples are representative of each other.

3.6.4 Laboratory Density

One moisture density test shall be conducted in accordance with the procedure contained in [ASTM D1557](#). An additional test shall be performed for any change in Base Soil source or classification (as determined by [ASTM D2487](#)), or at the direction of the Contracting Officer.

3.6.5 Field Density

Field in-place density tests shall be performed in accordance with [ASTM D1556](#) and/or [ASTM D6938](#). Perform not less than one in-place density test for each lift of Soil-Bentonite Fill per side of the culvert barrels and not less than one per lift at horizontal locations randomly staggered in the fill when fill has reached elevations above the barrels. When nuclear method is used for in-place density testing according to [ASTM D6938](#), the first daily test and every tenth test thereafter or the first daily test and once every third lift thereafter, whichever is more frequent, for each material type shall include a sand cone correlation test in accordance with [ASTM D1556](#). The sand cone test shall be performed adjacent to the location of the nuclear test, and shall include a nominal 6-inch diameter sand cone, and shall include a minimum wet soil weight of 6 pounds extracted from the hole. The density correlations shall be submitted with test results.

Each transmittal including density test data shall be provided electronically as an Excel Spreadsheet (.xls) file in addition to PDF format and must include a summary of all density correlations for the job neatly prepared on a summary sheet including at a minimum:

- a. Meter serial number and operator's initials
- b. Standard count for each test
- c. Description of material type, including USCS classification and color
- d. Probe depth
- e. Moisture content by each test method and the deviation
- f. Wet density by each test method and the deviation
- g. Detailed test location - State plane coordinates (x and y), elevation, and date
- h. Date of last calibration of meter including certification
- i. Corresponding Laboratory Density and Moisture Test
- j. Whether test passed or failed

3.6.6 Moisture Content

Determination of water content shall be performed in accordance with [ASTM D6938](#) when nuclear density test method is used. When nuclear method is used for in-place moisture content, the first and every tenth test thereafter for each material type shall include determination of moisture content based on [ASTM D2216](#). [ASTM D4643](#) may be used when rapid moisture content results are needed or as a substitute to [ASTM D6938](#) or if it is determined that the latter is not reliable. All rapid results obtained by [ASTM D4643](#) shall be confirmed by a test on a duplicate sample performed in accordance with [ASTM D2216](#). In the event of significant disagreement (more than 2%) between the [ASTM D6938](#) and [ASTM D2216](#) tests, [ASTM D2216](#) shall govern and [ASTM D6938](#) shall no longer be used until calibration tests show agreement between methods. In the event that [ASTM D6938](#) cannot be calibrated to provide accurate results, [ASTM D4643](#) and [ASTM D2216](#) shall be used exclusively to determine moisture. One (1) moisture content test will be performed each time a density test is performed on any given lift.

3.6.7 Grain Size Analysis

Grain size analysis tests shall be performed in accordance with [ASTM D422](#). One series of tests shall be conducted at the beginning of each work shift where Soil-Bentonite Fill is to be produced. A series of tests shall include a grain size analysis on representative samples of the stockpiled

Base Soil and one grain size analysis on representative samples of the mixed Soil-Bentonite Fill, as placed.

3.6.8 Liquid Limit and Plasticity Index

One liquid limit and plasticity index shall be performed on the Soil-Bentonite Fill for each grain size analysis conducted. Liquid limit and plasticity index shall be in accordance with [ASTM D4318](#).

3.6.9 Additional Testing

The Contracting Officer may request additional tests if there is reason to doubt the adequacy of the compaction, special compaction procedures are being used, materials change, if the Contracting Officer determines that the Contractor's testing is inadequate, or the Contractor is concentrating backfill and fill operations in a relatively small area.

3.6.10 Testing By The Government

During the life of this contract, the Government or its subcontracted lab will perform quality assurance tests. The Contractor shall make materials available for testing and expose materials for testing at the request of the Contracting Officer for the duration of this contract. The Contractor will provide a minimum of 72 hour notice prior to conducting sample collection at material provider site to allow government the ability to schedule resources for any split sampling during the duration of the contract.

3.6.11 Reporting

On a daily basis, 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 04](#) CONTRACTOR QUALITY CONTROL.

-- End of Section --

SUBMITTAL REGISTER

CONTRACT NO.
W912EP-18-R-0013

TITLE AND LOCATION
Herbert Hoover Dike Rehabilitation, Structure Replacements

CONTRACTOR

ACTIVITY NO	TRANSMITTAL NO	SPEC SECT	DESCRIPTION ITEM SUBMITTED	PARAGRAPH	GOVT CLASSIFICATION	CONTRACTOR: SCHEDULE DATES			CONTRACTOR ACTION		APPROVING AUTHORITY					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	MAILED TO CONTR/	DATE RCD FRM APPR AUTH
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		01 50 02	SD-02 Shop Drawings														
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			Contracting Officer's Field Office	2.1													
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			Invasive and Nuisance Species		G DO												
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			Environmental Protection Plan		G DO												
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			Bird Monitoring Qualifications		G DO												
			Eastern Indigo Snake Observer		G DO												
			Florida Bonneted Bat		G DO												
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			Eastern Indigo Snake Monitoring														
			Report														
			Project Environmental Summary														
			Sheet														
			Logs/Summary of Bird Nesting														
			Monitoring														
			Comprehensive Final Report														
		01 57 25	SD-03 Product Data														
			Calibration Standard														
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			Warranty Management Plan	1.4.1	G RO												
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			Reinforcing Steel	2.3														

