

AMENDMENT OF SOLICITATION/MODIFICATION OF CONTRACT			1. CONTRACT ID CODE	PAGE OF PAGES	
			J	1	3
2. AMENDMENT/MODIFICATION NO. 0001	3. EFFECTIVE DATE 09-Aug-2002	4. REQUISITION/PURCHASE REQ. NO. W32CS520546395		5. PROJECT NO.(If applicable)	
6. ISSUED BY USA ENGINEER DISTRICT, JACKSONVILLE 400 WEST BAY STREET CESAJ-CT (ROOM 867) JACKSONVILLE FL 32202-4412	CODE DACW17	7. ADMINISTERED BY (If other than item 6) See Item 6		CODE	
8. NAME AND ADDRESS OF CONTRACTOR (No., Street, County, State and Zip Code)			X	9A. AMENDMENT OF SOLICITATION NO. DACW17-02-B-0011	
			X	9B. DATED (SEE ITEM 11) 16-Jul-2002	
				10A. MOD. OF CONTRACT/ORDER NO.	
				10B. DATED (SEE ITEM 13)	
CODE	FACILITY CODE				
11. THIS ITEM ONLY APPLIES TO AMENDMENTS OF SOLICITATIONS					
<input checked="" type="checkbox"/> The above numbered solicitation is amended as set forth in Item 14. The hour and date specified for receipt of Offer <input checked="" type="checkbox"/> is extended, <input type="checkbox"/> is not extended.					
Offer must acknowledge receipt of this amendment prior to the hour and date specified in the solicitation or as amended by one of the following methods: (a) By completing Items 8 and 15, and returning <u>1</u> copies of the amendment; (b) By acknowledging receipt of this amendment on each copy of the offer submitted; or (c) By separate letter or telegram which includes a reference to the solicitation and amendment numbers. FAILURE OF YOUR ACKNOWLEDGMENT TO BE RECEIVED AT THE PLACE DESIGNATED FOR THE RECEIPT OF OFFERS PRIOR TO THE HOUR AND DATE SPECIFIED MAY RESULT IN REJECTION OF YOUR OFFER. If by virtue of this amendment you desire to change an offer already submitted, such change may be made by telegram or letter, provided each telegram or letter makes reference to the solicitation and this amendment, and is received prior to the opening hour and date specified.					
12. ACCOUNTING AND APPROPRIATION DATA (If required)					
13. THIS ITEM APPLIES ONLY TO MODIFICATIONS OF CONTRACTS/ORDERS. IT MODIFIES THE CONTRACT/ORDER NO. AS DESCRIBED IN ITEM 14.					
A. THIS CHANGE ORDER IS ISSUED PURSUANT TO: (Specify authority) THE CHANGES SET FORTH IN ITEM 14 ARE MADE IN THE CONTRACT ORDER NO. IN ITEM 10A.					
B. THE ABOVE NUMBERED CONTRACT/ORDER IS MODIFIED TO REFLECT THE ADMINISTRATIVE CHANGES (such as changes in paying office, appropriation date, etc.) SET FORTH IN ITEM 14, PURSUANT TO THE AUTHORITY OF FAR 43.103(B).					
C. THIS SUPPLEMENTAL AGREEMENT IS ENTERED INTO PURSUANT TO AUTHORITY OF:					
D. OTHER (Specify type of modification and authority)					
E. IMPORTANT: Contractor <input type="checkbox"/> is not, <input type="checkbox"/> is required to sign this document and return _____ copies to the issuing office.					
14. DESCRIPTION OF AMENDMENT/MODIFICATION (Organized by UCF section headings, including solicitation/contract subject matter where feasible.) San Juan Harbor, Puerto Rico: Project Modifications for Improvement of the Environment at La Esperanza Peninsula, Catano, Puerto Rico					
14.A. DESCRIPTIVE SPECIFICATION CHANGES: Any enclosures accompanying this amendment should be inserted in the plans and/or specifications as applicable. All superseded materials should be removed or adequately marked to indicate they have been superseded.					
14.B. The BID OPENING DATE is CHANGED to AUGUST 20, 2002 AT 11:00 A.M.					
(See Page 2 for continuation of description.)					
Except as provided herein, all terms and conditions of the document referenced in Item 9A or 10A, as heretofore changed, remains unchanged and in full force and effect.					
15A. NAME AND TITLE OF SIGNER (Type or print)			16A. NAME AND TITLE OF CONTRACTING OFFICER (Type or print)		
			TEL: _____ EMAIL: _____		
15B. CONTRACTOR/OFFEROR	15C. DATE SIGNED	16B. UNITED STATES OF AMERICA		16C. DATE SIGNED	
_____ (Signature of person authorized to sign)		BY _____ (Signature of Contracting Officer)			

SECTION SF 30 BLOCK 14 CONTINUATION PAGE

SECTION 00010 - SOLICITATION, OFFER, AND AWARD

14.C. Make the following pen and ink changes to Block 13.A.:

“Sealed offers in original and 0 copies to perform the work required are due at the place specified in Item 8 by 11:00:00 (hour) local time 8/20/02 (date).”

SECTION 00100 - INSTRUCTIONS TO OFFERORS/EVALUATION FACTORS FOR AWARD

14.D. Section 00100: Delete Paragraph Number 999.219-4002, Subcontracting Plan Target Goals, and replace with the following revised Paragraph Number 999.219-4002.

SUBCONTRACTING PLAN TARGET GOALS

The offeror's attention is directed to the Small, Small Disadvantaged And Women Owned Small Business Subcontracting Plan clause of this solicitation. The clause and this paragraph do not apply to small business concerns.

(a) Where applicable, the offeror shall submit a subcontracting plan to the Contracting Officer for review and approval prior to contract award. The subcontracting plan may be submitted with the offer or after the date set for receipt of offers. If the plan is not submitted with the offer, the Contracting Officer will request the plan and specify the due date. The plan must contain all required elements set forth in the above referenced contract clause; must address basic contract requirements and options separately; and must demonstrate how the Contractor will accomplish the subcontracting requirements consistent with the obligations described in the clause. The plan will be evaluated in accordance with Army FAR Supplement (AFARS) Appendix DD, Subcontracting Plan Evaluation Guide. (AFARS is available on the worldwide web at <http://acqnet.saalt.army.mil/library/default.htm>.) Acceptability of the plan will be one of the elements considered by the Contracting Officer when determining contractor responsibility prior to award of a contract.

(b) The following subcontracting target goals are provided for informational purposes only. They are not legally binding.

Category	Target Goal
(1) Small Business Concerns	71.1%
(2) SBA Small Disadvantaged Business Concerns	10.2%
(3) Women-Owned Small Business Concerns	10.6%
(4) SBA HUBZone Small Business Concerns	3.0%
(5) Service-Disabled Veteran-Owned Small Business Concerns	3.0%
(6) Veteran-Owned Small Business Concerns	5.0%

(Stated percentages are based on the total amount of planned subcontracting; not the price of the contract. These target goals do not apply to contracts for commercial items. See FAR Part 12. For definitions of small business concern, small disadvantaged business concern, and woman owned small business concern, see the Small Business Program Representations (FAR 52.219-1) provision in this section of this solicitation. For HUBZone small business concern qualifications, see FAR subpart 19.13.)

(c) After award of the contract and prior to commencement of work, the Deputy for Small Business will instruct the Contractor in the preparation and timely submission of required subcontracting reports (SF-294 and SF-295). Where practicable, the above briefing will take place during the pre-work conference.

(d) Additional information concerning subcontracting plan requirements may be obtained from Ms. Debra Overstreet, Deputy for Small Business, Phone: 904-232-1150, or email debra.k.overstreet@usace.army.mil.

(End of paragraph number 999.219-4002)

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14.E. SPECIFICATIONS:

14.E.1. Either asterisks appear before and after the line or lines where revisions have been made to the text on the enclosed revised or added pages or the text changes have been updated with additions noted with underlined text and deletions noted with line/cross-outs, and pertain only to changes made by this amendment.

14.E.2. The text changes may have necessitated reformatting of subsequent text or pages. If this is the case, those pages have also been issued as amended pages but are not marked with asterisks or underlined text and line/cross-outs.

DESIGN AUTHENTICATION: DELETE the existing DESIGN AUTHENTICATION after the Cover page and REPLACE with the attached revised DESIGN AUTHENTICATION.

SECTION 01330: SUBMITTAL PROCEDURES; DELETE APPENDIX 01330-A (Submittal Register) and REPLACE with the attached revised APPENDIX 01330-A (Submittal Register).

SECTION 02464: STEEL SHEET PILES; DELETE SECTION 02464 and REPLACE with the attached revised SECTION 02464.

SECTION 09965: PAINTING: STEEL SHEET PILES; DELETE SECTION 09965 and REPLACE with the attached revised SECTION 09965.

14.F. DRAWINGS: D. O. File No. 102-38,205 dated June 2001 in 8 Sheets + Cover:

DELETE Drawing Nos. 2/2 and 2/3 and REPLACE with the attached revised Drawing Nos. 2/2 and 2/3.

*
San Juan Harbor, Puerto Rico;
Project Modifications for Improvement of
the Environment at La Esperanza Peninsula,
Catano, Puerto Rico

IFB No. DACW17-02-B-0011

DESIGN AUTHENTICATION

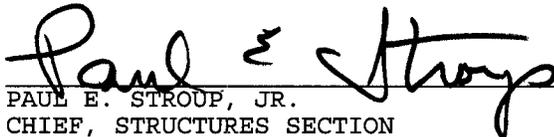
This project was designed by the Jacksonville District, U. S. Army Corps of Engineers. The initials or signatures and registration designations of individuals appear on these project documents within the scope of their employment as required by ER 1110-1-8152.



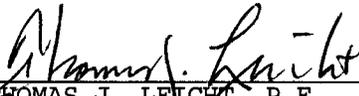
ANNE D. FORE
CHIEF, COST ENGINEERING BRANCH
ENGINEERING DIVISION



W. B. FARLEY
CHIEF, LEVEES AND WATERWAYS SECTION
DESIGN BRANCH, ENGINEERING DIVISION



PAUL E. STROUP, JR.
CHIEF, STRUCTURES SECTION
DESIGN BRANCH, ENGINEERING DIVISION



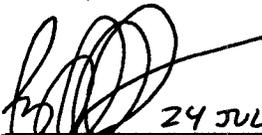
THOMAS J. LEICHT, P.E.
CHIEF, DESIGN BRANCH
ENGINEERING DIVISION



LUIS A. RUIZ, P.E.
CHIEF, GEOTECHNICAL BRANCH
ENGINEERING DIVISION



EDWARD E. MIDDLETON, Ph.D., P.E.
CHIEF, ENGINEERING DIVISION



JAMES G. MAY
COLONEL, CORPS OF ENGINEERS
DISTRICT ENGINEER

SUBMITTAL REGISTER

CONTRACT NO.
DACW17-02-B-0011

TITLE AND LOCATION La Esperanza Peninsula, Catano, Puerto Rico (Rev Am #0001)						CONTRACTOR											
ACTIVITY NO	TRANSMITTAL NO	SPEC SECT	DESCRIPTION ITEM SUBMITTED	PARAGRAPH #	GOVT CLASSIFICATION / REVIEW NUMBER	CONTRACTOR: SCHEDULE DATES			CONTRACTOR ACTION		APPROVING AUTHORITY					MAILED TO CONTR/ DATE RCD FRM APPR AUTH	REMARKS
						SUBMIT	APPROVAL NEEDED BY	MATERIAL NEEDED BY	CODE	DATE OF ACTION	DATE FWD TO APPR AUTH/ DATE RCD FROM CONTR	DATE FWD TO OTHER REVIEWER	DATE RCD FROM OTH REVIEWER	CODE	DATE OF ACTION		
(a)	(b)	(c)	(d)	(e)	(f)	(g)	(h)	(i)	(j)	(k)	(l)	(m)	(n)	(o)	(p)	(q)	(r)
	01000		SD-01 Preconstruction Submittals Hurricane and Severe Storm Plan		G COR												
			SD-02 Shop Drawings Construction Drawings		G COR												
			SD-07 Certificates Critical Lift Plan		G COR												
	01310		SD-01 Preconstruction Submittals Standard Form 100 FIO Affirmative Action Plan List of Subcontractors Signature Authority Drug-Free Work Place Record Accident Prevention Plan Diving Plan (including Activity Hazards Analysis)		G COR G COR												
	01321		SD-01 Preconstruction Submittals Construction Schedule		G COR												
	01330		SD-01 Preconstruction Submittals Submittal Register		G COR												
	01355		SD-01 Preconstruction Submittals Environmental Protection Plan SD-11 Closeout Submittals Logs/Final Summary Report FIO		G PD												

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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		
(a)	(b)	(c)	(d)	(e)	(f)	(g)	(h)	(i)	(j)	(k)	(l)	(m)	(n)	(o)	(p)	(q)	(r)
		01355	Project Environmental Summary Sheet														
		01411	SD-03 Product Data Calibration Standard FIO														
			SD-06 Test Reports Turbidity Monitoring FIO														
		01452	SD-01 Preconstruction Submittals Quality Control Plan		G COR												
			Personnel Qualifications		G COR												
			Letter of Authority FIO														
		01500	SD-01 Preconstruction Submittals Mobilization/Demobilization Plan FIO														
			Security Plan														
			SD-02 Shop Drawings Site Layout FIO														
			Temporary Electric Drawings														
			SD-07 Certificates Boat Operator's License FIO														
		01780	SD-02 Shop Drawings As-Built Drawings	1.2.1	G COR												

