



PUBLIC WORKS DEPARTMENT

INVITATION FOR BIDS,  
SPECIFICATIONS, AND CONTRACT DOCUMENTS

FOR

MURRAY STREET BRIDGE AT THE SMALL CRAFT HARBOR  
SEISMIC RETROFIT/BARRIER REPLACEMENT  
CITY PROJECT NO. C409321  
STATE/FEDERAL PROJECT NO. STPLZ-5025(084)

SANTA CRUZ CITY COUNCIL

Fred Keeley, Mayor  
Renee Golder, Vice Mayor  
Sandy Brown  
Sonja Brunner  
Shebreh Kalantari-Johnson  
Scott Newsome  
Martine Watkins

Matt Huffaker, City Manager

Bonnie Bush, City Clerk Administrator

Anthony P. Condotti, City Attorney

Nathan Nguyen, Public Works Department Director



**BID OPENING AUGUST 29, 2024 @ 2:00 PM PACIFIC DAYLIGHT TIME**  
**ALL CONTRACTOR QUESTIONS MUST BE RECEIVED BY AUGUST 1, 2024 @2:00 PM PACIFIC DAYLIGHT TIME**

Closing time to receive bids  
will be verified by the on-line clock maintained by the  
National Institute of Standards and Technology, found at:

<https://time.gov>

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## NOTICE INVITING SEALED BIDS

NOTICE IS HEREBY GIVEN that the City of Santa Cruz, California (the "City"), invites sealed Bids for the following "Project":

"MURRAY STREET BRIDGE AT THE SMALL CRAFT HARBOR  
SEISMIC RETROFIT/BARRIER REPLACEMENT  
CITY PROJECT NO. C409321  
STATE/FEDERAL PROJECT NO. STPLZ-5025(084)"

1. Location of Project. The Project is to be performed at the following location: Murray Street Bridge over the Small Craft Harbor.
2. Description of Work. The Project to be performed consists of furnishing all labor, materials, tools, equipment, and transportation required to complete the Project, with a scope of work to generally include, but is not limited to, the following: Seismically retrofitting the structure, replacing non-standard bridge barriers with new barriers and required shoulders, roadway approach work to accommodate the new bridge configuration, constructing retaining walls, bioretention facilities, storm drains, sewer force main, waterline and other appurtenances (the "Work"). For additional information, please contact the individual listed in Paragraph 18, below.
3. Time for Completion. The Project shall be completed in **750** working days. All time limits stated herein are of the essence.
4. Bidding Documents. The "Bidding Documents" shall include this Notice Inviting Bids, the Bid Form including all attachments included herein, General Requirements, Technical Specifications (including all plans, drawings, and reports), Addenda, draft Agreement, the City's Standard Specifications (dated 2002), as amended<sup>1</sup>, the State of California's Department of Transportation Standard Specifications (dated 2018), as amended or revised, and all other documents identified herein.
5. Obtaining the Bidding Documents. Bidding Documents may be downloaded, without charge, from the following designated website:  
<https://www.cityofsantacruz.com/business/bidding-information>.  
Paper Bidding Documents may be examined at the office of the Public Works  
  
Addenda, reports, and other information relevant to submitting a bid for the Project will be updated on the above listed website. Contractor shall email the Project Manager, Josh Spangrud ([jspangrud@santacruzca.gov](mailto:jspangrud@santacruzca.gov)) and Assistant Project Manager, Miguel Lizarraga ([mlizarraga@santacruzca.gov](mailto:mlizarraga@santacruzca.gov)) and request to

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<sup>1</sup> The City's Standard Specifications (dated 2002) are located via the City Website at:

<https://www.cityofsantacruz.com/home/showpublisheddocument?id=2467>.

MURRAY STREET BRIDGE AT THE SMALL CRAFT HARBOR, SEISMIC RETROFIT/BARRIER REPLACEMENT, CITY PROJECT NO. C409321, FEDERAL NO. PROJECT NO. STPLZ 5025(084)

be added to an email list to receive email alerts when any addenda, reports or other information are made available.

6. Submitted Bid. Each sealed Bid shall comply with the Bidding Documents and be submitted on the Bid Form, including all attachments. Contractor must clearly and legibly set forth all information requested in the manner and form indicated.

By submitting a Bid, the Bidder represents that it has carefully examined and investigated the Project site and all Bidding Documents.

Each Bid shall include a bid security in the form of a certified check, cashier's check, or bidder's bond made payable to the order of the City of Santa Cruz, California, for an amount not less than (10) percent of the amount of the Proposal. The bid security shall be given as a guarantee that the successful bidder will enter into the contract and will be declared forfeited if the successful bidder refuses or fails to enter into said contract.

All bidders shall submit with its Bid the included sworn statement of its financial responsibility, technical ability, and experience.

7. Addenda. All submitted Bids shall verify if the City has issued any addenda for this Project. It is the bidder's sole responsibility to ensure that all addenda requirements are included in the submitted Bid. All addenda shall be posted on the City's designated website.
8. Pre-Bid Conference(s). Two **mandatory** pre-bid conferences will be held at 790 Mariner Parkway, Santa Cruz, CA 95062 at the Plaza in the West Harbor, south of the bridge on July 17, 2024 at 2:00 PM local time and on July 24, 2024 at 2:00 PM local time. Bidders must attend one of these two meetings to be eligible to bid. All attendees will be required to follow any other safety measures currently recommended by the County Public Health Officer.
9. Withdrawing Submitted Bid. A bidder may withdraw a submitted Bid at any time prior to the time of bid opening only by written request to the City. Unless otherwise required by law, no bidder may withdraw its Bid for a period of sixty (60) days after the bid opening.
10. Award of Contract. The City will award the Project to the lowest responsible and responsive bidder. The City reserves the right to reject any and all Bids, including but not limited to for any minor irregularities, or waive any informalities or minor defects in proposals received. The City may reject a Bid if it determines that any of the bid prices are materially unbalanced to the potential detriment of the City.

Within ten (10) calendar days after receiving written notice that the contract has been awarded, the successful bidder shall return to the City the signed agreement, together with the completed Payment Bond and Faithful Performance Bond each in

MURRAY STREET BRIDGE AT THE SMALL CRAFT HARBOR, SEISMIC  
RETROFIT/BARRIER REPLACEMENT, CITY PROJECT NO. C409321, FEDERAL NO.  
PROJECT NO. STPLZ 5025(084)



an amount equal to one hundred percent (100%) of the contract price (The surety insurer shall be admitted to transact surety business in the State of California, as defined in Code of Civil Procedure section 995.120 , and as approved by the City Attorney. Personal sureties and unregistered surety companies are not acceptable), insurance certificates, and all other documents as required by the Bidding Documents.

11. Department of Industrial Relations Monitoring. This Project is subject to compliance monitoring and enforcement by the Department of Industrial Relations (DIR). Prevailing wages as published by the DIR are required for all workers, including those employed by subcontractors, for all non-federally funded projects.

No contractor or subcontractor may be listed on a Bid or awarded the contract for the Project unless registered with the DIR pursuant to Labor Code section 1725.5 and 1771.1. Refer to the DIR website, <http://www.dir.ca.gov>, to register and to find the correct wage rates and answers to questions related to prevailing wage requirements.

12. Federal Monitoring.

This Project is funded by federal funds. The City of Santa Cruz hereby notifies all bidders that it will affirmatively insure that in any agreement entered into pursuant to this advertisement, Disadvantaged Business Enterprises (DBEs) will be afforded full opportunity to submit bids in response to this invitation and will not be discriminated against on the grounds of race, color, sex, national origin, religion, age, or disability in consideration for an award.

The contractor, subrecipient, or subcontractor shall take necessary and reasonable steps to ensure that DBEs have the opportunity to participate in this contract. **The DBE goal is 21 percent.**

**For the Federal training program, the number of trainees or apprentices is 15.**

The federal minimum wage rates for this Project, as determined by the United States Department of Labor, are set forth on the following website: <https://sam.gov/wage-determination/CA20200018/27>. The current federal prevailing wage rates at the time of bid opening are incorporated into the Contract Documents. The effective general prevailing wage rates, which are determined and on-file with the California DIR, are incorporated herein.

If there is a difference between the federal minimum wage rates predetermined by the U.S. Department of Labor and the general prevailing wage rates determined by the California DIR for similar classifications of labor, the Contractor and subcontractors shall pay not less than whichever wage rate is higher. The DIR will not accept lower California wage rates not specifically included in the federal minimum wage rate determinations. This includes “helper”, or other classifications based on hours of experience, or other classifications not appearing in the federal

minimum wage rate determinations. Where federal minimum wage rate determinations do not contain the DIR's general prevailing wage rates otherwise available for use by the Contractor and Subcontractors, the Contractor and Subcontractor shall pay not less than the federal minimum wage rate which most closely approximates the duties of the employees in question.

This Project is also subject to the "Buy America" provisions of the Surface Transportation Assistance Act of 1982, as amended by the Intermodal Surface Transportation Efficiency Act of 1991 and as further amended by the Moving Ahead for Progress in the 21<sup>st</sup> Century Act (MAP-21) of 2012 and again by the Build America, Buy America Act (BABA) under Infrastructure Investment and Jobs Act (IIJA)/Bipartisan Infrastructure Law (BIL) (Pub. Law 117-58, Nov. 15, 2021).

This Project is also This Project is also subject to, but not limited to, Disadvantaged Business Enterprise good faith efforts, Davis-Bacon and California prevailing wage rates, American Iron and Steel requirements, the Contract Work Hours and Safety Standards Act, the Clean Air Act (42 U.S.C. 7401-7671) and the Federal Water Pollution Control Act (33 U.S.C. 1251-1387), as amended, and the Byrd Anti-Lobbying Amendment.

13. Licenses. Bidders and their proposed subcontractors shall hold such licenses as may be required by the laws of the State of California for the performance of the Work. The Contractor is required to ensure that all subcontractors listed in the Bid Form and working on this Project hold valid licenses and certifications suitable for their trade. Bidder is required to provide with its Bid satisfactory proof of licensure to the City.

Bidders bidding as the Prime Contractor shall possess a valid California Contractor's [Class A] license at the time of Contract award and all listed subcontractors shall hold valid licenses suitable for their trade at the time of Contract award. Failure to possess required licenses shall act as a bar to award of the contract to the bidder.

Bidder and all subcontractors shall maintain the required licenses throughout the entire Project until the City issues a Notice of Completion.

14. Retention. No retainage will be held by the Agency from progress payments due to the prime contractor. Prime contractors and subcontractors are prohibited from holding retainage from subcontractors. Any delay or postponement of payment may take place only for good cause and with the Agency's prior written approval. Any violation of these provisions shall subject the violating contractor or subcontractor to the penalties, sanctions, and other remedies specified in Section 7108.5 of the California Business and Professions Code and Section 10262 of the California Public Contract Code. This requirement shall not be construed to limit or
- MURRAY STREET BRIDGE AT THE SMALL CRAFT HARBOR, SEISMIC  
RETROFIT/BARRIER REPLACEMENT, CITY PROJECT NO. C409321, FEDERAL NO.  
PROJECT NO. STPLZ 5025(084)

1. impair any contractual, administrative or judicial remedies, otherwise available to the contractor or subcontractor in the event of a dispute involving late payment or nonpayment by the contractor, deficient subcontractor performance and/or noncompliance by a subcontractor. This clause applies to both DBE and non-DBE subcontractors.
2. Business License. All Contractors and subcontractors working in the City must have a valid City of Santa Cruz business license at the time the contract is awarded, pursuant to Santa Cruz Municipal Code (SCMC) Chapter 5.04.
3. Good Faith Local Hiring and Apprentices.

Section intentionally left blank.

4. Questions for City. All questions relative to this Project prior to the opening of Bids shall be in writing and received by August 1, 2024 at 2:00PM Pacific Daylight Time and shall be directed to:

City of Santa Cruz, Public Works Department  
809 Center Street, Room 201, Santa Cruz, California 95060  
Joshua Spangrud, PE  
Senior Professional Engineer  
Email: [jspangrud@santacruzca.gov](mailto:jspangrud@santacruzca.gov)  
Tel.: 831-420-5178 Fax: 831-420-5161

5. Pursuant to the provisions of California Labor Code Section 6707, each Bid submitted shall contain, as a separate bid item, adequate sheeting, shoring, and bracing, or equivalent method, for the protection of life or limb in trenches and open excavation, exceeding five feet, which shall conform to applicable safety orders. Neither this requirement, nor any payment by City for this separate bid item, shall be construed to impose tort liability on City, or its employees or agents, for any injury or damage caused by failure of any excavation or protective equipment or methods.

This Advertisement is issued by the City of Santa Cruz, California.

Dated: June 25, 2024



Kevin Crossley, PE  
Assistant Director/City Engineer  
Public Works Department  
809 Center Street, Rm. 201  
Santa Cruz, CA 95060

MURRAY STREET BRIDGE AT THE SMALL CRAFT HARBOR, SEISMIC  
RETROFIT/BARRIER REPLACEMENT, CITY PROJECT NO. C409321, FEDERAL NO.  
PROJECT NO. STPLZ 5025(084)

# SPECIAL NOTICES

- See section 1-1.07B of the Standard Specifications for changes to the definition of working day under “day”.
- See section 2 of the Standard Specifications for submittal requirements for DBE quotes and Non–Small Business Subcontractor Preference.
- The schedules for the submittal of DBE forms have been revised. See section 2-1.33B(2) of the Revised Standard Specifications for the submittal schedules.
- See sections 2 and 3 of the Standard Specifications for Contractors' registration requirements.
- The flagging and temporary traffic control requirements have been revised. See sections 7-1.03, 7-1.04, and 12 of the Standard Specifications.
- The bidder's attention is directed to the experience requirements of personnel for construction of the Sanitary Sewer Force Main in Section 79.
- Reference in these contract documents to "Department" shall refer to the City of Santa Cruz Public Works Department.
- The City advises bidders that potential claim records must be submitted by the Contractor to the Engineer for evaluation.
- Copies of the Caltrans 2018 Standard Specifications, 2018 Standard Plans (revised April 2021), and April 16, 2021 Revised Standard Specifications are included with the Supplemental Project Information for bidders' convenience.
- Existing foundation piles at Bent 6 were damaged by the Loma Prieta earthquake. After the pile cap extension has been removed, monitor the structure for settlement and alert the Engineer immediately if settlement is observed.

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# CHARACTER OF THE WORK

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This project poses significant challenges which bidders should consider in preparing their proposals including, but not limited to:

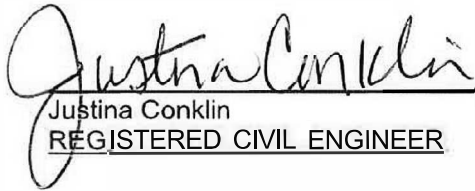
1. Maintaining traffic on Murray Street
2. Tides
3. Pile installation near mammals
4. Pile installation from barges and/or trestles
5. Possibly significant overpour around existing footings where piles and sheetpiling are to be installed.
6. Difficult pile installation near existing riprap around existing piers that may have shifted since originally placed.
7. Accuracy of as-built drawings is unknown. Existing subsurface bridge component dimensions (footings, pile caps, etc.) are unknown.
8. Maintaining boat access to North Harbor
9. Ongoing Harbor aeration and dredging operations
10. Pile driving in confined space between Murray Street Bridge and the Railroad Bridge
11. Complex staging
12. Coordination with utility Contractors and Port District Contractor(s)
13. Utility coordination
14. Permit requirements
15. Weak soils and the sheet piling retaining wall in the West Harbor

\*\*\*\*\*

CONTRACT NO. STPLZ 5025(084)

The special provisions contained herein  
have been prepared by or under the  
direction of the following Registered Persons.

ROADWAY

  
\_\_\_\_\_  
Justina Conklin  
REGISTERED CIVIL ENGINEER

6/22/24

DATE



LANDSCAPE

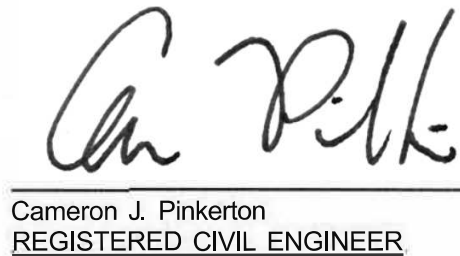
  
\_\_\_\_\_  
Patrick Boyd  
LICENSED LANDSCAPE ARCHITECT

6/22/24

DATE



STRUCTURES

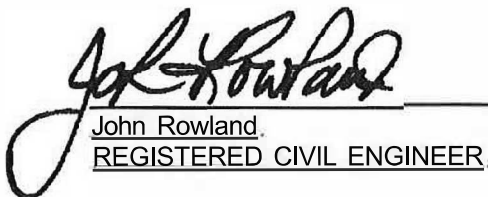
  
\_\_\_\_\_  
Cameron J. Pinkerton  
REGISTERED CIVIL ENGINEER

6/22/24

DATE



ELECTRICAL

  
\_\_\_\_\_  
John Rowland  
REGISTERED CIVIL ENGINEER

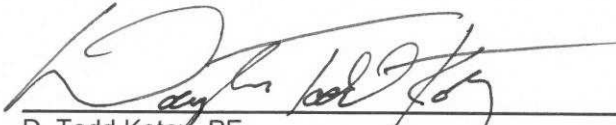
6/22/24

DATE



MURRAY STREET BRIDGE AT THE SMALL CRAFT HARBOR, SEISMIC RETROFIT/BARRIER REPLACEMENT, CITY PROJECT NO. C409321, FEDERAL NO. PROJECT NO. STPLZ 5025(084)

SANITARY SEWER FORCE MAIN

  
\_\_\_\_\_  
D. Todd Kotey, PE  
REGISTERED CIVIL ENGINEER

6/22/24

DATE



**TABLE OF CONTENTS**

**NOTICE INVITING SEALED BIDS .....N-1**

**SPECIAL NOTICES..... SN-1**

**CHARACTER OF THE WORK ..... i**

**TABLE OF CONTENTS..... iv**

**BID FORM ..... BF-1**

**BID BOND ..... BF-12**

**LIST OF SUBCONTRACTORS FORMS..... BF-13**

**DIR COMPLIANCE AFFIDAVIT..... BF-14**

**NON-COLLUSION DECLARATION ..... BF-15**

**IRAN CONTRACTING ACT CERTIFICATION..... BF-16**

**CERTIFICATION CONCERNING LOBBYING..... BF-18**

**STANDARD FORM LLL-DISCLOSURE OF LOBBYING ACTIVITES ..... BF-19**

**EQUAL EMPLOYMENT OPPORTUNITY CERTIFICATION..... BF-21**

**PUBLIC CONTRACT CODE SECTION 10285.1 STATEMENT..... BF-22**

**PUBLIC CONTRACT CODE SECTION 10162 QUESTIONNAIRE..... BF-23**

**DEBARMENT AND SUSPENSION CERTIFICATION ..... BF-24**

**CONTRACTOR’S CERTIFICATE RELATING TO WORKER’S COMPENSATION ..... BF-25**

**LAPM EXHIBIT 15-G ..... BF-26**

**LAPM EXHIBIT 15-H ..... BF-28**

**LAPM EXHIBIT 12-B ..... BF-31**

**LAPM EXHIBIT 9-I..... BF-33**

**AGREEMENT .....AGREEMENT-1**

**PAYMENT BOND ..... PAYMENT BOND-1**

**PERFORMANCE BOND..... PERFORMANCE BOND-1**

**GENERAL PROVISIONS..... GP-1**

**SPECIAL PROVISIONS ..... SP-1**

**DIVISION I GENERAL PROVISIONS ..... SP-2**

**1 GENERAL..... SP-2**

MURRAY STREET BRIDGE AT THE SMALL CRAFT HARBOR, SEISMIC  
RETROFIT/BARRIER REPLACEMENT, CITY PROJECT NO. C409321, FEDERAL NO.  
PROJECT NO. STPLZ 5025(084)



<b>2 BIDDING</b> .....	<b>SP-4</b>
<b>3 CONTRACT AWARD AND EXECUTION</b> .....	<b>SP-13</b>
<b>5 CONTROL OF WORK</b> .....	<b>SP-15</b>
<b>6 CONTROL OF MATERIALS</b> .....	<b>SP-39</b>
<b>7 LEGAL RELATIONS AND RESPONSIBILITY TO THE PUBLIC</b> .....	<b>SP-44</b>
<b>8 PROSECUTION AND PROGRESS</b> .....	<b>SP-53</b>
<b>9 PAYMENT</b> .....	<b>SP-55</b>
<b>DIVISION II GENERAL CONSTRUCTION</b> .....	<b>SP-58</b>
<b>10 GENERAL</b> .....	<b>SP-58</b>
<b>12 TEMPORARY TRAFFIC CONTROL</b> .....	<b>SP-63</b>
<b>13 WATER POLLUTION CONTROL</b> .....	<b>SP-70</b>
<b>14 ENVIRONMENTAL STEWARDSHIP</b> .....	<b>SP-72</b>
<b>15 EXISTING FACILITIES</b> .....	<b>SP-96</b>
<b>16 TEMPORARY FACILITIES</b> .....	<b>SP-110</b>
<b>DIVISION III EARTHWORK AND LANDSCAPE</b> .....	<b>SP-112</b>
<b>17 GENERAL</b> .....	<b>SP-112</b>
<b>19 EARTHWORK</b> .....	<b>SP-113</b>
<b>20 LANDSCAPE</b> .....	<b>SP-118</b>
<b>DIVISION V SURFACINGS AND PAVEMENTS</b> .....	<b>SP-119</b>
<b>39 ASPHALT CONCRETE</b> .....	<b>SP-119</b>
<b>DIVISION VI STRUCTURES</b> .....	<b>SP-120</b>
<b>49 PILING</b> .....	<b>SP-120</b>
<b>50 PRESTRESSING CONCRETE</b> .....	<b>SP-131</b>
<b>51 CONCRETE STRUCTURES</b> .....	<b>SP-132</b>
<b>52 REINFORCEMENT</b> .....	<b>SP-134</b>
<b>59 STRUCTURAL STEEL COATINGS</b> .....	<b>SP-135</b>
<b>60 EXISTING STRUCTURES</b> .....	<b>SP-136</b>
<b>DIVISION VIII MISCELLANEOUS CONSTRUCTION</b> .....	<b>SP-137</b>
<b>72 SLOPE PROTECTION</b> .....	<b>SP-137</b>
<b>73 CONCRETE CURBS AND SIDEWALKS</b> .....	<b>SP-140</b>
<b>75 MISCELLANEOUS METAL</b> .....	<b>SP-143</b>

MURRAY STREET BRIDGE AT THE SMALL CRAFT HARBOR, SEISMIC  
RETROFIT/BARRIER REPLACEMENT, CITY PROJECT NO. C409321, FEDERAL NO.  
PROJECT NO. STPLZ 5025(084)

<b>77 LOCAL INFRASTRUCTURE .....</b>	<b>SP-146</b>
<b>78 INCIDENTAL CONSTRUCTION .....</b>	<b>SP-151</b>
<b>79 SANITARY SEWER.....</b>	<b>SP-153</b>
<b>80 FENCES .....</b>	<b>SP-215</b>
<b>DIVISION IX TRAFFIC CONTROL DEVICES .....</b>	<b>SP-216</b>
<b>83 RAILINGS AND BARRIERS .....</b>	<b>SP-216</b>
<b>84 MARKINGS.....</b>	<b>SP-219</b>
<b>DIVISION X ELECTRICAL WORK .....</b>	<b>SP-220</b>
<b>87 ELECTRICAL SYSTEMS.....</b>	<b>SP-220</b>
<b>88 SANITARY SEWER FORCEMAIN ELECTRICAL AND INSTRUMENTATION.....</b>	<b>SP-221</b>
<b>DIVISION XI MATERIALS .....</b>	<b>SP-318</b>
<b>90 CONCRETE .....</b>	<b>SP-318</b>
<b>96 GEOSYNTHETICS.....</b>	<b>SP-319</b>

# STANDARD PLANS LIST

The standard plan sheets applicable to this Contract include those listed below. The applicable revised standard plans (RSPs) dated April 2021 listed below are included in the project plans.

## ABBREVIATIONS, LINES, SYMBOLS, AND LEGEND

A3A	Abbreviations (Sheet 1 of 3)
A3B	Abbreviations (Sheet 2 of 3)
A3C	Abbreviations (Sheet 3 of 3)
A10A	Legend - Lines and Symbols (Sheet 1 of 5)
A10B	Legend - Lines and Symbols (Sheet 2 of 5)
A10C	Legend - Lines and Symbols (Sheet 3 of 5)
A10D	Legend - Lines and Symbols (Sheet 4 of 5)
A10E	Legend - Lines and Symbols (Sheet 5 of 5)

## PAVEMENT MARKERS, TRAFFIC LINES, AND PAVEMENT MARKINGS

A20A	Pavement Markers and Traffic Lines - Typical Details
RSP A20B	Pavement Markers and Traffic Lines - Typical Details
RSP A20D	Pavement Markers and Traffic Lines - Typical Details
A24A	Pavement Markings - Arrows
A24C	Pavement Markings - Symbols and Numerals
A24D	Pavement Markings - Words
RSP A24E	Pavement Markings - Words

## EXCAVATION AND BACKFILL

A62B	Limits of Payment for Excavation and Backfill - Bridge Surcharge and Wall
A62C	Limits of Payment for Excavation and Backfill - Bridge

## OBJECT MARKERS, DELINEATORS, CHANNELIZERS, AND BARRICADES

A73C	Delineators, Channelizers and Barricades
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## MIDWEST GUARDRAIL SYSTEM - STANDARD RAILING SECTIONS

RSP A77L1	Midwest Guardrail System - Standard Railing Section (Wood Post with Wood Block)
RSP A77M1	Midwest Guardrail System - Standard Hardware
RSP A77N1	Midwest Guardrail System - Wood Post and Wood Block Details
A77N2	Midwest Guardrail System - Steel Post and Notched Wood Block Details
RSP A77N3	Midwest Guardrail System - Typical Line Post Embedment and Hinge Point Offset Details
RSP A77N4	Midwest Guardrail System - Typical Railing Delineation and Dike Positioning Details

## MIDWEST GUARDRAIL SYSTEM - TYPICAL LAYOUTS FOR STRUCTURES

RSP A77Q1	Midwest Guardrail System - Typical Layouts for Structure Approach
RSP A77Q4	Midwest Guardrail System - Typical Layouts for Structure Departure

MURRAY STREET BRIDGE AT THE SMALL CRAFT HARBOR, SEISMIC RETROFIT/BARRIER REPLACEMENT, CITY PROJECT NO. C409321, FEDERAL NO. PROJECT NO. STPLZ 5025(084)

**MIDWEST GUARDRAIL SYSTEM - CONNECTION DETAILS AND  
TRANSITION RAILING TO BRIDGE RAILINGS, ABUTMENTS AND  
WALLS**

<b>A77U1</b>	<b>Midwest Guardrail System - Connections to Bridge Railings without Sidewalks Details No. 1</b>
<b>A77U2</b>	<b>Midwest Guardrail System - Connections to Bridge Railings without Sidewalks Details No. 2</b>
<b>RSP A77U3</b>	<b>Midwest Guardrail System - Connections to Abutments and Walls</b>
<b>RSP A77U4</b>	<b>Midwest Guardrail System - Transition Railing (Type WB-31)</b>
<b>A77U5</b>	<b>Midwest Guardrail System - Transition to Metal Beam Guardrail</b>

**FENCES**

<b>RSP A85</b>	<b>Chain Link Fence</b>
<b>A85A</b>	<b>Chain Link Fence Details</b>
<b>A85B</b>	<b>Chain Link Fence Details</b>

**CURBS, DRIVEWAYS, DIKES, CURB RAMPS, AND ACCESSIBLE  
PARKING**

<b>A87A</b>	<b>Curbs and Driveways</b>
<b>A87B</b>	<b>Hot Mix Asphalt Dikes</b>

**DRAINAGE INLETS, PIPE INLETS AND GRATES**

<b>D71</b>	<b>Drainage Inlet Markers</b>
<b>D72E</b>	<b>CIP Drainage Inlets - Types GO and GDO</b>
<b>D72F</b>	<b>CIP Drainage Inlet Notes</b>
<b>D72G</b>	<b>CIP Drainage Inlet Tables</b>
<b>RSP D73E</b>	<b>Precast Drainage Inlets - Types GO and GDO</b>
<b>D73F</b>	<b>Precast Drainage Inlet Notes</b>
<b>D73G</b>	<b>Precast Drainage Inlet Tables</b>
<b>D74</b>	<b>Drainage Inlet Details</b>

**GUTTER AND INLET DEPRESSIONS**

<b>D78A</b>	<b>Gutter Depressions</b>
<b>D78C</b>	<b>Inlet Depressions - Hot Mix Asphalt Shoulders</b>

**PIPE DOWNDRAINS, ANCHORAGE SYSTEMS AND OVERSIDE DRAINS**

<b>D87D</b>	<b>Overside Drains</b>
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**FLARED END SECTIONS**

<b>D94A</b>	<b>Metal and Plastic Flared End Sections</b>
<b>D94B</b>	<b>Concrete Flared End Sections</b>

**TEMPORARY CRASH CUSHIONS, RAILING AND TRAFFIC SCREEN**

<b>T1A</b>	<b>Temporary Crash Cushion, Sand Filled (Unidirectional)</b>
<b>T1B</b>	<b>Temporary Crash Cushion, Sand Filled (Bidirectional)</b>
<b>T2</b>	<b>Temporary Crash Cushion, Sand Filled (Shoulder Installations)</b>
<b>T3A</b>	<b>Temporary Railing (Type K)</b>
<b>T3B</b>	<b>Temporary Railing (Type K)</b>

**TEMPORARY TRAFFIC CONTROL SYSTEMS**

<b>T9</b>	<b>Traffic Control System Tables for Lane and Ramp Closures</b>
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MURRAY STREET BRIDGE AT THE SMALL CRAFT HARBOR, SEISMIC  
RETROFIT/BARRIER REPLACEMENT, CITY PROJECT NO. C409321, FEDERAL NO.  
PROJECT NO. STPLZ 5025(084)

**TEMPORARY PEDESTRIAN ACCESS ROUTES**

**T30 Temporary Pedestrian Access Routes - Typical Sidewalk Closure and Pedestrian Detour**

**T31 Temporary Pedestrian Access Routes - Typical Sidewalk Diversion Within Roadbed**

**T33 Temporary Pedestrian Access Routes - Ramp**

**TEMPORARY WATER POLLUTION CONTROL**

**T51 Temporary Water Pollution Control Details (Temporary Silt Fence)**

**T52 Temporary Water Pollution Control Details (Temporary Straw Bale Barrier)**

**T56 Temporary Water Pollution Control Details (Temporary Fiber Roll)**

**T58 Temporary Water Pollution Control Details (Temporary Construction Entrance)**

**T59 Temporary Water Pollution Control Details (Temporary Concrete Washout Facility)**

**T61 Temporary Water Pollution Control Details (Temporary Drainage Inlet Protection)**

**T62 Temporary Water Pollution Control Details (Temporary Drainage Inlet Protection)**

**T63 Temporary Water Pollution Control Details (Temporary Drainage Inlet Protection)**

**T64 Temporary Water Pollution Control Details (Temporary Drainage Inlet Protection)**

**T65 Temporary Water Pollution Control Details (Temporary High-Visibility Fence)**

**BRIDGE DETAILS**

**RSP B0-1 Bridge Details**

**B0-3 Bridge Details**

**B0-5 Bridge Details**

**B0-13 Bridge Details**

**T-BEAM DETAILS**

**B6-1 T-Beam Details**

**B6-10 Utility Openings - T-Beam**

**JOINT SEALS**

**B6-21 Joint Seals (Maximum Movement Rating = 2")**

**DECK DRAINS**

**B7-5 Deck Drains**

**B7-6 Deck Drains - Types D-1 and D-2**

**CHAIN LINK RAILING, CABLE RAILING AND TUBULAR HAND RAILING**

**RSP B11-7 Chain Link Railing**

**RSP B11-47 Cable Railing**

MURRAY STREET BRIDGE AT THE SMALL CRAFT HARBOR, SEISMIC RETROFIT/BARRIER REPLACEMENT, CITY PROJECT NO. C409321, FEDERAL NO. PROJECT NO. STPLZ 5025(084)

## ROADSIDE SIGNS

- RS1 Roadside Signs - Typical Installation Details No. 1
- RS2 Roadside Signs - Wood Post - Typical Installation Details No. 2
- RS4 Roadside Signs - Typical Installation Details No. 4

## ELECTRICAL SYSTEMS - LEGEND

- RSP ES-1A Electrical Systems (Legend)
- RSP ES-1B Electrical Systems (Legend)
- RSP ES-1C Electrical Systems (Legend)

## ELECTRICAL SYSTEMS - SIGNAL HEADS, SIGNAL FACES AND MOUNTINGS

- RSP ES-4A Electrical Systems (Signal Head Mounting)
- RSP ES-4C Electrical Systems (Signal Heads and Mountings)
- RSP ES-4E Electrical Systems (Signal Heads and Optical Detector Mounting)

## ELECTRICAL SYSTEMS - DETECTORS

- ES-5A Electrical Systems (Loop Detectors)
- RSP ES-5B Electrical Systems (Detectors)
- RSP ES-5D Electrical Systems (Curb and Shoulder Termination, Trench, and Handhole Details)

## ELECTRICAL SYSTEMS - SIGNAL AND LIGHTING STANDARDS

- RSP ES-7B Electrical Systems (Signal and Lighting Standard, Type 1 and Equipment Identification Characters)

## ELECTRICAL SYSTEMS - SIGNAL AND LIGHTING STANDARD DETAILS

- RSP ES-7M Electrical Systems (Signal and Lighting Standard, Detail No. 1)
- RSP ES-7N Electrical Systems (Signal and Lighting Standard, Detail No. 2)

## ELECTRICAL SYSTEMS - PULL BOX

- RSP ES-8A Electrical Systems (Non-Traffic Pull Box)

## ELECTRICAL SYSTEMS - STRUCTURE INSTALLATIONS

- RSP ES-9E Electrical Systems (Flush-Mounted Soffit, Pendant soffit and Wall-Mounted Luminaire Structure Installations)

## ELECTRICAL SYSTEMS - SPLICE INSULATION METHODS, KINKING AND BANDING DETAILS

- ES-13A Electrical Systems (Splice Insulation Methods Details)
- RSP ES-13B Electrical Systems (Kinking and Banding Detail)

## TEMPORARY WOOD POLES

- ES-18A Temporary Wood Poles - General Notes
- RSP ES-18B Temporary Wood Poles - Non-Guyed - No Signals on Spans
- RSP ES-18C Temporary Wood Poles - Guyed - No Signals on Spans
- RSP ES-18D Temporary Wood Poles - Guyed - With Signal Faces on Spans
- RSP ES-18E Temporary Wood Poles - Non-Guyed - With Signal Faces on Span
- RSP ES-19A Temporary Wood Poles - Details No. 1
- ES-19B Temporary Wood Poles - Details No. 2
- RSP ES-19C Temporary Wood Poles - Details No. 3
- RSP ES-19D Temporary Wood Poles - Details No. 4

MURRAY STREET BRIDGE AT THE SMALL CRAFT HARBOR, SEISMIC RETROFIT/BARRIER REPLACEMENT, CITY PROJECT NO. C409321, FEDERAL NO. PROJECT NO. STPLZ 5025(084)

The applicable standard plans dated 2023 listed below are included in the plans:

**STRUCTURE APPROACH**

- B9-3**            **Structure Approach - Type R (10)**
- B9-4**            **Structure Approach - Type EQ (10)**
- B9-5**            **Structure Approach – Slab Details**

<b>CANCELED STANDARD PLANS LIST</b>					
The standard plan sheets listed below are canceled and not applicable to this contract.					
Plan No.	Date Canceled	Plan No.	Date Canceled	Plan No.	Date Canceled
P31B	10-18-19				
P32A	10-18-19				
P32B	10-18-19				
C7A	10-19-18				
C7B	10-19-18				
C7C	10-19-18				
D89	10-18-19				
B11-55	04-19-19				
B11-56	10-19-18				
B11-57	10-19-18				
B11-60	04-16-21				
RSP B11-61	04-16-21				
S140	04-16-21				
S141	04-16-21				
S142	04-16-21				
ES-2C	10-19-18				
RSP ES-3A	04-16-21				
RSP ES-3I	10-16-20				
ES-3J	10-16-20				
ES-3L	10-16-20				
ES-7P	04-17-20				

MURRAY STREET BRIDGE AT THE SMALL CRAFT HARBOR, SEISMIC RETROFIT/BARRIER REPLACEMENT, CITY PROJECT NO. C409321, FEDERAL NO. PROJECT NO. STPLZ 5025(084)

**BID FORM  
For**

MURRAY STREET BRIDGE AT THE SMALL CRAFT HARBOR

SEISMIC RETROFIT/BARRIER REPLACEMENT

CITY PROJECT NO. C409321

STATE/FEDERAL PROJECT NO. STPLZ-5025(084)

TO: The Council of the City of Santa Cruz

PROPOSAL OF: \_\_\_\_\_

Business Address: \_\_\_\_\_  
\_\_\_\_\_

Business Telephone: \_\_\_\_\_

The undersigned Bidder proposes and agrees, if this Bid is accepted, to enter into an Agreement, in the form specified in the Contract Documents, with the City of Santa Cruz ("City") to perform all work as specified or indicated in the Bidding Documents for the prices and within the times indicated in this Bid and in accordance with the Bidding Documents.

The undersigned Bidder understands that any or all quantities of work shown herein are approximate only and are subject to increase or decrease and offers to do the work whether the quantities are increased or decreased at the unit prices as stated in the following tabulation. The undersigned Bidder agrees to take in full payment for the work, including all applicable state and local taxes, the amount shown on the bid sheet.

Please note closing time to receive bids will be verified according to local telephone company time.

**IT IS UNDERSTOOD THAT THIS BID IS BASED UPON COMPLETION OF THE WORK AS SPECIFIED IN THE SPECIAL PROVISIONS WITHIN 750 WORKING DAYS, AND THE PRICES INCLUDE ALL STATE, FEDERAL, AND OTHER TAXES APPLICABLE TO THE PROJECT.**

The undersigned Bidder agrees to do any extra work, not covered by the above schedule of price, which may be ordered by the City, and to accept as full compensation therefore, such prices as may be agreed upon in writing by the City and the Contractor in accordance with the "Measurement and Payment" Section of the Standard Specifications.

If awarded the contract, the undersigned Bidder hereby agrees to submit the following documents to the City within ten (10) business days of the Notice of Award: a signed Agreement, executed bonds (including MURRAY STREET BRIDGE AT THE SMALL CRAFT HARBOR, SEISMIC RETROFIT/BARRIER REPLACEMENT, CITY PROJECT NO. C409321, FEDERAL NO. PROJECT NO. STPLZ 5025(084)



Faithful Performance Bond and Payment Bond), proper evidence of insurance, and any other forms or documents identified in the Bidding Documents and Notice of Award. The undersigned Bidder further agrees to begin work within ten (10) days after receiving the Notice to Proceed.

The undersigned Bidder has carefully examined the form of the Agreement, the Standard Specifications, the Plans and Special Provisions for the project hereinbefore described and referred to in the "Notice Inviting Sealed Bids" inviting bids for MURRAY STREET BRIDGE AT THE SMALL CRAFT HARBOR SEISMIC RETROFIT/BARRIER REPLACEMENT, CITY PROJECT NO. C409321, STATE/FEDERAL PROJECT NO. STPLZ-5025(084) and also the site of the work and will provide all necessary machinery, tools apparatus and other means of construction, and do all the work and furnish all materials required by said Specifications and Plans and Special Provisions in the manner described therein.

No bid will be considered for less than all items of this schedule and one contract will be awarded for the entire Project.

The undersigned has carefully checked the bid prices, and all computations involved in the preparation of this bid and understands that the City of Santa Cruz will not be responsible for any errors or omissions on the part of the undersigned in making up this bid.

This Bid is made with a full knowledge of the kind, quantities, and quality of the work and of materials, equipment, and plans required. This proposal is also made after a complete, careful, and independent examination and investigation of the site of the work, local conditions affecting the same, and materials to be encountered.

The undersigned Bidder hereby acknowledges receipt of the following Addenda:

<b>Addendum Number</b>	<b>Addendum Date</b>

The Bidder furthermore agrees that in case of its default in executing said Agreement with necessary bonds, the check or bond accompanying this Bid and money payable will become and remain the property of the City of Santa Cruz.

Enclosed is Bidder's bond, certified check, or cashier's check no. \_\_\_\_\_ of the \_\_\_\_\_ Bank for \$ \_\_\_\_\_ which is not less than 10 percent of the Bid submitted by the undersigned, payable to the City of Santa Cruz, California, and which is given as a guarantee that the undersigned will enter into the contract if awarded the work.

It is understood and agreed that the City may reject any or all proposals, or waive any informalities or minor defects in proposals received.

It is agreed that this bid may not be withdrawn over a period of sixty (60) days from the opening thereof.

Bidder submits the following complete and executed documents herewith to form a complete Bid:

1. Bid Form
2. Bid Item List
3. Bid Bond (if used as security)
4. List of Subcontractors Form
5. DIR Compliance Affidavit
6. Non-Collusion Declaration
7. Iran Contracting Act Certification
8. Certification Concerning Lobbying
9. Standard form LLL-Disclosure of Lobbying Activities (Exhibit 10-Q)
10. Certification Regarding Lobbying and Disclosure of Lobbying Activities
11. Equal Employment Opportunity Certification
12. Public Contract Code Statements and Questionnaire
13. Debarment and Suspension Certification
14. Contractor's Certificate Relating to Worker's Compensation
15. LAPM Exhibit 15-G
16. LAPM Exhibit 15-H
17. LAPM Exhibit 12-B
18. LAPM Exhibit 9-I

**Note: Bidders should not add any conditions or qualifying statement to this bid as otherwise the bid may be declared irregular as being not responsive to the Advertisement for Bids.**

The undersigned declares under penalty of perjury that the information contained in this Bid and all accompanying documents are true and correct. **A notary acknowledgment is required.**

Dated: \_\_\_\_\_ Firm Name: \_\_\_\_\_

Official Address: \_\_\_\_\_ Phone: \_\_\_\_\_

Email Address: \_\_\_\_\_

By: \_\_\_\_\_ Title: \_\_\_\_\_

State Contractor's License No.: \_\_\_\_\_

DIR Registration No.: \_\_\_\_\_

Signature of Bidder: \_\_\_\_\_

Name of Bidder: \_\_\_\_\_

Project Name/Number: MURRAY STREET BRIDGE AT THE SMALL CRAFT HARBOR SEISMIC RETROFIT/BARRIER REPLACEMENT, CITY PROJECT NO. C409321, STATE/FEDERAL PROJECT NO. STPLZ-5025(084)

**BID ITEM LIST**

ITEM NO.	F	ITEM CODE	ITEM	UNIT	QUANTITY	UNIT PRICE(\$)	UNIT PRICE EXTENSION (\$)
1		070030	LEAD COMPLIANCE PLAN	LS	1		
2		080050	PROGRESS SCHEDULE (CRITICAL PATH METHOD)	LS	1		
3		090100	TIME-RELATED OVERHEAD (WDAY)	WDAY	750		
4		090205	DISPUTE RESOLUTION BOARD ON-SITE MEETING	EA	16		
5		090210	HOURLY OFF-SITE DISPUTE-RESOLUTION-BOARD-RELATED TASKS	HR	320		
6		100001A	RESIDENT ENGINEERS OFFICE	LS	1		
7		100100	DEVELOP WATER SUPPLY	LS	1		
8		100200A	CONSTRUCTION STAKING	LS	1		
9		120090	CONSTRUCTION AREA SIGNS	LS	1		
10		120100	TRAFFIC CONTROL SYSTEM	LS	1		
11		120120	TYPE III BARRICADE	EA	44		
12		120152	TEMPORARY PAVEMENT MARKING (TAPE)	SQFT	170		
13		120182	PORTABLE DELINEATOR	EA	70		
14		124000	TEMPORARY PEDESTRIAN ACCESS ROUTE	LS	1		
15		128652	PORTABLE CHANGEABLE MESSAGE SIGN (LS)	LS	1		
16		129000	TEMPORARY RAILING (TYPE K)	LF	2600		
17		129110	TEMPORARY CRASH CUSHION	EA	7		
18		130100	JOB SITE MANAGEMENT	LS	1		
19		130300	PREPARE STORM WATER POLLUTION PREVENTION PLAN	LS	1		
20		130310	RAIN EVENT ACTION PLAN	EA	100		
21		130320	STORM WATER SAMPLING AND ANALYSIS DAY	EA	50		
22		130330	STORM WATER ANNUAL REPORT	EA	3		
23		130505	MOVE-IN/MOVE-OUT (TEMPORARY EROSION CONTROL)	EA	3		
24		130560	TEMPORARY SOIL BINDER	SQYD	1090		
25		130620	TEMPORARY DRAINAGE INLET PROTECTION	EA	17		
26		130640	TEMPORARY FIBER ROLL	LF	1210		
27		130710	TEMPORARY CONSTRUCTION ENTRANCE	EA	2		
28		130730	STREET SWEEPING	LS	1		
29		130900	TEMPORARY CONCRETE WASHOUT	LS	1		

MURRAY STREET BRIDGE AT THE SMALL CRAFT HARBOR, SEISMIC RETROFIT/BARRIER REPLACEMENT, CITY PROJECT NO. C409321, FEDERAL NO. PROJECT NO. STPLZ 5025(084)

30		131103	WATER QUALITY SAMPLING AND ANALYSIS DAY	EA	240		
31		131104	WATER QUALITY MONITORING REPORT	EA	12		
32		131105	WATER QUALITY ANNUAL REPORT	EA	3		
33		140003	ASBESTOS COMPLIANCE PLAN	LS	1		
34		141101	REMOVE YELLOW PAINTED TRAFFIC STRIPE (HAZARDOUS WASTE)	LF	900		
35		146002	CONTRACTOR-SUPPLIED BIOLOGIST (LS)	LS	1		
36		151627A	RECONSTRUCT BRIDGE PLAQUE	EA	1		
37		151628A	RELOCATE PACIFIC YACHTING STORAGE SHED	LS	1		
38		151629A	RELOCATE OAR HOUSE	LS	1		
39		151630A	RELOCATE OIL SHED	LS	1		
40		151631A	RELOCATE UCSC STORAGE BLDG, SHOP	LS	1		
41		151632A	RECONSTRUCT FLAGPOLE	EA	2		
42		151633A	REMOVE METAL BOLLARD	EA	4		
43		151635A	RELOCATE UCSC BOATING OFFICE	LS	1		
44		152634A	RESET STRUCTURE MOUNTED ELECTROLIER	EA	3		
45		153001A	REMOVE PEDESTRIAN BRIDGE	EA	1		
46		153124A	REMOVE CONCRETE (STAIRS)	SQYD	29		
47		153125A	REMOVE CONCRETE (EXPOSED AGGREGATE)	SQYD	24		
48		153126A	REMOVE CONCRETE SWALE AND INLET	LS	1		
49		153250A	RECONSTRUCT SEAWALL	LS	1		
50		153251A	REMOVE PIPE (ABANDONDED GAS)	LS	1		
51		160001A	TEMPORARY BUILDING	LS	1		
52		160110	TEMPORARY HIGH-VISIBILITY FENCE	LF	25		
53		170103	CLEARING AND GRUBBING (LS)	LS	1		
54		190101	ROADWAY EXCAVATION	CY	900		
55	F	192003	STRUCTURE EXCAVATION (BRIDGE)	CY	227		
56	F	192020	STRUCTURE EXCAVATION (TYPE D)	CY	142		
57	F	192037	STRUCTURE EXCAVATION (RETAINING WALL)	CY	1292		
58	F	192049	STRUCTURE EXCAVATION (SOLDIER PILE WALL)	CY	46		
59	F	193003	STRUCTURE BACKFILL (BRIDGE)	CY	185		
60	F	193013	STRUCTURE BACKFILL (RETAINING WALL)	CY	845		
61	F	193029	STRUCTURE BACKFILL (SOLDIER PILE WALL)	CY	19		
62	F	193116	CONCRETE BACKFILL (SOLDIER PILE WALL)	CY	114		
63	F	193119	LEAN CONCRETE BACKFILL	CY	64		

MURRAY STREET BRIDGE AT THE SMALL CRAFT HARBOR, SEISMIC RETROFIT/BARRIER REPLACEMENT, CITY PROJECT NO. C409321, FEDERAL NO. PROJECT NO. STPLZ 5025(084)

64		198400A	BIORETENTION SOIL MEDIA	CY	140		
65		202006	SOIL AMENDMENT	CY	1.4		
66		202038	PACKET FERTILIZER	EA	160		
67		203100	SOIL TESTING	EA	1		
68		204035	PLANT (GROUP A)	EA	160		
69		204099	PLANT ESTABLISHMENT WORK	LS	1		
70		205035	WOOD MULCH	CY	80		
71		206400	CHECK AND TEST EXISTING IRRIGATION FACILITIES	LS	1		
72		206560	CONTROL AND NEUTRAL CONDUCTORS	LS	1		
73		206562	1" REMOTE CONTROL VALVE	EA	2		
74		206747A	6 STATION IRRIGATION CONTROLLER (WALL MOUNTED)	EA	1		
75		206908A	6 STATION IRRIGATION CONTROLLER (PEDESTAL MOUNTED)	EA	1		
76	F	208220	1/2" DRIP IRRIGATION TUBING	LF	585		
77		208423	1" BACKFLOW PREVENTER ASSEMBLY	EA	2		
78		208440	BACKFLOW PREVENTER ENCLOSURE	EA	2		
79		208442	FLOW SENSOR	EA	2		
80		208450	DRIP VALVE ASSEMBLY	EA	2		
81		208572	1" GATE VALVE	EA	2		
82	F	208594	3/4" PLASTIC PIPE (SCHEDULE 40) (SUPPLY LINE)	LF	135		
83	F	208595	1" PLASTIC PIPE (SCHEDULE 40) (SUPPLY LINE)	LF	50		
84		210430	HYDROSEED	SQFT	5790		
85	F	208690	1 1/2" PVC PIPE CONDUIT (SLEEVE)	LF	52		
86		208815	2" WELDED STEEL PIPE CONDUIT	LF	41		
87		210010	MOVE-IN/MOVE-OUT (EROSION CONTROL)	EA	3		
88		220101	FINISHING ROADWAY	LS	1		
89		260203	CLASS 2 AGGREGATE BASE (CY)	CY	350		
90		390132	HOT MIX ASPHALT (TYPE A)	TON	760		
91		394074	PLACE HOT MIX ASPHALT DIKE (TYPE C)	LF	120		
92		394077	PLACE HOT MIX ASPHALT DIKE (TYPE F)	LF	70		
93		394090	PLACE HOT MIX ASPHALT (MISCELLANEOUS AREA)	SQYD	25		
94		398000	REMOVE ASPHALT CONCRETE PAVEMENT (CY)	CY	120		
95		480600	TEMPORARY SHORING	LS	1		
96		490325	STEEL SOLDIER PILE (HP 14 X 117)	LF	816		
97		490403	30" DRILLED HOLE	LF	800		
98		490618	96" CAST-IN-DRILLED-HOLE CONCRETE PILING	LF	122		

99		495103	FURNISH 16" CAST-IN-STEEL SHELL CONCRETE PILING	LF	1294		
100		495104	DRIVE 16" CAST-IN-STEEL SHELL CONCRETE PILE	EA	24		
101		495115	FURNISH 24" CAST-IN-STEEL SHELL CONCRETE PILING	LF	3273		
102		495116	DRIVE 24" CAST-IN-STEEL SHELL CONCRETE PILE	EA	90		
103		495124	FURNISH 30" CAST-IN-STEEL SHELL CONCRETE PILING	LF	1851		
104		495125	DRIVE 30" CAST-IN-STEEL-SHELL CONCRETE PILE	EA	23		
105		495191A	FURNISH 96" TEMPORARY CASING	LS	1		
106	F	510051	STRUCTURAL CONCRETE, BRIDGE FOOTING	CY	287		
107	F	510053	STRUCTURAL CONCRETE, BRIDGE	CY	525		
108	F	510054	STRUCTURAL CONCRETE, BRIDGE (POLYMER FIBER)	CY	245		
109	F	510060	STRUCTURAL CONCRETE, RETAINING WALL	CY	431		
110	F	510085	STRUCTURAL CONCRETE, APPROACH SLAB (TYPE EQ)	CY	4		
111		510087	STRUCTURAL CONCRETE, APPROACH SLAB (TYPE R)	CY	23		
112	F	510502	MINOR CONCRETE (MINOR STRUCTURE)	CY	8		
113		510504A	OVERFLOW STRUCTURE WITH BEEHIVE GRATE	EA	2		
114	F	511035	ARCHITECTURAL TREATMENT	SQFT	797		
115		511106	DRILL AND BOND DOWEL	LF	3156		
116		511111	DRILL AND BOND DOWEL (CHEMICAL ADHESIVE) (LF)	LF	77		
117		512204	FURNISH PRECAST PRESTRESSED CONCRETE GIRDER (50'-60')	EA	18		
118		512500	ERECT PRECAST PRESTRESSED CONCRETE GIRDER	EA	18		
119		519081	JOINT SEAL (MR 1/2")	LF	514		
120	F	520102	BAR REINFORCING STEEL (BRIDGE)	LB	168607		
121	F	520106A	BAR REINFORCING STEEL (EPOXY COATED) (RETAINING WALL)	LB	95046		
122	F	520110	BAR REINFORCING STEEL (EPOXY COATED) (BRIDGE)	LB	250296		
123	F	520120	HEADED BAR REINFORCEMENT	EA	396		
124	F	575004	TIMBER LAGGING	MFBM	3.84		
125		590120	CLEAN AND PAINT STEEL SOLDIER PILING	LS	1		
126		600001	PUBLIC SAFETY PLAN	LS	1		
127		600009	CORE AND PRESSURE GROUT DOWEL	LF	96		

128		600017	REMOVE RETAINING WALL (LF)	LF	130		
129		600019	REMOVE RETAINING WALL (WOOD)	LF	150		
130		600037	PREPARE CONCRETE BRIDGE DECK SURFACE	SQFT	15218		
131		600041	FURNISH POLYESTER CONCRETE OVERLAY	CF	2700		
132	F	600043	PLACE POLYESTER CONCRETE OVERLAY	SQFT	18479		
133		600072	CORE CONCRETE (10")	LF	33		
134		600114	BRIDGE REMOVAL (PORTION)	LS	1		
135		600133	RECONSTRUCT FENDER	LS	1		
136		641101	12" PLASTIC PIPE (ADS WT N-12)	LF	26		
137		641107	18" PLASTIC PIPE (ADS WT N-12)	LF	280		
138		665046	48" CORRUGATED STEEL PIPE (0.079" THICK)	LF	9		
139	F	682042	CLASS 2 PERMEABLE MATERIAL (BLANKET)	CY	218		
140		700617	DRAINAGE INLET MARKER	EA	5		
141		705204	18" CONCRETE FLARED END SECTION	EA	2		
142		705311	18" ALTERNATIVE FLARED END SECTION	EA	1		
143		710136	REMOVE PIPE (LF)	LF	240		
144		710158	REMOVE CATCH BASIN	EA	6		
145		720000A	RELOCATE RIPRAP	LS	1		
146		721810	SLOPE PAVING (CONCRETE)	CY	35		
147		723095	ROCK SLOPE PROTECTION (20 lb, CLASS I, METHOD B) (CY)	CY	14		
148		729011	ROCK SLOPE PROTECTION FABRIC (CLASS 8)	SQYD	60		
149		731504	MINOR CONCRETE (CURB AND GUTTER) (TYPE A2-8)	CY	14		
150		731508	MINOR CONCRETE (EXPOSED AGGREGATE CONCRETE)	SQFT	150		
151		731519A	MINOR CONCRETE (COBBLE PAVING)	SQFT	1287		
152		731522A	MINOR CONCRETE (STAIRS)	CY	9		
153		731628A	MINOR CONCRETE (DEEP CURB AND GUTTER)	CY	3.8		
154		731629A	MINOR CONCRETE (DEEP CURB)	CY	8		
155		731710	REMOVE CONCRETE CURB (LF)	LF	120		
156	F	750001	MISCELLANEOUS IRON AND STEEL	LB	478		
157	F	750501	MISCELLANEOUS METAL (BRIDGE)	LB	55115		
158	F	750505	BRIDGE DECK DRAINAGE SYSTEM	LB	11838		
159	F	750506	MISCELLANEOUS METAL (TIE ROD)	LB	8343		
160		750507A	BIRD DETERRENT SPIKE STRIPS	LF	829		
161		770001A	CATCH BASIN (CITY STD TYPE B)	EA	1		
162		770002A	OIL AND SEDIMENT TRAP (CITY STD)	EA	2		

163	770004A	MANHOLE (CITY STD)	EA	1		
164	770010A	MINOR CONCRETE (CURB, CITY STANDARD)	CY	7		
165	770011A	MINOR CONCRETE (CURB, GUTTER, AND SIDEWALK, CITY STANDARD)	CY	3.9		
166	770012A	MINOR CONCRETE (CURB AND GUTTER CITY STD)	CY	19		
167	770013A	MINOR CONCRETE (SIDEWALK, CITY STD)	CY	20		
168	770020A	6" GATE VALVE	EA	5		
169	770022A	12" GATE VALVE	EA	2		
170	770023A	REMOVE WATER VALVE	EA	6		
171	770032A	12" COATED DUCTILE IRON PIPE	LF	660		
172	770033A	6" PVC PIPE	LF	410		
173	770034A	TYPE K COPPER TUBING	LF	28		
174	770037A	REMOVE PIPE (PLASTIC, STEEL OR PVC)	LF	860		
175	770038A	REMOVE PIPE (ASBESTOS CEMENT)	LF	120		
176	770040A	6" 11¼° ELBOW	EA	7		
177	770041A	6" 22½° ELBOW	EA	11		
178	770042A	6" 45° ELBOW	EA	6		
179	770043A	6" 90° ELBOW	EA	3		
180	770044A	12" 11¼° ELBOW	EA	2		
181	770045A	12" 22½° ELBOW	EA	2		
182	770050A	THRUST BLOCKS	SQFT	70		
183	770060A	ABANDON PIPELINE	EA	1		
184	770090	LIGHTING (CITY STREET)	LS	1		
185	780211A	SURVEY MONUMENT	EA	2		
186	783000A	VERTICAL CLEARANCE GAUGE	LS	1		
187	790001A	SEWER FORCEMAIN MOBILIZATION AND DEMOBILIZATION	LS	1		
188	790002A	SHEETING, SHORING, AND BRACING	LS	1		
189	790003A	RECORD DRAWINGS	LS	1		
190	790004A	FURNISH AND INSTALL 36-INCH CASED C200 SEWER FORCEMAIN EPOXY LINED AND COATED WITH STIFFENER RINGS	LF	560		
191	790005A	FURNISH AND INSTALL 42-INCH C200 CASING EPOXY LINED AND COATED	LF	560		
192	790006A	FURNISH AND INSTALL PHASE 1 36-INCH C200 SEWER FORCEMAIN CMLC	LF	281		
193	790007A	REMOVE OR ABANDON SEWER FORCEMAIN	LS	1		
194	790009A	PRECAST CONCRETE VAULTS 3A AND 3B AND APPURTENANCE ASSEMBLIES	EA	2		



195		790010A	TRUSS SUPPORT TO BRIDGE STRUCTURE ASSEMBLY	EA	2		
196		790011A	PIPE TO TRUSS SUPPORT ASSEMBLY	EA	14		
197		790012A	PIPE CASING SUPPORT TO BENT 5 STRUCTURE ASSEMBLY	LS	1		
198		790013A	PIPE CASING SUPPORT TO STRUCTURE ASSEMBLY	EA	5		
199		790014A	CONSTRUCT TIE-IN AT APPROX. STATION 1+00	LS	1		
200		790015A	CONSTRUCT TIE-IN AT APPROX. STATION 9+40	LS	1		
201		790016A	ANTI-CLIMB AT ABUTMENTS 1 AND 10	LS	1		
202		790017A	SANITARY SEWER MANHOLE	EA	2		
203		790018A	ABANDON 8-INCH SEWER AND MANHOLE	LS	1		
204		790019A	8-INCH GRAVITY SEWER PIPELINE	LF	96		
205		790020A	REROUTE EXISTING SANITARY SEWER LATERAL TO NEW 8-INCH GRAVITY SEWER MAIN	EA	2		
206		800053A	WIRE MESH FENCE (MODIFIED)	LF	13		
207		800103	TEMPORARY FENCE (TYPE CL-6)	LF	730		
208		800104A	TEMPORARY FENCE (TYPE CL-6, PRIVACY)	LF	250		
209		800105A	TEMPORARY GATE	EA	2		
210		800320	CHAIN LINK FENCE (TYPE CL-4)	LF	190		
211		800365	CHAIN LINK FENCE (TYPE CL-6, SLATTED)	LF	210		
212		802180	12' CHAIN LINK GATE (TYPE CL-4)	EA	1		
213		802520	6' CHAIN LINK GATE (TYPE CL-6, SLATTED)	EA	2		
214		803015	REMOVE WOOD FENCE	LF	43		
215		803020	REMOVE FENCE	LF	130		
216		803050	REMOVE CHAIN LINK FENCE	LF	190		
217		803100	RECONSTRUCT FENCE	LF	100		
218		810230	PAVEMENT MARKER (RETROREFLECTIVE)	EA	80		
219		820250	REMOVE ROADSIDE SIGN	EA	1		
220		820530	RESET ROADSIDE SIGN	EA	3		
221		820610	RELOCATE ROADSIDE SIGN	EA	2		
222		820750	FURNISH SINGLE SHEET ALUMINUM SIGN (0.063"-UNFRAMED)	SQFT	9		
223		820840	ROADSIDE SIGN - ONE POST	EA	3		
224	F	833000A	METAL RAILING	LF	130		
225	F	833020A	CHAIN LINK RAILING (MODIFIED)	LF	60		
226	F	833085	PIPE HANDRAILING	LF	70		
227	F	833088A	PEDESTRIAN HAND RAILING	LF	658		
228	F	833094	TUBULAR BICYCLE RAILING	LF	543		

229	F	833095A	RECONSTRUCT RAILING	LF	15		
230	F	839527	CABLE RAILING (MODIFIED)	LF	123		
231		839543	TRANSITION RAILING (TYPE WB-31)	EA	2		
232		839586A	ALTERNATIVE IN-LINE TERMINAL SYSTEM (TL-2)	EA	2		
233	F	839791A	CALIFORNIA ST-75 BRIDGE RAIL (MOD)	LF	560		
234	F	839792A	CALIFORNIA ST-75SW BRIDGE RAIL (MOD-1)	LF	586		
235	F	839792B	CALIFORNIA ST-75SW BRIDGE RAIL (MOD-2)	LF	89		
236		840505	6" THERMOPLASTIC TRAFFIC STRIPE	LF	3560		
237		840651	PAINTED STALL LINES AND PAVEMENT MARKINGS	SQFT	260		
238		840515	THERMOPLASTIC PAVEMENT MARKING	SQFT	100		
239		846020	REMOVE PAINTED TRAFFIC STRIPE	LF	1090		
240		870201A	STAIRWAY LIGHTING	LS	1		
241		870202A	NAVIGATION LIGHTS	LS	1		
242		870203A	PATHWAY LIGHTS	LS	1		
243		870204A	SOFFIT LIGHTING	LS	1		
244		870205A	SERVICE PANEL	LS	1		
245		870206A	AERATOR ASSEMBLY	LS	1		
246		872002	TEMPORARY SIGNAL & LIGHTING	LS	1		
247		872010A	6" HDPE CONDUIT HORIZONTAL DIRECTIONAL DRILLING METHOD (PG&E)	LF	310		
248		872011A	6" HDPE CONDUIT (PG&E)	LF	530		
249		872012A	6" HDPE CONDUIT (COMCAST)	LF	290		
250		880021A	ELECTRICAL AND INSTRUMENTATION	LS	1		
251		999990	MOBILIZATION	LS	1		
						SUBTOTAL	
						10% CONTINGENCY	
						TOTAL	

Total Bid in Words: \_\_\_\_\_

\_\_\_\_\_

**BID BOND**  
**(If Bond Posted as Security)**

KNOW ALL PERSONS BY THESE PRESENT:

THAT WE, \_\_\_\_\_, AS PRINCIPAL, AND \_\_\_\_\_, AS SURETY, are held and firmly bound unto the City of Santa Cruz in the penal sum of 10 PERCENT OF THE TOTAL AMOUNT OF THE BID of the Principal above named, submitted by said Principal to the City of Santa Cruz for the work described below, for the payment of which sum in lawful money of the United States, well and truly to be made to the City of Santa Cruz to which said bid was submitted, we bind ourselves, our heirs, executors, administrators, and successors, jointly and severally, firmly by these presents. In no case shall the liability of the surety hereunder exceed the sum of \$\_\_\_\_\_.

THE CONDITION OF THIS OBLIGATION IS SUCH THAT, WHEREAS, the Principal has submitted the above-mentioned bid to the City of Santa Cruz, aforesaid, for certain construction specifically described as follows:

MURRAY STREET BRIDGE AT THE SMALL CRAFT HARBOR  
SEISMIC RETROFIT/BARRIER REPLACEMENT  
CITY PROJECT NO. C409321  
STATE/FEDERAL PROJECT NO. STPLZ-5025(084)"

NOW, THEREFORE, if the aforesaid Principal is awarded the contract and, within the time and manner required under the Special Provisions after the prescribed forms are presented to him/her for signature enters into a written contract, in the prescribed form, in accordance with the bid, and files the certificate of insurance and two bonds with the City, one to guarantee faithful performance, and the other to guarantee payment for labor and materials as required by law, then this obligation shall be null and void; otherwise, it shall be and remain in full force and virtue.

IN WITNESS WHEREOF, we have hereunto set our hands and seals on this \_\_\_\_\_ day of \_\_\_\_\_, 20 \_\_\_\_.

PRINCIPAL

SURETY

\_\_\_\_\_  
(Seal)

\_\_\_\_\_  
(Seal)

\_\_\_\_\_  
Signature

\_\_\_\_\_  
Signature

\_\_\_\_\_  
Title

\_\_\_\_\_  
Title

\_\_\_\_\_  
Address

\_\_\_\_\_  
Address

(Note: Signatures of those executing for the surety as an Attorney-in-Fact must include a Notary Acknowledgement.)

MURRAY STREET BRIDGE AT THE SMALL CRAFT HARBOR, SEISMIC RETROFIT/BARRIER REPLACEMENT, CITY PROJECT NO. C409321, FEDERAL NO. PROJECT NO. STPLZ 5025(084)

## LIST OF SUBCONTRACTORS FORMS

Name of Bidder: \_\_\_\_\_

Project Name/Number: MURRAY STREET BRIDGE AT THE SMALL CRAFT HARBOR

SEISMIC RETROFIT/BARRIER REPLACEMENT CITY PROJECT NO. C409321

STATE/FEDERAL PROJECT NO. STPLZ-5025(084)

Bidder will use Subcontractors for the Work:  YES  NO

For each subcontractor to whom the Bidder proposes to subcontract portions of the work in an amount in excess of one-half of one percent, Bidder shall indicate on this form each proposed subcontractor's legal/contracting entity name, business address and phone number, the Contractor's State Licensing Board license number, the public works contractor registration number issued pursuant to California Labor Code Section 1725.5, the dollar amount and proportion (in percent) of the Work of each Subcontractor (of any tier) to whom a portion of the Work will be awarded via one or more subcontracts, and the work to be performed by the subcontractor.

Subcontractor's Legal Name	Business Address and Phone Number	CSLB License Number	Public Works Contractor DIR Number	Subcontract Amount and Proportion of Total Bid Price	Work to Be Performed

(Attach additional sheets, if necessary)

**DIR COMPLIANCE AFFIDAVIT**

Name of Bidder: \_\_\_\_\_

Project Name/Number: MURRAY STREET BRIDGE AT THE SMALL CRAFT HARBOR

SEISMIC RETROFIT/BARRIER REPLACEMENT CITY PROJECT NO. C409321

STATE/FEDERAL PROJECT NO. STPLZ-5025(084)

California Labor Code requires private contractors, and their subcontractors, to pay prevailing wages to their workers when working on a project funded by a public entity. Prevailing wages are due if the project costs more than \$1,000, and involves the following construction work: new construction, alteration, demolition, installation, repair and/or maintenance. Contractors must also make an attempt to hire apprentices when the total project costs exceed \$30,000.

Prior to commencement of the Contract, all Contractors and subcontractors are required to register, and maintain active registration throughout the duration of the contract with the California Department of Industrial Relations (DIR). For information regarding registration, please go to <https://www.dir.ca.gov/Public-Works/PublicWorks.html>.

- No contractor or subcontractor may be listed on a bid proposal for a public works project (effective March 1, 2015) unless registered with the DIR pursuant to Labor Code section 1725.5 [with limited exceptions from this requirement for bid purposes only under Labor Code section 1771.1(a)].
- No contractor or subcontractor may be awarded a contract for public work on a public works project (effective April 1, 2015) unless registered with the DIR pursuant to Labor Code section 1725.5.
- DIR registration is required each fiscal year (July 1 – June 30).

I, the Bidder, certify that:

I acknowledge that this project is subject to compliance monitoring and enforcement by the Department of Industrial Relations. I am aware of the provisions of Senate Bill SB 854 and Labor Code sections 1725.5, 1771.1(a), 1774-1776, 1777.5, 1813, and 1815 which require Contractors to comply with all labor compliance requirements, including but not limited to, prevailing wage requirements, Public Works Contractor Registration Program, Electronic Certified Payroll Reporting, and other requirements described in the DIR website. I will comply with such provisions before commencing the performance of the work of this contract, and maintain compliance throughout the completion of said contract.

\_\_\_\_\_  
Signature

\_\_\_\_\_  
Date

\_\_\_\_\_  
Print Name

\_\_\_\_\_  
Title

**NON-COLLUSION DECLARATION**

(Pursuant to Section 7106 of the Public Contract Code)

Name of Bidder: \_\_\_\_\_

Project Name/Number: MURRAY STREET BRIDGE AT THE SMALL CRAFT HARBOR

SEISMIC RETROFIT/BARRIER REPLACEMENT CITY PROJECT NO. C409321

STATE/FEDERAL PROJECT NO. STPLZ-5025(084)

The undersigned declares:

I am the \_\_\_\_\_ of \_\_\_\_\_, the party making the foregoing bid.

The bid is not made in the interest of, or on behalf of, any undisclosed person, partnership, company, association, organization, or corporation. The bid is genuine and not collusive or sham. The bidder has not directly or indirectly induced or solicited any other bidder to put in a false or sham bid. The bidder has not directly or indirectly colluded, conspired, connived, or agreed with any bidder or anyone else to put in a sham bid, or to refrain from bidding. The bidder has not in any manner, directly or indirectly, sought by agreement, communication, or conference with anyone to fix the bid price of the bidder or any other bidder, or to fix any overhead, profit, or cost element of the bid price, or of that of any other bidder. All statements contained in the bid are true. The bidder has not, directly or indirectly, submitted his or her bid price or any breakdown thereof, or the contents thereof, or divulged information or data relative thereto to any corporation, partnership, company association, organization, bid depository, or to any member or agent thereof, to effectuate a collusive or sham bid, and has not paid, and will not pay, any person or entity for such purpose.

Any person executing this declaration on behalf of a bidder that is a corporation, partnership, joint venture, limited liability company, limited liability partnership, or any other entity, hereby represents that he or she has full power to execute, and does execute, this declaration on behalf of the bidder.

I declare under penalty of perjury under the laws of the State of California that the foregoing is true and correct and that this declaration is executed on \_\_\_\_\_, 20\_\_, at \_\_\_\_\_[City], \_\_\_\_\_, [State].

\_\_\_\_\_  
(Signature)

**IRAN CONTRACTING ACT CERTIFICATION  
CALIFORNIA PUBLIC CONTRACT CODE §§ 2202 – 2208**

*(If Bid For More than \$1,000,000)*

Name of Bidder: \_\_\_\_\_

Project Name/Number: MURRAY STREET BRIDGE AT THE SMALL CRAFT HARBOR  
SEISMIC RETROFIT/BARRIER REPLACEMENT CITY PROJECT NO. C409321  
STATE/FEDERAL PROJECT NO. STPLZ-5025(084)

Bidders are ineligible to bid on or submit a bid for any contract with a public entity for goods or services of one million dollars (\$1,000,000) or more if the Bidder engages in investment activities in Iran (Public Contract Code § 2204). For bids \$1,000,000 or more, Bidders must certify that it is not on the list of ineligible vendors prohibited from doing business with the State of California and shall complete the Iran Contracting Act Certification attached and submitted with their Bid. Failure to do so may deem the Bid nonresponsive. To submit a bid for this Project, please check one of the two options and complete the declaration, below. Please note: California law establishes penalties for providing false certifications, including civil penalties equal to the greater of \$250,000 or twice the amount of the contract for which the false certification was made, contract termination, and a three-year ineligibility to bid on contracts. (Public Contract Code § 2205).

Option 1: Certification

I, the official named below, certify that I am duly authorized to execute this certification on behalf of the vendor listed below, and the vendor identified below is **not** on the current list of persons engaged in investment activities in Iran created by the Department of General Services (DGS) and is not a financial institution extending twenty million dollars (\$20,000,000) or more in credit to another person/vendor, for 45 days or more, if that other person/vendor or person will use the credit to provide goods or services in the energy sector in Iran and is identified on the current list of persons engaged in investment activities in Iran created by DGS.

Option 2: Exemption

Pursuant to PCC Sections 2203(c) and (d), a public entity may permit a vendor engaged in investment activities in Iran, on a case-by-case basis, to be eligible for or to bid on, submit a proposal for, or enter into or renew a contract for goods and services. Vendor has obtained an exemption from the certification requirement under the Iran Contracting Act and attaches documentation herein demonstrating the exemption approval.

I declare under penalty of perjury under the laws of the State of California that the foregoing is true and correct and that this Certificate is executed on \_\_\_\_\_[date], at \_\_\_\_\_[city], \_\_\_\_\_[state].