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						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
		03 20 00	Qualification of Steel Bar Butt-Splicers	1.3.2														
		03 31 01	SD-03 Product Data															
			On-Site Batch Plant		G RO													
			Concrete Mixture Proportions	1.2	G RO													
			Testing Technicians	1.4														
			Conveying Equipment	2.2.2	G RO													
			Concrete Construction Inspector (CCI)	1.4														
			Construction Joint Treatment	3.1.4	G RO													
			Curing and Protection		G RO													
			Hot Weather Placing	3.2.5	G RO													
			Cold Weather Placing	3.2.4	G RO													
			Thermal Analysis		G RO													
			SD-06 Test Reports															
			Quality of Aggregates		G RO													
			Tests and Inspections	3.4	G RO													
			Mixer Uniformity	3.4.2.7	G RO													
			SD-07 Certificates															
			Batch Plant/Ready Mix Plant		G RO													
			Cementitious Materials	2.1.1														
			Aggregates		G RO													
			Impervious-Sheet Curing Materials															
			Air-Entraining Admixture	2.1.3.1														

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						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
		03 31 01	Membrane-Forming Curing Compound														
			Epoxy Resin	2.1.7													
			Latex Bonding Compound	2.1.6													
			Nonshrink Grout	2.1.5													
		03 35 00	SD-03 Product Data														
			Latex Bonding Compound	2.1	G DO												
			Epoxy Resin	2.2	G DO												
		03 39 00	SD-06 Test Reports														
			Testing and Inspection for CQC	3.2	G RO												
		05 50 14	SD-02 Shop Drawings														
			Quality Control Plan		G DO												
			Detail Drawings	1.3.2	G DO												
			Control Dimensions		G DO												
			SD-03 Product Data														
			Welding of Structural Steel	2.2.2.1	G DO												
			Welding of Stainless Steel	2.2.2.4	G DO												
			Welding of Aluminum		G DO												
			Structural Steel Welding Repairs	2.3.4	G DO												
			Materials Orders	2.1.1													
			Materials List	2.1.2													
			Shipping Bill	2.1.3													
			Tubular Welding Schedule		G DO												
			SD-06 Test Reports														
			Tests, Inspections, and Verifications	2.3													

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						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
		05 50 14	Fabrication Quality Control Reports															
			SD-07 Certificates															
			Qualification Of Structural Steel Fabricator		G DO													
			Qualification of Welders and Welding Operators	1.3.1	G DO													
			Application Qualification for Steel Studs	2.2.2.3	G DO													
			Application Qualification for Stainless Steel Studs	2.2.2.5	G DO													
			Welding of Aluminum		G DO													
			Inspector Qualifications	1.4.1	G DO													
			NDT Equipment Calibration Records		G DO													
			SD-08 Manufacturer's Instructions															
			Welding Procedure Specifications (WPS)		G DO													
			NDT Written Practice		G DO													
		05 50 15	SD-02 Shop Drawings															
			Quality Control Plan		G DO													
			Miscellaneous Metals & Standard Metal Articles	2.1	G DO													
			Shop Fabricated Metal Items	2.2	G DO													
			Control Dimensions		G DO													
			SD-03 Product Data															

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																		(g)
		05 50 15	Miscellaneous Metals & Standard Metal Articles	2.1	G DO													
			Shop Fabricated Metal Items	2.2	G DO													
			SD-06 Test Reports															
			Miscellaneous Metals & Standard Metal Articles	2.1	G DO													
			Shop Fabricated Metal Items	2.2	G DO													
			SD-07 Certificates															
			NDT Equipment Calibration Records		G DO													
			Welder Qualification Records		G DO													
			Inspector Qualifications		G DO													
			SD-08 Manufacturer's Instructions															
			Welding Procedure Specifications		G DO													
			NDT Written Practice		G DO													
		08 11 13	SD-02 Shop Drawings															
			Doors		G RO													
			Frames	2.2	G RO													
			Frames	2.2	G RO													
			Accessories															
			Weatherstripping	2.3														
			SD-03 Product Data															
			Doors		G RO													
			Frames	2.2	G RO													
			Accessories															
			Weatherstripping	2.3														

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																		(g)
		08 71 00	SD-02 Shop Drawings															
			Hardware schedule	1.3	G RO													
			Keying system	2.3.5														
			SD-03 Product Data															
			Hardware items	2.3	G RO													
			SD-07 Certificates															
			Certificates															
			SD-08 Manufacturer's Instructions															
			Installation	3.1														
			SD-10 Operation and Maintenance Data															
			Hardware Schedule	1.3	G RO													
		08 91 00	SD-02 Shop Drawings															
			Wall louvers	1.4														
			SD-03 Product Data															
			Metal Wall Louvers	2.2														
			SD-06 Test Reports															
			Test Data		G DO													
			SD-07 Certificates															
			Certification		G DO													
		13 34 23	SD-02 Shop Drawings															
			Shop and Erection Drawings		G DO													
			SD-03 Product Data															
			Manufacturer's Catalog Data															
			SD-07 Certificates															
			Qualifications	1.3.3														