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						SUBMIT	APPROVAL NEEDED BY	MATERIAL NEEDED BY	SECTION 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)
		02230	SD-03 Product Data														
			Materials Other Than Salable Timber	3.3.1	G RE												
		02325	SD-01 Preconstruction Submittals														
			Notice of Intent to Dredge FIO														
			Relocation of Navigation Aids														
			SD-07 Certificates														
			Notification of Discovery of Historical Period Shipwreck Sites														
			FIO														
			Notice of Need for Dredging Survey														
			Daily/Monthly Report of Operations														
			Notice of Misplaced Material														
		02464	SD-02 Shop Drawings														
			Steel Sheet Piles	2.1	G												
			SD-07 Certificates														
			Pile Pulling Method														
			Material Certificates														
			Pile Driving Equipment														
			Interlock Tension Test Procedure														
			SD-11 Closeout Submittals														
			Pile Driving Records														
		05055	SD-02 Shop Drawings														

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(a)	(b)	(c)	(d)	(e)	(f)	(g)	(h)	(i)	(j)	(k)	(l)	(m)	(n)	(o)	(p)	(q)	(r)
		05055	Detail Drawings		G												
			SD-03 Product Data														
			Welding Procedures of Structural Steel		G												
			Structural Steel Welding Repairs	2.3.3	G												
			Materials Orders	2.1.1	G												
			Materials List	2.1.2	G												
			Shipping Bill		G												
			SD-06 Test Reports														
			Tests, Inspections, and Verifications	2.3	G												
			SD-07 Certificates														
			Qualification of Welders, Welding Operators and Certification of NDT Operators		G												
			SD-11 Closeout Submittals														
			Materials Disposition Records														
		09965	SD-03 Product Data														
			Accident Prevention Plan		G SO												
			Confined Space Procedures		G SO												
			Respiratory Protection Program		G SO												
			Airborne Sampling Plan		G SO												
			Ventilation Assessment		G SO												
			Medical Surveillance Plan		G SO												
			Worker Protection Plan		G SO												
			Environmental Compliance Plan		G SO												

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		09965	Waste Classification, Handling, and Disposal Plan		G SO												
			Containment Plan		G ED												
			Visible Emissions Monitoring Plan		G SO												
			Ambient Air Monitoring Plan		G SO												
			SD-04 Samples														
			Specification and Proprietary Paints		G COR												
			Thinners		G COR												
			SD-06 Test Reports														
			Airborne Sampling Report		G SO												
			Inspection and Operation Records		G COR												
			SD-07 Certificates														
			Qualifications and Experience		G SO												
			Qualified Painting Contractor		G ED												
			Qualified Coating Thickness Gages		G COR												

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DIVISION 02 - SITE WORK

SECTION 02464

STEEL SHEET PILES

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- 1.3 DELIVERY, STORAGE AND HANDLING

PART 2 PRODUCTS

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- 2.2 STEEL PLATES
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- 3.2 INSTALLATION
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-- End of Section Table of Contents --

SECTION 02464

STEEL SHEET PILES

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 in the text by basic designation only.

AMERICAN SOCIETY FOR TESTING AND MATERIALS (ASTM)

ASTM A 6/A 6M	(2000) General Requirements for Rolled Structural Steel Bars, Plates, Shapes, and Sheet Piling
ASTM A 572/A 572M	(200) High-Strength Low-Alloy Columbium-Vanadium Structural Steel
ASTM A 690/A 690M	(1994) High-Strength Low-Alloy Steel H-Piles and Sheet Piling for Use in Marine Environments

AMERICAN WELDING SOCIETY, INC. (AWS)

AWS D1.1	(2000) Structural Welding Code - Steel
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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. The following shall be submitted in accordance with Section 01330 SUBMITTAL PROCEDURES:

SD-02 Shop Drawings

Steel Sheet Piles; G

Submit drawings for approval prior to start of the work or ordering materials. Include details of top protection, special reinforcing tips, tip protection, lagging, and fabricated additions to plain piles and driving, cut-off method, and corrosion protection. Drawings for sheet piling including fabricated sections shall show complete dimensions including minimum section properties and details of piling and the driving sequence and location of piling. Include details and dimensions of templates and other temporary guide structures for installing the piling. Provide details of the method of handling piling to prevent permanent deflection, distortion or damage to piling interlocks.

~~SD-06 Test Reports~~

~~Materials Tests~~

~~Interlock tension strength test conform to the piling manufacturer's standard test, include testing at least two 3 inch long coupons taken randomly from different as produced pilings of each heat and must be approved by the Contracting Officer.~~

SD-07 Certificates

Pile Pulling Method

Material Certificates

Submit for each shipment certificates and identified with specific lots prior to installing piling. Identification data should include piling type, dimensions, chemical composition, mechanical properties, section properties, heat number, and mill identification mark.

Pile Driving Equipment

Submit descriptions of pile driving equipment to be employed in the work to the Contracting Officer for approval. Descriptive information includes manufacturer's name, model numbers, capacity, rated energy, hammer details, cushion material, helmet and templates.

Interlock Tension Test Procedure

Submit the procedure for testing the tension strength of piling interlocks as required herein for approval prior to testing sheet piling.

SD-11 Closeout Submittals

Pile Driving Records

Records of the sheet piling driving operations shall be submitted after driving is completed. These records shall provide a system of identification which shows the disposition of approved piling in the work, driving equipment performance data, piling penetration rate data, piling dimensions and top and bottom elevations of installed piling. The format for driving records shall be as directed.

1.3 DELIVERY, STORAGE AND HANDLING

Handle piles using handling holes or lifting devices. Handle long length piles with care to prevent damage. Support on level blocks or racks spaced not more than 10 feet apart and not more than 2 feet from the ends. Supports between multiple lifts shall be in a vertical plane. Protect piling to prevent damage to coatings and to prevent corrosion prior to installation.

PART 2 PRODUCTS

2.1 STEEL SHEET PILES

Steel sheet piles should meet the requirements specified herein. Heavy gage hot-rolled sheet piling shall conform to ASTM A 572/A 572M, Grade 50, or ASTM A 690/A 690M. The interlock of sheet piling shall be free-sliding, allow a swing angle of at least 0.09 rad/ 5 degrees when threaded and maintain continuous interlocking when installed. Sheet piling including special fabricated sections shall be full-length sections of the dimensions shown. Fabricated sections shall conform to the requirements herein and the piling manufacturer's recommendations for fabricated sections. Provide sheet piling with standard pulling holes. Metalwork fabrication for sheet piling sections shall conform to the requirements of Section 05055, "Metalwork Fabrication".

2.2 STEEL PLATES

Structural steel plates for splices and other fabrication appurtenances shall conform to ASTM A 572/A 572M, Grade 50.

2.3 TESTS, INSPECTIONS, AND VERIFICATIONS

Requirements for material tests, workmanship and other measures for quality assurance shall be as specified and in Section 05055 METALWORK FABRICATION.

2.3.1 Materials Tests

Materials tests shall conform to the following requirements. Sheet piling and appurtenant materials shall be tested and certified by the manufacturer to meet the specified chemical, mechanical and section property requirements prior to delivery to the site. Testing of sheet piling for mechanical properties shall be performed after the completion of all rolling and forming operations. Testing of sheet piling shall meet the requirements of ASTM A 6/A 6M.

~~2.3.2 Interlocked Joint Strength in Tension Test~~

~~The interlocked joint strength in tension test shall conform to the piling manufacturer's standard test, include testing at least two 3 inch long coupons taken randomly from different as produced pilings of each heat and must be approved.~~

PART 3 EXECUTION

3.1 GRADING

Where indicated, work will be divided into grading areas within which satisfactory excavated material shall be placed in embankments, fills, and required backfills. The contractor shall not haul satisfactory material excavated in one grading area to another grading area except when so directed in writing. Pre-excavation or dredging will not be permitted. Backfill as indicated.

3.2 INSTALLATION

3.2.1 Pile Driver

Use a pile driver having a delivered force or energy suitable for the total weight of the pile and the character of subsurface material to be encountered. Operate the driver at the rate recommended by the manufacturer throughout the entire driving period. Repair damage to piling caused by use of a pile driver with excess delivered force or energy.

3.2.2 Pile Protection

Prior to driving, provide template or driving frame suitable for aligning, supporting, and maintaining sheet piling in the correct position during setting and driving. Use a system of structural framing sufficiently rigid to resist lateral and driving forces and to adequately support the sheet piling until design tip elevation is achieved. Provide at least two levels of support, at third points (not less than 20 feet apart). Templates shall not move when supporting sheet piling. Fit templates with wood blocking to bear against the web of each alternate sheet pile and hold the sheet pile at the design location alignment. Provide outer template straps or other restraints as necessary to prevent the sheets from warping or wandering from the alignment. Mark template for the location of the leading edge of each alternate sheet pile. If in view, also mark the second level to assure that the piles are vertical and in position. If two guide marks cannot be seen, other means must be used to keep the sheet pile vertical along its leading edge.

3.2.3 Pile Driving

Maintain piling vertical during driving. Drive piles in such a manner as to prevent damage to the piles and to provide a continuous closure. Where possible, drive Z-pile with the ball end leading. If an open socket is leading, a bolt or similar object placed in the bottom of the interlock will minimize packing material into it and ease driving for the next sheet.

Incrementally sequence driving of individual piles such that the tip of any sheet pile shall not be more than 4 feet below that of any adjacent sheet pile. When the penetration resistance exceeds five blows per inch, the tip of any sheet pile shall not be more than 2 feet below any adjacent sheet pile.

3.2.4 Cutting and Splicing

Piles driven to refusal or the point where additional penetration cannot be attained and are extending above the required top elevation in excess of the specified tolerance shall be cut off to the required elevation. Piles driven below the required top elevation and piles damaged by driving and cut off to permit further driving shall be extended as required to reach the top elevation by splicing when directed by the Contracting Officer. Unless absolutely required, splicing of sheet piles should be avoided. If directed by the Contracting Officer, splice piles as required to drive them to depths greater than shown on the drawings and extend them up to the required top elevation. Piles adjoining spliced piles shall be full length unless otherwise approved. If splices are allowed in adjoining piles, the splices must be spaced at least 20 feet apart in elevation. Welding of splices shall conform to the requirements of Section 05055, "Metalwork Fabrication." Ends of piles to be spliced shall be squared before splicing to eliminate dips or camber. Splice piles with concentric alignment of the interlocks so that there are no discontinuities, dips or camber at the abutting interlocks. Spliced piles shall be free sliding and able to obtain the maximum swing with contiguous piles. Trim the tops of piles excessively battered during driving, when directed at no cost to the Government. Pile cut-offs shall become the property of the Contractor and shall be removed from the site. Use a straight edge in cutting by burning to avoid abrupt nicks. Bolt holes shall be drilled or may be burned and reamed by approved methods which will not damage the surrounding metal. Holes other than bolt holes shall be reasonably smooth and of the proper size for rods or other items to be

inserted. Do not use explosives for cutting.

3.2.5 Welding

Shop and field welding, qualification of welding procedures, welders, and welding operators shall be in accordance with AWS D1.1.

3.2.6 Tolerances in Driving

Drive all piles with a variation from vertical of not more than 1/4 inch per foot. Place the pile so the face will not be more than 6 inches from vertical alignment at any point. Top of pile at elevation of cut-off shall be within 1/2 inch horizontally and 2 inches vertically of the location indicated. Manipulation of piles to force them into position will not be permitted. Check all piles for heave. Redrive all heaved piles to the required tip elevation.

3.2.7 Corrosion Protection

Coat sheet piling in accordance with Section 09965, "PAINTING: STEEL SHEET PILES".

3.3 INSPECTION

Perform continuous inspection during pile driving. Inspect all piles for compliance with tolerance requirements. Bring any unusual problems which may occur to the attention of the Contracting Officer.

3.3.1 Inspection of Driven Piling

The Contractor shall inspect the interlocks of the portion of driven piles that extend above ground. Remove and replace piles found to be out of interlock.

3.3.2 Pulling and Redriving

The Contractor may be required to pull selected piles after driving to determine the condition of the underground portions of piles. The pile pulling method must be approved by the Contracting Officer. Remove and replace at the Contractor's expense any pile pulled and found to be damaged to the extent that its usefulness in the structure is impaired. Re-drive piles pulled and found to be in satisfactory condition.

3.4 INSTALLATION RECORDS

Maintain a pile driving record for each sheet pile. Indicate on the installation record installation dates and times, type and size of hammer, rate of operation, total driving time, dimensions of driving helmet and cap used, blows required per foot for each foot of penetration, final driving resistance in blows for final 6 inches, pile locations, tip elevations, ground elevations, cut-off elevations, and any re-heading or cutting of piles. Record any unusual pile driving problems during driving. Submit complete records to the Contracting Officer.