BIDDER

MURRAY STREET BRIDGE AT THE SMALL CRAFT HARBOR, SEISMIC RETROFIT/BARRIER  
REPLACEMENT, CITY PROJECT NO. C409321, FEDERAL NO. PROJECT NO. STPLZ 5025(084)  
BF-16

\_\_\_\_\_  
Name: \_\_\_\_\_  
Title: \_\_\_\_\_



**CERTIFICATION CONCERNING LOBBYING**  
**31 U.S. CODE § 1352**

Project Name/Number: MURRAY STREET BRIDGE AT THE SMALL CRAFT HARBOR  
SEISMIC RETROFIT/BARRIER REPLACEMENT CITY PROJECT NO. C409321  
STATE/FEDERAL PROJECT NO. STPLZ-5025(084)

The undersigned certifies, to the best of his or her knowledge and belief that:

- (1) No Federal appropriated funds have been paid or will be paid, by or on behalf of the undersigned, to any person for influencing or attempting to influence an officer or employee of an agency, a Member of Congress, an officer or employee of Congress, or an employee of a Member of Congress in connection with the awarding of any Federal contract, the making of any Federal grant, the making of any Federal loan, the entering into any cooperative agreement, and the extension, continuation, renewal, amendment, or modification of any Federal contract, grant, loan, or cooperative agreement.
- (2) If any funds other than Federal appropriated funds have been paid or will be paid to any person for influencing or attempting to influence an officer or employee of any agency, a Member of Congress, an officer or employee of Congress, or an employee of a Member of Congress in connection with this federally-funded contract, grant loan, or cooperative agreement, it will complete and submit Standard Form-LLL, "Disclosure Form to Report Lobbying", in accordance with its instructions.
- (3) The undersigned shall require that the language of this certification be included in the award documents for all subawards at all tiers (including subcontracts, grants, and contracts under grants, loans, and cooperative agreements) and that all subrecipients shall certify and disclose accordingly.
- (4) This certification is a material representation of fact upon which reliance was placed when this transaction was made or entered into. Submission of this certification is a prerequisite for making or entering into this transaction imposed by section 1352, title 31 U.S. Code. Any person who fails to file the required certification shall be subject to a civil penalty of not less than \$10,000 and not more than \$100,000 for each such failure.

I declare under penalty of perjury under the laws of the State of California that the foregoing is true and correct and that this certificate is executed on \_\_\_\_\_[date], at \_\_\_\_\_[city], \_\_\_\_\_[state].

BIDDER: \_\_\_\_\_

\_\_\_\_\_

Name: \_\_\_\_\_

Title: \_\_\_\_\_

STANDARD FORM LLL-DISCLOSURE OF LOBBYING ACTIVITIES

EXHIBIT 10-Q DISCLOSURE OF LOBBYING ACTIVITIES

COMPLETE THIS FORM TO DISCLOSE LOBBYING ACTIVITIES PURSUANT TO 31 U.S.C. 1352

<b>1. Type of Federal Action:</b>		<b>2. Status of Federal Action:</b>		<b>3. Report Type:</b>		
<input type="checkbox"/>	a. contract	<input type="checkbox"/>	a. bid/offer/application	<input type="checkbox"/>	a. initial	
<input type="checkbox"/>	b. grant	<input type="checkbox"/>	b. initial award	<input type="checkbox"/>	b. material change	
<input type="checkbox"/>	c. cooperative agreement	<input type="checkbox"/>	c. post-award	<b>For Material Change Only:</b>		
<input type="checkbox"/>	d. loan	year _____ quarter _____				
<input type="checkbox"/>	e. loan guarantee	date of last report _____				
<input type="checkbox"/>	f. loan insurance					
<b>4. Name and Address of Reporting Entity</b>			<b>5. If Reporting Entity in No. 4 is Subawardee, Enter Name and Address of Prime:</b>			
<input type="checkbox"/>	Prime	<input type="checkbox"/>	Subawardee			
Tier _____, if known						
Congressional District, if known			Congressional District, if known			
<b>6. Federal Department/Agency:</b>			<b>7. Federal Program Name/Description:</b>			
			CFDA Number, if applicable _____			
<b>8. Federal Action Number, if known:</b>			<b>9. Award Amount, if known:</b>			
<b>10. Name and Address of Lobby Entity</b> (If individual, last name, first name, MI)			<b>11. Individuals Performing Services</b> (including address if different from No. 10) (last name, first name, MI)			
(attach Continuation Sheet(s) if necessary)						
<b>12. Amount of Payment (check all that apply)</b>			<b>14. Type of Payment (check all that apply)</b>			
\$ _____	<input type="checkbox"/>	actual	<input type="checkbox"/>	<input type="checkbox"/>	planned	
<b>13. Form of Payment (check all that apply):</b>			<input type="checkbox"/>			a. retainer
<input type="checkbox"/>	a. cash		<input type="checkbox"/>	b. one-time fee		
<input type="checkbox"/>	b. in-kind; specify: nature _____		<input type="checkbox"/>	c. commission		
	Value _____		<input type="checkbox"/>	d. contingent fee		
			<input type="checkbox"/>	e. deferred		
			<input type="checkbox"/>	f. other, specify _____		
<b>15. Brief Description of Services Performed or to be performed and Date(s) of Service, including officer(s), employee(s), or member(s) contacted, for Payment Indicated in Item 12:</b>						
(attach Continuation Sheet(s) if necessary)						
<b>16. Continuation Sheet(s) attached: Yes <input type="checkbox"/> No <input type="checkbox"/></b>						
<b>17. Information requested through this form is authorized by Title 31 U.S.C. Section 1352. This disclosure of lobbying reliance was placed by the tier above when his transaction was made or entered into. This disclosure is required pursuant to 31 U.S.C. 1352. This information will be reported to Congress semiannually and will be available for public inspection. Any person who fails to file the required disclosure shall be subject to a civil penalty of not less than \$10,000 and not more than \$100,000 for each such failure.</b>			Signature: _____			
			Print Name: _____			
			Title: _____			
			Telephone No.: _____ Date: _____			
<b>Federal Use Only:</b>			Authorized for Local Reproduction Standard Form - LLL			

Standard Form LLL Rev. 04-28-06

## INSTRUCTIONS FOR COMPLETING EXHIBIT 10-Q DISCLOSURE OF LOBBYING ACTIVITIES

This disclosure form shall be completed by the reporting entity, whether subawardee or prime federal recipient at the initiation or receipt of covered federal action or a material change to previous filing pursuant to title 31 U.S.C. Section 1352. The filing of a form is required for such payment or agreement to make payment to lobbying entity for influencing or attempting to influence an officer or employee of any agency, a Member of Congress an officer or employee of Congress or an employee of a Member of Congress in connection with a covered federal action. Attach a continuation sheet for additional information if the space on the form is inadequate. Complete all items that apply for both the initial filing and material change report. Refer to the implementing guidance published by the Office of Management and Budget for additional information.

1. Identify the type of covered federal action for which lobbying activity is or has been secured to influence, the outcome of a covered federal action.
2. Identify the status of the covered federal action.
3. Identify the appropriate classification of this report. If this is a follow-up report caused by a material change to the information previously reported, enter the year and quarter in which the change occurred. Enter the date of the last, previously submitted report by this reporting entity for this covered federal action.
4. Enter the full name, address, city, state, and zip code of the reporting entity. Include Congressional District if known. Check the appropriate classification of the reporting entity that designates if it is or expects to be a prime or subaward recipient. Identify the tier of the subawardee, e.g., the first subawardee of the prime is the first tier. Subawards include but are not limited to: subcontracts, subgrants, and contract awards under grants.
5. If the organization filing the report in Item 4 checks "Subawardee" then enter the full name, address, city, state, and zip code of the prime federal recipient. Include Congressional District, if known.
6. Enter the name of the federal agency making the award or loan commitment. Include at least one organization level below agency name, if known. For example, Department of Transportation, United States Coast Guard.
7. Enter the federal program name or description for the covered federal action (item 1). If known, enter the full Catalog of Federal Domestic Assistance (CFDA) number for grants, cooperative agreements, loans and loan commitments.
8. Enter the most appropriate federal identifying number available for the federal action identification in item 1 (e.g., Request for Proposal (RFP) number, Invitation for Bid (IFB) number, grant announcement number, the contract grant, or loan award number, the application/proposal control number assigned by the federal agency). Include prefixes, e.g., "RFP-DE-90-001."
9. For a covered federal action where there has been an award or loan commitment by the Federal agency, enter the federal amount of the award/loan commitments for the prime entity identified in item 4 or 5.
10. Enter the full name, address, city, state, and zip code of the lobbying entity engaged by the reporting entity identified in Item 4 to influence the covered federal action.
11. Enter the full names of the individual(s) performing services and include full address if different from 10 (a). Enter Last Name, First Name and Middle Initial (MI).
12. Enter the amount of compensation paid or reasonably expected to be paid by the reporting entity (Item 4) to the lobbying entity (Item 10). Indicate whether the payment has been made (actual) or will be made (planned). Check all boxes that apply. If this is a material change report, enter the cumulative amount of payment made or planned to be made.
13. Check all boxes that apply. If payment is made through an in-kind contribution, specify the nature and value of the in-kind payment.
14. Check all boxes that apply. If other, specify nature.
15. Provide a specific and detailed description of the services that the lobbyist has performed or will be expected to perform and the date(s) of any services rendered. Include all preparatory and related activity not just time spent in actual contact with federal officials. Identify the federal officer(s) or employee(s) contacted or the officer(s) employee(s) or Member(s) of Congress that were contacted.
16. Check whether or not a continuation sheet(s) is attached.
17. The certifying official shall sign and date the form, and print his/her name title and telephone number.

Public reporting burden for this collection of information is estimated to average 30-minutes per response, including time for reviewing instruction, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the collection of information. Send comments regarding the burden estimate or any other aspect of this collection of information, including suggestions for reducing this burden, to the Office of Management and Budget, Paperwork Reduction Project (0348-0046), Washington, D.C. 20503. SF-LLL-Instructions Rev. 06-04

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## EQUAL EMPLOYMENT OPPORTUNITY CERTIFICATION

*The Bidder's Execution on the signature portion of this Bid shall also constitute an endorsement and execution of those certifications which are a part of this Bid.*

The Bidder/Proposed Subcontractor, \_\_\_\_\_, hereby certifies that it  has /  has not (check one) participated in a previous contract or subcontract subject to the equal opportunity clauses, as required by Executive Orders 10925, 11114, or 11246, and that, where required, it has filed with the Joint Reporting Committee, the Director of the Office of Federal Contract Compliance, a Federal Government contracting or administering agency, or the Committee on Equal Employment Opportunity all reports due under the applicable filing requirements.

BIDDER

\_\_\_\_\_  
Name: \_\_\_\_\_  
Title: \_\_\_\_\_  
Date: \_\_\_\_\_

NOTE: The Bidder must place a check mark before "has" or "has not" in one of the boxes provided.

The above Certification is required by the Equal Employment Opportunity Regulations of the Secretary of Labor (41 CFR 60-1.7(b)(1)), and must be submitted by Bidders and Proposed Subcontractors only in connection with contracts and subcontracts, which are subject to the equal opportunity clause. Contracts and subcontracts which are exempt from the equal opportunity clause are set forth in 41 CFR 60-1.5. (Generally only contracts or subcontracts of \$10,000 or under are exempt.)

Currently, Standard Form 100 (EEO-1) is the only report required by the Executive Orders or their implementing regulations.

Proposed prime contractors or subcontractors who have participated in a previous contract or subcontract subject to the Executive Orders and have not filed the required reports, should note that 41 CFR 60-1.7(b)(1) prevents the award of contracts and subcontracts unless such contractor submits a report covering the delinquent period of such other period specified by the Federal Highway Administration or by the Director, Office of Federal Contract Compliance, and U.S. Department of Labor.

## **PUBLIC CONTRACT CODE SECTION 10285.1 STATEMENT**

In conformance with Public Contract Code Section 10285.1 (Chapter 376, Stats. 1985), the Bidder hereby declares under penalty of perjury under the laws of the State of California that the Bidder  has /  has not (check one) been convicted, within the preceding three (3) years of any offenses referred to in that Section, including any charge of fraud, bribery, collusion, conspiracy, or any other act in violation of any State or Federal antitrust law in connection with the bidding upon, award of, or performance of any public works contract (as defined in Public Contract Code Section 1101) with any public entity (as defined in Public Contract Code Section 1100). The term "Bidder" is understood to include any partner, member, officer, director, responsible managing officer, or responsible managing employee thereof, as referred to in Section 10285.1.

NOTE: The Bidder must place a check mark before "has" or "has not" in one of the boxes provided.

The above statement is part of the Bid. Signing this Bid on the signature portion thereof shall also constitute signature of this Statement.

Bidders are cautioned that making a false certification may subject the certifier to criminal prosecution.

**PUBLIC CONTRACT CODE SECTION 10162 QUESTIONNAIRE**

In conformance with Public Contract Code Section 10162, the Bidder shall complete under penalty of perjury the following Questionnaire:

- 1. Has the Bidder or any officer or employee of Bidder, who has a proprietary interest in the Bidder, ever been disqualified, removed, or otherwise prevented from bidding on or completing a federal, state, or local government project because of a violation of law or a safety regulation? Please check one of the below:

YES       NO

If the answer is “yes”, explain the circumstance.

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**PUBLIC CONTRACT CODE SECTION 10232 STATEMENT**

In conformance with Public Contract Code Section 10232, the Bidder hereby states under penalty of perjury that no more than one final unappealable finding of contempt of court by a federal court has been issued against the Contractor within the immediately preceding two year period because of the Contractor’s failure to comply with an order of a federal court which orders the Contractor to comply with an order of the National Labor Relations Board.

Note: The above Questionnaire and Statement are part of the Proposal. Signing the Proposal on the signature portion thereof shall also constitute signature of this Questionnaire and Statement.

Bidders are cautioned that making a false certification may subject the certifier to criminal prosecution.

**DEBARMENT AND SUSPENSION CERTIFICATION**

The Bidder, under penalty of perjury, certifies that except as noted below, it or any other person associated therewith in the capacity of owner, partner, director, officer, or manager:

- 1. Is not currently under suspension, debarment, voluntary exclusion, or determination of ineligibility by any Federal agency;
- 2. Has not been suspended, debarred, voluntarily excluded, or determined ineligible by any Federal agency within the past 3 years;
- 3. Does not have a proposed debarment pending; and
- 4. Has not been indicted, convicted, or had a civil judgment rendered against it by a court of competent jurisdiction in any matter involving fraud or official misconduct within the past three (3) years.

If there are any exceptions to this Certification, state the exceptions, including as to whom it applies, the initiating agency, and dates of action.

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Exceptions will not necessarily result in denial of award but will be considered by City in determining Bidder responsibility.

Note: Providing false information may result in criminal prosecution or administrative sanctions.

The above Certification is part of the Proposal. Signing the Proposal on the signature portion thereof shall also constitute signature of this Certification.

**CONTRACTOR'S CERTIFICATE RELATING TO WORKER'S COMPENSATION**

I, THE UNDERSIGNED, HEREBY CERTIFY that at all times during the performance of any work under contract with the City of Santa Cruz (check one of the following) for the MURRAY STREET BRIDGE AT THE SMALL CRAFT HARBOR SEISMIC RETROFIT/BARRIER REPLACEMENT CITY PROJECT NO. C40932, STATE/FEDERAL PROJECT NO. STPLZ-5025(084).

- I have and will maintain in full force and effect Workers' Compensation Insurance, as required by Section 3700 of the Labor Code, for the performance of the Work. My Workers' Compensation insurance carrier and policy number are:

Insurance Carrier: \_\_\_\_\_

Policy Number: \_\_\_\_\_

- I have and will maintain in full force and effect and have attached hereto a Certificate of Consent to Self-Insure issued by the Director of Industrial Relations, as provided for by Section 3700 of the Labor Code, for the performance of the Work.

I declare under penalty of perjury that the foregoing is true and correct and executed on \_\_\_\_\_, 20\_\_ at \_\_\_\_\_, California.

CONTRACTOR

\_\_\_\_\_

Name: \_\_\_\_\_

Title: \_\_\_\_\_



## LAPM EXHIBIT 15-G

### EXHIBIT 15-G CONSTRUCTION CONTRACT DBE COMMITMENT

1. Local Agency: City of Santa Cruz      2. Contract DBE Goal: 21%
3. Project Description: Construct seismic retrofit, barrier replacement, widening and sanitary sewer force main.
4. Project Location: The Project is to be performed at the Murray Street Bridge over the Small Craft Harbor.
5. Bidder's Name: \_\_\_\_\_ 6. Prime Certified DBE:  7. Bid Amount: \_\_\_\_\_
8. Total Dollar Amount for **ALL** Subcontractors: \_\_\_\_\_ 9. Total Number of **ALL** Subcontractors: \_\_\_\_\_

10. Bid Item Number	11. Description of Work, Service, or Materials Supplied	12. DBE Certification Number	13. DBE Contact Information (Must be certified on the date bids are opened)	14. DBE Dollar Amount
<b>Local Agency to Complete this Section upon Execution of Award</b>				<b>15. TOTAL CLAIMED DBE PARTICIPATION</b>
21. Local Agency Contract Number: <u>C409321</u> 22. Federal-Aid Project Number: <u>STPLZ-5025(084)</u> 23. Bid Opening Date: <u>08/29/2024</u> 24. Contract Award Date: _____ 25. Award Amount: _____				
Local Agency certifies that all DBE certifications are valid and information on this form is complete and accurate.				\$
26. Local Agency Representative's Signature _____ 27. Date _____ 28. Local Agency Representative's Name _____ 29. Phone _____ 30. Local Agency Representative's Title _____				%
IMPORTANT: Identify all DBE firms being claimed for credit, regardless of tier. Names of the First Tier DBE Subcontractors and their respective item(s) of work listed above must be consistent, where applicable with the names and items of the work in the "Subcontractor List" submitted with your bid. Written confirmation of each listed DBE is required.				
16. Preparer's Signature _____ 17. Date _____ 18. Preparer's Name _____ 19. Phone _____ 20. Preparer's Title _____				

- DISTRIBUTION:** 1. Original – Local Agency  
 2. Copy – Caltrans District Local Assistance Engineer (DLAE). Failure to submit to DLAE within 30 days of contract execution may result in de-obligation of federal funds on contract.  
 3. Include additional copy with award package.

**ADA Notice:** For individuals with sensory disabilities, this document is available in alternate formats. For information call (916) 654-6410 or TDD (916) 654-3880 or write Records and Forms Management, 1120 N Street, MS-89, Sacramento, CA 95814.

## INSTRUCTIONS – CONSTRUCTION CONTRACT DBE COMMITMENT

### CONTRACTOR SECTION

1. **Local Agency** - Enter the name of the local agency that is administering the contract.
2. **Contract DBE Goal** - Enter the contract DBE goal percentage as it appears on the project advertisement.
3. **Project Location** - Enter the project location(s) as it appears on the project advertisement.
4. **Project Description** - Enter the project description as it appears on the project advertisement (Bridge Rehab, Seismic Rehab, Overlay, Widening, etc.).
5. **Bidder's Name** - Enter the contractor's firm name.
6. **Prime Certified DBE** - Check box if prime contractor is a certified DBE.
7. **Bid Amount** - Enter the total contract bid dollar amount for the prime contractor.
8. **Total Dollar Amount for ALL Subcontractors** – Enter the total dollar amount for all subcontracted contractors. SUM = (DBEs + all Non-DBEs). Do not include the prime contractor information in this count.
9. **Total number of ALL subcontractors** – Enter the total number of all subcontracted contractors. SUM = (DBEs + all Non-DBEs). Do not include the prime contractor information in this count.
10. **Bid Item Number** - Enter bid item number for work, services, or materials supplied to be provided.
11. **Description of Work, Services, or Materials Supplied** - Enter description of work, services, or materials to be provided. Indicate all work to be performed by DBEs including work performed by the prime contractor's own forces, if the prime is a DBE. If 100% of the item is not to be performed or furnished by the DBE, describe the exact portion to be performed or furnished by the DBE. See LAPM Chapter 9 to determine how to count the participation of DBE firms.
12. **DBE Certification Number** - Enter the DBE's Certification Identification Number. All DBEs must be certified on the date bids are opened.
13. **DBE Contact Information** - Enter the name, address, and phone number of all DBE subcontracted contractors. Also, enter the prime contractor's name and phone number, if the prime is a DBE.
14. **DBE Dollar Amount** - Enter the subcontracted dollar amount of the work to be performed or service to be provided. Include the prime contractor if the prime is a DBE. See LAPM Chapter 9 for how to count full/partial participation.
15. **Total Claimed DBE Participation** - \$: Enter the total dollar amounts entered in the "DBE Dollar Amount" column. %: Enter the total DBE participation claimed ("Total Claimed DBE Participation Dollars" divided by item "Bid Amount"). If the total % claimed is less than item "Contract DBE Goal," an adequately documented Good Faith Effort (GFE) is required (see Exhibit 15-H DBE Information - Good Faith Efforts of the LAPM).
16. **Preparer's Signature** - The person completing the DBE commitment form on behalf of the contractor's firm must sign their name.
17. **Date** - Enter the date the DBE commitment form is signed by the contractor's preparer.
18. **Preparer's Name** - Enter the name of the person preparing and signing the contractor's DBE commitment form.
19. **Phone** - Enter the area code and phone number of the person signing the contractor's DBE commitment form.
20. **Preparer's Title** - Enter the position/title of the person signing the contractor's DBE commitment form.

### LOCAL AGENCY SECTION

21. **Local Agency Contract Number** - Enter the Local Agency contract number or identifier.
22. **Federal-Aid Project Number** - Enter the Federal-Aid Project Number(s).
23. **Bid Opening Date** - Enter the date contract bids were opened.
24. **Contract Award Date** - Enter the date the contract was executed.
25. **Award Amount** – Enter the contract award amount as stated in the executed contract.
26. **Local Agency Representative's Signature** - The person completing this section of the form for the Local Agency must sign their name to certify that the information in this and the Contractor Section of this form is complete and accurate.
27. **Date** - Enter the date the DBE commitment form is signed by the Local Agency Representative.
28. **Local Agency Representative's Name** - Enter the name of the Local Agency Representative certifying the contractor's DBE commitment form.
29. **Phone** - Enter the area code and phone number of the person signing the contractor's DBE commitment form.
30. **Local Agency Representative Title** - Enter the position/title of the Local Agency Representative certifying the contractor's DBE commitment form.

LAPM EXHIBIT 15-H

EXHIBIT 15-H: PROPOSER/CONTRACTOR GOOD FAITH EFFORTS

Federal-aid Project No(s). STPLZ-5025(084) Bid Opening Date 08/29/2024 CON

The City of Santa Cruz established a Disadvantaged Business Enterprise (DBE) goal of 21 % for this contract. The information provided herein shows the required good faith efforts to meet or exceed the DBE contract goal.

Proposers or bidders submit the following information to document their good faith efforts within five (5) calendar days from cost proposal due date or bid opening. Proposers and bidders are recommended to submit the following information even if the Exhibit 10-O1: Consultant Proposal DBE Commitments or Exhibit 15-G: Construction Contract DBE Commitment indicate that the proposer or bidder has met the DBE goal. This form protects the proposer’s or bidder’s eligibility for award of the contract if the administering agency determines that the bidder failed to meet the goal for various reasons, e.g., a DBE firm was not certified at bid opening, or the bidder made a mathematical error.

The following items are listed in the Section entitled “Submission of DBE Commitment” of the Special Provisions, **please attach additional sheets as needed:**

- A. The names and dates of each publication in which a request for DBE participation for this project was placed by the bidder (please attach copies of advertisements or proofs of publication):

Table with 2 columns: Publications, Dates of Advertisement. Includes horizontal lines for data entry.

- B. The names and dates of written notices sent to certified DBEs soliciting bids for this project and the dates and methods used for following up initial solicitations to determine with certainty whether the DBEs were interested (please attach copies of solicitations, telephone records, fax confirmations, etc.):

Table with 3 columns: Names of DBEs Solicited, Date of Initial Solicitation, Follow Up Methods and Dates. Includes horizontal lines for data entry.

C. The items of work made available to DBE firms including those unbundled contract work items into economically feasible units to facilitate DBE participation. It is the bidder's responsibility to demonstrate that sufficient work to facilitate DBE participation in order to meet or exceed the DBE contract goal.

Items of Work	Proposer or Bidder Normally Performs Item (Y/N)	Breakdown of Items	Amount (\$)	Percentage Of Contract
				0.00%
				0.00%
				0.00%
				0.00%

D. The names, addresses and phone numbers of rejected DBE firms, the reasons for the bidder's rejection of the DBEs, the firms selected for that work (please attach copies of quotes from the firms involved), and the price difference for each DBE if the selected firm is not a DBE:

Names, addresses and phone numbers of rejected DBEs and the reasons for the bidder's rejection of the DBEs:

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Names, addresses and phone numbers of firms selected for the work above:

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E. Efforts (e.g. in advertisements and solicitations) made to assist interested DBEs in obtaining information related to the plans, specifications and requirements for the work which was provided to DBEs:

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## LAPM EXHIBIT 12-B BIDDER'S LIST

In accordance with 49 CFR 26.11 the bidder shall list itself and all subcontractors (both DBE and non-DBE) who provided a quote or bid on the project regardless of whether the firm was selected by the bidder to participate as a subcontractor.

Firm Name/ Address/ City, State, ZIP	Age of Firm (years)	Annual Gross Receipts	Certified DBE?
<i>Prime Contractor Name</i>		<input type="checkbox"/> < \$1 million	<input checked="" type="checkbox"/> YES
<i>Address</i>		<input type="checkbox"/> < \$5 million	<input type="checkbox"/> NO
<i>City State ZIP</i>		<input type="checkbox"/> < \$10 million	<i>If YES list DBE ID #:</i>
		<input type="checkbox"/> < \$15 million	
		<input type="checkbox"/> > \$15 million	
<i>Subcontractor Name</i>		<input type="checkbox"/> < \$1 million	<input type="checkbox"/> YES
<i>Address</i>		<input type="checkbox"/> < \$5 million	<input type="checkbox"/> NO
<i>City State ZIP</i>		<input type="checkbox"/> < \$10 million	<i>If YES list DBE ID #:</i>
		<input type="checkbox"/> < \$15 million	
		<input type="checkbox"/> > \$15 million	
<i>Subcontractor Name</i>		<input type="checkbox"/> < \$1 million	<input type="checkbox"/> YES
<i>Address</i>		<input type="checkbox"/> < \$5 million	<input type="checkbox"/> NO
<i>City State ZIP</i>		<input type="checkbox"/> < \$10 million	<i>If YES list DBE ID #:</i>
		<input type="checkbox"/> < \$15 million	
		<input type="checkbox"/> > \$15 million	
<i>Subcontractor Name</i>		<input type="checkbox"/> < \$1 million	<input type="checkbox"/> YES
<i>Address</i>		<input type="checkbox"/> < \$5 million	<input type="checkbox"/> NO
<i>City State ZIP</i>		<input type="checkbox"/> < \$10 million	<i>If YES list DBE ID #:</i>
		<input type="checkbox"/> < \$15 million	
		<input type="checkbox"/> > \$15 million	
<i>Subcontractor Name</i>		<input type="checkbox"/> < \$1 million	<input type="checkbox"/> YES
<i>Address</i>		<input type="checkbox"/> < \$5 million	<input type="checkbox"/> NO
<i>City State ZIP</i>		<input type="checkbox"/> < \$10 million	<i>If YES list DBE ID #:</i>
		<input type="checkbox"/> < \$15 million	
		<input type="checkbox"/> > \$15 million	
<i>Subcontractor Name</i>		<input type="checkbox"/> < \$1 million	<input type="checkbox"/> YES
<i>Address</i>		<input type="checkbox"/> < \$5 million	<input type="checkbox"/> NO
<i>City State ZIP</i>		<input type="checkbox"/> < \$10 million	<i>If YES list DBE ID #:</i>
		<input type="checkbox"/> < \$15 million	
		<input type="checkbox"/> > \$15 million	

**LAPM EXHIBIT 12-B**

<i>Subcontractor Name</i>		<input type="checkbox"/> < \$1 million	<input type="checkbox"/> YES
<i>Address</i>		<input type="checkbox"/> < \$5 million	<input type="checkbox"/> NO
<i>City State ZIP</i>		<input type="checkbox"/> < \$10 million	<i>If YES list DBE ID #:</i>
		<input type="checkbox"/> < \$15 million	
		<input type="checkbox"/> > \$15 million	
<i>Subcontractor Name</i>		<input type="checkbox"/> < \$1 million	<input type="checkbox"/> YES
<i>Address</i>		<input type="checkbox"/> < \$5 million	<input type="checkbox"/> NO
<i>City State ZIP</i>		<input type="checkbox"/> < \$10 million	<i>If YES list DBE ID #:</i>
		<input type="checkbox"/> < \$15 million	
		<input type="checkbox"/> > \$15 million	
<i>Subcontractor Name</i>		<input type="checkbox"/> < \$1 million	<input type="checkbox"/> YES
<i>Address</i>		<input type="checkbox"/> < \$5 million	<input type="checkbox"/> NO
<i>City State ZIP</i>		<input type="checkbox"/> < \$10 million	<i>If YES list DBE ID #:</i>
		<input type="checkbox"/> < \$15 million	
		<input type="checkbox"/> > \$15 million	
<i>Subcontractor Name</i>		<input type="checkbox"/> < \$1 million	<input type="checkbox"/> YES
<i>Address</i>		<input type="checkbox"/> < \$5 million	<input type="checkbox"/> NO
<i>City State ZIP</i>		<input type="checkbox"/> < \$10 million	<i>If YES list DBE ID #:</i>
		<input type="checkbox"/> < \$15 million	
		<input type="checkbox"/> > \$15 million	
<i>Subcontractor Name</i>		<input type="checkbox"/> < \$1 million	<input type="checkbox"/> YES
<i>Address</i>		<input type="checkbox"/> < \$5 million	<input type="checkbox"/> NO
<i>City State ZIP</i>		<input type="checkbox"/> < \$10 million	<i>If YES list DBE ID #:</i>
		<input type="checkbox"/> < \$15 million	
		<input type="checkbox"/> > \$15 million	
<i>Subcontractor Name</i>		<input type="checkbox"/> < \$1 million	<input type="checkbox"/> YES
<i>Address</i>		<input type="checkbox"/> < \$5 million	<input type="checkbox"/> NO
<i>City State ZIP</i>		<input type="checkbox"/> < \$10 million	<i>If YES list DBE ID #:</i>
		<input type="checkbox"/> < \$15 million	
		<input type="checkbox"/> > \$15 million	





## AGREEMENT

THIS AGREEMENT, made and entered into this \_\_\_\_\_ day of \_\_\_\_\_, 20\_\_ (“Effective Date”), by and between the CITY OF SANTA CRUZ, a municipal corporation, hereinafter called “City,” and \_\_\_\_\_, hereinafter called “Contractor;”

WITNESSETH, that the parties hereto do mutually agree as follows:

### ARTICLE I

That for and in consideration of the covenants and agreements herein contained and the payments at the prices stated in the bid proposal attached hereto, and by this reference made a part hereof, the Contractor hereby covenants and agrees to furnish any and all required supervision, labor, equipment, material, services, and transportation, as set forth in the Contract Documents as hereinafter defined, and will bear any and all other expense necessary or incidental to the performance of certain work hereinafter specified, and to build, construct, reconstruct, pave or repave and complete improvements for:

MURRAY STREET BRIDGE AT THE SMALL CRAFT HARBOR  
SEISMIC RETROFIT/BARRIER REPLACEMENT CITY PROJECT NO. C409321  
STATE/FEDERAL PROJECT NO. STPLZ-5025(084)

(the “Project”) in strict conformity and compliance with the Contract Documents, and to do everything required by this Agreement, and by said Contract Documents as hereinafter defined (the “Work”).

### ARTICLE II

It is expressly agreed and understood by each and every party to this Agreement that the following documents, are hereby incorporated and made a part of this Agreement (hereinafter the “Contract Documents”):

1. Permits and other government approvals
2. All applicable Laws and Regulations
3. Duly issued Agreement modifications, and allowance authorization(s) signed by the City, in chronological order by effective date of each.
4. This Agreement, including:
  - a. Exhibit A – Contractor’s Bid Proposal, including all attachments
5. Payment Bond
6. Faithful Performance Bond
7. Insurance Certificates, including Contractor’s Certificate Relating to Worker’s Compensation
8. Invitation For Bids for MURRAY STREET BRIDGE AT THE SMALL CRAFT HARBOR SEISMIC RETROFIT/BARRIER REPLACEMENT CITY PROJECT NO. C409321 STATE/FEDERAL PROJECT NO. STPLZ-5025(084), including the Project Specifications, drawings, and plans, all Exhibits, and all Addenda in the reverse order of date of issuance
9. General Provisions
10. Special Provisions
11. Project Plans
12. General Conditions
13. Revised Standard Specifications
14. Standard Specifications, including the City Specifications and all applicable State Specifications and/or Drawings

MURRAY STREET BRIDGE AT THE SMALL CRAFT HARBOR, SEISMIC RETROFIT/BARRIER REPLACEMENT, CITY PROJECT NO. C409321, FEDERAL NO. PROJECT NO. STPLZ 5025(084)

15. Standard Plans
16. Bidding Documents
17. Supplemental Project Information

The parties to this Agreement do hereby expressly acknowledge that they have read, understand, and promise to comply with each and every provision of Contract Documents. There are no Contract Documents other than those indicated above. In the event inconsistencies, conflicts, or ambiguities between and among the Contract Documents are discovered, the parties shall attempt to resolve any ambiguity, conflict, or inconsistency informally, recognizing that the Contract Documents shall take precedence in the order in which they are listed above. Inclusion of an order of precedence herein does not in any way negate or reduce Contractor's obligation to report conflicts, discrepancies, apparent omissions, and similar matters to the City.

### ARTICLE III

It is expressly agreed and understood by the Contractor that the "Standard Specifications" consists of the documents on file at the Public Works Department of the City of Santa Cruz, entitled:

1. City of Santa Cruz Department of Public Works, Department of Parks and Recreation, and Water Department 2002 Standard Specifications ("City Specifications");
2. Standard Specifications of the State of California, Department of Transportation, dated 2018 ("State Specifications"); and
3. State of California /Caltrans: California Manual on Uniform Traffic Control Devices (CA MUTCD) (2014 Revision 7).
4. County of Santa Cruz Design Criteria December 2022 Edition

Where conflicts arise between the City's and County Sanitation District Standard Specifications and the State Specifications, the State's Standard Specifications shall control and apply. Where conflicts arise between the City's and County Design Criteria, the City's Standard Specifications shall control and apply.

### ARTICLE IV

Contractor shall conform to all laws and regulations of the United States and the State of California, as well as laws of Santa Cruz, as may be applicable to the Project. In addition, the City Council of the City of Santa Cruz endorses the MacBride Principles and the Peace Charter and encourages all companies doing business in Northern Ireland to abide by the MacBride Principles.

### ARTICLE V

The City hereby contracts to pay said Contractor the prices provided for in the Bid Proposal in the manner, to the extent, and at the times set forth in the Contract Documents.

### ARTICLE VI

It is agreed by the parties hereto that the acceptance of the Contractor's performance will be made only by an affirmative action of the City of Santa Cruz City Council in session, evidenced by resolution, and upon the filing by the Contractor of a Release of all Claims of every nature on account of work done under this Agreement, together with an affidavit that all claims have been fully paid. The acceptance by the Contractor of said final payment shall constitute a waiver of all claims against the City arising out of or in connection with this Agreement.

MURRAY STREET BRIDGE AT THE SMALL CRAFT HARBOR, SEISMIC RETROFIT/BARRIER REPLACEMENT, CITY PROJECT NO. C409321, FEDERAL NO. PROJECT NO. STPLZ 5025(084)

## ARTICLE VII

To the fullest extent permitted by law, Contractor shall defend, indemnify, and hold harmless the City and its respective officials, officers, directors, partners, employees, consultants, but not limited to its design engineers and authorized agents (“Indemnitees”) from and against any and all claims, suits, actions, judgments, demands, liabilities, losses, damages, expenses, including attorneys’ fees and costs of litigation (collectively, “Losses”), arising from personal or bodily injuries, death, property damage, or otherwise in any way related to, connected with, or resulting from the obligations or performance of the Work under this Agreement by Contractor, subcontractors, and their respective officers, directors, employees, agents, or other third parties directly or indirectly employed by or under the authority or control of Contractor or subcontractors. This provision shall not be deemed to require the Contractor to indemnify or hold harmless an Indemnitee for any Loss proximately caused by the sole or active negligence or willful misconduct of the Indemnitee, as determined by a court or other adjudicatory body of competent jurisdiction.

Contractor acknowledges and agrees that Contractor’s obligation to defend the City and the other Indemnitees arises at the time such Losses is tendered to Contractor by the Indemnitees and continues at all times until finally resolved, and/or decided by an adjudicatory body or a court of competent jurisdiction. This provision shall survive the termination of the Agreement or the completion of the Work.

This indemnification clause supersedes any other indemnification clauses contained in any other Contract Documents.

## ARTICLE VIII

Contractor shall be responsible for complying with the provisions of California Public Contract Code Section 7104 regarding trenching and excavations that extend deeper than four (4) feet below the surface. No change order issued pursuant to California Public Contract Code Section 7104 shall provide for any increase in compensation that would exceed the recovery allowed pursuant to the “Claims” section of the General Requirements.

## ARTICLE IX General Terms

1. Complete Agreement. This Agreement, along with the terms and conditions in the Contract Documents and any attachments, is the full and complete integration of the Parties’ agreement with respect to the matters addressed herein, and that this Agreement supersedes any previous written or oral agreements between the Parties with respect to the matters addressed herein. Unless otherwise stated, to the extent there is any conflict between this Agreement and any other agreement (written or oral), the terms of this Agreement shall control.
2. Severability. The unenforceability, invalidity or illegality of any provision(s) of this Agreement shall not render the other provisions unenforceable, invalid or illegal.
3. Waiver. Waiver by any party of any portion of this Agreement shall not constitute a waiver of the same or any other portion hereof.
4. Governing Law. This Agreement shall be governed by and interpreted in accordance with California law.

5. Contract Interpretation. Each party acknowledges that it has reviewed this Agreement and that the normal rule of construction to the effect that any ambiguities are to be resolved against the drafting party shall not be employed in the interpretation of this Agreement.
6. Counterparts. The Parties may execute this Agreement in two or more counterparts, which shall, in the aggregate, be deemed an original but all of which, together, shall constitute one and the same instrument. A scanned, electronic, facsimile or other copy of a party's signature shall be accepted and valid as an original.
7. Warranty of Authority. The signatories to this Agreement warrant and represent that each is authorized to execute this Agreement and that their respective signatures serve to legally obligate their respective representatives, agents, successors and assigns to comply with the provisions of this Agreement.

*Signature Page to Follow*

IN WITNESS WHEREOF, this Agreement is executed by the City Manager of the City of Santa Cruz, under and pursuant to a resolution of the City Council authorizing such execution, and the Contractor has affixed his/her signature hereto the day and year first hereinabove written.

**Approved as to Form by:**

\_\_\_\_\_ Date: \_\_\_\_\_  
Anthony P. Condotti, City Attorney

**For Contractor Name:**

Signature: \_\_\_\_\_ Date: \_\_\_\_\_  
(Name, Title)

**For CITY OF SANTA CRUZ, a municipal corporation**

\_\_\_\_\_ Date: \_\_\_\_\_  
Matt Huffaker, City Manager

## PAYMENT BOND

WHEREAS, as the City Council of the City of Santa Cruz, a municipal corporation in the County of Santa Cruz, State of California (the "City"), has awarded to \_\_\_\_\_ hereinafter designated as the "Principal", a contract for constructing the work or improvement described in the contract documents entitled: MURRAY STREET BRIDGE AT THE SMALL CRAFT HARBOR SEISMIC RETROFIT/BARRIER REPLACEMENT, CITY PROJECT NO. C409321, STATE/FEDERAL PROJECT NO. STPLZ-5025(084), adopted by the City Council of the City on June 14, 2022; and

WHEREAS, said Principal is required under the terms of said contract to furnish a Payment Bond, the surety of this bond will pay the same to the extent hereinafter set forth; and

WHEREAS, the said Principal is about to enter into the annexed contract with the City to complete the work or improvement referred to above for the City, all as more particularly and in detail shown upon the Contract Documents filed in the Office of the City Clerk of the City:

NOW, THEREFORE, we, the Principal, and \_\_\_\_\_, a corporation organized and existing under and by virtue of the laws of the State of \_\_\_\_\_ as "Surety", are held and firmly bound unto the City of Santa Cruz in the sum of \_\_\_\_\_ dollars (\$ \_\_\_\_\_), such sum being not less than one hundred percent (100%) of the estimated contract cost of the work, lawful money of the United States of America, to be paid to the City of Santa Cruz, for payment of which sum, well and truly to be made, we hereby bind ourselves, our heirs, administrators, executors, successors and assign jointly and severally.

THE CONDITION OF THIS OBLIGATION IS SUCH, that if said Principal or its heirs, executors, administrators, successors or assigns, shall fail to pay for any materials, provisions, vendor supplies, or equipment as provided in the contract documents, upon, for, or about the performance of the work contracted to be done, or for any work or waiver thereon of any kind, or for amounts due under the Unemployment Insurance Code with respect to work or labor performed by any such claimant, or fails to pay any of the persons authorized under Civil Code Section 9100 to assert a claim against a payment bond, or fails to pay for any amounts required to be deducted, withheld, and paid over to the Franchise Tax Board for the wages of employees of the Principal or his/her subcontractor pursuant to Section 18806 of the Revenue and Taxation Code, or fails to pay for any amounts required to be deducted, withheld, and paid over to the Employment Development Department from the wages of employees of the principal and all subcontractors with respect to such work and labor that the surety or sureties will pay for the same, in an amount not exceeding the sum specified in this bond, and also, in case suit is brought upon the bond, will pay, in addition to the face amount hereof, a reasonable attorney's fee, to be fixed by the Court.

The condition of this obligation is such that its terms inure to the benefit of any of the persons and entities authorized in Civil Code Section 9100 to assert a claim against a payment bond so as to give a right of action to such persons or entities or their assigns in any suit brought upon or action to enforce liability on the bond.

The Surety, for value received, hereby stipulates and agrees that no change, extension of time, alteration, or addition to the terms of the contract or to the work to be performed thereunder shall in any manner affect its obligation upon this bond, and it does hereby explicitly waive notice of any such change, extension of time, alteration or addition to the terms of the contract or to the work to be performed thereunder, and further explicitly hereby waives its rights under Civil Code Section

MURRAY STREET BRIDGE AT THE SMALL CRAFT HARBOR, SEISMIC RETROFIT/BARRIER REPLACEMENT, CITY PROJECT NO. C409321, FEDERAL NO. PROJECT NO. STPLZ 5025(084)

2819.

IN WITNESS WHEREOF, the above parties have executed this instrument under their seals this \_\_\_\_\_ day of \_\_\_\_\_, 20\_\_\_\_, and duly signed by its undersigned representative, pursuant to the authority of its governing body.

**PRINCIPAL:**

Firm name: \_\_\_\_\_

Printed name: \_\_\_\_\_

Signature: \_\_\_\_\_ Date: \_\_\_\_\_

Title: \_\_\_\_\_

**SURETY:**

Firm name: \_\_\_\_\_

Printed name: \_\_\_\_\_

Signature: \_\_\_\_\_ Date: \_\_\_\_\_

Title: \_\_\_\_\_

I hereby approve the form of the within bond.

\_\_\_\_\_  
City Attorney

\_\_\_\_\_  
Date

(Note: Signatures of those executing for the surety as an Attorney-in-Fact must include a Notary Acknowledgement.)

## PERFORMANCE BOND

WHEREAS, the City Council of the City of Santa Cruz, a municipal corporation in the County of Santa Cruz, State of California (the "City"), and \_\_\_\_\_ hereinafter designated as "Principal" have entered into an agreement whereby Principal agrees to install and complete the work or improvement described in the contract documents entitled: MURRAY STREET BRIDGE AT THE SMALL CRAFT HARBOR SEISMIC RETROFIT/BARRIER REPLACEMENT CITY PROJECT NO. C409321 STATE/FEDERAL PROJECT NO. STPLZ-5025(084), adopted by the City Council of the City on June 14, 2022; and

WHEREAS, said Principal is about to enter into the annexed agreement with the City as is required to furnish security for the faithful performance of said Agreement.

NOW, THEREFORE, we, the Principal, and \_\_\_\_\_, a corporation organized and existing under and by virtue of the laws of the State of \_\_\_\_\_, as "Surety", are held and firmly bound unto the City, in the sum of \_\_\_\_\_ (\$\_\_\_\_\_), such sum being not less than one hundred percent (100%) of the estimated contract cost of the work, lawful money of the United States of America, to be paid to the City, for payment of which sum, well and truly to be paid, we hereby jointly and severally bind ourselves, our heirs, administrators, executors, successors and assigns, by these presents;

NOW, THEREFORE, THE CONDITION OF THIS OBLIGATION IS SUCH, that if the above bound Principal, its heirs, executors, administrators, successors, or assigns will in all things abide by and well and truly keep and perform the covenants, conditions and provisions in the said agreement and any alteration thereof made as therein provided, on his or her part, to be kept and performed at the time and in the manner therein specified, and in all respects according to the true intent and meaning, and will indemnify and save harmless the City, its officers and agents, and employees, as therein stipulated, then this obligation will become null and void, otherwise it will be and remain in full force and effect.

As a part of the obligation secured hereby and in addition to the face amount specified therefore, there will be included costs and reasonable expenses and fees, including reasonable attorneys' fees, incurred by the City.

As a condition precedent to the satisfactory completion of the said contract, an obligation in the amount of \_\_\_\_\_ (\$\_\_\_\_\_), being not less than ten percent (10%) of the estimated contract cost, will remain in force for a period of one (1) year after the official acceptance of said work, during which time if the Principal, its heirs, executors, administrators, successors or assigns will fail to make full, complete and satisfactory repairs and replacements or totally protect the City of Santa Cruz from loss or damage made evident during said period of one (1) year from the date of official acceptance of said work and resulting from or caused by defective materials or faulty workmanship in the prosecution of the work done, the above obligation in the sum of (\$ \_\_\_\_\_), will remain in full force and effect, otherwise the obligation will be discharged. However, notwithstanding any other provisions of this paragraph, the obligation for the surety hereunder will continue so long as any obligation of the Principal remains.

The Surety, for value received, hereby stipulates and agrees that no change, extension of time, alteration, or addition to the terms of the contract or to the work to be performed thereunder or the specifications will in any manner affect this obligation upon this bond, and it does hereby explicitly waive notice of any such changes, extensions of time, alterations, or additions to the terms of the

MURRAY STREET BRIDGE AT THE SMALL CRAFT HARBOR, SEISMIC RETROFIT/BARRIER REPLACEMENT, CITY PROJECT NO. C409321, FEDERAL NO. PROJECT NO. STPLZ 5025(084)



contract or to the work to be performed thereunder, or to the specifications, and it further explicitly hereby waives its rights under California Civil Code § 2819.

IN WITNESS WHEREOF, the parties have executed this instrument under their seals this \_\_\_\_\_ day of \_\_\_\_\_, 20\_\_\_\_, and duly signed by its undersigned representative, pursuant to the authority of its governing body.

**PRINCIPAL:**

Firm name: \_\_\_\_\_

Printed name: \_\_\_\_\_

Signature: \_\_\_\_\_ Date: \_\_\_\_\_

Title: \_\_\_\_\_

**SURETY:**

Firm name: \_\_\_\_\_

Printed name: \_\_\_\_\_

Signature: \_\_\_\_\_ Date: \_\_\_\_\_

Title: \_\_\_\_\_

I hereby approve the form of the within bond.

\_\_\_\_\_  
City Attorney

\_\_\_\_\_  
Date

(Note: Signatures of those executing for the surety as an Attorney-in-Fact must include a Notary Acknowledgement.)

**REQUIRED CONTRACT PROVISIONS  
FEDERAL-AID CONSTRUCTION CONTRACTS**

- I. General
- II. Nondiscrimination
- III. Non-segregated Facilities
- IV. Davis-Bacon and Related Act Provisions
- V. Contract Work Hours and Safety Standards Act Provisions
- VI. Subletting or Assigning the Contract
- VII. Safety: Accident Prevention
- VIII. False Statements Concerning Highway Projects
- IX. Implementation of Clean Air Act and Federal Water Pollution Control Act
- X. Certification Regarding Debarment, Suspension, Ineligibility and Voluntary Exclusion
- XI. Certification Regarding Use of Contract Funds for Lobbying
- XII. Use of United States-Flag Vessels:

**ATTACHMENTS**

A. Employment and Materials Preference for Appalachian Development Highway System or Appalachian Local Access Road Contracts (included in Appalachian contracts only)

**I. GENERAL**

1. Form FHWA-1273 must be physically incorporated in each construction contract funded under title 23, United States Code, as required in 23 CFR 633.102(b) (excluding emergency contracts solely intended for debris removal). The contractor (or subcontractor) must insert this form in each subcontract and further require its inclusion in all lower tier subcontracts (excluding purchase orders, rental agreements and other agreements for supplies or services). 23 CFR 633.102(e).

The applicable requirements of Form FHWA-1273 are incorporated by reference for work done under any purchase order, rental agreement or agreement for other services. The prime contractor shall be responsible for compliance by any subcontractor, lower-tier subcontractor or service provider. 23 CFR 633.102(e).

Form FHWA-1273 must be included in all Federal-aid design-build contracts, in all subcontracts and in lower tier subcontracts (excluding subcontracts for design services, purchase orders, rental agreements and other agreements for supplies or services) in accordance with 23 CFR 633.102. The design-builder shall be responsible for compliance by any subcontractor, lower-tier subcontractor or service provider.

Contracting agencies may reference Form FHWA-1273 in solicitation-for-bids or request-for-proposals documents, however, the Form FHWA-1273 must be physically incorporated (not referenced) in all contracts, subcontracts and lower-tier subcontracts (excluding purchase orders, rental agreements and other agreements for supplies or services related to a construction contract). 23 CFR 633.102(b).

2. Subject to the applicability criteria noted in the following sections, these contract provisions shall apply to all work

performed on the contract by the contractor's own organization and with the assistance of workers under the contractor's immediate superintendence and to all work performed on the contract by piecework, station work, or by subcontract. 23 CFR 633.102(d).

3. A breach of any of the stipulations contained in these Required Contract Provisions may be sufficient grounds for withholding of progress payments, withholding of final payment, termination of the contract, suspension / debarment or any other action determined to be appropriate by the contracting agency and FHWA.

4. Selection of Labor: During the performance of this contract, the contractor shall not use convict labor for any purpose within the limits of a construction project on a Federal-aid highway unless it is labor performed by convicts who are on parole, supervised release, or probation. 23 U.S.C. 114(b). The term Federal-aid highway does not include roadways functionally classified as local roads or rural minor collectors. 23 U.S.C. 101(a).

**II. NONDISCRIMINATION (23 CFR 230.107(a); 23 CFR Part 230, Subpart A, Appendix A; EO 11246)**

The provisions of this section related to 23 CFR Part 230, Subpart A, Appendix A are applicable to all Federal-aid construction contracts and to all related construction subcontracts of \$10,000 or more. The provisions of 23 CFR Part 230 are not applicable to material supply, engineering, or architectural service contracts.

In addition, the contractor and all subcontractors must comply with the following policies: Executive Order 11246, 41 CFR Part 60, 29 CFR Parts 1625-1627, 23 U.S.C. 140, Section 504 of the Rehabilitation Act of 1973, as amended (29 U.S.C. 794), Title VI of the Civil Rights Act of 1964, as amended (42 U.S.C. 2000d et seq.), and related regulations including 49 CFR Parts 21, 26, and 27; and 23 CFR Parts 200, 230, and 633.

The contractor and all subcontractors must comply with: the requirements of the Equal Opportunity Clause in 41 CFR 60-1.4(b) and, for all construction contracts exceeding \$10,000, the Standard Federal Equal Employment Opportunity Construction Contract Specifications in 41 CFR 60-4.3.

Note: The U.S. Department of Labor has exclusive authority to determine compliance with Executive Order 11246 and the policies of the Secretary of Labor including 41 CFR Part 60, and 29 CFR Parts 1625-1627. The contracting agency and the FHWA have the authority and the responsibility to ensure compliance with 23 U.S.C. 140, Section 504 of the Rehabilitation Act of 1973, as amended (29 U.S.C. 794), and Title VI of the Civil Rights Act of 1964, as amended (42 U.S.C. 2000d et seq.), and related regulations including 49 CFR Parts 21, 26, and 27; and 23 CFR Parts 200, 230, and 633.

The following provision is adopted from 23 CFR Part 230, Subpart A, Appendix A, with appropriate revisions to conform to the U.S. Department of Labor (US DOL) and FHWA requirements.

**1. Equal Employment Opportunity:** Equal Employment Opportunity (EEO) requirements not to discriminate and to take affirmative action to assure equal opportunity as set forth under laws, executive orders, rules, regulations (see 28 CFR Part 35, 29 CFR Part 1630, 29 CFR Parts 1625-1627, 41 CFR Part 60 and 49 CFR Part 27) and orders of the Secretary of Labor as modified by the provisions prescribed herein, and imposed pursuant to 23 U.S.C. 140, shall constitute the EEO and specific affirmative action standards for the contractor's project activities under this contract. The provisions of the Americans with Disabilities Act of 1990 (42 U.S.C. 12101 et seq.) set forth under 28 CFR Part 35 and 29 CFR Part 1630 are incorporated by reference in this contract. In the execution of this contract, the contractor agrees to comply with the following minimum specific requirement activities of EEO:

a. The contractor will work with the contracting agency and the Federal Government to ensure that it has made every good faith effort to provide equal opportunity with respect to all of its terms and conditions of employment and in their review of activities under the contract. 23 CFR 230.409 (g)(4) & (5).

b. The contractor will accept as its operating policy the following statement:

"It is the policy of this Company to assure that applicants are employed, and that employees are treated during employment, without regard to their race, religion, sex, sexual orientation, gender identity, color, national origin, age or disability. Such action shall include: employment, upgrading, demotion, or transfer; recruitment or recruitment advertising; layoff or termination; rates of pay or other forms of compensation; and selection for training, including apprenticeship, pre-apprenticeship, and/or on-the-job training."

**2. EEO Officer:** The contractor will designate and make known to the contracting officers an EEO Officer who will have the responsibility for and must be capable of effectively administering and promoting an active EEO program and who must be assigned adequate authority and responsibility to do so.

**3. Dissemination of Policy:** All members of the contractor's staff who are authorized to hire, supervise, promote, and discharge employees, or who recommend such action or are substantially involved in such action, will be made fully cognizant of and will implement the contractor's EEO policy and contractual responsibilities to provide EEO in each grade and classification of employment. To ensure that the above agreement will be met, the following actions will be taken as a minimum:

a. Periodic meetings of supervisory and personnel office employees will be conducted before the start of work and then not less often than once every six months, at which time the contractor's EEO policy and its implementation will be reviewed and explained. The meetings will be conducted by the EEO Officer or other knowledgeable company official.

b. All new supervisory or personnel office employees will be given a thorough indoctrination by the EEO Officer, covering all major aspects of the contractor's EEO obligations within thirty days following their reporting for duty with the contractor.

c. All personnel who are engaged in direct recruitment for the project will be instructed by the EEO Officer in the contractor's procedures for locating and hiring minorities and women.

d. Notices and posters setting forth the contractor's EEO policy will be placed in areas readily accessible to employees, applicants for employment and potential employees.

e. The contractor's EEO policy and the procedures to implement such policy will be brought to the attention of employees by means of meetings, employee handbooks, or other appropriate means.

**4. Recruitment:** When advertising for employees, the contractor will include in all advertisements for employees the notation: "An Equal Opportunity Employer." All such advertisements will be placed in publications having a large circulation among minorities and women in the area from which the project work force would normally be derived.

a. The contractor will, unless precluded by a valid bargaining agreement, conduct systematic and direct recruitment through public and private employee referral sources likely to yield qualified minorities and women. To meet this requirement, the contractor will identify sources of potential minority group employees and establish with such identified sources procedures whereby minority and women applicants may be referred to the contractor for employment consideration.

b. In the event the contractor has a valid bargaining agreement providing for exclusive hiring hall referrals, the contractor is expected to observe the provisions of that agreement to the extent that the system meets the contractor's compliance with EEO contract provisions. Where implementation of such an agreement has the effect of discriminating against minorities or women, or obligates the contractor to do the same, such implementation violates Federal nondiscrimination provisions.

c. The contractor will encourage its present employees to refer minorities and women as applicants for employment. Information and procedures with regard to referring such applicants will be discussed with employees.

**5. Personnel Actions:** Wages, working conditions, and employee benefits shall be established and administered, and personnel actions of every type, including hiring, upgrading, promotion, transfer, demotion, layoff, and termination, shall be taken without regard to race, color, religion, sex, sexual orientation, gender identity, national origin, age or disability. The following procedures shall be followed:

a. The contractor will conduct periodic inspections of project sites to ensure that working conditions and employee facilities do not indicate discriminatory treatment of project site personnel.

b. The contractor will periodically evaluate the spread of wages paid within each classification to determine any evidence of discriminatory wage practices.

c. The contractor will periodically review selected personnel actions in depth to determine whether there is evidence of discrimination. Where evidence is found, the contractor will promptly take corrective action. If the review indicates that the discrimination may extend beyond the actions reviewed, such corrective action shall include all affected persons.

d. The contractor will promptly investigate all complaints of alleged discrimination made to the contractor in connection with its obligations under this contract, will attempt to resolve such complaints, and will take appropriate corrective action

within a reasonable time. If the investigation indicates that the discrimination may affect persons other than the complainant, such corrective action shall include such other persons. Upon completion of each investigation, the contractor will inform every complainant of all of their avenues of appeal.

#### **6. Training and Promotion:**

a. The contractor will assist in locating, qualifying, and increasing the skills of minorities and women who are applicants for employment or current employees. Such efforts should be aimed at developing full journey level status employees in the type of trade or job classification involved.

b. Consistent with the contractor's work force requirements and as permissible under Federal and State regulations, the contractor shall make full use of training programs (i.e., apprenticeship and on-the-job training programs for the geographical area of contract performance). In the event a special provision for training is provided under this contract, this subparagraph will be superseded as indicated in the special provision. The contracting agency may reserve training positions for persons who receive welfare assistance in accordance with 23 U.S.C. 140(a).

c. The contractor will advise employees and applicants for employment of available training programs and entrance requirements for each.

d. The contractor will periodically review the training and promotion potential of employees who are minorities and women and will encourage eligible employees to apply for such training and promotion.

**7. Unions:** If the contractor relies in whole or in part upon unions as a source of employees, the contractor will use good faith efforts to obtain the cooperation of such unions to increase opportunities for minorities and women. 23 CFR 230.409. Actions by the contractor, either directly or through a contractor's association acting as agent, will include the procedures set forth below:

a. The contractor will use good faith efforts to develop, in cooperation with the unions, joint training programs aimed toward qualifying more minorities and women for membership in the unions and increasing the skills of minorities and women so that they may qualify for higher paying employment.

b. The contractor will use good faith efforts to incorporate an EEO clause into each union agreement to the end that such union will be contractually bound to refer applicants without regard to their race, color, religion, sex, sexual orientation, gender identity, national origin, age, or disability.

c. The contractor is to obtain information as to the referral practices and policies of the labor union except that to the extent such information is within the exclusive possession of the labor union and such labor union refuses to furnish such information to the contractor, the contractor shall so certify to the contracting agency and shall set forth what efforts have been made to obtain such information.

d. In the event the union is unable to provide the contractor with a reasonable flow of referrals within the time limit set forth in the collective bargaining agreement, the contractor will, through independent recruitment efforts, fill the employment vacancies without regard to race, color, religion, sex, sexual orientation, gender identity, national origin, age, or disability; making full efforts to obtain qualified and/or qualifiable minorities and women. The failure of a union to provide

sufficient referrals (even though it is obligated to provide exclusive referrals under the terms of a collective bargaining agreement) does not relieve the contractor from the requirements of this paragraph. In the event the union referral practice prevents the contractor from meeting the obligations pursuant to Executive Order 11246, as amended, and these special provisions, such contractor shall immediately notify the contracting agency.

**8. Reasonable Accommodation for Applicants / Employees with Disabilities:** The contractor must be familiar with the requirements for and comply with the Americans with Disabilities Act and all rules and regulations established thereunder. Employers must provide reasonable accommodation in all employment activities unless to do so would cause an undue hardship.

**9. Selection of Subcontractors, Procurement of Materials and Leasing of Equipment:** The contractor shall not discriminate on the grounds of race, color, religion, sex, sexual orientation, gender identity, national origin, age, or disability in the selection and retention of subcontractors, including procurement of materials and leases of equipment. The contractor shall take all necessary and reasonable steps to ensure nondiscrimination in the administration of this contract.

a. The contractor shall notify all potential subcontractors, suppliers, and lessors of their EEO obligations under this contract.

b. The contractor will use good faith efforts to ensure subcontractor compliance with their EEO obligations.

#### **10. Assurances Required:**

a. The requirements of 49 CFR Part 26 and the State DOT's FHWA-approved Disadvantaged Business Enterprise (DBE) program are incorporated by reference.

b. The contractor, subrecipient or subcontractor shall not discriminate on the basis of race, color, national origin, or sex in the performance of this contract. The contractor shall carry out applicable requirements of 49 CFR part 26 in the award and administration of DOT-assisted contracts. Failure by the contractor to carry out these requirements is a material breach of this contract, which may result in the termination of this contract or such other remedy as the recipient deems appropriate, which may include, but is not limited to:

- (1) Withholding monthly progress payments;
- (2) Assessing sanctions;
- (3) Liquidated damages; and/or
- (4) Disqualifying the contractor from future bidding as non-responsible.

c. The Title VI and nondiscrimination provisions of U.S. DOT Order 1050.2A at Appendixes A and E are incorporated by reference. 49 CFR Part 21.

**11. Records and Reports:** The contractor shall keep such records as necessary to document compliance with the EEO requirements. Such records shall be retained for a period of three years following the date of the final payment to the contractor for all contract work and shall be available at reasonable times and places for inspection by authorized representatives of the contracting agency and the FHWA.

a. The records kept by the contractor shall document the following:

(1) The number and work hours of minority and non-minority group members and women employed in each work classification on the project;

(2) The progress and efforts being made in cooperation with unions, when applicable, to increase employment opportunities for minorities and women; and

(3) The progress and efforts being made in locating, hiring, training, qualifying, and upgrading minorities and women.

b. The contractors and subcontractors will submit an annual report to the contracting agency each July for the duration of the project indicating the number of minority, women, and non-minority group employees currently engaged in each work classification required by the contract work. This information is to be reported on [Form FHWA-1391](#). The staffing data should represent the project work force on board in all or any part of the last payroll period preceding the end of July. If on-the-job training is being required by special provision, the contractor will be required to collect and report training data. The employment data should reflect the work force on board during all or any part of the last payroll period preceding the end of July.

### III. NONSEGREGATED FACILITIES

This provision is applicable to all Federal-aid construction contracts and to all related construction subcontracts of more than \$10,000. 41 CFR 60-1.5.

As prescribed by 41 CFR 60-1.8, the contractor must ensure that facilities provided for employees are provided in such a manner that segregation on the basis of race, color, religion, sex, sexual orientation, gender identity, or national origin cannot result. The contractor may neither require such segregated use by written or oral policies nor tolerate such use by employee custom. The contractor's obligation extends further to ensure that its employees are not assigned to perform their services at any location under the contractor's control where the facilities are segregated. The term "facilities" includes waiting rooms, work areas, restaurants and other eating areas, time clocks, restrooms, washrooms, locker rooms and other storage or dressing areas, parking lots, drinking fountains, recreation or entertainment areas, transportation, and housing provided for employees. The contractor shall provide separate or single-user restrooms and necessary dressing or sleeping areas to assure privacy between sexes.

### IV. DAVIS-BACON AND RELATED ACT PROVISIONS

This section is applicable to all Federal-aid construction projects exceeding \$2,000 and to all related subcontracts and lower-tier subcontracts (regardless of subcontract size), in accordance with 29 CFR 5.5. The requirements apply to all projects located within the right-of-way of a roadway that is functionally classified as Federal-aid highway. 23 U.S.C. 113. This excludes roadways functionally classified as local roads or rural minor collectors, which are exempt. 23 U.S.C. 101. Where applicable law requires that projects be treated as a project on a Federal-aid highway, the provisions of this subpart will apply regardless of the location of the project. Examples include: Surface Transportation Block Grant Program projects funded under 23 U.S.C. 133 [excluding recreational trails projects], the Nationally Significant Freight and Highway

Projects funded under 23 U.S.C. 117, and National Highway Freight Program projects funded under 23 U.S.C. 167.

The following provisions are from the U.S. Department of Labor regulations in 29 CFR 5.5 "Contract provisions and related matters" with minor revisions to conform to the FHWA-1273 format and FHWA program requirements.

#### 1. Minimum wages (29 CFR 5.5)

a. *Wage rates and fringe benefits.* All laborers and mechanics employed or working upon the site of the work (or otherwise working in construction or development of the project under a development statute), will be paid unconditionally and not less often than once a week, and without subsequent deduction or rebate on any account (except such payroll deductions as are permitted by regulations issued by the Secretary of Labor under the Copeland Act ([29 CFR part 3](#))), the full amount of basic hourly wages and bona fide fringe benefits (or cash equivalents thereof) due at time of payment computed at rates not less than those contained in the wage determination of the Secretary of Labor which is attached hereto and made a part hereof, regardless of any contractual relationship which may be alleged to exist between the contractor and such laborers and mechanics. As provided in paragraphs (d) and (e) of 29 CFR 5.5, the appropriate wage determinations are effective by operation of law even if they have not been attached to the contract. Contributions made or costs reasonably anticipated for bona fide fringe benefits under the Davis-Bacon Act ([40 U.S.C. 3141\(2\)\(B\)](#)) on behalf of laborers or mechanics are considered wages paid to such laborers or mechanics, subject to the provisions of paragraph 1.e. of this section; also, regular contributions made or costs incurred for more than a weekly period (but not less often than quarterly) under plans, funds, or programs which cover the particular weekly period, are deemed to be constructively made or incurred during such weekly period. Such laborers and mechanics must be paid the appropriate wage rate and fringe benefits on the wage determination for the classification(s) of work actually performed, without regard to skill, except as provided in paragraph 4. of this section. Laborers or mechanics performing work in more than one classification may be compensated at the rate specified for each classification for the time actually worked therein: *Provided*, That the employer's payroll records accurately set forth the time spent in each classification in which work is performed. The wage determination (including any additional classifications and wage rates conformed under paragraph 1.c. of this section) and the Davis-Bacon poster (WH-1321) must be posted at all times by the contractor and its subcontractors at the site of the work in a prominent and accessible place where it can be easily seen by the workers.

b. *Frequently recurring classifications.* (1) In addition to wage and fringe benefit rates that have been determined to be prevailing under the procedures set forth in [29 CFR part 1](#), a wage determination may contain, pursuant to § 1.3(f), wage and fringe benefit rates for classifications of laborers and mechanics for which conformance requests are regularly submitted pursuant to paragraph 1.c. of this section, provided that:

(i) The work performed by the classification is not performed by a classification in the wage determination for which a prevailing wage rate has been determined;

(ii) The classification is used in the area by the construction industry; and

(iii) The wage rate for the classification bears a reasonable relationship to the prevailing wage rates contained in the wage determination.

(2) The Administrator will establish wage rates for such classifications in accordance with paragraph 1.c.(1)(iii) of this section. Work performed in such a classification must be paid at no less than the wage and fringe benefit rate listed on the wage determination for such classification.

c. *Conformance.* (1) The contracting officer must require that any class of laborers or mechanics, including helpers, which is not listed in the wage determination and which is to be employed under the contract be classified in conformance with the wage determination. Conformance of an additional classification and wage rate and fringe benefits is appropriate only when the following criteria have been met:

(i) The work to be performed by the classification requested is not performed by a classification in the wage determination; and

(ii) The classification is used in the area by the construction industry; and

(iii) The proposed wage rate, including any bona fide fringe benefits, bears a reasonable relationship to the wage rates contained in the wage determination.

(2) The conformance process may not be used to split, subdivide, or otherwise avoid application of classifications listed in the wage determination.

(3) If the contractor and the laborers and mechanics to be employed in the classification (if known), or their representatives, and the contracting officer agree on the classification and wage rate (including the amount designated for fringe benefits where appropriate), a report of the action taken will be sent by the contracting officer by email to [DBAconformance@dol.gov](mailto:DBAconformance@dol.gov). The Administrator, or an authorized representative, will approve, modify, or disapprove every additional classification action within 30 days of receipt and so advise the contracting officer or will notify the contracting officer within the 30-day period that additional time is necessary.

(4) In the event the contractor, the laborers or mechanics to be employed in the classification or their representatives, and the contracting officer do not agree on the proposed classification and wage rate (including the amount designated for fringe benefits, where appropriate), the contracting officer will, by email to [DBAconformance@dol.gov](mailto:DBAconformance@dol.gov), refer the questions, including the views of all interested parties and the recommendation of the contracting officer, to the Administrator for determination. The Administrator, or an authorized representative, will issue a determination within 30 days of receipt and so advise the contracting officer or will notify the contracting officer within the 30-day period that additional time is necessary.

(5) The contracting officer must promptly notify the contractor of the action taken by the Wage and Hour Division

under paragraphs 1.c.(3) and (4) of this section. The contractor must furnish a written copy of such determination to each affected worker or it must be posted as a part of the wage determination. The wage rate (including fringe benefits where appropriate) determined pursuant to paragraph 1.c.(3) or (4) of this section must be paid to all workers performing work in the classification under this contract from the first day on which work is performed in the classification.

d. *Fringe benefits not expressed as an hourly rate.* Whenever the minimum wage rate prescribed in the contract for a class of laborers or mechanics includes a fringe benefit which is not expressed as an hourly rate, the contractor may either pay the benefit as stated in the wage determination or may pay another bona fide fringe benefit or an hourly cash equivalent thereof.

e. *Unfunded plans.* If the contractor does not make payments to a trustee or other third person, the contractor may consider as part of the wages of any laborer or mechanic the amount of any costs reasonably anticipated in providing bona fide fringe benefits under a plan or program, *Provided*, That the Secretary of Labor has found, upon the written request of the contractor, in accordance with the criteria set forth in § 5.28, that the applicable standards of the Davis-Bacon Act have been met. The Secretary of Labor may require the contractor to set aside in a separate account assets for the meeting of obligations under the plan or program.

f. *Interest.* In the event of a failure to pay all or part of the wages required by the contract, the contractor will be required to pay interest on any underpayment of wages.

## 2. Withholding (29 CFR 5.5)

a. *Withholding requirements.* The contracting agency may, upon its own action, or must, upon written request of an authorized representative of the Department of Labor, withhold or cause to be withheld from the contractor so much of the accrued payments or advances as may be considered necessary to satisfy the liabilities of the prime contractor or any subcontractor for the full amount of wages and monetary relief, including interest, required by the clauses set forth in this section for violations of this contract, or to satisfy any such liabilities required by any other Federal contract, or federally assisted contract subject to Davis-Bacon labor standards, that is held by the same prime contractor (as defined in § 5.2). The necessary funds may be withheld from the contractor under this contract, any other Federal contract with the same prime contractor, or any other federally assisted contract that is subject to Davis-Bacon labor standards requirements and is held by the same prime contractor, regardless of whether the other contract was awarded or assisted by the same agency, and such funds may be used to satisfy the contractor liability for which the funds were withheld. In the event of a contractor's failure to pay any laborer or mechanic, including any apprentice or helper working on the site of the work all or part of the wages required by the contract, or upon the contractor's failure to submit the required records as discussed in paragraph 3.d. of this section, the contracting agency may on its own initiative and after written notice to the contractor, take such action as may be necessary to cause the suspension of any further payment, advance, or guarantee of funds until such violations have ceased.

b. *Priority to withheld funds.* The Department has priority to funds withheld or to be withheld in accordance with paragraph

2.a. of this section or Section V, paragraph 3.a., or both, over claims to those funds by:

- (1) A contractor's surety(ies), including without limitation performance bond sureties and payment bond sureties;
- (2) A contracting agency for its procurement costs;
- (3) A trustee(s) (either a court-appointed trustee or a U.S. trustee, or both) in bankruptcy of a contractor, or a contractor's bankruptcy estate;
- (4) A contractor's assignee(s);
- (5) A contractor's successor(s); or
- (6) A claim asserted under the Prompt Payment Act, [31 U.S.C. 3901–3907](#).

### 3. Records and certified payrolls (29 CFR 5.5)

a. *Basic record requirements (1) Length of record retention.* All regular payrolls and other basic records must be maintained by the contractor and any subcontractor during the course of the work and preserved for all laborers and mechanics working at the site of the work (or otherwise working in construction or development of the project under a development statute) for a period of at least 3 years after all the work on the prime contract is completed.

(2) *Information required.* Such records must contain the name; Social Security number; last known address, telephone number, and email address of each such worker; each worker's correct classification(s) of work actually performed; hourly rates of wages paid (including rates of contributions or costs anticipated for bona fide fringe benefits or cash equivalents thereof of the types described in [40 U.S.C. 3141\(2\)\(B\)](#) of the Davis-Bacon Act); daily and weekly number of hours actually worked in total and on each covered contract; deductions made; and actual wages paid.

(3) *Additional records relating to fringe benefits.* Whenever the Secretary of Labor has found under paragraph 1.e. of this section that the wages of any laborer or mechanic include the amount of any costs reasonably anticipated in providing benefits under a plan or program described in [40 U.S.C. 3141\(2\)\(B\)](#) of the Davis-Bacon Act, the contractor must maintain records which show that the commitment to provide such benefits is enforceable, that the plan or program is financially responsible, and that the plan or program has been communicated in writing to the laborers or mechanics affected, and records which show the costs anticipated or the actual cost incurred in providing such benefits.

(4) *Additional records relating to apprenticeship.* Contractors with apprentices working under approved programs must maintain written evidence of the registration of apprenticeship programs, the registration of the apprentices, and the ratios and wage rates prescribed in the applicable programs.

b. *Certified payroll requirements (1) Frequency and method of submission.* The contractor or subcontractor must submit weekly, for each week in which any DBA- or Related Acts-covered work is performed, certified payrolls to the contracting

agency. The prime contractor is responsible for the submission of all certified payrolls by all subcontractors. A contracting agency or prime contractor may permit or require contractors to submit certified payrolls through an electronic system, as long as the electronic system requires a legally valid electronic signature; the system allows the contractor, the contracting agency, and the Department of Labor to access the certified payrolls upon request for at least 3 years after the work on the prime contract has been completed; and the contracting agency or prime contractor permits other methods of submission in situations where the contractor is unable or limited in its ability to use or access the electronic system.