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		13 34 23	Design Certification															
			Plant Certification															
		13 51 00	SD-02 Shop Drawings															
			Survey Marker Placement and Settlement Monitoring Plan		G DO													
			SD-03 Product Data															
			Instrumentation Pre-Installation Form		G RO													
			Survey Markers		G DO													
			SD-06 Test Reports															
			Instrumentation Installation Form		G RO													
			Settlement Monitoring Readings		G DO													
			Thermistor Data		G DO													
			SD-10 Operation and Maintenance Data															
			Operation and Maintenance Manuals for all equipment (five copies each)		G DO													
			Manufacturer's Warranty															
			SD-11 Closeout Submittals															
			As-Built Drawings		G DO													
			As-Built Drawings for Settlement Monitoring Survey Markers		G DO													
		25 31 01	SD-02 Shop Drawings															
			Layout and Shop Drawings		G DO													
			SD-03 Product Data															

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		25 31 01	Catalog Data		G DO														
			Spare Equipment and Parts Data																
			SD-07 Certificates																
			Manufacturer's Representative		G DO														
			Qualifications																
			SD-10 Operation and Maintenance																
			Data																
			Operating Manuals		G DO														
		26 20 00	SD-02 Shop Drawings																
			Panelboards	2.11	G DO														
			Wireways	2.20	G DO														
			Marking Strips	3.1.7.1	G DO														
			SD-03 Product Data																
			Receptacles	2.10	G DO														
			Circuit breakers	2.11.3	G DO														
			Switches	2.8	G DO														
			Motor controllers	2.15	G DO														
			Meter base only	2.21	G DO														
			Surge protective devices	2.22	G DO														
			SD-06 Test Reports																
			Grounding system test	3.5.4	G DO														
			Ground-fault receptacle test	3.5.3	G DO														
			SD-10 Operation and Maintenance																
			Data																
			Electrical Systems	1.5.1	G DO														
		26 29 10	SD-02 Shop Drawings																

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																		(g)
		26 29 10	Controller, Terminal Leads, Terminal Blocks															
			Motor Nameplates, Equipment and Door Nameplates															
			Controller		G DO													
			Limit Switch		G DO													
			Electric Motor Actuator		G DO													
			Control Stations		G DO													
			Enclosing Case		G DO													
			SD-03 Product Data															
			Electric Motor Actuator		G DO													
			Actuator Motor		G DO													
			Limit Switch		G DO													
			Overload Relays		G DO													
			Controller															
			Control Stations		G DO													
			Wiring		G DO													
			Spare Parts List															
			Protective Coating List															
			SD-09 Manufacturer's Field Reports															
			Tests	2.18														
			SD-10 Operation and Maintenance Data															
			Operation and Maintenance Data		G DO													
		26 31 00	SD-02 Shop Drawings															

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		26 31 00	Schematic Diagrams		G DO														
			Interconnection Diagrams		G DO														
			Installation Drawings		G DO														
			SD-03 Product Data																
			Roof Mounting Structure for Modules (Racking)	2.4	G DO														
			Photovoltaic Modules	2.1	G DO														
			SD-05 Design Data																
			System Operation	1.6.3	G DO														
			SD-06 Test Reports																
			Field Test Plan		G DO														
			Field Test Reports		G DO														
			SD-07 Certificates																
			Installer	1.6.4	G DO														
			Materials	1.6.5	G DO														
			Warranty	1.8	G DO														
			SD-08 Manufacturer's Instructions																
			Installation Instructions		G DO														
			SD-10 Operation and Maintenance Data																
			Electrical Systems	1.6.6.1	G DO														
		26 41 01	SD-02 Shop Drawings																
			Detail Drawings	1.3	G DO														
			SD-07 Certificates																
			Materials	2.2															
		26 51 00	SD-02 Shop Drawings																

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		26 51 00	Luminaire Drawings		G DO													
			SD-03 Product Data															
			Luminaires	2.2	G DO													
			Light Sources	2.4	G DO													
			Drivers	2.3	G DO													
			LED Luminaire Warranty	1.6.1	G DO													
			Energy Efficiency	1.5.2.3														
			SD-07 Certificates															
			Luminaire Useful Life Certificate	1.6.1.1	G DO													
		26 56 00	SD-02 Shop Drawings															
			Luminaire Drawings		G DO													
			Poles	1.4.1.2	G DO													
			SD-03 Product Data															
			Luminaires	1.4.1.1	G DO													
			Luminaires	2.2	G DO													
			Lamps		G DO													
			Photocell switch	2.3	G DO													
			Steel poles	2.4.1	G DO													
			Brackets	2.5														
			Anchorage system		G DO													
			SD-05 Design Data															
			Design Data for Luminaires	1.4.2	G DO													
			SD-08 Manufacturer's Instructions															
			Poles	1.4.1.2														
			Foundation Requirements															
			Mounting Details															

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																		(g)
		31 05 19	SD-03 Product Data															
			Thread	2.1.2	G RO													
			Manufacturing Quality Assurance Sampling and Testing	2.2	G RO													
			SD-04 Samples															
			Quality Control Samples and Tests	3.1	G RO													
			SD-07 Certificates															
			Geotextile	2.1.1	G RO													
		31 32 11	SD-02 Shop Drawings															
			Installation Plan	3.1	G DO													
			SD-03 Product Data															
			Turf Reinforcement Mat	2.2	G DO													
			Percussion Driven Earth Anchors (PDEA)	2.3	G DO													
			Pins	2.4	G DO													
			Equipment	1.4	G DO													
			SD-04 Samples															
			Materials	1.9	G DO													
			Percussion Driven Earth Anchors (PDEA)	2.3	G DO													
			Pins	2.4	G DO													
			SD-06 Test Reports															
			Quality Control Testing	3.10	G RO													
			SD-07 Certificates															
			Turf Reinforcement Mat	2.2	G DO													