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PART 1 GENERAL

1.1 REFERENCES

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

AMERICAN NATIONAL STANDARDS INSTITUTE (ANSI)
ANSI Z87.1 (1989; Errata; Z87.1a) Occupational and Educational Eye and Face Protection
ANSI Z358.1 (1990) Emergency Eyewash and Shower Equipment

AMERICAN SOCIETY FOR TESTING AND MATERIALS (ASTM)
ASTM D 12 (1988; R 1998) Raw Tung Oil
ASTM D 153 (1986; R 1996e1) Specific Gravity of Pigments
ASTM D 235 (1999) Mineral Spirits (Petroleum Spirits) (Hydrocarbon Dry Cleaning Solvent)
ASTM D 281 (1995) Oil Absorption of Pigments by Spatula Rub-Out
ASTM D 304 (1995; R 1999) n-Butyl Alcohol (Butanol)
ASTM D 520 (1984; R 1995e1) Zinc Dust Pigment
ASTM D 561 (1982; R 1999) Carbon Black Pigment for Paint
ASTM D 740 (1994; R 1997) Methyl Ethyl Ketone
ASTM D 841 (1997) Nitration Grade Toluene
ASTM D 962 (1981; R 1999) Aluminum Powder and Paste Pigments for Paints
ASTM D 1045 (1995) Sampling and Testing Plasticizers Used in Plastics
ASTM D 1152 (1989; R 1997) Methanol (Methyl Alcohol)
ASTM D 1153 (1994; R 1997) Methyl Isobutyl Ketone
ASTM D 1186 (1993) Nondestructive Measurement of Dry Film Thickness of Nonmagnetic Coatings Applied to a Ferrous Base
ASTM D 1200 (1994; R 1999) Viscosity by Ford Viscosity Cup
ASTM D 1210 (1996) Fineness of Dispersion of Pigment-Vehicle Systems by Hegman-Type Gage
ASTM D 1308 (1987; R 1998) Effect of Household Chemicals on Clear and Pigmented Organic Finishes
ASTM D 1400 (1994) Nondestructive Measurement of Dry

Film Thickness of Nonconductive Coatings Applied to a Nonferrous Metal Base

ASTM D 1475 (1998) Density of Paint, Varnish, Lacquer, and Related Products

ASTM D 1640 (1995; R 1999) Drying, Curing, or Film Formation of Organic Coatings at Room Temperature

ASTM D 2369 (1998) Volatile Content of Coatings

ASTM D 2917 (1991; R 1998) Methyl Isoamyl Ketone

ASTM D 3721 (1983; R 1999) Synthetic Red Iron Oxide Pigment

ASTM D 4206 (1996) Sustained Burning of Liquid Mixtures Using the Small Scale Open-Cup Apparatus

ASTM D 4417 (1993; R 1999) Field Measurement of Surface Profile of Blast Cleaned Steel

ASTM E 1347 (1997) Color and Color-Difference Measurement by Tristimulus (Filter) Colorimetry

CODE OF FEDERAL REGULATIONS (CFR)

29 CFR 1910 Occupational Safety and Health Standards

29 CFR 1910.20 Access to Employee Exposure and Medical Records

29 CFR 1910.94 Ventilation

29 CFR 1910.134 Respiratory Protection

29 CFR 1910.146 Permit-required Confined Spaces

29 CFR 1910, Subpart I Personal Protective Equipment

29 CFR 1926 Safety and Health Regulations for Construction

29 CFR 1926.62 Lead

40 CFR 50.6 National Primary and Secondary Ambient Air Quality Standards for Particulate Matter

40 CFR 50.12 National Primary and Secondary Ambient Air Quality Standards for Lead

40 CFR 50, App B Reference Method for the Determination of Suspended Particulate Matter in the Atmosphere

40 CFR 58, App E Probe Siting Criteria for Ambient Air Quality Monitoring

40 CFR 60, App A, Mtd 22 Visual Determination of Fugitive Emissions

from Material Sources and Smoke Emissions from Flares

40 CFR 117 Determination of Reportable Quantities for Hazardous Substances

40 CFR 122 EPA Administered Permit Programs: The National Pollutant Discharge Elimination System

40 CFR 261 Identification and Listing of Hazardous Waste

40 CFR 261, App III Chemical Analysis Test Methods

40 CFR 261, App II, Mtd 1311 Toxicity Characteristic Leaching Procedure (TCLP)

40 CFR 262 Standards Applicable to Generators of Hazardous Waste
40 CFR 262.22 Number of Copies
40 CFR 263 Standards Applicable to Transporters of Hazardous Waste
40 CFR 302 Designation, Reportable Quantities and Notification
40 CFR 355 Emergency Planning and Notification
49 CFR 171, Subchapter C Hazardous Materials Regulations

COMMERCIAL ITEM DESCRIPTIONS (CID)

CID A-A-3130 Paint (For Application to Wet Surfaces)
CID A-A-3132 Coating System: Epoxy Primer/Urethane Topcoat, For Minimally Prepared Atmospheric Steel
CID A-A-50542 (Rev A) Coating System: Reflective, Slip-Resistant, Chemical-Resistant Urethane for Maintenance Facility Floors

ENGINEERING MANUALS (EM)

EM 385-1-1 (1996) U.S. Army Corps of Engineers Safety and Health Requirements Manual

FEDERAL STANDARDS (FED-STD)

FED-STD-595 (Rev B, Notice 1) Colors Used in Government Procurement

MASTER PAINTERS INSTITUTE (MPI)

MPI #9 Exterior Alkyd Enamel
MPI #46 Interior Enamel Undercoat
MPI #47 Interior Alkyd, Semi-Gloss
MPI #48 Interior Alkyd, Gloss
MPI #49 Interior Alkyd, Flat
MPI #50 Interior Latex Primer Sealer
MPI #51 Interior Alkyd, Eggshell
MPI #52 Interior Latex, Gloss Level 3
MPI #53 Interior Latex, Flat
MPI #54 Interior Latex, Semi-Gloss
MPI #114 Interior Latex, High Gloss (Acrylic)

MILITARY SPECIFICATIONS (MS)

MS MIL-DTL-24441 (Rev C, Supplement 1) Paint, Epoxy-Polyamide

NATIONAL FIRE PROTECTION ASSOCIATION (NFPA)

NFPA 70 (1999) National Electrical Code

NATIONAL INSTITUTE FOR OCCUPATIONAL SAFETY AND HEALTH
(NIOSH)
NIOSH Pub No. 98-119 (1998, 4th Ed., 2nd Supplement) NIOSH
Manual of Analytical Methods

THE SOCIETY FOR PROTECTIVE COATINGS (SSPC)

SECTION 09965 Page 9.CEGS
SSPC Guide 6 (1995) Containing Debris Generated During
Paint Removal Operations
SSPC QP 1 (1998) Standard Procedure for Evaluating
Qualifications of Painting Contractors

SSPC QP 2 (1995) Standard Procedure for Evaluating the
Qualifications of Painting Contractors to Remove Hazardous
Paint

SSPC Paint 16 (1991) Coal Tar Epoxy-Polyamide Black (or
Dark Red) Paint

SSPC Paint 20 (1991) Zinc-Rich Primers (Type I - "Inorganic"
and Type II - "Organic")

SSPC Paint 25 (1991) Red Iron Oxide, Zinc Oxide, Raw
Linseed Oil and Alkyd Primer (Without Lead and Chromate
Pigments)

SSPC Paint 27 (1991) Basic Zinc Chromate-Vinyl Butyral Wash
Primer

SSPC Paint 33 (1995) Coal Tar Mastic, Cold-Applied

SSPC PS 26.00 (2000) Aluminum-Pigmented Coating System for
Steel Surfaces, Performance-Based

SSPC SP 1 (1982) Solvent Cleaning

SSPC SP 3 (1995) Power Tool Cleaning

SSPC SP 5/NACE 1 (1994) White Metal Blast Cleaning

SSPC SP 6/NACE 3 (1994) Commercial Blast Cleaning

SSPC SP 7/NACE 4 (1994) Brush-Off Blast Cleaning

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 01330 SUBMITTAL

PROCEDURES:

SD-03 Product Data

Accident Prevention Plan; G, [Safety Office]

The Contractor shall submit an Accident Prevention Plan in

accordance with the requirements of Section 01 of EM 385-1-1. The plan shall include, but is not limited to, each of the topic areas listed in Appendix A therein and the requirements of paragraph SAFETY AND HEALTH PROVISIONS; each topic shall be developed in a concise manner to include management and operational aspects.

Confined Space Procedures; G, [Safety Office]

The Contractor shall submit detailed written standard operating procedures for confined spaces in accordance with 29 CFR 1910.146 and EM 385-1-1, Section 6I, and as further described in this paragraph.

a. The procedures shall include certificates of calibration for all testing and monitoring equipment. The certificates of calibration shall include: type of equipment, model number, date of calibration, firm conducting calibration, and signature of individual certifying calibration.

b. The procedures shall include methods of inspection of personal protective equipment prior to use.

c. The procedures shall include work practices and other engineering controls designed to reduce airborne hazardous chemical exposures to a minimum.

d. The procedures shall include specification of the design and installation of ventilation systems which shall provide adequate oxygen content and provide for the dilution of paint solvent vapor, lead, and other toxic particulates within the confined space. In addition, the contractor shall include plans to evaluate the adequacy of air flow patterns.

Respiratory Protection Program; G, [Safety Office]

The Contractor shall submit a comprehensive written respiratory protection program in accordance with 29 CFR 1910.134, 29 CFR 1926.62, and Section 05.E of EM 385-1-1.

Airborne Sampling Plan; G, [Safety Office]

The contractor shall submit an Airborne Sampling Plan detailing the NIOSH Pub No. 98-119, Factory Mutual, or Underwriters Laboratories approved equipment, equipment calibration procedures, sampling methods, sampling to be performed, and analytical procedures to be used based on the type of work to be performed and anticipated toxic contaminants to be generated. The contractor shall include the name of the accredited laboratory, listed by the American Industrial Hygiene Association (AIHA), to be used to conduct the analysis of any collected air samples.

Ventilation Assessment; G, [Safety Office]

The contractor shall submit a plan to provide ventilation assessment as required by paragraph PAINT APPLICATION, subparagraph VENTILATION.

Medical Surveillance Plan; G, [Safety Office]

The Contractor shall submit a Medical Surveillance Plan as required in paragraph MEDICAL STATUS and provide a statement from the examining physician indicating the name of each employee evaluated and any limitations which will preclude the employee from performing the work required. The statement shall include the date of the medical evaluation, the physician's name, signature, and telephone number.

Worker Protection Plan; G, [Safety Office]

The Contractor shall submit a Worker Protection Plan in accordance with the requirements of 29 CFR 1926.62. The plan shall address all necessary aspects of worker protection and shall include activities emitting lead, means to achieve compliance, alternative technologies considered, air monitoring program, implementation schedule, work practice program, administrative controls, multicontractor site arrangements, and jobsite inspections.

Environmental Compliance Plan; G, [Safety Office]

The Contractor shall submit an Environmental Compliance Plan.

The plan shall incorporate the submittals for, Ambient Air Monitoring Plan and Visible Emissions Monitoring Plan. The submitted plan shall also address all aspects of establishing and demarcating regulated areas, ventilation/containment system performance verification, and reporting of accidental releases.

Waste Classification, Handling, and Disposal Plan; G, [Safety Office]

The contractor shall submit a Waste Classification, Handling, and Disposal Plan in accordance with the requirements of 40 CFR 261 and 40 CFR 262 and paragraph Waste Classification, Handling, and Disposal.

Containment Plan; G, [EN]

The Contractor shall submit a plan for containing debris generated during paint removal operations in accordance with the requirements of paragraph Containment. The plan

shall include drawings, load-bearing capacity calculations, and wind load calculations. When the design is such that the spent abrasive is allowed to accumulate in quantities greater than 1,000 pounds, and/or impart a significant wind load on the structure, the contractor shall have the drawings approved by a registered structural engineer. The drawings and calculations shall be stamped with the engineer's seal. The contractor shall also identify the type and placement of water booms, methods for anchoring the booms, and the procedures for removing debris.

Visible Emissions Monitoring Plan; G, [Safety Office]
The Contractor shall submit a Visible Emissions Monitoring Plan in accordance with the paragraph Visible Emissions Monitoring. The plan shall include the provisions for halting work and correcting the containment in the event unacceptable emissions are observed. General statements shall not be used; specific methods, procedures, and details are required.

Ambient Air Monitoring Plan; G, [Safety Office]
The Contractor shall submit a plan for monitoring emissions of particulate matter 10 microns or less in size (PM-10). The plan shall comply with the requirements of EPA regulation 40 CFR 50.6 and paragraph PM-10 Monitoring. The plan shall also include provisions for halting work and correcting the containment in the event unacceptable emissions occur. The Contractor shall submit a plan for monitoring emissions of Total Suspended Particulates (TSP). The plan shall comply with the requirements of EPA regulation 40 CFR 50.12 and paragraph TSP Monitoring. The plan shall also include provisions for halting work and correcting the containment in the event unacceptable emissions occur.

SD-04 Samples

Specification and Proprietary Paints; G, [Area Office]
The Contractor shall submit samples of all special paint formula, Military, Master Painter Institute, Commercial Item Description, and SSPC paints. For products that are specified to be applied in accordance with the manufacturer's recommendations. The Contractor shall submit the paint producers product data sheet or other written instructions for those products. When the required quantity of any type is 50 gallons or less, the

Contractor shall submit in lieu of the liquid paint sample:

- a. A certified test report showing the results of required tests made on the material and a statement that it meets all of the specification requirements.
- b. A certified test report showing the results of required tests made on a previous batch of paint produced by the same firm using the same ingredients and formulation except for minor differences necessitated by a color change and a statement that the previous batch met all of the specification requirements. A report of tests on the proposed batch showing the following properties applicable to the material specifications shall be furnished: color, gloss, drying time, opacity, viscosity, weight per gallon, and fineness of grind.

Thinners; G, [Area Office]

Samples shall be submitted of the thinners which are those solvents used to reduce the viscosity of the paint.

SD-06 Test Reports

Airborne Sampling Report; G, [Safety Office]

The Contractor shall submit reports of airborne sampling tests as required by paragraph Airborne Sampling.

Inspection and Operation Records; G, [Area Office]

The Contractor shall submit records of inspections and operations performed in accordance with paragraph INSPECTION.