(2) *Information required.* The certified payrolls submitted must set out accurately and completely all of the information required to be maintained under paragraph 3.a.(2) of this section, except that full Social Security numbers and last known addresses, telephone numbers, and email addresses must not be included on weekly transmittals. Instead, the certified payrolls need only include an individually identifying number for each worker ( e.g., the last four digits of the worker's Social Security number). The required weekly certified payroll information may be submitted using Optional Form WH-347 or in any other format desired. Optional Form WH-347 is available for this purpose from the Wage and Hour Division website at <https://www.dol.gov/sites/dolgov/files/WHD/legacy/files/wh347.pdf> or its successor website. It is not a violation of this section for a prime contractor to require a subcontractor to provide full Social Security numbers and last known addresses, telephone numbers, and email addresses to the prime contractor for its own records, without weekly submission by the subcontractor to the contracting agency.

(3) *Statement of Compliance.* Each certified payroll submitted must be accompanied by a "Statement of Compliance," signed by the contractor or subcontractor, or the contractor's or subcontractor's agent who pays or supervises the payment of the persons working on the contract, and must certify the following:

(i) That the certified payroll for the payroll period contains the information required to be provided under paragraph 3.b. of this section, the appropriate information and basic records are being maintained under paragraph 3.a. of this section, and such information and records are correct and complete;

(ii) That each laborer or mechanic (including each helper and apprentice) working on the contract during the payroll period has been paid the full weekly wages earned, without rebate, either directly or indirectly, and that no deductions have been made either directly or indirectly from the full wages earned, other than permissible deductions as set forth in [29 CFR part 3](#); and

(iii) That each laborer or mechanic has been paid not less than the applicable wage rates and fringe benefits or cash equivalents for the classification(s) of work actually performed, as specified in the applicable wage determination incorporated into the contract.

(4) *Use of Optional Form WH-347.* The weekly submission of a properly executed certification set forth on the reverse side of Optional Form WH-347 will satisfy the requirement for submission of the "Statement of Compliance" required by paragraph 3.b.(3) of this section.



(5) *Signature.* The signature by the contractor, subcontractor, or the contractor's or subcontractor's agent must be an original handwritten signature or a legally valid electronic signature.

(6) *Falsification.* The falsification of any of the above certifications may subject the contractor or subcontractor to civil or criminal prosecution under [18 U.S.C. 1001](#) and [31 U.S.C. 3729](#).

(7) *Length of certified payroll retention.* The contractor or subcontractor must preserve all certified payrolls during the course of the work and for a period of 3 years after all the work on the prime contract is completed.

c. *Contracts, subcontracts, and related documents.* The contractor or subcontractor must maintain this contract or subcontract and related documents including, without limitation, bids, proposals, amendments, modifications, and extensions. The contractor or subcontractor must preserve these contracts, subcontracts, and related documents during the course of the work and for a period of 3 years after all the work on the prime contract is completed.

d. *Required disclosures and access (1) Required record disclosures and access to workers.* The contractor or subcontractor must make the records required under paragraphs 3.a. through 3.c. of this section, and any other documents that the contracting agency, the State DOT, the FHWA, or the Department of Labor deems necessary to determine compliance with the labor standards provisions of any of the applicable statutes referenced by § 5.1, available for inspection, copying, or transcription by authorized representatives of the contracting agency, the State DOT, the FHWA, or the Department of Labor, and must permit such representatives to interview workers during working hours on the job.

(2) *Sanctions for non-compliance with records and worker access requirements.* If the contractor or subcontractor fails to submit the required records or to make them available, or refuses to permit worker interviews during working hours on the job, the Federal agency may, after written notice to the contractor, sponsor, applicant, owner, or other entity, as the case may be, that maintains such records or that employs such workers, take such action as may be necessary to cause the suspension of any further payment, advance, or guarantee of funds. Furthermore, failure to submit the required records upon request or to make such records available, or to permit worker interviews during working hours on the job, may be grounds for debarment action pursuant to § 5.12. In addition, any contractor or other person that fails to submit the required records or make those records available to WHD within the time WHD requests that the records be produced will be precluded from introducing as evidence in an administrative proceeding under [29 CFR part 6](#) any of the required records that were not provided or made available to WHD. WHD will take into consideration a reasonable request from the contractor or person for an extension of the time for submission of records. WHD will determine the reasonableness of the request and may consider, among other things, the location of the records and the volume of production.

(3) *Required information disclosures.* Contractors and subcontractors must maintain the full Social Security number and last known address, telephone number, and email address

of each covered worker, and must provide them upon request to the contracting agency, the State DOT, the FHWA, the contractor, or the Wage and Hour Division of the Department of Labor for purposes of an investigation or other compliance action.

#### **4. Apprentices and equal employment opportunity (29 CFR 5.5)**

a. *Apprentices (1) Rate of pay.* Apprentices will be permitted to work at less than the predetermined rate for the work they perform when they are employed pursuant to and individually registered in a bona fide apprenticeship program registered with the U.S. Department of Labor, Employment and Training Administration, Office of Apprenticeship (OA), or with a State Apprenticeship Agency recognized by the OA. A person who is not individually registered in the program, but who has been certified by the OA or a State Apprenticeship Agency (where appropriate) to be eligible for probationary employment as an apprentice, will be permitted to work at less than the predetermined rate for the work they perform in the first 90 days of probationary employment as an apprentice in such a program. In the event the OA or a State Apprenticeship Agency recognized by the OA withdraws approval of an apprenticeship program, the contractor will no longer be permitted to use apprentices at less than the applicable predetermined rate for the work performed until an acceptable program is approved.

(2) *Fringe benefits.* Apprentices must be paid fringe benefits in accordance with the provisions of the apprenticeship program. If the apprenticeship program does not specify fringe benefits, apprentices must be paid the full amount of fringe benefits listed on the wage determination for the applicable classification. If the Administrator determines that a different practice prevails for the applicable apprentice classification, fringe benefits must be paid in accordance with that determination.

(3) *Apprenticeship ratio.* The allowable ratio of apprentices to journeyworkers on the job site in any craft classification must not be greater than the ratio permitted to the contractor as to the entire work force under the registered program or the ratio applicable to the locality of the project pursuant to paragraph 4.a.(4) of this section. Any worker listed on a payroll at an apprentice wage rate, who is not registered or otherwise employed as stated in paragraph 4.a.(1) of this section, must be paid not less than the applicable wage rate on the wage determination for the classification of work actually performed. In addition, any apprentice performing work on the job site in excess of the ratio permitted under this section must be paid not less than the applicable wage rate on the wage determination for the work actually performed.

(4) *Reciprocity of ratios and wage rates.* Where a contractor is performing construction on a project in a locality other than the locality in which its program is registered, the ratios and wage rates (expressed in percentages of the journeyworker's hourly rate) applicable within the locality in which the construction is being performed must be observed. If there is no applicable ratio or wage rate for the locality of the project, the ratio and wage rate specified in the contractor's registered program must be observed.

b. *Equal employment opportunity.* The use of apprentices and journeyworkers under this part must be in conformity with



the equal employment opportunity requirements of Executive Order 11246, as amended, and [29 CFR part 30](#).

c. Apprentices and Trainees (programs of the U.S. DOT).

Apprentices and trainees working under apprenticeship and skill training programs which have been certified by the Secretary of Transportation as promoting EEO in connection with Federal-aid highway construction programs are not subject to the requirements of paragraph 4 of this Section IV. 23 CFR 230.111(e)(2). The straight time hourly wage rates for apprentices and trainees under such programs will be established by the particular programs. The ratio of apprentices and trainees to journeyworkers shall not be greater than permitted by the terms of the particular program.

**5. Compliance with Copeland Act requirements.** The contractor shall comply with the requirements of 29 CFR part 3, which are incorporated by reference in this contract as provided in 29 CFR 5.5.

**6. Subcontracts.** The contractor or subcontractor must insert FHWA-1273 in any subcontracts, along with the applicable wage determination(s) and such other clauses or contract modifications as the contracting agency may by appropriate instructions require, and a clause requiring the subcontractors to include these clauses and wage determination(s) in any lower tier subcontracts. The prime contractor is responsible for the compliance by any subcontractor or lower tier subcontractor with all the contract clauses in this section. In the event of any violations of these clauses, the prime contractor and any subcontractor(s) responsible will be liable for any unpaid wages and monetary relief, including interest from the date of the underpayment or loss, due to any workers of lower-tier subcontractors, and may be subject to debarment, as appropriate. 29 CFR 5.5.

**7. Contract termination: debarment.** A breach of the contract clauses in 29 CFR 5.5 may be grounds for termination of the contract, and for debarment as a contractor and a subcontractor as provided in 29 CFR 5.12.

**8. Compliance with Davis-Bacon and Related Act requirements.** All rulings and interpretations of the Davis-Bacon and Related Acts contained in 29 CFR parts 1, 3, and 5 are herein incorporated by reference in this contract as provided in 29 CFR 5.5.

**9. Disputes concerning labor standards.** As provided in 29 CFR 5.5, disputes arising out of the labor standards provisions of this contract shall not be subject to the general disputes clause of this contract. Such disputes shall be resolved in accordance with the procedures of the Department of Labor set forth in 29 CFR parts 5, 6, and 7. Disputes within the meaning of this clause include disputes between the contractor (or any of its subcontractors) and the contracting agency, the U.S. Department of Labor, or the employees or their representatives.

**10. Certification of eligibility.** a. By entering into this contract, the contractor certifies that neither it nor any person or firm who has an interest in the contractor's firm is a person or firm ineligible to be awarded Government contracts by virtue of [40 U.S.C. 3144\(b\)](#) or § 5.12(a).

b. No part of this contract shall be subcontracted to any person or firm ineligible for award of a Government contract by virtue of [40 U.S.C. 3144\(b\)](#) or § 5.12(a).

c. The penalty for making false statements is prescribed in the U.S. Code, Title 18 Crimes and Criminal Procedure, [18 U.S.C. 1001](#).

**11. Anti-retaliation.** It is unlawful for any person to discharge, demote, intimidate, threaten, restrain, coerce, blacklist, harass, or in any other manner discriminate against, or to cause any person to discharge, demote, intimidate, threaten, restrain, coerce, blacklist, harass, or in any other manner discriminate against, any worker or job applicant for:

a. Notifying any contractor of any conduct which the worker reasonably believes constitutes a violation of the DBA, Related Acts, this part, or [29 CFR part 1](#) or [3](#);

b. Filing any complaint, initiating or causing to be initiated any proceeding, or otherwise asserting or seeking to assert on behalf of themselves or others any right or protection under the DBA, Related Acts, this part, or [29 CFR part 1](#) or [3](#);

c. Cooperating in any investigation or other compliance action, or testifying in any proceeding under the DBA, Related Acts, this part, or [29 CFR part 1](#) or [3](#); or

d. Informing any other person about their rights under the DBA, Related Acts, this part, or [29 CFR part 1](#) or [3](#).

## V. CONTRACT WORK HOURS AND SAFETY STANDARDS ACT

Pursuant to 29 CFR 5.5(b), the following clauses apply to any Federal-aid construction contract in an amount in excess of \$100,000 and subject to the overtime provisions of the Contract Work Hours and Safety Standards Act. These clauses shall be inserted in addition to the clauses required by 29 CFR 5.5(a) or 29 CFR 4.6. As used in this paragraph, the terms laborers and mechanics include watchpersons and guards.

**1. Overtime requirements.** No contractor or subcontractor contracting for any part of the contract work which may require or involve the employment of laborers or mechanics shall require or permit any such laborer or mechanic in any workweek in which he or she is employed on such work to work in excess of forty hours in such workweek unless such laborer or mechanic receives compensation at a rate not less than one and one-half times the basic rate of pay for all hours worked in excess of forty hours in such workweek. 29 CFR 5.5.

**2. Violation; liability for unpaid wages; liquidated damages.** In the event of any violation of the clause set forth in paragraph 1. of this section the contractor and any subcontractor responsible therefor shall be liable for the unpaid wages and interest from the date of the underpayment. In addition, such contractor and subcontractor shall be liable to the United States (in the case of work done under contract for the District of Columbia or a territory, to such District or to such territory), for liquidated damages. Such liquidated damages shall be computed with respect to each individual laborer or

mechanic, including watchpersons and guards, employed in violation of the clause set forth in paragraph 1. of this section, in the sum currently provided in 29 CFR 5.5(b)(2)\* for each calendar day on which such individual was required or permitted to work in excess of the standard workweek of forty hours without payment of the overtime wages required by the clause set forth in paragraph 1. of this section.

\* \$31 as of January 15, 2023 (See 88 FR 88 FR 2210) as may be adjusted annually by the Department of Labor, pursuant to the Federal Civil Penalties Inflation Adjustment Act of 1990.

### 3. Withholding for unpaid wages and liquidated damages

a. *Withholding process.* The FHWA or the contracting agency may, upon its own action, or must, upon written request of an authorized representative of the Department of Labor, withhold or cause to be withheld from the contractor so much of the accrued payments or advances as may be considered necessary to satisfy the liabilities of the prime contractor or any subcontractor for any unpaid wages; monetary relief, including interest; and liquidated damages required by the clauses set forth in this section on this contract, any other Federal contract with the same prime contractor, or any other federally assisted contract subject to the Contract Work Hours and Safety Standards Act that is held by the same prime contractor (as defined in § 5.2). The necessary funds may be withheld from the contractor under this contract, any other Federal contract with the same prime contractor, or any other federally assisted contract that is subject to the Contract Work Hours and Safety Standards Act and is held by the same prime contractor, regardless of whether the other contract was awarded or assisted by the same agency, and such funds may be used to satisfy the contractor liability for which the funds were withheld.

b. *Priority to withheld funds.* The Department has priority to funds withheld or to be withheld in accordance with Section IV paragraph 2.a. or paragraph 3.a. of this section, or both, over claims to those funds by:

- (1) A contractor's surety(ies), including without limitation performance bond sureties and payment bond sureties;
- (2) A contracting agency for its procurement costs;
- (3) A trustee(s) (either a court-appointed trustee or a U.S. trustee, or both) in bankruptcy of a contractor, or a contractor's bankruptcy estate;
- (4) A contractor's assignee(s);
- (5) A contractor's successor(s); or
- (6) A claim asserted under the Prompt Payment Act, [31 U.S.C. 3901](#)–3907.

**4. Subcontracts.** The contractor or subcontractor must insert in any subcontracts the clauses set forth in paragraphs 1. through 5. of this section and a clause requiring the subcontractors to include these clauses in any lower tier subcontracts. The prime contractor is responsible for compliance by any subcontractor or lower tier subcontractor with the clauses set forth in paragraphs 1. through 5. In the

event of any violations of these clauses, the prime contractor and any subcontractor(s) responsible will be liable for any unpaid wages and monetary relief, including interest from the date of the underpayment or loss, due to any workers of lower-tier subcontractors, and associated liquidated damages and may be subject to debarment, as appropriate.

**5. Anti-retaliation.** It is unlawful for any person to discharge, demote, intimidate, threaten, restrain, coerce, blacklist, harass, or in any other manner discriminate against, or to cause any person to discharge, demote, intimidate, threaten, restrain, coerce, blacklist, harass, or in any other manner discriminate against, any worker or job applicant for:

a. Notifying any contractor of any conduct which the worker reasonably believes constitutes a violation of the Contract Work Hours and Safety Standards Act (CWHSSA) or its implementing regulations in this part;

b. Filing any complaint, initiating or causing to be initiated any proceeding, or otherwise asserting or seeking to assert on behalf of themselves or others any right or protection under CWHSSA or this part;

c. Cooperating in any investigation or other compliance action, or testifying in any proceeding under CWHSSA or this part; or

d. Informing any other person about their rights under CWHSSA or this part.

### VI. SUBLETTING OR ASSIGNING THE CONTRACT

This provision is applicable to all Federal-aid construction contracts on the National Highway System pursuant to 23 CFR 635.116.

1. The contractor shall perform with its own organization contract work amounting to not less than 30 percent (or a greater percentage if specified elsewhere in the contract) of the total original contract price, excluding any specialty items designated by the contracting agency. Specialty items may be performed by subcontract and the amount of any such specialty items performed may be deducted from the total original contract price before computing the amount of work required to be performed by the contractor's own organization (23 CFR 635.116).

a. The term "perform work with its own organization" in paragraph 1 of Section VI refers to workers employed or leased by the prime contractor, and equipment owned or rented by the prime contractor, with or without operators. Such term does not include employees or equipment of a subcontractor or lower tier subcontractor, agents of the prime contractor, or any other assignees. The term may include payments for the costs of hiring leased employees from an employee leasing firm meeting all relevant Federal and State regulatory requirements. Leased employees may only be included in this term if the prime contractor meets all of the following conditions: (based on longstanding interpretation)

- (1) the prime contractor maintains control over the supervision of the day-to-day activities of the leased employees;
- (2) the prime contractor remains responsible for the quality of the work of the leased employees;

- (3) the prime contractor retains all power to accept or exclude individual employees from work on the project; and
- (4) the prime contractor remains ultimately responsible for the payment of predetermined minimum wages, the submission of payrolls, statements of compliance and all other Federal regulatory requirements.

b. "Specialty Items" shall be construed to be limited to work that requires highly specialized knowledge, abilities, or equipment not ordinarily available in the type of contracting organizations qualified and expected to bid or propose on the contract as a whole and in general are to be limited to minor components of the overall contract. 23 CFR 635.102.

2. Pursuant to 23 CFR 635.116(a), the contract amount upon which the requirements set forth in paragraph (1) of Section VI is computed includes the cost of material and manufactured products which are to be purchased or produced by the contractor under the contract provisions.

3. Pursuant to 23 CFR 635.116(c), the contractor shall furnish (a) a competent superintendent or supervisor who is employed by the firm, has full authority to direct performance of the work in accordance with the contract requirements, and is in charge of all construction operations (regardless of who performs the work) and (b) such other of its own organizational resources (supervision, management, and engineering services) as the contracting officer determines is necessary to assure the performance of the contract.

4. No portion of the contract shall be sublet, assigned or otherwise disposed of except with the written consent of the contracting officer, or authorized representative, and such consent when given shall not be construed to relieve the contractor of any responsibility for the fulfillment of the contract. Written consent will be given only after the contracting agency has assured that each subcontract is evidenced in writing and that it contains all pertinent provisions and requirements of the prime contract. (based on long-standing interpretation of 23 CFR 635.116).

5. The 30-percent self-performance requirement of paragraph (1) is not applicable to design-build contracts; however, contracting agencies may establish their own self-performance requirements. 23 CFR 635.116(d).

## **VII. SAFETY: ACCIDENT PREVENTION**

This provision is applicable to all Federal-aid construction contracts and to all related subcontracts.

1. In the performance of this contract the contractor shall comply with all applicable Federal, State, and local laws governing safety, health, and sanitation (23 CFR Part 635). The contractor shall provide all safeguards, safety devices and protective equipment and take any other needed actions as it determines, or as the contracting officer may determine, to be reasonably necessary to protect the life and health of employees on the job and the safety of the public and to protect property in connection with the performance of the work covered by the contract. 23 CFR 635.108.

2. It is a condition of this contract, and shall be made a condition of each subcontract, which the contractor enters into pursuant to this contract, that the contractor and any subcontractor shall not permit any employee, in performance of the contract, to work in surroundings or under conditions which are unsanitary, hazardous or dangerous to his/her health or safety, as determined under construction safety and

health standards (29 CFR Part 1926) promulgated by the Secretary of Labor, in accordance with Section 107 of the Contract Work Hours and Safety Standards Act (40 U.S.C. 3704). 29 CFR 1926.10.

3. Pursuant to 29 CFR 1926.3, it is a condition of this contract that the Secretary of Labor or authorized representative thereof, shall have right of entry to any site of contract performance to inspect or investigate the matter of compliance with the construction safety and health standards and to carry out the duties of the Secretary under Section 107 of the Contract Work Hours and Safety Standards Act (40 U.S.C. 3704).

## **VIII. FALSE STATEMENTS CONCERNING HIGHWAY PROJECTS**

This provision is applicable to all Federal-aid construction contracts and to all related subcontracts.

In order to assure high quality and durable construction in conformity with approved plans and specifications and a high degree of reliability on statements and representations made by engineers, contractors, suppliers, and workers on Federal-aid highway projects, it is essential that all persons concerned with the project perform their functions as carefully, thoroughly, and honestly as possible. Willful falsification, distortion, or misrepresentation with respect to any facts related to the project is a violation of Federal law. To prevent any misunderstanding regarding the seriousness of these and similar acts, Form FHWA-1022 shall be posted on each Federal-aid highway project (23 CFR Part 635) in one or more places where it is readily available to all persons concerned with the project:

18 U.S.C. 1020 reads as follows:

"Whoever, being an officer, agent, or employee of the United States, or of any State or Territory, or whoever, whether a person, association, firm, or corporation, knowingly makes any false statement, false representation, or false report as to the character, quality, quantity, or cost of the material used or to be used, or the quantity or quality of the work performed or to be performed, or the cost thereof in connection with the submission of plans, maps, specifications, contracts, or costs of construction on any highway or related project submitted for approval to the Secretary of Transportation; or

Whoever knowingly makes any false statement, false representation, false report or false claim with respect to the character, quality, quantity, or cost of any work performed or to be performed, or materials furnished or to be furnished, in connection with the construction of any highway or related project approved by the Secretary of Transportation; or

Whoever knowingly makes any false statement or false representation as to material fact in any statement, certificate, or report submitted pursuant to provisions of the Federal-aid Roads Act approved July 11, 1916, (39 Stat. 355), as amended and supplemented;

Shall be fined under this title or imprisoned not more than 5 years or both."

**IX. IMPLEMENTATION OF CLEAN AIR ACT AND FEDERAL WATER POLLUTION CONTROL ACT (42 U.S.C. 7606; 2 CFR 200.88; EO 11738)**

This provision is applicable to all Federal-aid construction contracts in excess of \$150,000 and to all related subcontracts. 48 CFR 2.101; 2 CFR 200.327.

By submission of this bid/proposal or the execution of this contract or subcontract, as appropriate, the bidder, proposer, Federal-aid construction contractor, subcontractor, supplier, or vendor agrees to comply with all applicable standards, orders or regulations issued pursuant to the Clean Air Act (42 U.S.C. 7401-7671q) and the Federal Water Pollution Control Act, as amended (33 U.S.C. 1251-1387). Violations must be reported to the Federal Highway Administration and the Regional Office of the Environmental Protection Agency. 2 CFR Part 200, Appendix II.

The contractor agrees to include or cause to be included the requirements of this Section in every subcontract, and further agrees to take such action as the contracting agency may direct as a means of enforcing such requirements. 2 CFR 200.327.

**X. CERTIFICATION REGARDING DEBARMENT, SUSPENSION, INELIGIBILITY AND VOLUNTARY EXCLUSION**

This provision is applicable to all Federal-aid construction contracts, design-build contracts, subcontracts, lower-tier subcontracts, purchase orders, lease agreements, consultant contracts or any other covered transaction requiring FHWA approval or that is estimated to cost \$25,000 or more – as defined in 2 CFR Parts 180 and 1200. 2 CFR 180.220 and 1200.220.

**1. Instructions for Certification – First Tier Participants:**

- a. By signing and submitting this proposal, the prospective first tier participant is providing the certification set out below.
- b. The inability of a person to provide the certification set out below will not necessarily result in denial of participation in this covered transaction. The prospective first tier participant shall submit an explanation of why it cannot provide the certification set out below. The certification or explanation will be considered in connection with the department or agency's determination whether to enter into this transaction. However, failure of the prospective first tier participant to furnish a certification or an explanation shall disqualify such a person from participation in this transaction. 2 CFR 180.320.
- c. The certification in this clause is a material representation of fact upon which reliance was placed when the contracting agency determined to enter into this transaction. If it is later determined that the prospective participant knowingly rendered an erroneous certification, in addition to other remedies available to the Federal Government, the contracting agency may terminate this transaction for cause of default. 2 CFR 180.325.
- d. The prospective first tier participant shall provide immediate written notice to the contracting agency to whom this proposal is submitted if any time the prospective first tier participant learns that its certification was erroneous when submitted or has become erroneous by reason of changed circumstances. 2 CFR 180.345 and 180.350.

e. The terms "covered transaction," "debarred," "suspended," "ineligible," "participant," "person," "principal," and "voluntarily excluded," as used in this clause, are defined in 2 CFR Parts 180, Subpart I, 180.900-180.1020, and 1200. "First Tier Covered Transactions" refers to any covered transaction between a recipient or subrecipient of Federal funds and a participant (such as the prime or general contract). "Lower Tier Covered Transactions" refers to any covered transaction under a First Tier Covered Transaction (such as subcontracts). "First Tier Participant" refers to the participant who has entered into a covered transaction with a recipient or subrecipient of Federal funds (such as the prime or general contractor). "Lower Tier Participant" refers any participant who has entered into a covered transaction with a First Tier Participant or other Lower Tier Participants (such as subcontractors and suppliers).

f. The prospective first tier participant agrees by submitting this proposal that, should the proposed covered transaction be entered into, it shall not knowingly enter into any lower tier covered transaction with a person who is debarred, suspended, declared ineligible, or voluntarily excluded from participation in this covered transaction, unless authorized by the department or agency entering into this transaction. 2 CFR 180.330.

g. The prospective first tier participant further agrees by submitting this proposal that it will include the clause titled "Certification Regarding Debarment, Suspension, Ineligibility and Voluntary Exclusion-Lower Tier Covered Transactions," provided by the department or contracting agency, entering into this covered transaction, without modification, in all lower tier covered transactions and in all solicitations for lower tier covered transactions exceeding the \$25,000 threshold. 2 CFR 180.220 and 180.300.

h. A participant in a covered transaction may rely upon a certification of a prospective participant in a lower tier covered transaction that is not debarred, suspended, ineligible, or voluntarily excluded from the covered transaction, unless it knows that the certification is erroneous. 2 CFR 180.300; 180.320, and 180.325. A participant is responsible for ensuring that its principals are not suspended, debarred, or otherwise ineligible to participate in covered transactions. 2 CFR 180.335. To verify the eligibility of its principals, as well as the eligibility of any lower tier prospective participants, each participant may, but is not required to, check the System for Award Management website (<https://www.sam.gov/>). 2 CFR 180.300, 180.320, and 180.325.

i. Nothing contained in the foregoing shall be construed to require the establishment of a system of records in order to render in good faith the certification required by this clause. The knowledge and information of the prospective participant is not required to exceed that which is normally possessed by a prudent person in the ordinary course of business dealings.

j. Except for transactions authorized under paragraph (f) of these instructions, if a participant in a covered transaction knowingly enters into a lower tier covered transaction with a person who is suspended, debarred, ineligible, or voluntarily excluded from participation in this transaction, in addition to other remedies available to the Federal Government, the department or agency may terminate this transaction for cause or default. 2 CFR 180.325.

\*\*\*\*\*

**2. Certification Regarding Debarment, Suspension, Ineligibility and Voluntary Exclusion – First Tier Participants:**

a. The prospective first tier participant certifies to the best of its knowledge and belief, that it and its principals:

(1) Are not presently debarred, suspended, proposed for debarment, declared ineligible, or voluntarily excluded from participating in covered transactions by any Federal department or agency, 2 CFR 180.335;.

(2) Have not within a three-year period preceding this proposal been convicted of or had a civil judgment rendered against them for commission of fraud or a criminal offense in connection with obtaining, attempting to obtain, or performing a public (Federal, State, or local) transaction or contract under a public transaction; violation of Federal or State antitrust statutes or commission of embezzlement, theft, forgery, bribery, falsification or destruction of records, making false statements, or receiving stolen property, 2 CFR 180.800;

(3) Are not presently indicted for or otherwise criminally or civilly charged by a governmental entity (Federal, State or local) with commission of any of the offenses enumerated in paragraph (a)(2) of this certification, 2 CFR 180.700 and 180.800; and

(4) Have not within a three-year period preceding this application/proposal had one or more public transactions (Federal, State or local) terminated for cause or default. 2 CFR 180.335(d).

(5) Are not a corporation that has been convicted of a felony violation under any Federal law within the two-year period preceding this proposal (USDOT Order 4200.6 implementing appropriations act requirements); and

(6) Are not a corporation with any unpaid Federal tax liability that has been assessed, for which all judicial and administrative remedies have been exhausted, or have lapsed, and that is not being paid in a timely manner pursuant to an agreement with the authority responsible for collecting the tax liability (USDOT Order 4200.6 implementing appropriations act requirements).

b. Where the prospective participant is unable to certify to any of the statements in this certification, such prospective participant should attach an explanation to this proposal. 2 CFR 180.335 and 180.340.

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**3. Instructions for Certification - Lower Tier Participants:**

(Applicable to all subcontracts, purchase orders, and other lower tier transactions requiring prior FHWA approval or estimated to cost \$25,000 or more - 2 CFR Parts 180 and 1200). 2 CFR 180.220 and 1200.220.

a. By signing and submitting this proposal, the prospective lower tier participant is providing the certification set out below.

b. The certification in this clause is a material representation of fact upon which reliance was placed when this transaction was entered into. If it is later determined that the prospective lower tier participant knowingly rendered an erroneous certification, in addition to other remedies available to the Federal Government, the department, or agency with which

this transaction originated may pursue available remedies, including suspension and/or debarment.

c. The prospective lower tier participant shall provide immediate written notice to the person to which this proposal is submitted if at any time the prospective lower tier participant learns that its certification was erroneous by reason of changed circumstances. 2 CFR 180.365.

d. The terms "covered transaction," "debarred," "suspended," "ineligible," "participant," "person," "principal," and "voluntarily excluded," as used in this clause, are defined in 2 CFR Parts 180, Subpart I, 180.900 – 180.1020, and 1200. You may contact the person to which this proposal is submitted for assistance in obtaining a copy of those regulations. "First Tier Covered Transactions" refers to any covered transaction between a recipient or subrecipient of Federal funds and a participant (such as the prime or general contract). "Lower Tier Covered Transactions" refers to any covered transaction under a First Tier Covered Transaction (such as subcontracts). "First Tier Participant" refers to the participant who has entered into a covered transaction with a recipient or subrecipient of Federal funds (such as the prime or general contractor). "Lower Tier Participant" refers any participant who has entered into a covered transaction with a First Tier Participant or other Lower Tier Participants (such as subcontractors and suppliers).

e. The prospective lower tier participant agrees by submitting this proposal that, should the proposed covered transaction be entered into, it shall not knowingly enter into any lower tier covered transaction with a person who is debarred, suspended, declared ineligible, or voluntarily excluded from participation in this covered transaction, unless authorized by the department or agency with which this transaction originated. 2 CFR 1200.220 and 1200.332.

f. The prospective lower tier participant further agrees by submitting this proposal that it will include this clause titled "Certification Regarding Debarment, Suspension, Ineligibility and Voluntary Exclusion-Lower Tier Covered Transaction," without modification, in all lower tier covered transactions and in all solicitations for lower tier covered transactions exceeding the \$25,000 threshold. 2 CFR 180.220 and 1200.220.

g. A participant in a covered transaction may rely upon a certification of a prospective participant in a lower tier covered transaction that is not debarred, suspended, ineligible, or voluntarily excluded from the covered transaction, unless it knows that the certification is erroneous. A participant is responsible for ensuring that its principals are not suspended, debarred, or otherwise ineligible to participate in covered transactions. To verify the eligibility of its principals, as well as the eligibility of any lower tier prospective participants, each participant may, but is not required to, check the System for Award Management website (<https://www.sam.gov/>), which is compiled by the General Services Administration. 2 CFR 180.300, 180.320, 180.330, and 180.335.

h. Nothing contained in the foregoing shall be construed to require establishment of a system of records in order to render in good faith the certification required by this clause. The knowledge and information of participant is not required to exceed that which is normally possessed by a prudent person in the ordinary course of business dealings.

i. Except for transactions authorized under paragraph e of these instructions, if a participant in a covered transaction knowingly enters into a lower tier covered transaction with a person who is suspended, debarred, ineligible, or voluntarily

excluded from participation in this transaction, in addition to other remedies available to the Federal Government, the department or agency with which this transaction originated may pursue available remedies, including suspension and/or debarment. 2 CFR 180.325.

\* \* \* \* \*

#### **4. Certification Regarding Debarment, Suspension, Ineligibility and Voluntary Exclusion--Lower Tier Participants:**

a. The prospective lower tier participant certifies, by submission of this proposal, that neither it nor its principals:

(1) is presently debarred, suspended, proposed for debarment, declared ineligible, or voluntarily excluded from participating in covered transactions by any Federal department or agency, 2 CFR 180.355;

(2) is a corporation that has been convicted of a felony violation under any Federal law within the two-year period preceding this proposal (USDOT Order 4200.6 implementing appropriations act requirements); and

(3) is a corporation with any unpaid Federal tax liability that has been assessed, for which all judicial and administrative remedies have been exhausted, or have lapsed, and that is not being paid in a timely manner pursuant to an agreement with the authority responsible for collecting the tax liability. (USDOT Order 4200.6 implementing appropriations act requirements)

b. Where the prospective lower tier participant is unable to certify to any of the statements in this certification, such prospective participant should attach an explanation to this proposal.

\* \* \* \* \*

#### **XI. CERTIFICATION REGARDING USE OF CONTRACT FUNDS FOR LOBBYING**

This provision is applicable to all Federal-aid construction contracts and to all related subcontracts which exceed \$100,000. 49 CFR Part 20, App. A.

1. The prospective participant certifies, by signing and submitting this bid or proposal, to the best of his or her knowledge and belief, that:

a. No Federal appropriated funds have been paid or will be paid, by or on behalf of the undersigned, to any person for influencing or attempting to influence an officer or employee of any Federal agency, a Member of Congress, an officer or employee of Congress, or an employee of a Member of Congress in connection with the awarding of any Federal contract, the making of any Federal grant, the making of any Federal loan, the entering into of any cooperative agreement, and the extension, continuation, renewal, amendment, or modification of any Federal contract, grant, loan, or cooperative agreement.

b. If any funds other than Federal appropriated funds have been paid or will be paid to any person for influencing or attempting to influence an officer or employee of any Federal agency, a Member of Congress, an officer or employee of Congress, or an employee of a Member of Congress in connection with this Federal contract, grant, loan, or

cooperative agreement, the undersigned shall complete and submit Standard Form-LLL, "Disclosure Form to Report Lobbying," in accordance with its instructions.

2. This certification is a material representation of fact upon which reliance was placed when this transaction was made or entered into. Submission of this certification is a prerequisite for making or entering into this transaction imposed by 31 U.S.C. 1352. Any person who fails to file the required certification shall be subject to a civil penalty of not less than \$10,000 and not more than \$100,000 for each such failure.

3. The prospective participant also agrees by submitting its bid or proposal that the participant shall require that the language of this certification be included in all lower tier subcontracts, which exceed \$100,000 and that all such recipients shall certify and disclose accordingly.

#### **XII. USE OF UNITED STATES-FLAG VESSELS:**

This provision is applicable to all Federal-aid construction contracts, design-build contracts, subcontracts, lower-tier subcontracts, purchase orders, lease agreements, or any other covered transaction. 46 CFR Part 381.

This requirement applies to material or equipment that is acquired for a specific Federal-aid highway project. 46 CFR 381.7. It is not applicable to goods or materials that come into inventories independent of an FHWA funded-contract.

When oceanic shipments (or shipments across the Great Lakes) are necessary for materials or equipment acquired for a specific Federal-aid construction project, the bidder, proposer, contractor, subcontractor, or vendor agrees:

1. To utilize privately owned United States-flag commercial vessels to ship at least 50 percent of the gross tonnage (computed separately for dry bulk carriers, dry cargo liners, and tankers) involved, whenever shipping any equipment, material, or commodities pursuant to this contract, to the extent such vessels are available at fair and reasonable rates for United States-flag commercial vessels. 46 CFR 381.7.

2. To furnish within 20 days following the date of loading for shipments originating within the United States or within 30 working days following the date of loading for shipments originating outside the United States, a legible copy of a rated, 'on-board' commercial ocean bill-of-lading in English for each shipment of cargo described in paragraph (b)(1) of this section to both the Contracting Officer (through the prime contractor in the case of subcontractor bills-of-lading) and to the Office of Cargo and Commercial Sealift (MAR-620), Maritime Administration, Washington, DC 20590. (MARAD requires copies of the ocean carrier's (master) bills of lading, certified onboard, dated, with rates and charges. These bills of lading may contain business sensitive information and therefore may be submitted directly to MARAD by the Ocean Transportation Intermediary on behalf of the contractor). 46 CFR 381.7.



**ATTACHMENT A - EMPLOYMENT AND MATERIALS  
PREFERENCE FOR APPALACHIAN DEVELOPMENT  
HIGHWAY SYSTEM OR APPALACHIAN LOCAL ACCESS  
ROAD CONTRACTS (23 CFR 633, Subpart B, Appendix B)**

This provision is applicable to all Federal-aid projects funded under the Appalachian Regional Development Act of 1965.

1. During the performance of this contract, the contractor undertaking to do work which is, or reasonably may be, done as on-site work, shall give preference to qualified persons who regularly reside in the labor area as designated by the DOL wherein the contract work is situated, or the subregion, or the Appalachian counties of the State wherein the contract work is situated, except:

a. To the extent that qualified persons regularly residing in the area are not available.

b. For the reasonable needs of the contractor to employ supervisory or specially experienced personnel necessary to assure an efficient execution of the contract work.

c. For the obligation of the contractor to offer employment to present or former employees as the result of a lawful collective bargaining contract, provided that the number of nonresident persons employed under this subparagraph (1c) shall not exceed 20 percent of the total number of employees employed by the contractor on the contract work, except as provided in subparagraph (4) below.

2. The contractor shall place a job order with the State Employment Service indicating (a) the classifications of the laborers, mechanics and other employees required to perform the contract work, (b) the number of employees required in each classification, (c) the date on which the participant estimates such employees will be required, and (d) any other pertinent information required by the State Employment Service to complete the job order form. The job order may be placed with the State Employment Service in writing or by telephone. If during the course of the contract work, the information submitted by the contractor in the original job order is substantially modified, the participant shall promptly notify the State Employment Service.

3. The contractor shall give full consideration to all qualified job applicants referred to him by the State Employment Service. The contractor is not required to grant employment to any job applicants who, in his opinion, are not qualified to perform the classification of work required.

4. If, within one week following the placing of a job order by the contractor with the State Employment Service, the State Employment Service is unable to refer any qualified job applicants to the contractor, or less than the number requested, the State Employment Service will forward a certificate to the contractor indicating the unavailability of applicants. Such certificate shall be made a part of the contractor's permanent project records. Upon receipt of this certificate, the contractor may employ persons who do not normally reside in the labor area to fill positions covered by the certificate, notwithstanding the provisions of subparagraph (1c) above.

5. The provisions of 23 CFR 633.207(e) allow the contracting agency to provide a contractual preference for the use of mineral resource materials native to the Appalachian region.

6. The contractor shall include the provisions of Sections 1 through 4 of this Attachment A in every subcontract for work which is, or reasonably may be, done as on-site work.

## **GENERAL PROVISIONS**

### **1. Failure to Execute Contract**

Failure of the lowest responsible and responsive bidder to execute the Contract and provide all acceptable bonds and documents as required by the Contract Documents as provided herein within ten (10) calendar days after such bidder has received the Contract for execution shall be just cause for the annulment of the award and the forfeiture of the bid security. This period of time shall be subject to extension for such further period as may be agreed upon in writing between the City and Bidder concerned.

### **2. Contractor's Insurance**

Contractor will procure and maintain for the duration of the contract, insurance against claims for injuries to persons or damages to property which may arise from or in connection with the performance of the work hereunder and the results of that work by the Contractor, its/his agents, representatives, employees or subcontractors.

#### **A. CERTIFICATE REQUIREMENTS**

The City will be issued a Certificate of Insurance (a Memorandum of Understanding will not be accepted) with the following minimum requirements:

- Certificate(s) will show current policy number(s) and effective dates,
- Coverage and policy limits will meet, or exceed, requirements below,
- The Certificate Holder will be City of Santa Cruz, Risk Management, 1200 Pacific Avenue, Suite 290, Santa Cruz, CA 95060,
- Certificate will be signed by an authorized representative,
- An endorsement will be provided to show the City, its officers, officials, employees, agents, but not limited to its design engineers and volunteers as additional insureds.
- Coverage must be maintained during the term of the Agreement with the City, unless a longer duration is required.

#### **B. MINIMUM SCOPE AND LIMITS OF INSURANCE**

Contractor acknowledges that the insurance coverage and policy limits set forth in this section constitute the minimum amount of coverage required. If Contractor maintains a broader insurance coverage and/or higher limits than the minimums shown below, the City of Santa Cruz requires and shall be entitled to the broader insurance and/or limits maintained by the Contractor. Any available insurance proceeds in excess of the specified minimum limits of insurance and coverage shall be available to the City of Santa Cruz.

Coverage will be at least as broad as:

- MARINE GENERAL LIABILITY (MGL) OR COMMERCIAL GENERAL LIABILITY (CGL):  
\$10,000,000 PER OCCURRENCE; \$15,000,000 AGGREGATE  
Proof of coverage for \$10 Million per occurrence with no waterborne exclusions including Contractual Liability; Products and Completed Operations, Property Damage, Bodily Injury, Personal and Advertising Injury; Terminal

MURRAY STREET BRIDGE AT THE SMALL CRAFT HARBOR, SEISMIC  
RETROFIT/BARRIER REPLACEMENT, CITY PROJECT NO. C409321, FEDERAL NO.  
PROJECT NO. STPLZ 5025(084)



Operators/Wharfingers Liability; Sudden and Accidental Pollution; US Longshoreman & Harbor Workers; and Maritime Employers Liability. If a general aggregate limit applies, either the general aggregate limit will apply separately to this project or the general aggregate limit will be at least twice the required occurrence limit.

- VESSEL HULL & MACHINERY, PROTECTION & INDEMNITY, VESSEL POLLUTION LIABILITY: Proof of coverage including coverage for Bodily Injury and Property Damage; Premises Liability; Contractual Liability; Products and Completed Operations; Sudden & Accidental Pollution on an “occurrence” basis with limits of no less than Five Millions Dollars (\$5,000,000) per occurrence. If a general aggregate limit applies, either the general aggregate limit will apply separately to this project or the general aggregate limit will be at least twice the required occurrence limit.
- AUTOMOBILE LIABILITY: Proof of coverage for \$1,000,000 provided on ISO Form Number CA 00 01 covering any auto (Code 1), or if Contractor has no owned autos, hired, (Code 8) and non-owned autos (Code 9), per accident for bodily injury and property damage.
- WORKERS’ COMPENSATION AS REQUIRED BY THE STATE OF CALIFORNIA, WITH STATUTORY LIMITS, AND EMPLOYER’S LIABILITY INSURANCE: \$1,000,000 per accident for bodily injury or disease.  
The Worker’s Compensation policy must be **endorsed** with a waiver of subrogation in favor of the City for all work performed by the Contractor and its employees.

Contractor is required to be insured for coverage for benefits under the United States Longshoreman’s and Harbor Workers’ Compensation Act and the Jones Act for any work on, over, or near any navigable waters. Contractors is required to be insured for coverage for benefits under Marine Employers Liability.

- CONTRACTORS POLLUTION LIABILITY and/or ASBESTOS POLLUTION LIABILITY (CPL) (if project involves environmental hazards) with limits no less than \$2,000,000 per occurrence or claim, and \$4,000,000 policy aggregate.
  1. If the services involve lead-based paint or asbestos identification / remediation, the Pollution Liability shall not contain lead-based paint or asbestos exclusions. If the services involve mold identification / remediation, the Pollution Liability shall not contain a mold exclusion and the definition of “Pollution” shall include microbial matter including mold.
  2. The Automobile Liability policy shall be **endorsed** to include **Transportation Pollution Liability** insurance, covering hazardous materials to be transported by Contractor pursuant to the Agreement. This coverage may also be provided on the Contractors Pollution Liability policy.
- BUILDER’S RISK (Course of Construction) insurance utilizing an “All Risk” (Special Perils) coverage form, with limits equal to the completed value of the project and no coinsurance penalty provisions.

### C. OTHER INSURANCE PROVISIONS

The insurance policies are to comply with the following provisions:

- **ADDITIONAL INSURED STATUS**  
The City, its officers, officials, employees, agents, design consultants, and volunteers are to be covered as additional insureds on the CGL, CPL and automobile insurance (if transporting hazardous materials) policies with respect to liability arising out of work or operations performed by or on behalf of Contractor including materials, parts, or equipment furnished in connection with such work or operations. General liability coverage will be provided in the form of an **endorsement** to Contractor's insurance at least as broad as ISO Form CG 20 10 11 85, or if not available, through the addition of **both** CG 20 10 CG 20 26, CG 20 33, or CG 20 38; **and** CG 20 37 (if a later edition is used).
- **PRIMARY COVERAGE**  
For any claims related to this Agreement, Contractor's insurance coverage will be **primary** insurance as respects the City, its officers, officials, employees, agents, design consultants, and volunteers. Any insurance or self-insurance maintained by the City, its officers, officials, employees, agents, design consultants, or volunteers will be excess of Contractor's insurance and will not contribute with it.
- **NOTICE OF CANCELLATION**  
Each insurance policy required above shall state that the coverage shall not be canceled, except with notice to the City.
- **WAIVER OF SUBROGATION**  
Contractor hereby grants to the City a waiver of any right to subrogation, except as otherwise not applicable, which any insurer of said Contractor may acquire against the City by virtue of the payment of any loss, including attorney's fees under such insurance. Contractor agrees to obtain any endorsement that may be necessary to effectuate this waiver of subrogation, but this provision applies regardless of whether or not the City has received a waiver of subrogation endorsement from the insurer.
- **EXCESS LIABILITY/UMBRELLA INSURANCE POLICIES**  
The excess/liability policies will provide similar coverage as the primary CGL policy with no new exclusions - Excess liability insurance must **follow form** the terms, conditions, definitions, and exclusions of the underlying CGL insurance. The excess/umbrella policy must also be written on a primary and noncontributory basis for an additional insured, and that it will apply before any other insurance that is available to such additional insured which covers that person or organization as a named insured, and we will not share with that other insurance.  
  
The policy regarding Limits of Insurance regarding Aggregates must provide that the aggregate limits if applicable shall apply in the same manner as the aggregate limits shown in the Schedule of the Underlying Insurance.
- **SELF-INSURED RETENTIONS**  
Self-insured retentions must be declared to and approved by the City. City may require Contractor to purchase coverage with a lower retention or provide proof of ability to pay losses and related expenses. The policy language shall provide, or

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RETROFIT/BARRIER REPLACEMENT, CITY PROJECT NO. C409321, FEDERAL NO.  
PROJECT NO. STPLZ 5025(084)

be endorsed to provide, that the self-insured retention may be satisfied by either the named insured or City.

- **ACCEPTABILITY OF INSURERS**  
Insurance is to be placed with insurers with a current A.M. Best's rating of no less than A: VII, unless otherwise acceptable to the City.
- **BUILDER'S RISK (COURSE OF CONSTRUCTION) INSURANCE**  
Contractor may submit evidence of Builder's Risk insurance in the form of Course of Construction coverage. Such coverage shall **name the City as a loss payee** as their interest may appear.
- **CLAIMS MADE POLICIES**  
If any of the required policies provide coverage on a claims-made basis:
  1. The Retroactive Date must be shown and must be before the date of the contract or the beginning of contract work.
  2. Insurance must be maintained and evidence of insurance must be provided for at least five (5) years after completion of the contract of work.
  3. If coverage is canceled or non-renewed, and not *replaced with another claims-made policy form with a Retroactive Date* prior to the contract effective date, the Contractor must purchase "extended reporting" coverage for a minimum of *five (5) years* after completion of contract work.
- **VERIFICATION OF COVERAGE**  
Contractor will furnish the City with original Certificates of Insurance including all required amendatory endorsements (or copies of the applicable policy language effecting coverage required by this clause) and a copy of the Declarations and Endorsement Page of the CGL,CPL, and Automobile Policies listing all policy endorsements to be approved by the City before work commences. However, failure to obtain the required documents prior to the work beginning will not waive the Contractor's obligation to provide them. The City reserves the right to require complete, certified copies of all required insurance policies, including endorsements required by these specifications, at any time.

#### **D. SUBCONTRACTORS**

Contractor shall include all Subcontractors as additional insureds under their policies or shall furnish separate certificates and endorsements for each Subcontractor not included as an additional insured. For each Subcontractor not included as an additional insured, Contractor shall require and verify that each such Subcontractor maintain insurance meeting all the requirements stated herein, and Contractor shall ensure that City is an additional insured on insurance required from Subcontractors.

#### **E. SPECIAL RISKS/CIRCUMSTANCES**

City reserves the right to modify these requirements, including limits, based on the nature of the risk, prior experience, insurer, coverage, or other special circumstances and provide notice to Contractor.

### 3. Claims

#### **A. DEFINITION OF "CLAIM".**

All provisions of California Public Contract Code Section 9204 are incorporated into and form an integral part of the Contract Documents for this Project. The City and Contractor comply with California Public Contract Code Section 9204 when applicable.

As used herein, the term "Claim" means a separate written demand or assertion by Contractor sent by registered mail or certified mail, with return receipt requested, for one or more of the following arising out of or related to the Contract Documents or the performance of the Work: (A) a time extension, including, without limitation, for relief from damages or penalties for delay assessed by the City under the Contract; (B) payment by the City of money or damages arising from work done by, or on behalf of, the Contractor pursuant to the Contract and payment for which is not otherwise expressly provided or to which the claimant is not otherwise entitled; (C) payment of an amount that is disputed by the City, as defined in Public Contract Code Section 9204(c).

A Claim does not include, and the procedures for processing of Contractor Claims do not apply to the following:

- (i) Claims respecting penalties for forfeitures prescribed by statute or regulation which a government agency is specifically authorized to administer, settle, or determine (other than penalties for delay assessed by the City under the Contract).
- (ii) Claims respecting personal injury, death, reimbursement, or other compensation arising out of or resulting from liability for personal injury or death.
- (iii) False claims liability under California Government Code Section 12650, et seq.
- (iv) Defects in the Work first discovered by City after final payment by City to Contractor.
- (v) Claims respecting stop notices.
- (vi) The right of City to specific performance or injunctive relief to compel performance of any provision of the Contract Documents or for other City claims against the Contractor.

#### **B. TIME PERIOD FOR SUBMISSION OF CLAIM.**

If a Claim involves an adjustment to the Contract Sum or to the Contract Time due to Extra Work, then the Claim arises upon issuance of a decision denying, in whole or in part, Contractor's Change Order Request. All other Claims arise when Contractor discovers, or should have discovered, the circumstances giving rise to the Claim (even if Contractor has not yet been damaged or delayed).

A Claim that does not involve an adjustment to the Contract Sum or Contract Time for Extra Work may be asserted if, and only if, Contractor gives written notice of intent to file the Claim to the City within five (5) calendar days of the date the Claim arises. A

written notice of intent to file a Claim shall be valid if, and only if, it identifies the event or condition giving rise to the Claim, states its probable effect, if any, with respect to Contractor's entitlement to an adjustment of the Contract Sum or Contract Time, and complies with the requirements of Section 3(C), below.

All Claims and supporting documentation and certifications must be filed as soon as possible, but no later than thirty (30) calendar days after the Claim arises. No Claims shall be filed after the final payment has been issued unless otherwise permitted by law.

**C. REASONABLE DOCUMENTATION.**

The Claim must include the following:

- (i) A statement that it is a Claim and a request for a decision on the Claim;
  - a. A detailed factual narrative of events fully describing the nature and circumstances giving rise to the Claim, including but not limited to, necessary dates, locations, and items of Work effected and reasonable documentation to support the Claim;
- (ii) A certification, executed by each Subcontractor claiming not less than 5% of the total monetary amount sought by the Claim, that the Subcontractor's portion of the Claim is filed in good faith.
- (iii) If the Claim involves an adjustment to the Contract Sum or Contract Time for Extra Work, a statement demonstrating that a Change Order Request was submitted in a timely manner as required by the Contract Documents. If the Claim does not involve an adjustment to the Contract Sum or Contract Time for Extra Work, a statement demonstrating that a notice of intent to file the Claim was submitted in a timely manner as required by the Contract Documents.
- (iv) A detailed justification for any remedy or relief sought by the Claim, including, without limitation:
  - a. A detailed cost breakdown in the form required for submittal of Change Order Requests, including an estimate of the costs incurred or to be incurred. To the extent costs have been incurred when the Claim is submitted, the Claim must include actual cost records (including, without limitation, payroll records, material and rental invoices, and the like) demonstrating that costs claimed have actually been incurred. To the extent costs have not yet been incurred at the time of Claim submittal, actual cost records must be submitted on a current basis not less than once a month during any periods costs are incurred.
  - b. Copies of actual job cost records demonstrating that the costs have been incurred.
  - c. If the Claim is based on an error, omission, conflict, or ambiguity in the Contract Documents: (1) a sworn statement by Contractor and any Subcontractors or Sub-subcontractors involved in the Claim, to the effect that the error, omission, conflict, or ambiguity was not discovered prior to submission of the Bid, or (2) if not discovered, a statement

demonstrating that the error, omission, conflict, or ambiguity could not have been discovered by Contractor, its Subcontractors or Sub-subcontractors in exercise of the degree of care required of them under the Contract Documents for review of the Bid Documents prior to submission of the Bid.

- (v) If the Claim involves a request for adjustment of the Contract Time, written documentation demonstrating that Contractor has complied with the requirements of the Contract Documents pertaining to proving the right to an extension of time and demonstrating that Contractor is entitled to an extension of time under the Contract Documents.
- (vi) A written certification signed by a responsible managing officer of Contractor's organization, who has the authority to sign subcontracts and purchase orders on behalf of Contractor and who has personally investigated and confirmed the truth and accuracy of the matters set forth in such certification, in the following form:

"I hereby certify under penalty of perjury under the laws of the State of California that I am a managing officer of (Contractor's name) and that I have reviewed the Claim presented herewith on Contractor's behalf and/or on behalf of (Subcontractor's/Sub-subcontractor's name(s)) and that the following statements are true and correct.

- a. The facts alleged in or that form the basis for the Claim are true and accurate.
- b. The Claim is submitted in good faith.
- c. The Change Order Request was timely submitted, as required by the Contract Documents.
- d. Contractor does not know of any facts or circumstances, not alleged in the Claim, that by reason of their not being alleged render any fact or statement alleged in the Claim materially misleading.
- e. Contractor has, with respect to any request for money or damages alleged in or that forms the basis for the Claim, reviewed the job cost records (including those maintained by Contractor and by any Subcontractor or Sub-subcontractor, of any Tier, that is asserting all or any portion of the Claim) and confirmed with reasonable certainty that the Losses or damages suffered by Contractor and/or such Subcontractor or Sub-subcontractor were in fact suffered in the amounts and for the reasons alleged in the Claim.
- f. Contractor has, with respect to any request for extension of time or claim of Delay, disruption, hindrance or interference alleged in or that forms the basis for the Claim, reviewed the job schedules (including those maintained by Contractor and by any Subcontractor or Sub-subcontractor, of any Tier, that is asserting all or any portion of the Claim) and confirmed on an event-by-event basis that the delays or disruption suffered by Contractor and /or such Subcontractor or Sub-subcontractor were in fact experienced for the



- durations, in the manner, and with the consequent effects on the time and/or sequence of performance of the Work, as alleged in the Claim; and.
- g. Contractor has not received payment from City for, nor has Contractor previously released City from, any portion of the Claim.

Signature: \_\_\_\_\_

Name: \_\_\_\_\_

Title: \_\_\_\_\_

Company: \_\_\_\_\_

Date: \_\_\_\_\_

**D. ASSERTION OF CLAIMS.**

- (i) Notwithstanding the making of any Claim or the existence of any dispute regarding any Claim, unless otherwise directed by City, Contractor shall not delay, slow, or stop performance of the Work, but shall diligently proceed with performance in accordance with the Contract Documents and City will continue to make payments as required by the Contract Documents.
- (ii) All Claims and supporting documentation must be sent to the City by registered mail or certified mail with return receipt requested.
- (iii) Strict compliance with these requirements is conditions precedent to Contractor's right to an informal conference to meet and confer to resolve a Claim, mediate a Claim, or arbitrate or litigate a Claim. The failure of Contractor to strictly comply with the requirements of this Section constitutes a failure by Contractor to exhaust its administrative remedies with the City, thereby denying any court or arbitration panel of jurisdiction to adjudicate the Claim.
- (iv) There shall be no waiver of any of the rights set forth in California Public Contract Code Section 9204; provided, however, that (i) upon receipt of a Claim, the parties may mutually agree to waive, in writing, mediation and proceed directly to the commencement of a civil action or binding arbitration, as applicable; and (ii) the City may prescribe reasonable Change Order, Claim, and Dispute Resolution Procedures and requirements in addition to the provisions of this section, so long as the contractual provisions do not conflict with or otherwise the timeframes and procedures set forth in Public Contract Code Section 9204.
- (v) The City's right to commence the Contract dispute resolution process shall arise at any time following the City's actual discovery of the circumstances giving rise to the dispute. Nothing herein shall preclude the City from asserting disputes in response to a Claim asserted by Contractor.

**E. DECISION OF CITY ON CLAIMS.**

- (i) Pursuant to Public Contracting Code section 9204(d), upon receipt of a Claim, the City shall conduct a reasonable review of the claim and, within 45 days, shall provide the Contractor a written statement identifying what portion of the Claim is disputed and what portion is undisputed. Upon receipt of the Claim, the Owner's

Representative, City, and Contractor may, by mutual agreement, extend the time period provided in this Section. If City determines that additional supporting data are necessary to fully evaluate a Claim, City will request such additional supporting data in writing. Such data shall be furnished by Contractor to City no later than 10 days after the date of such request. Any payment due to Contractor by City on an undisputed portion of the Claim shall be processed and made within 60 days after the written statement is issued.

- (ii) If the City needs approval from its governing body to provide the Contractor with a written statement identifying the disputed portion and the undisputed portion of the Claim, and the governing body does not meet within the forty-five (45) days or within the mutually agreed to extension of time following receipt of a Claim sent by registered mail or certified mail, return receipt requested, the City shall have up to three (3) days following the next duly publicly noticed meeting of the governing body after the forty-five (45) day period, or extension, expires to provide the Contractor a written statement identifying the disputed portion and the undisputed portion.
- (iii) Failure by the City to respond to a Claim from Contractor within the time periods described in this Section 3 and California Public Contract Code Section 9204 or to otherwise meet the time requirements shall result in the Claim being deemed rejected in its entirety. A Claim that is denied by reason of the City's failure to have responded to a Claim, or its failure to otherwise meet the time requirements of this Article 4.2 and California Public Contract Code Section 9204, shall not constitute an adverse finding with regard to the merits of the Claim or the responsibility or qualifications of the Contractor.
- (iv) Any payment due on an undisputed portion of the Claim shall be processed and made within 60 days after the City issues its written statement.
- (v) Amounts not paid in a timely manner as required by this Section shall bear interest at 7 percent per annum, pursuant to Public Contracting Code section 9204(d)(4).
- (vi) If a subcontractor or a lower tier subcontractor lacks standing to assert a Claim against the City because privity of contract does not exist, the Contractor may present to the City a Claim on behalf of a subcontractor or a lower tier subcontractor. A subcontractor may request in writing, either on its own behalf or on behalf of a lower tier subcontractor, that the Contractor present a Claim for work which has been performed by the subcontractor or lower tier subcontractor on behalf of the subcontractor. The subcontractor requesting the Claim be presented to the City shall furnish reasonable documentation supporting the Claim. Within 45 days of receipt of this written request, the Contractor shall notify the subcontractor in writing as to whether the Contractor presented the Claim to the City and, if the Contractor did not present the Claim, provide the subcontractor with a statement of the reasons for not having done so.

#### **F. MEET AND CONFER CONFERENCE.**

If the Contractor disputes the City's written response, or if the City fails to respond to a Claim issued pursuant to Section 3(E) within the time prescribed, the Contractor may



demand in writing an informal conference to meet and confer for settlement of the issue in dispute. Upon receipt of a demand in writing sent by registered mail or certified mail, return receipt requested, the City shall schedule a meet and confer conference within 30 days for settlement of the dispute.

#### **G. MEDIATION.**

- (i) Within ten (10) business days following the conclusion of the meet and confer conference, specified in Section 3(F), if the Claim or any portion of the Claim remains in dispute, the City shall provide the Contractor a written statement identifying the portion of the Claim that remains in dispute and the portion that is undisputed. Any payment due on an undisputed portion of the Claim shall be processed and made within sixty (60) days after the City issues its written statement. Any disputed portion of the Claim, as identified by the Contractor in writing, shall be submitted to nonbinding mediation, with the City and the Contractor sharing the associated costs equally. The City and the Contractor shall mutually agree to a mediator within ten (10) business days after the disputed portion of the Claim has been identified in writing. If the parties cannot agree upon a mediator, each party shall select a mediator and those mediators shall select a qualified neutral third party to mediate with regard to the disputed portion of the Claim. Each party shall bear the fees and costs charged by its respective mediator in connection with the selection of the neutral mediator. If mediation is unsuccessful, the parts of the Claim remaining in dispute shall be subject to applicable procedures outside this section.
- (ii) For purposes of this Section, mediation includes any nonbinding process, including, but not limited to, neutral evaluation, or a dispute review board, in which an independent third party or board assists the parties in dispute resolution through negotiation or by issuance of an evaluation. Any mediation utilized shall conform to the timeframes in this section.
- (iii) Unless otherwise agreed to by the City and the Contractor in writing, the mediation conducted pursuant to this section shall excuse any further obligation under Public Contract Code Section 20104.4 to mediate after litigation has been commenced.

#### **H. ARBITRATION AND LITIGATION.**

- (i) In the event mediation does not resolve the parties' dispute, the parties shall comply with the Arbitration provisions set forth in Public Contract Code Sections 10240 – 1024.13.
- (ii) Unless the City and Contractor otherwise agree in writing, the arbitration decision shall be binding upon the parties, made under and in accordance with the laws of the State of California, supported by substantial evidence, and in writing. If the total of all Claims or cross Claims submitted to arbitration is in excess of \$50,000, the award shall contain the basis for the decision, findings of fact, and conclusions of law. Any arbitration award shall be subject to confirmation, vacation, or correction under the procedures and on the grounds specified in the

California Code of Civil Procedure including without limitation Section 1296. The expenses and fees of the arbitrators and the administrative fees of the AAA shall be divided among the parties equally. Each party shall pay its own counsel fees, witness fees, and other expenses incurred for its own benefit.

- (iii) The City may, but is not required, to assert as a counterclaim any matter arising out of the claims asserted by Contractor in the arbitration. City's failure to assert any such counterclaim in an arbitration shall be without prejudice to the City's right to assert the counterclaim in litigation or other proceeding.
- (iv) Any litigation shall be filed in the Superior Court of the State of California for the County of Santa Cruz.

#### **I. WAIVER.**

A waiver of or failure by the City to enforce any requirement in this Section 3 in connection with any Claim shall not constitute a waiver of and shall not preclude the City from enforcing such requirements in connection with any other Claims.

The Contractor agrees and understands that no oral approval, either express or implied, of any Claim shall be binding upon the City unless and until such approval is ratified by execution of a written Change Order.

#### **4. Time of Completion**

Attention is directed to the provisions in Section 8 (Prosecution and Progress) of the Special Provisions and these General Conditions.

The Contractor shall promptly start the work and diligently prosecute the work to completion before the expiration of **750 working days** after the date of the Notice to Proceed.

Full compensation for any additional costs occasioned by compliance with the provisions in this section shall be considered as included in the prices paid for the various contract items of work and no additional compensation will be allowed therefore.

#### **5. Failure to Complete the Work on Time (Liquidated Damages)**

All time limits stated in the Contract Documents are of the essence. If the work is not completed by Contractor in the time specified in the Contract Documents, or within any period of extension authorized in writing by the City, it is understood that City will suffer damage; and it being impracticable and infeasible to determine the amount of actual damage, it is agreed that Contractor will pay the City, as fixed and liquidated damages, and not as a penalty, the sum of **Thirteen Thousand and Five Hundred (\$13,500)** dollars for each calendar day of delay until the work is completed and accepted, and Contractor and his/her surety will be liable for the amount thereof; provided, however, that Contractor shall not be charged liquidated damages because of any delays in the completion of the work due to unforeseeable causes beyond the control and without the fault or negligence of Contractor.

Contractor shall, within ten (10) days from the beginning of any such delay, notify City in writing of the cause of the delay; whereupon City shall ascertain the facts and the extent of

the delay and extend the time for completing the work when, in its judgment, the findings of fact justify such an extension. City's finding of fact thereon shall be final and conclusive on the parties hereto.

#### 6. Existing Facilities

Prospective bidders shall visit the work site and determine for themselves the existing conditions at the Project site, including location of utilities. The Contractor shall take precaution so as to avoid damaging existing public facilities and private improvements.

In accordance with California Government Code Section 4215, the City assumes the responsibility for the timely removal, relocation, or protection of existing main or trunk line utility facilities located on the Project site if such utilities are not identified in the plans and specifications made a part of the invitation for bids. The City will compensate the Contractor for the costs of locating, repairing damage not due to the Contractor's failure to exercise reasonable care, and removing or relocating existing main or trunk line utility facilities located at the Project site and not identified with reasonable accuracy in plans and specifications made a part of the invitation for bids. The City will also compensate the Contractor for the cost of equipment on the Project necessarily idled during such work. The Contractor will not be assessed liquidated damages for delay in completion of the project, when such delay was caused by the City's or utility owner's failure to provide for removal or relocation of such main or trunk line utility facilities.

Nothing in this provision or the Contract Documents will be deemed to require the City to indicate the presence of existing service laterals or appurtenances whenever the presence of such utilities on the Work site can be inferred from the presence of other visible facilities, such as buildings, meter, and junction boxes, on or adjacent to the Project site; provided, however, that nothing in this provision or the Contract Documents shall relieve the City from identifying main or trunk lines in the plans and specifications made a part of the invitation for bids.

Nothing in this provision or the Contract Documents will preclude the City from pursuing any appropriate remedy against the utility for delays which are the responsibility of the utility.

Nothing in this provision or the Contract Documents will be construed to relieve the utility from any obligation as required either by law or by contract to pay the cost of removal or relocation of existing utility facilities.

If the Contractor while performing the Work discovers utility facilities not identified by the City in the plans and specifications made a part of the invitation for bids, the Contractor must immediately notify the City and utility in writing.

Either the City or the utility, whichever owns existing main or trunk line utility facilities located on the Work site, shall have sole discretion to effect repairs or relocation work or to permit the Contractor to perform such repairs or relocation work at a reasonable price

The Contractor will be required to work around public utility facilities that are to remain in place within the construction area or that are to be relocated and relocation operations  
MURRAY STREET BRIDGE AT THE SMALL CRAFT HARBOR, SEISMIC  
RETROFIT/BARRIER REPLACEMENT, CITY PROJECT NO. C409321, FEDERAL NO.  
PROJECT NO. STPLZ 5025(084)

have not been completed, and the Contractor will be held liable to the owners of such facilities for any damage or interference with service resulting from his/her operations.

The exact locations of underground facilities and improvements within the construction area shall be ascertained by the Contractor before using equipment that may damage or interfere with service resulting from the Contractor's operations. It shall be the Contractor's responsibility to notify public utilities that the Contractor is working in the vicinity of their facilities.

Other forces may be engaged in moving or reconstructing utility facilities or maintaining service of utility facilities, and the Contractor shall cooperate with such forces and conduct the Contractor's operation in such a manner as to avoid unnecessary delay or hindrance to the work being performed by such other forces.

All underground utilities including but not limited to water service, sewer laterals, electrical service, and gas service broken or disturbed by the Contractor's crew will be replaced or repaired by the Contractor or Utility Company at the Contractor's expense.

The Contractor shall consult with utilities and notify them of any relocation or protection in sufficient time to allow the utilities to perform the work in a complete and orderly manner.

Water pollution control work and storm water pollution prevention work shall conform to Chapter 4 of the Best Management Practices Manual for the City's Storm Water Management Program available on the City of Santa Cruz website at: <http://www.cityofsantacruz.com/government/city-departments/public-works/stormwater/best-management-practices>.

The Contractor shall take all necessary precautions to prevent any leakage or sewage spills of any kind onto adjacent property, public or private roadway, drainage systems, and waterways. The Contractor shall be liable for any and all clean-up costs or any fines that may be levied including those by the Regional Water Quality Control Board (RWCQB) against the City, in the event that such leakage or spill occurs. The Contractor shall also be responsible for reporting any and all spill to the appropriate regulatory agencies, including the RWCQB and the Santa Cruz-County Health Department.

Full compensation for conforming to the requirements of **“WATER POLLUTION CONTROL”** including furnishing all labor, materials, equipment, tools, and incidentals shall be included in the various bid item prices and no additional compensation will be allowed.

#### 7. Maintenance and Clean-Up

Throughout the construction period, the Contractor shall keep the Project site in a neat and clean condition, shall dispose of any surplus materials in an approved manner off the site, and maintain proper housekeeping practices to the satisfaction of the Engineer.

When any material is to be disposed of outside of the easement or street or highway right-of-way, the Contractor shall first obtain written permission from the owner on whose property the disposal is to be made. Disposal must conform to grading ordinance of the

jurisdiction in which the Work is performed. Location of disposal sites shall be submitted to the Engineer for review and subject to his/her approval.

Upon completion of the Work, and prior to requesting final inspection, the Contractor shall thoroughly clean the site of the Work of all rubbish, excess materials, falsework, temporary structures, and equipment, and all portions of the Work shall be left in a neat and orderly condition. The final inspection, acceptance, and final payment will not be made until this has been accomplished.

#### 8. State of California Department of Transportation Standard Specifications

All Work under the Contract shall conform to the applicable requirements of the 2018 State of California Department of Transportation Standard Specifications and Revised Standard Specifications dated April 16, 2021, both documents being included in Supplemental Project Information. Said State Specifications are to be considered an integral part of the specifications for all purposes related to this Contract.

Definitions of terms not defined in City Standard Specifications shall be as defined in the 2018 State Standard Specifications, included as supplemental project information.

#### 9. Notification of Project Commencement

The Contractor shall notify the City Engineer at least five (5) business days prior to mobilizing to the Project site.

#### 10. Project Schedule

The Contractor shall prepare a project schedule and submit it to the Engineer for his/her review and approval five (5) days prior to the beginning of the Work. Work shall be conducted between the hours of **8AM and 6 PM**, Monday to Friday, except with the permission of the Director, except in case of any emergency and in accordance with CDFW permit requirements stating:

Conduct Work During Daylight Hours. Unless otherwise authorized in writing by CDFW, contractor shall terminate all project activities covered under agreement with CDFW 30 minutes before sunset and shall not resume until 30 minutes after sunrise as established by the U.S. Naval Observatory Astronomical Applications Department. This sunrise and sunset data is available at:

[Table of Sunrise/Sunset, Moonrise/Moonset, or Twilight Times for an Entire Year \(navy.mil\)](http://www.navy.mil)

In-water work windows occur from June 15 through October 15 as described in the project permits.

#### 11. Progress and Final Payment

Progress and final payments will be made in accordance with Section 9 of the Standard Specifications, except as herein modified.

Payments are made every two weeks by the City Finance Department. The Contractor may receive partial payments only once for any month. A listing of payment cut-off dates is available upon request.

12. Extra Work

Extra work shall conform to the provisions in Section 9 of the California Standard Specifications and to these General Provisions.

Any alleged extra work or delays shall be given in writing within 24 hours of any occurrence to the Project Engineer or Inspector. The Contractor shall submit to the Project Engineer or Inspector an extra work report for each day the extra work is performed. The report shall be submitted prior to the start of work the following day. The report shall include: (1) a description of the extra work; (2) the quantity, classification, and working hours of the extra work labor force; (3) the type of equipment, code number, and hours of operation of the equipment towards extra work; and (4) the quantity and type of materials used for extra work.

13. This section intentionally omitted

14. This section intentionally omitted

15. Trenching Requirements

Pursuant to Labor Code Section 6705 and these General Conditions, before the excavation of any trench or trenches five (5) feet or more in depth, where the estimated contract expenditure is twenty-five thousand dollars (\$25,000) or more, the Contractor shall submit a detailed plan showing the design of shoring, bracing, sloping, or other provisions to be made for worker protection from the hazard of caving ground during the excavation of such trench or trenches. If such plan varies from the shoring system standards, established by the Construction Safety Orders, the plan shall be prepared by a registered civil or structural engineer. No excavation shall be started until said plan has been approved by the City Engineer. When the estimated contract expenditure is less than twenty-five thousand dollars (\$25,000) the above-mentioned shoring plan may be required at the discretion of the City Engineer prior to or during the course of construction.

Pursuant to Public Contract Code Section 7104, for any project which involves digging trenches or other excavations that extend deeper than four (4) feet:

1. The Contractor shall promptly, and before the following conditions are disturbed, notify the local public entity, in writing, of any:
  - a. Material that the Contractor believes may be hazardous waste material, as defined in Section 25117 of the Health and Safety Code, that is required to be removed to a Class I, Class II, or Class III disposal site in accordance with provisions of existing law;



- b. Subsurface or latent physical conditions at the site differing from those indicated by information about the site made available to bidders prior to the deadline for submitting bids.
  - c. Unknown physical conditions at the site of any unusual nature, different materially from those ordinarily encountered and generally recognized as inherent in work of the character provided for in the Contract.
2. The City shall promptly investigate the conditions, and if it finds that the conditions do materially so differ, or do involve hazardous waste, and cause a decrease or increase in the Contractor's cost of, or the time required for, performance of any part of the Work shall issue a change order under the procedures described in the Contract.
3. In the event that a dispute arises between the City and the Contractor whether the conditions materially differ, or involve hazardous waste, or cause a decrease or increase in the Contractor's cost of, or time required for, performance of any part of the Work, the Contractor shall not be excused from any scheduled completion date provided for by the Contract, but shall proceed with all Work to be performed under the Contract. The Contractor shall retain any and all rights provided either by contract or by law which pertain to the resolution of disputes and protests between the parties.

#### 16. Third Party Claims

Both parties shall timely notify the other of the receipt of any third-party claim relating to the Contract or Project. The City shall be entitled to recover its reasonable costs incurred in providing such notice.

#### 17. Force Majeure

Neither party hereto shall be considered in default in the performance of its obligation hereunder to the extent that the performance of any such obligation is prevented or delayed by an act of God, natural disaster, pandemic, acts of terrorism, war, or other peril, which is beyond the reasonable control of the affected party and without the negligence of the respective Parties. Each party hereto shall give notice promptly to the other of the nature and extent of any Force Majeure claimed to delay, hinder, or prevent performance of the services under this Agreement. Each Party will, however, make all reasonable efforts to remove or eliminate such a cause of delay or default and will, upon the cessation of the cause, diligently pursue performance of its obligations in this Contract.