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		31 41 16	SD-02 Shop Drawings															
			Metal Sheet Piling	2.1	G DO													
			SD-03 Product Data															
			Driving	3.2.2.2	G DO													
			Pile Driving Equipment	3.2.1	G DO													
			Pulling and Redriving	3.2.5	G DO													
			SD-06 Test Reports															
			Materials Tests	2.3.1	G RO													
			SD-11 Closeout Submittals															
			Pile Driving Record	3.4														
		32 11 23	SD-03 Product Data															
			Offsite Plant, Equipment, and Tools	1.5	G RO													
			Waybills and delivery tickets; Aggregate Sources	1.6 3.1.2	G RO G DO													
			SD-06 Test Reports															
			Sampling and Testing	1.3	G RO													
			Field Density Tests	1.3.2	G RO													
		32 12 16	SD-03 Product Data															
			Offsite Plant, Equipment, and Tools	1.5	G RO													
			Job-Mix Formula (JMF)	2.2.1	G RO													
			Contractor Quality Control	3.3	G RO													
			Material Acceptance	3.12	G RO													
			Waybills and Delivery Tickets		G RO													
			SD-04 Samples															

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		32 12 16	Superpave Type SP-9.5		G RO														
			Structural Course (Traffic Level C)																
			Aggregates	3.4.2	G RO														
			SD-06 Test Reports																
			QC Monitoring	3.3.2															
			Aggregates	3.4.2	G RO														
			SD-07 Certificates																
			Sampling and Testing	1.4	G RO														
			Testing Laboratory	1.4.2	G RO														
			Superpave Type SP-9.5 or	2.2	G RO														
			SP-12.5 Structural Course (Traffic																
			Level C)																
			Asphalt Cement Binder		G RO														
			SD-11 Closeout Submittals																
			Warranty	3.13	G RO														
		32 92 19	SD-03 Product Data																
			Equipment																
			Surface Erosion Control Material																
			Chemical Treatment Material																
			Delivery																
			Finished Grade and Topsoil																
			Topsoil																
			Quantity Check																
			Seed Establishment Period																
			Maintenance Record																
			Application of Pesticide																

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		32 92 19	SD-06 Test Reports															
			Equipment Calibration															
			Soil Test															
			SD-07 Certificates															
			Temporary Seeding															
			Seed															
			Topsoil															
			pH Adjuster															
			Fertilizer															
			Organic Material															
			Soil Conditioner															
			Mulch															
			Asphalt Adhesive															
			Pesticide															
		32 92 23	SD-03 Product Data															
			Delivery															
			Finished Grade and Topsoil															
			Topsoil															
			Quantity Check			G RO												
			Sod Establishment Period			G RO												
			Maintenance Record															
			SD-06 Test Reports															
			Equipment Calibration															
			Soil Test															
			SD-07 Certificates															
			Sod															

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						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	
																		(g)
		32 92 23	Topsoil Fertilizer															
		33 29 00	SD-02 Shop Drawings Well Closure Plan SD-06 Test Reports Post Construction Well Closure Report Water Level Summary Report		G DO													
		33 46 13	SD-07 Certificates Materials	2.1	G RO													
		35 20 16	SD-02 Shop Drawings Detail Drawings SD-03 Product Data Materials Materials Welding Gate Lifting Stem SD-05 Design Data Gate Component Design SD-06 Test Reports Tests, Inspections, and Verifications Acceptance Trial Operation and Test Procedures Acceptance Trial Operation and Test	2.3.1 2.1 2.1 2.3.2.1	G DO G DO G DO													
				2.4	G DO													
				3.2	G DO													

SUBMITTAL REGISTER

CONTRACT NO.
W912EP-18-R-0013

TITLE AND LOCATION
Herbert Hoover Dike Rehabilitation, Structure Replacements

CONTRACTOR

ACTIVITY NO	TRANSMITTAL NO	SPEC SECT	DESCRIPTION ITEM SUBMITTED	PARAGRAPH	GOVT CLASSIFICATION	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
		35 20 16	SD-10 Operation and Maintenance Data															
			Operation and Maintenance Data															
			Operation and Maintenance Instructions Manual		G DO													
		35 20 17	SD-02 Shop Drawings															
			Detail Drawings	2.3.1	G DO													
			SD-03 Product Data															
			Materials	2.1														
			Materials	2.1														
			Welding	2.3.2.1	G DO													
			SD-06 Test Reports															
			Tests, Inspections, and Verifications	2.4														
			Acceptance Trial Operation and Test	3.2	G DO													
		35 31 19	SD-02 Shop Drawings															
			Stone Source		G DO													
			Construction Methods		G DO													
			SD-05 Design Data															
			Survey		G DO													
			SD-06 Test Reports															
			Bulk Specific Gravity		G DO													
			Gradation Test		G DO													
			Evaluation Testing of Stone Report		G DO													