Submittals shall be made on a daily basis.

SD-07 Certificates

Qualifications and Experience; G, [Safety Office]

The Contractor shall submit certification pursuant to paragraph QUALIFICATIONS for all job sites. Submittal of the qualifications and experience of any additional qualified and competent persons employed to provide on-site environmental, safety, and health shall also be provided. Acceptance of this submission must be obtained prior to the submission of other required environmental safety, and health submittal items.

Qualified Painting Contractor; G, [EN]

The Contractor shall submit a copy of their current SSPC QP 1 certification.

Qualified Coating Thickness Gages; G, [Area Office]

Documentation of manufacturer's certification shall be submitted for all coating thickness gages.

1.3 QUALIFICATIONS

Qualifications and experience shall comply with the following:

1.3.1 Certified Professional

The Contractor shall utilize a qualified and competent person as defined in Section 01 of EM 385-1-1 to develop the required safety and health submittal and to provide on-site safety and health services during the contract period. The person shall be a Certified Industrial Hygienist (CIH), with a minimum of 3 years of demonstrated experience in similar related work. The Contractor shall certify that the Certified Industrial Hygienist (CIH) holds current and valid certification from the American Board of Industrial Hygiene (ABIH). The CIH may utilize other qualified and competent persons, as defined in EM 385-1-1, to conduct on-site safety and health activities as long as these persons have a minimum of 2 years of demonstrated experience in similar related work and are under the direct supervision of CIH.

1.3.2 Certified Laboratory

The Contractor shall provide documentation which includes the name, address, and telephone number of the laboratories to be providing services. In addition, the documentation shall indicate that each laboratory is an EPA National Lead Laboratory Accreditation Program (NLLAP) accredited laboratory and that each is rated proficient in the NIOSH/EPA Environmental Lead Proficiency Analytical Testing Program (ELPAT) and will document the date of current accreditation. Certification shall include accreditation for heavy metal analysis, list of experience relevant to analysis of lead in air, and a Quality Assurance and Quality Control Program.

1.3.3 Qualified Painting Contractor

The Contractor shall be a certified SSPC-QP 1 Painting Contractor.

1.3.4 Qualified Paint Applicator

Documentation of certification shall be submitted for all paint applicators. Prior to the initiation of any work all paint applicators shall be tested and certified as meeting the requirements of the qualified paint applicator. Certification shall be administered by the government

approved independent third party Test Agency. Applicators failing the certification test shall not be permitted to apply any paint on the project.

1.3.4.1 Test Plate

The test plate shall consist of a 6 feet by 6 feet steel plate with a 3/8 inch minimum thickness. The test plate shall have at least six bolts, three with bolt heads exposed and three with threads exposed, a 12-inch wide flange and a 6-inch diameter pipe each 18-inches long welded perpendicular to the test panel and a 6-inch deep T-beam with sealed ends welded horizontal across the test panel one foot up from the bottom all within the area to be painted on one side. Bolts shall be one-inch minimum in diameter.

1.3.4.2 Certification Test Procedure

Certification testing of paint applicators shall be conducted at the job site in coordination with the Contracting Officer. The Contractor shall supply the fabricated test plates to be used for the tests and shall provide crane service, rigging, and any other work necessary to provide accessibility for the certification testing and inspection. In preparation, the Contractor shall clean and prepare the test plates in accordance with the requirements of the contracted work. Abrasive blasting shall be performed with the blast media to be used in the contract. The paints to be applied shall be the Contractor supplied materials and shall be those previously tested and approved for use on the contract. Paints shall be applied as specified in the contract. The painter being tested shall mix and thin the paints to be used in the test and shall set up and adjust the application equipment for use. Each painter shall apply each of the types of paint comprising the specified system. The test plate shall be painted in a near vertical position.

1.3.4.3 Certification Criteria

The paint applicator shall be evaluated based on the conformance of the applied paint system to the requirements of the specifications. Deficiencies in the coatings, improper mixing or improper application methods are basis for failure. The Test Agency shall be the sole judge as to the acceptability of each paint applicators performance.

1.3.5 Coating Thickness Gage Qualification

Documentation of certification shall be submitted for all coating thickness gages. Magnetic flux thickness gages as described in ASTM D 1186 shall be used to make all coating thickness measurements on ferrous metal substrates. Eddy current thickness gages as described in ASTM D 1400 shall be used to measure coating thickness on all nonferrous metal substrates. Gages shall have an accuracy of +/- 3 percent or better. Gages to be used on the job shall be certified by the manufacturer as meeting these requirements.

1.4 SAMPLING AND TESTING

The Contractor shall allow at least 30 days for sampling and testing. Sampling may be at the job site or source of supply. The Contractor shall notify the Contracting Officer when the paint and thinner are available for sampling. Sampling of each batch shall be witnessed by the Contracting Officer unless otherwise specified or directed. A 1-quart sample of paint and thinner shall be submitted for each batch proposed for use. The sample shall be labeled to indicate formula or specification number and nomenclature, batch number, batch quantity, color, date made, and applicable project contract number. Testing will be performed by the Government. Costs for retesting rejected material will be deducted from payments to the Contractor at the rate of [\$1000.00] dollars for each paint sample retested and [\$750.00] dollars for each thinner retested.

1.5 SAFETY AND HEALTH PROVISIONS

Work shall be performed in accordance with the requirements of 29 CFR 1910, 29 CFR 1926, EM 385-1-1, and other references as listed herein. Matters of interpretation of the standards shall be submitted to the Contracting Officer for resolution before starting work. Where the regulations conflict, the most stringent requirements shall apply. Paragraph SAFETY AND HEALTH PROVISIONS supplements the requirements of EM 385-1-1, paragraph (1). In any conflict between Section 01 of EM 385-1-1 and this paragraph, the provisions herein shall govern.

1.5.1 Abrasive Blasting

The Contractor shall comply with the requirements in

Section 06.H of EM 385-1-1.

1.5.1.1 Hoses And Nozzles

In addition to the requirements in Section 20 of EM 385-1-1, hoses and hose connections of a type to prevent shock from static electricity shall be used. Hose lengths shall be joined together by approved couplings of a material and type designed to prevent erosion and weakening of the couplings. The couplings and nozzle attachments shall fit on the outside of the hose and shall be designed to prevent accidental disengagement.

1.5.1.2 Workers Other Than Blasters

Workers other than blasting operators working in close proximity to abrasive blasting operations shall be protected by utilizing MSHA/NIOSH-approved half-face or full-face air purifying respirators equipped with high-efficiency particulate air (HEPA) filters, eye protection meeting or exceeding ANSI Z87.1 and hearing protectors (ear plugs and/or ear muffs) providing a noise reduction rating of at least 20 dBA or as needed to provide adequate protection.

1.5.2 Cleaning with Compressed Air

Cleaning with compressed air shall be in accordance with Section 20.B.5 of EM 385-1-1 and personnel shall be protected as specified in 29 CFR 1910.134.

1.5.3 Cleaning with Solvents

1.5.3.1 Ventilation

Ventilation shall be provided where required by 29 CFR 1910.146 or where the concentration of solvent vapors exceeds 10 percent of the Lower Explosive Limit (LEL). Ventilation shall be in accordance with 29 CFR 1910.94, paragraph (c)(5).

1.5.3.2 Personal Protective Equipment

Personal protective equipment shall be provided where required by 29 CFR 1910.146 and in accordance with 29 CFR 1910, Subpart I.

1.5.4 Pretreatment of Metals and Concrete with Acids

1.5.4.1 Personal Protective Equipment Personnel shall be protected in accordance with 29 CFR 1910, Subpart I.

1.5.4.2 Emergency Equipment

In addition to the requirements of Section 05 of EM 385-1-1, the Contractor shall provide an eyewash in accordance

with ANSI Z358.1, paragraph (6).

1.5.5 Mixing Epoxy and Polyurethane Resin Formulations

1.5.5.1 Exhaust Ventilation

Local exhaust ventilation shall be provided in the area where the curing agent and resin are mixed. This ventilation system shall be capable of providing at least 100 linear fpm of capture velocity measured at the point where the curing agent and resin contact during mixing.

1.5.5.2 Personal Protective Equipment

Exposure of skin and eyes to epoxy resin components shall be avoided by wearing appropriate chemically resistant gloves, apron, safety goggles, and face shields meeting or exceeding the requirements of ANSI Z87.1.

1.5.5.3 Medical Precautions

Individuals who have a history of sensitivity to epoxy or polyurethane resin systems shall be medically evaluated before any exposure can occur. Individuals who are medically evaluated as exhibiting a sensitivity to epoxy resins shall not conduct work tasks or otherwise be exposed to such chemicals. Individuals who develop a sensitivity shall be immediately removed from further exposure and medically evaluated.

1.5.5.4 Emergency Equipment

A combination unit, comprised of an eyewash and deluge shower, within close proximity to the epoxy or polyurethane resin mixing operation shall be provided in accordance with ANSI Z358.1, paragraph (9).

1.5.6 Paint Application

1.5.6.1 Ventilation

When using solvent-based paint in confined spaces, ventilation shall be provided to exchange air in the space at a minimum rate of 5,000 cubic feet per minute per spray gun in operation. It may be necessary to install both a mechanical supply and exhaust ventilation system to effect adequate air changes within the confined space. All air-moving devices shall be located and affixed to an opening of the confined space in a manner that assures that the airflow is not restricted or short circuited and is supplied in the proper direction. Means of egress shall not be blocked. Ventilation shall be continued after completion of painting and through the drying phase of the operation. If the ventilation system fails or the

concentration of volatiles exceeds 10 percent of the LEL (except in the zone immediately adjacent to the spray nozzle), painting shall be stopped and spaces evacuated until such time that adequate ventilation is provided. An audible alarm that signals system failure shall be an integral part of the ventilation system. The effectiveness of the ventilation shall be checked by using ventilation smoke tubes and making frequent oxygen and combustible gas readings during painting operations. Exhaust ducts shall discharge clear of the working areas and away from possible sources of ignition.

1.5.6.2 Explosion Proof Equipment

Electrical wiring, lights, and other equipment located in the paint spraying area shall be of the explosion proof type designed for operation in Class I, Division 1, Group D, hazardous locations as required by the NFPA 70. Electrical wiring, motors, and other equipment, outside of but within 20 feet of any spraying area, shall not spark and shall conform to the provisions for Class I, Division 2, Group D, hazardous locations. Electric motors used to drive exhaust fans shall not be placed inside spraying areas or ducts. Fan blades and portable air ducts shall be constructed of nonferrous materials. Motors and associated control equipment shall be properly maintained and grounded. The metallic parts of air-moving devices, spray guns, connecting tubing, and duct work shall be electrically bonded and the bonded assembly shall be grounded.

1.5.6.3 Further Precautions

- a. Workers shall wear nonsparking safety shoes.
- b. Solvent drums taken into the spraying area shall be placed on nonferrous surfaces and shall be grounded. Metallic bonding shall be maintained between containers and drums when materials are being transferred.
- c. Insulation on all power and lighting cables shall be inspected to ensure that the insulation is in excellent working condition and is free of all cracks and worn spots. Cables shall be further inspected to ensure that no connections are within 50 feet of the operation, that lines are not overloaded, and that they are suspended with sufficient slack to prevent undue stress or chafing.

1.5.6.4 Ignition Sources

Ignition sources, to include lighted cigarettes, cigars,

pipes, matches, or cigarette lighters shall be prohibited in area of solvent cleaning, paint storage, paint mixing, or paint application.

1.5.7 Health Protection

1.5.7.1 Air Sampling

The Contractor shall perform air sampling and testing as needed to assure that workers are not exposed to contaminants above the permissible exposure limit. In addition, the Contractor shall provide the Contracting Officer with a copy of the test results from the laboratory within five working days of the sampling date and shall provide results from direct-reading instrumentation on the same day the samples are collected.

1.5.7.2 Respirators

During all spray painting operations, spray painters shall use approved SCBA or SAR (air line) respirators, unless valid air sampling has demonstrated contaminant levels to be consistently within concentrations that are compatible with air-purifying respirator Assigned Protection Factor (APF). Persons with facial hair that interferes with the sealing surface of the face piece to face seal or interferes with respirator valve function shall not be allowed to perform work requiring respiratory protection. Air-purifying chemical cartridge/canister half- or full-face piece respirators that have a particulate prefilter and are suitable for the specific type(s) of gas/vapor and particulate contaminant(s) may be used for nonconfined space painting, mixing, and cleaning (using solvents). These respirators may be used provided the measured or anticipated concentration of the contaminant(s) in the breathing zone of the exposed worker does not exceed the APF for the respirator and the gas/vapor has good warning properties or the respirator assembly is equipped with a NIOSH-approved end of service life indicator for the gas(es)/vapor anticipated or encountered. Where paint contains toxic elements such as lead, cadmium, chromium, or other toxic particulates that may become airborne during painting in nonconfined spaces, air-purifying half- and full-face piece respirators or powered air-purifying respirators equipped with appropriate gas vapor cartridges, in combination with a high-efficiency filter, or an appropriate canister incorporating a high-efficiency filter, shall be used.

1.5.7.3 Protective Clothing and Equipment

All workers shall wear safety shoes or boots, appropriate gloves to protect against the chemical to be encountered, and breathable, protective, full-body covering during spray-painting applications. Where necessary for emergencies, protective equipment such as life lines, body harnesses, or other means of personnel removal shall be used during confined-space work.