#### 18. Contractor Not an Agent

Except as City may specify in writing, Contractor shall have no authority, express or implied, to act on behalf of City in any capacity whatsoever as an agent. Contractor shall have no authority, express or implied, pursuant to this Contract to bind City to any obligation whatsoever.

## 19. Conflicts of Interest

Contractor owes City a duty of undivided loyalty in performing the Work and services under this Contract. Contractor covenants (on behalf of Contractor and its employees, agents, representatives, and subcontractors) that there is no direct or indirect interest, financial or otherwise, which would conflict in any manner or degree with the performance of services required under this Contract. Contractor acknowledges and agrees to comply with applicable provisions of conflict of interest law and regulations, including the Political Reform Act, Section 1090 of the Government Code, and the City's conflict of interest code. Contractor will immediately advise City if Contractor learns of a conflicting financial interest of Contractor during the term of this Contract.

## 20. City Property

Unless otherwise provided herein, Contractor agrees that all copyrights which arise from creation of Project-related documents and materials pursuant to this Agreement shall be vested in the City and Contractor waives and relinquishes all claims to copyright or other intellectual property rights in favor of City. Any work product related to this Contract shall be confidential, not to be used by the Contractor on other projects or disclosed to any third party, except by agreement in writing by the City, or except as otherwise provided herein.

## 21. Equal Employment Opportunity/Non-Discrimination Policies

City's policies promote a working environment free from abusive conduct, discrimination, harassment, and retaliation; and require equal opportunity in employment for all regardless of race, religious creed (including religious dress and grooming practices), color, national origin (including language use restrictions), ancestry, religion, disability (mental and physical), medical condition, sex, gender (including gender identity and gender expression), physical characteristics, marital status, age, sexual orientation, genetic information (including family health history and genetic test results), organizational affiliation, and military or veteran status, or any other consideration made unlawful by local, State or Federal law. Contractor must comply with all applicable Federal and State and local equal employment opportunity laws and regulations, and Contractor is responsible for ensuring that effective policies and procedures concerning the prevention of abusive conduct, discrimination, harassment, and retaliation exist in Contractor's business organization. The City's current Equal Employment Opportunity and Non-Discrimination policies to which this Section applies may be viewed at:

<http://www.codepublishing.com/CA/SantaCruz/?SantaCruz09/SantaCruz0983.html> and  
<http://www.cityofsantacruz.com/home/showdocument?id=59192>.

## 22. Termination

### A. City May Terminate for Cause

The occurrence of any one or more of the following events will constitute a default by Contractor and justify termination for cause:



- Contractor's persistent failure to perform the Work in accordance with the Contract Documents (including, but not limited to, failure to supply sufficient skilled workers or suitable materials or equipment, or failure to adhere to the Progress Schedule);
- Failure of Contractor to perform or otherwise comply with a term of the Contract Documents;
- Contractor's disregard of Laws or Regulations of any public body having jurisdiction; or Contractor's repeated disregard of the authority of City or Engineer.

If one or more of the events identified above occurs, then after giving Contractor (and any surety) at least fourteen (14) calendar days' written notice of City's intent to terminate the Contract, City may proceed to:

- declare Contractor to be in default, and give Contractor (and any surety) written notice that the Contract is terminated; and
- enforce the rights available to City under any applicable performance bond.

Subject to the terms and operation of any applicable performance bond, if City has terminated the Contract for cause, City may exclude Contractor from the Site, take possession of the Work and all materials and equipment stored at the Site for which City has paid Contractor, including materials and equipment stored elsewhere, and complete the Work as City may deem expedient.

City may proceed with termination of the Contract under this Section, unless Contractor within seven (7) days of the date of the notice of intent to terminate begins to correct Contractor's failure to perform and proceeds diligently to cure such failure.

If the contract is terminated as provided herein, Contractor shall not be entitled to receive any further payment. If the unpaid balance of the Contract Price exceeds the cost to complete the Work, including all related claims, costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals) sustained by City, such excess will be paid to Contractor. If the cost to complete the Work including such related claims, costs, losses, and damages exceeds such unpaid balance, Contractor shall pay the difference to City within thirty (30) calendar days of City's invoice to Contractor. Such claims, costs, losses, and damages incurred by City will be reviewed as to reasonableness. When exercising any rights or remedies under this paragraph, City shall not be required to obtain the lowest price for the Work performed.

Where Contractor's services have been so terminated by City, the termination will not affect any rights or remedies of City against Contractor then existing or which may thereafter accrue, or any rights or remedies of City against Contractor or any surety under any payment bond or performance bond. Any retention or payment of money due Contractor by City will not release Contractor from liability.

#### B. City May Terminate for Convenience

Upon fourteen (14) calendar days' written notice to Contractor, the City may, without cause and without prejudice to any other right or remedy of City, terminate the Contract. In such case, Contractor shall submit a claim for payment including required certifications as required in the Contract Documents within six (6) months of the effective date of termination. Subject to verification to City's satisfaction, Contractor will be eligible to be paid for (without duplication of any items):

completed and acceptable Work executed in accordance with the Contract Documents prior to the effective date of termination;

expenses sustained prior to the effective date of termination in performing services and furnishing labor, materials, or equipment as required by the Contract Documents in connection with uncompleted Work; and

other reasonable expenses directly attributable to termination, including costs incurred to prepare a termination for convenience cost proposal.

City shall not be liable for costs incurred by Contractor, or any Subcontractor or supplier, after receipt of a notice of termination.

City shall deduct from Contractor any advance payments made to Contractor related to the terminated portion of the Contract Documents, any claim which City may have against Contractor in connection with the Contract Documents, and any other applicable costs.

#### C. Contractor May Stop Work or Terminate

If, through no act or fault of Contractor, or Subcontractor, or any employee or agent of Contractor or any Subcontractor, (1) the Work is suspended for more than 180 consecutive days by City or under an order of court or other public authority, or (2) the City fails to act on an application for payment within 30 days after it is submitted by Contractor, or (3) City fails for sixty (60) calendar days to pay Contractor any undisputed sum finally determined to be due, then Contractor may, upon thirty (30) days' written notice to City, and provided City does not remedy such suspension or failure to cure within fourteen (14) days of the default, terminate the contract and recover payment for Work actually performed.

In lieu of terminating the Contract and without prejudice to any other right or remedy, if City has failed to act on an application for payment by Contractor within thirty (30) days after it is submitted, or City has failed for sixty (60) days to pay Contractor any undisputed sum finally determined to be due, Contractor may, fourteen (14) days after written notice to City, stop the Work until payment is made of all such amounts due Contractor, including interest thereon. The provisions of this paragraph are not intended to preclude Contractor from submitting a Change Proposal for an adjustment in Contract Price or Contract Times or otherwise for expenses or damage directly attributable to Contractor's stopping the Work as permitted by this paragraph.

**[End of Section]**

# SPECIAL PROVISIONS

## ORGANIZATION

Special provisions are under headings that correspond with the main-section headings of the *2018 State Standard Specification*. A main-section heading is a heading shown in the table of contents of the *State Standard Specifications*.

Each special provision begins with a revision clause that describes or introduces a revision to the *2018 State Standard Specifications* as revised by any revised standard specification.

Any paragraph added or deleted by a revision clause does not change the paragraph numbering of the *2018 State Standard Specifications* for any other reference to a paragraph of the *2018 State Standard Specifications*.

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# DIVISION I GENERAL PROVISIONS

## 1 GENERAL

### Add to section 1-1.01:

#### Bid Items and Applicable Sections

Item code	Item description	Applicable section
100200 A	CONSTRUCTION STAKING	05
153001 A	REMOVE PEDESTRIAN BRIDGE	60
600133	RECONSTRUCT FENDER	15
731710	REMOVE CONCRETE CURB (LF)	15
770037 A	REMOVE PIPE (PLASTIC, STEEL OR PVC)	71
870206 A	AERATOR ASSEMBLY	15

### Add to Section 1-1.06:

SCCRTC: Santa Cruz County Regional Transportation Commission and its authorized representatives

SCWD: City of Santa Cruz Water Department

### Add the following after the first sentence of the definition of delay in Section 1-1.07B:

Up to 16 hours of delay per month is anticipated due to environmental-monitor-instructed work stoppages. Such work stoppages are considered as included in the original number of working days and thus shall not be considered as delays.

### Add to Section 1-1.07B:

City: City of Santa Cruz Public Works Department and its authorized representatives

Department: City of Santa Cruz Public Works Department and its authorized representatives

Port District: Santa Cruz Port District and its authorized representatives

Port Contractor: Contractor working for the Port District on dock reconstruction and other work

MURRAY STREET BRIDGE AT THE SMALL CRAFT HARBOR, SEISMIC RETROFIT/BARRIER REPLACEMENT, CITY PROJECT NO. C409321, FEDERAL NO. PROJECT NO. STPLZ 5025(084)



## 2 BIDDING

### Add between the 1st and 2nd paragraphs of section 2-1.06B:

The City makes the following supplemental project information available:

Means	Description
<p>Included in the <i>Information Handout</i> contained on CD or download from website</p>	<ol style="list-style-type: none"> <li>1. Caltrans Revised Standard Specifications (RSS) 04-16-21</li> <li>2. 2018 Entire Revised Standard Plans-260-sheets-April-2021</li> <li>3. Geotechnical Information               <ol style="list-style-type: none"> <li>3.1. Final Foundation Report dated July 2023</li> <li>3.2. Final Foundation Report for Earth Retaining Systems – RW9 dated July 2023</li> <li>3.3. Final Foundation Report for Pile Supported Retaining Walls</li> </ol> </li> <li>4. 2018 Caltrans Standard Plans</li> <li>5. Murray Bridge As built – Full Set</li> <li>6. As Built West Harbor Plaza Area</li> <li>7. Reconstruction of Boatyard, K and Rowing Docks Santa Cruz Harbor Tsunami Recovery June 1, 2014</li> <li>8. Santa Cruz-Water As-Built-Harbor</li> <li>9. Final Environmental Documents               <ol style="list-style-type: none"> <li>9.1. Initial Study - Final Nov 2007</li> <li>9.2. Initial Study Comments &amp; Responses FINAL 1-10-09</li> <li>9.3. Initial Study Addendum Final 2-27-09</li> <li>9.4. Essential Fish Habitat-Murray-FINAL City Signed 8-26-10</li> <li>9.5. USFWS Listed Species Update 08-03-10</li> <li>9.6. Mitigation Avoidance Measures Summary Rev 7-28-23</li> <li>9.7. Biological Assessment Murray FINAL City Signed 8-26-10</li> <li>9.8. Natural Environment Study – Murray- FINAL City Signed 8-26-10</li> <li>9.9. Murray Bridge MND Addendum FINAL 9-15-14</li> <li>9.10. Incidental Harassment Authorization Application 7-22-16</li> <li>9.11. Marine Wildlife Protection Plan (MWPP) 2023 4-7-23</li> <li>9.12. Hydroacoustic Monitoring Plan</li> <li>9.13. Environmental Commitments Record</li> </ol> </li> <li>10. Permits               <ol style="list-style-type: none"> <li>10.1. CDFW Lake or Streambed Alteration Agreement - 2014-0313 Final</li> <li>10.2. RWQCB 401 Water Quality Certification</li> <li>10.3. Coastal Development Permit signed 1/20/23</li> </ol> </li> </ol>

MURRAY STREET BRIDGE AT THE SMALL CRAFT HARBOR, SEISMIC RETROFIT/BARRIER REPLACEMENT, CITY PROJECT NO. C409321, FEDERAL NO. PROJECT NO. STPLZ 5025(084)

	<ul style="list-style-type: none"> <li>10.4. Incidental Harassment Authorization Year 1</li> <li>10.5. Incidental Harassment Authorization Year 2</li> <li>10.6. USACE 404 Permit</li> <li>10.7. Coast Guard Revocable License signed 4/27/22</li> <li>10.8. USFW BO 2-4-11</li> <li>11. Caltrans Structure Maintenance and Investigation Reports</li> <li>12. Water System Standard Specifications of the City of Santa Cruz</li> <li>13. Photos of West Harbor Facilities to be reconstructed</li> <li>14. C1-Bent 9 Sink Hole Repair</li> <li>15. Santa Cruz Small Craft Harbor Full Set Design Drawings 1962</li> <li>16. Santa Cruz Harbor Bridge Full Set-Repairs 1993</li> <li>17. 33 CFR § 118.160 - Vertical clearance gauges</li> </ul>
<p>Included in the <i>Information Handout</i> contained on CD or download from website (Continued)</p>	<ul style="list-style-type: none"> <li>18. Chapter 9.36 - City of Santa Cruz Noise Ordinance</li> <li>19. City of Santa Cruz Noise Ordinance No 2017-17</li> <li>20. Survey Monuments on Murray Street</li> <li>21. Lower West Harbor-Full Set</li> <li>22. Building SC Harbor G. Wagoner-Excerpt</li> <li>23. PG&amp;E Greenbook Manual</li> <li>24. F-10 E CLIFF TRANS (SSFM as-built)</li> <li>25. Port Documents <ul style="list-style-type: none"> <li>25.1. Wastewater Discharge Permit 2020-2023</li> <li>25.2. Storm Water Discharge Permit - 2015</li> <li>25.3. Storm Water Discharge Permit - 2018 Amendment</li> <li>25.4. Wastewater Discharge Permit GEN0093</li> <li>25.5. Santa Cruz Port District - Demolition and Reconstruction of "FF", "Sailing", &amp; "Rowing" Docks – Phase 1 Plans Part 1</li> <li>25.6. Santa Cruz Port District - Demolition and Reconstruction of "FF", "Sailing", &amp; "Rowing" Docks – Phase 1 Plans Part 2</li> <li>25.7. Santa Cruz Port District - Demolition and Reconstruction of "FF", "Sailing", &amp; "Rowing" Docks – Special Provisions</li> </ul> </li> <li>26. Response from Coast Guard 05-09-14</li> <li>27. Railroad Bridge Plans 1969</li> <li>28. Bulk Water &amp; Hydrant Meter Application &amp; Fees Handout</li> <li>29. County of Santa Cruz Design Criteria December 2022.pdf</li> <li>30. City of Santa Cruz Standard Construction Details</li> <li>31. Port Relocation Plan</li> </ul>

MURRAY STREET BRIDGE AT THE SMALL CRAFT HARBOR, SEISMIC RETROFIT/BARRIER REPLACEMENT, CITY PROJECT NO. C409321, FEDERAL NO. PROJECT NO. STPLZ 5025(084)

	<p>32. City of Santa Cruz Water System Standard Specifications Dec 2009</p> <p>33. Photo #1 of Aerator Starter</p> <p>34. Photo #2 of Aerator Starter</p> <p>35. Right of Way Agreements (9 files)</p> <p>36. Approved Utility Packages (3 files)</p> <p>37. CDP Adaptive Public Access Plan</p> <p>38. Caltrans 2018 Standard Specifications</p> <p>39. Fitzgerald Formliner – San Diego Dry Stack, #17911 Cutsheet</p> <p>40. Caltrans 2023 Standard Plans for Approach Slabs, B9-3 to B9-5</p> <p>41. Copy of Flow Data from Santa Cruz County Sanitation District</p> <p>42. PG&amp;E Gas Line Requirements</p> <p>43. Temporary Lighting Sample Fixture Cut Sheet</p> <p>44. Updated Flow Data from Santa Cruz County Sanitation District</p> <p>45. East Cliff Sewer Force Main As-built Plans – 1974</p> <p>46. City of Santa Cruz BMP Manual</p>
Included with the project plans	Log of Test Borings, sheets 1 through 10



**Replace Section 2-1.12 with:**

**2-1.12 DISADVANTAGED BUSINESS ENTERPRISES**

**2-1.12A General**

Section 2-1.12 applies to a federal-aid contract.

Under 49 CFR 26.13(b):

The contractor, sub recipient, or subcontractor shall not discriminate on the basis of race, color, national origin, or sex in the performance of this contract. The contractor shall carry out applicable requirements of 49 CFR part 26 in the award and administration of DOT-assisted contracts. Failure by the contractor to carry out these requirements is a material breach of this contract, which may result in the termination of this contract or such other remedy as the recipient deems appropriate, which may include, but is not limited to:

- (1) Withholding monthly progress payments;
- (2) Assessing sanctions;
- (3) Liquidated damages; and/or
- (4) Disqualifying the contractor from future bidding as non-responsible.

Include this assurance in each subcontract you sign with a subcontractor.

**2-1.12B Disadvantaged Business Enterprise Goal**

**2-1.12B(1) General**

Section 2-1.12B applies if a DBE goal is shown on the *Notice to Bidders*.

The City of Santa Cruz shows a DBE goal to comply with the DBE program objectives provided in 49 CFR 26.1.

Make work available to DBEs and select work parts consistent with the available DBEs, including subcontractors, suppliers, service providers, and truckers.

Meet the DBE goal shown on the *Notice to Bidders* or demonstrate that you made adequate good faith efforts to meet this goal.

You are responsible to verify at bid opening that each DBE firm is certified as a DBE by the California Unified Certification Program (CUCP) and possesses the most specific available North American Industry Classification System (NAICS) Codes and California Work Codes applicable to the type of work the firm will perform on the Contract. You are responsible for documenting each DBE firm's certification by printing out the California Unified Certification Program (CUCP) profile data for each DBE firm. The CUCP database of certified DBE firms is located on the following website:

<https://caltrans.dbesystem.com/>

Determine that selected DBEs perform a commercially useful function for the type of work the DBE will perform on the Contract as provided in 49 CFR 26.55(c)(1)–(4). Under 49 CFR 26.55(c)(1)–(4), the DBE must be responsible for the execution of a distinct element of work and must carry out its responsibility by actually performing, managing, and supervising the work.

DBE participation will count toward the Caltrans federally mandated statewide overall DBE goal.

MURRAY STREET BRIDGE AT THE SMALL CRAFT HARBOR, SEISMIC  
RETROFIT/BARRIER REPLACEMENT, CITY PROJECT NO. C409321, FEDERAL NO.  
PROJECT NO. STPLZ 5025(084)

Credit for materials or supplies you purchase from DBEs will be evaluated on a contract-by-contract basis and counts toward the goal in the following manner:

1. 100 percent if the materials or supplies are obtained from a DBE manufacturer.
2. 60 percent if the materials or supplies are obtained from a DBE regular dealer.
3. Only fees, commissions, and charges for assistance in the procurement and delivery of materials or supplies if they are obtained from a DBE that is neither a manufacturer nor a regular dealer. 49 CFR 26.55 defines *manufacturer* and *regular dealer*.

You receive credit toward the goal if you employ a DBE trucking company that is performing a commercially useful function. The City of Santa Cruz uses the following factors from 49 CFR 26.55(d) in determining whether a DBE trucking company is performing a commercially useful function:

- The DBE must be responsible for the management and supervision of the entire trucking operation for which it is responsible on a particular contract, and there cannot be a contrived arrangement for the purpose of meeting DBE goals.
- The DBE must itself own and operate at least one fully licensed, insured, and operational truck used on the contract.
- The DBE receives credit for the total value of the transportation services it provides on the Contract using trucks it owns, insures, and operates using drivers it employs.
- The DBE may lease trucks from another DBE firm, including an owner-operator who is certified as a DBE. The DBE who leases trucks from another DBE receives credit for the total value of the transportation services the lessee DBE provides on the Contract.
- The DBE may lease trucks without drivers from a non-DBE truck leasing company. If the DBE leases trucks from a non-DBE truck leasing company and uses its own employees as drivers, it is entitled to credit for the total value of these hauling services.
- A lease must indicate that the DBE has exclusive use of and control over the truck. This does not preclude the leased truck from working for others during the term of the lease with the consent of the DBE, so long as the lease gives the DBE absolute priority for use of the leased truck. Leased trucks must display the name and identification number of the DBE.

#### **2-1.12B(2) DBE Commitment Submittal**

Submit the DBE Commitment form and the following supporting DBE information no later than 4 p.m. on the 5th day after bid opening:

- Quote from each DBE shown on the DBE Commitment form that describes the type and dollar amount of work
- DBE Confirmation form for each DBE shown on the DBE Commitment form to establish that it will be participating in the Contract in the type and dollar amount of work shown on the form.
- If a DBE is participating as a joint venture partner, submit a copy of the joint venture agreement.

If the last day for submitting the DBE information falls on a Saturday or holiday, it may be submitted on the next business day with the same effect as if it had been submitted on the 5th day.

Failure to submit a completed DBE Confirmation form and a copy of the quote from each DBE will result in disallowance of the DBE's participation.

MURRAY STREET BRIDGE AT THE SMALL CRAFT HARBOR, SEISMIC  
RETROFIT/BARRIER REPLACEMENT, CITY PROJECT NO. C409321, FEDERAL NO.  
PROJECT NO. STPLZ 5025(084)

### **2-1.12B(3) DBE Good Faith Efforts Submittal**

You can meet the DBE requirements by either documenting commitments to DBEs to meet the DBE goal or by documenting adequate good faith efforts to meet the DBE goal. An adequate good faith effort means that the bidder must show that it took all necessary and reasonable steps to achieve a DBE goal that, by their scope, intensity, and appropriateness to the objective, could reasonably be expected to meet the DBE goal.

If your DBE Commitment form shows that you have not met the DBE goal, complete and submit the DBE Good Faith Efforts Documentation form no later than 4 p.m. on the 5th day after bid opening showing that you made adequate good faith efforts to meet the goal. If the last day for submitting the DBE Good Faith Efforts Documentation form falls on a Saturday or holiday, it may be submitted on the next business day with the same effect as if it had been submitted on the 5th day.

Only good faith efforts directed toward obtaining participation by DBEs are considered.

Even if your DBE Commitment form shows that you have met the DBE goal, submit the DBE Good Faith Efforts Documentation form within the specified time to protect your eligibility for award of the contract in the event the City of Santa Cruz finds that the DBE goal has not been met.

Refer to 49 CFR 26 appendix A for guidance regarding evaluation of good faith efforts to meet the DBE goal.

The City of Santa Cruz considers DBE commitments of other bidders in determining whether the low bidder made good faith efforts to meet the DBE goal.

### **2-1.12B(4) Bidder's List Submittal**

Submit the Bidder's List form no later than 4 p.m. on the 5th day after bid opening. List yourself and each subcontractor (regardless of DBE status) that provided a quote or bid on this contract in accordance with 49 CFR 26.11.

**Replace *Reserved* in section 2-1.44 with:**

## **2-1.44 ESCROW OF BID DOCUMENTATION**

### **2-1.44A General**

The City requires the first, second, and third apparent low bidders to submit bid documentation to be placed in escrow. If requested, the fourth and subsequent apparent low bidders must submit bid documentation for escrow.

Nothing in the bid documentation is to be construed to change or modify the terms or conditions of the contract.

The City will not use bid documentation for pre-award evaluation of your anticipated methods of construction or to assess your qualifications for performing the work.

Your signature on the bid form certifies that you have examined the contents and have submitted all documents used in preparation of the bid submittal for escrow.

MURRAY STREET BRIDGE AT THE SMALL CRAFT HARBOR, SEISMIC  
RETROFIT/BARRIER REPLACEMENT, CITY PROJECT NO. C409321, FEDERAL NO.  
PROJECT NO. STPLZ 5025(084)

The City stipulates and expressly acknowledges that the submitted bid documentation constitutes trade secrets and will not be deemed public records. This acknowledgment is based on the City's express understanding that the information contained in the bid documentation is not known outside the bidder's business, is known only to a limited extent and only by a limited number of employees of the bidder, is safeguarded while in the bidder's possession, is extremely valuable to the bidder and could be extremely valuable to the bidder's competitors by virtue of it reflecting the bidder's contemplated techniques of construction.

The City acknowledges that the bid documentation includes a compilation of information used in the bidder's business, intended to give the bidder an opportunity to obtain an advantage over competitors who do not know of or use the contents of the documentation.

The City agrees to safeguard the bid documentation, and all information contained therein, against disclosure, including disclosure of subcontractor bid documentation to you and other subcontractors, to the fullest extent permitted by law.

In the event of arbitration or litigation, the bid documentation will be subject to discovery, and the City assumes no responsibility for safeguarding the bid documentation unless you have obtained an appropriate protective order issued by the arbitrator or the court.

Bid documentation will be held in escrow until the Contract has been completed, the ultimate resolution of all disputes and claims has been achieved, and receipt of final payment has been accepted by you. The escrowed bid documentation will then be released from escrow.

#### **2-1.44B Bid Documentation Submittal**

Bid documentation must be submitted by an authorized representative to Kevin Crossley, Assistant Director/City Engineer. Submit the name of the authorized representative to the Assistant Director/City Engineer no later than 4:00 p.m. on the first Monday after the bid opening.

Submit bid documentation to the Assistant Director/City Engineer for escrow on the first Tuesday after bid opening between 1:00PM. and 2:00PM at the Public Works Department, 809 Center Street, Room 201, Santa Cruz, California 95060.

Submit a hard copy of your bid documentation in a sealed container, clearly marked with the bidder's name, date of submittal, contract number, and the words, "Bid Documentation for Escrow."

Bid documentation must be legible and contain all documents, including calculations, used to compile the bid submittal. Clearly itemize your estimated costs of performing the work. Calculations must be complete and detailed enough to allow for an in-depth analysis of your bid. These are the only documents that will be accepted from you regarding preparation of the bid for use in resolution of disputes.

Bid documentation for escrow must include:

1. Quantity takeoffs.
2. Rate schedules for the direct costs and the time- and non-time related indirect costs for:
  - 2.1. Labor (by craft).
  - 2.2. Plant and equipment ownership and operation.
  - 2.3. Permanent and expendable materials, insurance, and subcontracted work.

MURRAY STREET BRIDGE AT THE SMALL CRAFT HARBOR, SEISMIC  
RETROFIT/BARRIER REPLACEMENT, CITY PROJECT NO. C409321, FEDERAL NO.  
PROJECT NO. STPLZ 5025(084)

3. Estimated construction schedules, including sequence and duration, and development of production rates.
4. Quotations, terms, and limitations of quotes and subcontracts related to subcontractors, manufacturers, and suppliers.
5. Estimates of field and home office overhead.
6. Estimated contingency and profit for each bid item of work.
7. Names of the persons responsible for preparing the bidder's estimate and other reports, calculations, assumptions, and supplemental information used by the bidder to arrive at the estimate submitted with the Bid book.
8. Bid documentation for each subcontractor, manufacturer, and supplier whose subcontract or purchase orders exceed or are expected to exceed \$250,000.00. Bid documentation for other subcontractors, manufacturers, and suppliers may be submitted, if required by the bidder, or requested by the subcontractor, manufacturer, or supplier.

If the bidder is a joint venture, the bid documentation must include the joint venture agreement, the joint venture estimate comparison, and final reconciliation of the joint venture bid.

The City provides copies of the verified Bid books submitted by the 1st, 2nd, and 3rd low bidders to the respective bidders for inclusion in the bid documentation to be escrowed.

The bid documentation of a subcontractor, manufacturer, or supplier must conform to the same requirements as the bidder's documentation.

Subcontracts and purchase orders not executed or entered into at the time of bid must be submitted for inclusion in the escrowed documentation within 14 days of execution of the subcontract or purchase order.

To substitute a subcontractor, manufacturer, or supplier you must submit replacement bid documentation for review, approval, and escrow before authorization of the substitution will be granted.

Failure to submit the complete bid documentation within the time specified may result in a nonresponsive bid.

#### **2.1.44C Bid Documentation Evaluation**

The authorized representative of the apparent low bidder and the City will evaluate the apparent low bidder's bid documents for escrow for legibility and to ensure authenticity.

If requested, the bid documentation of a subcontractor, manufacturer, or supplier will be evaluated only by the subcontractor, manufacturer, or supplier and the City. The bid documentation must be placed in a separate container within the bidder's container. Evaluation of subcontractors', manufacturers', and suppliers' bid documentation will be accomplished in the same manner as for the bidder's bid documentation. The request from the subcontractor, manufacturer, or supplier must be included with the bid documentation.

Evaluation of bid documentation will not include review or constitute approval of:

1. Proposed construction methods
2. Estimating assumptions
3. Interpretation of the contract

MURRAY STREET BRIDGE AT THE SMALL CRAFT HARBOR, SEISMIC  
RETROFIT/BARRIER REPLACEMENT, CITY PROJECT NO. C409321, FEDERAL NO.  
PROJECT NO. STPLZ 5025(084)

The evaluation will not alter any conditions or terms of the contract.

Acceptance or rejection of the apparent low bidder's bid documentation by the City will be completed within 48 hours of the apparent lower bidder's submittal.

Once the documentation has been evaluated and deemed to be legible and authentic it will be inventoried and escrowed.

At the completion of the evaluation, the apparent low bidder's bid documentation will be sealed and jointly deposited at a commercial business in the City of Santa Cruz, CA.

Bid documentation submitted by the second and third apparent low bidders will be jointly deposited at the Public Works Department, 809 Center Street, Room 201, Santa Cruz, California.

The City pays for the direct cost of depositing the bid documentation in escrow at the agreed commercial business.

If the apparent low bid is withdrawn, rejected, or nonresponsive, the bid documentation of the next low bidder will be evaluated and inventoried in the manner specified above, then sealed and deposited again in escrow.

Upon execution of the contract or rejection of all bids, the bid documentation will be returned to the unsuccessful bidders.

**2-1.44D Bid Documentation Use**

Bid documentation is subject to joint review by you, your authorized representative and the City.

Components of the bid documentation may be examined by your authorized representative and the City at any time to assist in the negotiation of price adjustments and change order work or to settle claims or disputes.

If a subcontractor, manufacturer, or supplier requests, its bid documentation will be subject to only joint examination by the subcontractor, supplier, or manufacturer and the City unless it involves a dispute or claim against the City.

The joint examination must be performed within 15 days of receipt of a written request to do so by either party. Refusal by you to participate in the joint examination of bid documentation will be considered as a failure by you to exhaust administrative claim remedies with respect to the particular protest, notice of potential claim, or claim. In addition, this refusal by you constitutes a bar to future arbitration with respect to the protest, potential claim, or claim as provided by Public Contract Code § 10240.2.

If requested by a Dispute Resolution Advisor or Dispute Resolution Board, the bid documentation may be used to assist the Advisor or Board in its recommendations.

^^

### 3 CONTRACT AWARD AND EXECUTION

Replace Section 3-1.04 with:

#### **3-1.04 CONTRACT AWARD:**

If the Agency awards the Contract, the award is made to the lowest responsible and responsive bidder.

Bidders who wish to lodge a protest as to the award of the bid must do so before 5:00 p.m. of the fifth business day following the notice of intent to award the Contract. Failure to timely file a written protest shall constitute a waiver of right to protest. Untimely protests will not be accepted or considered. Bid protests must be submitted, in writing, to: CITY OF SANTA CRUZ PUBLIC WORKS DEPARTMENT, ATTENTION OF THE PROJECT MANAGER, 809 Center Street, Room 201, Santa Cruz, California 95060. Protests may be hand-delivered, mailed certified United States Postal Services (USPS) mail, or E-mail to the attention of the project manager [The Project Manager's E-mail address may be obtained by calling (831) 755-4800]. Bid protests must include the project name and project number, a complete statement describing the basis for the bid protest, including a detailed statement of all legal and factual grounds for the protest, any documentation supporting the protestor's grounds for the protest, and the form of relief requested and the legal basis for such relief. The party lodging the protest must also include their contact information including mailing address, telephone number, and E-mail address.

If a valid protest is timely filed, the Department shall investigate the bid protest. The protested bidder shall have three (3) business days to respond to any Public Works, Facilities & Parks requests to provide additional information. The Department shall respond to the protesting party, stating its finding. The Department Director shall make a recommendation to the Board regarding the bid protest.

The award of the Contract, if it be awarded, will be to the lowest responsible bidder within ninety (90) days after bid opening, whose bid complies with all the requirements prescribed.

In determining the lowest "responsible" Bidder, consideration shall be given to the general competency of Bidder in regard to the work covered by the bid.

The Contract shall be executed by the successful bidder and shall be returned, together with the Contract bonds and insurance certificates, to the CITY OF SANTA CRUZ PUBLIC WORKS DEPARTMENT so that it is received within ten (10) days, not including Saturdays, Sundays and legal holidays, after the bidder has received the Contract for execution. Failure to do so shall be just cause for forfeiture of the bid guaranty. The executed Contract documents shall be delivered to the following address:

City Clerk  
Public Works Department  
809 Center Street, Room 201, Santa Cruz, California 95060

MURRAY STREET BRIDGE AT THE SMALL CRAFT HARBOR, SEISMIC  
RETROFIT/BARRIER REPLACEMENT, CITY PROJECT NO. C409321, FEDERAL NO.  
PROJECT NO. STPLZ 5025(084)





## 5 CONTROL OF WORK

### Replace the 2nd and 3rd paragraphs of section 5-1.09A with:

Professionally facilitated project partnering is required.

### Replace section 5-1.13B with:

#### **5-1.13B Disadvantaged Business Enterprises**

##### **5-1.13B(1) General**

Section 5-1.13B applies to a federal-aid contract.

Use each DBE as listed on the DBE Commitment form unless you receive City of Santa Cruz prior authorization for termination under section 5-1.13B(2)(c). Ensure that all subcontracts and agreements with DBEs to supply labor or materials are performed under 49 CFR 26.

Maintain records of subcontracts made with DBE subcontractors and records of materials purchased from DBE suppliers. Include in the records:

1. Name and business address of each DBE subcontractor, DBE vendor, and DBE trucking company, regardless of tier
2. Date of payment and total amount paid to each DBE business

If you are a DBE contractor, include the date of work performed by your own forces and the corresponding value of the work.

Before the 15th day of each month for the previous month's work, submit the Monthly DBE Trucking Verification form (LAPM Exhibit 16-Z1)

If a DBE is decertified before completing its work, the business must notify you in writing of the decertification date within 15 days of decertification. Notify the Engineer and submit the DBE's decertification notice within 2 business days of your receipt. Upon work completion, complete a Disadvantage Business Enterprises (DBE) Certification Status Change form, Exhibit 17-O, and submit within 10 days of Contract acceptance.

Upon work completion, complete a Final Report – Utilization of Disadvantaged Business Enterprises (DBE), First-Tier Subcontractors form (LAPM Exhibit 17-F) and submit within 10 days of Contract acceptance. The City of Santa Cruz withholds the greater of 10 percent of the DBE commitment or \$10,000 until the form is submitted. The City of Santa Cruz releases the withhold upon submission of the completed form. If additional payments are made to a DBE after submittal of the completed form, submit an updated form to reflect such payments.

Failure to carry out requirements of 49 CFR 26 is a material breach of the Contract, which may result in the termination of the Contract or other remedy as the City of Santa Cruz deems appropriate, such as:

1. Withholding monthly progress payments
2. Assessing sanctions
3. Applying liquidated damages
4. Disqualification from future bidding as nonresponsive

MURRAY STREET BRIDGE AT THE SMALL CRAFT HARBOR, SEISMIC  
RETROFIT/BARRIER REPLACEMENT, CITY PROJECT NO. C409321, FEDERAL NO.  
PROJECT NO. STPLZ 5025(084)

## **5-1.13B(2) Disadvantaged Business Enterprises**

### **5-1.13B(2)(a) General**

Section 5-1.13(B)(2) applies if a DBE goal is shown on the *Notice to Bidders*.

Certification as a DBE identifies if the business has the means to perform its work under assigned North American Industry Classification System codes and work codes applicable to the type of work the DBE will perform on the Contract. Certification does not ensure the DBE will perform a commercially useful function on the Contract.

You are responsible for ensuring each DBE listed on the DBE Commitment form performs:

1. The description and value of the subcontracted work or material supplied as committed
2. A commercially useful function under 49 CFR 26.55 for committed work or materials

For DBE committed work, the City of Santa Cruz only pays for work performed or supplied by the listed DBE and if a commercially useful function was performed by the listed DBE.

You are responsible to remediate noncompliant DBE work to meet your DBE commitment. Submit a DBE commitment remediation plan within 5 business days of the Engineer's request.

Pay your DBEs in conformance with section 5-1.13E.

Failure to promptly pay DBEs may result in a withholds corresponding to the value of the DBE's committed work from future progress payments. In addition, unpaid DBE amounts will not count towards your DBE commitment, which may result in equivalent withholds or deductions and a 2 percent penalty on the unpaid amount for every month payment is not made.

### **5-1.13B(2)(b) Commercially Useful Function**

DBEs must perform a commercially useful function under 49 CFR 26.55 when performing work or supplying materials listed on the DBE Commitment form. The DBEs value of work will only count toward the DBE commitment if the DBE performs a commercially useful function under 49 CFR 26.55.

Provide written notification to the Engineer at least 15 days in advance of each DBE's initial performance of work or supplying materials for the Contract. Include the DBE's name, contract work to be performed, and the location, date, and time of where their work will take place.

Within 10 days of a DBE initially performing work or supplying materials on the Contract, submit your initial evaluation and validation of their performance of a commercially useful function using DBE Commercially Useful Function Evaluation form (LAPM Exhibit 9-J). Include the following supporting information with your submittal:

1. Subcontract agreement with the DBE
2. Purchase orders
3. Bills of lading
4. Invoices
5. Proof of payment

Monitor your DBEs' performance of commercially useful function with quarterly evaluations and validations throughout their duration of work on the Contract using DBE Commercially Useful Function Evaluation form. Submit your quarterly evaluation and validation DBE Commercially

MURRAY STREET BRIDGE AT THE SMALL CRAFT HARBOR, SEISMIC  
RETROFIT/BARRIER REPLACEMENT, CITY PROJECT NO. C409321, FEDERAL NO.  
PROJECT NO. STPLZ 5025(084)

Useful Function Evaluation forms by the 5th of the month for the previous three month's work. Include any additional supplemental supporting information with your submittal. If your DBE's work-start and -end dates for the Contract exceed a three-month period, regardless of time not on the Contract, quarterly evaluations and validations are required.

Notify the Engineer immediately if you believe the DBE may not be performing a commercially useful function.

The City of Santa Cruz will verify your DBEs performance of commercially useful functions by reviewing your initial and quarterly DBE Commercially Useful Function Evaluation forms, your submitted supporting information, field observations, and through select City of Santa Cruz evaluations. The City of Santa Cruz may evaluate DBEs and their commercially useful function performance at any time during the Contract. In such instances, the City of Santa Cruz will provide written notice to you and your DBE at least 2 business days prior to the evaluation. You and your DBE must participate in the evaluation. Upon completing the evaluation, the City of Santa Cruz will share the evaluation results with you and your DBE. The evaluation results may include items that must be remedied upon your receipt. If the City of Santa Cruz determines the DBE is not performing a commercially function you must suspend performance of the noncompliant work.

You and your DBEs must submit any additional commercially useful function related records and documents within 5 business days of City of Santa Cruz request such as:

1. Proof of ownership or lease and rental agreements for equipment
2. Tax records
3. Employee rosters
4. Certified payroll records
5. Inventory rosters

Failure to submit required DBE Commercially Useful Function Evaluation forms or requested records and documents will result in withhold of payment for the value of work completed by the DBE.

If you and or the City of Santa Cruz determine a listed DBE is not performing a commercially useful function in performance of their DBE committed work, suspend performance of the noncompliant portion of the work. Submit a corrective action plan within 5 days of the noncompliant commercially useful function determination. The plan must identify how you will remediate when feasible or demonstrate commercially useful function compliance for the remaining portion of the DBE's work. Allow 5 days for plan review. The corrective actions must be implemented within 5 days of Engineer's authorization of your plan and prior to resumption of the noncompliant portion of the DBE's committed work.

If corrective actions cannot be accomplished to assure the DBE will perform a commercially useful function on the Contract, you may have good cause to request termination of the DBE under section 5-1.13B(2)(c).

#### **5-1.13B(2)(c) Termination**

Termination of a DBE may be allowable for good cause reasons under 49 CFR 26.53(f)(3) with prior written authorization from the City of Santa Cruz.

MURRAY STREET BRIDGE AT THE SMALL CRAFT HARBOR, SEISMIC  
RETROFIT/BARRIER REPLACEMENT, CITY PROJECT NO. C409321, FEDERAL NO.  
PROJECT NO. STPLZ 5025(084)

You must provide documentation supporting good cause reasoning with your termination request. If the termination request is authorized by the City of Santa Cruz, you must then either replace the DBE with another DBE or demonstrate good faith efforts to do so under 5-1.13B(2)(d).

Use the following procedure to request the termination of a DBE or portion of their work:

1. Provide written notice to the DBE of your intent to use other forces or material sources and include one or more of the good cause reasons under 49 CFR 26.53(f)(3). Simultaneously send a copy of this written notice to the Engineer. Your written notice to the DBE must request they provide any response to both you and the Engineer.
2. Provide the DBE with 5 business days to respond to your written notice by either acknowledging their agreement or documenting their reasoning as to why the use of other forces or sources of materials should not occur. If the DBE does not respond within 5 business days, you may move forward with the request process as if the DBE had agreed to your written notice.
3. Submit your DBE termination request by written letter to the Engineer and include:
  - 3.1. One or more good cause reasons identified under 49 CFR 26.53(f)(3) along with supporting documentation.
  - 3.2. Your written notice to the DBE regarding the request, including proof of transmission and tracking documentation of your written notice.
  - 3.3. The DBE's response to your written notice, if received. If a written response was not provided, provide a statement to that effect.

The City of Santa Cruz will respond to your complete DBE termination request as follows:

1. Where the DBE has agreed in writing or fails to timely respond to your written notice, the City of Santa Cruz will respond within 2 business days from receipt of your request.
2. Where the DBE has disagreed in writing with your written notice, the City of Santa Cruz will meet with you and the DBE within 5 business days from receipt of your request. The City of Santa Cruz will respond to your request within 5 business days from this meeting.
3. If you fail to provide a complete request for DBE termination the City of Santa Cruz will identify deficiencies within 5 business days from receipt of your request.

If the City of Santa Cruz authorizes your DBE termination request it will do so in writing.

Work performed by a firm other than the committed DBE or authorized replacement DBE without first obtaining City of Santa Cruz authorization for termination will be a violation of these specifications and DBE federal regulations. Such violations will result in payment deductions for the value of the work associated with the noncompliant DBE commitment. In addition, if the committed DBE is also a listed subcontractor, the City of Santa Cruz applies an additional penalty up to 10 percent of the value of the subject work as a permanent deduction.

#### **5-1.13B(2)(d) Replacement**

After receiving City of Santa Cruz written authorization of your DBE termination request, you must obtain separate City of Santa Cruz authorization of your replacement plan.

Your replacement plan must identify DBE replacement firms to perform the work or demonstrate that you have made a good faith effort to use DBE replacement firms. DBE replacement firms must:

MURRAY STREET BRIDGE AT THE SMALL CRAFT HARBOR, SEISMIC  
RETROFIT/BARRIER REPLACEMENT, CITY PROJECT NO. C409321, FEDERAL NO.  
PROJECT NO. STPLZ 5025(084)

1. Perform at least the same dollar amount of work as the terminated DBE to the extent needed to meet the DBE commitment
2. Possess certifications for the most specific available North American Industry Classification System codes and work codes applicable to the work the firm will perform on the Contract
3. Perform a commercially useful function under 49 CFR 26.55

Use the following procedure to request authorization of your replacement plan:

1. Submit a request to replace a DBE with other forces or material sources by written letter to the City of Santa Cruz which must include:
  - 1.1. Description of remaining uncommitted item work made available for replacement DBE solicitation and participation.
  - 1.2. The proposed DBE replacement firm's business information, the work they have agreed to perform, and the following:
    - 1.2.1. Quote for bid item work and description of work to be performed
    - 1.2.2. Proposed subcontract agreement and written confirmation of agreement to perform on the Contract
    - 1.2.3. Revised Subcontracting Request form
    - 1.2.4. Revised Exhibit 15-G: Construction Contract DBE Commitment
2. If you have not identified a DBE replacement firm, submit documentation of your good faith efforts to use DBE replacement firms within 7 days of City of Santa Cruz's authorization to terminate the DBE. You may request the City of Santa Cruz's approval to extend this submittal period to a total of 14 days. The City of Santa Cruz considers your documented actions taken to identify a DBE replacement firm in determining whether a good faith effort was made under 49 CFR 26 app A. Submit documentation of actions taken to find a DBE replacement firm, such as:
  - 2.1. Search results of certified DBEs available to perform the original DBE work identified and or other work you had intended to self-perform, to the extent needed to meet your DBE commitment
  - 2.2. Solicitations of DBEs for performance of work identified in 2.1
  - 2.3. Correspondence with interested DBEs that may have included contract details and requirements
  - 2.4. Negotiation efforts with DBEs that reflect why an agreement was not reached
  - 2.5. If a DBE's quote was rejected, provide your reasoning for the rejection, such as why the DBE was unqualified for the work, or why the price quote was unreasonable or excessive
  - 2.6. Copies of each DBE's and non-DBE's price quotes for work identified in 2.1, as the City of Santa Cruz may contact the firms to verify solicitation efforts and determine if the DBE quotes are substantially higher
  - 2.7. Additional documentation that you believe supports your good faith effort

The City of Santa Cruz will respond to your complete replacement plan as follows:

1. If a DBE replacement firm has been identified and required documentation has been provided, the City of Santa Cruz will respond within 2 business days from receipt of your plan
2. If a DBE replacement firm has not been identified, but good faith effort documents have been provided, the City of Santa Cruz will respond within 5 business days from receipt of your plan

MURRAY STREET BRIDGE AT THE SMALL CRAFT HARBOR, SEISMIC  
RETROFIT/BARRIER REPLACEMENT, CITY PROJECT NO. C409321, FEDERAL NO.  
PROJECT NO. STPLZ 5025(084)

3. If you fail to provide a complete replacement plan, the City of Santa Cruz will return your request and identify deficiencies within 5 business days from receipt of your plan

If the City of Santa Cruz authorizes your replacement plan it will do so in writing.

Submit a revised Subcontracting Request form if your replacement plan is authorized.

DBE committed work performed by a nonauthorized firm, will be a violation of these specifications and DBE federal regulations. Such violations will result in payment deductions for the value of the work associated with the DBE commitment. The City of Santa Cruz will take a permanent deduction for the value of the DBE work that was not performed by the authorized DBE. In addition, if the associated work was also to be performed by a listed subcontractor, the City of Santa Cruz applies an additional penalty up to 10 percent of the value of the subject work as a permanent deduction.

### **5-1.13B(3) Use of Joint Checks**

You may use a joint check between the Contractor or lower-tier subcontractor and a DBE subcontractor purchasing materials from a material supplier if you obtain prior approval from the City of Santa Cruz for your proposed use of joint checks upon submittal of a DLA Disadvantaged Business Enterprises (DBE) Joint Check Agreement Request form (LAPM Exhibit 9-K).

To use a joint check, the following conditions must be met:

1. All parties, including the Contractor, must agree in writing to the use of a joint check
2. Entity issuing the joint check acts solely to guarantee payment
3. DBE must release the check to the material supplier
4. City of Santa Cruz must authorize the request before implementation
5. Any party to the agreement must provide requested documentation within 10 days of the City of Santa Cruz's request for the documentation
6. Agreement to use a joint check must be short-term, not to exceed 1 year, allowing sufficient time needed to establish or increase a credit line with the material supplier

A request for a joint check agreement may be initiated by any party.

If a joint check is used, the DBE remains responsible for all elements of 49 CFR 26.55(c)(1).

Failure to comply with section 5-1.13B(3) disqualifies DBE participation and results in no credit and no payment to the Contractor for DBE participation.

A joint check may not be used between the Contractor or subcontractor and a DBE regular dealer, bulk material supplier, manufacturer, wholesaler, broker, trucker, packager, manufacturer's representative, or other persons who arrange or expedite transactions.

### **Replace section 5-1.13E with:**

#### **5-1.13E Prompt Payment**

Section 5-1.13E applies to a federal-aid contract.

Pay your subcontractors within 7 days of receipt of each progress payment, unless otherwise agreed to in writing in accordance with Business and Professionals Code section 7108.5

MURRAY STREET BRIDGE AT THE SMALL CRAFT HARBOR, SEISMIC  
RETROFIT/BARRIER REPLACEMENT, CITY PROJECT NO. C409321, FEDERAL NO.  
PROJECT NO. STPLZ 5025(084)

Before the 15th day of each month for the previous month's work, submit the Prompt Payment Certification form (LAPM Exhibit 9-P) regardless of whether you made any payments.

The City of Santa Cruz may request additional documentation to verify the information provided on the Prompt Payment Certification form is complete.

If there is a good faith dispute over any portion of the amount due on a progress payment to a subcontractor or other entity, you may withhold no more than 150 percent of the disputed amount. Provide a written withhold notification to the subcontractor or other entity and the Engineer no later than 7 days after receipt of the corresponding progress payment that includes the following:

1. Value of the disputed work
2. Amount of the withhold being taken
3. Bid item numbers or change order numbers associated with the disputed work
4. Explanation of the deficiencies of the disputed work and how the corresponding value was calculated
5. Corrective actions to be taken for release of withheld amount

The City of Santa Cruz may request additional documentation from you to evaluate whether you applied the withhold in good faith.

If the City of Santa Cruz determines your withhold was not applied in good faith, the City of Santa Cruz may withhold the same amount from your future progress pay estimate. The City of Santa Cruz may also apply a 2 percent penalty on the withhold amount for every month payment is not made.

**Replace section 5-1.14 with:**

**5-1.14 SAFETY QUALITY CONTROL MANAGER**

**5-1.14A General**

Allocate a dedicated, full-time, on-site safety quality control manager (SQCM) to project safety, for the duration of this Contract. The SQCM must be available after hours as needed. The SQCM is not required to be on-site during a plant establishment period or when no work is being performed during project temporary suspensions.

Develop a written site-specific safety program (SSSP) that incorporates known hazards associated with the project.

**5-1.14A(1) Submittals**

Submit a resume of the SQCM before starting work on the project, including education, heavy *construction safety experience, and completed safety training.*

*Submit a copy of the SQCM's certificates for Cal/OSHA 30-hour construction training course and traffic control supervisor training as an informational submittal. The certificate must include:*

1. *Names of Department authorized entity providing certification*
2. *Name of the individual receiving certification*
3. *Date when the certification was provided*
4. *Expiration date*

*Submit a copy of the SSSP as informational submittals:*

MURRAY STREET BRIDGE AT THE SMALL CRAFT HARBOR, SEISMIC  
RETROFIT/BARRIER REPLACEMENT, CITY PROJECT NO. C409321, FEDERAL NO.  
PROJECT NO. STPLZ 5025(084)

1. *At least 15 working days before starting work*
2. *At least 48 hours before starting work whenever a revision is made to the SSSP*

*Submit daily safety status reports within two working days of report date, including completed construction site safety inspection checklists as informational submittals.*

#### **5-1.14A(2) Quality Assurance**

##### **5-1.14A(2)(a) General**

Not Used

##### **5-1.14A(2)(b) Certifications**

The SQCM must have completed training and received a certificate of completion for:

1. Cal/OSHA 30-hour construction training course
2. Traffic control supervisor certification. Department authorized traffic control supervisor training providers list is available at:

<https://dot.ca.gov/programs/construction/safety-traffic/safety-training-courses>

The SQCM must have one of the following certifications from the Board of Certified Safety Professionals:

1. Certified Safety Professional
2. Construction Health and Safety Technician
3. Occupational Hygiene and Safety Technician

##### **5-1.14A(2)(c) Qualifications**

The SQCM must be a competent and qualified person, as defined by Cal/OSHA, and must provide safety oversight on the project. The SQCM must have:

1. Four-year college degree
2. At least 5 years of experience in heavy construction safety
3. Knowledge in the area of safety procedure for all types of work being performed on this project
4. Knowledge of State Standard specifications and State Standard Plans, Cal/OSHA policy and procedures, and California Code of Regulations Title 8 safety requirements

The SQCM must have completed safety training and maintain valid certifications for:

1. First aid
2. Cardiopulmonary resuscitation (CPR)
3. Confined space
4. Fall protection

#### **5-1.14B Materials**

Not Used

#### **5-1.14C Construction**

The SQCM must be available by:

MURRAY STREET BRIDGE AT THE SMALL CRAFT HARBOR, SEISMIC  
RETROFIT/BARRIER REPLACEMENT, CITY PROJECT NO. C409321, FEDERAL NO.  
PROJECT NO. STPLZ 5025(084)



1. Cellular telephone
2. Two-way radio
3. Mobile internet access

The SQCM must:

1. Develop the SSSP
2. Confirm each worker's compliance with the Cal/OSHA drug testing requirements
3. Conduct the on-site new project orientation for each worker assigned to the project
4. Review the construction work plans for each subcontractor before starting work
5. Conduct or attend pre-planning sessions for high hazard work such as excavations, demolition, confined space entry, falsework, crane hoisting, high-risk utilities such as, high pressure pipelines with fuel or natural gas, and tunneling or boring
6. Conduct weekly job site safety meetings
7. Review work schedules including subcontractors', to ensure adequacy of job hazard analyses and address all safety concerns and issues
8. Ensure SDSs are available on-site for all materials and have a hazard communication program for informing workers of material hazards
9. Verify compliance with hazardous waste requirements under section 14-11, including spill prevention and control measures
10. Conduct daily safety inspection of the job site for hazards and compliance with safety requirements in the specifications and 8 CA Code of Regs
11. Document safety inspections at every location where construction activity is active using a construction site safety inspection checklist that includes at a minimum:
  - 11.1. Date
  - 11.2. Name of inspector
  - 11.3. Inspection location
  - 11.4. Construction activity
  - 11.5. Name of foreperson
  - 11.6. Safety topics that include:
    - 11.6.1. General
    - 11.6.2. Housekeeping and sanitation
    - 11.6.3. Fire prevention
    - 11.6.3. Personal protective equipment
    - 11.6.4. Electrical safety
    - 11.6.5. Hand and power tools
    - 11.6.6. Falsework safety
    - 11.6.7. Scaffolding safety
    - 11.6.8. Ladder safety
    - 11.6.9. Excavations and trenches
    - 11.6.10. Heavy equipment
    - 11.6.11. Cranes
    - 11.6.12. Concrete construction
    - 11.6.13. Steel erection
    - 11.6.14. Welding and cutting
    - 11.6.15. HMA or concrete paving
    - 11.6.16. Tunneling
    - 11.6.17. Confined space
    - 11.6.18. Fall protection

MURRAY STREET BRIDGE AT THE SMALL CRAFT HARBOR, SEISMIC  
RETROFIT/BARRIER REPLACEMENT, CITY PROJECT NO. C409321, FEDERAL NO.  
PROJECT NO. STPLZ 5025(084)

12. Ensure that the lane closure traffic control daily report is completed by the traffic control technicians and traffic control daily review report is completed by the traffic control supervisor when a traffic control supervisor is required
13. Review the lane closure traffic control daily reports and traffic control daily review reports for any work zone related safety issues
14. Revise SSSP to include procedures to mitigate hazardous situations identified in construction site safety inspections, lane closure traffic control daily reports, and traffic control daily review reports
15. Investigate any near misses or reported incidents in a timely manner and take appropriate action to prevent similar incidents in the future
16. Report all incidents to the Engineer immediately, including the investigation of any close calls
17. Prepare a daily safety status report that includes:
  - 17.1. Daily construction work activities, including temporary traffic control
  - 17.2. Safety related field activities
  - 17.3. Identified safety deficiencies and corrective actions taken
  - 17.4. Meetings, conversations, and other communications related to safety issues
  - 17.5. Any reported near misses or incidents
18. Submit daily safety status reports to yours on-site superintendent for submittal to the Engineer

When monitoring work zone, take immediate corrective action and notify the Engineer if an imminent danger is identified.

If the Engineer determines the SQCM is not meeting the intended duties and responsibilities, you must replace the SQCM within 30 calendar days of written notice from the Engineer. If you need to replace the SQCM, notify the Engineer and provide replacement SQCM resume and required certifications at least 15 working days before the replacement.

#### **5-1.14D Payment**

Not Used

#### **Add to the end of section 5-1.20A:**

During the progress of the work under this Contract, work under the following contracts may be in progress at or near the job site of this Contract:

MURRAY STREET BRIDGE AT THE SMALL CRAFT HARBOR, SEISMIC  
RETROFIT/BARRIER REPLACEMENT, CITY PROJECT NO. C409321, FEDERAL NO.  
PROJECT NO. STPLZ 5025(084)

**Coincident or Adjacent Contracts**

Project	Contract No.	County–Route– Post Mile	Location	Type of work
Coastal Rail Trail Segment 8	TBD	N/A	Santa Cruz Beach Boardwalk	Multi-use Trail
Coastal Rail Trail Segment 9	TBD	N/A	Twin Lakes	Multi-use Trail
Port facilities relocation	TBD	N/A	Santa Cruz Small Craft Harbor	Temporary and permanent facilities relocations

Coordinate lane closures and traffic handling with the Engineer and with contractors of coincident or adjacent projects. Potential conflicts may not be limited to the contracts listed above.

Concurrent with your construction, the Port of Santa Cruz will have a Contractor (Port Contractor) onsite to perform work in the Santa Cruz Yacht Harbor and the West Harbor parking lot. The work performed by the Port Contractor is essential for the completion of this project and involves providing power to temporary structures and removing, relocating and reinstalling structures and docks near the bridge to provide safety and necessary space for staging, pile driving and other construction activities as shown on the plans. This work will be performed under the same permits as this contract. Certain elements of the Port Contractor's work must be completed before you will be able to proceed with your work. You will coordinate work, workspace and schedules with the Port Contractor to reduce conflicts and delays. Work to be performed by the Port Contractor and when it will be performed includes, but is not limited to:

Description of Work By Port Contractor	Work to Begin	Duration Working Days	Prime Contractor's Dependent Activities
Construct temporary rowing racks	Within 40 working days of Prime Contractor mobilizing on site.	10	All Contractor work over West Harbor Parking lot and waterway
Relocate boats and equipment	Within 20 working days of Port Contractor's Phase 1A.	2	After temporary rowing racks are ready and just prior to Port's Phase 1A start date.
Port Contractor Phase 1A: FF South and Sailing Dock Demolition	Prior to Bridge Demolition	20	All Contractor work over West Harbor Parking lot and waterway

MURRAY STREET BRIDGE AT THE SMALL CRAFT HARBOR, SEISMIC RETROFIT/BARRIER REPLACEMENT, CITY PROJECT NO. C409321, FEDERAL NO. PROJECT NO. STPLZ 5025(084)

Port Contractor Phase 1B: New FF South, Temporary and Sailing docks	Prior to Bridge Demolition	40	All Contractor work over West Harbor Parking lot and waterway
Port Contractor Phase 1B: Remove Gangway at FF North and Relocate to FF South	At end of Phase 1B	5	No land access to FF North after gangway removal.
Port Contractor Phase 1C: Remove FF North Dock, Rowing and BY docks	To be coordinated with Contractor work schedule	30	Port Contractor work in waterway near Bridge. Once completed, Contractor has waterway access for bridge construction.
Port Contractor Phase 2: Rebuild FF Dock North, Rowing and Boatyard Docks	As soon as Murray Street Bridge in-water work is completed	80	As soon as Murray Street Bridge in-water work is completed

Within 10 working days of Notice to Proceed, you must provide to the Engineer as a submittal, A schedule of these activities coordinated with and signed by the Port Contractor for approval. This will become a part of your overall project schedule. Changes to this schedule must be approved by the Port Contractor and the Engineer.

**Add to the end of section 5-1.20C:**

This project does not include work on the railroad property, but a railroad is within the project limits. Do not trespass on the SCCRTC railroad property adjacent to the Murray Street Bridge outside of project construction easements.

**5-1.20C(1) General**

Your attention is directed to the railroad track on the Santa Cruz County Regional Transportation Commission (SCCRTC) right of way within the project limits. The term "Railroad" shall mean the SCCRTC and any railroad company having trackage rights on SCCRTC property.

While rail operations are not currently ongoing, it is possible that rail operations may commence at some point during the duration of this project. If that occurs, the following provisions in this Section 5-1.20C will take effect. Costs to secure the insurance type(s) and limits above that required by General Provision #2Section 5-1.20C(3) will be considered Extra Work.

No work may occur within 25-feet of the centerline of the closest railroad track without the written approval of the Railroad.

MURRAY STREET BRIDGE AT THE SMALL CRAFT HARBOR, SEISMIC RETROFIT/BARRIER REPLACEMENT, CITY PROJECT NO. C409321, FEDERAL NO. PROJECT NO. STPLZ 5025(084)

Your attention is directed to the Agreement between the Railroad and the City, which will be provided as supplemental project information. Exhibits to the Agreement specify certain requirements to be followed; most notably:

Exhibit B – General Provisions

Exhibit D – Contractors Right of Entry Agreement

Exhibit E – Railroad Insurance Requirements

Exhibit F – Railroad Coordination Requirements

Your right to enter the Railroad's property is subject to the absolute right of the Railroad to cause your work on the Railroad's property to cease if, in the opinion of the Railroad, your activities create a hazard to the Railroad's property, employees, or operations.

You must attend a preconstruction meeting with the Railroad's representative(s).

### **5-1.20C(2) Right of Entry Agreement**

Should you elect to work in the area inside of 25-feet from the centerline of the closest railroad track, you will be required to secure a Right of Entry Agreement with the Railroad and the following provisions apply.

Provide to the Engineer, in writing, the advance notice requirements set forth in the Right of Entry Agreement before performing any work on, or adjacent to the property or tracks of the Railroad. The Engineer will facilitate coordination with the Railroad.

Comply with the rules and regulations of the Railroad or the instructions of its representatives in relation to protecting the tracks and property of the Railroad and the traffic moving on such tracks, as well as the wires, signals and other property of the Railroad, its tenants or licensees, at and in the vicinity of the work during the period of construction. Your responsibility for safe conduct and adequate policing and supervision of its work at the job site shall not be lessened or otherwise affected by the presence at the work site of the Railroad representatives, or by your compliance with any requests or recommendations made by the Railroad representatives.

Perform work so as not to endanger or interfere with the safe operation of the tracks and property of the Railroad and traffic moving on such tracks, as well as wires, signals and other property of the Railroad, its tenants or licensees, at or in the vicinity of the work.

Take protective measures to keep the Railroad facilities, including track ballast, free of sand or debris resulting from your operations. Damage to the Railroad facilities resulting from your operations will be repaired or replaced by the Railroad and the cost of such repairs or replacement shall be deducted from your progress and final pay estimates.

Notify the Engineer and the Railroad's "Call Before You Dig" at least forty-eight (48) hours prior to commencing work on railroad property to determine location of fiber optics or other buried utilities or facilities in the railroad right of way. Coordinate with the Railroad and the Telecommunication Company(ies) to arrange for relocation or other protection of the system prior to beginning any work on or near Railroad property.

All heavy equipment provided or leased by you must be equipped with audible back-up warning devices. If in the opinion of the Railroad Representative any of your or your subcontractor's

MURRAY STREET BRIDGE AT THE SMALL CRAFT HARBOR, SEISMIC  
RETROFIT/BARRIER REPLACEMENT, CITY PROJECT NO. C409321, FEDERAL NO.  
PROJECT NO. STPLZ 5025(084)

equipment is unsafe for use on the Railroad's right-of-way, you, at the request of the Railroad representative, shall remove such equipment from the Railroad right-of-way.

### **5-1.20C(3) Railroad Insurance**

In addition to any other form of insurance or bonds required under the terms of the contract and specifications, you will be required to carry insurance of the kinds and in the amounts hereinafter specified.

Such insurance shall be approved by the Railroad before any work is performed on the Railroad's property and shall be carried until all work required to be performed on or adjacent to the Railroad's property under the terms of the contract is satisfactorily completed as determined by the Engineer, and thereafter until all tools, equipment and materials have been removed from the Railroad's property and such property is left in a clean and presentable condition.

Actual costs for the additional premiums which you are required to pay to procure the insurance coverages listed below over and above the premiums you paid for insurance specified in Section 7 of these special provisions will be reimbursed as Extra Work.

The following insurance coverage will be required:

- 1. Commercial General Liability Insurance.** Commercial general liability (CGL) with a limit of not less than \$5,000,000 for each occurrence and an aggregate limit of not less than \$10,000,000. CGL insurance must be written on ISO occurrence form CG 00 01 12 04 (or a substitute form providing equivalent coverage).  
The policy must also contain the following endorsement, which must be stated on the certificate insurance:  
Contractual Liability Railroads ISO form CG 24 17 10 01 (or a substitute form providing equivalent coverage) showing "SCCRTC Property" as the Designated Job Site.
- 2. Business Automobile Coverage Insurance.** Business auto coverage written on ISO form CA 001 (or a substitute form providing equivalent liability coverage) with a combined single limit of not less than \$5,000,000 for each accident.  
The policy must contain the following endorsements, which must be stated on the certificate of insurance:  
Coverage For Certain Operations in Connection With Railroad ISO form CA 20 70 10 01 (or a substitute form providing equivalent coverage) showing "SCCRTC Property" as the Designated Job Site.  
Motor Carrier Act Endorsement - Hazardous materials clean up (MCS-90) if required by law.
- 3. Workers' Compensation and Employers' Liability Insurance.** Coverage must include but not be limited to:  
Contractor's statutory liability under the workers' compensation laws of the State of California. Employers' Liability (Part B) with limits of at least \$500,000 each accident, \$500,000 disease policy limit \$500,000 each employee.

If you are self-insured, evidence of state approval and excess workers compensation coverage must be provided. Coverage must include liability arising out of the U.S. Longshoremen's and Harbor Workers' Act, the Jones Act, and the Outer Continental Shelf Land Act, if applicable.

The policy must contain the following endorsement, which must be stated on the certificate of insurance:

Alternate Employer endorsement ISO form WC 00 03 01 A (or a substitute form proving equivalent coverage) showing Railroad in the schedule as the alternate employer (or a substitute form providing equivalent coverage).

4. **Railroad Protective Liability Insurance.** You must maintain Railroad Protective Liability insurance written on ISO occurrence form CG 00 35 12 04 (or a substitute form providing equivalent coverage) on behalf of the Railroad as named insured, with a limit of not less than \$2,000,000 per occurrence and an aggregate of \$6,000,000. A binder stating the policy is in place must be submitted to the Railroad before the work maybe commenced and until the original policy is forwarded to the Railroad.
5. **Umbrella or Excess Insurance.** If you utilize umbrella or excess policies, these policies must "follow form" and afford no less coverage than the primary policy.
6. **Pollution Liability Insurance.** Pollution liability coverage must be written on ISO form Pollution Liability Coverage Form Designated Sites CG 00 39 12 04 (or substitute form providing equivalent liability coverage), with limits of at least \$5,000,000 per occurrence and an aggregate limit of \$10,000,000.

If the scope of work as defined in this Agreement includes the disposal of any hazardous or nonhazardous materials from the job site, you must furnish to Railroad evidence of pollution legal liability insurance maintained by the disposal site operator for losses arising from the insured facility accepting the materials, with coverage in minimum amounts of \$10,000,000 per loss, and an annual aggregate of \$20,000,000.

#### **Other Requirements**

7. All policy(ies) required above (excluding worker's compensation and employer's liability) must include Railroad as "Additional Insured" using ISO Additional Insured Endorsement CG 20 26, and CA 20 48 (or substitute forms providing equivalent coverage). The coverage provided to Railroad as additional insured shall, to the extent provided under ISO Additional Insured Endorsement CG 20 26, and 20 48 provide coverage for Railroad's negligence whether sole or partial, active or passive, and shall not be limited by your liability under the indemnity provisions of this Agreement.
8. Punitive damages exclusion, if any, must be deleted (and the deletion indicated on the certificate of insurance), unless the law governing this Agreement prohibits all punitive damages that might arise under this Agreement.
9. You waive all rights of recovery, and your insurers also waive all rights of subrogation of damages against Railroad and its agents, officers, directors, and employees. This waiver must be stated on the certificate of insurance.
10. Prior to commencing the work, furnish the Railroad with a certificate(s) of insurance, executed by a duly authorized representative of each insurer, showing compliance with the insurance requirements in this Agreement.

MURRAY STREET BRIDGE AT THE SMALL CRAFT HARBOR, SEISMIC  
RETROFIT/BARRIER REPLACEMENT, CITY PROJECT NO. C409321, FEDERAL NO.  
PROJECT NO. STPLZ 5025(084)

11. All insurance policies must be written by a reputable insurance company acceptable to Railroad or with a current Best's Insurance guide Rating of A- and Class VII or better, and authorized to do business in the State of California.
12. The fact that insurance is obtained by you or by the Railroad on your behalf will not be deemed to release or diminish your liability, including, without limitation, liability under the indemnity provisions of this Agreement. Damages recoverable by Railroad from you or any third party will not be limited by the amount of the required insurance coverage.

#### **5-1.20C(4) Railroad Flagging**

If required, SCCRTC furnishes railroad flagging and submittal reviews in accordance with the provisions in this section and the requirements of the operating railroad and the Railroad Agreement that will be added in "Supplemental Project Information" of these special provisions.

Secure a railroad flagger as needed to perform your work, including providing the appropriate advance notice to the SCCRTC.

The City will not reimburse you for fines, penalties, or any other expenses assessed by the Railroad.

Any plan review or inspection fees described in Exhibit C-1 of the Railroad Agreement will be paid by the City and are not included in this contract.

You are encouraged to organize your work so as to minimize the required flagging effort. At such time as the need arises, a reasonable number of working days requiring flaggers should be negotiated so as to minimize the flagging cost. The number of days should be based on review of the then-current Progress Schedule, properly updated and approved per Section 8-1.02D of the Standard Specifications. Unit flagging costs will be based on the then-current daily flagging rate provided by the Railroad. The City will fully cover flagging costs for the negotiated number of working days; you are responsible for costs for days afterwards. For flagging costs for which you are responsible, the City will pay any railroad invoices for flagging and deduct the amount paid from your progress payment.

#### **Replace "Reserved" in Section 5-1.20D with:**

A portion of this project is located within the jurisdiction of the Santa Cruz Port District, the United States Coast Guard, and several private owners. The City has applied for and will possess a right of entry, encroachment permit, or temporary construction easement for each parcel prior to issuing the Notice to Proceed. It will be your responsibility to obtain any additional required permits for this work. Applying for any required permits must be a First Order of Work to avoid negative impacts to the work schedule. Actual costs associated with the RWQCB annual permit(s) will be reimbursed at cost.

A portion of this project is located within parcels owned by private parties. The City has obtained temporary construction easements for this work; the easement deed is included in Supplemental Project Information. It will be your responsibility to schedule your work within the allowable work period specified therein.

#### **Replace Section 5-1.20G Reserved with:**

#### **5-1.20G Coordination with the Port District**

MURRAY STREET BRIDGE AT THE SMALL CRAFT HARBOR, SEISMIC  
RETROFIT/BARRIER REPLACEMENT, CITY PROJECT NO. C409321, FEDERAL NO.  
PROJECT NO. STPLZ 5025(084)



**5-1.20G(1) General**

The Port District operates and maintains the Santa Cruz South Harbor and North Harbor (Woods Lagoon). This operation will be ongoing throughout the project.

Activities in the Port include, but are not limited to:

1. Storage and operation of private boats and yachts
2. Kayaking classes (UCSC)
3. Dinner cruises (Chardonnay Sailing Charters)
4. Boatyard operations and businesses in the East Harbor
5. Dredging operations at the Harbor entrance and North Harbor from October through April.
6. Aeration operations are continuous during summer months.

Provide the Port District a schedule of construction activities within 30 calendar days of NTP and coordinate with the Port District regarding your operations and occupation of Port properties. Prosecute your work to allow the Port District to continue operations. If your schedule of construction activities changes, immediately notify the Port District and re-coordinate to facilitate Port operations.

Navigation lights must be operational at all times. Install temporary navigation lights prior to removal of existing lights. Coordinate with the Port District to replace Navigation Lights as needed during construction. Navigation Lights will be replaced at their existing location at the end of construction.

Attention is directed to section 12-8 of these special provisions regarding waterway traffic control.

The Port District will have a Contractor on site concurrent with your activities. You will coordinate with the Port District and their Contractor to provide access to necessary work site areas so that work on the docks as described in the plans can be performed.

**5-1.20G(2) Materials**

Not used.

**5-1.20G(3) Construction**

Not used.

**5-1.20G(1) Payment**

Not used.

**Replace Section 5-1.20H Reserved with:**

**5-1.20H O'Neill Property Coordination**

MURRAY STREET BRIDGE AT THE SMALL CRAFT HARBOR, SEISMIC RETROFIT/BARRIER REPLACEMENT, CITY PROJECT NO. C409321, FEDERAL NO. PROJECT NO. STPLZ 5025(084)

### **5-1.20H(1) General**

Notify the Engineer 20 working days prior to performing any work at 144 Fairview Place, Santa Cruz CA 95062 and the Engineer will notify the property owner. Property owner may remove existing plants along the fence line. If these plants are removed without providing adequate notice, replace plants with plants of the same species at no additional cost to the project. If the property owner decides not to remove these plants, then the cost of removal will be included the price bid for Clearing and Grubbing. Stumps of all trees removed on the O'Neill property during the construction of temporary and permanent fences will be ground out to 2' below grade and original grade reestablished.

Prepare a pre-construction photo log of the work area and provide to the Engineer for review and approval prior to performing any work on the property.

Upon completion of all work on the property Prepare a post-construction photo log of the work area and provide to the Engineer for review and approval,

### **5-1.20H(2) Materials**

Not used.

### **5-1.20H(3) Construction**

Not used.

### **5-1.20H(4) Payment**

Not used.

\*\*\*\*

## **Replace Section 5-1.24 of the RSS with:**

### **5-1.24 Construction Staking**

#### **5-1.24A General**

This work consists of the furnishing and setting of construction stakes and markers to establish the lines and grades required for the completion of the work as shown on the plans and as specified in the State Standard Specifications and these special provisions and as necessary for the Engineer to check lines, grades, alignment and elevations.

It is your responsibility to perform construction surveys, place temporary survey markers, and layout the project in conformance with the Contract drawings. The City Engineer or their designated appointee will review the survey information that you submit prior to construction. City review does not relieve you of the responsibility for correctly locating all lines and grades.

Place stakes and marks as directed under Chapter 12, "Construction Surveys," of the Caltrans Surveys Manual.

Furnish and set construction stakes and marks with accuracy adequate to assure that the completed work conforms to the lines, grades, and section shown on the plans. Vertical alignment and the coordinates of centerlines and layout lines will be furnished for your use in performing the construction staking.