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						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
		35 31 19	SD-07 Certificates															
			Weight Scale Certification		G RO													
		35 41 00	SD-02 Shop Drawings															
			Dewatering Work Plan	3.5	G DO													
			Dewatering Work Plan	3.5.6	G DO													
			Dewatering Well Screen Filter Media															
			Shoring, Sheeting, and Bracing		G DO													
			Excavation	3.6	G DO													
			Excavation Access Plan		G DO													
			Plan of Operations		G DO													
			Embankment and Backfill Materials	1.3.1	G DO													
			Survey of Restored Embankment		G DO													
			SD-06 Test Reports															
			Foundation Inspection Checklist		G RO													
			Nuclear Density		G RO													
			Measurement of Fill Material		G RO													
			Testing															
			SD-07 Certificates															
			Testing		G RO													
		35 42 00	SD-02 Shop Drawings															
			Soil-Bentonite Fill Mix Design and Laboratory Test Results		G DO													
			SD-03 Product Data															
			Equipment and Plans		G DO													

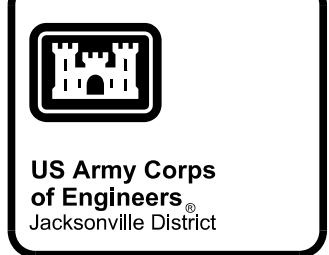
SUBMITTAL REGISTER

CONTRACT NO.
W912EP-18-R-0013

TITLE AND LOCATION
Herbert Hoover Dike Rehabilitation, Structure Replacements

CONTRACTOR

ACTIVITY NO	TRANSMITTAL NO	SPEC SECT	DESCRIPTION ITEM SUBMITTED	PARAGRAPH	CLASSIFICATION	CONTRACTOR: SCHEDULE DATES			CONTRACTOR ACTION		APPROVING AUTHORITY					REMARKS		
						SUBMIT	APPROVAL NEEDED BY	MATERIAL NEEDED BY	ACTION CODE	DATE OF ACTION	DATE FWD TO APPR AUTH/ FROM CONTR	DATE FWD TO OTHER REVIEWER	DATE RCD FROM OTH REVIEWER	ACTION CODE	DATE OF ACTION		MAILED TO CONTR/ DATE RCD FRM APPR AUTH	
																		(g)
		35 42 00	SD-06 Test Reports															
			Calibration Curves		G RO													
			Soil Classification Test		G DO													
			Field Density		G RO													
			Laboratory Density		G RO													
			Nuclear Density		G RO													
			SD-07 Certificates															
			Certificates of Compliance		G RO													
		35 42 35	SD-03 Product Data															
			Stone Source		G DO													
			Filter Gravel (No. 89)		G DO													
			SD-06 Test Reports															
			Bulk Specific Gravity		G DO													
			Gradation Test		G DO													
			Evaluation Testing of Stone Report		G DO													



GENERAL NOTES:

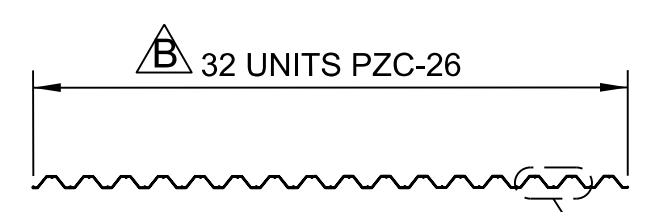
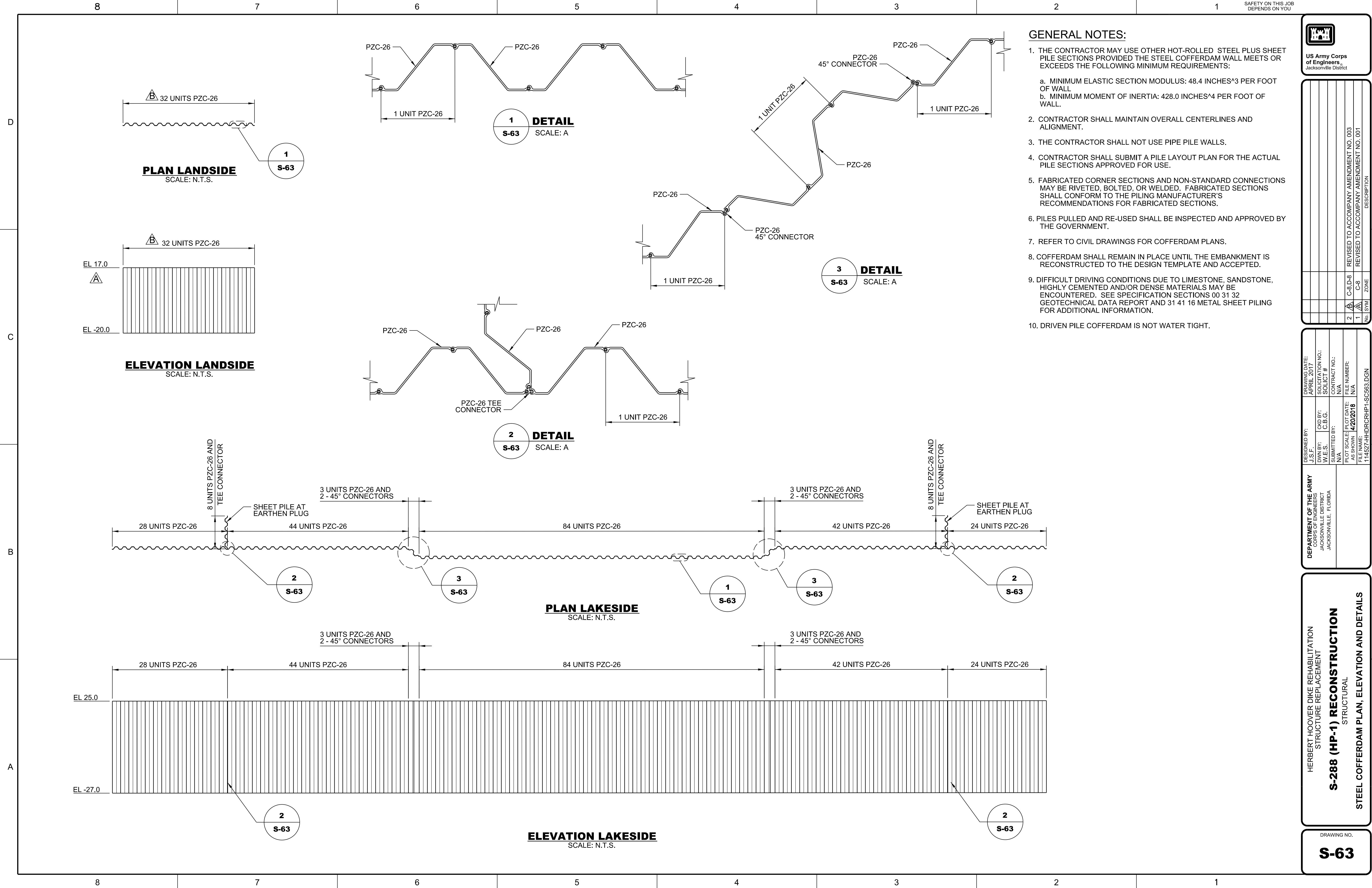
- THE CONTRACTOR MAY USE OTHER HOT-ROLLED STEEL PLUS SHEET PILE SECTIONS PROVIDED THE STEEL COFFERDAM WALL MEETS OR EXCEEDS THE FOLLOWING MINIMUM REQUIREMENTS:
 - MINIMUM ELASTIC SECTION MODULUS: 48.4 INCHES³ PER FOOT OF WALL
 - MINIMUM MOMENT OF INERTIA: 428.0 INCHES⁴ PER FOOT OF WALL.
- CONTRACTOR SHALL MAINTAIN OVERALL CENTERLINES AND ALIGNMENT.
- THE CONTRACTOR SHALL NOT USE PIPE PILE WALLS.
- CONTRACTOR SHALL SUBMIT A PILE LAYOUT PLAN FOR THE ACTUAL PILE SECTIONS APPROVED FOR USE.
- FABRICATED CORNER SECTIONS AND NON-STANDARD CONNECTIONS MAY BE RIVETED, BOLTED, OR WELDED. FABRICATED SECTIONS SHALL CONFORM TO THE PILING MANUFACTURER'S RECOMMENDATIONS FOR FABRICATED SECTIONS.
- PILES PULLED AND RE-USED SHALL BE INSPECTED AND APPROVED BY THE GOVERNMENT.
- REFER TO CIVIL DRAWINGS FOR COFFERDAM PLANS.
- COFFERDAM SHALL REMAIN IN PLACE UNTIL THE EMBANKMENT IS RECONSTRUCTED TO THE DESIGN TEMPLATE AND ACCEPTED.
- DIFFICULT DRIVING CONDITIONS DUE TO LIMESTONE, SANDSTONE, HIGHLY CEMENTED AND/OR DENSE MATERIALS MAY BE ENCOUNTERED. SEE SPECIFICATION SECTIONS 00 31 32 GEOTECHNICAL DATA REPORT AND 31 41 16 METAL SHEET PILING FOR ADDITIONAL INFORMATION.
- DRIVEN PILE COFFERDAM IS NOT WATER TIGHT.

NO.	BY	ZONE	DESCRIPTION
2	Δ	C-S,D-8	REVISED TO ACCOMPANY AMENDMENT NO. 003
1	Δ	C-8	REVISED TO ACCOMPANY AMENDMENT NO. 001