1.6 MEDICAL STATUS

Prior to the start of work and annually thereafter, all Contractor employees working with or around paint systems, thinners, blast media, those required to wear respiratory protective equipment, and those who will be exposed to high noise levels shall be medically evaluated for the particular type of exposure they may encounter. Medical records shall be maintained as required by 29 CFR 1910.20. The evaluation shall include:

- a. Audiometric testing and evaluation of employees who will work in a noise environment with a time weighted average greater than or equal to 90 dBA.
- b. Vision screening (employees who use full-face piece respirators shall not wear contact lenses).
- c. Medical evaluation shall include, but shall not be limited to, the following:
 - (1) Medical history including, but not limited to, alcohol use, with emphasis on liver, kidney, and pulmonary systems, and sensitivity to chemicals to be used on the job.
 - (2) General physical examination with emphasis on liver, kidney, and pulmonary system.
 - (3) Determination of the employee's physical and psychological ability to wear respiratory protective equipment and to perform job-related tasks.
 - (4) Determination of baseline values of biological indices for later comparison to changes associated with exposure to paint systems and thinners or blast media, which include: liver function tests to include SGOT, SGPT, GGPT, alkaline phosphates, bilirubin, complete urinalysis, EKG (employees over age 40), blood urea nitrogen (bun), serum creatinine, pulmonary function test, FVC, and FEV, chest x-ray (if medically indicated), blood lead and ZPP (for individuals where it is known there will be an exposure to materials containing lead), other criteria that may be deemed necessary by the Contractor's physician, and Physician's statements for individual employees that medical status would permit specific task performance.

(5) For lead-based paint removal, the medical requirements of 29 CFR 1926.62 shall also be included.

1.7 CHANGE IN MEDICAL STATUS

Any employee whose medical status has changed negatively due to work related chemical and/or physical agent exposure while working with or around paint systems and thinners, blast media, or other chemicals shall be evaluated by a physician, and the Contractor shall obtain a physicians statement as described in paragraph MEDICAL STATUS prior to allowing the employee to return to those work tasks. The Contractor shall notify the Contracting Officer in writing of any negative changes in employee medical status and the results of the physicians reevaluation statement.

1.8 ENVIRONMENTAL PROTECTION

In addition to the requirements of section 01354 the Contractor shall comply with the following environmental protection criteria.

1.8.1 Waste Classification, Handling, and Disposal

The Contractor shall be responsible for assuring the proper disposal of all hazardous and nonhazardous waste generated during the project. Hazardous waste shall be placed in properly labeled closed containers and shall be shielded adequately to prevent dispersion of the waste by wind or water. Any evidence of improper storage shall be cause for immediate shutdown of the project until corrective action is taken. Nonhazardous waste shall be stored in closed containers separate from hazardous waste storage areas. All hazardous waste shall be transported by a licensed transporter in accordance with 40 CFR 263 and 49 CFR 171, Subchapter C. All nonhazardous waste shall be transported in accordance with local regulations regarding waste transportation. In addition to the number of manifest copies required by 40 CFR 262.22, one copy of each manifest will be supplied to the Contracting Officer prior to transportation.

1.8.2 Containment

The Contractor shall contain debris generated during paint removal operations in accordance with the requirements of SSPC Guide 6, Class [_2A_]. Where required the minimum air movement velocity shall be 100 fpm for cross-draft ventilation or 60 fpm for downdraft ventilation.

1.8.3 Visible Emissions Monitoring

The time of emissions shall be measured in accordance with 40 CFR 60, App A, Mtd 22. Visible emissions shall be monitored for not less than 15 minutes of every hour. Visible emissions for each hour shall be calculated by extrapolation. In no case shall visible emissions extend greater than 150 ft in any direction horizontal from the containment. In no case shall visible emissions be observed in the area of any sensitive receptor. If such emissions occur the job shall be shut down immediately and corrective action taken. The foreman shall be notified whenever visible emissions exceed 200 seconds in a 1 hour period. The foreman shall be notified and the job shall be shut down and corrective action taken whenever visible emissions exceed 300 seconds in a 2 hour period. Total observed visible emissions from the containment shall not exceed 5 percent of the work day. Shutdown and corrective action shall be taken by the Contractor to prevent such an occurrence. The Contractor shall document each time that the work is halted due to a violation of the visible emissions criteria. Documentation shall include the cause for shutdown and the corrective action taken to resolve the problem.

1.9 PAINT PACKAGING, DELIVERY, AND STORAGE

Paints shall be processed and packaged to ensure that within a period of one year from date of manufacture, they will not gel, liver, or thicken deleteriously, or form gas in the closed container. Paints, unless otherwise specified or permitted, shall be packaged in standard containers not larger than 5 gallons, with removable friction or lug-type covers. Containers for vinyl-type paints shall be lined with a coating resistant to solvents in the formulations and capable of effectively isolating the paint from contact with the metal container. Each container of paint or separately packaged component thereof shall be labeled to indicate the purchaser's order number, date of manufacture, manufacturer's batch number, quantity, color, component identification and designated name, and formula or specification number of the paint together with special labeling instructions, when specified. Paint shall be delivered to the job in unbroken containers. Paints that can be harmed by exposure to cold weather shall be stored in ventilated, heated shelters. All paints shall be stored under cover from the elements and in locations free

from sparks and flames.

PART 2 PRODUCTS

2.1 SPECIAL PAINT FORMULAS

Special paints shall have the composition as indicated in the formulas listed herein. Where so specified, certain components of a paint formulation shall be packaged in separate containers for mixing on the job. If not specified or otherwise prescribed, the color shall be that naturally obtained from the required pigmentation.

2.2 PAINT FORMULATIONS

Special paint formulas shall comply with the following:

2.2.1 Formula V-102e, Vinyl-Type Ready-Mixed Aluminum Impacted Immersion Coating

INGREDIENTS PERCENT BY MASS

Vinyl Resin, Type 3 18.2

Aluminum Powder 8.3

Diisodecyl Phthalate 3.1

Methyl Isobutyl Ketone 33.8

Toluene 36.6

INGREDIENTS PERCENT BY MASS

100.0

a. The paint shall be furnished with the aluminum pigment mixed into the vehicle.

b. The viscosity of the paint shall be between 60 and 90 seconds using ASTM D 1200 and a No. 4 Ford cup.

2.2.2 Formula V-766e, Vinyl-Type White (or Gray) Impacted Immersion Coating

INGREDIENTS PERCENT BY MASS

Vinyl Resin, Type 3 5.6

Vinyl Resin, Type 4 11.6

Titanium Dioxide and (for Gray)

Carbon Black 13.0

Diisodecyl Phthalate 2.9

Methyl Isobutyl Ketone 32.0

Toluene 34.7

Ortho-Phosphoric Acid 0.2

100.0

- a. The dispersion of pigment shall be accomplished by means of pebble mills or other approved methods to produce a fineness of grind (ASTM D 1210) of not less than 7 on the Hegman scale. Grinding in steel-lined or steel-ball mills will not be permitted. No grinding aids, antissettling agents, or any other materials except those shown in the formula will be permitted. The paint shall show the proper proportions of specified materials when analyzed by chromatographic and/or spectrophotometric methods. The ortho-phosphoric acid shall be measured accurately and diluted with at least four parts of ketone to one part of acid and it shall be slowly incorporated into the finished paint with constant and thorough agitation.
- b. The viscosity of the paint shall be between 60 and 90 seconds using ASTM D 1200 and a No. 4 Ford cup.
- c. The white and gray paints shall be furnished in the volume ratio designated by the purchaser. The gray paint shall contain no pigments other than those specified. Enough carbon black shall be included to produce a dry paint film having a reflectance of 20-24 (ASTM E 1347). The resulting gray color shall approximate color 26231 of FED-STD-595.

2.2.3 Formula VZ-108d, Vinyl-Type Zinc-Rich Impacted Immersion Coating

INGREDIENTS PERCENT BY WEIGHT POUNDS GALLONS

COMPONENT A

Vinyl Resin, Type 3	16.6	109.2	9.65
Methyl Isobutyl Ketone	80.6	528.9	79.30
Suspending Agent E	0.7	4.6	0.28
Suspending Agent F	0.4	2.7	0.19
Methanol	0.5	3.3	0.50
Synthetic Iron Oxide (Red)	1.2	7.9	0.19

100.0	656.6	90.11
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COMPONENT B

INGREDIENTS PERCENT BY WEIGHT POUNDS GALLONS

Silane B	100.0	4.1	0.47
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COMPONENT C

Zinc Dust	100.0	550.0	9.42
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100.00	(mixed paint)	
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The iron oxide and suspending agents shall be dispersed into the vehicle (Component A) to a fineness of grind of

not less than 4 on the Hegman scale (ASTM D 1210). Grinding in steel-lined containers or using steel-grinding media shall not be permitted. The sole purpose of the iron oxide pigment is to produce a contrasting color. A red iron oxide-type 3 vinyl resin vehicle paste may be used in place of dry iron oxide provided compensating adjustment are made in the additions of Type 3 resin and methyl isobutyl ketone. The finished product with zinc dust added shall produce a paint which has a red tone upon drying and a reflectance of not more than 16 (ASTM E 1347).

b. VZ-108d paint shall be supplied as a kit. Each kit shall consist of 4.5 gallons (33.1 pounds) of Component A in a 5-gallon lug closure type pail, 27.5 pounds of zinc dust (Component C) packaged in a 1-gallon plastic pail, and 3 fluid ounces of silane (Component B) packaged in a glass bottle of suitable size having a polyethylene lined cap. The bottle of silane shall be placed on the zinc dust in the 1 gallon pail. In addition to standard labeling requirements, each container of each component shall be properly identified as to component type and each container label of Component A shall carry the following:

MIXING AND APPLICATION INSTRUCTIONS: WARNING - THIS PAINT WILL NOT ADHERE TO STEEL SURFACES UNLESS COMPONENT B IS ADDED. Remove the 3 ounces of bottled Component B (silane) from the Component C (zinc dust) container and add to the base paint Component A) with thorough stirring. Then sift the zinc dust into the base paint while it is being vigorously agitated with a power-driven stirrer and continue the stirring until the zinc dust has been dispersed. The mixed paint shall at some point be strained through a 30-60 mesh screen to prevent zinc dust slugs from reaching the spray gun nozzle. The paint shall be stirred continuously during application at a rate that will prevent settling. If spraying is interrupted for longer than 15 minutes, the entire length of the hose shall be whipped vigorously to redisperse the zinc. If the spraying is to be interrupted for more than 1 hour, the hose shall be emptied by blowing the paint back into the paint pot. Thinning will not normally be required when ambient temperatures are below about 80 degrees F, but when the ambient and steel temperatures are higher, methyl isoamyl ketone (MIAK) or methyl isobutyl ketone (MIBK) should be used. If paint is kept covered at all times, its pot life will be about 8 days.

2.2.4 Formula C-200a, Coal Tar-Epoxy (Black) Paint

The paint shall conform to SSPC Paint 16 manufactured with Type 1 pitch. In addition to standard labeling, container labels shall include the term, Corps of Engineers Formula C-200a.

2.3 INGREDIENTS FOR SPECIAL PAINT FORMULAS

The following ingredient materials and thinners apply only to those special paints whose formulas are shown above in detail.

2.3.1 Pigments and Suspending Agents

2.3.1.1 Aluminum Powder

For vinyl paint aluminum powder shall conform to ASTM D 962, Type 1, Class B.

2.3.1.2 Carbon Black

Carbon black shall conform to ASTM D 561, Type I or II.

2.3.1.3 Zinc Dust

Zinc dust pigment shall conform to ASTM D 520, Type II.

2.3.1.4 Iron Oxide

Iron oxide, (Dry) synthetic (red), shall conform to ASTM D 3721. In addition, the pigment shall have a maximum oil absorption of 24 and a specific gravity of 4.90 to 5.20 when tested in accordance with ASTM D 281 and ASTM D 153, Method A, respectively. When the pigment is dispersed into specified vinyl paint formulation, the paint shall have color approximating FED-STD-595 color 10076 (dark red paint), and shall show no evidence of incompatibility or reaction between pigment and other components after 6 months storage.

2.3.1.5 Titanium Dioxide

Titanium dioxide in vinyl paint Formula V-766e shall be one of the following: Kronos 2160 or 2101, Kronos, Inc.; Ti-Pure 960, E.I. Dupont DeNemours and Co., Inc.

2.3.1.6 Suspending Agent E

Suspending Agent E shall be a light cream colored finely divided powder having a specific gravity of 2 to 2.3. It shall be an organic derivative of magnesium aluminum silicate mineral capable of minimizing the tendency of zinc

dust to settle hard without increasing the viscosity of the paint appreciably. MPA-14, produced by RHEOX, Inc., has these properties.

2.3.1.7 Suspending Agent F

Suspending Agent F shall be a light cream colored finely divided powder having a specific gravity of approximately 1.8. It shall be an organic derivative of a special montmorillonite (trialkylaryl ammonium hectorite). Bentone 27, produced by RHEOX, Inc., has these properties.

2.3.2 Resins, Plasticizer, and Catalyst

2.3.2.1 Diisodecyl Phthalate Diisodecyl Phthalate shall have a purity of not less than 99.0 percent, shall contain not more than 0.1 percent water, and shall have an acid number (ASTM D 1045) of not more than 0.10.

2.3.2.2 Vinyl Resin, Type 3

Vinyl resin, Type 3, shall be a vinyl chloride-acetate copolymer of medium average molecular weight produced by a solution polymerization process and shall contain 85 to 88 percent vinyl chloride and 12 to 15 percent vinyl acetate by weight. The resin shall have film-forming properties and shall, in specified formulations, produce results equal to Vinylite resin VYHH, as manufactured by the Union Carbide Corporation.