MURRAY STREET BRIDGE AT THE SMALL CRAFT HARBOR, SEISMIC  
RETROFIT/BARRIER REPLACEMENT, CITY PROJECT NO. C409321, FEDERAL NO.  
PROJECT NO. STPLZ 5025(084)

Make all computations necessary to establish the exact position of the work from control points. All computations, survey notes, and other records necessary to accomplish the work will be neat, legible, and accurate. Furnish copies of such computations, notes and other records to the Engineer prior to beginning work that requires their use.

Remove construction stakes from the site of work when no longer needed.

Upon completion of construction staking and prior to acceptance of the contract, furnish all computations, survey notes, and other data used to accomplish the work to the Engineer and these will become the property of the City. As part of the submittal to the City provide a record of survey by a licensed surveyor in California.

Survey each rail of the Santa Cruz County Regional Transportation Commission (SCCRTC) tracks within the project area at 50-foot intervals before and after pile driving to ensure that the tracks have not been displaced vertically or laterally as a result of pile driving activities. Your surveyor licensed in the state of California will perform surveys. If displacements of more than 1/8" vertically or 1/4" laterally are found, you will coordinate with the SCCRTC to reset the tracks to their original location, for which you will be responsible for reimbursing SCCRTC for all associated costs.

**5-1.24B Materials**

Not used.

**5-1.24C Construction**

Not used.

**5-1.24D Payment**

Not used.

**Add between the 2nd and 3rd paragraphs of section 5-1.32:**

Where City-owned areas have been designated for Contractor's use beneath bridge structures, comply with the following:

1. Do not store any of the following beneath structures:
  - 1.1 Explosives or explosive materials
  - 1.2 Flammable or combustible materials
  - 1.3 Incompatible materials, such as chlorine and ammonia, or batteries and fuels, in the same secondary containment facility
2. Material storage may not encroach on any of the following:
  - 2.1 Within 20 feet of any bridge support
  - 2.2 Within 10 feet of any exposed footing or pile cap
  - 2.3 Within a 6-foot minimum clear zone height from the bottom of superstructure to top of material storage
3. Do not obstruct drainage systems

MURRAY STREET BRIDGE AT THE SMALL CRAFT HARBOR, SEISMIC  
RETROFIT/BARRIER REPLACEMENT, CITY PROJECT NO. C409321, FEDERAL NO.  
PROJECT NO. STPLZ 5025(084)

**Add to the end of section 5-1.32:**

Personal vehicles of your employees must not be parked on the traveled way or shoulders, including sections closed to traffic.

**Add at the beginning of section 5-1.36A:**

Notify in writing or by phone, the following utilities, agencies and the Engineer, five (5) days prior to the beginning of construction:

Agency	Utility	Contact	Address	Phone
City of Santa Cruz	Waterline	Doug Valby	212 Locust Street, Suite C  Santa Cruz, CA 95060	(831) 212-5501
County of Santa Cruz	Sanitary Sewer Force Main	Ashleigh Trujillo	701 Ocean Street, Room 410  Santa Cruz, CA 95060	(831) 454-2160
PG&E	Electric	Jesse Gonzales	615 7 <sup>th</sup> Avenue Santa Cruz, CA 95062	(831) 676-1970
PG&E	Gas	Estevan Garza	615 7 <sup>th</sup> Avenue  Santa Cruz, CA  95062	(831) 236-1309
Comcast	Cable	Mark Giblin	106 Whispering Pines, Dr.  Scotts Valley, CA 95066	(831) 440-4023
AT&T	Cable/Telephone	Robin Barnett De Alvarez	515 Chappell  Watsonville, CA 95076	Email:rb6978@att.com

**Add between the 2nd and 3rd paragraphs of section 5-1.36C(3):**

Utilities will require temporary and permanent relocation during the project. Provide the utility contractor full and unimpeded access to necessary work site areas so that the utility relocation can be performed. This includes accommodating all of the utility contractor's equipment, MURRAY STREET BRIDGE AT THE SMALL CRAFT HARBOR, SEISMIC RETROFIT/BARRIER REPLACEMENT, CITY PROJECT NO. C409321, FEDERAL NO. PROJECT NO. STPLZ 5025(084)

personnel, and materials required for the utility owner to complete the relocation. Additionally, Conduits, hangers and appurtenances necessary to complete these utility relocations as shown on the plans will be completed as part of your contract. Coordinate with the utility owner with regard to access, schedules and materials prior to the relocation work by the utility owner.

The utility owner will relocate a utility shown in the following table below before the corresponding date shown.

**Utility Relocation and Date of the Relocation**

Utility	Location	Date
3" Gas line	On Murray Street hanging from bridge to be capped and abandoned	Completed on August 7, 2023

During the progress of the work under this Contract, the utility owner will relocate a utility shown in the following table within the corresponding number of working days shown. Notify the Engineer when the site is ready for utility work. After verifying the site is ready for utility work, the Engineer will provide advance notice to the utility owner in accordance with the table below. The working days noted in the table below indicate days allowed for utility relocation.

**Utility Relocation and Department-Arranged Time for the Relocation**

Utility	Location	Advance notice to Utility and Engineer (Working days)	Working days (Unless otherwise noted)
PG&E Gas  Contact: Steven Garza E4gn@pge.com Phone: (831) 236-1309	North side of bridge between Station 10+50 to Station 17+50 – Gas conduit to be placed on north side of Murray Street and connect to existing gas main. Gas conduit to be placed through the 8" casing on the north side of bridge. Contractor to install hangers and casing, prior to utility relocation.	100	20
PG&E OH Electric Relocation  Contact: Jesse Gonzales J8GN@pge.com Phone: 831-676-1970 (cell)	North side overhead facilities to be relocated underground, on the north side of the bridge. City's Contractor to drill through the diaphragms and abutments, and hang the utilities under the bridge. Then City's Contractor to construct the casing in the approaches of Murray Street, as shown on the Plans. City's Contractor will also use a Horizontal	60	60

MURRAY STREET BRIDGE AT THE SMALL CRAFT HARBOR, SEISMIC RETROFIT/BARRIER REPLACEMENT, CITY PROJECT NO. C409321, FEDERAL NO. PROJECT NO. STPLZ 5025(084)

	<p>Directional Drilling method to construct casing on the northwest side of the bridge, as shown on the Plans.</p> <p>Once the underground infrastructure has been constructed, PG&amp;E will remove the overhead lines from the north side of the bridge. PG&amp;E will construct pull boxes, vaults, and pull wires through casings/conduits. PG&amp;E will establish power to the east and west harbor. See final PG&amp;E relocation plans in Supplemental Information.</p>		
<p>Comcast</p> <p>Contact: Mark Giblin mark_giblin@comcast.net Phone: (831) 440-4023</p>	<p>North side overhead facilities to be relocated underground, on the north side of the bridge. City's Contractor to drill through the diaphragms and abutments, and hang the utilities under the bridge. Then City's Contractor to construct the casing in the approaches of Murray Street, as shown on the Plans.</p> <p>Once the underground infrastructure has been constructed, Comcast will remove the overhead lines from the north side of the bridge. Comcast will construct pull boxes, vaults, and pull wires through casings/conduits. See final Comcast relocation plans in Supplemental Information.</p>	60	20

Installation of the utilities shown in the following table requires coordination with your activities. Make the necessary arrangements with the utility company through the Engineer and submit a schedule:

1. Verified by a representative of the utility company
2. Allowing at least the time shown for the utility owner to complete its work

MURRAY STREET BRIDGE AT THE SMALL CRAFT HARBOR, SEISMIC RETROFIT/BARRIER REPLACEMENT, CITY PROJECT NO. C409321, FEDERAL NO. PROJECT NO. STPLZ 5025(084)

3. PG&E Gas requires 3 week advance notice to adjust valves to grade.

**Utility Relocation and Contractor-Arranged Time for the Relocation**

Utility	Utility address	Location	Working days
PG&E Gas  Contact: Steven Garza E4gn@pge.com Phone: (831) 236-1309	615 7th Avenue Santa Cruz, CA 95062	Adjusting Valve to Grade at Station 17+90	1 day

To allow pile driving, drilling activities, or substructure construction, the utility owner will rearrange the utilities shown in the following table during construction activities. No other utility will be rearranged or temporarily deactivated before or during construction activities unless you make arrangements with the utility owner.

**Utility Rearrangement for Pile Driving, Drilling Activities, or Substructure Construction**

Utility	Location, duration, and timing
PGE Overhead Lines  Contact: Jesse Gonzales J8GN@pge.com Phone: 831-676-1970 (cell)	Prior to installation of anchor piles and grade beam at Abutment 10, the overhead electric lines on the north side of the Murray Street bridge need to be routed through the bridge and approaches as shown on the utility plans.
Comcast temporary relocation  Contact: Mark Giblin mark_giblin@comcast.net Phone: (831) 440-4023	Prior to installation of anchor piles and grade beam at Abutment 10, the overhead Comcast lines on the north side of the Murray Street bridge need to be routed through the bridge and approaches as shown on the utility plans.

To allow pile driving, drilling activities and substructure construction at Bent 3 and Bent 4, relocate or reconstruct the utilities shown in the following table during construction activities. Notify the Engineer at least 30 calendar days before the interfering utilities are to be rearranged, so that the Port can be notified. Attention is direction to Section 15-1.03M of these special provisions.





## 6 CONTROL OF MATERIALS

### Add to the beginning of section 6-1.02:

The City Water Department furnishes you with:

- Water meter spacers. Contact the City Water Department at (831) 420-5210 to obtain the spacers.

Install the spacers. Advise the City Water Department after you install the spacers. Water meters will then be installed by the City Water Department after inspections are completed.

### **Add to section 6-1.03 of the RSS:**

#### **6-1.03B Submittals**

##### **6-1.03B(1) General**

Not Used

##### **6-1.03B(2) Work Plan**

For local material, such as rock, gravel, earth, structure backfill, pervious backfill, imported borrow, and culvert bedding, obtained from a (1) noncommercial source, or (2) source not regulated under California jurisdiction, submit a local material plan for each material at least 60 calendar days before placing the material. The local material plan must include:

1. Certification signed by you and an engineer who is registered as a civil engineer in the State or a professional geologist licensed as a professional geologist by the State stating:

I am aware local material from a noncommercial source or a source not regulated under CA jurisdiction must be sampled and analyzed for pH and lead and may require sampling and analysis under section 6-1.03B(3) for other constituents of concern based on the land use history. I am aware that local material sources must not contain ADL at concentrations greater than 80 mg/kg total lead or equal to or greater than 5 mg/L soluble lead as determined by the Waste Extraction Test (WET) Procedures, 22 CA Code of Regs § 66261.24(a)(2) App II. I am aware that a maximum quantity of material may be excavated at the site based on the minimum number of samples taken before excavating at the site under section 6-1.03B(3).

2. Land use history of the local material location and surrounding property
3. Sampling protocol
4. Number of samples per volume of local material
5. QA and QC requirements and procedures
6. Qualifications of sampling personnel
7. Stockpile history
8. Name and address of the analytical laboratory that will perform the chemical analyses
9. Analyses that will be performed for lead and pH
10. Other analyses that will be performed for possible hazardous constituents based on:

MURRAY STREET BRIDGE AT THE SMALL CRAFT HARBOR, SEISMIC  
RETROFIT/BARRIER REPLACEMENT, CITY PROJECT NO. C409321, FEDERAL NO.  
PROJECT NO. STPLZ 5025(084)

- 10.1. Source property history
- 10.2. Land use adjacent to source property
- 10.3. Constituents of concern in the ground water basin where the job site is located

The plan must be sealed and signed by an engineer who is registered as a civil engineer in the State or a professional geologist licensed as a professional geologist by the State.

If the plan requires revisions, the Engineer provides comments. Submit a revised plan within 5 working days of receiving comments. Allow 5 working days for the review.

#### **6-1.03B(3) Analytical Test Results**

At least 15 days before placing local material, submit analytical test results for each local material obtained from a noncommercial source or a source not regulated under CA jurisdiction. The analytical test results must include:

1. Certification signed by an engineer who is registered as a civil engineer in the State or a professional geologist licensed as a professional geologist by the State stating:

The analytical testing described in the local material plan has been performed. I performed a statistical analysis of the test results using the US EPA's ProUCL software with the applicable 95 percent upper confidence limit. I certify that the material from the local material source is suitable for unrestricted use at the job site, it has a pH above 5.0, does not contain soluble lead in concentrations equal to or greater than 5mg/l as determined by the Waste Extraction Test (WET) Procedures, 22 CA Code of Regs § 66261.24(a)(2) App II, does not contain lead in concentrations above 80 mg/kg total lead, is free from all other contaminants identified in the local material plan, and will comply with the job site's basin plan and water quality objectives of the RWQCB.

2. Chain of custody of samples
3. Analytical results no older than 1 year
4. Statistical analysis of the data using US EPA's ProUCL software with a 95 percent upper confidence limit
5. Comparison of sample results to hazardous waste concentration thresholds and the RWQCB's basin plan requirements and water quality objectives for the job site location

#### **6-1.03B(4) Sample and Analysis**

Sample and analyze local material from a (1) noncommercial source or (2) source not regulated under CA jurisdiction:

1. Before bringing the local material to the job site
2. As described in the local material plan
3. Under US EPA Test Methods for Evaluating Solid Waste, Physical/Chemical Methods (SW-846)

The sample collection must be designed to generate a data set representative of the entire volume of proposed local material.

Before excavating at the (1) noncommercial material source or (2) a source not regulated under CA jurisdiction, collect the minimum number of samples and perform the minimum number of

MURRAY STREET BRIDGE AT THE SMALL CRAFT HARBOR, SEISMIC  
RETROFIT/BARRIER REPLACEMENT, CITY PROJECT NO. C409321, FEDERAL NO.  
PROJECT NO. STPLZ 5025(084)

analytical tests for the corresponding maximum volume of local material as shown in the following table:

**Minimum Number of Samples and Analytical Tests for Local Material**

Maximum volume of imported borrow (cu yd)	Minimum number of samples and analytical tests
< 5,000	8
5,000–10,000	12 for the first 5,000 cu yd plus 1 for each additional 1,000 cu yd or portion thereof
10,000–20,000	17 for the first 10,000 cu yd plus 1 for each additional 2,500 cu yd or portion thereof
20,000–40,000	21 for the first 20,000 cu yd plus 1 for each additional 5,000 cu yd or portion thereof
40,000–80,000	25 for the first 40,000 cu yd plus 1 for each additional 10,000 cu yd or portion thereof
> 80,000	29 for the first 80,000 cu yd plus 1 for each additional 20,000 cu yd or portion thereof

Do not collect composite samples or mix individual samples to form a composite sample.

Analyze the samples using the US EPA's ProUCL software with a 95 percent upper confidence limit. All chemical analysis must be performed by a laboratory certified by the SWRCB's Environmental Laboratory Accreditation Program (ELAP).

The analytical test results must demonstrate that the local material:

1. Is not a hazardous waste
2. Has a pH above 5.0
3. Has an average total lead concentration, based upon the 95 percent upper confidence limit, at or below 80 mg/kg
4. Is free of possible contaminants identified in the local material plan
5. Complies with the RWQCB's basin plan for the job site location
6. Complies with the RWQCB's water quality objectives for the job site location

### **6-1.03C Local Material Management**

Do not place local material until authorized.

If the Engineer determines the appearance, odor, or texture of any delivered local material suggests possible contamination, sample and analyze the material. The sampling and analysis is change order work unless (1) hazardous waste is discovered or (2) the analytical test results indicate the material does not comply with section 6-1.03B(3).

Dispose of noncompliant local material at an appropriately permitted CA Class I, CA Class II or CA Class III facility. You are the generator of noncompliant local material.

**Replace section 6-1.04 with:**

**6-1.04 BUY AMERICA**

**6-1.04A General**

Buy America requirements do not apply to the following:

1. Tools and construction equipment used in performing the work
2. Temporary work that is not incorporated into the finished project

**6-1.04B Crumb Rubber (Pub Res Code § 42703(d))**

Furnish crumb rubber with a certificate of compliance. Crumb rubber must be:

1. Produced in the United States
2. Derived from waste tires taken from vehicles owned and operated in the United States

**6-1.04C Steel and Iron Materials**

Steel and iron materials must be melted and manufactured in the United States except:

1. Foreign pig iron and processed, pelletized, and reduced iron ore may be used in the domestic production of the steel and iron materials
2. If the total combined cost of the materials produced outside the United States does not exceed the greater of 0.1 percent of the total bid or \$2,500, the material may be used if authorized

Furnish steel and iron materials to be incorporated into the work with certificates of compliance and certified mill test reports. Mill test reports must indicate where the steel and iron were melted and manufactured.

All melting and manufacturing processes for these materials, including an application of a coating, must occur in the United States. Coating includes all processes that protect or enhance the value of the material to which the coating is applied.

**6-1.04D Manufactured Products**

Iron and steel used in precast concrete manufactured products must meet the requirements of section 6- 1.04C regardless of the amount used.

Iron and steel used in other manufactured products must meet the requirements of section 6-1.04C if the weight of steel and iron components constitute 90 percent or more of the total weight of the manufactured product.

**6-1.04E Construction Materials**

Buy America requirements apply to the following construction materials unless otherwise specified:

1. Non-ferrous metals
2. Plastic and polymer-based products such as:
  - 2.1. Polyvinylchloride

MURRAY STREET BRIDGE AT THE SMALL CRAFT HARBOR, SEISMIC RETROFIT/BARRIER REPLACEMENT, CITY PROJECT NO. C409321, FEDERAL NO. PROJECT NO. STPLZ 5025(084)



## 7 LEGAL RELATIONS AND RESPONSIBILITY TO THE PUBLIC

**Replace *Reserved* in section 7-1.02K(6)(e) with:**

### **7-1.02K(6)(e)(i) General**

Section 7-1.02K(6)(e) applies to scaffolding constructed (1) over traffic, (2) on or suspended from a bridge, or (3) within a distance equal to the scaffolding height plus 6 feet from the edge of a traveled way open to traffic, except section 7-1.02K(6)(e) does not apply to scaffolding at sound walls, retaining walls, and buildings.

Submit 6 copies of shop drawings and 1 copy of calculations.

The shop drawings and calculations must be sealed and signed by:

1. Engineer who is registered as a civil engineer
2. Independent reviewer who is:
  - 2.1. Registered as a civil engineer in the State
  - 2.2. Not employed by the same entity that prepared the drawings

Include in the submittal:

1. Descriptions, calculations, and values for loads anticipated during erection, use, and removal of the scaffolding.
2. Methods and equipment for erecting, moving, and removing scaffolding.
3. Design details, including bolt layouts, welding details, and connections to existing structures.
4. Stress sheets, including a summary of computed stresses in the scaffolding and in the connections between the scaffolding and existing structures. The computed stresses must include the effects of erection, movement, and removal of the scaffolding.

If manufactured scaffolding is used, the manufacturer's name, address, and telephone number must be shown on the shop drawings.

Welding must comply with AWS D1.1 for steel and AWS D1.2 for aluminum.

Group	Gamma factor	Beta factors		
		D	(L+I)H	(L+I)P
$I_H^a$	1.3	1	1	0
$I_{PC}^b$	1.3	1	0	1
$I_{PW}^c$	1.3	1	1	1.15

<sup>a</sup>H denotes HL-93 loads

<sup>b</sup>PC denotes P loads on closely spaced girders

<sup>c</sup>PW denotes P loads on widely spaced girders

For truss-type bridges, all connections must be made through stringers, floor beams, or truss panel points, and no connections are allowed that may cause bending stresses in a truss member.

**Replace Section 7-1.02K(6)(j)(iii) of the RSS for Section 7-1.02K(6)(j)(iii) with:**

**7-1.02K(6)(j)(iii) Unregulated Earth Material Containing Lead**

Section 7-1.02K(6)(j)(iii) includes specifications for handling, removing, and disposing of unregulated earth material containing lead. Management of this material exposes workers to health hazards that must be addressed in your lead compliance plan. This material contains average lead concentrations below 80 mg/kg total lead and below 5 mg/L soluble lead and is not regulated by DTSC as a hazardous substance or a hazardous waste. This material does not require disposal at a permitted landfill or solid waste disposal facility. The RWQCB has jurisdiction over reuse of this material at locations outside the job site limits.

Manage regulated earth material containing lead under sections 14-11.08 and 14-11.09.

Unregulated earth material exists throughout the job site.

Submit a Lead Compliance Plan

Lead is typically found within the top 2 feet of material within the highway. Reuse all of the excavated material on the right-of-way.

Handle the material under all applicable laws, rules, and regulations, including those of the following agencies:

1. Cal/OSHA
2. CA RWQCB, Central Coast Region
3. CA Department of Toxic Substances Control

If you choose to dispose of unregulated material at a commercial landfill:

1. Transport it to a Class III or Class II landfill appropriately permitted to receive the material
2. You are responsible for identifying the appropriately permitted landfill to receive the material and for all associated trucking and disposal costs, including any additional sampling and analysis required by the receiving landfill

**Add to end of Section 7-1.04:**

You must:

1. Notify emergency service providers 5 working days before any street closure during construction.
  - 1.1. City Police – (831) 471-1131
  - 1.2. County Sheriff - (831) 454-7600
  - 1.3. Fire Department - P: 831-420-5030
  - 1.4. Ambulance services - 831-454-4120.
  - 1.5. California Highway Patrol - (831) 219-0200

2. Contact businesses and residents and advise them of planned access or parking impacts before construction activities begin,

MURRAY STREET BRIDGE AT THE SMALL CRAFT HARBOR, SEISMIC RETROFIT/BARRIER REPLACEMENT, CITY PROJECT NO. C409321, FEDERAL NO. PROJECT NO. STPLZ 5025(084)

3. Provide, at all times, access to properties adjacent to the project area.



**Add after Section 7-1.11D:**

**7-1.12 Title VI ASSURANCES**

The U.S. Department of Transportation Order No.1050.2A requires all federal-aid Department of Transportation contracts between an agency and a contractor to contain Appendix A and E. Appendix B only requires inclusion if the contract impacts deeds effecting or recording the transfer of real property, structures, or improvements thereon, or granting interest therein. Appendices C and D only require inclusion if the contract impacts deeds, licenses, leases, permits, or similar instruments entered into by the recipient.

**APPENDIX A**

During the performance of this contract, the contractor, for itself, its assignees, and successors in interest (hereinafter referred to as the “contractor”) agrees as follows:

1. **Compliance with Regulations:** The contractor (hereinafter includes consultants) will comply with the Acts and the Regulations relative to Non- discrimination in Federally-assisted programs of the U.S. Department of Transportation, Federal Highway Administration, as they may be amended from time to time, which are herein incorporated by reference and made a part of this contract.
2. **Non-discrimination:** The contractor, with regard to the work performed by it during the contract, will not discriminate on the grounds of race, color, national origin, age, sex, or disability in the selection and retention of subcontractors, including procurements of materials and leases of equipment. The contractor will not participate directly or indirectly in the discrimination prohibited by the Acts and the Regulations, including employment practices when the contract covers any activity, project, or program set forth in Appendix B of 49 CFR Part 21.
3. **Solicitation for Subcontracts, Including Procurements of Materials and Equipment:** In all solicitations, either by competitive bidding, or negotiation made by the contractor for work to be performed under a subcontract, including procurements of materials, or leases of equipment, each potential subcontractor or supplier will be notified by the contractor of the contractor’s obligations under this contract and the Acts and the Regulations relative to Non-discrimination on the grounds of race, color, national origin, age, sex, or disability.
4. **Information and Reports:** The contractor will provide all information and reports required by the Acts, the Regulations, and directives issued pursuant thereto and will permit access to its books, records, accounts, other sources of information, and its facilities as may be determined by the Recipient or the FHWA to be pertinent to ascertain compliance with such Acts, Regulations, and instructions. Where any information required of a contractor is in the exclusive possession of another who fails or refuses to furnish the information, the contractor will so certify to the

MURRAY STREET BRIDGE AT THE SMALL CRAFT HARBOR, SEISMIC  
RETROFIT/BARRIER REPLACEMENT, CITY PROJECT NO. C409321, FEDERAL NO.  
PROJECT NO. STPLZ 5025(084)

Recipient or the FHWA, as appropriate, and will set forth what efforts it has made to obtain the information.

5. **Sanctions for Noncompliance:** In the event of a contractor's noncompliance with the Non-discrimination provisions of this contract, the Recipient will impose such contract sanctions as it or the FHWA may determine to be appropriate, including, but not limited to:
  1. withholding payments to the contractor under the contract until the contractor complies; and/or
  2. cancelling, terminating, or suspending a contract, in whole or in part.
6. **Incorporation of Provisions:** The contractor will include the provisions of paragraphs one through six in every subcontract, including procurements of materials and leases of equipment, unless exempt by the Acts, the Regulations and directives issued pursuant thereto. The contractor will take action with respect to any subcontract or procurement as the Recipient or the FHWA may direct as a means of enforcing such provisions including sanctions for noncompliance. Provided, that if the contractor becomes involved in, or threatened with litigation by a subcontractor, or supplier because of such direction, the contractor may request the Recipient to enter into any litigation to protect the interests of the Recipient. In addition, the contractor may request the United States to enter into the litigation to protect the interests of the United States.

## **APPENDIX B**

### **CLAUSES FOR DEEDS TRANSFERRING UNITED STATES PROPERTY**

The following clauses will be included in deeds effecting or recording the transfer of real property, structures, or improvements thereon, or granting interest therein from the United States pursuant to the provisions of Assurance 4:

**NOW THEREFORE**, the U.S. Department of Transportation as authorized by law and upon the condition that the California Department of Transportation will accept title to the lands and maintain the project constructed thereon in accordance with Title 23 U.S.C., the regulations for the administration of the preceding statute, and the policies and procedures prescribed by the FHWA of the U.S. Department of Transportation in accordance and in compliance with all requirements imposed by Title 49, Code of Federal Regulations, U.S. Department of Transportation, Subtitle A, Office of the Secretary, Part 21, Non-discrimination in Federally-assisted programs of the U.S. Department of Transportation pertaining to and effectuating the provisions of Title VI of the Civil Rights Act of 1964 (78 Stat. 252; 42 U.S.C. § 2000d to 2000d-4), does hereby remise, release, quitclaim and convey unto the California Department of Transportation all the right, title and interest of the MURRAY STREET BRIDGE AT THE SMALL CRAFT HARBOR, SEISMIC RETROFIT/BARRIER REPLACEMENT, CITY PROJECT NO. C409321, FEDERAL NO. PROJECT NO. STPLZ 5025(084)

U.S. Department of Transportation in and to said lands described in Exhibit A attached hereto and made a part hereof.

**(HABENDUM CLAUSE)**

**TO HAVE AND TO HOLD** said lands and interests therein unto the California Department of Transportation and its successors forever, subject, however, to the covenants, conditions, restrictions and reservations herein contained as follows, which will remain in effect for the period during which the real property or structures are used for a purpose for which Federal financial assistance is extended or for another purpose involving the provision of similar services or benefits and will be binding on the California Department of Transportation, its successors and assigns.

The California Department of Transportation, in consideration of the conveyance of said lands and interest in lands, does hereby covenant and agree as a covenant running with the land for itself, its successors and assigns, that (1) no person will on the grounds of race, color, or national origin, be excluded from participation in, be denied the benefits of, or be otherwise subjected to discrimination with regard to any facility located wholly or in part on, over, or under such lands hereby conveyed [.] [and]\* (2) that the California Department of Transportation will use the lands and interests in lands and interest in lands so conveyed, in compliance with all requirements imposed by or pursuant to Title 49, Code of Federal Regulations, U.S. Department of Transportation, Subtitle A, Office of the Secretary, Part 21, Non-discrimination in Federally-assisted programs of the U.S. Department of Transportation, Effectuation of Title VI of the Civil Rights Act of 1964, and as said Regulations and Acts may be amended[, and (3) that in the event of breach of any of the above-mentioned non-discrimination conditions, the Department will have a right to enter or re-enter said lands and facilities on said lands, and that above described land and facilities will thereon revert to and vest in and become the absolute property of the U.S. Department of Transportation and its assigns as such interest existed prior to this instruction].\*

(\*Reverter clause and related language to be used only when it is determined that such a clause is necessary in order to make clear the purpose of Title VI.)

**APPENDIX C**

**CLAUSES FOR TRANSFER OF REAL PROPERTY ACQUIRED OR IMPROVED UNDER THE ACTIVITY, FACILITY, OR PROGRAM**

The following clauses will be included in deeds, licenses, leases, permits, or similar instruments entered into by the California Department of Transportation pursuant to the provisions of Assurance 7(a):

- A. The (grantee, lessee, permittee, etc. as appropriate) for himself/herself, his/her heirs, personal representatives, successors in interest, and assigns, as a part of

MURRAY STREET BRIDGE AT THE SMALL CRAFT HARBOR, SEISMIC RETROFIT/BARRIER REPLACEMENT, CITY PROJECT NO. C409321, FEDERAL NO. PROJECT NO. STPLZ 5025(084)

the consideration hereof, does hereby covenant and agree [in the case of deeds and leases add "as a covenant running with the land"] that:

1. In the event facilities are constructed, maintained, or otherwise operated on the property described in this (deed, license, lease, permit, etc.) for a purpose for which a U.S. Department of Transportation activity, facility, or program is extended or for another purpose involving the provision of similar services or benefits, the (grantee, licensee, lessee, permittee, etc.) will maintain and operate such facilities and services in compliance with all requirements imposed by the Acts and Regulations (as may be amended) such that no person on the grounds of race, color, or national origin, will be excluded from participation in, denied the benefits of, or be otherwise subjected to discrimination in the use of said facilities.
- B. With respect to licenses, leases, permits, etc., in the event of breach of any of the above Non-discrimination covenants, the California Department of Transportation will have the right to terminate the (lease, license, permit, etc.) and to enter, re-enter, and repossess said lands and facilities thereon, and hold the same as if the (lease, license, permit, etc.) had never been made or issued.\*
- C. With respect to a deed, in the event of breach of any of the above Non-discrimination covenants, the California Department of Transportation will have the right to enter or re-enter the lands and facilities thereon, and the above described lands and facilities will there upon revert to and vest in and become the absolute property of the California Department of Transportation and its assigns.

(\*Reverter clause and related language to be used only when it is determined that such a clause is necessary to make clear the purpose of Title VI.)

## **APPENDIX D**

### **CLAUSES FOR CONSTRUCTION/USE.ACCESS TO REAL PROPERTY ACQUIRED UNDER THE ACTIVITY, FACILITY OR PROGRAM**

The following clauses will be included in deeds, licenses, permits, or similar instruments/agreements entered into by the California Department of Transportation pursuant to the provisions of Assurance 7(b):

- A. The (grantee, licensee, permittee, etc., as appropriate) for himself/herself, his/her heirs, personal representatives, successors in interest ,and assigns, as a part of the consideration hereof, does hereby covenant and agree (in the case of deeds and leases add, "as a covenant running with the land") that (1) no person on the ground of race, color, or national origin, will be excluded from participation in, denied the benefits of, or be otherwise subjected to discrimination in the use of said facilities,

MURRAY STREET BRIDGE AT THE SMALL CRAFT HARBOR, SEISMIC  
RETROFIT/BARRIER REPLACEMENT, CITY PROJECT NO. C409321, FEDERAL NO.  
PROJECT NO. STPLZ 5025(084)

(2) that in the construction of any improvements on, over, or under such land, and the furnishings of services thereon, no person on the ground of race, color, or national origin, will be excluded from participation in, denied the benefits or, or otherwise be subjected to discrimination, (3) that the (grantee, licensee, lessee, permittee, etc.) will use the premises in compliance with all other requirements imposed by or pursuant to the Acts and Regulations, as amended, set forth in this Assurance.

- B. With respect to (licenses, leases, permits, etc.) in the event of breach of any of the above of the above Non-discrimination covenants, the California Department of Transportation will have the right to terminate the (license, permits, etc., as appropriate) and to enter or re-enter and repossess said land and the facilities thereon, and hold the same as if said (license, permit, etc., as appropriate) had never been made or issued.\*
- C. With respect to deeds, in the event of breach of any of the above Non-discrimination covenants, the California Department of Transportation will there upon revert to and vest in and become the absolute property of the California Department of Transportation and its assigns.

(\*Reverter clause and related language to be used only when it is determined that such a clause is necessary to make clear the purpose of Title VI.)

## APPENDIX E

During the performance of this contract, the contractor, for itself, its assignees, and successors in interest (hereinafter referred to as the “contractor”) agrees to comply with the following non-discrimination statutes and authorities, including, but not limited to:

### **Pertinent Non-Discrimination Authorities:**

- Title VI of the Civil Rights Act of 1964 (42 U.S.C. § 2000d *et seq.*, 78 stat. 252), prohibits discrimination on the basis of race, color, national origin); and 49 CFR Part 21.
- The Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970, (42 U.S.C. § 4601), (prohibits unfair treatment of persons displaced or whose property has been acquired because of Federal or Federal-aid programs and projects);
- Federal-Aid Highway Act of 1973, (23 U.S.C. § 324 *et seq.*), prohibits discrimination on the basis of sex;
- Section 504 of the Rehabilitation Act of 1973, (29 U.S.C. § 794 *et seq.*), as amended, (prohibits discrimination on the basis of disability); and 49 CR Part 27;
- The Age Discrimination Act of 1975, as amended, (42 U.S.C. § 6101 *et seq.*),

MURRAY STREET BRIDGE AT THE SMALL CRAFT HARBOR, SEISMIC RETROFIT/BARRIER REPLACEMENT, CITY PROJECT NO. C409321, FEDERAL NO. PROJECT NO. STPLZ 5025(084)

prohibits discrimination on the basis of age);

- Airport and Airway Improvement Act of 1982, (49 U.S.C. § 471, Section 47123), as amended, (prohibits discrimination based on race, creed, color, national origin, or sex);
- The Civil Rights Restoration Act of 1987, (PL 100-209), (Broadened the scope, coverage and applicability of Title VI of the Civil Rights Act of 1964, The Age Discrimination Act of 1975 and Section 504 of the Rehabilitation Act of 1973, by expanding the definition of the terms “programs or activities” to include all of the programs or activities of the Federal-aid recipients, sub-recipients and contractors, whether such programs or activities are Federally funded or not);
- Titles II and III of the Americans with Disabilities Act, which prohibit discrimination of the basis of disability in the operation of public entities, public and private transportation systems, places of public accommodation, and certain testing entities (42 U.S.C. §§ 12131 – 12189) as implemented by Department of Transportation regulations 49 C.F.R. parts 37 and 38;
- The Federal Aviation Administration’s Non-discrimination statute (49 U.S.C. § 47123) (prohibits discrimination on the basis of race, color, national origin, and sex);
- Executive Order 12898, Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations, which ensures discrimination against minority populations by discouraging programs, policies, and activities with disproportionately high and adverse human health or environmental effects on minority and low-income populations;
- Executive Order 13166, Improving Access to Services for Persons with Limited English Proficiency, and resulting agency guidance, national origin discrimination includes discrimination because of limited English proficiency (LEP). To ensure compliance with Title VI, you must take reasonable steps to ensure that LEP persons have meaningful access to your programs (70 Fed. Reg. at 74087 to 74100);
- Title IX of the Education Amendments of 1972, as amended, which prohibits you from discriminating because of sex in education programs or activities (20 U.S.C. 1681 et seq).

AA

## 8 PROSECUTION AND PROGRESS

Section 8-1.04B does not apply.

### Replace Delayed Start in section 8-1.04C with:

Start job site activities within 55 days after receiving notice that the Contract has been approved by the City Attorney or the attorney appointed and authorized to represent the City.

Do not start other job site activities until the following information is received by the Engineer:

1. Notice of Materials To Be Used form.
2. Written statement from the vendor that the order for the sign panels has been received and accepted by the vendor. The statement must show the dates that the materials will be shipped.
3. Written statement from the vendors/fabricators that the orders for the following items have been received and accepted by the vendor/fabricator. The statement must show the dates that the materials will be shipped.
  1. Structural steel for piles
  2. SSFM manifolds
  3. SSFM valves
  4. 36" Steel SSFM pipe
  5. Steel utilities casings

You may start job site activities before the 15th day after Contract approval if you:

1. Obtain specified authorization or acceptance for each submittal before the 15th day
2. Receive authorization to start

Submit a notice 72 hours before starting job site activities. If the project has more than 1 location of work, submit a separate notice for each location.

### Add to the end of section 8-1.10B:

Liquidated damages for not completing the following work within the specified durations will be as shown in table below. Liquidated damages will be assessed based on hours or calendar days.

Task	Duration	Liquidated Damages
SSFM; install East and West Connections, installed concurrently	4 hr	\$10,000 (per hour)
South Side Bent 6 in-water work	15 Wday	\$2000 (per day)
South Side Bent 7 in-water work	15 Wday	\$2000 (per day)
South Side Bent 8 in-water work	15 Wday	\$2000 (per day)
North Side Bent 6 in-water work	15 Wday	\$2000 (per day)

MURRAY STREET BRIDGE AT THE SMALL CRAFT HARBOR, SEISMIC RETROFIT/BARRIER REPLACEMENT, CITY PROJECT NO. C409321, FEDERAL NO. PROJECT NO. STPLZ 5025(084)





## **9 PAYMENT**

**Replace section 9-1.16A with:**

### **9-1.16A APPLICATIONS FOR PAYMENT**

#### **9-1.16A(1) General**

Based upon Applications for Payment submitted to the Engineer by the Contractor, the City shall make progress payments to the Contractor as provided below and elsewhere in the Contract Documents.

The pay period covered by each Application for Payment shall be one calendar month ending on the 20th day of the month.

The Contractor shall submit each Application for Payment to the Engineer by the last day of each month.

Pursuant to section 9-1.02 Measurement, Contractor's Applications for Payment shall be based on the actual installed quantities for payment.

Applications for Payment shall indicate the percentage of completion of each portion of the work for which a lump sum price is specified as of the end of the period covered by the Application for Payment.

#### **9-1.16A(2) Applications for Payment**

Contractor shall submit to the Engineer an Application for Payment on a form furnished by the Engineer for work completed in accordance with the measurement of quantities. Such application shall be supported by such data substantiating the Contractor's right to payment the Engineer may require.

By submitting an Application for Payment, the Contractor warrants that all work has been performed in compliance with the Contract Documents, and that all quantities and amounts set forth therein accurately reflect the amount of work completed during that pay period.

Each Application for Payment shall be reviewed by the Engineer as soon as practicable after receipt for the purpose of determining that the Application for Payment is a "proper" payment request, accurately reflecting the value of work completed and submitted with the documents required by the Contract Documents. An Application for Payment shall be deemed "proper" only if it is properly completed and submitted on the proper forms. The Engineer shall have the right to adjust any estimate of quantity and to subsequently correct any error made in any Application for Payment.

The City will make payment to the Contractor not later than 30 days after the Engineer's verification and approval that an Application for Payment is undisputed and properly submitted.

MURRAY STREET BRIDGE AT THE SMALL CRAFT HARBOR, SEISMIC  
RETROFIT/BARRIER REPLACEMENT, CITY PROJECT NO. C409321, FEDERAL NO.  
PROJECT NO. STPLZ 5025(084)

The Contractor may elect to allow an alternative procedure for processing monthly applications for payment whereby the Engineer prepares monthly progress payment estimates. To initiate such alternative procedure, the Contractor shall submit to the Engineer a written request (before the 10th day of the month) which authorizes the Engineer to prepare the monthly progress payment estimates for all remaining payments due under the Contract. Under such alternative procedure, the City, once in each month, shall cause an estimate in writing to be made by the Engineer, and the Contractor's signature approving the progress payment estimate shall be considered "receipt of an undisputed and properly submitted payment request" from the Contractor under Public Contract Code section 20104.50, and the City shall make payment to the Contractor within 30 days after such receipt.

Applications for Payment shall include the following:

Contractor's Verification: Contractor has carefully prepared this entire document and hereby attests that the quantities and amounts stated herein accurately represent the total work that has been performed in compliance with the Contract Documents. Contractor will pay any released retainage to Subcontractor due to accepted complete work of the Subcontractors portion of the work within 30 days of receipt of payment as required under 49 CFR 26.29(b)(3).

Under the alternative procedure described above, progress pay estimates prepared by the Engineer shall include the following:

Contractor's Verification: Contractor has carefully reviewed this entire document and hereby attests that the quantities and amounts stated herein accurately represent the total work that has been performed in compliance with the Contract Documents. Contractor will pay any released retainage to Subcontractor due to accepted complete work of the Subcontractors portion of the work within 30 days of receipt of payment as required under 49 CFR Part 26 sub section 26.29(b)(3).

#### **9-1.16A(3) Payments for Authorized Changes**

Applications for Payment may include requests for payment on account of changes in the work that have been properly authorized by Change Orders and by Construction Change Directives, which shall be itemized separately from base Contract work.

#### **9-1.16A(4) No Requests for Disputed Subcontractor Work**

Applications for Payment shall not include requests for payment of amounts the Contractor does not intend to pay to a Subcontractor or material supplier because of a dispute or other reason, or as to which an appropriate stop payment notice release has not been filed.

#### **9-1.16A(5) Improper Application for Payment**

In accordance with Public Contract Code section 20104.50, any Application for Payment determined by the Engineer not to be a proper payment request, suitable

MURRAY STREET BRIDGE AT THE SMALL CRAFT HARBOR, SEISMIC  
RETROFIT/BARRIER REPLACEMENT, CITY PROJECT NO. C409321, FEDERAL NO.  
PROJECT NO. STPLZ 5025(084)



## **DIVISION II GENERAL CONSTRUCTION**

### **10 GENERAL**

#### **Add to the end of section 10-1.02C(2):**

Protect any irrigation component to be relocated before performing any other construction activity in the area.

#### **Add to the beginning of section 10-1.02E:**

Construct the new pavement structure adjacent to the existing traveled way by successively excavating, preparing subgrade, placing base materials, and paving. Perform these activities concurrently after you start paving. Excavation within 8 feet of the existing traveled way must not precede the paving operation by more than 2 working days unless:

1. Authorized
2. Material is placed and compacted against the vertical cuts within 8 feet of the existing traveled way. During excavation, you may use native material for this purpose except you must use structural material once you start placing the pavement structure. Place the material to the top of the existing pavement and taper at a slope of 4:1 (horizontal:vertical) or flatter to the bottom of the excavation. Do not use treated base for the taper.

Do not work at the following locations until PG&E has relocated their electrical lines on the north side of the bridge:

1. North anchor pile installation at east end of bridge
2. North grade beam installation at east end of bridge
3. Abutment 10 construction

You may work within the water only from June 15 to October 15 of each year. If more time is needed complete project activities, between the period of October 15 to November 15, work may be authorized on a week-by-week basis with written approval from CDFW. Work outside this period from a trestle that you install during this period subject to permit and environmental requirements.

The following general order of work has been established as a conceptual sequence to complete the project. This Order of work is reflected in the stage construction drawings of the project plans. This order of work does not contain all elements of work but reflects certain key elements that should be completed prior to other elements in order to prevent conflicts and complete the project within the established time period. Review the sequence and the staging drawings and submit a detailed stage construction plan indicating the order in which you anticipate performing the work for approval. Changes to this order of work will be reviewed by the Engineer.

1. Prior to disconnecting the 12" water main on Murray Street Bridge, construct both Waterline #5 located on Lake Avenue and Waterline #3 located in the East Harbor, including disinfecting, testing and placing in service, including the fire hydrant isolation valve and lateral and 1" service lateral.

MURRAY STREET BRIDGE AT THE SMALL CRAFT HARBOR, SEISMIC  
RETROFIT/BARRIER REPLACEMENT, CITY PROJECT NO. C409321, FEDERAL NO.  
PROJECT NO. STPLZ 5025(084)

2. Provide West Harbor access for the removal and reconfiguration of docks (by others)
3. Relocate rowing racks and jet float (by others)
4. Remove Dock F-F and Dock F-F pedestrian walkway (by others)
5. Construct temporary new West Harbor guest dock FF and pedestrian gangway (by others)
6. Construct utility ductbank including conduits through the bridge and in the approaches; all work to allow PG&E and Comcast to relocate their electrical lines.
7. Construct Bent 9 and Abutment 10.
8. Construct north side piles, piles caps, columns, bent caps, deck and barrier, and fender system
9. Construct SSFM and tie in to existing SSFM
10. Abandon existing SSFM in harbor
11. Construct south side widening (piles, pile caps, columns, bent caps, deck and barrier and fender system
12. Construct retaining walls. RW #11 must be constructed before RW #9.
13. Finalize civil, roadway and bridge work
14. Restore harbor to original condition

**Replace Section 10-2 Reserved with:**

**10-2 RESIDENT ENGINEER'S OFFICE**

**10-2.01(A) General**

Furnish, in less than 10 working days after award of contract, until one hundred percent of the work is accepted, a Resident Engineer's office conforming to these special provisions. The office will be within one-quarter mile of the project site or as approved by the Engineer.

The overall size of the office will be 720 square feet minimum, and it will be furnished with doors and windows capable of being locked. The office will be partitioned to provide two private offices of not less than 120 square feet each and a conference area of not less than 180 square feet. The private offices will be provided with a lockable closet, at least 25 feet of 12-inch wide shelving located as designated by the Engineer, and two portable book cases, each with a minimum of three four-foot long (or four three-foot long) shelves. All shelves will provide 13" minimum of clear vertical space.

If the office is a trailer, the perimeter of the office area will be secured by an 8-foot high chain link fence with 3 strands of barbed wire on top. Provide a lockable gate and lock assembly with 2 keys. Title to the trailer and provided contents will remain with the Contractor. Provide the Engineer with a copy of written permission or agreement to place the Resident Engineer's trailer on private property unless such private property is within a project construction easement shown on the plans.

MURRAY STREET BRIDGE AT THE SMALL CRAFT HARBOR, SEISMIC  
RETROFIT/BARRIER REPLACEMENT, CITY PROJECT NO. C409321, FEDERAL NO.  
PROJECT NO. STPLZ 5025(084)

The office will be furnished with:

- three parking spaces (within the above chain link fence or contiguous to the office building)
- HVAC system capable of maintaining interior temperature between 68 and 78 degrees F.
- Four desks with lockable drawers
- Four 5-foot minimum layout tables
- One 4-foot by 8-foot conference table and 8 standard chairs
- Four desk chairs with arms
- 2 four-drawer legal size filing cabinets
- 1 plan rack
- One refrigerator (12 cu.ft. minimum, with 3 cu.ft. minimum freezer)
- One fire extinguisher
- One first-aid kit (bandages, gauze, etc.)
- Bottled drinking water,
- Restroom or portable restroom
- Sink with hot and cold water,
- Soap, and paper products.

Provide, not less than weekly, office cleaning service including wastepaper/trash removal, floor cleaning, and rest room maintenance all to the satisfaction of the Engineer.

Provide for the City's exclusive possession and use a complete, a new work station system with four work stations connected to a networked printer/scanner/copier unit. Configure, install/setup, maintain, and repair the computer system. The Engineer may use the furnished computer hardware, software, and instruction manuals for any purposes relating to the project. Used computer components will not be accepted. Before delivery and setup of the computer system, submit to the Engineer for approval a detailed list of all computer hardware and software the Contractor proposes to furnish. The minimum computer system to be furnished will include the following:

1. Complete networked work stations, including four workstations each with:

- 1.1. wireless keyboard,
- 1.2. wireless optical mouse,
- 1.3. Two 24-inch color monitors for each workstation,
- 1.4. four laptop docking stations
- 1.5. High-speed internet connection with minimum 50 Mbps. Internet may be provided by cable or satellite connection.

2. Computer operating system and other software:

- 2.1. Oracle Primavera P6 Version 20.12 Professional Project Management for Windows (see "Progress Schedule" section of these special provisions).

3. A network copier/scanner/printer with the following machine specifications, capabilities, and supplies:

MURRAY STREET BRIDGE AT THE SMALL CRAFT HARBOR, SEISMIC  
RETROFIT/BARRIER REPLACEMENT, CITY PROJECT NO. C409321, FEDERAL NO.  
PROJECT NO. STPLZ 5025(084)

- 3.1. automatic duplexing and collating,
- 3.2. black/white and color network printing,
- 3.3. black/white and color copying,
- 3.4. black/white and color scanning,
- 3.5. paper sizes 8 1/2" x 11", 8 1/2" x 14", and 11" x 17", and
- 3.6. printing and paper supplies for 2000-8 1/2" x 11", 500-8 1/2" x 14", and 1000-11" x 17" sheets per month.

4. All necessary cables and hardware devices to link computer network hardware together for operational use.

The computer hardware and software furnished will be compatible with the Contractor's project scheduling software and the project management and administration needs of the Engineer and will include instruction manuals and other documentation normally provided with the software.

Furnish, install, set up, maintain, and repair the computer hardware and software ready for use at a location determined by the Engineer. The hardware and software will be installed and ready for use one working day after the office is made available to the Engineer.

When no claims involving contract progress are pending, all computer hardware and software furnished will be removed by the Contractor upon acceptance of the contract. When contract claims involving contract progress are pending, computer hardware or software will not be removed until the final estimate has been submitted to the Contractor. If, before the final estimate has been submitted to the Contractor, the Contractor requests relief of maintenance of the Resident Engineer's Office and if such a request is approved by the Engineer, relocate the computer system to another location, within the City limits, as designated by the Engineer.

Equipment furnished will be for the Engineer's sole use and of standard quality and new or like new in appearance and function. The office will be installed and ready for occupancy no later than ten (10) working days after award of contract. For each day thereafter that the office is not ready for occupancy, you will be assessed damages in the amount of \$100.00 per calendar day. Monthly internet bills will be paid by the Contractor and reimbursed by contract change order without markups.

#### **10-2.01(B) Materials**

Not used.

#### **10-2.01(C) Construction**

Not used.

#### **10-2.01(D) Payment**

The contract lump sum price paid for Resident Engineers office will include full compensation for furnishing and installing in less than 10 working days after award of contract, maintaining until the final estimate has been approved by the Engineer, and removing the office, utility connections including bottled water service, furnishings, computer system, office equipment, office supplies, weekly cleaning and sanitation and utility billings as specified in these special provisions and as designated by the Engineer.

MURRAY STREET BRIDGE AT THE SMALL CRAFT HARBOR, SEISMIC  
RETROFIT/BARRIER REPLACEMENT, CITY PROJECT NO. C409321, FEDERAL NO.  
PROJECT NO. STPLZ 5025(084)





## 12 TEMPORARY TRAFFIC CONTROL

### Add the following to Section 12-3.11B(2) of the RSS:

Provide two General Information Signs as designated by the Engineer. The signs will indicate:

**HARBOR BUSINESSES  
ARE OPEN DURING THE  
MURRAY STREET BRIDGE  
REHABILITATION PROJECT**

The signs will be 48 by 30 inches, have a black legend on a retroreflective, fluorescent orange background, and be in conformance with Section 12-3.11B(1).

### Replace section 12-3.11B(5)(b) of the RSS with:

#### **12-3.11B(5)(b) Construction Project Funding Identification Signs**

Construction project funding identification C47A(CA) sign must comply with the policy for construction funding identification signs in section 6F.109(CA) of the *California MUTCD* and the Standard specifications on the Department's Traffic Operations website.

Sign must be mounted on a wood post complying with section 82-3.

Sign panels must be framed, single-sheet, aluminum panels complying with section 82-2.

Background on the sign must be Type XI retroreflective sheeting. Type XI retroreflective sheeting must be on the Authorized Material List for signing and delineation materials.

Legend must be retroreflective except for nonreflective black letters and numerals.

Legend for the type of project must read as BRIDGE CONSTRUCTION

Legend for the types of funding on a construction project funding sign must read as follows and in the following order:

1. *FEDERAL HIGHWAY TRUST FUNDS*
2. *STATE HIGHWAY FUNDS*
3. *CITY TRANSPORTATION FUNDS*

Engineer provides the year of completion for the legend on the sign. Install a sign overlay for the year of completion within 15 working days of notification.

Legend for the year of completion on a construction project funding sign must read as *YEAR OF COMPLETION 2027*

Do not add information to the construction project funding identification sign unless authorized. Add the following funding partner agency pictographs:

MURRAY STREET BRIDGE AT THE SMALL CRAFT HARBOR, SEISMIC  
RETROFIT/BARRIER REPLACEMENT, CITY PROJECT NO. C409321, FEDERAL NO.  
PROJECT NO. STPLZ 5025(084)

Partner funding agency	Height dimension of pictograph with notes
City Gas Tax	12 inches high including "Your Tax Dollars at Work"
SB-1 LBSRA	12 inches high
FHWA	12 inches high

**Add the following to section 12-3.11C(2) of the RSS:**

Install 48 by 30 inch General Information signs at the location(s) determined by the Engineer before starting major work activities visible to highway users.

Dispose of general information signs upon completion of the project if authorized.

**Add the following to section 12-3.11C(3)(b) of the RSS:**

Install 48 by 30 inch construction project funding identification signs at the location(s) determined by the Engineer before starting major work activities visible to highway users.

Dispose of construction project funding identification signs upon completion of the project if authorized.

**Add the following after section 12-3.11C(3)(b) of the RSS:**

**12-3.11C(3)(c) General Information Signs**

Non-Construction ID General Information signs are Stationary-Mounted Signs.

**Replace Not Used in section 12-3.11D of the RSS with:**

Full compensation for conforming to the requirements of this section will be considered as included in the price paid for Construction Area Signs and no additional compensation will be allowed therefor.

**Add to the end of section 12-4.02C(1) of the RSS:**

Keep the full width of the traveled way open to traffic when no active construction activities are occurring in the traveled way or within 6 feet of the traveled way.

**Replace *Reserved* in section 12-4.02C(3)(d) of the RSS with:**

You may completely close Murray Street during the hours shown on chart no. 1 for

1. Constructing Bent 9 and Abutment 10 including anchor pile installation outside the period from July 1 through mid-November (maximum of 90 working days total).
2. Sewer installation including sewer vaults and appurtenances (maximum of 60 working days total)
3. Girder erection (5 working days)
4. Polyester overlay (5 working days)
5. Final approach AC overlays (2 days)
6. Striping (1 days)

MURRAY STREET BRIDGE AT THE SMALL CRAFT HARBOR, SEISMIC RETROFIT/BARRIER REPLACEMENT, CITY PROJECT NO. C409321, FEDERAL NO. PROJECT NO. STPLZ 5025(084)

When Murray Street is completely closed, detour traffic as shown on the traffic handling plans. Each closure will be a minimum of 5 working days in duration.

You may close city-street lanes using one-way traffic-control lane closure on Murray Street maintaining east-bound traffic only as shown on chart no. 2 for all remaining working days.

**Replace *Reserved* in section 12-4.02C(3)(m) of the RSS with:**

Comply with the requirements for a **Complete City Street** Closure shown in the following chart:

Chart No. 1																									
Location: Murray Street										Direction: East/West															
Closure limits: Station 9+00 to Station 19+00																									
Hour	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
Mon– Thu	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
Fri	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
Sat	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
Sun	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
Legend:																									
1	Provide at least 1 city street lane open in the direction of travel.																								
C	Street may be closed.																								
N	No work is allowed.																								
R	Provide at least 1 through traffic lane not less than 10 feet in width for use by both directions of travel. (Reversing Control)																								
REMARKS: The number of through traffic lanes in each direction of travel is <u>  0  </u> .																									

Comply with the requirements for a **City Street Lane** Closure shown in the following chart:

MURRAY STREET BRIDGE AT THE SMALL CRAFT HARBOR, SEISMIC  
RETROFIT/BARRIER REPLACEMENT, CITY PROJECT NO. C409321, FEDERAL NO.  
PROJECT NO. STPLZ 5025(084)

Chart No. 2																									
Location: Murray Street										Direction: East															
Closure limits: Station 9+00 to Station 19+00																									
Hour	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
Mon– Thu	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
F1i	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Sat	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Sun	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Legend:																									
1	Provide at least 1 city street lane open in the direction of travel. (eastbound only)																								
C	Street may be closed.																								
N	No work is allowed.																								
R	Provide at least 1 through traffic lane not less than 10 feet in width for use by both directions of travel. (Reversing Control)																								
REMARKS: The number of through traffic lanes in the eastbound direction of travel is <u>1</u> .																									

**Add to the end of section 12-4.02C(8)(a) of the RSS:**

For a complete City street closure or one-lane closure, install the closure signs at least 7 calendar days before closing the City street or lane. Notify the Engineer at least 5 working days before installing the signs. If the City street or lane is not closed on the posted day, change the closure to allow for a 3-working-day advance notice before closure.

If shoulders are closed at Murray Street, use the following advance warning sign:

- 1 W21-5b (Right/Left Shoulder Closed Ahead)

For concrete pavement and approach slab replacement activities, place a Fresh Concrete (C43(CA)) sign at the start of the work . Keep the sign in place during the curing period.

**Replace section 12-4.02C(12) of the RSS with:**

**12-4.02C(12) Construction Work Zone Speed Limit Reduction**

**12-4.02C(12)(a) General**

Section 12-4.02C(12) includes specifications for providing, installing, maintaining, and removing traffic control devices for reducing the speed limit for the construction work zones.

Speed limit reduction is limited to 10 mph from the posted speed limit in construction work zones unless a greater speed limit reduction is specified. Construction work zone speed limit

MURRAY STREET BRIDGE AT THE SMALL CRAFT HARBOR, SEISMIC RETROFIT/BARRIER REPLACEMENT, CITY PROJECT NO. C409321, FEDERAL NO. PROJECT NO. STPLZ 5025(084)

reduction can either be required when construction activities are active in a closure as a temporary condition or 24 hours a day, 7 days a week based on the roadway conditions when specified.

Speed limit reduction for Murray Street and Eaton Street is to be reduced from 25 mph to 15 mph. Place traffic control devices as shown for multiple speed limit reduction steps within traffic control system. Speed limits can be stepped down in 5 or 10 mph increments.

Temporary construction work zone speed limit reduction is required for lane closures when construction activities require workers to be present within the lane closures. Construction work zone speed limit reduction is not required for short duration closures of 1 hour or less or when the length of lane closure is 1/2 mile or less.

Construction work zone speed limit reduction is required 24 hours a day, 7 days a week when construction activities affect the roadway around the clock 24 hours a day, 7 days a week as shown on the traffic handling plans.

#### **12-4.02C(12)(b) Materials**

For construction work zone speed limit reduction for 24 hours a day, 7 days a week, construction area signs must comply with the requirements for stationary-mounted signs in section 12-3.11. When the duration of construction work zone speed limit reduction for 24 hours a day, 7 days a week is 7 days or less, you may use portable signs that comply with the requirements for portable signs in section 12-3.11.

For temporary construction work zone speed limit reduction, signs must comply with the requirements for portable signs in section 12-3.11.

The PCMS must comply with section 12-3.32.

#### **12-4.02C(12)(c) Construction**

Advise motorists of construction work zone speed limit reductions starting 14 calendar days in advance of implementing the speed limit reduction using a PCMS displaying the alternating messages *Reduced Speed* and *Starting XX/XX/XX (Date)*.

When construction work zone speed limit reduction is in effect, the PCMS message must be 15 MPH *ZONE AHEAD* and *WILL BE ENFORCED*. Mount a 48-by-48-inch W3-5 15 MPH "SPEED LIMIT" ahead symbol sign on the PCMS trailer.

Cover all existing speed limit signs while the construction work zone speed limit reduction is in effect. Remove covers when construction work zone speed limit reduction is no longer in effect. For construction work zone speed limit reduction for 24 hours a day, 7 days a week, you may remove the existing speed limit signs and replace the signs when the construction activities that required the 24 hours a day, 7 days a week speed limit reduction are completed.

**12-4.02C(12)(d) Payment** For construction work zone speed limit reduction for 24 hours a day, 7 days a week, signs are paid for as construction area signs and PCMS is paid for as portable changeable message sign. Covering and removing covers of existing speed limit signs are included in the price paid for construction area signs.

#### **Replace Section 12-8 RESERVED of the RSS with:**

MURRAY STREET BRIDGE AT THE SMALL CRAFT HARBOR, SEISMIC  
RETROFIT/BARRIER REPLACEMENT, CITY PROJECT NO. C409321, FEDERAL NO.  
PROJECT NO. STPLZ 5025(084)

## 12-8 WATERWAY TRAFFIC CONTROL

### 12-8.01A GENERAL

Provide channel access to and from the North Harbor at all times between Bents 6 and 7 and Bents 7 and 8, except as follows:

For single channel closures you will submit a waterway closure plan and schedule 30 calendar days in advance of first closure. Changes to the waterway closure plan must be submitted and will require approval in advance of the rescheduled closure. For allowable closure durations see table in section 8-1.10B.

Full channel closures will not be permitted.

Provide waterway traffic controls, including two patrol boat/flaggers (one for each side of the bridge), during periods of single channel closures, consistent with U.S. Coast Guard (USCG) requirements. You will coordinate with the USCG to determine these requirements.

Notify the Port District and Coast Guard seven (7) days in advance of channel closure. The patrol boat with flaggers will be in the water 30 minutes prior to closure of a channel and will remain to direct boaters until 30 minutes after the channel is reopened.

### 12-8.01B MATERIALS

Not Used

### 12-8.01C CONSTRUCTION

Not Used

### 12-8.01D PAYMENT

Not Used

^^

### **13 WATER POLLUTION CONTROL**

#### **Add to the end of section 13-1.01A:**

The specifications in section 13 for water quality monitoring apply to the following work activities whenever they occur in water:

1. Pile Driving Steel Shells
2. In-Water Concrete Placement
3. Cofferdam and Footing/Pile Cap Construction
4. RSP Placement
5. Sanitary Sewer Force Main Construction

The receiving water for this project is Woods Lagoon.

Water pollution control work and storm water pollution prevention work shall conform to Chapter 4 of the Best Management Practices Manual for the City's Storm Water Management Program available as Supplemental Project Information and on the City of Santa Cruz website at:

<http://www.cityofsantacruz.com/government/city-departments/public-works/stormwater/best-management-practices>.

The Contractor shall take all necessary precautions to prevent any leakage or sewage spills of any kind onto adjacent property, public or private roadway, drainage systems, and waterways. The Contractor shall be liable for any and all clean-up costs or any fines that may be levied including those by the Regional Water Quality Control Board (RWCQB) against the City, in the event that such leakage or spill occurs. The Contractor shall also be responsible for reporting any and all spill to the appropriate regulatory agencies, including the RWCQB and the Santa Cruz County Health Department.

#### **Add to the end of section 13-3.01A:**

This project's risk level is 2.

#### **Add between the 4th and 5th paragraphs of section 13-3.01C(2)(a):**

The following RWQCBs will review the authorized SWPPP:

1. Central Coast Regional Water Quality Control Board

#### **Add to paragraph 4 of section 13-4.03C(1)**

You are prohibited from fueling, cleaning, or maintenance of equipment except in designed areas located as far from Harbor waters as possible. Maintain adequate materials onsite for containment and clean-up of any spills.

#### **Add to section 13-4.03C(3):**

Store and contain all excavated soils, fill and construction materials in a designated area away from Harbor waters and cover stockpiled soils to prevent release of sediment.

Securely cover stockpiles of debris, soil and other materials which can become windblown.

Locate all equipment and spoils in staging areas designated by the Engineer.

MURRAY STREET BRIDGE AT THE SMALL CRAFT HARBOR, SEISMIC  
RETROFIT/BARRIER REPLACEMENT, CITY PROJECT NO. C409321, FEDERAL NO.  
PROJECT NO. STPLZ 5025(084)



Locate all stockpiling and vehicle staging areas as far as possible from residential areas as practicable.

Install temporary erosion and sedimentation control devices

Insure that all fill material is clean and meets applicable water quality standards

**Add to section 13-4.03G:**

Control the dewatering process to limit turbidity.

^^

## **14 ENVIRONMENTAL STEWARDSHIP**

### **Add to the end of Section 14-1.02:**

An ESA exists on this project.

Before starting job site activities, install temporary high visibility fence to protect the ESA and protected trees (at dripline) and mark its boundaries.

### **Replace Section 14-1.03 RESERVED with:**

#### **14-1.03 ENVIRONMENTAL COORDINATION**

You must:

1. Coordinate training schedules with the Contractor-Supplied biologist and the City-Supplied Marine Wildlife Monitor, who will conduct environmental awareness training for all construction crews before project implementation.
2. In addition to the mitigation measures specifically noted in these special provisions, conform to the mitigation requirements included in the project environmental documents and permits. These documents are provided as Supplemental Project Information as stated in Section 2 BIDDING of these special provisions.
3. Unless otherwise authorized in writing by CDFW, terminate all project activities covered under agreement with CDFW 30 minutes before sunset and do not resume until 30 minutes after sunrise as established by the U.S. Naval Observatory Astronomical Applications Department.
4. Notify the Engineer and CDFW in writing via email, at least 5 calendar days prior to project initiation and within 5 calendar days of project completion.
5. At each project location immediately before in-water work, ground disturbing activities, or vegetation removal, a CDFW-approved, qualified, Contractor-supplied biologist shall survey the project area for presence of regulated species that may be present. The biologist shall record all regulated species encountered during survey(s) and submit the record to CDFW within 7 days after survey completion. If regulated wildlife species are found in the project site, the project shall halt construction until the regulated wildlife species leaves the work area or is relocated by the qualified biologist to outside the work area. The measure does not authorize "take" of any state or federally listed species.

### **Replace Section 14-2.03A General with:**

#### **14-2.03A General**

Section 14-2 applies if archeological resources are discovered at the job site. Do not disturb the resources and immediately:

1. Stop all work within a 150-foot radius of the discovery

MURRAY STREET BRIDGE AT THE SMALL CRAFT HARBOR, SEISMIC  
RETROFIT/BARRIER REPLACEMENT, CITY PROJECT NO. C409321, FEDERAL NO.  
PROJECT NO. STPLZ 5025(084)

2. Protect the discovery area
3. Notify the Engineer

If archaeological resources or human remains are discovered during construction, immediately notify the Engineer, halt work within 150 feet of the find, and a qualified archaeologist will assess its significance. If the find is determined to be significant, appropriate mitigation measures will be formulated and implemented.

Do not move archaeological resources or take them from the job site. Do not resume work within the discovery area until authorized.

If ordered, furnish resources to assist in the investigation or recovery of archaeological resources. This work is change order work.

**Add to the 1st paragraph of section 14-6.03A:**

This project is within or near habitat for the regulated species shown in the following table:

<b>Regulated Species</b>
Steelhead ( <i>Oncorhynchus mykiss</i> )
North American Green Sturgeon ( <i>Acipenser medirostris</i> )
Southern Sea Otter ( <i>Enhydra lutris nereis</i> )
Harbor Seal ( <i>Phoca vitulina richardsi</i> )
California Sea Lion ( <i>Zalophus californianus</i> )
Migratory birds
Great Blue Heron or Egret
Western Gull and Swallows
Bats

This project includes the sensitive habitats shown in the following table:

<b>Sensitive Habitats</b>
Bat Roosting Crevices in Bridge
Trees
Woods Lagoon
Santa Cruz Small Craft Harbor
Heron Rookeries

**Replace item 1 in the 2nd paragraph of section 14-6.03A with:**

1. Stop all work within a 150-foot radius of the discovery, except as shown in the following table:

### Radius Exceptions

Species	Work stoppage radius (feet)
Marine Mammals (Impact Pile Driving)	207
Marine Mammals (Vibratory Pile Driving)	1345
Marine Mammals (in-water with no Pile Driving)	50
Large Raptor such as Buteos	1000
Small Raptor such as Accipiters	250
Passerines	100
Other Avian Species	300
Bats	50

Modifications or reductions to work stoppage radii may be accommodated through consultation with CDFW and NMFS, based on monitoring results and site conditions. Per the CDFW Permit, if active nests are found, the CDFW-approved Qualified Biologist shall establish an appropriate buffer to comply with the Migratory Treaty Act of 1918 and Fish and Game Code 3503. The CDFW-approved Qualified Biologist shall document pre-construction baseline monitoring of the nest to characterize “normal” bird behavior. The CDFW-approved Qualified biologist shall monitor the nesting birds and shall increase the buffer if they determine the birds are showing signs of unusual or stressed behavior by project activities. Abnormal nesting behaviors which may cause reproductive harm include, but are not limited to, defensive flights/vocalizations directed towards project personnel, standing up from a brooding position, and flying away from the nest. The CDFW-approved Qualified Biologist shall have authority to order the cessation of all nearby project activities if the nesting birds exhibit abnormal behavior which may cause reproductive failure (nest abandonment and loss of eggs and/or young) until an appropriate buffer is established. To prevent encroachment, the established buffer(s) shall be clearly marked for avoidance. The established buffer(s) shall remain in effect until the young have fledged or the nest has been abandoned as confirmed by the CDFW-approved Qualified Biologist. Signs of nest abandonment, as determined by the CDFW-approved Qualified Biologist, shall be reported to CDFW within 24 hours.

Use the protocols for the corresponding regulated species shown in the following table:

MURRAY STREET BRIDGE AT THE SMALL CRAFT HARBOR, SEISMIC  
RETROFIT/BARRIER REPLACEMENT, CITY PROJECT NO. C409321, FEDERAL NO.  
PROJECT NO. STPLZ 5025(084)

Regulated species name	Protocol
All Species	<p>Verify no regulated species are present near equipment prior to operation.</p> <p>Notify the Contractor-Supplied Biologist and the City-Supplied Marine Wildlife Monitor (MWM) 45 calendar-days in advance of any construction activities.</p> <p>Notify Engineer and construction staff when environmental awareness training sessions are scheduled.</p> <p>Immediately notify the Contractor-Supplied Biologist or the City-Supplied MWM if any regulated species is observed on site.</p>
Marine Mammals	<p>Verify no marine mammals are present within buffer zone.</p> <p>No disturbance or noise will be used to encourage the movement of the regulated species from the work area. The City will contact USFWS and NMFS to determine the best approach for exclusion of the regulated species from the in-water work area.</p> <p>No intentional hazing will be used on eastern Pacific harbor seals, California sea lions, southern sea otters, other marine mammals, or other state- or federally listed threatened or endangered species. The City will contact Caltrans, USFWS and CDFW if sea otters begin to occur in the vicinity of the bridge work, to determine whether any changes to this mitigation plan may be required.</p>
Bats	<p>For construction activities scheduled during bat reproductive season (April 1 – August 31) or winter roost season (October 15 – February 15), the Contractor-Supplied Biologist is to conduct a bat survey 30 calendar days prior to Construction Activities to determine if bats are roosting within the bridge’s expansion joint crevices and other locations. The biologist shall make an effort to identify the bat species and its use of the bridge (maternity, bachelor, day roosting) and shall avoid disturbing bats during surveys. The City shall notify CDFW within 24 hours if bats are found during surveys.</p>
Migratory Birds, Avian Species, and Nesting Raptors	<p>Prior to the beginning of nesting season, install exclusionary measures such as netting and visual deterrents per preconstruction surveys and routinely inspect them and keep them in good repair until construction is complete and you remove the exclusionary devices.</p>

	<p>Notify the Contractor-Supplied Biologist of work that will need to be monitored including but not limited to exclusionary device installation and work within designated buffer zones and any vegetation removal during the bird nesting season (February to August).</p> <p>If bird exclusion will be required to complete the project submit a bird exclusion plan to the City for review and follow the guidance of the Contractor-supplied biologist and CDFW to ensure correct installation and implementation.</p>
Migratory Birds, Avian Species, and Nesting Raptors (continued)	<p>Noise controls will be implemented at the source:</p> <ul style="list-style-type: none"> <li>-Operations will be conducted to avoid noisiest construction activities (pile driving) during breeding season.</li> <li>-Modern and quieter alternate equipment will be used.</li> <li>-Equipment will be operated at lowest possible power levels.</li> </ul> <p>For Pelican roosts: Workers will not engage in harassment of the bird/s or any activity to encourage flushing. If a pelican or group of pelicans enters the project area once construction activities have begun for the day, no further avoidance efforts are required.</p>
Steelhead	<p>Use a vibratory driver for installation of dock piles, and temporary trestle piles if a construction trestle is erected.</p> <p>Install a bubble curtain system to attenuate noise during installation of piles.</p> <p>Prior to in-water work activities, install exclusionary measures (bubble curtains) and routinely inspect and keep in good repair until construction is complete and the exclusionary devices are removed.</p>

Monitor regulated species according to the schedule shown in the following table:

Monitoring type	Schedule
Vehicle/Equipment Inspection for Wildlife	Daily
Tree Inspection for Nests	Prior to Tree Removal
Exclusionary Measures (Netting, etc.)	Daily (Feb to August)
Bats	Prior to Construction activities
Marine Mammals	Daily during in-water activities
Steelhead	Daily during in-water activities

MURRAY STREET BRIDGE AT THE SMALL CRAFT HARBOR, SEISMIC RETROFIT/BARRIER REPLACEMENT, CITY PROJECT NO. C409321, FEDERAL NO. PROJECT NO. STPLZ 5025(084)

Prior to construction, the CDFW-approved qualified biologist or biological monitor will conduct workers training to instruct construction crews regarding the status and sensitivity of the regulated species in the area and the actions to be taken to avoid or minimize impacts in the event of a regulated species entering the proposed work area, including responsibilities, communication procedures, monitoring protocols, and operational procedures. Instruction shall consist of a presentation by the CDFW-approved qualified biologist that includes a discussion of the biology, general behavior, and the habits of the regulated species identified in the Streambed Alteration Agreement and that may be present at the site, how they may be encountered within the work area, and procedures to follow when are encountered. Interpretation shall be provided for non-English speaking workers, and the same instruction shall be provided for any new workers prior to their participation in onsite project activities. Copies of the agreement with CDFW shall be maintained at the worksite with the project supervisor. All workers present at the training shall sign a roster acknowledging that they participated in the training and that the roster shall be kept on site and made available upon request.

**Replace the 2nd paragraph of section 14-6.03B with:**

The City anticipates nesting or attempted nesting by migratory and nongame birds from February to August.

**Add to section 14-6.03B:**

**14-6.03B(1) General**

Conduct a pre-construction survey for special-status nesting avian species (and other species protected under the Migratory Bird Treaty Act [MBTA]) at least 30 days prior to the beginning of construction activities and again within 72 hours before beginning construction during the nesting/breeding season (typically February 1 through August 15). If there is a lapse of four or more days in project construction during the nesting/breeding season, conduct an additional pre-construction survey within 72 hours before resuming construction to assure that this area is not actively being used. If active nesting is not occurring, project construction activities may begin. The minimum survey radii surrounding the work area shall be as specified in 14-6.03A, or as determined by the qualified biologist.