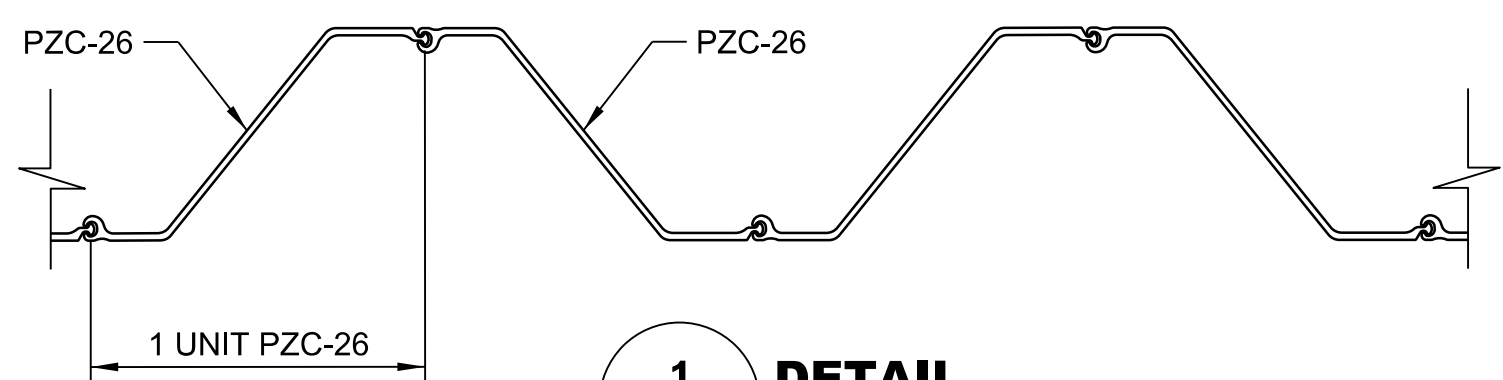
DESIGNED BY: J.S.F. W.E.S.	APPROVED DATE: APR 2017	DESIGNED BY: C.B.G.	APPROVED DATE: MAY 2018
DEPARTMENT OF THE ARMY CORPS OF ENGINEERS JACKSONVILLE DISTRICT JACKSONVILLE, FLORIDA	PROJECT NO. NO. 114527-HDRCRHP1-SC563.DGN	DESIGNED BY: N/A	APPROVED DATE: N/A
FILE NAME: 114527-HDRCRHP1-SC563.DGN	AS SHOWN	CONTRACT NO.:	FILE NUMBER:

HERBERT HOOVER DIKE REHABILITATION
STRUCTURE REPLACEMENT
S-288 (HP-1) RECONSTRUCTION
STRUCTURAL
STEEL COFFERDAM PLAN, ELEVATION AND DETAILS