2.3.2.3 Vinyl Resin, Type 4

Vinyl resin, Type 4, shall be a copolymer of the vinyl chloride-acetate type produced by a solution polymerization process, shall contain (by weight) 1 percent interpolymerized dibasic acid, 84 to 87 percent vinyl chloride, and 12 to 15 percent vinyl acetate. The resin shall have film-forming properties and shall, in the specified formulations, produce results equal to Vinylite resin VMCH, as manufactured by the Union Carbide Corporation.

2.3.2.4 Ortho-phosphoric Acid

Ortho-phosphoric acid shall be a chemically pure 85-percent grade.

2.3.3 Solvent and Thinners

2.3.3.1 Methanol

Methanol (methyl alcohol) shall conform to ASTM D 1152.

2.3.3.2 Methyl Ethyl Ketone

Methyl ethyl ketone (MEK) shall conform to ASTM D 740.

2.3.3.3 Methyl Isobutyl Ketone

Methyl isobutyl ketone (MIBK) shall conform to ASTM D 1153.

2.3.3.4 Methyl Isoamyl Ketone

Methyl isoamyl ketone (MIAK) shall conform to ASTM D 2917.

2.3.3.5 Toluene

Toluene shall conform to ASTM D 841.

2.3.4 Silane B

Silane B for Formula VZ-108d shall be N-beta-(aminoethyl)-gamma-aminopropyltrimethoxy silane. Silane A-1120, produced by the C.K. Witco Corporation, and Silane Z-6020, produced by Dow Corning Corporation, are products of this type.

2.4 TESTING

2.4.1 Chromatographic Analysis

Solvents in vinyl paints and thinners shall be subject to analysis by programmed temperature gas chromatographic methods and/or spectrophotometric methods, employing the same techniques that give reproducible results on prepared control samples known to meet the specifications. If the solvent being analyzed is of the type consisting primarily of a single chemical compound or a mixture of two or more such solvents, interpretation of the test results shall take cognizance of the degree of purity of the individual solvents as commercially produced for the paint industry.

2.4.2 Vinyl Paints

Vinyl paints shall be subject to the following adhesion test. When V-766 formulation is tested, 5 to 7 mils (dry) shall be spray applied to mild steel panels. The steel panels shall be essentially free of oil or other contaminants that may interfere with coating adhesion. The test panels shall be dry blast cleaned to a White Metal grade which shall be in compliance with SSPC SP 5/NACE 1. The surface shall have an angular profile of 2.0 to 2.5 mils as measured by ASTM D 4417, Method C. When V-102 formulation is tested, it shall be spray applied over 1.5 to 2.5 mils (dry) of V-766 known to pass this test. When VZ-108 is tested, the coating shall be mixed in its proper proportions and then spray applied to a dry film thickness of 1.5 to 2.5 mils above the blast profile. The VZ-108 shall be top coated with a V-766 known to pass this test. In all cases, the complete system shall have a total dry

film thickness of 5 to 7 mils above the blast profile. After being air dried for 2 hours at room temperature, the panel shall be dried in a vertical position for 16 hours at 120 degrees F. After cooling for 1 hour, the panel shall be immersed in tap water at 85 to 90 degrees F for 48 to 72 hours. Immediately upon removal, the panel shall be dried with soft cloth and examined for adhesion as follows: With a pocket knife or other suitable instrument, two parallel cuts at least 1 inch long shall be made 1/4 to 3/8 inch apart through the paint film to the steel surface. A third cut shall be made perpendicular to and passing through the end of the first two. With the tip of the knife blade, the film shall be loosened from the panel from the third cut between the parallel cuts for a distance of 1/8 to 1/4 inch. With the panel being held horizontally, the free end of the paint film shall be grasped between the thumb and forefinger and pulled vertically in an attempt to remove the film as a strip from between the first two cuts. The strip of paint film shall be removed at a rate of approximately 1/10 inch per second and shall be maintained in a vertical position during the process of removal. The adhesion is acceptable if the strip of paint breaks when pulled or if the strip elongates a minimum of 10 percent during its removal. Paints not intended to be self-priming shall exhibit no delamination from the primer.

PART 3 EXECUTION

3.1 CLEANING AND PREPARATION OF SURFACES TO BE PAINTED

3.1.1 General Requirements

Both Ssurfaces of the sheetpiles, full length, to be painted, shall be cleaned before applying paint or surface treatments. Deposits of grease or oil shall be removed in accordance with SSPC SP 1, prior to mechanical cleaning. Solvent cleaning shall be accomplished with mineral spirits or other low toxicity solvents having a flash point above 100 degrees F. Clean cloths and clean fluids shall be used to avoid leaving a thin film of greasy residue on the surfaces being cleaned. Items not to be prepared or coated shall be protected from damage by the surface preparation methods. Machinery shall be protected against entry of blast abrasive and dust into working parts. Cleaning and painting shall be so programmed that dust or other contaminants from the cleaning process do not fall on wet, newly painted surfaces, and surfaces not intended to be painted shall be suitably protected from the effects of cleaning and painting operations. Welding of,

or in the vicinity of, previously painted surfaces shall be conducted in a manner to prevent weld spatter from striking the paint and to otherwise reduce coating damage to a minimum; paint damaged by welding operations shall be restored to original condition. Surfaces to be painted that will be inaccessible after construction, erection, or installation operations are completed shall be painted before they become inaccessible.

3.1.2 Ferrous Surfaces Subject to Severe Exposure

Ferrous surfaces subject to extended periods of immersion or as otherwise required shall be dry blast-cleaned to SSPC SP 5/NACE 1. The blast profile, unless otherwise specified, shall be 1.5 to 2.5 mils as measured by ASTM D 4417, Method C. Appropriate abrasive blast media shall be used to produce the desired surface profile and to give an angular anchor tooth pattern. If recycled blast media is used, an appropriate particle size distribution shall be maintained so that the specified profile is consistently obtained. Steel shot or other abrasives that do not produce an angular profile shall not be used. Weld spatter not dislodged by blasting shall be removed with impact or grinding tools and the areas reblasted prior to painting. Surfaces shall be dry at the time of blasting. Blast cleaning to SSPC SP 5/NACE 1 shall be done in the field and, unless otherwise specifically authorized, after final erection. Within 8 hours after cleaning, prior to the deposition of any detectable moisture, contaminants, or corrosion, all ferrous surfaces blast cleaned to SSPC SP 5/NACE 1 shall be cleaned of dust and abrasive particles by brush, vacuum cleaner, and/or blown down with clean, dry, compressed air, and given the first coat of paint. Upon written request by the Contractor, the Contracting Officer may authorize mill or shop cleaning of assembled or partially assembled components specified to receive ~~the vinyl-type paint system or~~ System No. 6-A-Z employing the epoxy zinc-rich primer. The surfaces, if shop blasted, shall be shop coated with the first and second coats of the specified paint system except that the epoxy zinc-rich primed surfaces shall receive an extra single spray coat of the zinc primer at the time field painting is started, as specified in the paint system instructions. The shop coating shall be maintained in good condition by cleaning and touching up of areas damaged during the construction period. If pinpoint or general rusting appears, surfaces shall be reblasted and repainted at no added cost to the

Government. Prior to the field application of subsequent coats, soiled areas of the shop coating shall be thoroughly cleaned and all welds or other unpainted or damaged areas shall be cleaned and coated in a manner to make them equivalent to adjacent, undamaged paint surfaces.

3.2 PAINT APPLICATION

3.2.1 General

Each coat shall be free from holidays, pinholes, bubbles, runs, drops, ridges, waves, laps, excessive or unsightly brush marks, and variations in color, texture, and gloss. Application of initial or subsequent coatings shall not commence until the Contracting Officer has verified that atmospheric conditions and the surfaces to be coated are satisfactory. Each paint coat shall be applied in a manner that will produce an even, continuous film of uniform thickness. Edges, corners, crevices, seams, joints, welds, rivets, corrosion pits, and other surface irregularities shall receive special attention to ensure that they receive an adequate thickness of paint. Spray equipment shall be equipped with traps and separators and where appropriate, mechanical agitators, pressure gauges, pressure regulators, and screens or filters. Air caps, nozzles, and needles shall be as recommended by the spray equipment manufacturer for the material being applied.

3.2.2 Mixing and Thinning

Paints shall be thoroughly mixed, strained where necessary, and kept at a uniform composition and consistency during application. Paste or dry-powder pigments specified to be added at the time of use shall, with the aid of powered stirrers, be incorporated into the vehicle or base paint in a manner that will produce a smooth, homogeneous mixture free of lumps and dry particles. Where necessary to suit conditions of the surface temperature, weather, and method of application, the paint may be thinned immediately prior to use. Thinning shall generally be limited to the addition of not more than 1 pint per gallon of the proper thinner; this general limitation shall not apply when more specific thinning instructions are provided. Paint that has been stored at low temperature, shall be brought up to at least 70 degrees F before being mixed and thinned, and its temperature in the spray tank or other working container shall not fall below 60 degrees F during the

application. Paint that has deteriorated in any manner to a degree that it cannot be restored to essentially its original condition by customary field-mixing methods shall not be used and shall be removed from the project site. Paint and thinner that is more than 1 year old shall be re-sampled and resubmitted for testing to determine its suitability for application.

3.2.3 Atmospheric and Surface Conditions

Paint shall be applied only when the relative humidity is less than 50% and to surfaces that are more than 5 degrees F above the dew point temperature and that are completely free of moisture as determined by sight and touch. Paint shall not be applied to surfaces upon which there is detectable frost or ice. Except as otherwise specified, the temperature of the surfaces to be painted and of air in contact therewith shall be not less than 45 degrees F during paint application nor shall paint be applied if the surfaces can be expected to drop to 32 degrees F or lower before the film has dried to a reasonably firm condition. During periods of inclement weather, painting may be continued by enclosing the surfaces and applying artificial heat, provided the minimum temperatures and surface dryness requirements prescribed previously are maintained. Paint shall not be applied to surfaces heated by direct sunlight or other sources to temperatures that will cause detrimental blistering, pinholing, or porosity of the film.

3.2.4 Time Between Surface Preparation and Painting

Surfaces that have been cleaned and/or otherwise prepared for painting shall be primed as soon as practicable after such preparation has been completed but, in any event, prior to any deterioration of the prepared surface.

3.2.5 Method of Paint Application

Unless otherwise specified, paint shall be applied by brush or spray to ferrous and nonferrous metal surfaces. Special attention shall be directed toward ensuring adequate coverage of edges, corners, crevices, pits, rivets, bolts, welds, and similar surface irregularities. Other methods of application to metal surfaces shall be subject to the specific approval of the Contracting Officer. Paint on plaster, concrete, or other nonmetallic surfaces shall be applied by brush, roller, and/or spray.

3.2.6 Coverage and Film Thickness

Film thickness or spreading rates shall be as specified hereinafter. Where no spreading rate is specified, the paint shall be applied at a rate normal for the type of material being used. In any event, the combined coats of a specified paint system shall completely hide base surface and the finish coats shall completely hide undercoats of dissimilar color.

3.2.6.1 Measurement on Ferrous Metal

Where dry film thickness requirements are specified for coatings on ferrous surfaces, measurements shall be made with a gage qualified in accordance with paragraph Coating Thickness Gage Qualification. They shall be calibrated and used in accordance with ASTM D 1186. They shall be calibrated using plastic shims with metal practically identical in composition and surface preparation to that being coated, and of substantially the same thickness (except that for measurements on metal thicker than 1/4 inch, the instrument may be calibrated on metal with a minimum thickness of 1/4 inch). Frequency of measurements shall be as recommended for field measurements by ASTM D 1186 and reported as the mean for each spot determination. The instruments shall be calibrated or calibration verified prior to, during, and after each use.

3.2.6.2 Measurements on Nonferrous Metal

Where dry film thickness requirements are specified for coatings applied to nonferrous metal surfaces, measurements shall be made using a gage qualified in accordance with paragraph Coating Thickness Gage Qualification. They shall be calibrated and used in accordance with ASTM D 1400. Calibration shall be on metal identical in composition and surface preparation to that being coated and of substantially the same thickness (except that for measurements on metal thicker than 1/4 inch, the instrument may be calibrated on metal with a minimum thickness of 1/4 inch). Frequency of measurements shall be as recommended for field measurements by ASTM D 1400 and reported as the mean for each spot determination. The instruments shall be calibrated or calibration verified prior to, during, and after each use.

3.2.7 Progress of Painting Work

Where field painting on any type of surface has commenced, the complete painting operation, including priming and

finishing coats, on that portion of the work shall be completed as soon as practicable, without prolonged delays. Sufficient time shall elapse between successive coats to permit them to dry properly for re-coating, and this period shall be modified as necessary to suit adverse weather conditions. Paint shall be considered dry for re-coating when it feels firm, does not deform or feel sticky under moderate pressure of the finger, and the application of another coat of paint does not cause film irregularities such as lifting or loss of adhesion of the undercoat. All coats of all painted surfaces shall be unscarred and completely integral at the time of application of succeeding coats. At the time of application of each successive coat, undercoats shall be cleaned of dust, grease, overspray, or foreign matter by means of airblast, solvent cleaning, or other suitable means. Cement and mortar deposits on painted steel surfaces, not satisfactorily removed by ordinary cleaning methods, shall be brush-off blast cleaned and completely repainted as required. Undercoats of high gloss shall, if necessary for establishment of good adhesion, be scuff sanded, solvent wiped, or otherwise treated prior to application of a succeeding coat. Field coats on metal shall be applied after erection except as otherwise specified and except for surfaces to be painted that will become inaccessible after erection.