If a nesting regulated bird is found during the survey, construction within 300 feet of the regulated species nest sites shall be halted and should be postponed until after the bird has fledged or consultation with the California Department of Fish and Wildlife is conducted to determine alternative measures or appropriate buffers with a minimum buffer of 250 feet for raptors and 100 feet for passerines. The CDFW-approved qualified biologist shall monitor the nesting birds and shall increase the buffer if it is determined that the birds are showing signs of unusual or stressed behavior by project activities, including heron rookeries. The CDFW-approved qualified biologist shall order cessation of nearby project activities if the nesting birds exhibit abnormal behavior, which may cause reproductive failure (nest abandonment and loss of eggs and/or young) until an adequate buffer is established. To prevent encroachment, the established buffer(s) shall be clearly marked for avoidance and shall remain in effect until the young have fledged or the nest has been abandoned as confirmed by the biologist. Signs of nest abandonment, as determined by the CDFW-approved qualified biologist, shall be reported to CDFW within 24 hours.



In the event that encroaching within these buffers is necessary (and is approved via consultation with CDFW), the following must be met for all species protected under the MBTA and California Fish and Game Code:

- a) Ensure that noise levels at sensitive receptor sites (i.e., nests) are kept below 60 dB at all times, even when buffer adjustments are allowed under consultation with CDFW (i.e., encroachment within the 250- and 100-foot buffer may be allowed under consultation, if the 60 dB noise is demonstrated to be maintained).
- b) Ensure that there is sufficient visual screening (via screens or sound barriers) to avoid disturbing nests.
- c) Have a trained biologist observer present at all times during authorized activities that require encroachment; the biologist should ensure that animals are not showing signs of distress, and if they do, the observer has the authority to halt work until it can safely continue.
- d) Inform California Coastal Commission of buffer adjustments recommended by CDFW.

Survey results for nesting birds shall be submitted to CDFW within 7 days of survey completion.

#### **14-6.03B(2) Bank Swallow Protection**

If active bank swallow nests are found during the nesting bird surveys, immediately notify the Engineer who shall notify CDFW. In consultation with CDFW, measures may be added to avoid impacts to bank swallow, a state threatened species. If take of bank swallow cannot be avoided, the City shall obtain an Incidental Take Permit.

#### **14-6.03B(3) Pelican Protection**

If pelicans roost in the project area before construction activities have commenced for the day, do not begin construction activities until the bird/s have flushed. Do not engage in harassment of the bird/s or any activity to encourage flushing. If a pelican or group of pelicans enters the project area once construction activities have begun for the day, no further avoidance efforts are required.

#### **14-6.03B(4) Great Blue Heron & Egret Protection**

Conduct a pre-construction survey 30 to 90 days prior to the beginning of construction activities that occur during the heron breeding season (typically late December through mid-June) to determine if active nesting is occurring at the heron rookery. If active nesting is not occurring, you may begin project construction activities. If active nests are observed, do not perform construction activities until the young have fledged or an appropriate buffer zone is established by a qualified biologist in consultation with resource agencies as needed. with a minimum buffer of 250 feet for raptors and 100 feet for passerines. In the event that encroaching within these buffers is necessary (and is approved via consultation with CDFW), the following must be met for all species protected under the MBTA and California Fish and Game Code:

- a) Ensure that noise levels at sensitive receptor sites (i.e., nests) are kept below 60 dB at all times, even when buffer adjustments are allowed under consultation with CDFW (i.e., encroachment within the 250 and 100 foot buffer may be allowed under consultation, if the 60 dB noise is demonstrated to be maintained).

- b) Ensure that there is sufficient visual screening (via screens or sound barriers) to avoid disturbing nests.
- c) Have a trained biologist observer present at all times during authorized activities that require encroachment; the biologist should ensure that animals are not showing signs of distress, and if they do, the observer has the authority to halt work until it can safely continue.
- d) Inform California Coastal Commission of buffer adjustments recommended by CDFW.

**Add to section 14-6.03C:**

**14-6.03C(1) General**

Regulated fish are anticipated. Implement the following protection measures:

1. Exclude fish from the work area in the following sequence:
  1. Install exclusionary materials and remove as many fish as possible
  2. Install a cofferdam or water bypass
  3. Gradually dewater the work area
  4. Remove the remaining fish using one or a combination of seining, baited minnow traps, and dip net and hand removal
2. Maintain exclusionary material and cofferdams such that regulated fish are prevented from entering the work area. Exclusionary material must be 0.25 inch stretched mesh. The dewatering pump screen's approach velocity must not exceed 0.33 feet per second.
3. The Contractor-supplied biologist is to relocate the fish if relocation is allowed. Relocate the regulated fish as soon as possible to a location with suitable habitat at least 250 feet from the work area.
4. If handling regulated fish, minimize stress by:
  1. Keeping the fish in water to the maximum extent possible during relocation
  2. Keeping the fish in cool, shaded, and aerated water while in captivity
  3. Protecting the fish from excessive noise, handling, temperature variation, jostling, or overcrowding while in captivity
  4. Removing the fish from water only when releasing them
  5. Segregating young-of-year salmonids into separate containers from older salmonids and other aquatic predators
5. Conduct pile driving activities in Harbor waters from June 15 to October 15, outside the fish migration period, unless otherwise permitted by the National Marine Fisheries Service (NMFS). This applies to all pile driving activity, including installation of permanent bridge piles, harbor berth replacement piles, and temporary piles to support a construction trestle, if one is utilized, as well as removal of existing berth piles and removal of temporary trestle piles, if a construction trestle is erected. Criteria for extension of pile driving would include

MURRAY STREET BRIDGE AT THE SMALL CRAFT HARBOR, SEISMIC  
RETROFIT/BARRIER REPLACEMENT, CITY PROJECT NO. C409321, FEDERAL NO.  
PROJECT NO. STPLZ 5025(084)

consideration of weather conditions. For example, a low rainfall period in November and December could warrant extension to the beginning of January.

6. Do not use Impact hammers except in cases where vibratory hammers are not a feasible option. Install bubble curtains at all piles driven by impact hammers to reduce sound levels for fish and/or marine mammals that may be present in the area and undetected. If the use of an impact hammer results in exceedance of sound thresholds, cease impact pile driving and revise the sound attenuation method through modifications such as changing bubble density, bubble size, or the number of bubble curtain rings employed. Conduct additional sound monitoring of five piles for two days to demonstrate that compliance has been achieved, and use the modified methods for the remainder of pile driving. Place a wooden or similar material cushion block between the pile cap and hammer during all impact pile driving to reduce sound levels for fish and/or marine mammals that may be present in the area undetected.
7. Pile driving activities that rely on impact hammers rather than vibratory techniques must be designed to assure compliance with the interim criteria for Sound Exposure Levels (SEL) less than or equal to 187 decibels (dB) in any single strike, and peak sound pressure less than or equal to 206 dB in any single strike, measured at a distance of 32.8 feet (10 meters) from the source.
8. The vibratory pile driving buffer radius may be reduced or increased based on a measurement of the distance the 160 db pressure travels in the underwater harbor waters and/or through the air. This will be determined using approved in-water and in-air acoustic monitoring devices. The City of Santa Cruz will notify Caltrans in writing of the proposed change in buffer zone area, who in turn will notify NMFS.
9. Implement attenuation systems and vibration monitoring during the installation of all piles and as directed by the Contractor-supplied biologist and PLACs.
10. At the commencement of any impact pile-driving activities, or after a break in impact hammer driving of 30 minutes or more, implement a soft start procedure. The "soft start" shall consist of an initial set of 3 strikes made by the impact hammer at 40 percent energy, followed by a one-minute waiting period, then two subsequent three-strike sets, before initiating continuous driving. The pile driver shall also employ sound dampening techniques (i.e., wooden blocks, pile cushions, and/or caps) during all impact hammer pile-driving activities. If vibratory pile-driving is used, a soft start procedure shall also be used, but would constitute a gradual ramp up of vibratory intensity as follows: An initial one-minute period of vibratory driving at 40 percent energy, followed by a one-minute waiting period, followed by a two-minute period of vibratory driving at 40 percent energy before commencing vibratory driving at full energy. The purpose of the soft-start procedure is to allow marine mammals a chance to leave the site prior to the impact hammer operating at full capacity. Notify property owners and residents located within 150 feet of the pile installation locations at least one week prior to construction.

#### **14-6.03C(2) Sound Attenuation System**

##### **14-6.03C(2)(a) General**

##### **14-6.03C(2)(a)(i) Summary**

MURRAY STREET BRIDGE AT THE SMALL CRAFT HARBOR, SEISMIC  
RETROFIT/BARRIER REPLACEMENT, CITY PROJECT NO. C409321, FEDERAL NO.  
PROJECT NO. STPLZ 5025(084)

Section 14-6.03C(2) includes specifications for designing, furnishing, installing, operating, maintaining and removing a sound attenuation system to attenuate underwater energy generated by driving piles. Refer to the PLACs for additional information regarding underwater sound attenuation requirements.

#### **14-6.03C(2)(a)(ii) Definitions**

Pile installation includes all activities involved with driving a single pile.

#### **14-6.03C(2)(a)(iii) Submittals**

Submit working drawings with the supplement to the drawings for the sound attenuation system. Working drawings must be signed by an engineer who is registered in the State.

Working drawings must include:

1. Complete details of the system including mechanical and structural details
2. Description of measures taken to avoid shining light into the water during pile driving.

The supplement to the working drawings must include:

1. Documentation of previous, successful use of the attenuation system to be used
2. Independently checked design calculations
3. Materials list including the quantity, name of the manufacturer and the source, model number, description, and standard of manufacture
4. Calculations showing pressure loss in the piping system and estimated flows from the most removed orifice of the aeration piping
5. Contingency plan to be implemented when the peak decibel (dB) threshold is exceeded

Submit the working drawings and supplement to the working drawings 40 working days prior to the start of covered activities as defined in PLACs.

Allow 10 working days for review.

If revisions are required, the Engineer notifies you of the date when the review stopped and provides comments. Submit revised working drawings and supplement working drawings within 15 working days of receiving the comments. The City's review resumes when complete working drawings and the complete supplement to the working drawings have been resubmitted.

The Engineer will submit the working drawings and supplement to the working drawings to the permitting agencies for approval.

Do not start pile driving activities until the working drawings and the supplement to the working drawings are authorized.

#### **14-6.03C(2)(a)(iv) Quality Assurance**

At least 15 minutes prior to and during pile driving operations do not shine light directly into the water in areas adjacent to piles being driven.

MURRAY STREET BRIDGE AT THE SMALL CRAFT HARBOR, SEISMIC  
RETROFIT/BARRIER REPLACEMENT, CITY PROJECT NO. C409321, FEDERAL NO.  
PROJECT NO. STPLZ 5025(084)

Inspect the sound attenuation system for proper operation before each deployment and as necessary during deployment.

If the sound attenuation fails, immediately stop pile driving and notify the Engineer.

Failure of the attenuator system includes, but is not limited to, the following methods of failure:

- Sound levels exceed allowable limits
- Erosion of holes or clogged holes that degrade the performance of the sound attenuation system
- Sound attenuation system not in contact with river bottom
- Uneven bubble flux around pile
- Isolation casing not fully dewatered

Do not resume pile driving until the attenuator system is operating in conformance with the requirements of this section. Obtain authorization before resuming pile driving.

#### **14-6.03C(2)(a)(v) Removal**

Completely remove the sound attenuation system when it is no longer needed.

The sound attenuation system remains your property upon completion of the Contract.

#### **14-6.03C(2)(b) Air Bubble Curtain System**

##### **14-6.03C(2)(b)(i) General**

Section 14-6.03C(2)(b) applies when an air bubble curtain system is used to attenuate underwater energy generated by driving piles.

##### **14-6.03C(2)(b)(ii) Materials**

An air bubble curtain system (ABC) is composed of an air compressor(s), supply lines to deliver the air, distribution manifolds or headers, perforated aeration pipes, and a frame. A confined ABC includes some type of fabric or material surrounding the ABC to contain the air bubbles in a vertical column around the pile. The frame facilitates transport and placement of the system, keeps the aeration pipes stable, and provides ballast to counteract the buoyancy of the aeration pipes in operation.

##### **14-6.03C(2)(b)(iii) Construction**

Ensure the ABC extends from the harbor bottom to the water surface during maximum water-current conditions.

The ABC must consist of perforated aeration pipes with the following:

1. Arrange pipes in a concentric pattern which allow the pile driving operation to be

completely enclosed by bubbles for the full depth of the water column and for a radial dimension no more than 20 inches measured from the outside surface of the pile.

2. The lowest layer of perforated aeration pipes will be designed to ensure contact with the mudline without sinking into the mud
3. Provide a bubble flux of 2.6 cubic yards per minute (71 cubic feet per minute) per linear yard of pipe. Air holes must be full depth of the water column

### **14-6.03C(3) Underwater Sound Measurement**

#### **14-6.03C(3)(a) General**

The underwater sound measurement activities described below will be conducted by the Marine Wildlife Monitor assigned to the Project. The Marine Wildlife Monitor will be supplied by the City. The Contractor will provide the necessary equipment and support the City-Supplied MWM in performing sound measurement activities as required by the PLAC's.

#### **14-6.03C(3)(a)(i) Summary**

Section 14-6.03C(3) includes specifications to conduct, calibrate, monitor and report underwater sound measurements using a hydroacoustic system that measures and stores underwater sound levels.

#### **14-6.03C(3)(a)(ii) Submittals**

Submit a Hydroacoustic Monitoring Plan (HMP) 60 calendar days prior to the start of covered activities as defined in PLACs (See guidelines provided in the Supplemental Information Item 9.12 Hydroacoustic Monitoring Plan May 2023).

The HMP must:

1. Be prepared by a hydroacoustic monitoring specialist
2. Use the Underwater Noise Monitoring Template found at [www.dot.ca.gov/env/bio/hydroacoustics.html](http://www.dot.ca.gov/env/bio/hydroacoustics.html)
3. Include:
  - 3.1. Work to be performed
  - 3.2. Equipment used
  - 3.3. Duration of work
  - 3.4. Control measures
  - 3.5. Noise monitoring procedures
  - 3.6. Contingency plan if control measures are not effective.
  - 3.7. Allow 10 working days for review of the contingency plan.

If revisions are required, the Engineer notifies you of the date when the review stopped and provides comments. Submit a revised HMP within 10 working days of receiving the comments. The City's review resumes when a complete HMP has been resubmitted.

The Engineer will submit the HMP to the permitting agencies for approval.

#### **14-6.03C(3)(b) Quality Assurance**

Do not start pile driving activities until the HMP is authorized.

MURRAY STREET BRIDGE AT THE SMALL CRAFT HARBOR, SEISMIC  
RETROFIT/BARRIER REPLACEMENT, CITY PROJECT NO. C409321, FEDERAL NO.  
PROJECT NO. STPLZ 5025(084)

### **14-6.03C(3)(c) Hydroacoustic Monitoring Equipment**

The hydroacoustic monitoring specialist is responsible for the implementation of the HMP. The hydroacoustic monitoring specialist must:

1. Have at least 5 years of paid, professional experience in the field of hydroacoustic monitoring
2. Be approved by the Engineer

### **14-6.03C(2)(c) Equipment**

Take measurements using hydrophones that have a flat frequency response and are omnidirectional over a minimum frequency range of 20 Hz to 20,000 Hz.

The sound level monitoring equipment must:

1. Withstand the marine and construction environment
2. Collect signals into a data-logging device
3. Have an accuracy of 1 dB from 20 Hz to 20,000 Hz
4. Have the capability to measure unweighted peak sound pressures from 170 dB to 220 dB referenced to 1 micro Pascal ( $\mu\text{Pa}$ )
5. Measure the unweighted sound exposure level (SEL) in dB referenced to  $1 \mu\text{Pa}^2$ -second
6. Have the capability to provide a real time readout display of underwater sound levels. The real-time display must provide the unweighted peak sound pressure and SEL
7. Log data during the required measurement event (example: one pile driving event or one day)
8. Capture the maximum peak sound pressure levels along with the SEL for each continuous 1 second period or individual strike

### **14-6.03C(3)(d) Calibrating**

Calibrate the measurement system prior to use in the field each day. An acoustical piston phone and hydrophone coupler must be used along with the manufacturer's calibration certificates.

Use an acoustically certified piston phone and hydrophone coupler that fits the hydrophone to directly calibrate the measurement system. The volume correction of the hydrophone coupler using the hydrophone is known so that the piston phone produces a known signal that can be compared against the measurement system response. The response of the measurement system is noted in the field book and applied to all measurements.

You are responsible for ensuring that the equipment is calibrated and set to measure sounds in the proper range. Ensure that the pile driving sounds do not overload the instrumentation and the noise floor of the instrumentation is not set too high for pile driving sounds above the 170 dB peak to be measured accurately.

### **14-6.03C(3)(e) Monitoring**

MURRAY STREET BRIDGE AT THE SMALL CRAFT HARBOR, SEISMIC  
RETROFIT/BARRIER REPLACEMENT, CITY PROJECT NO. C409321, FEDERAL NO.  
PROJECT NO. STPLZ 5025(084)

The City-Supplied MWM(s) will monitor underwater sound during the impact hammer and vibration pile installation activities. There may be more than one MWM due to the differing species and large exclusion zone. The monitoring duties of the City Supplied MWM(s) will include the following:

**Pre-Construction Monitoring.** Prior to initiation of in-water construction, the City-Supplied MWM(s) will conduct monitoring of marine mammals to update existing information on the animals' occurrence in and near the project area, their movement patterns, and their use of any haul-out sites. This preconstruction monitoring will take place at least five days prior to the start of in-water construction and will cover a period of at least one week (with at least 5 days of actual observation over a period of 4 hours each day), 2 hours in the morning at the time that construction activities would begin and 2 hours at midday, when construction activities would resume after a lunch break.

**In-Water Construction Biological Monitoring.** Each day, before pile driving (or other loud in-water construction activity) begins, the City-Supplied MWM(s) will survey for marine mammals for a minimum of 30 minutes within the shutdown zone (a 10-meter/32.8-foot radius area surrounding each work site where construction could cause physical disturbance to a marine mammal) and the exclusion zones.

The City-Supplied MWM(s) will also scan for regulated species throughout the shutdown zone and exclusion zones throughout in-water project activities, as elaborated below. At the daily conclusion of pile installation, the City-Supplied MWM will also conduct 30 minutes of post-pile driving activity and clearance monitoring of the exclusion zones before leaving the site, noting changes in marine mammal activity or presence after pile installation activities stop.

The City-Supplied MWM(s) will be present during all in-water construction activities and near-water pile installation to search for regulated marine mammal species and halt project activities that could result in injury or mortality to these species. The City-Supplied MWMs shall avoid direct physical interaction with marine mammals during construction activity. The City-Supplied MWM(s) should not be assigned duties apart from observing marine mammals to ensure optimal detection probability.

**Construction Halts.** Construction halts will be enacted immediately upon detection of regulated marine wildlife within the exclusion zone. Provide notification to the equipment operator and the Engineer. Pile driving will be delayed until the marine mammal(s) has moved beyond the exclusion zone, verified by visual confirmation by the City-Supplied MWM or lack of visual sighting within the exclusion zone for 30 minutes following the last sighting. The monitor will record the species, numbers and behaviors of any animal(s) entering the exclusion zone after commencement of work and notify the City of Santa Cruz within 48 hours. If the shutdown zone is not entirely visible (e.g., due to darkness, fog, etc.), do not commence with pile driving or continue to proceed (if it is underway) until visual conditions have improved and the entirety of the shutdown zone is visible to the City Supplied -MWM(s). A halt will also be enacted if a marine mammal species for which the IHA is not authorized, or an authorized species that has surpassed the take allowance is observed within the exclusion zones.

**Preliminary Exclusion Zones.** During hydroacoustic testing in accordance with an approved Hydroacoustic Testing Plan, implement the following minimum exclusion zones for marine mammals for installation of piles:

MURRAY STREET BRIDGE AT THE SMALL CRAFT HARBOR, SEISMIC  
RETROFIT/BARRIER REPLACEMENT, CITY PROJECT NO. C409321, FEDERAL NO.  
PROJECT NO. STPLZ 5025(084)



- a. During vibratory installation of concrete or steel piles, a 410-meter (1,345-foot) exclusion zone for all marine mammals other than southern sea otters.
- b. During all pile installation regardless of pile type or installation methods, a 63-meter (207-foot) exclusion zone for southern sea otters.

An additional non-pile driving exclusion zone will apply to in-water construction activities that do not result in loud or impulsive sounds, such as the use of heavy equipment to construct bridge abutments. For these activities, a 50-foot radius non-pile driving exclusion zone will be established. These exclusion zones will be visibly flagged on the banks of the harbor to facilitate construction monitoring efforts. Each day, prior to the start of construction activities, the approved City Supplied MWM(s) will survey the shutdown zone and exclusion zones for marine mammals.

**Exclusion Zone Changes – Acoustical Monitoring.** Acoustical monitoring will be conducted during pile driving activities according to the Contractor's Hydroacoustic Monitoring Plan (**See section 14-6.03C(3)(a)(ii)**) to determine sound generation and propagation within the Harbor. The preliminary exclusion zones for installation of concrete and steel piles described under Measure 10 of the MWPP (e.g., 410 meters for vibratory installation for marine mammals other than sea otters) may be reduced or increased based on a measurement of the distance that the 160 decibel (db) sound pressure travels underwater and/or through the air. This shall be determined using approved in-water and in-air acoustic monitoring devices operated in accordance with the Hydroacoustic Testing Plan approved by NOAA Fisheries and the CCC Executive Director. The City of Santa Cruz shall notify NOAA Fisheries and the CCC Executive Director in writing of a proposed change in the exclusion zone radius and will not adjust the exclusion zone without approval from these entities. An approved City-Supplied MWM will operate the monitoring devices during pile driving and any other loud in-water construction activities, such as use of hydraulic tools. The devices, placed at the edge of the exclusion zone, will produce acoustic data for the duration of noise-producing activities. An alarm would alert the monitor to sound levels approaching 160 db. If the 160 db threshold is exceeded at the current approved exclusion zone, the exclusion zone will be increased to the distance along the edges of the harbor where the in-water sound pressure drops below 160 db. This would be a dynamic buffer and would be expected to change as project activities change (e.g., different pile types or sizes are driven or different methods are used), potentially on a daily or weekly basis. The exclusion zone may be reduced or increased based the results of the approved Hydroacoustic Testing Plan (under separate cover), but will not exceed the 160 dB isopleth.

**Underwater Acoustical Monitoring – Use of Vibratory Pile Driving Equipment.** You will be allowed to use vibratory driving if you can demonstrate through implementation of the Hydroacoustic Testing Plan that the 120 dB vibratory threshold will not be exceeded within 1,000 meters (3,281 feet) of pile driving. If this cannot be achieved, you will then be required to use impact driving only and limit measured sound levels to 160 dB or less at 1,000 meters. The distance from the bridge to the breakwater is about 780 meters (2,559 feet). This means that the impact distance for either vibratory or impact driving has the potential to extend about 220 meters (722 feet) into Monterey Bay. These distances do not represent exclusion zones intended to prevent Level A harassment (those are described as part of Measures 10 and 11), but rather distances beyond which Level B harassment could occur.

**Disturbance Prohibition.** Do not intentionally haze (e.g., disturbance, noise) eastern Pacific harbor seals, California sea lions, southern sea otters, or other state- or federally-listed

MURRAY STREET BRIDGE AT THE SMALL CRAFT HARBOR, SEISMIC  
RETROFIT/BARRIER REPLACEMENT, CITY PROJECT NO. C409321, FEDERAL NO.  
PROJECT NO. STPLZ 5025(084)

threatened or endangered species. The City of Santa Cruz will contact USFWS and NOAA Fisheries as appropriate to determine the best approach for exclusion of the regulated species from the in-water work area and whether any changes to this marine wildlife protection plan may be required.

**Notification of Injury.** In the event that the City-Supplied MWM(s) determines that a marine mammal has been injured by project activities, cease all work and notify the City of Santa Cruz. The City of Santa Cruz will consult with NOAA Fisheries and USFWS depending on the species affected to determine if additional measures are necessary. The City of Santa Cruz would report the incident to the Office of Protected Resources (OPR), NOAA Fisheries (PR.ITP.MonitoringReports@noaa.gov) and to the West Coast regional stranding network (866-767-6114) as soon as feasible. If the death or injury was clearly caused by the specified activity, immediately cease the activities until NOAA Fisheries OPR is able to review the circumstances of the incident and determine what, if any, additional measures are appropriate to ensure compliance with the terms of the IHAs.

The City-Supplied MWM(s) will be required to prepare and submit reports as specified in the MWPP.

#### **14-6.03C(4) Payment**

The sound attenuation system and underwater sound measurement are included in the contract unit prices paid for the various pile items shown on the bid item list.

#### **Replace the list in the 2nd paragraph of section 14-6.03D(1) with:**

1. Prior to construction, conduct a bird survey to ensure that the project Authority is in compliance with the Migratory Bird Treaty Act (MBTA). Avian species include, but are not limited to pelicans, Great Blue Heron, egrets, swallows, and Western Gulls. The qualified Contractor-supplied biologist will identify other species prior to and during construction.
2. Clear work area prior to vegetation removal.
3. Monitor regulated species within the project area.
4. Ensure that construction activities do not result in the take of regulated species.
5. Ensure that construction activities comply with PLAC's.
6. Immediately notify the Engineer of any take of regulated species or violation of a biological resource PLAC.
7. Operate the monitoring devices during pile driving and any other loud construction activities, such as bridge demolition or use of hydraulic tools. The devices, placed at the determined buffer, will produce acoustic data for the duration of noise-producing activities. An alarm will be provided to alert the monitor to sound levels approaching 160 db. The City-Supplied Marine Wildlife Monitor will be responsible for observing marine wildlife, as noted elsewhere in these Special Provisions.
8. If project activities are to be initiated outside of the breeding season, the qualified Contractor-supplied biologist will remove existing nests and/or direct the Contractor to install exclusion netting under the bridge to prevent nesting for the season. Swallow nests should be removed from the bridge structure before the breeding season including the courtship period, usually January through August. Exclusion netting should be

MURRAY STREET BRIDGE AT THE SMALL CRAFT HARBOR, SEISMIC  
RETROFIT/BARRIER REPLACEMENT, CITY PROJECT NO. C409321, FEDERAL NO.  
PROJECT NO. STPLZ 5025(084)

subsequently installed to prevent reestablishment of nest structures on the bridge infrastructure during construction.

Bat species may also roost and nest in abandoned swallow nests; therefore, the qualified biologist shall also conduct focused pre-construction inspections of all swallow nests to be removed. If occupied by bats, swallow nest removal should occur after young are capable of flying and prior to seasonal torpor (September 1 to October 31). Removal of nests previously occupied by bats should occur at night when bats have left to forage.

9. The qualified Contractor-supplied biologist will be on-site during nesting season to observe the heron rookery. If active heron rookery nests are observed, cease construction activities in the area until the young have fledged or an appropriate buffer zone is established by the biologist in consultation with resource agencies as needed. If it appears that project activities may cause nest abandonment or disruption of breeding, even with noise reducing controls implemented, cease project activities until the young are able to fly well or Caltrans and the USFWS have been consulted and additional measures taken to protect the heron rookeries.
10. The qualified Contractor Supplied biologist will conduct a focused pre-construction survey of the Murray Street bridge to determine if bats are roosting in the bridge's expansion joint crevices if bridge construction activities are scheduled during the breeding season of native bat species (April 1 through August 31), including the Hoary bat (*Lasiurus cinereus*). If bats are not found, further mitigation will not be necessary. If roosting bats are found, delay project activities until a) roosting bats have vacated the crevices, b) juvenile bats have fledged, c) the installation of bat exclusion devices (by the qualified biologist) between February 15 and April 15 or between September 15 and October 15, outside of bat reproductive and winter roost seasons, or d) maintain the buffer specified in 14-6.03F. The biologist or qualified biological monitor will document the effectiveness of the exclusion devices to ensure that all roosting bats have vacated the roost prior to initiation of construction.

If these actions do not result in exclusion, a qualified biologist in possession of an applicable California Department of Fish and Wildlife (CDFW) Memorandum of Understanding should remove and relocate the roosting bats to an appropriate alternate habitat (a roost with comparable spatial and thermal characteristics).

11. Ensure that noise levels at sensitive receptor sites (i.e.: nests) are kept below 60 dB at all times, even when buffer adjustments are allowed under consultation with CDFW (i.e.: encroachment within the 250- and 100 foot buffer may be allowed under consultation. If the 60 dB noise is demonstrated to be maintained).

Ensure that there is sufficient visual screening (via screens or sound barriers) to avoid disturbing nests.

Have a trained biologist observer present at all times during authorized activities that require encroachment; the biologist should ensure that animals are not showing signs of distress and if they do, the observer has the authority to halt work until it can safely continue.

MURRAY STREET BRIDGE AT THE SMALL CRAFT HARBOR, SEISMIC  
RETROFIT/BARRIER REPLACEMENT, CITY PROJECT NO. C409321, FEDERAL NO.  
PROJECT NO. STPLZ 5025(084)

Inform California Coastal Commission of buffer adjustments recommended by CDFW.

**Add to section 14-6.03D(1):**

A Contractor-supplied biologist who performs specialized activities must have demonstrated field experience working with the regulated species or performing the specialized task. The biologist must have experience that complies with the requirements shown in the following table:

Specialized activity/species	Requirements
Relocating Bats	Possession of an applicable Department of Fish and Wildlife Memorandum of Understanding

Within 20 working days before starting job site activities, submit protocols for species protection surveys. Use protocols required in the PLACs.

Survey the job site for regulated species and submit a preconstruction survey report within 14 days before starting work.

The preconstruction survey report must include the following:

1. Detailed observations and locations where regulated species were observed
2. Statement that no regulated species were observed
3. Relevant Photos
4. GPS Locations and mapping of covered area
5. Datapoints of any significant observations
6. Field datasheets
7. Names of surveyors
8. Dates of surveys
9. Any other pertinent data found from the surveys

Submit an initial monitoring report as an informational submittal within 12 hours after starting ground-disturbing activities.

Submit monitoring reports according to the following schedule:

Monitoring type	Report schedule
Nesting Bird Surveys	Submit report 72 hours prior to start of work
Bat Surveys	Submit report 30 days prior to start of work
Compliance Monitoring	Daily when covered activities occur. Submit report weekly every Monday following the start of construction

Submit a biological resource incident report within 24 hours of the incident.

The incident report must include:

1. Description of any take of regulated species or any violation of a biological resource PLAC
2. Species name and number taken

MURRAY STREET BRIDGE AT THE SMALL CRAFT HARBOR, SEISMIC RETROFIT/BARRIER REPLACEMENT, CITY PROJECT NO. C409321, FEDERAL NO. PROJECT NO. STPLZ 5025(084)

3. Details of required notifications with contact information
4. Corrective actions proposed or taken
5. Disposition of taken species
6. Age and sex class of each animal (if possible)
7. Activity and direction of movement
8. Ongoing project activities at the time of observation
9. Responses of regulated species to project activities
10. Any unusual behavior or circumstances observed (project- or non-project related)
11. Location, date and time of each observation

Submit summary monitoring reports to Caltrans, who will forward reports to NMFS and USFWS by December 31 of each year that in-water construction activities take place.

The annual monitoring report must include:

1. Start and end dates of construction
2. Project impacts on the regulated species
3. Species protection measures and implementation details
4. Incidental take details, including species name, number taken, people contacted, contact information, and disposition of taken species
5. Assessment of the effectiveness of the species protection measures in mitigating project impacts
6. Recommendations for improving species protection measures

Submit a final monitoring report no later than 30 calendar days after completion of the project. If the report requires revisions, the City provides comments. Submit a revised report within calendar 7 days of receiving comments. The final monitoring report must be a cumulative report including:

1. Start and end dates of construction
2. Project impacts on the regulated species
3. Species protection measures and implementation details
4. Incidental take details, including species name, number taken, people contacted, contact information, and disposition of taken species
5. Assessment of the effectiveness of the species protection measures in mitigating project impacts
6. Recommendations for improving species protection measures

**Add after the 1st sentence of the 3rd paragraph of section 14-6.03D(2):**

Allow 15 working days for review.

**Replace section 14-6.05 RESERVED with:**

**14-6.05 Marine Mammal Protection**

Remove known or potential marine mammal resting sites prior to construction based on the outcome of preconstruction surveys to assess if and how marine mammals utilize the construction area of potential impact. This preconstruction monitoring will take place at least

MURRAY STREET BRIDGE AT THE SMALL CRAFT HARBOR, SEISMIC RETROFIT/BARRIER REPLACEMENT, CITY PROJECT NO. C409321, FEDERAL NO. PROJECT NO. STPLZ 5025(084)

five days prior to the start of in-water construction. All known and potential resting/haul-out sites that occur in the construction work area shall be removed beyond area of activity, preferably to a near-by location outside of the work area prior to construction, either under the bridge or above. These sites could include floating docks (e.g. Dock FF) rubber docks or boats, such as those used by UCSC.

Do not perform impact pile driving activities within a 63-meter (207-foot) radius and vibratory pile driving activities within a 410-meter (1,345-foot) radius if marine mammals other than sea otters are present, and do not perform impact pile driving or vibratory pile driving within a 63-meter (207-foot) radius if sea otters are present. These radii will be visibly flagged on the banks of the harbor during these activities. Each day prior to the commencement of pile-driving, the approved monitor will survey the exclusion zone for marine mammals. If a marine mammal is detected within the exclusion zone, delay pile driving until the marine mammal(s) has moved beyond the exclusion zone, verified by visual confirmation or lack of visual sighting within the next 15 minutes of the last sighting. If the animal should move back into the exclusion zone after the commencement of pile-driving, no further work stoppage will be necessary. The exclusion zone radius may be reduced based on a measurement of the distance the 160 db pressure travels in the underwater harbor waters. This would be determined using an approved acoustic monitoring device following an approved Hydroacoustic Monitoring Plan. The City of Santa Cruz would notify NOAA Fisheries in writing of the proposed change in exclusion zone area.

**Replace section 14-6.06 RESERVED with:**

**14-6.06 Bat Protection**

Seal any bat roosting habitat crevices or install bat exclusion devices prior to the onset of bat reproductive season (April 1). Swallow nests, which could be occupied by the same bat species roosting in crevices, should only be removed after a thorough nest inspection. If occupied, nest removal should occur after young are capable of flying and prior to seasonal torpor (September 1 to October 31). Removal of nests previously occupied by bats should occur at night when bats have left to forage.

If roosting bats are found during surveys, delay project activities until roosting bats have vacated the crevices, or juvenile bats have fledged, or install bat exclusion devices (by a qualified biologist) between February 15 and April 15 or between September 15 and October 15, outside of bat reproductive and winter roost seasons, or maintain adequate buffers as shown below. A qualified monitor will document the effectiveness of the exclusion devices to ensure that all roosting bats have vacated the roost prior to initiation of construction.

Table 7-1. Recommended Disturbance Buffer Zones for Day and Night Roosts

Bat Species	Distance (in feet) between Activity/Equipment and Roosts					
	Construction Trucks and Heavy Equipment*	Small Vehicles	Drilling, Trenching, and Small Equipment	Light Source without Shielding	Pedestrian Traffic	Stationary Diesel/Gasoline Exhaust Sources >2 minutes
Pallid bat, Townsend's big-eared bat	120	90	150	400	65	250
Other species of bats in California	100	65	150	300	65	250
Yuma myotis, Mexican free-tailed bat	90	65	150	250	65	250

\*See Caltrans (2016) for detailed discussions of noise impacts to bats at transportation projects and specific dB levels of low frequency values for construction trucks and heavy equipment.

Survey results for nesting bats shall be submitted to CDFW within 7 days of survey completion.

**Bat Protection.** Bats shall not be disturbed by any Project-related activities without specific notice to and consultation with CDFW. Construction work shall not start on the bridge, or within 50 feet of the bridge, if bats are found nesting/roosting within the bridge structure. If bats are documented using the bridge, the qualified biologist shall conduct weekly surveys at the bridge until the bats have left the area for the fall/winter season.

**Bat Mitigation and Monitoring Plan.** If bats are found using the bridge during surveys, the CDFW-approved qualified Contractor-supplied biologist shall prepare and submit a Bat Mitigation and Monitoring Plan (MMP) at least 15 days prior to the start of construction for CDFW review. City shall not initiate construction until receiving written approval from CDFW. The MMP shall include: i) an assessment of all project impacts to bats, including noise disturbance during construction; ii) effective avoidance and minimization measures to protect bats; iii) and compensatory mitigation for permanent impacts to bats or their nesting/roosting habitat. CDFW reserves the right to provide additional provisions to protect nesting/roosting bats.

**Replace the 2nd paragraph of section 14-8.02 with:**

Noise from job site activities must not exceed 86 dBA  $L_{max}$  at 50 feet from the job site from 6:00 p.m. to 8:00 a.m.

This requirement in no way relieves you from responsibility for complying with City of Santa Cruz Noise ordinance, Chapter 9-36 Noise. A copy of this ordinance is provided with the Project Supplemental Information.

Said noise level requirement will apply to all equipment on the job or related to the job, including but not limited to trucks, transit mixers or transient equipment that may or may not be owned by you. The use of loud sound signals will be avoided in favor of light warnings except those

MURRAY STREET BRIDGE AT THE SMALL CRAFT HARBOR, SEISMIC RETROFIT/BARRIER REPLACEMENT, CITY PROJECT NO. C409321, FEDERAL NO. PROJECT NO. STPLZ 5025(084)

required by safety laws for the protection of personnel. All work will be done between the hours of 8:00 a.m. and 6:00 p.m., Monday through Friday in accordance with General Provision 10 Project Schedule of these specifications, unless authorized in writing by the Engineer. Between the hours of 6:00 p.m. and 8:00 a.m., you must not use any diesel engine or gasoline engine generators or power sources unless approved in writing by the Engineer.

Deliver materials to the site(s) during working hours as defined above except with the prior written permission of the Engineer.

Work done on non-working day Saturdays, Sundays, and holidays and outside regular working hours will be with the prior written approval of the Engineer.

**Add to section 14-8.02:**

Keep all equipment in good repair and fitted with superior quality mufflers. Keep all equipment properly maintained to assure that no additional noise, due to worn or improperly maintained parts, would be generated.

Assure that mobile noise-generating equipment and machinery are shut off when not in use.

Locate all stationary noise-generating construction equipment as far as possible from nearby residential areas as practicable.

Furnish 1 Type 1 sound-level meter and 1 acoustic calibrator for the City to use until Contract acceptance to monitor noise.

The sound-level meter must:

1. Be calibrated and certified by the manufacturer or an independent acoustical laboratory before delivery to the City.
2. Be capable of taking measurements using the A-weighting network and the slow-response settings.
3. Have a microphone fitted with a windscreen.
4. Be recalibrated annually by the manufacturer or an independent acoustical laboratory.

Provide training in noise monitoring to one (1) City employee designated by the Engineer. The person delivering the training must be trained in noise monitoring.

The City returns the equipment to you at Contract acceptance.

**Add after the 2nd paragraph of section 14-11.12A:**

Test existing yellow traffic stripes and pavement markings for lead chromate. If the average lead concentration exceeds 1,000 mg/kg total lead or 5 mg/l soluble lead the residue from the removal of this material is a Department-generated hazardous waste. Remove and dispose of the hazardous material as follows:

**Add after the 1st paragraph of 14-11.12E:**

After the Engineer accepts the analytical test results, dispose of yellow thermoplastic and yellow paint hazardous waste residue at a Class 1 disposal facility located in California 20 working days after accumulating 220 lb of residue.

If less than 220 lb of hazardous waste residue and dust is generated in total, dispose of it within 20 working days after the start of accumulation of the residue.

MURRAY STREET BRIDGE AT THE SMALL CRAFT HARBOR, SEISMIC  
RETROFIT/BARRIER REPLACEMENT, CITY PROJECT NO. C409321, FEDERAL NO.  
PROJECT NO. STPLZ 5025(084)



If the average lead concentrations are less than 1,000 mg/kg total lead and 5 mg/L soluble lead, this residue:

1. Is a nonhazardous waste
2. Does not contain heavy metals in concentrations that exceed thresholds established by the Health and Safety Code and 22 CA Code of Regs
3. Is not regulated by the Federal Resource Conservation and Recovery Act, 42 USC § 6901 et seq.

Management of this material exposes workers to health hazards that must be addressed in your lead compliance plan.

**Replace Section 14-11.17 RESERVED with:**

**14-11.17 CONTAMINATED FILL SOIL**

**14-11.17A General**

In conformance with the recommendations of the Phase 1 Environmental Assessment, test fill soils excavated from the west end of the bridge for motor oil (with silica gel clean-up). Test fill soils excavated from the east end of the bridge for diesel, arsenic, motor oil (with silica gel clean-up), and lead (used in old paints). If motor oil is detected, test further for polychlorinated biphenyls (PCBs), due to the presence of a nearby transformer. Treat and/or dispose of any contaminants found in conformance with Section 14-11.03 of the Standard Specifications.

**14-11.17B Materials**

Not Used

**14-11.17C Construction**

Not used.

**14-11.17D Payment**

Full compensation for testing and disposing of fill soils, will be considered as extra work.

^^

## **15 EXISTING FACILITIES**

### **Add to Section 15-1.03B CONCRETE REMOVAL:**

Types of concrete facilities to be removed may include curbs, gutters, gutter depressions, sidewalks, slope paving, barriers, retaining walls, catch basins, swale and inlets, minor structures, aprons, PCC pavement, exposed aggregate, and stairs.

Removal of the concrete stairs will also include the removal of the metal railing and path lighting.

Payment for removing and disposing of the metal railing found at the concrete stairs will be included in the cost bid for Remove Concrete (Stairs).

### **Replace Section 15-1.03D Reserved with:**

#### **15-1.03D RECONSTRUCT BRIDGE PLAQUE**

##### **15-1.03D(1) General**

Remove and reinstall the existing plaque mounted in the concrete barrier near Abutment 10 on the south side of the bridge in the same location on the new south barrier.

Carefully remove and clean of all adhering materials. Protect and store the plaque until re-installed.

##### **15-1.03D(2) Materials**

Not Used

##### **15-1.03D(3) Construction**

Not Used

##### **15-1.03D(4) Payment**

Not Used

**Replace Section 15-1.03E Reserved with:**

**15-1.03E RELOCATE PACIFIC YACHTING STORAGE SHED**

**15-1.03E(1) General**

This work consists of furnishing a new storage shed (shed) at the temporary location indicated on the plans. After construction of the new shed at the temporary location, remove the existing shed. Upon substantial completion of the project, relocate the new shed back to the permanent location shown on the plans.

Coordinate with PG&E to provide temporary power to the building until no longer required.

**15-1.03E(2) Materials**

The shed may be a prefabricated type.

The shed shall be of similar, or better, size, features, and quality than the existing shed located at Bridge Bent 3.

**15-1.03E(3) Construction**

Provide battery-powered lighting in the shed in its temporary location and maintain the battery and lighting throughout the project until you relocate the shed and connect it to power and lighting.

The owner will be responsible to:

1. Remove their property from the existing shed prior to removal.
2. Relocate their property to the shed in its temporary location.
3. Remove their property from the shed in its temporary location prior to relocation of the shed.
4. Relocate their property to the relocated shed.

You will be responsible to:

1. Provide a submittal for the new shed for review by the Engineer and the owner. Allow two (2) weeks for initial review and one week for each subsequent review and secure approval before purchasing the shed.
2. Construct the new shed.
3. Notify the Engineer two weeks prior to removing the existing shed and allow the owner one week to remove their property from the existing shed.
4. Upon substantial completion of the project, notify the Engineer of the schedule to relocate the shed.
5. Allow the owner one week to remove their property from the shed in its temporary location.
6. Relocate the shed to the location shown on the plans. Prior to the owner occupying the shed, schedule a walk through with the Engineer and the owner to verify the condition and obtain their acceptance of the shed in its final location.
7. Repair any damage to the new shed until Contract acceptance, up to and including complete replacement at no cost to the City.

MURRAY STREET BRIDGE AT THE SMALL CRAFT HARBOR, SEISMIC  
RETROFIT/BARRIER REPLACEMENT, CITY PROJECT NO. C409321, FEDERAL NO.  
PROJECT NO. STPLZ 5025(084)

#### **15-1.03E(4) Payment**

Not used.

#### **Replace section 15-1.03F Reserved with:**

#### **15-1.03F RECONSTRUCT 4" WIDE UTILITY CHASE AND ELECTRICAL OUTLETS**

##### **15-1.03F(1) General**

Prior to removal, document the preconstruction condition of the utility chase found along the existing retaining wall near the access road on the east side of the port using photographs and notes. Provide documentation to the Engineer prior to removal.

The utilities located within the utility chase are unknown but may include electrical and compressed air.

After construction of Retaining Wall #18, reconstruct utilities in kind and reconnect to the existing facilities.

##### **15-1.03F(2) Materials**

Not Used

##### **15-1.03F(3) Construction**

Not Used

##### **15-1.03F(4) Payment**

Payment for Reconstruct 4" Wide Utility Chase and Electrical Outlets is included in the payment for Structural Concrete, Retaining Wall.

#### **Replace Section 15-1.03G Reserved with:**

#### **15-1.03G RECONSTRUCT FLAGPOLE**

##### **15-1.03G(1) General**

Prior to removal, document the preconstruction condition of the flagpole base and retaining wall attachment using photographs and notes. Provide documentation to the Engineer prior to removing the flagpole.

After removing the existing flagpole, store and protect the pole, flag, and hardware.

Coordinate the replacement of the flagpole with the retaining wall #18 work.

MURRAY STREET BRIDGE AT THE SMALL CRAFT HARBOR, SEISMIC  
RETROFIT/BARRIER REPLACEMENT, CITY PROJECT NO. C409321, FEDERAL NO.  
PROJECT NO. STPLZ 5025(084)

### **15-1.03G(2) Materials**

Not Used

### **15-1.03G(3) Construction**

Not Used

### **15-1.03G(4) Payment**

Not Used

**Replace Section 15-1.03H Reserved with:**

### **15-1.03H PROTECT WEST HARBOR**

#### **15-1.03H(1) General**

The West Harbor contains features that must be protected in place or restored or replaced at the completion of the project. These features include, but are not limited to:

- Exposed aggregate paving
- Benches
- Trash receptacles
- Picnic tables
- Monuments
- Decorative pilasters
- Flagpole(s)
- Decorative lighting
- Plaques
- Engraved bricks
- Signage
- Parking meters
- Curbs, gutters and sidewalks
- Landscaping
- Bike racks

Within five (5) working days of receiving Notice to Proceed, prepare pre-project photo-documentation of all elements of the West Harbor. Photos will be high definition and assembled in an electronic media format. Annotate all photos to identify the location, the date and brief description of the item(s) documented.

After completion of all work within the West Harbor and removal of your equipment, materials and staging area, prepare post-project photo-documentation of all elements of the west harbor. Photos will be high definition and assembled in an electronic media format. All photos will be annotated to identify the location, the date and brief description of the item(s) documented.

Provide photo-documentation to the Engineer. The Engineer will review the West Harbor and the photo-documentation and notify you of required repairs to restore the West Harbor. Make repairs in a timely manner before project final acceptance.

MURRAY STREET BRIDGE AT THE SMALL CRAFT HARBOR, SEISMIC  
RETROFIT/BARRIER REPLACEMENT, CITY PROJECT NO. C409321, FEDERAL NO.  
PROJECT NO. STPLZ 5025(084)

### **15-1.03H(2) Materials**

Use new materials or existing materials approved by the Engineer to restore the West Harbor.

### **15-1.03H(3) Construction**

Not used.

### **15-1.03H(4) Payment**

Full compensation for preparing pre-project and post-project photo-documentation of the West Harbor, and protecting the features therein, will be considered as included in the prices paid for the other contract items of work involved and no additional compensation will be allowed therefor.

Repair or replacement of items determined to be damaged during construction will be done at no cost to the City of Santa Cruz.

## **Replace Section 15-1.03I Reserved with**

### **15-1.03I AERATOR ASSEMBLY**

#### **15-1.03I(1) General**

Remove the aerator assemblies located at Bent 7 footing south end, total 2, and temporarily relocate them to adjacent bents including supplying temporary power during construction at Bent 7. Refabricate the assemblies as needed, and furnish and install new aerators at the similar edge location of the newly constructed Bent 7 footing extension.

If you move the assemblies during the summer, they cannot be shut down for more than 2 hours during relocation and must remain operational at all other times. Coordinate any shutdown with the Port District and the Engineer.

Submit 2 copies of shop drawings showing details of the refabrication of removed material and the fabrication of new material as needed. Include a list of new material, the type of metal, and metal specifications.

Refabrication of removed material, fabrication of new material, and installation of the bracket assembly must comply with the specifications in section 55-1.

Abraded and damaged galvanized surfaces on the removed material must be repaired under section 75-1.02B.

#### **15-1.03I(2) Materials**

Not used.

#### **15-1.03I(3) Construction**

Not used.

#### **15-1.03I(4) Payment**

Not used.

MURRAY STREET BRIDGE AT THE SMALL CRAFT HARBOR, SEISMIC  
RETROFIT/BARRIER REPLACEMENT, CITY PROJECT NO. C409321, FEDERAL NO.  
PROJECT NO. STPLZ 5025(084)

**Replace section 15-1.03J Reserved with:**

**15-1.03J RECONSTRUCT FENDER**

**15-1.03J(1) General**

Remove fenders at Bents 5 through 8. Furnish and install new plastic lumber fenders.

Submit 2 copies of shop drawings showing details of the fabrication of new material. Include a list of new material, the type of plastic lumber, and plastic lumber specifications.

Fabrication and installation of plastic lumber must conform to the provisions in Section 57-3 "Plastic Lumber Structures" of the Standard Specifications and these Special Provisions.

**15-1.03J(2) Materials**

Not used.

**15-1.03J(3) Construction**

Not used.

**15-1.03J(4) Payment**

Not Used

**Replace section 15-1.03K Reserved with:**

**15-1.03K RESET STRUCTURE MOUNTED ELECTROLIER**

**15-1.03K(1) General**

Remove the structure mounted electroliers, located at Bents 3, 6, and 9 bent caps north for construction activity on the north side of the structure. Protect existing anchorage during construction activity. After construction activity permits, install each electrolier at its original location.

**15-1.03K(2) Material**

Not used.

**15-1.03K(3) Construction**

Not used.

**15-1.03K(4) Payment**

Not used.

**Add after Section 15.-1.03K:**

**15-1.03L REMOVE METAL BOLLARD**

**15-1.03L(1) General**

Remove metal bollards including any foundations or sleeves.

MURRAY STREET BRIDGE AT THE SMALL CRAFT HARBOR, SEISMIC  
RETROFIT/BARRIER REPLACEMENT, CITY PROJECT NO. C409321, FEDERAL NO.  
PROJECT NO. STPLZ 5025(084)

Do not remove metal bollards until they are in conflict with other construction activities.

**15-1.03L(2) Material**

Not used.

**15-1.03L(3) Construction**

Not used.

**15-1.03L(4) Payment**

Not Used



### 15-1.03M RELOCATE UTILITIES

#### 15-1.03M(1) General

The following utilities are in conflict with the Contractor's construction activities at the foundation of Bent 3 and Bent 4. Cap and remove the existing utilities to facilitate construction and reconstruct the utilities as shown on the plans or at a proposed new location to reestablish service.

<b>Bent 3</b>			
<b>Utility</b>	<b>Location</b>	<b>Action During Construction</b>	<b>Final Location</b>
4" Sanitary Sewer	West Harbor, serving 790 Mariner Park Way	Cap and remove portion	Reconstruct around foundation, Verify that sewer grades are maintained.
6" Waterline	West Harbor, serving 790 Mariner Park Way	Cap and remove portion	Reconstruct around foundation
Harbor Fire Suppression Line	West Harbor serving Port boat docks	Expose and reroute line. Fire suppression line cannot be out of service for more than 1 hour. Coordinate closure with Port before shutting down line.	Reconstruct around foundation.

<b>Bent 4</b>			
<b>Utility</b>	<b>Location</b>	<b>Action During Construction</b>	<b>Final Location</b>
Harbor Fire Suppression Line	West Harbor on sea wall	Remove fire suppression line and all appurtenances during construction and replace on newly reconstructed sea wall	Reconstruct on reconstructed sea wall

#### 15-1.03M(2) Materials

Not used

MURRAY STREET BRIDGE AT THE SMALL CRAFT HARBOR, SEISMIC RETROFIT/BARRIER REPLACEMENT, CITY PROJECT NO. C409321, FEDERAL NO. PROJECT NO. STPLZ 5025(084)

### **15-1.03M(3) Construction**

Not used

### **15-1.03M(4) Payment**

Payment for establishing elevations and flowlines, rerouting, capping, removing and reconstructing utilities at or near 790 Mariner Park Way to facilitate footing construction at Bents 3 and 4 is included in the payment for Structure Excavation (Bridge).

Payment for removing and replacing fire suppression line and appurtenances at Bent 4 is included in the payment for Reconstruct Sea Wall.

### **15-1.03N RELOCATE OIL SHED**

#### **15-1.03N(1) General**

This work consists of furnishing a new waste oil storage shed, including a foundation and tank (collectively, the shed), at the temporary location indicated on the plans. After construction of the new shed at the temporary location, remove the existing shed. Upon substantial completion of the project, relocate the new shed back to the existing shed location.

#### **15-1.03N(2) Materials**

The shed may be a prefabricated type.

The shed shall be of similar, or better, size, features, and quality than the existing shed located beneath Bridge span 1.

#### **15-1.03N(3) Construction**

Provide battery-powered lighting in the shed in its temporary location and maintain the battery and lighting throughout the project until you relocate the shed and connect it to power and lighting.

The owner will be responsible to:

1. Remove their property from the existing shed prior to removal.
2. Relocate their property to the shed in its temporary location.
3. Remove their property from the shed in its temporary location prior to relocation of the shed.
4. Relocate their property to the relocated shed.

You will be responsible to:

1. Provide a submittal for the new shed for review by the Engineer and the owner. Allow two (2) weeks for initial review and one week for each subsequent review and secure approval before purchasing the shed.
2. Construct the new shed.
3. Notify the Engineer two weeks prior to removing the existing shed and allow the owner one week to remove their property from the existing shed.
4. Upon substantial completion of the project, notify the Engineer of the schedule to relocate the shed.

MURRAY STREET BRIDGE AT THE SMALL CRAFT HARBOR, SEISMIC  
RETROFIT/BARRIER REPLACEMENT, CITY PROJECT NO. C409321, FEDERAL NO.  
PROJECT NO. STPLZ 5025(084)

5. Allow the owner one week to remove their property from the shed in its temporary location.
6. Relocate the shed to the location shown on the plans. Prior to the owner occupying the shed, schedule a walk through with the Engineer and the owner to verify the condition and obtain their acceptance of the shed in its final location.
7. Repair any damage to the new shed until Contract acceptance, up to and including complete replacement at no cost to the City.

#### **15-1.03N(4) Payment**

Not used.

### **15-1.03O RELOCATE OAR HOUSE**

#### **15-1.03O(1) General**

This work consists of furnishing a new 8' x 12' building (Oar House) at the temporary location indicated on the plans. After construction of the new building at the temporary location, remove the existing building. Upon substantial completion of the project, relocate the new building back to the existing building location.

Coordinate with PG&E to provide temporary power to the building until no longer required.

#### **15-1.03O(2) Materials**

The building may be a prefabricated type.

The building shall be of similar, or better, size, features, and quality than the existing building located adjacent to and north of Bridge Bent 3.

#### **15-1.03O(3) Construction**

Provide battery-powered lighting in the building in its temporary location and maintain the battery and lighting throughout the project until you relocate the building and connect it to power and lighting.

The owner will be responsible to:

1. Remove their property from the existing building prior to removal.
2. Relocate their property to the building in its temporary location.
3. Remove their property from the building in its temporary location prior to relocation of the building.
4. Relocate their property to the relocated building.

You will be responsible to:

1. Provide a submittal for the new building for review by the Engineer and the owner. Allow two (2) weeks for initial review and one week for each subsequent review and secure approval before purchasing the building.
2. Construct the new building.
3. Notify the Engineer two weeks prior to removing the existing building and allow the owner one week to remove their property from the existing building.

MURRAY STREET BRIDGE AT THE SMALL CRAFT HARBOR, SEISMIC  
RETROFIT/BARRIER REPLACEMENT, CITY PROJECT NO. C409321, FEDERAL NO.  
PROJECT NO. STPLZ 5025(084)

4. Upon substantial completion of the project, notify the Engineer of the schedule to relocate the building.
5. Allow the owner one week to remove their property from the building in its temporary location.
6. Relocate the building to the location shown on the plans. Prior to the owner occupying the building, schedule a walk through with the Engineer and the owner to verify the condition and obtain their acceptance of the building in its final location.
7. Repair any damage to the new building until Contract acceptance, up to and including complete replacement at no cost to the City.

#### **15-1.03O(4) Payment**

Not used.

#### **15-1.03P RELOCATE UCSC STORAGE BUILDING AND SHOP**

##### **15-1.03P(1) General**

This work consists of furnishing two (2) new 8' x 12' buildings (storage building and shop) at the temporary location indicated on the plans. After construction of the new buildings at the temporary locations, remove the existing buildings. Upon substantial completion of the project, relocate the new buildings back to the existing building locations.

Coordinate with PG&E to provide temporary power to the building until no longer required.

##### **15-1.03P(2) Materials**

The buildings may be a prefabricated type.

The buildings shall be of similar, or better, size, features, and quality than the existing buildings located beneath Bridge span 2.

##### **15-1.03P(3) Construction**

Provide battery-powered lighting in the buildings in their temporary locations and maintain the battery and lighting throughout the project until you relocate the buildings and connect them to power and lighting.

The owner will be responsible to:

1. Remove their property from the existing buildings prior to removal
2. Relocate their property to the buildings in their temporary locations
3. Remove their property from the buildings in their temporary locations prior to relocation of the buildings
4. Relocate their property to the relocated buildings.

You will be responsible to:

1. Provide a submittal for the new buildings for review by the Engineer and the owner. Allow two (2) weeks for initial review and one week for each subsequent review and secure approval before purchasing the buildings.
2. Construct the new buildings.

MURRAY STREET BRIDGE AT THE SMALL CRAFT HARBOR, SEISMIC  
RETROFIT/BARRIER REPLACEMENT, CITY PROJECT NO. C409321, FEDERAL NO.  
PROJECT NO. STPLZ 5025(084)

3. Notify the Engineer two weeks prior to removing the existing buildings and allow the owner one week to remove their property from the existing buildings.
4. Upon substantial completion of the project, notify the Engineer of the schedule to relocate the buildings.
5. Allow the owner one week to remove their property from the buildings in their temporary locations.
6. Relocate the buildings to the locations shown on the plans. Prior to the owner occupying the buildings, schedule a walk through with the Engineer and the owner to verify the condition and obtain their acceptance of the buildings in their final locations.
7. Repair any damage to the new buildings until Contract acceptance, up to and including complete replacement at no cost to the City.

#### **15-1.03P(4) Payment**

Not used

#### **15-1.03Q RELOCATE UCSC BOATING OFFICE**

##### **15-1.03Q(1) General**

This work consists of furnishing a new Boating Office (building) at the temporary location indicated on the plans. After construction of the new building at the temporary location, the Port Contractor will remove the existing building. Upon substantial completion of the project, relocate the new building back to the existing building location or other location on Dock F-F indicated by the Engineer.

Coordinate with PG&E to provide temporary power to the building until no longer required.

##### **15-1.03Q(2) Materials**

The building may be a prefabricated type.

The building shall be of similar, or better, size, features, and quality than the existing building located on the southern portion of Dock F-F.

##### **15-1.03Q(3) Construction**

Provide battery-powered lighting in the building in its temporary location and maintain the battery and lighting throughout the project until you relocate the building and connect it to power and lighting.

The owner will be responsible to:

1. Remove their property from the existing building prior to removal.
2. Relocate their property to the building in its temporary location.
3. Remove the existing building.
4. Remove their property from the building in its temporary location prior to relocation of the building.
5. Relocate their property to the relocated building.

You will be responsible to:

MURRAY STREET BRIDGE AT THE SMALL CRAFT HARBOR, SEISMIC  
RETROFIT/BARRIER REPLACEMENT, CITY PROJECT NO. C409321, FEDERAL NO.  
PROJECT NO. STPLZ 5025(084)

1. Provide a submittal for the new building for review by the Engineer and the owner. Allow two (2) weeks for initial review and one week for each subsequent review and secure approval before purchasing the building.
2. Construct the new building.
3. Allow the owner access to the new building.
4. Upon substantial completion of the project, notify the Engineer of the schedule to relocate the building.
5. Allow the owner one week to remove their property from the building in its temporary location.
6. Relocate the building to the location shown on the plans. Prior to the owner occupying the building, schedule a walk through with the Engineer and the owner to verify the condition and obtain their acceptance of the building in its final location.
7. Repair any damage to the new building until Contract acceptance, up to and including complete replacement at no cost to the City.

#### **15-1.03Q(4) Payment**

Not used

#### **15-1.03R RECONSTRUCT SEAWALL**

##### **15-1.03R(1) General**

This work consists of removing and reconstructing a portion of the west harbor seawall at Bent 4 as necessary to allow for pile and footing construction as shown on the plans.

##### **15-1.03R(2) Materials**

Not use

##### **15-1.03R(3) Construction**

Reconstruct the seawall in its current location. Reconstruct the fire line conduit.

##### **15-1.03R(4) Payment**

Not used

#### **15-1.03S RECONSTRUCT RAILING**

##### **15-1.03S(1) General**

Replace the portion of the metal railing removed with the Seawall at Bent 4 as shown on the plans.

##### **15-1.03S(2) Materials**

Metal railing shall match the existing railing.

##### **15-1.03S(3) Construction**

Not used

MURRAY STREET BRIDGE AT THE SMALL CRAFT HARBOR, SEISMIC  
RETROFIT/BARRIER REPLACEMENT, CITY PROJECT NO. C409321, FEDERAL NO.  
PROJECT NO. STPLZ 5025(084)



## 16 TEMPORARY FACILITIES

Replace Section 16-3 with:

### 16-3.1 TEMPORARY BUILDING

#### 16-3.1(1) General

Furnish, until one hundred percent (100%) of the work is accepted, a temporary building located as shown in the plans to house the Chardonnay Sailing Charters and the Pacific Yachting offices conforming to these special provisions.

- The overall size of the office will be 625 square feet minimum, split equally into two offices. Each office will be furnished with doors and windows capable of being locked.
- Furnish keys to tenants for their use until 100% of work is accepted.
- The temporary office must be accessible for persons with disabilities.
- Parking spaces for three (3) full-size vehicles within 50 feet of temporary building. One parking space will be ADA accessible.
- The office will be furnished with or provide for the following:
  - HVAC system to maintain interior temperature between 68 and 78 degrees F.
  - Window blinds on all windows (including any window in the door) for security.
  - Bottled water cooler and cups.
  - A ADA-accessible portable restroom located within 50 feet of the temporary building.
    - Restroom will be furnished with hot and cold running water.
    - Provide semi-weekly restroom cleaning.
    - Restroom cleaning will include black and gray water removal and providing paper products, deodorizer and hand sanitizer.
- Coordinate with PG&E to provide temporary power to the temporary building until no longer required.

Coordinate for and provide the following utility services for the office:

1. Electrical power
2. High-speed internet connection with minimum speed of 50 Mbps

You will be responsible to:

1. Notify the Engineer two weeks prior to and allow tenants one week to remove their property from the existing building to the temporary building.
2. Protect the existing unoccupied building in its current location. Damage to existing building, up to and including complete replacement will be the responsibility of the Contractor at no cost to the City.
3. Upon substantial completion of the project, notify the Engineer of the schedule to return tenants to their original location.
4. Allow tenants one week to remove their property from the temporary building back to the existing building.

MURRAY STREET BRIDGE AT THE SMALL CRAFT HARBOR, SEISMIC  
RETROFIT/BARRIER REPLACEMENT, CITY PROJECT NO. C409321, FEDERAL NO.  
PROJECT NO. STPLZ 5025(084)







## **19 EARTHWORK**

**Replace item 2 in the list of section 19-2.04 with:**

2. Ditch and bioretention facility excavation.

**Add to the end of section 19-2.04:**

Removing curbs, gutters, sidewalks and AC dikes is included in Roadway Excavation.

**Add to the end of section 19-3.01A:**

Structure backfill (soldier pile wall) includes constructing the geocomposite drain system to the curb and gutter. The systems must comply with section 68-7.

**Add to the beginning of section 19-3.03B(1):**

For footings at locations with structure excavation (Type D), ground or surface water is expected to be encountered but seal course concrete is not needed.

**Add to section 19-3.04:**

Structure excavation for footings at locations not shown as structure excavation (Type D) and where ground or surface water is encountered is paid for as structure excavation (bridge).

Pervious backfill material placed within the limits of payment for bridges is paid for as structure backfill (bridge). Pervious backfill material placed within the limits of payment for retaining walls is paid for as structure backfill (retaining wall).

**Replace Section 19-12 RESERVED with:**

**19-12 BIORETENTION SOIL MEDIA (BSM)**

### **19-12.01 GENERAL**

#### **19-12.01A Summary**

This item includes the work involved with placing bioretention soil media where shown in the project plans

#### **19-12.01B Submittals**

The applicant must submit to the municipality for approval:

- A. A sample of mixed bioretention soil.
- B. Certification from the soil supplier or an accredited laboratory that the Bioretention Soil meets the requirements of this guideline specification.
- C. Grain size analysis results of the fine sand component performed in accordance with ASTM D 422, Standard Test Method for Particle Size Analysis of Soils.
- D. Quality analysis results for compost performed in accordance with Seal of Testing Assurance (STA) standards, as specified in Section 1.4.

MURRAY STREET BRIDGE AT THE SMALL CRAFT HARBOR, SEISMIC  
RETROFIT/BARRIER REPLACEMENT, CITY PROJECT NO. C409321, FEDERAL NO.  
PROJECT NO. STPLZ 5025(084)

- E. Organic content test results of mixed Bioretention Soil. Organic content test shall be performed in accordance with by Testing Methods for the Examination of Compost and Composting (TMECC) 05.07A, "Loss-On- Ignition Organic Matter Method".
- F. Grain size analysis results of compost component performed in accordance with ASTM D 422, Standard Test Method for Particle Size Analysis of Soils.
- G. A description of the equipment and methods used to mix the sand and compost to produce Bioretention Soil.
- H. Provide the following information about the testing laboratory(ies) name of laboratory(ies) including
  - 1) contact person(s)
  - 2) address(es)
  - 3) phone contact(s)
  - 4) e-mail address(es)
  - 5) qualifications of laboratory(ies), and personnel including date of current certification by STA, ASTM, or approved equal

**19-12.02 MATERIALS**

**19-12.02A General**

Bioretention soil shall achieve a long-term, in-place infiltration rate of at least 5 inches per hour. Bioretention soil shall also support vigorous plant growth.

Bioretention Soil shall be a mixture of fine sand, and compost, measured on a volume basis:

- 60%-70% Sand
- 30%-40% Compost

**19-12.02B Sand for Bioretention**

A. General

Sand shall be free of wood, waste, coating such as clay, stone dust, carbonate, etc., or any other deleterious material. All aggregate passing the No. 200 sieve size shall be non-plastic.

B. Sand for Bioretention Soil Texture

Sand for Bioretention Soils shall be analyzed by an accredited lab using #200, #100, #40, #30, #16.

#8, #4, and 3/8 inch sieves (ASTM D 422 or as approved by municipality), and meet the following gradation:

Sieve Size	Percent Passing (by weight)	
	<i>Min</i>	<i>Max</i>
3/8 inch	100	100
No. 4	90	100
No. 8	70	100
No. 16	40	95

MURRAY STREET BRIDGE AT THE SMALL CRAFT HARBOR, SEISMIC RETROFIT/BARRIER REPLACEMENT, CITY PROJECT NO. C409321, FEDERAL NO. PROJECT NO. STPLZ 5025(084)

No. 30	15	70
No. 40	5	55
No. 100	0	15
No. 200	0	5

Note: all sands complying with ASTM C33 for fine aggregate comply with the above gradation requirements.

### 19-12.02C Compost Material

Compost shall be a well decomposed, stable, weed free organic matter source derived from waste materials including yard debris, wood wastes or other organic materials not including manure or biosolids meeting the standards developed by the US Composting Council (USCC). The product shall be certified through the USCC Seal of Testing Assurance (STA) Program (a compost testing and information disclosure program).

#### A. Compost Quality Analysis

Before delivery of the soil, the supplier shall submit a copy of lab analysis performed by a laboratory that is enrolled in the US Composting Council's Compost Analysis Proficiency (CAP) program and using approved Test Methods for the Evaluation of Composting and Compost (TMECC). The lab report shall verify:

- 1) Feedstock Materials shall be specified and include one or more of the following: landscape/yard trimmings, grass clippings, food scraps, and agricultural crop residues.
- 2) Organic Matter Content: 35% - 75% by dry wt.
- 3) Carbon and Nitrogen Ratio: C:N < 25:1 and C:N >15:1
- 4) Maturity/Stability: shall have a dark brown color and a soil- like odor. Compost exhibiting a sour or putrid smell, containing recognizable grass or leaves, or is hot (120F) upon delivery or rewetting is not acceptable. In addition any one of the following is required to indicate stability:
  - a. Oxygen Test < 1.3 O<sub>2</sub> /unit TS /hr
  - b. Specific oxy. Test < 1.5 O<sub>2</sub> / unit BVS /
  - c. Respiration test < 8 C / unit VS / day
  - d. Dewar test < 20 Temp. rise (°C)
  - e. Solvita® > 5 Index value
- 5) Toxicity: any one of the following measures is sufficient to indicate non-toxicity.
  - f. NH<sub>4</sub>- : NO<sub>3</sub>-N < 3
  - g. Ammonium < 500 ppm, dry basis
  - h. Seed Germination > 80 % of control
  - i. Plant Trials > 80% of control
  - j. e. Solvita® > 5 Index value
- 6) Nutrient Content: provide analysis detailing nutrient content including N-P-K, Ca, Na, Mg, S, and B.
  - k. Total Nitrogen content 0.9% or above preferred.
  - l. Boron: Total shall be <80 ppm; Soluble shall be <2.5 ppm
- 7) Salinity: Must be reported; < 6.0 mmhos/cm
- 8) pH shall be between 6.5 and 8. May vary with plant species.

MURRAY STREET BRIDGE AT THE SMALL CRAFT HARBOR, SEISMIC RETROFIT/BARRIER REPLACEMENT, CITY PROJECT NO. C409321, FEDERAL NO. PROJECT NO. STPLZ 5025(084)

B. Compost for Bioretention Soil Texture

Compost for Bioretention Soils shall be analyzed by an accredited lab using #200, 1/4 inch, 1/2 inch, and 1 inch sieves (ASTM D 422 or as approved by municipality), and meet the following gradation:

Sieve Size	Percent Passing (by weight)	
	<i>Min</i>	<i>Max</i>
1 inch	99	100
1/2 inch	90	100
1/4 inch	40	90
No. 200	2	10

- C. Bulk density: shall be between 500 and 1100 dry lbs/cubic yard
- D. Moisture Content shall be between 30% - 55% of dry solids.
- E. Inerts: compost shall be relatively free of inert ingredients, including glass, plastic and paper, < 1 % by weight or volume.
- F. Weed seed/pathogen destruction: provide proof of process to further reduce pathogens (PFRP). For example, turned windrows must reach min. 55C for 15 days with at least 5 turnings during that period.
- G. Select Pathogens: Salmonella <3 MPN/4grams of TS, or Coliform Bacteria <10000 MPN/gram.
- H. Trace Contaminants Metals (Lead, Mercury, Etc.) Product must meet US EPA, 40 CFR 503 regulations.
- I. Compost Testing

The compost supplier will test all compost products within 120 calendar days prior to application. Samples will be taken using the STA sample collection protocol. (The sample collection protocol can be obtained from the U.S. Composting Council, 4250 Veterans Memorial Highway, Suite 275, Holbrook, NY 11741 Phone: 631-737- 4931, [www.compostingcouncil.org](http://www.compostingcouncil.org)). The sample shall be sent to an independent STA Program approved lab. The compost supplier will pay for the test.

**19-12.02D Verification of Alternative Bioretention Soil Mixes**

Bioretention soils not meeting the above criteria may be evaluated on a case by case basis. Alternative bioretention soil must meet the following specification: "Soils for bioretention facilities must be sufficiently permeable to infiltrate runoff at a minimum rate of 5 inches per hour during the life of the facility, and must provide sufficient retention of moisture and nutrients to support healthy vegetation."

The following guidance is offered to assist municipalities with verifying that alternative soil mixes meet the specification:

1 General Requirements

Bioretention soil shall achieve a long-term, in-place infiltration rate of at least 5 inches per hour. Bioretention soil shall also support vigorous plant growth.

1.1 Submittals

MURRAY STREET BRIDGE AT THE SMALL CRAFT HARBOR, SEISMIC RETROFIT/BARRIER REPLACEMENT, CITY PROJECT NO. C409321, FEDERAL NO. PROJECT NO. STPLZ 5025(084)

The applicant must submit to the municipality for approval:

- A. A sample of mixed bioretention soil.
- B. Certification from the soil supplier or an accredited laboratory that the Bioretention Soil meets the requirements of this guideline specification.
- C. Certification from an accredited geotechnical testing laboratory that the Bioretention Soil has an infiltration rate between 5 and 12 inches per hour as tested according to Section 1.2.
- D. Organic content test results of mixed Bioretention Soil. Organic content test shall be performed in accordance with by Testing Methods for the Examination of Compost and Composting (TMECC) 05.07A, "Loss-On-Ignition Organic Matter Method".
- E. Grain size analysis results of mixed bioretention soil performed in accordance with ASTM D 422, Standard Test Method for Particle Size Analysis of Soils.
- F. A description of the equipment and methods used to mix the sand and compost to produce Bioretention Soil.
- G. Provide the following information about the testing laboratory(ies) name of laboratory(ies) including
  - 1) contact person(s)
  - 2) address(es)
  - 3) phone contact(s)

**19-12.03 CONSTRUCTION**

Not Used

**19-12.04 PAYMENT**

The payment quantity for Bioretention Soil Media (CY) also includes the work associated with installing the 30 ml. HDPE Liner per the project plans.