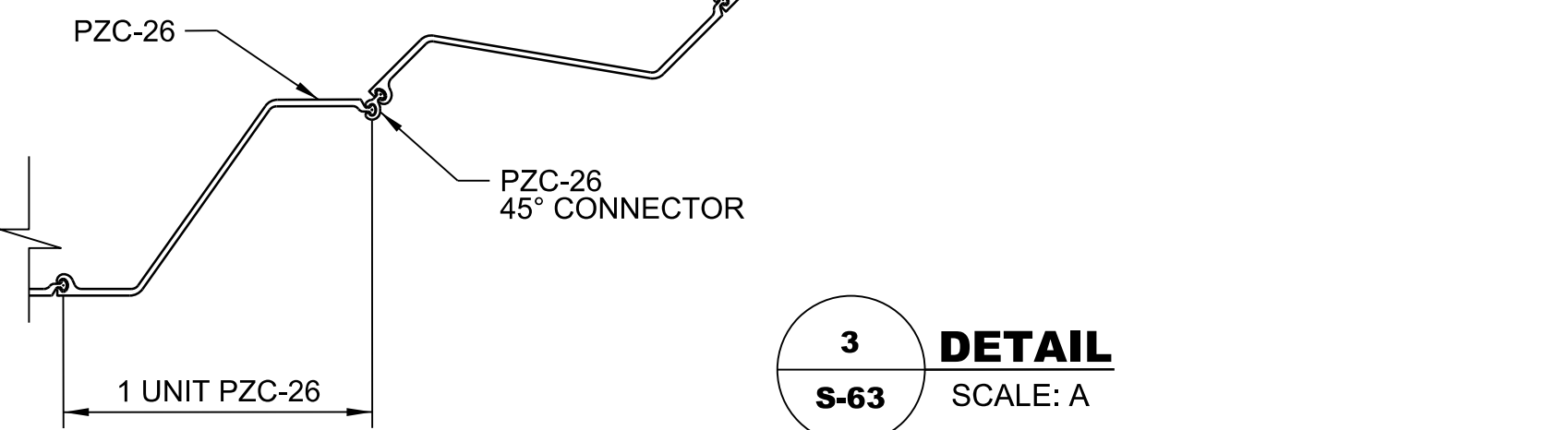
DRAWING NO.
S-63



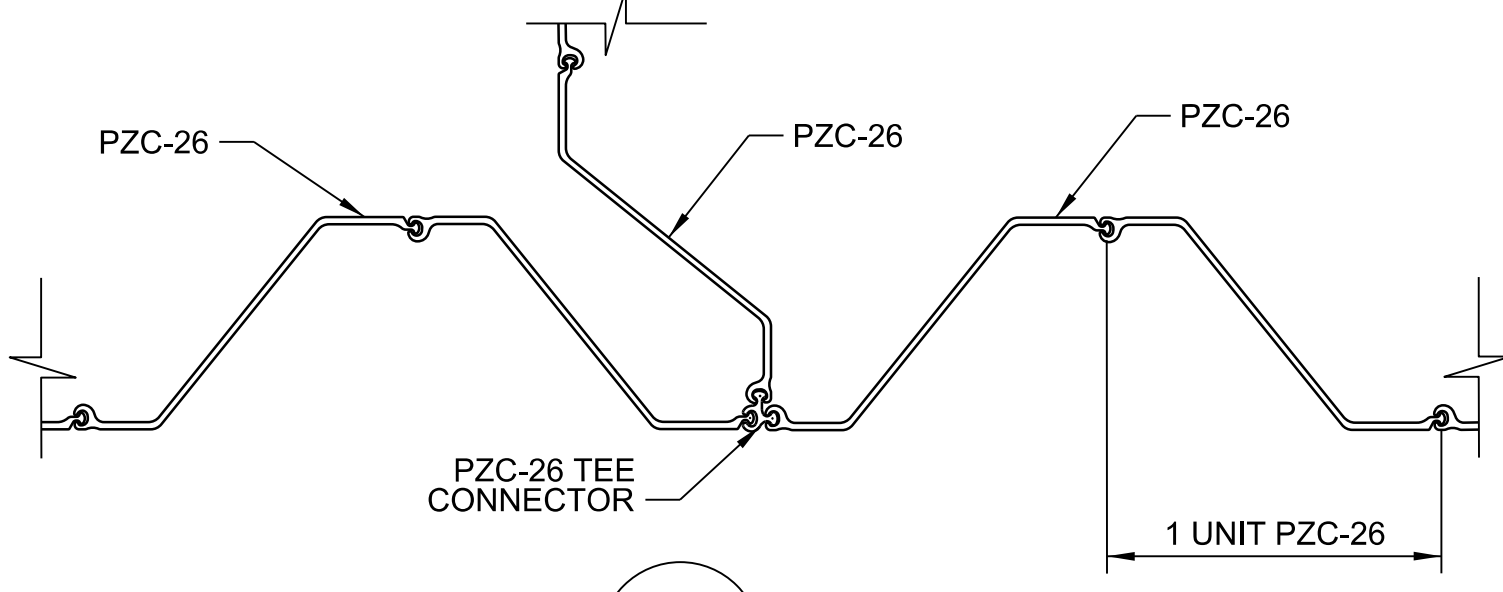
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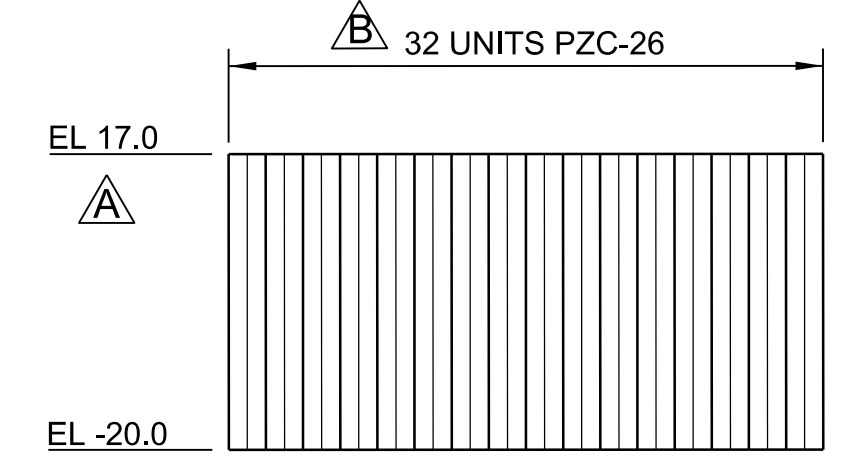
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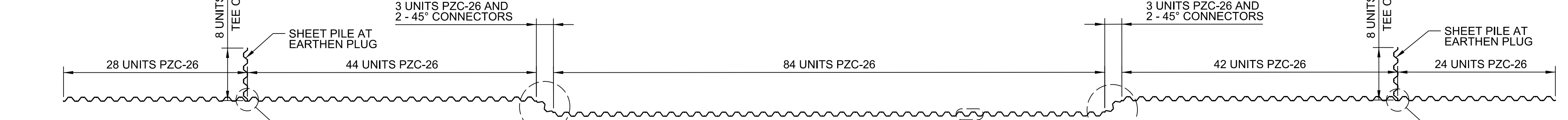
3 DETAIL
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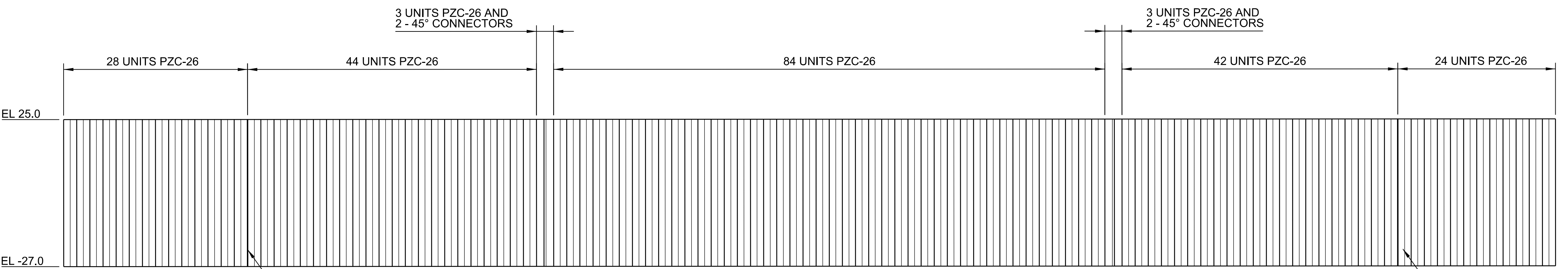
2 DETAIL
S-63 SCALE: A



ELEVATION LANDSIDE
SCALE: N.T.S.



PLAN LAKESIDE
SCALE: N.T.S.



ELEVATION LAKESIDE
SCALE: N.T.S.