3.2.8 Contacting Surfaces

When ordinary bolted contact is to exist between surfaces of ferrous or other metal parts of substantially similar chemical composition such surfaces will not be required to be painted, but any resulting crevices shall subsequently be filled or sealed with paint. Contacting metal surfaces formed by high-strength bolts in friction-type connections shall not be painted. Where a nonmetal surface is to be in bolted contact with a metal surface, the contacting surfaces of the metal shall be cleaned and given three coats of the specified primer. Unless otherwise specified, corrosion-resisting metal surfaces, including cladding therewith, shall not be painted.

3.2.9 Drying Time Prior to Immersion

Minimum drying periods after final coat prior to immersion shall be: epoxy systems at least 57 days., ~~vinyl-type paint systems at least 3 days.~~ Minimum drying periods shall be

increased twofold if the drying temperature is below 65 degrees F and/or if the immersion exposure involves considerable abrasion.

3.2.10 Protection of Painted Surfaces

Where shelter and/or heat are provided for painted surfaces during inclement weather, such protective measures shall be maintained until the paint film has dried and discontinuance of the measures is authorized. Items that have been painted shall not be handled, worked on, or otherwise disturbed until the paint coat is fully dry and hard. All metalwork coated in the shop or field prior to final erection shall be stored out of contact with the ground in a manner and location that will minimize the formation of water-holding pockets; soiling, contamination, and deterioration of the paint film, and damaged areas of paint on such metalwork shall be cleaned and touched up without delay. The first field coat of paint shall be applied within a reasonable period of time after the shop coat and in any event before weathering of the shop coat becomes extensive.

~~3.2.11 Vinyl Paints~~

~~3.2.11.1 General~~

~~Vinyl paints shall be spray applied, except that areas inaccessible to spraying shall be brushed. Airless spray equipment shall not be used. All of the vinyl paints require thinning for spray application except the zinc rich vinyl paint (Formula VZ 108d) which will normally require thinning only under certain weather conditions.~~

~~Thinners for vinyl paints shall be as follows:~~

~~APPROXIMATE AMBIENT AIR TEMPERATURE~~

~~(Degrees F)~~

~~Below 50 MEK~~

~~50 — 70 MIBK~~

~~Above 70 MIAK~~

~~The amount of thinner shall be varied to provide a wet spray and avoid deposition of particles that are semidry when they strike the surface.~~

~~Vinyl paints shall not be applied when the temperature of the ambient air and receiving surfaces is less than 35 degrees F nor when the receiving surfaces are higher than 125 degrees F. Each spray coat of vinyl paint shall consist of a preliminary extra spray pass on edges, corners, interior angles, pits, seams, crevices, junctions of joining members, rivets, weld lines, and similar surface~~

~~irregularities followed by an overall double spray coat. A double spray coat of vinyl type paint shall consist of applying paint to a working area of not less than several hundred square feet in a single, half-lapped pass, followed after drying to at least a near tack-free condition by another spray pass applied at the same coverage rate and where practicable at right angles to the first. Bolts, and similar surface projections shall receive sprayed paint from every direction to ensure complete coverage of all faces. Pits, cracks, and crevices shall be filled with paint insofar as practicable, but in any event, all pit surfaces shall be thoroughly covered and all cracks and crevices shall be sealed off against the entrance of moisture. Fluid and atomization pressures shall be kept as low as practicable consistent with good spraying results. Unless otherwise specified, not more than 2.0 mils, average dry film thickness, of vinyl paint shall be applied per double spray coat. Except where otherwise indicated, an undercoat of the vinyl type paint may receive the next coat any time after the undercoat is tack-free and firm to the touch, provided that no speedup or delay in the re-coating schedule shall cause film defects such as sags, runs, air bubbles, air craters, or poor intercoat adhesion. Neither the prime coat nor any other coat shall be walked upon or be subjected to any other abrading action until it has hardened sufficiently to resist mechanical damage.~~

~~3.2.11.2 Vinyl Zinc Rich Primer~~

~~Primer shall be field mixed combining components A, B, and C. Mixing shall be in accordance with label instructions. After mixing, the paint shall be kept covered at all times to avoid contamination and shall be applied within 8 days after it is mixed. When the ambient and/or steel temperature is below about 80 degrees F, the paint will not normally require thinning; however, the paint shall at all times contain sufficient volatiles (thinners) to permit it to be satisfactorily atomized and to provide a wet spray and to avoid deposition of particles that are semidry when they reach the surface. The paint shall be stirred continuously during application at a rate that will prevent the zinc dust from settling. When spraying is resumed after any interruption of longer than 15 minutes, the entire length of the material hose shall be whipped vigorously until any settled zinc is redispersed. Long periods of permitting the paint to remain stagnant in the~~

~~hose shall be avoided by emptying the hoses whenever the painting operation is to be suspended for more than 1 hour. The material (paint) hoses shall be kept as short as practicable, preferably not more than 50 feet in length. Equipment used for spraying this zinc primer shall not be used for spraying other vinyl type paints without first being thoroughly cleaned, since many of the other paints will not tolerate zinc contamination; no type of hot spray shall be used. An average dry film thickness of up to 2.5 mils may be applied in one double spray coat. Unless specifically authorized, not more than 8 days shall elapse after application of a VZ-108d zinc rich coat before it receives a succeeding coat.~~

~~3.2.11.3 Vinyl Paints~~

~~Vinyl Paints (Formulas V-102e and V-766e) are ready mixed paints designed to be spray applied over a wide range of ambient temperatures by field thinning with the proper type and amount of thinner. For spray application, they shall be thinned as necessary up to approximately 25 percent (1 quart per gallon of base paint) with the appropriate thinner; when ambient and steel temperatures are above normal, up to 40 percent thinning may be necessary for satisfactory application.~~

3.2.12 Coal Tar-Epoxy (Black) Paint (Formula C-200a)

3.2.12.1 Mixing

Component B shall be added to previously stirred Component A and thoroughly mixed together with a heavy-duty mechanical stirrer just prior to use. The use of not more than 1 pint of xylene thinner per gallon of paint will be permitted to improve application properties and extend pot life. The pot life of the mixed paint, extended by permissible thinning, may vary from 2 hours in very warm weather to 5 or more hours in cool weather. Pot life in warm weather may be extended by precooling the components prior to mixing; cooling the mixed material; and/or by slow, continuous stirring during the application period. The mixed material shall be applied before unreasonable increases in viscosity take place.

3.2.12.2 Application

Spray guns shall be of the conventional type equipped with a fluid tip of approximately 0.09 inch in diameter and external atomization, seven-hole air cap. Material shall

be supplied to the spray gun from a bottom withdrawal pot or by means of a fluid pump; hose shall be 1/2 inch in diameter. Atomization air pressure shall not be less than 80 psi. High-pressure airless spray equipment shall not be used. Brush application shall be with a stiff-bristled tool heavily laden with material and wielded in a manner to spread the coating smoothly and quickly without excessive brushing. The coverage rate of the material is approximately 110 square feet per gallon per coat to obtain 20 mils (dry thickness) in a two-coat system. The paint shall flow together and provide a coherent, pinhole-free film. The direction of the spray passes (or finish strokes if brushed) of the second coat shall be at right angles to those of the first where practicable.

3.2.12.3 Subsequent Coats

Except at the high temperatures discussed later in this paragraph, the drying time between coal tar-epoxy coats shall not be more than 72 hours, and application of a subsequent coat as soon as the undercoat is reasonably firm is strongly encouraged. Where the temperature for substrate or coating surfaces during application or curing exceeds or can be expected to exceed 125 degrees F as the result of direct exposure to sunlight, the surfaces shall be shaded by overhead cover or the interval between coats shall be reduced as may be found necessary to avoid poor intercoat adhesion. Here, poor intercoat adhesion is defined as the inability of two or more dried coats of coal tar-epoxy paint to resist delamination when tested aggressively with a sharp knife. Under the most extreme conditions involving high ambient temperatures and sun-exposed surfaces, the drying time between coats shall not exceed 10 hours, and the reduction of this interval to a few hours or less is strongly encouraged. Where the curing time of a coal tar-epoxy undercoat exceeds 72 hours of curing at normal temperatures, 10 hours at extreme conditions, or where the undercoat develops a heavy blush, it shall be given one of the following treatments before the subsequent coat is applied:

- a. Etch the coating surface lightly by brush-off blasting, using fine sand, low air pressure, and a nozzle-to-surface distance of approximately 3 feet.
- b. Remove the blush and/or soften the surface of the coating by wiping it with cloths dampened with 1-methyl-2-pyrrolidone. The solvents may be applied to the surface by

fog spraying followed by wiping, but any puddles of solvent must be mopped up immediately after they form. The subsequent coat shall be applied in not less than 15 minutes or more than 3 hours after the solvent treatment.

3.2.12.4 Ambient Temperature

Coal tar-epoxy paint shall not be applied when the receiving surface or the ambient air is below 50 degrees F nor unless it can be reasonably anticipated that the average ambient temperature will be 50 degrees F or higher for the 5-day period subsequent to the application of any coat.

3.2.12.5 Safety

In addition to the safety provisions in paragraph SAFETY AND HEALTH PROVISIONS, other workmen as well as painters shall avoid inhaling atomized particles of coal tar-epoxy paint and contact of the paint with the skin.

3.3 PAINT SYSTEMS APPLICATION

The required paint systems and the surfaces to which ~~they~~it shall be applied are shown in this paragraph, and/or in the drawings. Supplementary information follows.

3.3.1 Fabricated and Assembled Items

Items that have been fabricated and/or assembled into essentially their final form and that are customarily cleaned and painted in accordance with the manufacturer's standard practice will be exempted from equivalent surface preparation and painting requirements described herein, provided that:

- a. Surfaces primed (only) in accordance with such standard practices are compatible with specified field-applied finish coats.
- b. Surfaces that have been primed and finish painted in accordance with the manufacturer's standard practice are of acceptable color and are capable of being satisfactorily touched up in the field.
- c. Items expressly designated herein to be cleaned and painted in a specified manner are not coated in accordance with the manufacturer's standard practice if different from that specified herein.

3.3.2 Surface Preparation

The method of surface preparation and pretreatment shown in the tabulation of paint systems is for identification

purposes only. Cleaning and pretreatment of surfaces prior to painting shall be accomplished in accordance with detailed requirements previously described.

~~3.3.3 System No. 3-A-Z~~

~~Paint shall be spray applied to an average dry film thickness of a minimum of 6.5 mils for the completed system, and the thickness at any point shall not be less than 5.5 mils. The dry film thickness of the zinc rich coat shall be approximately 2.5 mils. Specified film thickness, including the prescribed total, shall be attained in any event, and any extra coats needed to attain specified thickness shall be applied at no additional cost to the Government. Attaining of the specified film thickness in fewer than the prescribed number of coats or spray passes will be acceptable provided heavier applications do not cause an increase in pinholes, bubbles, blisters, or voids in the dried film and also provided that not more than 2.0 mils (dry film thickness) per double spray coat nor more than 1.0 mil per single spray pass of non zinc paint shall be applied at one time.~~

3.3.4 System No. 6-A-Z

Epoxy zinc-rich primer 19B shall be applied in accordance with the manufacturer's directions in a single, half-lapped spray coat to an average dry film thickness of a minimum of 3.0 mils. The thickness at any point shall not be less than 2.5 mils or greater 8 mils for the primer. After a minimum drying period of 6 hours and no more than 96 hours, at least two coats of coal tar epoxy paint shall be applied to provide a minimum thickness at any point of 16 mils for the completed system. If the epoxy zinc-rich paint has been applied in the shop or otherwise has been permitted to cure for longer than 96 hours, it shall be re-coated with an additional thin tack coat of the zinc-rich paint, which in turn shall be overcoated within 96 hours with the first coat of coal tar-epoxy paint. The specified film thicknesses shall be attained in any event, and any additional coats needed to attain specified thickness shall be applied at no additional cost to the Government.

3.3.28 Protection of Nonpainted Items and Cleanup
Walls, equipment, fixtures and all other items in the vicinity of the surfaces being painted shall be maintained

free from damage by paint or painting activities. Paint spillage and painting activity damage shall be promptly repaired.

3.4 INSPECTION

The Contractor shall inspect, document, and report all work phases and operations on a daily basis. As a minimum the daily report shall contain the following:

- a. Inspections performed, including the area of the structure involved and the results of the inspection.
- b. Surface preparation operations performed, including the area of the structure involved, the mode of preparation, the kinds of solvent, abrasive, or power tools employed, and whether contract requirements were met.
- c. Thinning operations performed, including thinners used, batch numbers, and thinner/paint volume ratios.
- d. Application operations performed, including the area of the structure involved, mode of application employed, ambient temperature, substrate temperature, dew point, relative humidity, type of paint with batch numbers, elapsed time between surface preparation and application, elapsed time for re-coat, condition of underlying coat, number of coats applied, and if specified, measured dry film thickness or spreading rate of each new coating.