^^







## DIVISION VI STRUCTURES

### 49 PILING

#### Add to the end of section 49-1.01D(4):

The City performs dynamic monitoring of the first production pile driven for each control zone at the support location shown in the following table:

Bridge no.	Support location or control zone
36C0108	Bents 2 through 8, one pile at each support on each north and south side; total 14

#### Add to section 49-1.01D(5):

Perform test borings on the Murray Street Bridge at the locations shown in the following table to determine the elevation of top of rock:

Bent/Abut no.	Location
Abut 1	One pile
2, 3, and 4	South side, one pile
3	North side, one pile
5, 6, 7, and 8	South side, one pile
5, 6, 7, and 8	North side, one pile
Abut 10	One pile
Anchor Piles	N/A

#### Replace the 4th paragraph of section 49-1.01D(5) with:

Drill test borings at the center of each pile location shown with the orientation of the specified batter.

Drill test borings by rotary drill methods to the specified tip elevation shown or top of rock elevation, whichever is deeper. Test borings must be at least 3 inches in diameter.

#### Add after section 49-1.01D(5) Test Borings:

#### 49-1.01E Dredging

MURRAY STREET BRIDGE AT THE SMALL CRAFT HARBOR, SEISMIC RETROFIT/BARRIER REPLACEMENT, CITY PROJECT NO. C409321, FEDERAL NO. PROJECT NO. STPLZ 5025(084)

No sediment may be allowed in the waterway as a result of pile installation. Survey the channel bottom along the upstream and down stream faces of the bridge prior to any in-water work to develop a pre-construction profile. This profile will be maintained throughout construction. At the completion of all in-water work, survey the channel again to develop a post-construction profile. Submit the profile to the Engineer for final acceptance.

Coordinate all dredging activities with the Port District.

Coordinate with the Port District to ensure that the channel has sufficient depth to allow for dredge movement at low tide from May through October.

**Add to section 49-1.03:**

Expect difficult pile installation due to the conditions shown in the following table:

Pile location		Conditions
Bridge no.	Support location	
36C0108	Abutments 1 and 10	Groundwater, underground utilities, presence of sand, very soft clays (bay mud), and channel deposits overlying cemented dense silty sand, caving soils, man-made fill materials, subsurface concrete debris, variable rock level, the requirements of pile embedment into highly cemented rock, overpour from construction of existing footings, traffic control, sound control, and vibration monitoring.
36C0108	Bents 2 and 3	Surface and groundwater, underground utilities, presence of sand, very soft clays (bay mud), and channel deposits overlying cemented dense silty sand, caving soils, man-made fill materials, subsurface concrete debris, variable rock level, the requirements of pile embedment into highly cemented rock, overpour from construction of existing footings, sound control, harbor usage, traffic control, and vibration monitoring.
36C0108	Bents 4 through 9	Groundwater, low overhead clearance, underground utilities, presence of sand, very soft clays (bay mud), and channel deposits overlying cemented dense silty sand, caving soils, man-made fill materials and large subgrade riprap, tidal flow fluctuation, subsurface concrete debris, variable rock level, the requirements of pile embedment into highly cemented rock, overpour from construction of existing footings, sound control, harbor usage, traffic control, and vibration monitoring.
36C0108	Anchor piles beyond Abutment 10	Caving due to presence of loose/soft soil layers, presence of groundwater, presence of "intact" rock with local restraint, strongly cemented zones that may be difficult for auger equipment to penetrate.
Ret Wall No. 9	All	Similar to conditions at Abutments.
Ret Wall No. 11	All	Similar to conditions at Abutments.
Ret Wall No. 17	All	Similar to conditions at Abutments.
Ret Wall No. 18	All	Similar to conditions at Abutments.

MURRAY STREET BRIDGE AT THE SMALL CRAFT HARBOR, SEISMIC RETROFIT/BARRIER REPLACEMENT, CITY PROJECT NO. C409321, FEDERAL NO. PROJECT NO. STPLZ 5025(084)

**Add to end of section 49-1.04:**

Performing test borings and surveys and dredging associated with maintaining the existing channel profile are included in the price paid for the various types or classes of piling shown in the Bid Item List.

**Add to section 49-2.01A(3)(a):**

Before installing driven piles, submit a Pile and Driving Data Form for each pile type for each of the support locations or control zones shown in the following table:

Bridge no.	Pile type	Support location or control zone
36C-108	CISS NPS 16x0.5	Abutment 1
36C-108	CISS NPS 30x0.625	Bent 2
36C-108	CISS NPS 30x0.625	Bent 3
36C-108	CISS NPS 30x0.625	Bent 4
36C-108	CISS NPS 30x0.625	Bent 5
36C-108	CISS NPS 30x0.625	Bent 6
36C-108	CISS NPS 30x0.625	Bent 7
36C-108	CISS NPS 30x0.625	Bent 8
36C-108	CISS NPS 16x0.5	Bent 9
36C-108	CISS NPS 16x0.5	Abutment 10

**Add to section 49-2.01A(3)(b):**

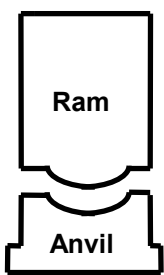
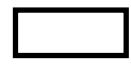
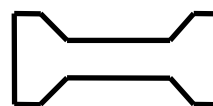


Before installing driven piles, submit a driving system submittal for each pile type for each of the support locations or control zones shown in the following table:

Bridge no.	Pile type	Support location or control zone
36C-108	CISS NPS 16x0.5	Abutment 1
36C-108	CISS NPS 30x0.625	Bent 2
36C-108	CISS NPS 30x0.625	Bent 3
36C-108	CISS NPS 30x0.625	Bent 4
36C-108	CISS NPS 30x0.625	Bent 5
36C-108	CISS NPS 30x0.625	Bent 6
36C-108	CISS NPS 30x0.625	Bent 7
36C-108	CISS NPS 30x0.625	Bent 8
36C-108	CISS NPS 16x0.5	Bent 9
36C-108	CISS NPS 16x0.5	Abutment 10

CALIFORNIA DEPARTMENT OF TRANSPORTATION  
TRANSPORTATION LABORATORY

# PILE AND DRIVING DATA FORM

Structure Name : \_\_\_\_\_ Contract No.: \_\_\_\_\_  
 \_\_\_\_\_ Project: \_\_\_\_\_  
 Structure No.: \_\_\_\_\_ Pile Driving Contractor or  
 Dist./Co./Rte./Post Mi: \_\_\_\_\_ Subcontractor \_\_\_\_\_ (Pile Driven By)

 <p>Ram Anvil</p>	<p><b>Hammer</b></p>	<p>Manufacturer: _____ Model: _____                  Type: _____ Serial No.: _____                  Min Rated Energy: _____ at _____ Length of Stroke _____ Fuel Setting                  Max Rated Energy: _____ at _____ Length of Stroke _____ Fuel Setting                  Ram Weight: _____ kips                  Modifications: _____                  _____                  _____</p>
	<p><b>Capblock (Hammer Cushion)</b></p>	<p>Material: _____                  Thickness: _____ in Area: _____ in<sup>2</sup>                  Modulus of Elasticity - E: _____ ksi                  Coefficient of Restitution - e: _____</p>
	<p><b>Pile Cap</b></p>	<p> <input type="checkbox"/> Helmet  <input type="checkbox"/> Bonnet  <input type="checkbox"/> Anvil Block  <input type="checkbox"/> Drivehead                 </p> <p>Weight: _____ kips</p>
	<p><b>Pile Cushion</b></p>	<p>Material: _____                  Thickness: _____ in Area: _____ in<sup>2</sup>                  Modulus of Elasticity - E: _____ ksi                  Coefficient of Restitution - e: _____</p>
	<p><b>Pile</b></p>	<p>Pile Type: _____                  Length (In Leads): _____ ft                  Lb/ft.: _____ Taper: _____                  Wall Thickness: _____ in                  Cross Sectional Area: _____ in<sup>2</sup>                  Design Pile Capacity: _____ kips                  Description of Splice: _____                  _____                  Tip Treatment Description: _____                  _____                  _____</p>

**DISTRIBUTE:**

Translab,  
Foundation Testing

Translab,  
Geotechnical Design

Note: If mandrel or follower is used to drive the pile, attach separate manufacturer's detail sheet(s) including weight and dimensions.

Submitted By: \_\_\_\_\_  
 Date: \_\_\_\_\_ Phone No.: \_\_\_\_\_

MURRAY STREET BRIDGE AT THE SMALL CRAFT HARBOR, SEISMIC  
 RETROFIT/BARRIER REPLACEMENT. CITY PROJECT NO. C409321. FEDERAL NO.  
 PROJECT NO. STPLZ 5025(084)

**Replace the 1st paragraph of section 49-2.05B with:**

Steel sheet piling must comply with ASTM A690/A690M for interlocking marine grade steel sheet piling and be manufactured by the hot rolling method.

**Add after the first paragraph in Section 49-3.01C:**

For CIDH concrete piles 24 inches in diameter or larger, except for those constructed under slurry, construct CIP concrete piles such that the excavation methods and the concrete placement procedures provide for placing the concrete with the use of a temporary casing, unless an uncased hole is approved in writing by the Engineer.

**Add to section 49-3.02B(6)(c):**

The synthetic slurry must be one of the materials shown in the following table:

Material	Manufacturer
SlurryPro CDP	KB INTERNATIONAL LLC 735 BOARD ST STE 209 CHATTANOOGA TN 37402 (423) 266-6964
Super Mud	PDS CO INC 105 W SHARP ST EL DORADO AR 71731 (870) 863-5707
Shore Pac GCV	CETCO Construction DRILLING PRODUCTS 2870 FORBS AVE HOFFMAN ESTATES IL 60192 (800) 527-9948
Terragel or Novagel Polymer	GEO-TECH SERVICES LLC 220 N. ZAPATA HWY STE 11A-449A LAREDO TX 78043 (210) 259-6386
BIG FOOT	MATRIX Construction PRODUCTS 50 S MAIN ST STE 200 NAPERVILLE IL 60540 (877) 591-3137
POLY-BORE	BAROID INDUSTRIAL DRILLING PRODUCTS 3000 N SAM HOUSTON PKWY EAST HOUSTON TX 77032 (877) 379-7412

Use synthetic slurries in compliance with the manufacturer's instructions. Synthetic slurries shown in the above table may not be appropriate for a given job site.

MURRAY STREET BRIDGE AT THE SMALL CRAFT HARBOR, SEISMIC  
RETROFIT/BARRIER REPLACEMENT, CITY PROJECT NO. C409321, FEDERAL NO.  
PROJECT NO. STPLZ 5025(084)

Synthetic slurries must comply with the Department's requirements for synthetic slurries to be included in the above table. The requirements are available from:

Offices of Structure Design  
P.O. Box 168041  
MS# 9-4/11G  
Sacramento, CA 95816-8041

SlurryPro CDP synthetic slurry must comply with the requirements shown in the following table:

**SlurryPro CDP**

Quality characteristic	Test method	Requirement
Density During drilling (pcf)	Mud weight (density), API RP 13B-1, section 4	≤ 67.0 <sup>a</sup>
Before final cleaning and immediately before placing concrete (pcf)		≤ 64.0 <sup>a</sup>
Viscosity During drilling (sec/qt)	Marsh funnel and cup. API RP 13B-1, section 6.2	50–120
Before final cleaning and immediately before placing concrete (sec/qt)		≤ 70
pH	Glass electrode pH meter or pH paper	6.0–11.5
Sand content, percent by volume Before final cleaning and immediately before placing concrete (%)	Sand, API RP 13B-1, section 9	≤ 1.0

NOTE: Slurry temperature must be at least 40 °F when tested.

<sup>a</sup>If authorized, you may use slurry in a salt water environment. The allowable density of slurry in a salt water environment may be increased by 2 pcf.



Super Mud synthetic slurry must comply with the requirements shown in the following table:

**Super Mud**

Quality characteristic	Test method	Requirement
Density During drilling (pcf)	Mud weight (density), API RP 13B-1, section 4	≤ 64.0 <sup>a</sup>
Before final cleaning and immediately before placing concrete (pcf)		≤ 64.0 <sup>a</sup>
Viscosity During drilling (sec/qt)	Marsh funnel and cup. API RP 13B-1, section 6.2	32–60
Before final cleaning and immediately before placing concrete (sec/qt)		≤ 60
pH	Glass electrode pH meter or pH paper	8.0–10.0
Sand content, percent by volume Before final cleaning and immediately before placing concrete (%)	Sand, API RP 13B-1, section 9	≤ 1.0

NOTE: Slurry temperature must be at least 40 °F when tested.

<sup>a</sup>If authorized, you may use slurry in a salt water environment. The allowable density of slurry in a salt water environment may be increased by 2 pcf.

Shore Pac GCV synthetic slurry must comply with the requirements shown in the following table:

**Shore Pac GCV**

Quality characteristic	Test method	Requirement
Density During drilling (pcf)	Mud weight (density), API RP 13B-1, section 4	≤ 64.0 <sup>a</sup>
Before final cleaning and immediately before placing concrete (pcf)		≤ 64.0 <sup>a</sup>
Viscosity During drilling (sec/qt)	Marsh funnel and cup. API RP 13B-1, section 6.2	33–74
Before final cleaning and immediately before placing concrete (sec/qt)		≤ 57
pH	Glass electrode pH meter or pH paper	8.0–11.0
Sand content, percent by volume Before final cleaning and immediately before placing concrete (%)	Sand, API RP 13B-1, section 9	≤ 1.0

NOTE: Slurry temperature must be at least 40 °F when tested.

<sup>a</sup>If authorized, you may use slurry in a salt water environment. The allowable density of slurry in a salt water environment may be increased by 2 pcf.

MURRAY STREET BRIDGE AT THE SMALL CRAFT HARBOR, SEISMIC  
RETROFIT/BARRIER REPLACEMENT, CITY PROJECT NO. C409321, FEDERAL NO.  
PROJECT NO. STPLZ 5025(084)

Terragel or Novagel Polymer synthetic slurry must comply with the requirements shown in the following table:

**Terragel or Novagel Polymer**

Quality characteristic	Test method	Requirement
Density During drilling (pcf)	Mud weight (density), API RP 13B-1, section 4	≤ 67.0 <sup>a</sup>
Before final cleaning and immediately before placing concrete (pcf)		≤ 64.0 <sup>a</sup>
Viscosity During drilling (sec/qt)	Marsh funnel and cup. API RP 13B-1, section 6.2	45–104
Before final cleaning and immediately before placing concrete (sec/qt)		≤ 104
pH	Glass electrode pH meter or pH paper	6.0–11.5
Sand content, percent by volume Before final cleaning and immediately before placing concrete (%)	Sand, API RP 13B-1, section 9	≤ 1.0

NOTE: Slurry temperature must be at least 40 °F when tested.

<sup>a</sup>If authorized, you may use slurry in a salt water environment. The allowable density of slurry in a salt water environment may be increased by 2 pcf.

BIG-FOOT synthetic slurry must comply with the requirements shown in the following table:

**BIG-FOOT**

Quality characteristic	Test method	Requirement
Density During drilling (pcf)	Mud weight (density), API RP 13B-1, section 4	≤ 64.0 <sup>a</sup>
Before final cleaning and immediately before placing concrete (pcf)		≤ 64.0 <sup>a</sup>
Viscosity During drilling (sec/qt)	Marsh funnel and cup. API RP 13B-1, section 6.2	30–125
Before final cleaning and immediately before placing concrete (sec/qt)		55-114
pH	Glass electrode pH meter or pH paper	8.5–10.5
Sand content, percent by volume Before final cleaning and immediately before placing concrete (%)	Sand, API RP 13B-1, section 9	≤ 1.0

NOTE: Slurry temperature must be at least 40 °F when tested.

<sup>a</sup>If authorized, you may use slurry in a salt water environment. The allowable density of slurry in a salt water environment may be increased by 2 pcf.

POLY-BORE synthetic slurry must comply with the requirements shown in the following table:

**POLY-BORE**

Quality characteristic	Test method	Requirement
Density During drilling (pcf)	Mud weight (density), API RP 13B-1, section 4	62.8-65.8 <sup>a</sup>
Before final cleaning and immediately before placing concrete (pcf)		62.8-64.0 <sup>a</sup>
Viscosity During drilling (sec/qt)	Marsh funnel and cup. API RP 13B-1, section 6.2	50-80
Before final cleaning and immediately before placing concrete (sec/qt)		50-80
pH	Glass electrode pH meter or pH paper	7.0-10.0
Sand content, percent by volume Before final cleaning and immediately before placing concrete (%)	Sand, API RP 13B-1, section 9	≤ 1.0

NOTE: Slurry temperature must be at least 40 °F when tested.

<sup>a</sup>If authorized, you may use slurry in a salt water environment. The allowable density of slurry in a salt water environment may be increased by 2 pcf.

**Add to section 49-3.02C(1):**

If the piling center-to-center spacing is less than 4 pile diameters, do not drill holes or drive casing for an adjacent pile until 24 hours have elapsed after concrete placement in the preceding pile and your prequalification test results for the concrete mix design show that the concrete will attain at least 1800 psi compressive strength at the time of drilling or driving.

Drilling equipment must be equipped with instrumentation to accurately measure the downward force in pounds. The instrumentation dial or display must be clearly visible for reading during operation.

**Replace the first paragraph in Section 49-3.02C(3) with:**

Furnish temporary steel casings where shown or where necessary to control water or to prevent quick soil conditions or caving of the hole. Place temporary casings tight in the hole. Cast-in-place concrete piles 24 inches in diameter or larger shall be constructed so that the excavation methods and the concrete placement procedures provide for placing the concrete with the use of a temporary casing, unless an uncased hole is approved in writing by the Engineer, or by excavation and depositing concrete under slurry.

**Replace section 49-4.01C(1) of the RSS with:**

**49-4.01C(1) General**

Submit as an informational submittal the proposed drilling equipment operational capacities for:

1. Downward force in pounds
2. Torque in foot-pounds

MURRAY STREET BRIDGE AT THE SMALL CRAFT HARBOR, SEISMIC  
RETROFIT/BARRIER REPLACEMENT, CITY PROJECT NO. C409321, FEDERAL NO.  
PROJECT NO. STPLZ 5025(084)

3. Rotational speed in revolutions/minute
4. Rate of penetration in feet/hour
5. Number and type of drilling cutters or drilling teeth on drilling tool

**Add between the 1st and 2nd paragraphs of section 49-4.03A of the RSS:**

Drilling equipment must be equipped with instrumentation to accurately measure the downward force in pounds. The instrumentation dial or display must be clearly visible for reading during operation.

**Add to section 49-4.03B:**

Rock subsurface foundation material is anticipated at the soldier pile retaining wall location. Conventional drilling equipment for drilling in soils may not be suitable for drilling holes for the steel soldier piling.

^^



## 51 CONCRETE STRUCTURES

### Add to the list in paragraph 2 of 51-1.01A:

10. Overflow structure with beehive grate

### Add to the list in paragraph 6 of 51-1.01A:

9. Overflow structure with beehive grate

### Replace the 1st paragraph of section 51-1.01C(1) with:

Submit a deck placement plan for concrete bridge decks and overlays. Include in the placement plan your method and equipment for ensuring that the concrete bridge deck is kept damp by misting immediately after finishing the concrete surface.

### Add to section 51-1.01C(1):

If the methacrylate crack treatment is applied to a bridge deck within 100 feet of a residence, business, or public space, submit a public safety plan. Include with the submittal:

1. Copy of public notification letter with a list of delivery addresses and posting locations. The letter must describe the work to be performed and state the treatment work locations, dates, and times. Deliver copies of the letter to residences and businesses within 100 feet of the treatment work and to local fire and police officials, at least 10 working days before starting treatment activities. Post a copy of the letter at the job site.
2. Airborne emissions monitoring plan. Plan must include monitoring point locations. A CIH certified in comprehensive practice by the American Board of Industrial Hygiene must prepare and execute the plan.
3. Action plan for protecting the public if levels of airborne emissions exceed permissible levels.
4. Copy of the CIH's certification.

After completing methacrylate crack treatment activities, submit results from monitoring production airborne emissions as an informational submittal.

### Add to end of Section 51-1.03E(3)

Utilize GPR (Ground Penetrating Radar or equivalent) to locate subsurface rebar and rebar patterns and precisely mark their locations prior to any drill and bond activity. Provide Engineer documentation of subsurface rebar and rebar patterns.

### Add to the list in the 2nd paragraph of section 51-1.03F(3):

9. Surfaces of the existing structure, as defined above, where holes and depressions are filled

### Add to section 51-1.03G(2):

Concrete surfaces identified to receive architectural treatment on Retaining Wall No. 11 and 17 must be created using elastomeric reusable form liner.

MURRAY STREET BRIDGE AT THE SMALL CRAFT HARBOR, SEISMIC  
RETROFIT/BARRIER REPLACEMENT, CITY PROJECT NO. C409321, FEDERAL NO.  
PROJECT NO. STPLZ 5025(084)

Item 17911 San Diego Dry Stack – “Random stacked field stone” by Fitzgerald Formliners in Santa Ana, CA or a similar stacked stone pattern form liner must be used. Concrete mix will have integral color conforming to Davis Colors Flagstone Brown #641 or equivalent color approved by the Engineer.

Prepare test panels of the architectural treatment in accordance with 51-1.01D(2)(c) Test Panels.

The Engineer determines the acceptability of the selected form liners, finish and color proposed for use.

**Add to section 51-1.04:**

Concrete pedestals on Bent 5 will be paid for as Structural Concrete, Bridge.

The portion of the retaining wall extension between Retaining Wall 9 and Retaining Wall 11 is considered part of Retaining Wall 11.

**Replace item 3 in the list in the 2nd paragraph of section 51-4.03B with:**

3. Except for box girders, a minimum of 1-1/2" inch of deck slab concrete is maintained between deck slab reinforcement and the top of PC I and double T-girders.

**Add to section 51-4.03B:**

Provide temporary lateral bracing for all girders. Install bracing at each end of the girder segments and at the midspan. Bracing must be in place before releasing erection equipment and must remain in place until 48 hours after concrete diaphragms are placed.

Design temporary bracing to prevent overturning and resist the lateral pressures shown in the following table:

Structure height, H (feet above ground)	Lateral pressure <sup>a</sup> (psf)
$0 < H \leq 30$	15
$30 < H \leq 50$	20
$50 < H \leq 100$	25
$H > 100$	30

<sup>a</sup>Apply the lateral pressure at the top of the girder in either direction.

^^

**52 REINFORCEMENT**

**Add to section 52-1.04:**

The bar reinforcing steel for the concrete pedestal on Bent 5 will be paid for as Bar Reinforcing Steel (Epoxy Coated) (Bridge).

The bar reinforcing steel for the retaining wall extension between Retaining Wall 9 and Retaining Wall 11 will be paid for as Bar Reinforcing Steel (Epoxy Coated) (Retaining Wall).

**Add to section 52-2.03A(1):**

Use pre-fabricated epoxy coated reinforcement meeting ASTM A934 at all locations except CISS pile reinforcement is uncoated and use epoxy coated reinforcement meeting ASTM A775 for girder stirrup reinforcement.

^^



**59 STRUCTURAL STEEL COATINGS**

**Add to section 59-2.01A(1):**

Bridge name and number	Work description	Coating system
Soldier piles at Retaining Wall No. 9.	Clean, blast clean, and paint new steel .	Zinc

**Replace *Reserved* in section 59-2.01A(3)(b) with:**

Submit proof of each required SSPC-QP certification as specified in section 8-1.04C. Required certifications are:

1. SSPC-QP 1
2. AISC-420-10/SSPC-QP 3, enclosed shop

Instead of submitting proof of SSPC-QP 1 certification, you may submit documentation with your painting quality work plan showing compliance with the requirements in section 3 of SSPC-QP 1. Regardless of the option you select, submit proof of CAS certifications as specified in section 59-2.01A(3)(c).

Instead of submitting proof of AISC-420-10/SSPC-QP 3, enclosed shop certification, you may submit documentation with your painting quality work plan showing compliance with the requirements in sections 5 through 18 of AISC-420-10/SSPC-QP 3.

**Add to section 59-2.01C(4)(b)(iv):**

For Soldier piles at Retaining Wall No. 9 the 1st finish coat must match color no. 10055 of FED-STD 595. The 2nd finish coat must match color no. 10055 of FED-STD 595.

^^



## **DIVISION VIII MISCELLANEOUS CONSTRUCTION**

### **72 SLOPE PROTECTION**

#### **Add to section 72-11.01A:**

Construct slope paving as shown on the plans with a recess for cobbles. Cobbles to comply with section 73-5 Minor Concrete (Cobble Paving).

#### **Replace *Reserved* in section 72-11.01A(4) with:**

Construct a test panel at the job site before placing the permanent slope paving.

The test panel includes both the slope paving (concrete) and the minor concrete (cobble paving).

The test panel must be:

1. At least 4 by 6 feet
2. Constructed with the same materials as the permanent work
3. Finished and cured using the same methods as the permanent work

If the test panel is rejected, construct another test panel.

#### **Add after section 72-11.03:**

### **72-11.04 SLOPE PAVING (COBBLE PAVING)**

#### **72-11.04A General**

Section 72-11.04 includes specifications for placing cobbles on top of slope paving concrete.

At least 15 working days before delivery of the cobbles to the project site, submit samples for acceptance by the engineer.

Slope paving concrete must comply with section 72-11.

#### **72-11.04B Materials**

##### **72-11.04B(1) Cobbles**

Cobbles for the cobble paving must be clean, smooth, and obtained from a single source. Cobbles must be natural color stone and include a variety of colors including but not limited to dark red and rose to dark and light gray river rock cobble. Cobbles will confirm to the following grading:

MURRAY STREET BRIDGE AT THE SMALL CRAFT HARBOR, SEISMIC  
RETROFIT/BARRIER REPLACEMENT, CITY PROJECT NO. C409321, FEDERAL NO.  
PROJECT NO. STPLZ 5025(084)

Sieve size	Percentage passing
10 inch	100
6 inch	0–10

Cobbles must be thoroughly washed to remove all dirt and dust. Cobbles may be damp when placed in the mortar bed in the slope paving recess.

Flat or needle shapes will not be allowed unless the thickness of the individual piece is greater than 1/3 the length.

**72-11.04B(2) Cement**

Cement must comply with section 90-1.02B(2).

**72-11.04B(3) Concrete**

Concrete must comply with section 90-2 except the maximum aggregate size must not be larger than 3/4 inch.

**72-11.04B(4) Mortar**

Hydrated lime must comply with ASTM C 207, Type S.

Mortar sand must be commercial quality and free of organic impurities and lumps of clay and shale.

Mortar for laying cobbles must consist by volume of 1 part cement, 0–0.5 part hydrated lime, and 2.25–3 parts mortar sand. Add enough water to make a workable mortar. Accurately measure and thoroughly mix each batch of mortar. Do not re-temper mortar more than one hour after mixing.

Reduce the amount of lime as necessary to prevent leaching and efflorescence on the finished surface.

For the mortar, you may use a proprietary, premixed packaged blend of cement, lime, and sand, without color, that requires only water to prepare for use as brick mortar or grout. Packages of the premixed mortar must show the manufacture's name, brand, weight, and color identification. Submit the manufacturer's instructions for mixing proportions and procedures.

**72-11.04C Construction**

The concrete base must be cured by the water method for at least 48 hours and prepared to receive a mortar setting bed under the specifications for horizontal construction joints in section 51-1.03D(4).

The setting bed of mortar must have a thickness of not less than 2 inches. Embed cobbles in mortar to a depth of approximately 1 inch. Space between cobbles must not exceed 1-1/2 inch.

Placing of concrete or cement mortar after cobbles have been set and cleaning of cobble surface must comply with section 72-3.03E except that the minimum penetration of concrete will be 4 inches and cobbles must project above the concrete by a height of 0.25 to 0.32 times the cobble thickness.

Loose cobbles will not be allowed and must be reset.

MURRAY STREET BRIDGE AT THE SMALL CRAFT HARBOR, SEISMIC RETROFIT/BARRIER REPLACEMENT, CITY PROJECT NO. C409321, FEDERAL NO. PROJECT NO. STPLZ 5025(084)

**72-11.04D Payment**

Not used.

**Add to the end of section 72-17.01A**

Rock Slope Protection (Riprap), located at the banks in front of Bent 9, must be removed, stock piled and re-installed at Bent 9 in the same location.

Rocks are to be removed prior to the construction of Bent 9 and stored within the acquired temporary construction easements for the Project. The access roads must not be blocked.

Placement of Rock Slope Protection (Riprap) must comply with section 72-2 and must be by Method B.

**Replace Not Used in section 72-17.01D with**

Full compensation for Relocate Riprap includes removing, stock piling, storing, placement of rock slope protection (rip rap) and furnishing and placement of Class 8 RSP fabric.

^^

## **73 CONCRETE CURBS AND SIDEWALKS**

### **Replace 1st paragraph of section 73-1.01 with:**

Section 73-1 includes general specifications for constructing concrete curbs, sidewalks, and their appurtenances, such as gutter depressions and island paving, and curb ramps, stairs, step light bollards, and driveways.

### **Add to section 73-1.02A:**

Concrete must be minor concrete complying with section 90-2 and may contain returned plastic concrete complying with section 90-9.

### **Replace section 73-3.01A with:**

Section 73-3 includes general specifications for constructing concrete curbs, sidewalks, and their appurtenances, such as gutter depressions and island paving, and curb ramps, stairs, step light bollards, and driveways.

### **Add to the beginning of section 73-3.03:**

Before placing concrete, verify that forms and job site constraints allow the required dimensioning and slopes shown. Immediately notify the Engineer if you encounter job site conditions that will not accommodate the design details. Ordered modifications are change order work.

### **Add to end of section 73-3.03:**

Prepare subgrade to required grade and cross section. Remove soft or spongy base material 4 inches below subgrade elevation and backfill with sand to produce a stable foundation.

### **Add to end of section 73-3.04:**

Payment for excavation, backfill, and making the subgrade elevation is included in the cost for Minor Concrete (Stairs).

Payment for post pockets and mortar is included in the cost for Minor Concrete (Stairs).

Payment for step light bollards is included in the cost for Minor Concrete (Stairs).

### **Replace section 73-5 RESERVED WITH:**

## **73-5 EXPOSED AGGREGATE CONCRETE**

### **73-5.01 GENERAL**

The work will consist of furnishing and placing exposed aggregate concrete as indicated on the plans, including providing samples of the seeding aggregate, placing seed aggregate, brushing and flushing the surface to expose the seeded aggregate surface, curing, and acid washing the surface. This section will apply to all surface finishes indicated as "exposed aggregate" on the plans. This work will be performed in conformance with Section 73 "Concrete Curbs and

MURRAY STREET BRIDGE AT THE SMALL CRAFT HARBOR, SEISMIC  
RETROFIT/BARRIER REPLACEMENT, CITY PROJECT NO. C409321, FEDERAL NO.  
PROJECT NO. STPLZ 5025(084)

Sidewalks" and Section 90-2, "Minor Concrete," of the State Standard Specifications, except as specified in these special provisions.

Work on exposed aggregate concrete will be performed by a specialty Contractor who has had 5 or more years of experience performing work of a similar complexity and quality. The Specialty Contractor must furnish installers' qualifications upon request by the Engineer.

### **73-5.02 MATERIALS**

Submit mix designs to the Engineer at or before the preconstruction meeting.

Provide a sample bag of seeding aggregate to the Engineer for approval at least two weeks before placement of exposed aggregate concrete. If the Engineer finds the sample does not reasonably match the color, size, texture, or other attributes of the existing exposed aggregate, provide another sample. You will not be allowed additional working days for failure to find a reasonably matched sample.

Do not alter aggregate source and cement type and brand once construction begins.

Match the aggregate used in seeding to the size and color of the existing exposed aggregate to the satisfaction of the Engineer. Use hard, sound durable aggregate that is free of all deleterious materials and staining qualities. Do not use flat, silvery stones.

### **73-5.03 CONSTRUCTION**

Prior to the concrete placement operation, wash all selected seeding aggregate thoroughly so it is free of all dust, dirt, and clay particles. Provide aggregate in damp condition, but without free surface water at the time of seeding application. Maintain sufficient select aggregate on hand to complete seeding once it has started.

After the base concrete is placed as specified elsewhere in these special provisions, the strike off and bull float operations will be such that a level surface is obtained sufficiently below the final finish grade to allow for volume growth due to addition of seeding aggregate.

Start the seeding operation immediately after placement of concrete as described above. Carefully and uniformly seed the select aggregate by suitable means so that the entire surface is completely covered with one layer of stone. Remove stacked stone as well as silvery particles at this time. Embed the aggregate by suitable means. Under no circumstances will areas lacking in mortar be filled with small quantities of the base concrete mix.

When the concrete is hard enough to retain the embedded aggregate and the mortar is still soft enough to be removed by brushing, the surface will be brushed and flushed with water. The exposing operation of washing and brushing with a stiff bristle broom will continue until the surface matches the existing exposed aggregate concrete finish. The final washing operation will cease when the flush water runs clear and there is no noticeable cement film on the aggregate. Work will be planned so that the concrete placing and aggregate seeding procedures are coordinated with the capabilities of the washing and brushing crew. An approved chemical retarder sprayed onto the freshly floated surface may be used to extend the working time for exposure of aggregate. Attention is directed to the Water Pollution Control section of these special provisions.

As soon as the washing operation ceases, the curing operation will begin. Follow all manufacturers' recommendations for cure powders used on exposed aggregate.

MURRAY STREET BRIDGE AT THE SMALL CRAFT HARBOR, SEISMIC  
RETROFIT/BARRIER REPLACEMENT, CITY PROJECT NO. C409321, FEDERAL NO.  
PROJECT NO. STPLZ 5025(084)

After the slab is cured and no sooner than two weeks after the concrete has been placed, cement film will be removed from the surface of the aggregate by acid wash. Delaying the acid wash additional time is permissible, in fact, desirable. The slab will be saturated with water, brushed free of standing water, and washed with a 5% to 10% solution of Muriatic Acid. Several flushings with clear water should follow the acid wash.

**73-5.04 PAYMENT**

Not used.

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## **75 MISCELLANEOUS METAL**

**Replace section 75-1.02C with:**

### **75-1.02C Bird Deterrent Spike Strips**

#### **75-1.02C(1) General**

##### **75-1.02C(1)(a) Summary**

Section 75-1.02C includes specifications for constructing bird deterrent spike strips on top of all concrete bent caps and abutment seats.

##### **75-1.02C(1)(b) Definitions**

Not Used

##### **75-1.02C(1)(c) Submittals**

Provide a specification sheet of the proposed product to the Engineer for approval prior to ordering.

##### **75-1.02C(1)(d) Quality Assurance**

Not Used

#### **75-1.02C(2) Materials**

Bird deterrent spike strips, fasteners, and hardware shall be made of stainless steel in accordance with Section 75 Miscellaneous Metal, or of PVC.

Each strip will be a minimum of 1-foot long and have a minimum of 48 spikes per foot of strip length that are 4-inches long.

#### **75-1.03C(3) Construction**

Install bird deterrent spike strips along the edges of the tops of all bent caps and abutment seats. Install the strips per manufacturer recommendations.

#### **75-1.02C(4) Payment**

Not Used

### **Add to the list in the 2nd paragraph of section 75-3.01A:**

6. Tie rod assemblies between Abutment 10 and anchor piles
7. NPS 6 casing for electrical and communication utilities and hanger assemblies
8. NPS 8 casing for gas utilities and adjustable clevis hanger assemblies

MURRAY STREET BRIDGE AT THE SMALL CRAFT HARBOR, SEISMIC  
RETROFIT/BARRIER REPLACEMENT, CITY PROJECT NO. C409321, FEDERAL NO.  
PROJECT NO. STPLZ 5025(084)

9. NPS 12 casing for water and adjustable clevis hanger assemblies

**Add to the end of section 75-3.01A:**

Bridge deck drainage system consists of:

1. NPS 6 drain pipe
2. Adjustable clevis hanger assemblies
3. Deck drain type B and connection piping
4. Deck drain type D-1 and connection piping

**Replace items 3 and 4 in the list in the 1st paragraph of section 75-3.02D(2) with:**

3. Comply with ASTM A276, Type 316

**Replace *Reserved* in section 75-8 with:**

**75-8.01 General**

**75-8.01A Summary**

Section 75-8 includes specifications for installing tie rod assemblies.

Anchor pile tie rods assemblies consist of pregrouted HS rods, bearing plates, couplers, and anchorage devices.

Earthwork for tie rod assemblies must comply with section 19-3.

**75-8.01B Definitions**

Not Used

**75-8.01C Submittals**

For the corrosion-inhibiting grease, submit a Certificate of compliance.

**75-8.01D Quality Assurance**

Tie rod assemblies must comply with the sampling requirements for prestressing steel in section 50. Tensioning of the tie rods is not required.

**75-8.02 Materials**

You are responsible for selecting the type of anchorage devices and couplers and for determining the required lengths of the rod assemblies.

HS rods must comply with ASTM A722/A722M, including supplementary requirements.

Tie rod assemblies must comply with the material specifications for prestressing steel in section 50.

The anchorage device and coupler must develop at least 90 percent of the ultimate tensile strength of the HS rod.

HS rods must be sheathed full-length with PVC or HDPE corrugated plastic and pregrouted.

Galvanize exposed steel parts except HS rods.

Anchorage devices and couplers must include locking devices to prevent turning or loosening.

MURRAY STREET BRIDGE AT THE SMALL CRAFT HARBOR, SEISMIC  
RETROFIT/BARRIER REPLACEMENT, CITY PROJECT NO. C409321, FEDERAL NO.  
PROJECT NO. STPLZ 5025(084)

Ship each rod assembly as a complete unit, including anchorage device and coupler.

Corrosion-inhibiting grease must:

1. Provide corrosion protection to the tie rod anchorage
2. Be chemically stable and nonreactive with the tie rod
3. Be organic
4. Have appropriate polar, moisture displacing, and corrosion inhibiting additives
5. Have the physical properties shown in Table 1 of *Specification for Unbonded Single Strand Tendons* published by the Post-Tensioning Institute

Bearing plates must comply with ASTM A36/A36M.

**75-8.03 Construction**

Remove pavement and base under section 15.

Structural concrete backfill for pavement outside the limits of approach slabs must comply with the specifications for approach slab concrete in section 51-5.

Fill the tube at the end anchorage with corrosion-inhibiting grease.

After installation, clean exposed parts of threads of HS rods as specified for repairing damaged galvanized surfaces.

Lean concrete backfill must comply with section 19-3 except use at least 282 pounds of cement per cubic yard.

Provide supports at no more than 5 foot spacing to maintain the untensioned, pregouted tie rods on straight vertical and horizontal alignment during placement of concrete and lean concrete backfill.

**75-8.04 Payment**

Anchor pile tie rod assemblies are paid for as miscellaneous metal (tie rod).

^^

## **77 LOCAL INFRASTRUCTURE**

**Replace Section 77-1 RESERVED with:**

### **77-1 CITY OF SANTA CRUZ STANDARDS**

#### **77-1.01A GENERAL**

Section 77-1 includes City of Santa Cruz (SC) requirements and roadway work items to be constructed per the City of Santa Cruz Water System Standard Specifications and City of Santa Cruz Standard Construction Details.

#### **77-1.02 CATCH BASIN (CITY STD TYPE B)**

##### **77-1.02A General**

Construct this item per the latest edition of the City of Santa Cruz Standard Specifications and SC Standard Detail 6 of 23 Catch Basin (Type B).

##### **77-1.02B Materials**

Materials will conform to Section 11-02 Materials of the City of Santa Cruz Standard Specifications.

##### **77-1.02C Construction**

Construction will conform to Section 11-12 CATCH BASINS of the City of Santa Cruz Standard Specifications.

##### **77-1.02D Payment**

Not Used

#### **77-1.03 OIL AND SEDIMENT TRAP (CITY STD)**

##### **77-1.03A General**

Construct this item per the latest edition of the City of Santa Cruz Standard Specifications and City of Santa Cruz Standard Construction Detail 7 of 20 Oil and Sediment Trap.

##### **77-1.03B Materials**

Not Used

##### **77-1.03C Construction**

Not Used

##### **77-1.03D Payment**

Not Used

#### **77-1.04 MANHOLE (CITY STD)**

##### **77-1.04A General**

Construct per the latest edition of the City of Santa Cruz Standard Specifications and City of Santa Cruz Standard Details 3 and 4 of 20 Standard Manhole and Manhole Frame and Cover.

MURRAY STREET BRIDGE AT THE SMALL CRAFT HARBOR, SEISMIC  
RETROFIT/BARRIER REPLACEMENT, CITY PROJECT NO. C409321, FEDERAL NO.  
PROJECT NO. STPLZ 5025(084)

**77-1.04B Materials**

Materials will conform to Section 11-02 Materials of the City of Santa Cruz Standard Specifications.

**77-1.04C Construction**

Construct this item per Section 11-9 MANHOLES of the City of Santa Cruz Standard Specifications.

**77-1.04D Payment**

Not Used

**77-1.05 MINOR CONCRETE (CURB, CITY STD)**

**77-1.05A General**

Construct this item per the latest edition of the City Santa Cruz Standard Specifications and SC Standard Detail 12 of 23 Curb.

**77-1.05B Materials**

Materials will conform to Section 10-02 Materials of the City of Santa Cruz Standard Specifications.

**77-1.05C Construction**

Construct this item per Sections 10-03 SUB-GRADE PREPARATION, 10.04 FORMING, 10.05 EXPANSION JOINTS, 10.06 PLACING AND FINISHING CONCRETE, and 10.07 CLEAN-UP of the City of Santa Cruz Standard Specifications.

**77-1.05D Payment**

Not Used

**77-1.06 MINOR CONCRETE (CURB, GUTTER, AND SIDEWALK, CITY STD)**

**77-1.06A General**

Construct this item per the latest edition of the City Santa Cruz Standard Specifications and SC Standard Detail 8 of 23 Curb, Gutter, and Sidewalk. This detail applies to Minor Concrete (Curb, Gutter, and Sidewalk) and to Minor Concrete (Sidewalk).

**77-1.06B Materials**

Materials will conform to Section 10-02 Materials of the City of Santa Cruz Standard Specifications.

**77-1.06C Construction**

Construct this item per Sections 10-03 SUB-GRADE PREPARATION, 10.04 FORMING, 10.05 EXPANSION JOINTS, 10.06 PLACING AND FINISHING CONCRETE, and 10.07 CLEAN-UP of the City of Santa Cruz Standard Specifications.

**77-1.06D Payment**

Not Used

**77-1.07 MINOR CONCRETE (CURB AND GUTTER, CITY STD)**

MURRAY STREET BRIDGE AT THE SMALL CRAFT HARBOR, SEISMIC RETROFIT/BARRIER REPLACEMENT, CITY PROJECT NO. C409321, FEDERAL NO. PROJECT NO. STPLZ 5025(084)

### **77-1.07A General**

Construct per the latest edition of the City Santa Cruz Standard Specifications and SC Standard Detail 8 of 23 Curb, Gutter, and Sidewalk.

### **77-1.07.02 Materials**

Materials will conform to Section 10-02 Materials of the City of Santa Cruz Standard Specifications.

### **77-1.07.03 Construction**

Construct this item per Sections 10-03 SUB-GRADE PREPARATION, 10.04 FORMING, 10.05 EXPANSION JOINTS, 10.06 PLACING AND FINISHING CONCRETE, and 10.07 CLEAN-UP of the City of Santa Cruz Standard Specifications.

### **77-1.07.04 Payment**

Not Used

**Add after section 77-1:**

## **77-2 WATER SYSTEM**

### **77-2.01 GENERAL**

#### **77-2.01A Summary**

Section 77-2 includes specifications for installing the water system.

The water system will be constructed per the latest edition of the City of Santa Cruz Water System Standard Specifications. Any deviations from the City of Santa Cruz Water System Standard Specifications must be supported in writing and approved by the Santa Cruz Water Department (SCWD).

The SCWD Standard Construction Details are to be followed in the installation of water mains and appurtenances. The Standard Details are found in Section 3 of the City of Santa Cruz Water System Standard Specifications.

#### **77-2.01B Submittals**

Prior to construction, and with sufficient time to verify compliance, submit two copies of cut sheets and specifications for all materials proposed to be used in the construction of the project or which will become the property of the City. The Engineer may approve or reject the submittals in writing based upon conformance with the City of Santa Cruz Water System Standard Specifications and the specifications referenced herein. No material will be used for construction which has not been approved by the Engineer.

#### **77-2.01C Inspection**

All work done for SCWD or to SCWD facilities will be subject to rigid inspection. Provide safe access to all parts of the work as necessary for the Engineer to confirm compliance with these specifications and to record measurements. Work or material that does not conform to the specifications may be rejected at any stage of the work. Remove and rebuild, at your expense, any part of the work that includes substandard materials or has been improperly executed.

MURRAY STREET BRIDGE AT THE SMALL CRAFT HARBOR, SEISMIC  
RETROFIT/BARRIER REPLACEMENT, CITY PROJECT NO. C409321, FEDERAL NO.  
PROJECT NO. STPLZ 5025(084)

## **77-2.02 MATERIALS**

Materials used for all Water System work will conform to the latest edition of the City of Santa Cruz Water System Standard Specifications.

The Water System installed on the bridge will conform to the following requirements:

1. Pipes will be Restrained Ductile Iron Pipe-TR Flex manufactured by US Pipe, or equal.
2. Pipe and fittings will be coated with 25 mils of Ceramawrap Epoxy, manufactured by Induron Protective Coatings, or equal.
3. Hardware for fittings and other appurtenances will be stainless steel

## **77-2.03 CONSTRUCTION**

Construct the Water System per the latest edition of the Santa Cruz Water System Standard Specifications.

## **77-2.04 PAYMENT**

The work required to install the water systems is paid for under the various water system bid items and includes, but is not limited to excavation, joints and fittings, appurtenances, backfilling and paving, pressure and leak tests, 6-inch tees, hydrant isolation valves, and reconnections and tie-ins.

## **77-3 REMOVE PIPE (ASBESTOS CEMENT)**

### **77-3.01 GENERAL**

Section 15-1.03E includes specifications for removing facilities or portions of facilities that contain asbestos. Remove asbestos pipes per Section 1-3 "Excavation" of the City of Santa Cruz Water System Standard Specifications.

You are responsible for the proper removal and disposal of asbestos-containing materials. Comply with all current federal, state, and local laws, standards, and regulatory agency requirements concerning the handling of asbestos containing materials. Removal and disposal of existing asbestos materials will be performed using means and methods as recommended by the American Water Works Association, as allowed by OSHA, and by employees who have been properly trained as required by OSHA.

Submit a copy of all relevant CAL/OSHA documentation, and documented worker training to City prior to handling any asbestos-containing materials. Asbestos disturbance and or removal activities will be conducted by properly trained, accredited, and licensed personnel using proper protective equipment. Such activities must be performed within a posted regulated area intended to keep unauthorized people out of the asbestos work area. Asbestos cement pipe will be cut only with a snap-type cutter and never with an abrasive saw. Field-cut asbestos cement pipe ends will not be re-beveled. Asbestos-containing materials must be kept wet and as intact as possible. Such materials must be promptly sealed leak-tight in a six mil thick poly bag with labeling that meets OSHA requirements and hauled to a legal disposal facility that accepts copy of the waste manifest to City in order to document proper disposal.

### **77-3.02 MATERIALS**

Not Used

MURRAY STREET BRIDGE AT THE SMALL CRAFT HARBOR, SEISMIC  
RETROFIT/BARRIER REPLACEMENT, CITY PROJECT NO. C409321, FEDERAL NO.  
PROJECT NO. STPLZ 5025(084)

**77-3.03 CONSTRUCITON**

Not Used

**77-3.04 PAYMENT**

Full compensation for furnishing all labor, materials, tools, equipment, and incidentals and for doing all the work involved in complying with current federal, state, and local laws to remove asbestos cement pipe will be considered as included in the contract prices paid for remove pipe (asbestos cement) and no additional compensation will be allowed therefor.

**77-4 ABANDON CULVERTS AND PIPELINES**

**77-4.01 GENERAL**

Abandon culverts or pipelines by removing portions of the culverts or pipelines, filling the inside, and backfilling the depressions and trenches to grade. As an alternative to abandoning a culvert or pipeline, you may remove the culvert or pipeline, dispose of it, and backfill.

Notify the Engineer before abandoning a culvert or pipeline.

**77-4.02 MATERIALS**

Openings into existing structures that are to remain in place must be plugged with minor concrete under section 90.

**77-4.03 CONSTRUCITON**

Wherever culverts or pipelines intersect side slopes, remove them to a depth of at least 3 feet. Measure the depth normal to the plane of the finished side slope. Abandon the remaining portion of the culvert or pipeline.

Culverts or pipelines that are 12 inches or more in diameter must be completely filled by authorized methods. Backfill with sand that is clean, free draining, and free from roots and other deleterious substances. As an alternative to sand, you may backfill with one of the following:

- 1.      Controlled low-strength material under section 19-3.02F
- 2.      Slurry cement backfill under section 19-3.02D

Ends of culverts and pipelines must be securely closed by a 6-inch-thick, tight-fitting plug or wall of commercial-quality concrete.

**77-4.04 PAYMENT**

Payment for backfilling inside or outside the culverts or pipelines is included in the payment for abandon culvert or abandon pipeline.

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**78 INCIDENTAL CONSTRUCTION**  
**78-2 SURVEY MONUMENTS**

**Add to section 78-2.01:**

Your surveyor will coordinate with you to re-set survey monuments within the project limits.

To preserve the location of the monument, your surveyor should set reference points outside of the limits of disturbance.

Construct the box and cover per the detail as noted on the Plans.

Your Surveyor is responsible for referencing, re-setting, and filing of corner records for all survey monuments disturbed or destroyed by construction activities in accordance with Section 8771 of the Land Surveyors Act.

All survey monuments and references must be set or re-set by or under the direction of a California Licensed Land Surveyor or a California Registered Civil Engineer authorized to practice Land Surveying.

The corner records, prepared by your surveyor, must be filed with the County of Santa Cruz Surveyor prior to project acceptance.

**Replace 2nd paragraph of section 78-2.02 with:**

Furnish survey marker discs. Survey marker discs will be leaded red or semi-red brass conforming to ASTM Designation: B584, Copper Alloy UNS No. C84400. The disc must be 2-1/2 inches in diameter and at least 2-1/2 inches long.

**Add to section 78-2.02:**

Survey monuments placed in new bridge deck construction must be modified Type A, as detailed in the State Standard Plans A74, and must consist of a marker disc placed on the surface of the concrete bridge deck without specific concrete depth, reinforcing, or chamfer.

**Add to section 78-2.03:**

Survey monuments on new bridge deck construction do not have monument cases.

It is essential that the survey monuments be placed in the correct locations. Survey monuments placed in unacceptable locations must be removed and replaced at your expense.

**Replace Section 78-6 RESERVED with:**

**78-6 PROTECTION OF WEST HARBOR SEAWALL**

**78-6.01 GENERAL**

The West Harbor Seawall is susceptible to distress and deformed during backfilling operations during its original construction. Excerpts from a report that was created during the seawall construction has been included in the Supplement Project Information for reference. Monitor movements and protect the wall and structures in the vicinity of the wall during construction. Large loads and equipment should be set back from the wall to limit surcharge loads on the

MURRAY STREET BRIDGE AT THE SMALL CRAFT HARBOR, SEISMIC  
RETROFIT/BARRIER REPLACEMENT, CITY PROJECT NO. C409321, FEDERAL NO.  
PROJECT NO. STPLZ 5025(084)



**Replace section 79 RESERVED with:**

**79 SANITARY SEWER**

**Incorporated KA changes for project 7/20/21 KJG\*\***

**79-1 GENERAL**

**79-1.01 GENERAL**

**79-1.01A Summary**

Section 79-1 includes general specifications for installing the new permanent force main on the north side of the bridge, abandoning the existing force main buried under the Harbor, appurtenances as part of the bridge seismic retrofit project.

Determine quantities required to complete work. Submit the quantities as part of the schedule of values.

The schedule of values must include type, size, and installation method for:

1. Sewer Force main Mobilization and Demobilization
2. Sheet piling, Shoring, and Bracing
3. Record Drawings
4. Furnish and Install 36-Inch Cased C200 Sewer Force main Epoxy Lined and Coated with Stiffener Rings
5. Furnish and Install 42-Inch C200 Casing Epoxy Lined and Coated
6. Furnish and Install 36-Inch C200 Sewer Force main CMLC
7. Remove or Abandon Sewer Force main
8. Precast Concrete Vaults 3A and 3B and Appurtenances Assemblies
9. Truss Support to Bridge Structure Assembly
10. Pipe to Truss Support Assembly
11. Pipe Casing Support to Bent 5 Structure Assembly
12. Pipe Casing Support to Structure Assembly
13. Construct Tie-In at Approx. Station 1+00
14. Construct Tie-In at Approx. Station 9+40
15. Anti-Climb at Abutments 1 and 10
16. Sanitary Sewer Manholes
17. Abandon 8" Gravity Sewer Pipe and Manhole
18. 8-inch Gravity Sewer Pipeline
19. Reroute Existing Sanitary Sewer Lateral to New 8-inch Gravity Sewer Main
20. Electrical and Instrumentation

MURRAY STREET BRIDGE AT THE SMALL CRAFT HARBOR, SEISMIC  
RETROFIT/BARRIER REPLACEMENT, CITY PROJECT NO. C409321, FEDERAL NO.  
PROJECT NO. STPLZ 5025(084)

### **79-1.01B Quality Assurance**

#### **79-1.01B(1) Regulatory Requirements:**

Comply with the latest County of Santa Cruz Design Criteria, unless otherwise specified.

Piping materials must bear label, stamp, or other markings of specified testing agency.

#### **79-1.01B(1)(a) Hazardous Waste**

Handling and disposal of all hazardous waste shall be in accordance with all applicable federal, state, and local requirements.

Asbestos cement pipe is expected to be encountered in the Work, refer to the latest version of the County of Santa Cruz Design Criteria for removal of asbestos cement pipe.

### **79-1.01C Submittals**

#### **79-1.01C(1) General**

Submittals covered by these requirements include manufacturers' information, test procedures, test results, samples, requests for substitutions, trench safety plan and miscellaneous work-related submittals. Submittals must also include, but not be limited to, all mechanical equipment and systems, materials, and detailed piping layout drawings and details. Furnish all drawings, specifications, descriptive data, certificates, samples, tests, methods, schedules, and manufacturer's installation and other instructions as described to demonstrate fully that the materials and equipment furnished and the methods of work comply with the Contract Documents.

Prepare and submit to the Engineer, within two weeks after the date of the Preconstruction Conference, a complete list of material submittals intended to be delivered. No payment will be made until this list is reviewed and found acceptable to the Engineer.

Allow the Engineer at least 14 days for review of all submittals, submit five (5) copies of each shop drawing, five (5) copies of all operation and maintenance manuals, and three (3) specimens of each sample requested. All sample specimens will be retained by the Engineer. Identify all submittals including schedules and operation and maintenance manuals on the transmittal form. Obtain an electronic or original copy of the transmittal form from the Engineer. Submittals must include submittal number, specification section, plan page reference number (where applicable), the supplier, etc. Submit in time for critical path work.

Submittals that are related to or affect each other must be forwarded simultaneously as a package to facilitate coordinated review. Uncoordinated submittals will be rejected. Do not combine unrelated materials in the same submittal.

The Engineer reserves the right to require submittals in addition to those called for in individual sections.

Schedule submittals to avoid concentration of submittals in a short time period. Scheduling of submittals must be included in the Progress Schedule.

A copy of the specification section, and all referenced and applicable sections, with any addendum updates included, must be submitted with each paragraph check-marked to indicate specification compliance or marked to indicate requested deviations from specification requirements. Check marks (✓) denote full compliance with a paragraph as a whole. If deviations from the specifications are indicated, and requested by you, each deviation must be

MURRAY STREET BRIDGE AT THE SMALL CRAFT HARBOR, SEISMIC  
RETROFIT/BARRIER REPLACEMENT, CITY PROJECT NO. C409321, FEDERAL NO.  
PROJECT NO. STPLZ 5025(084)

underlined and denoted by a number in the margin to the right of the identified paragraph. The remaining portions of the paragraph not underlined will signify compliance with the Contract Documents. The submittal must be accompanied by a detailed, written justification for each deviation. Failure to include a copy for the marked-up specification sections, along with justification(s) for any requested deviations to the specification requirements, with the submittal is sufficient cause for rejection of the entire submittal with no further consideration.

For each resubmittal, provide a copy of submittal comments and a separate letter, on company letterhead, identifying how each submittal comment has been addressed in the resubmittal.

### **79-1.01C(2) Engineer's Approval**

The Engineer will indicate acceptance or disapproval of each submittal, and reasons for disapproval.

1. If no corrections are required, the copies will be returned marked "NO EXCEPTION NOTED (Confirm)" and work may begin immediately on incorporating the material and equipment covered by the submittal into the project.
2. If limited corrections are required, the copies will be returned marked "NOTE MARKINGS (Confirm)". Work may begin immediately on incorporating the material and equipment covered by the corrected submittal into the project.
3. If insufficient or incorrect data has been submitted, the copies will be returned marked "NOTE MARKINGS (Resubmit)". No work incorporating the material and equipment covered by this submittal into the project may begin until the submittal has been revised, resubmitted, and returned marked either "NO EXCEPTION NOTED (Confirm)" or "NOTE MARKINGS (Confirm)".
4. If the submittal is unacceptable, the copies will be returned marked "REJECTED (Resubmit)". No work incorporating the material and equipment covered by this submittal into the project may begin until a new submittal has been made and returned marked either "NO EXCEPTION NOTED (Confirm)" or "NOTE MARKINGS (Confirm)".
5. If the submittal was not reviewed by the Engineer, the copies will be returned marked "NOT REVIEWED".

Do not change any drawing after it has been marked "NO EXCEPTION NOTED (Confirm)" or "NOTE MARKINGS (Confirm)" or change any approved equipment or material without written permission of the Engineer. Comply with all submittals as marked by the Engineer.

If more than TWO (2) submittals for a single item are required because of incorrect or insufficient data, or the submittal is unacceptable, or because you wish to change previously approved material, then all costs incurred by the Engineer for the additional review will be deducted from monies due you.

### **79-1.01C(3) Certificates**

For those items called for in individual sections, furnish certificates from manufacturers, suppliers, or others certifying that materials or equipment being furnished under the Contract comply with the requirements of these specifications.

### **79-1.02 MATERIALS**

Materials and hot dip galvanizing for pipe supports must comply with Caltrans Standard Specifications Section 75.

MURRAY STREET BRIDGE AT THE SMALL CRAFT HARBOR, SEISMIC  
RETROFIT/BARRIER REPLACEMENT, CITY PROJECT NO. C409321, FEDERAL NO.  
PROJECT NO. STPLZ 5025(084)

**79-1.03 CONSTRUCTION**

Not Used

**79-1.04 PAYMENT**

Not Used

**79-2 TRENCHING AND BACKFILLING**

**79-2.01 GENERAL**

**79-2.01A Summary**

Section 79-2 includes specifications for trenching and backfilling during the construction and installation of pipelines. All trenching will be open cut, unless otherwise approved in writing. It includes all clearing and grubbing, trenching, dewatering, incidental work, and providing specified backfill.

Perform all earthwork and trenching operations indicated and required for construction of the work, complete and in place, in compliance with the latest County of Santa Cruz Design Criteria, unless otherwise specified.

**79-2.01B Submittals**

Submittals must comply with Section 79-1.01C- Submittals.

Submit a Utility Protection Plan and Excavation Protection Plan, including:

1. Methods and sequencing of mass excavation
2. Proposed on-site and/or offsite spoil disposal locations
3. Anticipated difficulties and proposed resolutions
4. Proposed haul routes

Submit product data for geotextile fabric and marking tapes as well as for imported materials.

Submit one copy of a report from a testing laboratory verifying that material conforms to the specified gradations of characteristics for granular material, imported sand, rock refill for foundation stabilization, cement mix, and water. Submit controlled low-strength material and concrete mix designs. Submit method of compaction in pipe zone.

**79-2.01C Project Conditions**

Obtain all required permits and licenses before installing utilities. Install utilities in compliance with requirements of the authority having jurisdiction.

Arrange construction sequences to provide the shortest practical time that the trenches will be open, to avoid hazard to other contractors and public, and to minimize the possibility of trench collapse.

**79-2.01D Testing for Compaction**

The Engineer will test for compaction at locations determined by the Engineer.

Where compaction tests indicate a failure to meet the specified compaction, rework the entire failed area until the specified compaction is achieved.

MURRAY STREET BRIDGE AT THE SMALL CRAFT HARBOR, SEISMIC  
RETROFIT/BARRIER REPLACEMENT, CITY PROJECT NO. C409321, FEDERAL NO.  
PROJECT NO. STPLZ 5025(084)

CLSM must have in-place testing under ASTM C403 and compressive testing under ASTM D4832.

### 79-2.01E Definitions

**Pipe Bedding or Pipe Base** – The pipe bedding or base is defined as a minimum 6-inches thick layer of material immediately below the bottom of the pipe or conduit and extending over the full trench width in which the pipe is bedded.

**Pipe Zone** – The pipe zone includes the full width of trench from the bottom of the pipe or conduit to a horizontal level 12-inches above the top of the pipe.

**Street Zone** – The street zone includes the asphalt concrete and aggregate base pavement section placed over the trench zone.

**Trench Zone** – The trench zone includes the portion of the trench from the top of the pipe zone to the bottom of the street zone in paved areas or to the existing surface in unpaved areas.

**Relative Compaction** – The ratio, in percent, of the as-compacted dry density determined under ASTM D3017 or D2922 to the laboratory maximum dry density determined under ASTM D1557.

### 79-2.02 MATERIALS

#### 79-2.02A Engineered Fill (Type 1)

Engineered fill must consist of excavated native or imported material free of debris and organic materials and free of any rocks over 3-inches in diameter. Process materials to place at the thickness shown and at the optimum moisture content to obtain level compaction as specified.

#### 79-2.02B Imported Sand (Type 2)

Imported washed sand used for the pipe bedding and pipe zones must be free of clay or organic material and have the following gradation:

Sieve Size	Percent Passing by Weight
3/8-inch	100
No. 4	50 – 100
No. 200	0-20

Imported sand must have a sand equivalent not less than 28 per ASTM D 2419.

#### 79-2.02C Class 2 Aggregate Base (Type 3)

Backfill material consisting of Class 2 Aggregate Base must comply with Caltrans Standard Specifications Section 26-1.02. Recycled material such as recycled concrete or recycled asphaltic concrete is not allowed, unless approved by the Engineer.

#### 79-2.02D 3/4-Inch Crushed Rock (Type 4)

Crushed rock base and gravel must be natural or crushed rock, free from organic matter, and have the following gradation:

Sieve Size	Percent Passing by Weight
3/8-inch	90-100
No. 50	0- 100
No. 100	0-8
No. 200	0-4

Crushed rock used within the pipe base zone, pipe zone, or for foundation stabilization and over-excavation must be enveloped in geotextile fabric. Durability Index must be at least 40 under California Test Method No. 229 or ASTM D3744. Filter fabric must be Mirafi 140 N, Mirafi 700X, or approved equal.

**79-2.02E Cement Slurry (Type 5)**

Cement slurry backfill materials must comply with Caltrans Standard Specification Section 19-3.02E, except that one sack cement per yard (94-lbs.) must be used. Slurry must be placed within one hour after initial mixing.

**79-2.02F Nonshrink Grout**

Nonshrink grout must comply with the Corps of Engineers, Specification for Nonshrink Grout, CRD-C588 and these special provisions. Use a non-gas liberating type, cement base, premixed product requiring only the addition of water for the required consistency. Grout must be Masterflow 713, as manufactured by Master Builders Company, Cleveland OH., Upcon by Upco Co., Cleveland OH, or approved equal.

**79-2.02G Threaded Rebar Coupler**

**79-2.02G(1) Mechanical Coupler**

Reinforcement bars may be spliced with a mechanical connection. Provide a full mechanical connection that develops in tension or compression to at least 125% of specified yield strength ( $f_y$ ) of the bar under ACI 318 Section 12.14.3.2. Coupler must comply with Caltrans STD-20-01. The locations of the connections are subject to Engineer’s authorization. Mechanical couplers must be Barsplicer XP System by BarSplice Products Inc., or approved equal.

**79-2.02H Backfill Material Schedule (For Placement)**

Backfill materials must be provided according to the following unless otherwise shown:

Pipe Bedding or Pipe Base must be Type 2 backfill material.

Pipe Zone must be either Type 2 or Type 3 backfill material.

Trench Zone must be either Type 1 or Type 3 backfill material.

Street Zone backfill material shall be per the latest Santa Cruz County Design Criteria.

**79-2.02I Materials Testing**

All soils testing of samples submitted must be from a testing laboratory of the Engineer’s choosing and at the Santa Cruz County Sanitation District’s expense. The Engineer may request that you supply samples for testing of any material used in the work.

Particle size analysis of soils and aggregates will be performed using ASTM D422.



Determination of sand equivalent value will be performed using ASTM D2419. Unified Soil Classification System: References in this section to soil classification types and standards have the meanings and definitions indicated in ASTM D2487. You are bound by all applicable provisions of ASTM D2487 in the interpretation of soil classifications.

**79-2.02J Refill for Foundation Stabilization and Over-excavation**

Remove loose materials at trench bottoms resulting from excavation disturbances until the soil is firm. If soft, loose, or unstable areas are encountered, per the Engineer’s discretion, these areas should be over-excavated to a firm base or a minimum depth of 2 feet. Refill consists of materials for filling the over-excavation; refill material shall be either Type 2 or Type 4 backfill material. Crushed rock must be enveloped in geotextile fabric.

**79-2.02K Concrete Thrust Blocks**

Cement for concrete for thrust blocks must comply with Caltrans Standard Specifications Section 90-1.02B(2).

**79-2.02L Water for Compaction**

Water for compaction must be clean and free of oil, acids, salts, and other deleterious substances. Water must be supplied by you and is included in the payment for the various bid items. Water must be drawn from a hydrant meter. Make arrangements with the local water purveyor to obtain hydrant meter. Coordinate with the Engineer for the use of the water and provide all necessary labor and equipment to extract, transport and apply the water for compaction. You are responsible for the repair of any damage to the existing facilities which can be attributed to this operation.

**79-2.02M Tracer Wire and Marking Tape**

**79-2.02M(1) Tracer Wire**

Manufacturer must have performance data showing 5 years of successful underground testing in terms of durability related to damage of protective insulation and effects of potential corrosion of the wire used. If the manufacturer has not completed 5 years of corrosion testing, a 5-year warranty must be provided. Refer to latest version of County of Santa Cruz Design Criteria for further material and installation requirements.

**79-2.02M(2) Marking Tape**

Comply with APWA Uniform Color Code for Temporary Marking of Underground Facilities and NEMA Z535.1, Safety Color Code.

<b>Color</b>	<b>Facility</b>
Red	Electric power lines, cables, conduit and lightning cables
Orange	Communicating alarm or signal lines, cables, or conduit
Yellow	Gas, oil, steam, petroleum, or gaseous materials
Green	Sewers and drain lines
Blue	Potable Water

MURRAY STREET BRIDGE AT THE SMALL CRAFT HARBOR, SEISMIC RETROFIT/BARRIER REPLACEMENT, CITY PROJECT NO. C409321, FEDERAL NO. PROJECT NO. STPLZ 5025(084)

Purple	Reclaimed water, irrigation, and slurry lines
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Acceptable manufacturers for marking tape include Calpico Inc. or approved equal.

Marking tape must be 3-inch wide “Green” color for with an overall minimum thickness of 6 mil and a solid aluminum foil core with minimum thickness of 3 mil. The solid foil core must be encased between two clear layers of 100% virgin polypropylene or polyethylene film. Marking tape must be permanently printed on both sides with a repeating warning “Caution: Sewer Pipe Below” at maximum interval of 2 feet.

Refer to County of Santa Cruz Design Criteria for further material and installation requirements.

**79-2.03 CONSTRUCTION**

**79-2.03A General**

It is the intent of these special provisions that all streets, structures and utilities be left in a condition equal to or better than original condition at the completion of the project. Where damage occurs and cannot be repaired or replaced, you must purchase and install new materials to the satisfaction of the Engineer. Plans and/or specifications cover and govern replacement and restoration of foreseeable damage.

**79-2.03B Compaction Requirements**

Unless otherwise described relative compaction in pipe trenches must be as follows:

- 1. Pipe Bedding: 90% relative compaction.
- 2. Pipe Zone: 95% relative compaction.
- 3. Backfill in Trench Zone: 90% relative compaction.
- 4. Backfill in Street Zone in Paved Areas or within Limits of Aggregate Base Roadways: Must be compacted under the latest Santa Cruz County Design Criteria
- 5. Refill for Foundation Stabilization: 95% relative compaction.
- 6. Refill for Over-excavation: 95% relative compaction.

Where compaction tests indicate a failure to meet the specified compaction, rework the entire failed area until the specified compaction has been achieved.

**79-2.03C Material Replacement**

Remove and replace any trenching and backfilling material which does not meet the specifications, at your expense.

**79-2.03D Sloping, Sheeting, Shoring and Bracing of Trenches**

Trenches must have sloping, sheeting, shoring, and bracing under 29 CFR 1926, Subpart P.

**79-2.03E Sidewalk Pavement and Curb Removal**

Use a saw wheel or other approved device to cut paved or surfaced streets the width shown. Remove any cut or broken pavement from the site during excavation.

**79-2.03F Trench Widths**

Trench widths in the pipe zone must be a minimum of 9-inches and maximum of 15-inches on either side of the pipe. Comply with 29 CFR 1926 Subpart P. Trench width at the top of the trench will not be limited except where width of excavation would undercut adjacent structures and  
MURRAY STREET BRIDGE AT THE SMALL CRAFT HARBOR, SEISMIC  
RETROFIT/BARRIER REPLACEMENT, CITY PROJECT NO. C409321, FEDERAL NO.  
PROJECT NO. STPLZ 5025(084)

footings. If undercutting occurs, then the width of trench must be at least two feet between the top edge of the trench and the structure or footing.

### **79-2.03G Exploratory Excavation**

Call local utility line information service at 811 no less than three (3) working days before performing work. Request underground utilities to be located and marked within and surrounding construction areas. Coordinate with and notify utility companies should it be necessary to remove or relocate facilities. Maintain and protect above and below grade utilities that are to remain.

Excavate and expose buried points of connection to existing utilities where shown. Perform excavation before preparation of shop drawings for connections, and use the data obtained in preparing the shop drawings. Dig such exploratory test pits and perform potholing as may be necessary in advance of trenching to determine the exact location and elevation of substructures, pipelines, duct banks, conduits, and other obstructions which are likely to be encountered or need to be connected to, and make acceptable provisions for their protection, support, and maintenance of their continued operation.

Within one week of excavation, submit data including dates, locations excavated, and sketches to the Engineer.

Immediately notify the utility to any damage to utilities from all excavation activities.

### **79-2.03H Length of Open Trench**

Do not exceed 100 feet of open trench in advance of pipe laying or the amount of pipe installed in one working day, whichever is less, and not more than 100 feet in the rear of pipe laying, unless authorized by the permit.

At the end of each working day, the entire trench must be backfilled or plated to match the existing surface. Cover all trenches overnight between two consecutive working days with backfill or trench covers approved by the Engineer. All trenches must stay securely closed over the weekends.

Any section of trench left unattended must meet the following requirements:

1. Isolate the trench from unauthorized access with rigid barricades and/or temporary fencing and clearly mark and delineate it with warning signs, reflective cones, and warning lights.
2. If within the street right-of-way, plate the trench using trench plates and provide sheeting, shoring and bracing to support the trench plates sufficiently to carry H-20 traffic loads. Applicable state, county and municipal safety rules will govern installation and maintenance of trench plates.

New asphalt paving must be placed within one (1) week after backfilling the trench, unless otherwise authorized by the Engineer.

### **79-2.03I Location of Excavated Material**

During trench excavation, place the excavated material only within the working area. Do not obstruct any roadways, streets, or construction activities performed by others. Conform to the federal, state, and local codes governing the safe loading of trenches with excavated material.

### **79-2.03J Foundation Stabilization**

After the required excavation has been completed, the Engineer will inspect the exposed subgrade to determine the need for any additional excavation. It is the intent that additional excavation be conducted in all areas within the influence of the pipeline where unacceptable materials exist at the exposed subgrade. Over-excavation includes the removal of all unacceptable materials that exist directly beneath the pipeline to the required trench dimensions.

1. Cross-sectional dimensions and depths of excavations shown are subject to such changes as may be found necessary by the Engineer to secure foundations free from soft, weathered, shattered, loose material, or other objectional materials.
2. Unsuitable materials must be removed and replaced only as directed in writing by the Engineer.
3. Unsuitable materials removed shall be replaced with Class 2 Aggregate Base under Section 26-1.02B of the Caltrans Standard Specifications. -All material placed must be compacted to 95 percent of maximum dry density.
4. Install nonwoven geotextile under trench stabilization material, over the soft or yielding excavated surface:
  - a. Install the nonwoven geotextile ahead of placement of the trench stabilization material, continuously along the excavation bottom and centered on the pipe centerline.
  - b. Use nonwoven geotextile of a width equal to the pipe diameter plus 2 feet.
  - c. Place laps or splices in the geotextile in the direction of the pipe laying.

Backfill the trench to subgrade of pipe base with refill material for foundation stabilization. Compact in layers not exceeding 6-inches deep to the required grade.

Approved foundation stabilization work is change-order work.

The Santa Cruz County Sanitation District shall only be responsible for payment of materials placed within the dimensions shown and additional materials placed at the discretion of the Engineer in the field.

### **79-2.03K Bedding**

All utility vaults, all steel pipe, all concrete sewer pipe, all plastic pipe, all pipe under existing or future structures or roadways, and all utilities at a depth greater than 6 feet must be laid in pipe bedding material.

Place compacted bedding material the full width of the excavated trench to a depth shown on the trench detail included in the plans. In lieu of a detail, the depth must be 6 inches.

Spread the bedding smoothly over the entire width of the trench to the proper grade so the pipe is uniformly supported along the barrel.

Grade and compact each lift to provide a firm, unyielding surface along the entire pipe length. For rigid pipe, compact to at least 90 percent relative compaction unless otherwise shown.

Excavate bell holes at each joint to permit proper assembly and inspection of the joint.

Check grade and correct irregularities in bedding materials.

Center pipes horizontally in trench widths

MURRAY STREET BRIDGE AT THE SMALL CRAFT HARBOR, SEISMIC  
RETROFIT/BARRIER REPLACEMENT, CITY PROJECT NO. C409321, FEDERAL NO.  
PROJECT NO. STPLZ 5025(084)

### **79-2.03L Installing Buried Piping**

Backfill as described.

Avoid damage to the pipe. Do not drop or dump pipe into trenches.

Inspect each pipe or fitting before placing into the trench. Inspect the interior and exterior protective coatings and patch damaged areas in the field with material recommended by the protective coating manufacturer. Clean ends of pipe thoroughly and remove foreign matter and dirt from inside of pipe. Keep pipe clean during and after installation.