3.5 PAINTING SCHEDULES

~~SYSTEM NO. 3-A-Z~~

~~Items or surfaces to be coated: Steel Sheet Piles
SURFACE PREPARATION 1st COAT 2nd COAT 3rd COAT 4th COAT
White metal Vinyl zinc White Vinyl Aluminum Aluminum
blast rich VZ-108d V-766e Vinyl Vinyl
cleaning (double (double V-102e V-102e as spray coat) spray
coat) (double needed to spray coat) obtain the required
thickness)~~

SYSTEM NO. 6-A-Z

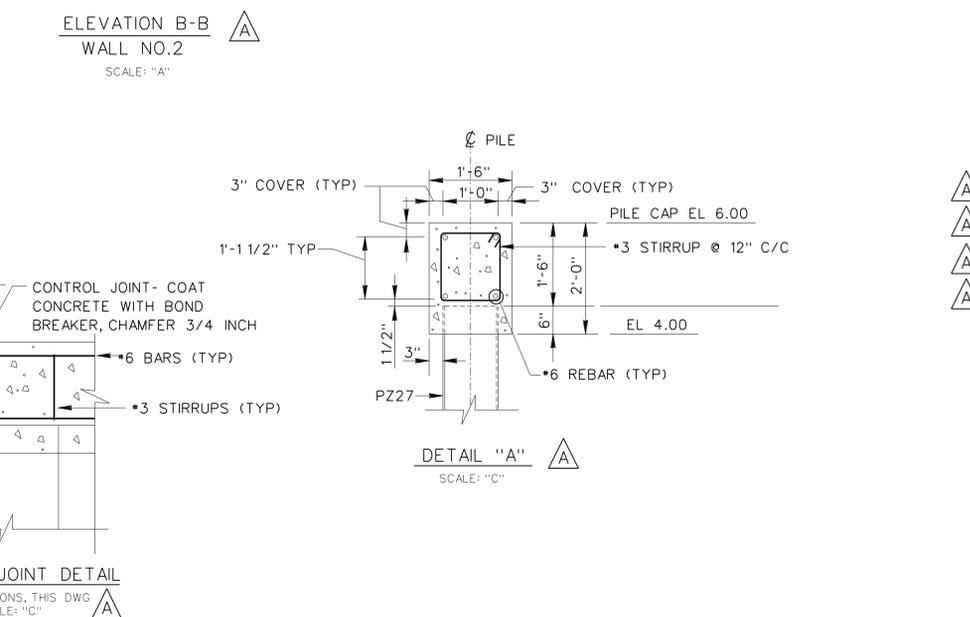
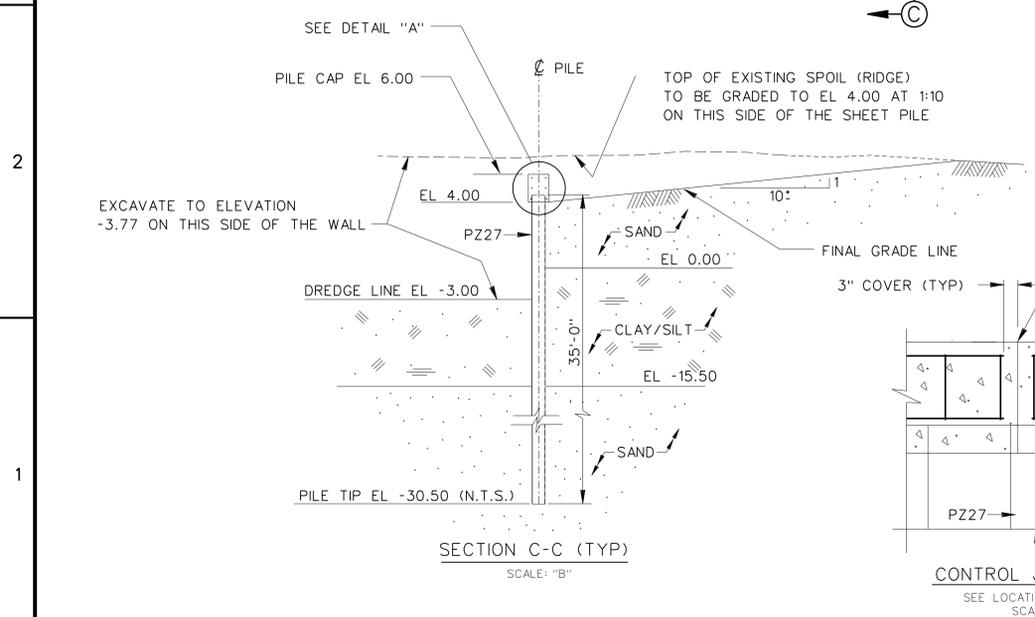
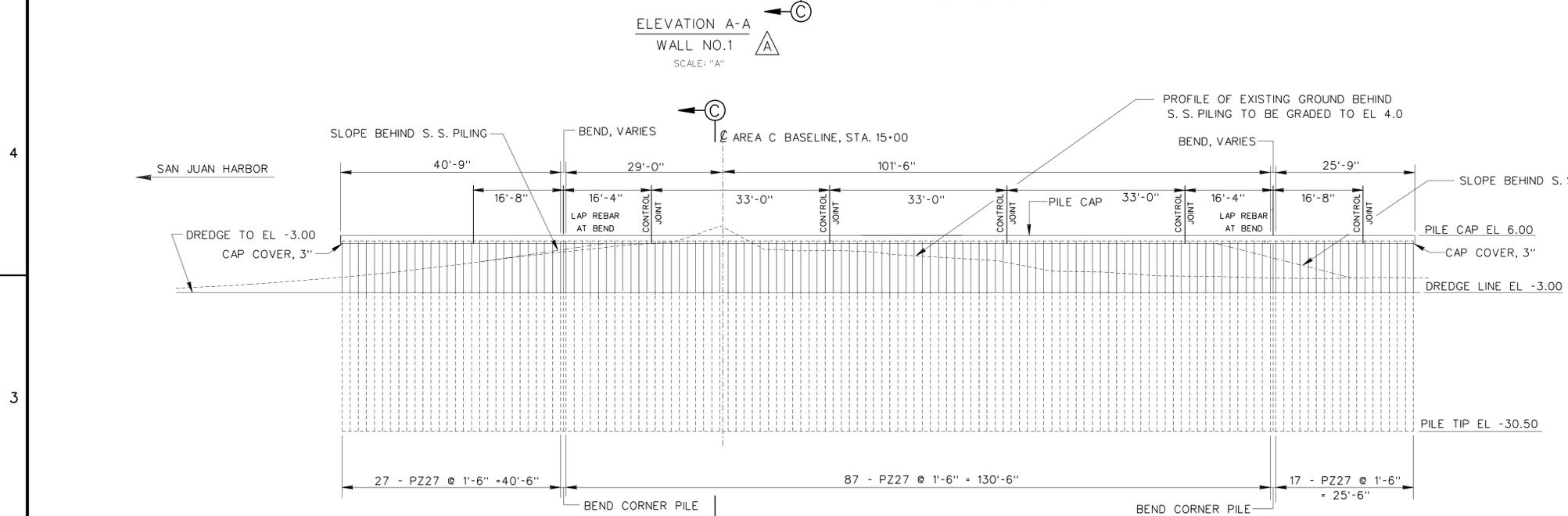
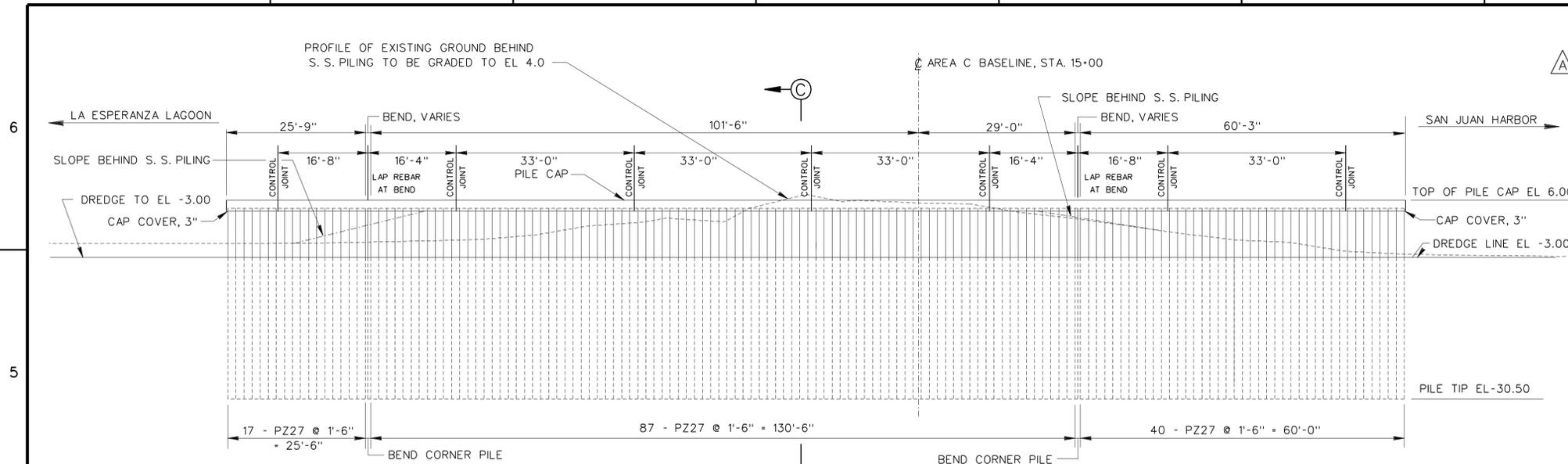
Items or surfaces to be coated: Both sides of
the Steel Sheet Piles for the full length.

SURFACE	1st & 2nd	3rd COAT	4th COAT
PREPARATION	COAT		
White metal	MS MIL-DTL-24441	Coal tar-	Coal tar-
blast	/19B	epoxy C-200a	epoxy C-200a
Cleaning		(black)	(black)

End of Section -

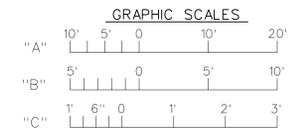
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A B C D E F G H



- CONCRETE NOTES:**
1. REINFORCEMENT DETAILING AND PLACEMENT SHALL CONFORM TO ACI 315 AND ACI 318.
 2. ALL REINFORCEMENT STEEL SHALL BE A615, GRADE 60 EXCEPT #3 BARS MAY BE GRADE 40.
 3. NO WELDING OF REINFORCEMENT STEEL SHALL BE PERMITTED.
 4. MINIMUM COVER FOR ALL STEEL SHALL BE 3 INCHES.
 5. LAP SPLICE FOR #6 LONGITUDINAL BARS SHALL BE 1'-6". LAP BARS AT ALL BENDS.
 6. CONCRETE SHALL CONFORM TO ASTM C 943. CONCRETE WORK SHALL CONFORM TO ACI 318, PART ENTITLED "CONSTRUCTION REQUIREMENTS".
 7. COMPRESSIVE STRENGTH IN 28 DAYS SHALL BE 5,500; ENTRAINED-AIR CONTENT SHALL BE BETWEEN 1 AND 6 PERCENT BY VOLUME; AND SLUMP SHALL BE BETWEEN 2 AND 4 INCHES, WITH A HIGHER SLUMP ALLOWED (NOT TO EXCEED 7 INCHES) WHEN A HIGH RANGE WATER REDUCER IS USED.
 8. MINIMUM TOTAL CEMENTITIOUS CONTENT SHALL BE 658 LB/CY AND MAXIMUM WATER CEMENTITIOUS RATIO LBS/LB SHALL BE 0.41.
 9. CONCRETE SHALL BE CURED FOR 7 DAYS AFTER PLACEMENT.
 10. PROVIDE 3/4 INCH CHAMFER ON ALL LONGITUDINAL EDGES OF CONCRETE CAP.

- SHEET PILE NOTES:**
1. FOR LOCATION PLAN OF WALLS, SEE DWG NO 2/1.
 2. ALL SHEET PILES SHALL BE ASTM A572 GR 50 STEEL.
 3. TESTING, HANDLING AND DRIVING OF SHEET PILES ARE PER SPECIFICATION.
 4. ALL BOLTS SHALL BE HIGH STRENGTH A 325 BOLTS.
 5. SHEET PILES SHALL BE GIVEN A COAT OF ASPHALT PAINT AS PER SPECIFICATION PRIOR TO INSTALLATION.
 6. SHEET PILES SHALL BE DRIVEN IN TO GROUND PRIOR TO DREDGING OR EXCAVATION.
 7. THE TOP ELEVATION OF ALL SHEET PILE WALLS SHALL BE EL. +6.00.
 8. THE GROUND BEHIND THE WALLS SHALL START AT EL. +4.00 AND SHALL BE SLOPED AT 1V ON 10H, OR AS SHOWN ON THE DRAWINGS.
 9. NOT USED
 10. NOT USED.
 11. NOT USED.
 12. NOT USED.
 13. SOIL LAYER DETAILS SHOWN ON SECTION C-C (THIS DWG) AND SECTION E-E (DWG NO 2/3) ARE FOR INFORMATION ONLY. ACTUAL SOIL LAYERS AT ACTUAL WALL LOCATIONS MAY BE DIFFERENT.



SAFETY ON THIS JOB DEPENDS ON YOU

Approved	
Revised	
Amendment	
No.	9
Symbol	
Zone	
Description	REVISED TO ACCOMPANY AMENDMENT NO. 0001.

DEPARTMENT OF THE ARMY
JACKSONVILLE DISTRICT, CORPS OF ENGINEERS
JACKSONVILLE, FLORIDA

Inv. No. DACW17-02-B-00XX
Date: AS SHOWN
Scale: AS SHOWN
Plot date: PLOT SCALE:
Date: JUNE 2001
D.O.F. FILE NO. 102-38,205

San Juan Harbor, Puerto Rico
PROJECT MODIFICATIONS FOR IMPROVEMENT OF THE ENVIRONMENT
LA ESPERANZA PENINSULA
CATANO, PUERTO RICO
SHEET PILE WALLS 1 & 2
ELEVATIONS AND DETAILS

DRAWING NO.
2/2