Grade the bottom of the trench to the line and grade to which the pipe is to be laid, with allowance for pipe thickness and bedding depth. Remove hard spots that would prevent a uniform thickness of bedding. Place the specified thickness pipe base material over the full width of trench. Grade the top of the pipe base ahead of the pipe laying to provide firm, continuous, uniform support along the full length of pipe, and compact to the relative compaction specified. After laying each section of the pipe, check the grade and alignment and correct any irregularities before laying next joint. Verify pipe grade at not more than 50 feet intervals, in the presence of the Engineer.

After pipe has been bedded, place pipe zone material simultaneously on both sides of the pipe, keeping the level of backfill the same on each side. Carefully place the material around the pipe so that the pipe barrel is completely supported and that no voids or compacted areas are left beneath the pipe. Use particular care in placing material on the underside of pipe to prevent lateral movement during subsequent backfilling.

When pipe laying is not in progress, including the noon hours, close the open ends of pipe. Do not allow trench water, animals, or foreign material to enter the pipe.

Remove and dispose of all water entering the trench during the process of pipe laying. Keep the trench dry until the pipe laying and jointing are completed.

#### **79-2.03L(1) Tracer Wire and Marking Tape**

Tracer wire must be installed without splices. Wire must be installed on the top of all pipes and taped every 5 feet and grounded. At both terminations of the pipe, tracer wire shall run up manholes and be securely placed under the cover frame and make easily accessible loop within the manhole. See Figures SS-4 and SS-5 for additional details.

Marking tape must be placed 12 inches above the top of pipe.

#### **79-2.03M Backfill and Compaction**

Compact trench backfill to the specified relative compaction. Compact by using mechanical compaction or hand tamping. Compact materials placed within 24 inches of the outer surface of the pipe by hand tamping and/or small handheld tampering equipment. Do not use any axle-driven or tractor-drawn compaction equipment within 5 feet of building wall, foundations, or other structures.

Backfill and compaction must meet the following requirements:

1. Backfill trenches to contours and elevations with unfrozen fill materials.
2. Systematically backfill to allow maximum time for natural settlement. Do not backfill over porous, wet, frozen, or spongy subgrade surfaces.
3. Maintain optimum moisture content of fill materials to attain required compaction density.

MURRAY STREET BRIDGE AT THE SMALL CRAFT HARBOR, SEISMIC  
RETROFIT/BARRIER REPLACEMENT, CITY PROJECT NO. C409321, FEDERAL NO.  
PROJECT NO. STPLZ 5025(084)

4. Place fill materials, with the exception of CLSM, in continuous layers and compact to 6 to 8-inch loose lifts.
  - a) Prevent pipe from moving either horizontally or vertically during placement and compaction of pipe zone materials.
5. Employ placement methods that do not disturb or damage nearby or adjacent foundation perimeter drainage or utilities in trench.
6. Do not use power-driven impact compactors to compact pipe zone material.
7. Backfill all trenches and excavations immediately after pipe or conduit is in approved condition to receive it. Backfill must be carried to completion as rapidly as possible, unless otherwise directed by the Engineer.
8. Under no circumstances is water be permitted to rise in open trenches after pipe has been placed.
9. Do not allow backfill material to free fall into the trench or allow heavy, sharp pieces of material to be placed as backfill until after at least 24 inches of backfill has been provided over the top of pipe.
10. Use hand compactors for compaction until at least 24 inches of backfill is placed over top of pipe. Thoroughly tamp each lift, including area under haunches, with handheld tamping bars supplemented by "walking in" and slicing material under haunches with a shovel to ensure that voids are completely filled before placing each succeeding lift.
11. Placement of Sand:
  - a) Place medium sand in lifts not to exceed 8 inches in uncompacted thickness.
  - b) Compact each lift to a minimum of 95% relative compaction before placing succeeding lifts.
12. Placement of CLSM:
  - a) Discharge from truck-mounted drum-type mixer into trench.
  - b) Placement must not subject the pipe to floatation.
  - c) No compaction of CLSM is allowed.
  - d) Use steel plates to protect the CLSM from traffic a minimum of 24 hours. After 24 hours, the CLSM may be paved, or opened to traffic until permanent surface restoration is completed, if it has hardened sufficiently to prevent rutting.
13. Do not start new trenching when earlier trenches need backfilling or the surfaces of streets or other areas need to be restored to a safe and proper condition.
14. Do not leave trench open at end of working day.

### **Field Quality Control**

All testing and reporting must be conducted and completed by an independent laboratory provided by the Santa Cruz County Sanitation District. Initial testing will be paid for by the Santa Cruz County Sanitation District. Subsequent testing after failure of initial acceptance testing is at your expense.

Perform laboratory material tests under ASTM D1557.

In-place compaction testing of pipeline backfill materials must be performed at 2-foot elevation increments, one test per 200 lineal feet of pipeline trench as measured along pipe centerline at locations determined by the Engineer. The Engineer may reduce the frequency when satisfied with method of compaction. The Engineer may direct testing at a higher frequency, at no additional cost to the Santa Cruz County Sanitation District, upon failure to obtain specified densities or if you change compaction equipment or methods of compaction.

MURRAY STREET BRIDGE AT THE SMALL CRAFT HARBOR, SEISMIC  
RETROFIT/BARRIER REPLACEMENT, CITY PROJECT NO. C409321, FEDERAL NO.  
PROJECT NO. STPLZ 5025(084)

Perform in-place compaction tests under material tests under the following:

- a) Density Tests: ASTM D2922
- b) Moisture Tests: ASTM D3017

When tests indicate Work does not meet specified requirements, remove Work, replace and retest at your own expense.

### **79-2.03N Surface Restoration and Cleanup**

At the end of each workday, all open trenches must be backfilled and all trenches within streets must be temporarily paved or covered to the satisfaction of the Engineer and the local permitting agency. Replace temporary paving with permanent street paving at the completion of construction within street rights-of-way, or sooner, if deemed necessary by the Engineer. No gravel-filled trenches are allowed open within the street right-of-way at the end of the workday.

Where trenches cross lawns, garden areas, pastures, cultivated fields, or other areas on which reasonable topsoil conditions exist, remove the topsoil to the specified depth and place the material in a stockpile. Do not mix topsoil with other excavated material. After the trench has been backfilled, the topsoil must be replaced.

Clean up and remove all excess materials, construction materials, debris from construction, etc. Replace or repair any fences, mailboxes, signs, landscaping, or other facilities removed or damaged during construction. Replace all lawns, topsoil, shrubbery, flowers, etc., damaged or removed during construction. You are responsible for seeing that lawns, shrubs, etc. remain alive and leave premises in condition equal to original condition before construction.

### **79-2.04 PAYMENT**

Not Used

## **79-3 TEMPORARY AND PERMANENT SEWER PIPELINES**

### **79-3.01 GENERAL**

#### **79-3.01A Summary**

Section 79-3 includes specifications for furnishing and installing pipe and fittings on the bridge and in buried applications. All pipe and fittings must meet the technical criteria related to material and installation of steel and PVC pipe and associated appurtenances.

Provide submittals for the following items and any additional items required in the specifications for the particular types of pipe:

1. Piping and joint materials
2. Fittings
3. Specialties
4. Fabrication drawings of all major runs of pipe and all pipe which cannot be fabricated in the field.
5. The arrangement of piping and appurtenances proposed to serve equipment of other than the first named manufacturer.

MURRAY STREET BRIDGE AT THE SMALL CRAFT HARBOR, SEISMIC  
RETROFIT/BARRIER REPLACEMENT, CITY PROJECT NO. C409321, FEDERAL NO.  
PROJECT NO. STPLZ 5025(084)

Contractor must investigate the space requirements of the proposed piping before submitting shop drawings.

### **79-3.01B Quality Assurance**

#### **79-3.01B(1) Quality Assurance for Steel Pipe**

##### **79-3.01B(1)(a) Pipe Manufacturer Qualifications**

Certified to ISO 9000, the Steel Plate Fabricator's Association (SPFA), or Lloyd's Register Quality Assurance (LRQA) and experienced in fabrication of AWWA C200 pipe of similar diameters, lengths, and wall thickness. Experience in the production facilities and personnel is required, not the name of the company that owns the production facility or employs the personnel.

##### **79-3.01B(1)(b) Inspection**

All pipe, linings and coatings, welds, and related work are subject to inspection at the place of manufacture under the provisions of ANSI/AWWA C200, as supplemented by these Specifications. Notify the Engineer in writing of the manufacturing starting date not less than 14 calendar days before the start of any phase of the pipe manufacture, welding, lining and coating, testing, or field operations.

##### **79-3.01B(1)(c) Tests**

Except as modified in these Specifications, test all materials used in the manufacture of the pipe under the requirements of ANSI/AWWA C200, C205, C214 and C222, as applicable and ASTM Standards D4541, D1737-62, D2240, D2794, D4060, D543, E96-A, G53, B117 and G-8. Shop-test and certify each length of pipe of each diameter and pressure class after the joint configuration is completed and before lining and coating to a pressure that will result in a hoop stress in the pipe wall of at least 75 percent of the minimum specified yield strength of the steel. Maintain test pressure for a sufficient time to observe the weld seams.

Material testing shall be paid by you. The Engineer has the right to witness all testing conducted.

The Engineer may request additional samples, at no additional cost, of any material including lining and coating for testing by the Santa Cruz County Sanitation District. The Santa Cruz County Sanitation District does not pay for the additional samples.

##### **79-3.01B(1)(d) Welding Procedure Specifications**

Qualify all Welding Procedure Specifications (WPS) used to fabricate and install pipe by testing under ASME Boiler and Pressure Vessel Code (BPVC) for shop welds and ANSI/AWS D1.1 for field welds. Prequalified welding procedures permitted by ANSI/AWS D1.1 are not allowed. Provide written WPS for all welds, both shop and field. Include WPSs qualified under the ASME BPVC Supplementary Essential Variables for notch-tough welding. Apply all provisions of ANSI/AWS D1.1 pertaining to notch-tough welding. Provide notch-tough welding procedures for welding all steel greater than 1/2-inch thick.

Welder Performance Qualifications: Perform all welding by skilled welders, welding operators, and tackers who have had adequate experience in the methods and materials to be used. Qualify welders meet the requirements under the provisions of ASME BPVC for shop welds and ANSI/AWS D1.1 for field welds. Furnish all material and bear the expense of qualifying welders.

MURRAY STREET BRIDGE AT THE SMALL CRAFT HARBOR, SEISMIC  
RETROFIT/BARRIER REPLACEMENT, CITY PROJECT NO. C409321, FEDERAL NO.  
PROJECT NO. STPLZ 5025(084)



Shop Nondestructive Testing: Perform nondestructive testing (NDT) for various weld categories as specified below. Submit with testing written documentation of procedures. Acceptance criteria must comply with Section VIII of the ASME Boiler and Pressure Vessel Code:

1. Butt Joint Welds: Spot radiographically examine pipe under Paragraph UW-52 of the ASME Boiler and Pressure Vessel Code Section VIII, Division 1. If, in the opinion of the Engineer, the welds cannot readily be radiographed, they must be 100 percent ultrasonically examined per UW-53.
2. Fillet Welds: Examine 10 percent of all fillet welds using the magnetic particle inspection method under ASME Boiler and Pressure Vessel Code, Section VIII, Division 1, Appendix 6.
3. Groove Welds: 100 percent ultrasonically examine all groove welds that cannot be readily radiographically spot examined under ASME Boiler and Pressure Vessel Code, Section VIII, Division 1, Appendix 12. In addition to weld tests specified above, doubler pads and double welded lap joints must be air tested under AWWA C206.

Field Nondestructive Testing: Perform field testing under Section 79-4.

Onsite Observation: Provide an experienced staff member from the pipe fabricator to be onsite during initial installation of the pipe and fittings, and at other times when requested by the Engineer. The staff member's duties shall include, but are not limited to, the following:

1. Observing the installation and welding of the pipe and fittings.
2. Reporting concerns to the Engineer's onsite observer.
3. Answering questions and providing assistance to the Engineer and you.
4. Providing a minimum of two days onsite observation as requested by Engineer.

Certified Welding Inspector: Provide a certified welding inspector(s) (CWI) for all shop welding as specified in AWWA C200. The CWI(s) must visually inspect welds, verify proper procedures are being followed using qualified welders, supervise Contractor's NDT and witness Engineer's non-destructive testing. The CWI(s) must submit written certification that all welds were performed in conformance with these documents. All shop weld tests must be reviewed and signed by the CWI(s).

Pipe Manufacturer/Fabricator: Provide manufacturer or fabricator of the pipe experienced in fabricating pipe of similar steel types, diameters, lengths, and wall thicknesses required for the Work. The fabricator or manufacturer must demonstrate using your schedule, current production capability for the volume of Work required for this Project. Experience must include successful fabrication to AWWA C200 standards of at least 10,000 linear feet of 36-inch or larger pipe, with wall thicknesses 0.40-inch or greater, within the 5-year period immediately preceding the bid date. Experience must be applicable to the fabrication plant facilities and personnel, and is not required to be specifically related to the company or corporation that currently owns the fabrication facility or employs the personnel. Verification of experience and production capability will be conducted as part of the initial submittal review process for steel pipe and your schedule.

Provide field lining and coating personnel trained and certified by the manufacturer for field application of the specified products. Provide documentation from the manufacturer indicating current certification.

MURRAY STREET BRIDGE AT THE SMALL CRAFT HARBOR, SEISMIC  
RETROFIT/BARRIER REPLACEMENT, CITY PROJECT NO. C409321, FEDERAL NO.  
PROJECT NO. STPLZ 5025(084)

### **79-3.01B(2) Steel Pipe Fabricated Specials**

Inspection: All specials are subject to inspection at the place of manufacture/fabrication as outlined in Section 79-3.02.

Shop Testing of Steel Pipe Fabricated Specials:

1. If a special has been fabricated from straight pipe not previously tested and is of the type listed below, hydrostatically test the special with a pressure equal to 1-1/2 times the design working pressure. All bends, wyes, crosses, tees with side outlet diameter greater than 30 percent of the main pipe diameter, and manifolds.
2. If specials have been fabricated from successfully tested straight pipe, no additional hydrostatic test is required unless otherwise indicated. No shop test pressure under 100 psi allowed.
3. Non-destructive test all welds at the specials fabricator's facility as specified below for various weld categories. Submit with testing written documentation of procedures under Section V, and acceptance criteria under Section VIII, Div. I of the ASME Boiler and Pressure Vessel Code.
  - a. Butt Joint Welds: Spot radiographically examine pipe under paragraph UW-52 of the ASME Boiler and Pressure Vessel Code Section VIII, Division 1. If, in the opinion of the Engineer, the welds cannot readily be radiographed, they must be 100 percent ultrasonically examined.
  - b. Fillet Welds: Examine 10 percent of all fillet welds using the magnetic particle inspection method.
  - c. Groove Welds: 100 percent ultrasonically examine all groove welds that cannot be readily radiographically spot examined.
  - d. Welds on pipe seams for previously successfully tested straight pipe do not need to be retested.
  - e. In addition to weld tests specified, double pads must be air tested as stated in AWWA C206.
  - f. Refer to Section 79-4 for field nondestructive testing.
4. Correct weld defects, cracks, leaks, distortion, or signs of distress during testing. Gouge out and re-weld weld defects. Retest the special after corrections.
5. Provide extra length to each opening of the special where welded test heads or bulkheads are used. Trim back the special to the design points after removal of each test head with all finished plate edges ground smooth, straight, and prepared for the field joint.
6. Perform testing before joints have been coated or lined.
7. Perform tests. The Engineer has the right to witness all testing conducted by you, provided your schedule is not delayed for the convenience of the Engineer.
8. The Engineer may request additional samples of any material including lining and coating samples for testing by the Santa Cruz County Sanitation District. The Santa Cruz County Sanitation District does not pay for the additional samples.

### **79-3.01B(2)(i) Ultrasonic Examination**

1. Examine steel plate that will be in welded joints or welded stiffener elements ultrasonically for laminar discontinuities where both of the following conditions exist:
  - a. Plate in the welded joint has a thickness exceeding 1/2 inch.
  - b. Plate in the welded joint is subject to transverse tensile stress through its thickness during the welding or service.

MURRAY STREET BRIDGE AT THE SMALL CRAFT HARBOR, SEISMIC  
RETROFIT/BARRIER REPLACEMENT, CITY PROJECT NO. C409321, FEDERAL NO.  
PROJECT NO. STPLZ 5025(084)

2. Ultrasonic examination may be waived where joints are designated to minimize potential laminar tearing.
3. Provide ultrasonic examination in under ASTM A578 – Straight Beam Ultrasonic Examination of Plain and Clad Steel Plates for Special Applications with a Level I acceptance standard.
4. Plates that are not in conformance with the acceptance criteria in ASTM A578 may be used in the Work if the areas that contain the discontinuities are a distance at least four times the greatest dimension of the discontinuity away from the weld joint.

Field Testing: Provide field testing conforming to the requirements of Section 79-4.

Welding Procedure Specifications: Provide all welding procedures used to fabricate pipe under Section 79-3.02.

Welder Performance Qualifications: Provide all welder performance qualifications accordance with Section 79-3.02.

Certified Welding Inspector: Provide a certified welding inspector for shop fabrication work and have the responsibilities outlined in Section 79-3.02.

Provide specials fabricator experienced in the fabrication of fittings and specials similar to those required for the Work. Experience must include specials for 42-inch diameter or larger pipe. The fabricator must demonstrate the ability to post weld heat treat entire fittings, as manufactured, to relieve stresses induced by manufacturing. All previous work must be for projects requiring fabrication to AWWA C200 and C208 standards: Provide fabricator having continuous experience with specials fabrication as specified for at least 5 years before starting work.

Fabrication: Fabricate all specials in the shop. No field fabrication of specials will be allowed unless specifically authorized by the Engineer. Authorization will be based on clear demonstration by the fabricator that the fabricator has the appropriate equipment to mobilize to construct the specials according to these documents for shop fabrication, including holding the appropriate tolerances, performing the indicated testing, and providing the appropriate post weld heat treatment.

### **79-3.01B(3) Metal Fabrications**

The extent of metal fabrications work is shown on the Drawings and includes items fabricated from iron, steel, stainless steel and aluminum shapes, plates, bars, sheets, strips, tubes, pipes, and castings which are not a part of structural steel or other metal systems in other sections of these specifications. This includes shop-fabricated metal items, anchors, bolts and fasteners.

### **79-3.01B(4) Truss Bridge**

Bridge spans must be a nominal 120' (straight line dimension) as measured from each end of the bridge structure (out to out dimension). Bridge width must be 6'-0" outside dimensions as measured from the outside face of the elements comprising the truss structural members (chords and verticals).

Bridge(s) must be designed as a Connector® (Half-Thru Pratt truss) or equal, that has one diagonal per truss panel and plumb end vertical members. Interior vertical members must be perpendicular to the chord faces.

MURRAY STREET BRIDGE AT THE SMALL CRAFT HARBOR, SEISMIC  
RETROFIT/BARRIER REPLACEMENT, CITY PROJECT NO. C409321, FEDERAL NO.  
PROJECT NO. STPLZ 5025(084)

Fabricate all members of the vertical trusses (top and bottom chords, verticals, and diagonals) from square and/or rectangular structural steel tubing. Fabricate other structural members and bracing from structural steel shapes or square and rectangular structural steel tubing.

Unless the floor and fastenings are specifically designed to provide adequate lateral support to the top flange of open shape stringers (w-shapes or channels), provide a minimum of one stiffener in each stringer at every floor beam location.

Design the bridge to accommodate the Utility Supports as shown. Provide and install utility supports on the bridge in the field.

The bridge must have a vertical camber dimension at mid-span equal to 100% of the full dead load deflection.

Construct bridge abutments at the same elevation on both ends of the bridge.

### **79-3.01B(4)(a) Engineering**

Perform structural design of the bridge structure(s) by or under the direct supervision of a licensed professional engineer and complying with recognized engineering practices and principles. The Licensed Professional Engineer is to hold a current P.E. or S.E. license (where required). The engineer must be a direct employee of the bridge supplier, no outsourcing of engineering is allowed.

In considering design and fabrication issues, assume this structure is statically loaded. Dynamic analysis is required and must comply with ASCE 7-16. The Fracture Critical requirements have been waived, including article 8.2.3 of the AASHTO LRFD Guide Specification for Design of Pedestrian Bridges, December 2009.

1. Dead Load: The bridge structure design must consider its own dead load (superstructure and original decking), pipe support system loads, as well as the additional loads listed below.
2. Uniform Live Load: Bridge is subject to the following uniform live loads:
  - a. Casing pipe + Carrier pipe + Water (Normal Operating Condition): 700plf
  - b. Casing pipe + Carrier pipe + Water + Super-imposed live load (Normal Operating Condition Plus Maintenance): 800plf
  - c. Casing pipe + Carrier pipe + Water in Carrier and Casing (Emergency Carrier Breach Condition): 850plf
3. Vehicle/Moving Loads: Bridge is not subject to vehicle loading.
4. Wind Load:
  - a. Horizontal Forces
  - b. Design the bridge(s) for a minimum wind load of 35 pounds per square foot on the full vertical projected area of the bridge as if enclosed. Consider wind load accordance with AASHTO Signs and Luminaires, but in no case will the wind load be taken as less than 35 pounds per square foot. Apply the wind load horizontally at right angles to the longitudinal axis of the structure.
  - c. Consider the wind loading both in the design of the lateral load bracing system and in the design of the truss vertical members, floor beams and their connections.
  - d. Overturning Forces
  - e. Calculate the effect of forces tending to overturn structures assuming that the wind direction is at right angles to the longitudinal axis of the structure. In addition, apply an

MURRAY STREET BRIDGE AT THE SMALL CRAFT HARBOR, SEISMIC  
RETROFIT/BARRIER REPLACEMENT, CITY PROJECT NO. C409321, FEDERAL NO.  
PROJECT NO. STPLZ 5025(084)

upward force at the windward quarter point of the transverse superstructure width. This force must be 20 pounds per square foot of deck.

5. Top Chord/Railing Loads:  
Design the top chord, truss verticals, and floor beams for lateral wind loads and for any loads required to provide top chord stability; however, in no case can the load be less than 50 pounds per lineal foot or a 200 pound point load, whichever produces greater stresses, applied in any direction at any point along the top chord or at the top of the safety system (42" or 54" above deck level), if higher than the top chord.
6. Load Combinations:  
The load combinations must comply with AASHTO LRFD "Standard Specifications for Highway Bridges" latest edition.  
The foundation engineer must determine any additional loads (i.e. earth pressure, stream force on abutments, wind loads other than those applied perpendicular to the long axis of the bridge, etc.) and load combinations required for design of the abutments.

#### **79-3.01B(4)(b) Design Limitations**

1. Vertical Deflection: The vertical deflection of the main trusses due to service pedestrian live load must not exceed 1/360 of the span. The deflection of the floor system members (floor beams and stringers) due to service pedestrian live load must not exceed 1/360 of their respective spans. Deflection limits due to occasional vehicular traffic must not be considered.
2. Horizontal Deflection: The horizontal deflection of the structure due to lateral wind loads must not exceed 1/360 of the span under design wind load.
3. Vibration: Vibration requirements under the AASHTO LRFD Guide Specification for the Design of Pedestrian Bridges are waived.
4. Minimum Thickness of Metal: The minimum thickness of all structural steel members must be 1/4" nominal and comply with the AISC Manual of Steel Construction' "Standard Mill Practice Guidelines". For ASTM A500 and ASTM A847 tubing, the section properties used for design must comply with the Steel Tube Institute of North America's Hollow Structural Sections "Dimensions and Section Properties".

#### **79-3.01B(4)(c) Design Codes and References**

Design structural members must comply with recognized engineering practices and principles as follows:

1. Structural Steel: American Association of State Highway and Transportation Officials (AASHTO).
2. The "LRFD Guide Specification for the Design of Pedestrian Bridges" latest edition (AASHTO).
3. Welded Tubular Connections: American Association of State Highway and Transportation Officials / American Welding Society (AASHTO/AWS) and the American Institute of Steel Construction (AISC). Check all welded tubular connections, when within applicable limits, for the limiting failure modes outlined in AASHTO or under the "Manual of Steel Construction: LRFD; (Load Resistance Factor Design)" as published by the American Institute of Steel Construction (AISC).  
Top Chord Stability: Structural Stability Research Council (SSRC), formerly Column Research Council. The top chord must be considered as a column with elastic lateral supports at the panel points. The critical buckling force of the column, so determined, must

MURRAY STREET BRIDGE AT THE SMALL CRAFT HARBOR, SEISMIC  
RETROFIT/BARRIER REPLACEMENT, CITY PROJECT NO. C409321, FEDERAL NO.  
PROJECT NO. STPLZ 5025(084)

exceed the maximum force from dead load and live load (uniform or vehicular) in any panel of the top chord by not less than 50 percent for parallel chord truss bridges or 100 percent for bowstring bridges. The design approach to prevent top chord buckling must comply with E.C. Holt's research work in conjunction with the Column Research Council on the stability of the top chord of a half through truss.

For uniformly loaded bridges, proportion the vertical truss members, the floor beams and their connections (transverse frames) to resist a lateral force of not less than  $1/100k$  times the top chord compressive load, but not less than .004 times that top chord load, applied at the top chord panel points of each truss. The top chord load is determined by using the larger top chord axial force in the members on either side of the "U-frame" being analyzed. For end frames, the same concept applies except the transverse force is 1% of the axial load in the end post member.

For bridges with vehicle loads, the lateral force applied at the top chord elevation for design of the transverse frames must not be less than 1% of the top chord compression due to dead load plus any vehicle loading.

The bending forces in the transverse frames, as determined above, act in conjunction with all forces produced by the actual bridge loads as determined by an appropriate analysis which assumes that the floor beams are "fixed" to the trusses at each end.

NOTE: Consider the effects of three-dimensional loading (including "U-frame" requirements) in the design of the structure. Add the "U-frame" forces to the forces derived from a three-dimensional analysis of the bridge.

### **79-3.01C Submittals**

#### **79-3.01C(1) General**

Submittals must comply with Section 79-1.01C- Submittals.

Steel pipe and steel pipe specials must be from a single pipe supplier.

Submit shop and layout drawings showing the location and dimensions of the pipe and fittings larger than 2 inches nominal diameter. Include layout lengths of valves, meters, and other equipment determining pipe dimensions. Label or number each fitting or piece of pipe.

#### 1. Fabrication Information:

- a. Pipe and pipe fitting wall construction details that indicate the type and thickness of cylinder, coating and lining holdbacks, manufacturing tolerances, maximum angular joint deflection limitations, and all other pertinent information required for the manufacture and installation of the product.
- b. Details of all fittings and specials such as elbows, wyes, tees, outlets, connections, end caps, test bulkheads, and nozzles or other specials that indicate amount and position of all reinforcement. Properly reinforce all fittings and specials to withstand the internal pressure, both circumferential and longitudinal, and the external loading conditions as indicated in the Contract Documents.
- c. Submit welded joint details for all shop and field welded joint types including beveled ends for alignment conformance and deep bell or butt strap joints required for control of temperature stresses.

MURRAY STREET BRIDGE AT THE SMALL CRAFT HARBOR, SEISMIC  
RETROFIT/BARRIER REPLACEMENT, CITY PROJECT NO. C409321, FEDERAL NO.  
PROJECT NO. STPLZ 5025(084)

- d. Pipe Fabricator's Credentials: Submit the credentials for the pipe manufacturer/fabricator. Include reference names, telephone numbers, and descriptions of projects for pipe conforming to AWWA C200 and of similar diameter, length, and wall thicknesses, as specified. Project descriptions shall include, but not be limited to, length, diameter, wall thickness, steel metallurgy, location of facility where pipe was manufactured/fabricated, and key plant personnel involved with the work. Submit names and qualifications of current plant personnel to be used to manufacture/fabricate pipe for the Work. Submit project descriptions and schedules for current contracted workload for the plant to be used to manufacture/fabricate pipe for the Work. Submit production schedule for manufacturing/fabricating pipe for the Work as part of Contractor's schedule. Include steel pipe production schedule in all versions of your schedule, beginning with the first schedule Submittal.
- e. Manufacturer's written Quality Assurance/Control Program.
2. Material lists and steel reinforcement schedules that include and describe all materials to be utilized. Metallurgical test reports for steel proposed for use on the Project. Submit chemical and physical test reports from each heat of steel that indicate the steel conforms to the Project Specifications.
3. Line Layout Information:
  - a. Line layout marking diagrams compatible with the requirements of AWWA Manual 11 (M11) and that indicate the specific number of each pipe and fitting and the location of each pipe and the direction of each fitting in the completed line. In addition, include the pipe station and centerline elevation at all changes in grade or horizontal alignment, the station and centerline elevation to which the bell end of each pipe will be laid, and all elements of curves and bends in both horizontal and vertical alignment. Clearly indicate the location of all mitered pipe sections, beveled ends for alignment conformance, and deep bell or butt strap joints for temperature stress control on the diagrams.
  - b. Drawings showing the location and details of bulkheads for hydrostatic testing of the pipeline and details for removal of test bulkheads and repair of the lining and coating.
  - c. Details and locations of closures for length adjustment, temporary access manways, vents, and weld lead pass holes as indicated and as required for construction convenience.
4. Welding Information: Submit the following before performing Work:
  - a. Information regarding location, type, size, and extent of all welds. Show the Welding Procedure Specifications (WPS) numbers on the Shop Drawings. Distinguish between shop and field welds in the Shop Drawings. Indicate in Shop Drawings, by welding symbols or sketches, the details of the welded joints and the preparation of base metal required to make them.
  - b. Written welding procedures for shop and field welds, including Welding Procedure Specifications (WPSs) and Procedure Qualification Records (PQRs).
  - c. Written nondestructive testing (NDT) procedure specifications, and NDT personnel qualifications.
  - d. Submit current welder performance qualifications (WPQs) for each welder used before their performing Work either in the shop or field. Qualification testing must be as specified in Article 1.4 - Quality Assurance, Paragraph F, in this Section.
  - e. Submit the credentials of certified welding inspectors (CWIs) and quality control specialist for review before starting welding in the shop. Include, but not be limited to, American Welding Society AWSQC1 Certification. Certify other NDT quality control personnel to ASNT TC1 A, Level II or higher.

MURRAY STREET BRIDGE AT THE SMALL CRAFT HARBOR, SEISMIC  
RETROFIT/BARRIER REPLACEMENT, CITY PROJECT NO. C409321, FEDERAL NO.  
PROJECT NO. STPLZ 5025(084)

- f. Submit all NDT data for each shop-welded and field-welded joint including all testing on each weld joint and re-examination of repaired welds. Provide welding inspector(s) to review and sign test data.
  - g. Submit welder logs for field and shop welding listing all welders to be used for the Work, the welding process, position, welder stamp number, certification date, and status for each welder.
  - h. Submit a welding map showing the sequence of welds for all field welds.
  - j. Submit a written rod control procedure for shop and field operations demonstrating how you intend to maintain rods in good condition throughout the Work and ensure that the proper rods are used for each weld.
5. Handling and Support Information: Submit detailed drawings indicating the type, number and other pertinent details of the slings, strutting and other methods proposed for pipe support and handling during manufacturing, transport, and installation.
6. Control of Temperature Stresses:
- a. Submit proposed sequencing of events to control temperature stresses in the pipe wall during installation before starting of field welding.
  - b. Submit the proposed sequencing of events or special techniques to minimize distortion of the steel as may result from shop welding procedures. Submit plan for installation procedures to address impacts of ambient temperature relative to installed temperature following backfill, including sun exposure before backfilling operations.
  - c. Submit plan for monitoring pipeline temperatures.

Furnish a certified affidavit of compliance for all pipe and other products or materials furnished under this Section of the Specifications, as specified in ANSI/AWWA C200, Steel Plate Fabricator Association Certification or compliance with quality control procedures contained in SPFA Certification Program, and the following supplemental requirements:

- 1. Physical and chemical properties of all steel.
- 2. Hydrostatic test reports.
- 3. Results of production weld tests.
- 4. Compliance with the additional requirements included in these Contract Documents.
- 5. All welds were performed in conformance with these documents.

You are responsible for all expenses incurred in making samples or collecting data for certification of tests.

### **79-3.01C(2) Submittals For Steel Pipe Fabrications**

Submit Shop Drawings and line layout diagrams of all steel pipe fabricated specials. All submittals required for steel pipe and related work as listed in Section 79-3.02 are also required for specials. Shop Drawings must indicate the type, size, and location of all reinforcement pieces.

Submit design calculations for review before fabrication of pipe specials.

Furnish a certified affidavit of compliance referencing Specifications and these Contract Documents for all steel pipe fabricated specials and other product or materials provided under this section.

MURRAY STREET BRIDGE AT THE SMALL CRAFT HARBOR, SEISMIC  
RETROFIT/BARRIER REPLACEMENT, CITY PROJECT NO. C409321, FEDERAL NO.  
PROJECT NO. STPLZ 5025(084)



### **79-3.01C(3) Submittals For Metal Fabrications**

Manufacturer's Data: For information only, submit copies of manufacturer's specifications, load tables, dimension diagrams, anchor details and installation instructions for products to be used in miscellaneous metal work, including paint products.

Shop Drawings:

1. General: Submit copies of shop drawings for the fabrication and erection of all assemblies of miscellaneous metal work which are not completely shown by the manufacturer's data sheets.
  - a. Include plans, elevations and details of sections and connections and fabricators proposed shop coat paint or galvanizing specifications.
  - b. Show anchorage and accessory items.
  - c. Furnish setting drawings, diagrams, templates, instructions, and directions for installation of anchorages, such as concrete inserts, anchor bolts, and miscellaneous items having integral anchors, which are to be embedded in concrete construction.
  - d. Indicate welded connections using standard AWS A2.4 welding symbols.
  - e. Indicate net weld lengths.

Samples:

1. Submit two sets of representative samples of materials, illustrating factory finishes as may be requested by the Engineer.
2. Engineer's review will be for color, texture, style, and finish only.

Field Quality-Control Submittals: Indicate results of Contractor-furnished tests and inspections.

Submit qualifications for licensed professional to perform Delegated Design Submittals as noted above.

Transporting, handling, storing, and protecting products under manufacturer's requirements. Accept metal fabrications on-site in labeled shipments. Inspect for damage. Protect metal fabrications from damage by exposure to weather or by ground contact.

Verify field measurements before preparation of Shop Drawings and fabrication. Indicate field measurements on Shop Drawings. Do not delay job progress; allow for trimming and fitting where taking field measurements before fabrication.

### **79-3.01C(4) Submittals For Truss Bridge**

Submit schematic drawings and diagrams after receipt of order. Submittal drawings must be unique drawings illustrating the specific portion of the work activities to be done. Note all relative design information such as member sizes, bridge reactions, and general notes clearly on the drawings. Drawings must have cross referenced details and sheet numbers. All drawings must be signed and sealed by an engineer who is registered as a civil engineer in the State of California.

Submit structural calculations for the bridge superstructure by the bridge manufacturer and reviewed by the approving engineer. Sign and seal all calculations by signed and sealed by an engineer who is registered in the State of California. The calculations must include all design information necessary to determine the structural adequacy of the bridge. The calculations must include the following:

MURRAY STREET BRIDGE AT THE SMALL CRAFT HARBOR, SEISMIC  
RETROFIT/BARRIER REPLACEMENT, CITY PROJECT NO. C409321, FEDERAL NO.  
PROJECT NO. STPLZ 5025(084)

1. All AASHTO LRFD checks for axial, bending and shear forces in the critical member of each truss member type (i.e. top chord, bottom chord, floor beam, vertical, etc.).
2. Checks for the critical connection failure modes for each truss member type (i.e. vertical, diagonal, floor beam, etc.). Give special attention to all welded tube on tube connections.
3. All bolted splice connections.
4. Main truss deflection checks.
5. U-Frame stiffness checks (used to determine K factors for out-of-plane buckling of the top chord)

NOTE: The analysis and design of triangulated truss bridges must account for moments induced in members due to joint fixity where applicable. Moments due to both truss deflection and joint eccentricity must be considered.

Welder certifications in compliance with AWS standard qualification tests. Welding procedures in compliance with:

1. Welding and weld procedure qualification tests must comply with the provisions of ANSI/AWS D1.1 "Structural Welding Code", latest edition. Filler metal must comply with the applicable AWS Filler Metal Specification. For exposed, bare, unpainted applications of corrosion resistant steels (i.e. ASTM A588 and A847), the filler metal must comply with AWS D1.1.
2. Welders must be properly certified, each must submit certification of satisfactorily passing AWS standard qualification tests for all positions with unlimited thickness of base metal, have a minimum of 6 months experience in welding tubular structures and have demonstrated the ability to make uniform sound welds of the type required.

### **79-3.01C(5) Submittals For Painting**

Submit a materials list and samples as required and as follows:

1. Materials list naming each product to be used identified by manufacturer and type number.
2. Volatile organic compound (VOC) level (gm/l) and manufacturer's certification of compliance with applicable air quality limits for each coating.
3. Manufacturer's application recommendations for each product submitted.
4. Submit a current chart of the Manufacturer's available colors for selection by the Engineer, forty-five (45) days before the start of coating and painting. Samples, when reviewed and accepted by the Engineer, must establish the quality of the painted surface where these applications are indicated.
5. The Santa Cruz County Sanitation District will select colors from the submittal information presented. Mechanical and piping systems may include multiple color selections in order to properly identify process facilities. The Santa Cruz County Sanitation District may choose up to two (2) colors for the exterior for the exposed pipe and support systems. The District's selection will be based upon the requirements of permitting with the California Coastal Commission and any other pertinent permitting agency.

All paint and coating products must comply with the applicable limits on volatile organic compounds (VOC) as established by the United States Environmental Protection Agency and by State and local air quality regulating agencies. Verify compliance of all paints and coatings. In the event that any paint or coating listed herein is found to be non-compliant, notify the Engineer and the Engineer will select a substitute coating or paint.

MURRAY STREET BRIDGE AT THE SMALL CRAFT HARBOR, SEISMIC  
RETROFIT/BARRIER REPLACEMENT, CITY PROJECT NO. C409321, FEDERAL NO.  
PROJECT NO. STPLZ 5025(084)

## **79-3.02 MATERIALS**

### **79-3.02A General**

Call out all sizes of pipe on the drawings and specified herein. All pipe and fittings delivered to the job site must be clearly marked to identify the material, class, thickness, and manufacturer. All material must be new and free of blemishes.

The sewer force main and casings must comply with the table in Section 79-3.02B(1).

Working pressure rating is 100 psi for all materials, unless noted otherwise on plans.

### **79-3.02B Pipe**

#### **79-3.02B(1) Polyvinyl Chloride (PVC) Pipe (Buried)**

Use PVC pipe for vault drains as shown.

#### **79-3.02B(2) Ductile Iron Pipe (DIP)**

Not Used

#### **79-3.02B(3) Steel Pipe (Buried)**

Provide manufacture of lined and coated steel pipe and steel pipe fabricated specials (See Section 79-3.01B) under the direction of one steel pipe Supplier only. This does not prevent a separate Supplier from manufacturing portions of the material such as specials or fittings; however, all related activities are the responsibility of a single Supplier.

1. Ensure all pipe, fittings, and specials are being manufactured in full accordance with the Drawings and Specifications including use of the appropriate materials, and performing the appropriate manufacturing, shop testing, and shipping procedures.
2. Prepare all Submittal information and Shop Drawings.
3. Make corrections that may be required to the Submittal information and Shop Drawings.
4. Certify that the pipe and specials are manufactured under the Specifications and Drawings.

Markings: The manufacturer must legibly mark all pipes and specials as noted in the laying schedule and marking diagram. Number each pipe in sequence and said number must appear on the laying schedule and marking diagram in its proper location for installation. Mark all pipe sections and fittings at each end with top field centerline. Paint or mark the word "top" on the outside top spigot of each pipe section.

Shipping of Pipe: Cut pipe supports to fit the diameter of the pipe and placed at the ends of pipe lengths in such a manner as to prevent injury to the coating. Provide all binding and lifting straps in the form of flat belting or approved equal and not so tight as to distort the pipe. Cover ends of the pipe to prevent exhaust from entering the pipe during shipping. Install the pipe end covering shortly after lining and coating is completed. Provide covering consisting of 6 mil polyethylene sheeting tightly attached to each pipe end with plastic banding. Provide adequate strutting on all straight pipe so as to avoid damage to the pipe during handling, storage, hauling, and installation. Apply the following requirements for all lined steel pipe:

1. Place strutting as soon as practicable after the lining has been applied and keep in place while the pipe is loaded, transported, unloaded, installed, and backfilled at the jobsite.
2. Provide strutting materials, of size and spacing adequate to support the earth backfill plus greater loads that may be imposed by the backfilling and compaction equipment.

MURRAY STREET BRIDGE AT THE SMALL CRAFT HARBOR, SEISMIC  
RETROFIT/BARRIER REPLACEMENT, CITY PROJECT NO. C409321, FEDERAL NO.  
PROJECT NO. STPLZ 5025(084)

3. Repair or replace pipe damaged during handling, hauling, storage, or installation due to improper strutting.
4. Place strutting a minimum of 48 inches from the ends of the pipe.

Handling and Storage: Handle pipe, as a minimum, at the 1/3 points by use of wide slings, padded cradles, or other devices designed and constructed to prevent damage to the pipe coating and exterior. The use of chains, hooks, or other equipment that might injure the pipe coating and exterior will not be permitted. Suitably support stockpiled pipe and secure to prevent accidental rolling. All pipe handling equipment and methods must be acceptable to the Engineer. You and the manufacturer of coated steel pipe are responsible to prevent damage of the coating that might be caused by handling, shipping, or storage of the completed pipe.

You are fully liable for the cost of replacement or repair of pipe manufactured under this Contract that is damaged.

Support stockpiled pipe on sand or earth berms free of rock exceeding 3 inches in diameter. Do not roll the pipe. Secure pipe to prevent accidental rolling.

Laying Lengths: Provide maximum pipe laying lengths of 48 feet with shorter lengths provided where shown or as required. Select lengths to accommodate your operation, including coordination with traffic control, street, and utility crossing construction.

Buried steel carrier pipe (Pipe Type 1) must be:

1. AWWA C200 and must conform to the requirements of ASTM A36, ASTM A572, Grade 42, ASTM A570, Grades 33 and 36, or ASTM A283, Grade D.
2. Pipe must be straight or spiral seam, unless noted otherwise.
3. Minimum design pressure must be 100 psi.
4. Inside diameter must be the nominal diameter, unless noted otherwise on the drawings.
5. Steel wall thickness must comply with the table below.
6. Cement mortar lined and coated pipe under AWWA C205.
7. Reinforce fittings, elbows, and branches under AWWA Manual M11, rated for a working pressure of 100 PSI.

#### **79-3.02B(4) Steel Pipe (Above-Ground for Installation on Bridge)**

See section 79-3.02B(3) for shipping and handling pipe requirements.

The above ground steel carrier pipe (Pipe Type 2) must be:

1. AWWA C200 and must conform to the requirements of ASTM A36, ASTM A572, Grade 42, ASTM A570, Grades 33 and 36, or ASTM A283, Grade D.
2. Pipe must be straight or spiral seam.
3. Minimum design pressure must be 100 psi.
4. Inside Diameter must be the nominal diameter identified unless noted otherwise on the drawings.
5. Coating system must comply with the above below. Coating systems where shown must comply with Caltrans Standard Specifications Section 79-3.02A.

The above ground steel casing (Pipe Type 7) must be:

MURRAY STREET BRIDGE AT THE SMALL CRAFT HARBOR, SEISMIC  
RETROFIT/BARRIER REPLACEMENT, CITY PROJECT NO. C409321, FEDERAL NO.  
PROJECT NO. STPLZ 5025(084)

1. AWWA C200 and must conform to the requirements of ASTM A1018 Grade 40, Modified, Minimum Yield Point = 42,000psi; ASTM A572, Grade 42
2. Pipe must be spiral seam.
3. Minimum design pressure must be 100 psi.
4. Inside diameter must be 42 inches.
5. Steel wall minimum thickness must be 7/16 inches.
6. Lined and coated under Section 79-3.02A.

**Steel Pipe Schedule**

Pipe Type	Application	Diameter (inches)	Buried or Exposed	Pipe Type	Cylinder Thickness (inches)	Joint Type	Lining	Coating	Reference
1	Forcemain	36	Buried	C200	0.1875	Weld Bell	CML	CMC	AWWA C205
2	Forcemain	36	Cased	C200	0.15625	Full Penetration Butt Joint	Epoxy	Epoxy	Section 79-3.02E
7	Casing	42	Exposed	C200	0.4375	Full Penetration Butt Joint	Epoxy	Epoxy	Section 79-3.02E

**79-3.02B(5) Steel Fabricated Specials**

Fabricate all pipe specials in the shop.

Provide linings and coatings as specified in Section 79-3.02A.

Provide all specials and fittings under AWWA C200 and conforming to the dimensions of AWWA C208. Unless otherwise indicated, provide the minimum radius of elbows at 2.5 times the pipe diameter and the maximum miter angle on each section of the elbow not to exceed 11-1/4 degrees.

Provide shop welding conforming to the applicable provisions of the ASME Boiler and Pressure Vessel Code.

Provide reinforcement and design for wyes, tees, outlets, and nozzles under AWWA C208 and as shown.

Provide steel for wyes and reducers under ASTM A516, Grade 70.

Line and coat by hand-application specials and fittings that cannot be mechanically lined and coated using the same materials as used for the pipe and under applicable AWWA or ASTM Standards, as modified by the applicable pipe section in these Specifications. Coating and lining applied must provide protection equal to that for the pipe. Fittings may be fabricated from pipe that has been mechanically lined and coated. Repair, as specified for pipe, areas of lining and coating that have been damaged by such fabrication.

Provide access manways with covers as shown.

Provide all threaded outlets being forged steel suitable for 3,000 psi service and manufactured by Vogt, or equal.

MURRAY STREET BRIDGE AT THE SMALL CRAFT HARBOR, SEISMIC RETROFIT/BARRIER REPLACEMENT, CITY PROJECT NO. C409321, FEDERAL NO. PROJECT NO. STPLZ 5025(084)

Moderate deflections and long radius curves may be made by means of beveled joint rings, by pulling standard joints, by using short lengths or pipe, or a combination of these methods:

1. The maximum total allowable angle for beveled joints is 5 degrees per pipe joint. Provide bevels on the bell ends. Mitering of the spigot ends will not be permitted. The maximum allowable pulled joint is a 1-inch pull out from normal joint closure. Pulled joints must not result in a gap between the bell and spigot at the weld location that exceeds 1/8 inch. Construct all horizontal deflections or fabricated angles on the alignment.

Construct all vertical deflections on the alignment and at locations adjacent to underground obstructions, points of minimum earth cover, and pipeline outlets and structures. Match pipe angle points to the angle points shown on the Drawings.

Crotch Plates:

1. Fabricate from fully kilned, fine grain, pressure vessel steel conforming to ASTM A516, grade 70 and as follows:
2. Normalize plates.
3. Provide plates having sulfur content not exceeding 0.005 percent, carbon not exceeding 0.20 percent and manganese not exceeding 1.20 percent.
4. Perform Charpy vee-notch tests in a direction transverse to final rolling under ASTM A370 on coupons taken from each plate. Acceptance must be 25 ft.-lbs. at 30 degrees F.
5. Provide carbon equivalent not exceeding 0.45 percent.
6. Perform through-thickness tension testing under ASTM A770 with acceptance criteria complying with Article 5 of ASTM A770 on each plate.
7. Conduct straight-beam ultrasonic examination under ASTM A435 with acceptance criteria complying with Article 6 of ASTM A435 on each plate.

Fabricate tees, wyes, crosses, elbows, and manifolds so the outlet clearances and reinforcing plates from weld joints are a minimum of 5 times cylinder thickness or 2 inches, whichever is greater. Orient longitudinal weld joints in adjacent cylinder sections so there is a minimum offset of 5 times cylinder thickness or 2 inches, whichever is greater.

Steel Welding Fittings: Provide steel welding fittings conforming to ASTM A 234 – Piping Fittings of Wrought Carbon Steel and Alloy Steel for Moderate and High Temperature Service.

Lining: Providing lining conforming to the requirements in Section 79-3.02A.

Coating: Apply all requirements pertaining to thickness and application of coating of adjacent straight pipe to specials. Unless otherwise indicated, extend the coating on the buried portion of a pipe section passing through a structure wall to the center of the wall, or to a wall flange, if one is indicated.

Marking: Place mark indicating the true vertical axis of the special on the top and bottom of the special.

### **79-3.02B(6) Metal Fabrications**

For the fabrication of miscellaneous metal work items which will be exposed to view, use only materials which are smooth and free of surface blemishes including pitting, seam marks, roller marks, rolled trade names, roughness and defects which impair strength, durability and

MURRAY STREET BRIDGE AT THE SMALL CRAFT HARBOR, SEISMIC  
RETROFIT/BARRIER REPLACEMENT, CITY PROJECT NO. C409321, FEDERAL NO.  
PROJECT NO. STPLZ 5025(084)

appearance. Remove such blemishes by grinding or by welding and grinding before cleaning, treating and application of surface finishes including zinc coatings.

## ANCHORS

1. All anchors must be epoxy anchors or expansion anchors as shown in the Drawings.
2. Materials:
  - a. As shown in the Drawings.
  - b. For direct bury:
    - 1) Malleable iron complying with ASTM A47.
    - 2) Cast steel complying with ASTM A27.
    - 3) Iron and steel galvanized in compliance with ASTM A153.
  - c. For wetted atmospheric conditions and inside of vaults
    - 1) Type 316 stainless steel.
  - d. Threaded rod, nuts, bolts and washers:
    - 2) Material matching anchor insert type.
3. Types:
  - a. Threaded-type Concrete Inserts:
    - 1) Internally threaded to receive machine bolts.
    - 2) Malleable iron, ASTM A47.
    - 3) Cast steel, ASTM A27.
    - 4) Stainless steel, type 304, ASTM A320.
  - b. Wedge-type Concrete Inserts:
    - 1) Box-type ferrous castings, designed to accept bolts having special wedge-shaped heads.
  - c. Slotted-type Concrete Inserts:
    - 1) Box-type welded construction with slot designed to receive square head bolt and with knockout cover.
4. Manufacturers:
  - 1) Hilti, Inc.
  - 2) Simpson Strong-Tie Co., Inc.
  - 3) Proprietary products as named in the Drawings.

## ROUGH HARDWARE

Furnish bent or otherwise custom fabricated bolts, plates, anchors, hangers, dowels and other miscellaneous steel and iron shapes as required for framing and supporting systems. Acceptable manufacturers are Simpson, or approved equal.

Manufacture or fabricate items of sizes, shapes and dimensions required. Furnish malleable iron washers for heads and nuts which bear on wood structural connections; elsewhere furnish galvanized steel washers.

## MISCELLANEOUS FABRICATIONS, FRAMING AND SUPPORTS

Provide miscellaneous steel framing and supports required.

Fabricate miscellaneous units to the sizes, shapes and profiles shown in the Drawings or, if not shown, of the required dimensions to receive adjacent grating, plates doors, or other work to be retained by the framing.

MURRAY STREET BRIDGE AT THE SMALL CRAFT HARBOR, SEISMIC  
RETROFIT/BARRIER REPLACEMENT, CITY PROJECT NO. C409321, FEDERAL NO.  
PROJECT NO. STPLZ 5025(084)

Except as otherwise shown, fabricate from structural steel shapes and plate and steel bars, all welded construction using mitered corners, welded brackets and splice plates and a minimum number of joints for field connection.

Cut, drill and tap units to receive hardware and similar items to be anchored to the work.

Equip units with integrally welded anchors for casting into concrete, bolting to structural steel or building into masonry. Furnish inserts if units must be installed after concrete is placed.

Galvanize all miscellaneous fabrications unless otherwise noted.

## MATERIALS

Provide materials listed below unless otherwise shown or specified other sections of these specification.

1. Steel:
  - a. Structural W Shapes: ASTM A992.
  - b. Structural Shapes: ASTM A36.
  - c. Channels and Angles: ASTM A36.
  - d. Steel Plate: ASTM A36.
  - e. Steel Plate to be Bent or Cold Formed: ASTM A283, Grade C.
  - f. Hollow Structural Sections: ASTM A500, Grade B.
  - g. Structural Pipe: ASTM A53, Grade B, Schedule 40 unless shown otherwise in Drawings.
  - h. Bar: ASTM A36 .
    - 1) Cold-Finished Steel Bar: ASTM A108, grade as selected by fabricator.
  - i. Sheet Steel: ASTM A653, Grade 33 Structural Quality.
  - j. Tubing: ASTM A513, Type 5, minimum 50 ksi yield strength.
  - k. Standard Bolts: ASTM A307; Grade A.
    - 1) Washers: ASTM F844.
  - l. High Strength Bolts: ASTM A325.
    - 1) Washers: ASTM F436; Type 1.
  - m. Nuts: ASTM A563; heavy-hex type.
  - n. Welding Materials: AWS D1.1; type required for materials being welded.
2. Stainless Steel:
  - a. Bars and Shapes: ASTM A276; Type 316.
  - b. Tubing: ASTM A269; Type 316.
  - c. Pipe: ASTM A312, seamless; Type 316.
  - d. Plate, Sheet, and Strip: ASTM A666; Type 316.
  - e. Bolts, Nuts, and Washers: ASTM A354; Type 316.
  - f. Welding Materials: AWS D1.6; type required for materials being welded.
3. Aluminum:
  - a. Structural Aluminum Shapes and Plates: ASTM B308, Alloy 6061, Temper T66, Anodic Coating Class I, anodized after fabrication.
  - b. Aluminum-Alloy-Drawn Seamless Tubes: ASTM B210 Alloy 6063, Temper T6.
  - c. Aluminum-Alloy Bars: ASTM B211 Alloy 6063, Temper T6.
  - d. Bolts, Nuts, and Washers: Stainless steel or Steel, galvanized.
  - e. Welding Materials: AWS D1.1; type required for materials being welded.
4. Bolts, Nuts, and Washers for Equipment and Piping:
  - a. Select fasteners for the type, grade and class required for the installation of miscellaneous metal items.

MURRAY STREET BRIDGE AT THE SMALL CRAFT HARBOR, SEISMIC  
RETROFIT/BARRIER REPLACEMENT, CITY PROJECT NO. C409321, FEDERAL NO.  
PROJECT NO. STPLZ 5025(084)



- b. Carbon Steel:
  - 1) General: Zinc-coated, ASTM A153.
  - 2) Structural Connections: ASTM A307, Grade 2 (60 ksi), hot-dip galvanized.
  - 3) Anchor Bolts: ASTM A307, Grade 2 (60 ksi), hot-dip galvanized.
  - 4) Pipe and Equipment Flange Bolts: ASTM A193, Grade B-7.
  - 5) High Strength Bolts: ASTM F3125, Heavy Hex Head.
- c. Stainless Steel: Type 316 stainless steel, Class 2; ASTM A193 for bolts; ASTM A194 for nuts.
  - 1) Where stainless steel bolts are in contact with dissimilar metals, used glass epoxy insulating sleeves and washers to electrically isolate the bolts.

## FABRICATION

1. Workmanship:
  - a. Use materials of the size and thickness shown in the Drawings or, if not shown, of the required size and thickness to produce adequate strength and durability in the finished product for the intended use as approved by the Engineer.
  - b. Work to the dimensions shown in the Drawings or accepted on Shop Drawings, using proven details of fabrication and support.
  - c. Use the type of materials shown in the Drawings or specified for the various components of work.
  - d. Form exposed work true to line and level with accurate angles and surfaces and straight sharp edges.
  - e. Ease exposed edges to a radius of approximately 1/32 inch, unless otherwise shown in the Drawings.
  - f. Form bent-metal corners to the smallest radius possible without causing grain separation or otherwise impairing the work.
2. Fit and shop-assemble items in largest practical sections for delivery to Site.
3. Fabricate items with joints tightly fitted and secured.
4. Continuously seal joint members by means of continuous welds complying with the recommendations of AWS, unless otherwise noted or approved.
5. Grind exposed joints flush and smooth with adjacent finish surface. Make exposed joints butt tight, flush, and hairline. Ease exposed edges to small, uniform radius.
6. Exposed Mechanical Fastenings: Flush countersunk screws or bolts; unobtrusively located; consistent with design of component, except where specifically noted otherwise.
7. Supply components required for anchorage of fabrications. Fabricate anchors and related components of same material and finish as fabrication, except where specifically noted otherwise.
8. Loose Bearing and Leveling Plates:
  - a. Provide loose bearing and leveling plates for steel items bearing on masonry or concrete construction, made flat, free from warps or twists, and of required thickness and bearing area.
  - b. Drill plates to receive anchor bolts and for grouting as required.
  - c. Galvanize after fabrication.
9. Miscellaneous Steel Trim:
  - a. Provide shapes and sizes for profiles shown in the Drawings.
  - b. Except as otherwise indicated, fabricate units from structural steel shapes and plates and steel bars, with continuously welded joints and smooth exposed edges.

MURRAY STREET BRIDGE AT THE SMALL CRAFT HARBOR, SEISMIC  
 RETROFIT/BARRIER REPLACEMENT, CITY PROJECT NO. C409321, FEDERAL NO.  
 PROJECT NO. STPLZ 5025(084)

- c. Use concealed field splices wherever possible.
  - d. Provide cutouts, fittings and anchorages as required for coordination of assembly and installation with other work.
10. Fabrication Tolerances:
- e. Squareness: 1/8-inch maximum difference in diagonal measurements.
  - f. Maximum Offset between Faces: 1/16 inch.
  - g. Maximum Misalignment of Adjacent Members: 1/16 inch.
  - h. Maximum Bow: 1/8 inch in 48 inches.
  - i. Maximum Deviation from Plane: 1/16 inch in 48 inches.

## FINISHES

1. Steel:
  - a. Clean surfaces of rust, scale, grease, and foreign matter before finishing.
  - b. Do not prime surfaces in direct contact with concrete or where field welding is required.
  - c. Prime-paint items with one coat, except where galvanizing is specified.
  - d. Coatings as specified under this section.
    - 1) Primer paint selected must be compatible with the required finish coats of paint.
    - 2) At locations in contact with potable water, use only primer approved for potable water use.
  - e. Galvanizing for Rolled, Pressed and Forged Steel Shapes, Plates, Bars and Strips: ASTM A123; hot-dip galvanize after fabrication.
  - f. Galvanizing for Fasteners, Connectors, and Anchors:
    - 1) Hot-Dip Galvanizing: ASTM A153.
    - 2) Mechanical Galvanizing: ASTM B695; Class 50 minimum.
  - g. Chrome Plating: ASTM B177, nickel-chromium alloy, satin finish.
  - h. Sheet Steel: Galvanized.
  - i. Bolts: Hot-dip galvanized.
  - j. Nuts: Hot-dip galvanized.
  - k. Washers: Hot-dip galvanized.
  - l. Touchup Primer for Galvanized Surfaces: ASTM A780 (A780M), A1. Repair Using Zinc-Based Alloys (Heat and Stick Method).
2. Stainless Steel:
  - a. Satin-Polished Finish: Number 4, satin directional polish parallel with long dimension of finished face.
  - b. Mirror-Polished Finish: Number 8, mirror polish with preliminary directional polish lines removed.
3. Aluminum:
  - a. Protection of All Aluminum:
    - 3) Aluminum surfaces in contact with cementitious, masonry or dissimilar materials, apply the following coating system:
      - 1) One (1) coat of epoxy primer, 1 to 2 mils dry film (D.F.).
      - 2) Followed by two (2) coats of Bitumastic, 6 to 8 mils D.F.
      - 3) Followed by two (2) coats of tarset material, 6 to 8 mils D.F.
4. Shop Painting
  - a. Shop painting of metal fabrications is allowed only at the sole discretion of the Engineer.
  - b. Shop paint miscellaneous metal work under this section with the following exceptions:
    - 1) Those members or portions of members to be embedded in concrete or masonry.
    - 2) Surfaces and edges to be field welded.

MURRAY STREET BRIDGE AT THE SMALL CRAFT HARBOR, SEISMIC  
 RETROFIT/BARRIER REPLACEMENT, CITY PROJECT NO. C409321, FEDERAL NO.  
 PROJECT NO. STPLZ 5025(084)

- 3) Galvanized surfaces.
- c. Remove scale, rust and other deleterious materials before the shop coat of paint is applied.
  - 1) Clean off heavy rust and loose mill scale under SSPC SP-7, Brush-off Blast Cleaning.
  - 2) Remove oil, grease and similar contaminants under SSPC SP-1, Solvent Cleaning.
- d. Immediately following surface preparation, brush or spray on metal primer paint under manufacturer's instructions or as specified below.
- e. Apply one (1) shop coat of metal primer paint to fabricated metal items, except apply two (2) coats of paint to surfaces which will be inaccessible after assembly or erection. Change color of second coat to distinguish it from the first.
- 5. Touch-up Painting, Pre-painted Items:
  - a. Immediately after erection, clean field welds, bolted connections, and abraded areas of the shop paint, and paint all exposed areas with the same material as used for shop painting.

### **79-3.02B(7) Truss Bridge**

Fabricate bridges from high strength, low alloy, atmospheric corrosion resistant ASTM A847 cold-formed welded square and rectangular tubing and/or ASTM A588, or ASTM A242, ASTM A606 plate and structural steel shapes ( $F_y = 50,000$  psi). The minimum corrosion index of atmospheric corrosion resistant steel, as determined under ASTM G101, must be 6.0.

Do not design the bridge to accommodate a deck.

### **79-3.02C Joints and Fittings**

#### **79-3.02C(1) PVC**

Not Used

#### **79-3.02C(2) DIP**

Not Used

#### **79-3.02C(3) Steel**

Steel joints and fittings must meet fabricated steel, AWWA C200, AWWA C208; lining, coating, and ends to match pipe. Pressure rating and wall thickness must be equal to pipe or greater.

The type of reinforcement required for outlet, tee, or wye branches on fabricated fittings must comply with AWWA M11, Steel Pipe – A Guide for Design and Installation.

#### **79-3.02C(3)(i) Steel (Buried)**

Expanded bell and spigot, welded, except where indicated or required to be flanged or plain end for flex couplings or valves.

#### **79-3.02C(3)(ii) Steel (Above Ground)**

##### **79-3.02C(3)(ii)(1) Conductor Casing**

Joints must be double or single welded - butt joint.

##### **79-3.02C(3)(ii)(2) Carrier Pipe**

Joints for permanent piping must be full penetration butt welded. Temporary bypass piping must have restrained flexible couplings.

MURRAY STREET BRIDGE AT THE SMALL CRAFT HARBOR, SEISMIC  
RETROFIT/BARRIER REPLACEMENT, CITY PROJECT NO. C409321, FEDERAL NO.  
PROJECT NO. STPLZ 5025(084)

Where flanges are shown, the following must be used:

1. Unless otherwise specified or required for the installation, steel flanges must be ANSI B16.5, minimum Class 150, plain face or AWWA C207, Class D. Where 300 lb flanges are called for, they must be forged steel, raised face under ANSI B16.5. Plain faced flanges must not be bolted to raised face flanges. Gaskets must be full face 1/8 inch thick Garlock Multi-swell Style 3760, or approved equal.
2. Gaskets for plain faced flanges must be the full face type. Thickness must be 1/16-inch. Unless otherwise specified, gaskets for raised face flanges must match the raised face and must be 1/8-inch thick.
3. Flange assembly bolts must be ANSI B18.2.1, Grade 5 minimum, hexagon head carbon steel machine bolts with ANSI B18.2.2 standard hot pressed hexagon nuts. Threads must be ANSI B1.1, standard coarse thread series; bolts must be Class 2A, nuts must be Class 2B. Bolt length must conform to ANSI B16.5. Flange assembly bolts and nuts for exposed service must be (zinc phosphate coated, zinc electroplating (ASTM B633), hot dip galvanized, Tripac 2000 Blue Coating System). Flange assembly bolts and nuts for submerged or buried service must be 303, 304, or 316 stainless steel as approved by the Engineer regardless of any other protective coating.

#### **79-3.02C(4) HDPE**

Not Used

#### **79-3.02D Valves and Appurtenances**

##### **79-3.02D(1) Valves**

All gate valves must be Mueller 2361, or approved equal complying with AWWA C509 and the following:

1. Flange joint
2. Resilient seated with fully encapsulated gate
3. Epoxy coated inside and outside
4. Full-size waterway
5. Open to the left
6. Non-rising stems with O-ring seals
7. Complete with cast iron glands; high strength cast iron tee-head bolts and hex nuts; plain rubber gaskets conforming to ASA specification A21.11.
8. 150-psi working pressure rating

##### **79-3.02D(2) Plug Valves**

Not Used

##### **79-3.02D(3) Miscellaneous Valves**

###### **79-3.02D(3)(i) Sewage Combination Air/Vacuum Valves**

The sewage combination air/vacuum valves must conform to the following conditions, standards, and materials:

1. Construction: Single body, double orifice valve.
2. Inlet Size: Greater than 2-inch diameter.
3. Cast iron body & cover. Comply with ASTM A126, Grade B.
4. Stainless steel orifice and float. Comply with ASTM A240 T304.

MURRAY STREET BRIDGE AT THE SMALL CRAFT HARBOR, SEISMIC  
RETROFIT/BARRIER REPLACEMENT, CITY PROJECT NO. C409321, FEDERAL NO.  
PROJECT NO. STPLZ 5025(084)

5. Valves seats: Buna-N (Nitrile Rubber).

Manufacturers: DeZurik - APCO Series 440C SCAV, or approved equal.

### **79-3.02D(4) Precast Concrete Vault and Lid**

#### **79-3.02D(4)(i) Precast Concrete Vault**

The valve vaults must be as shown, precast. Frame for lid of vault may be cast-in-place but must conform to slope of roadway. The lid must be concrete, heavy traffic rated, locking, with "SEWER" inscribed on the lid.

Submit shop drawings for precast concrete valve vaults indicating all interior and exterior dimensions, lifting inserts, connection embeds and joints, details of reinforcement, access hatches, and ladders.

Must be manufactured to conform to ASTM C913 and must be designed to meet the following requirements:

1. Loading: ASTM C890-A16 / AASHTO HS20 live loading and installation conditions. Where vaults are below grade, a dead load of 125 pounds per cubic foot must be added for the soil.
2. Lateral loads - Static: 105 x Depth of fill (psf) triangular equivalent fluid pressure plus a surcharge of an additional three (3) feet of soil depth in areas subject to vehicular traffic (assume traffic load in all areas, unless indicated otherwise by the Contract Documents).
3. Lateral loads - Seismic acceleration: UBC Zone 3 requirements ( $I = 1.25$ ) where  $I =$  importance factor,  $I = 1.25$ , but not less than 0.20 g acting on structure mass. Seismic loading need not be considered simultaneously with traffic surcharge.
4. Minimum 28-Day Compressive Strength: 3,000 psi.
5. Honeycombed or retempered concrete is not permitted.
6. No knockouts are allowed to be cast into vault walls. All pipe penetrations must be pre-formed or core-drilled at the required locations.
7. Accessories such as ladders, floor grates at sumps, and other features must be provided as shown.
8. Vault dimensions must be as shown.
9. Vaults must have concrete top slabs with access openings as shown.
10. Lids must have lifting holes.
11. Vaults with manhole access must have cast iron lids per Santa Cruz County Design Criteria Figure SS-23A.
12. When leveling bolts are used to set the vault top sections, ensure the load from the top slab is transferred through grout to the vault walls so that the load is not carried by the leveling bolts.

#### **79-3.02D(4)(ii) Access Hatches**

Not Used

#### **79-3.02D(4)(iii) Fall Protection**

Not Used

### **79-3.02E Painting and Finish Schedule**

Paint and coating products must be fresh and well ground; not settle readily, cake, or thicken in the container; be broken up readily with paddle to a smooth consistency; and have easy

MURRAY STREET BRIDGE AT THE SMALL CRAFT HARBOR, SEISMIC  
RETROFIT/BARRIER REPLACEMENT, CITY PROJECT NO. C409321, FEDERAL NO.  
PROJECT NO. STPLZ 5025(084)

application properties. Other painting materials such as linseed oil, turpentine, mineral spirits, miscellaneous thinners, varnish, and shellac must be of the highest quality.

Specifically manufacture all paints and coatings for use on projects of this type and on surfaces intended by the paint manufacturer. Paints and coatings must be Tnemec or approved equal. Deliver all paint and coatings in original containers, with seals unbroken.

To establish a standard of quality, several specific paint and coating products are listed below.

To ensure a satisfactory painting job it is essential that the paints applied in the shop and in the field be mutually compatible. Where prime coats are shop applied, instruct suppliers to provide compatible primers with the finish coats selected. In no case will primers be allowed that are not manufactured by the suppliers of the finish coats unless approved by the Engineer.

The coating systems in this section are for coatings manufactured by the Sherwin-Williams company. The acceptance of "or equal" manufacturer's products is at the sole discretion and approval of the Santa Cruz County Sanitation District. The following index lists the various painting and coating systems by generic type:

Coating Type #	Description	Interior/ Exterior	Surface Prep	Prep per	Coating System	Mils dft	Repair Coating System at Joints	Mils dft
1	36-Inch Carrier Pipe	Int & Ext	Blast clean Near White Metal Std	SSPC-SP10	One coat Polycote 110 or 115	25-35	Polycote 115FR	25-35
2	42-Inch Outer Pipe	Int	Blast clean Near White Metal Std	SSPC-SP10	One coat Polycote 110 or 115	25-35	Polycote 115FR	25-35
3	42-Inch Outer Pipe, Exposed Steel Supports, & Misc. Metals	Ext	Blast clean Near White Metal Std	SSPC-SP10	Prime Coat: Zinc Clad 4100 Epoxy Zinc Finish Coat: Sherloxane 800 Polysiloxane	3-5 4-6	Macropoxy 646 Epoxy Sherloxane 800 Polysiloxane	5-10 4-6
4	Truss & Supports	Int..	Blast clean Near White Metal Std	SSPC-SP10	Prime Coat: Zinc Clad 4100 Epoxy Zinc Finish Coat: Sherloxane 800 Polysiloxane	3-5 4-6	Macropoxy 646 Epoxy Sherloxane 800 Polysiloxane	5-10 4-6

### 79-3.02F Linings and Coatings for Pipes, Valves, and Fittings

#### 79-3.02F(1) Cement Mortar

Where specified, pipe and fittings must be coated with cement mortar under AWWA C205. Use spiral wire reinforcement for pipe and wire mesh or fabric for fittings and specials. Steel piping for appurtenances 4-inches and greater must be mortar lined and coated.

Minimum thickness must comply with AWWA C205. Provide Type II or V cement.

Provide cement in mortar lining not originating from kilns that burn metal-rich hazardous waste fuel and do not use fly ash or pozzolan as a cement replacement. Admixtures must contain no calcium chloride.

Cement-Mortar Lining for Shop Application: Unless indicated otherwise, clean and line in the shop interior surfaces of pipe, specials, and fittings with cement mortar lining applied centrifugally in conformity with AWWA C205. During the lining operation and thereafter, maintain the pipe, specials, and fittings in a round condition by suitable bracing or strutting. The lining machines must be of a type that has been used successfully for similar pipelines. Take

MURRAY STREET BRIDGE AT THE SMALL CRAFT HARBOR, SEISMIC RETROFIT/BARRIER REPLACEMENT, CITY PROJECT NO. C409321, FEDERAL NO. PROJECT NO. STPLZ 5025(084)

every precaution to prevent damage to the lining. If lining is damaged or found defective at the Site, replace the damaged or unsatisfactory portions with lining conforming to these Specifications.

Provide lining having a minimum thickness and tolerance under AWWA C205.

Leave the pipe bare as indicated where field joints occur. Leave ends of the linings square and uniform. Feathered or uneven edges will not be permitted.

Remove defective linings, as determined by the Engineer, from the pipe wall and replace to the full thickness required. Cut back defective linings to a square shoulder to avoid feather edged joints.

Regulate the progress of the application of mortar lining in order that handwork, including the repair of defective areas, is cured under AWWA C205. Use same cement mortar for patching as the mortar for machine lining; except, provide a finer grading of sand and mortar richer in cement when field inspection indicates that such mix will improve the finished lining of the pipe.

Line and coat by hand application specials and fittings that cannot be mechanically lined and coated using the same materials as used for the pipe and under applicable AWWA or ASTM standards and this section. Apply coating and lining in manner to provide protection equal to that for the pipe. Fittings may be fabricated from pipe that has been mechanically lined or coated, or both. Repair by hand-application areas of lining and coating damaged by such fabrication.

Cement-Mortar Lining for Field Application; Unless otherwise indicated, provide mortar lined steel pipe. Provide materials and design of in-place cement mortar lining under AWWA C602 and the following supplementary requirements:

1. Pozzolanic material must not be used in the mortar mix.
2. Admixtures must contain no calcium chloride.
3. Provide the minimum lining thickness as indicated for shop-applied cement mortar lining and finished inside diameter after lining as Shown.
4. Temperature and shrinkage cracks in the mortar less than 1/16-inch wide need not be repaired. Engineer will reject pipe, specials, or fittings with mortar cracks wider than 1/16-inch.

Protection of Pipe Lining Interior: Provide a 12-mil polyethylene sheet, or other suitable bulkhead, on the ends of the pipe and on each opening to prevent drying out of the lining for pipe, specials, and fittings with plant-applied cement-mortar linings. Provide bulkheads substantial enough to remain intact during shipping and storage until the pipe is installed.

### **79-3.02F(2) Fusion Bonded Epoxy**

Fusion bonded epoxy coating must be applied to appurtenances under 4-inches diameter.

The coating material must be a one component, 100% solids, thermosetting, fusion-bonded, dry-powder epoxy coating: Scotchkote 206N (3M Company) or approved equal. It must be suitable for application by thermal fusion bonding.

Minor damage to the fusion bonded coating such as nicks and pinholes, must be repaired in the factory or field using a two part, 100% solids, epoxy paint: Scotchkote 323 (3M Company), or approved equal.

MURRAY STREET BRIDGE AT THE SMALL CRAFT HARBOR, SEISMIC  
RETROFIT/BARRIER REPLACEMENT, CITY PROJECT NO. C409321, FEDERAL NO.  
PROJECT NO. STPLZ 5025(084)



### 79-3.02H CLSM Controlled Low-Strength Material (CLSM)

If authorized, CLSM may be used as structure backfill, see Caltrans Standard Specification 19-3.02G

The Design Mix must be as described in the following paragraphs:

1. Composed of cement, pozzolans, fine aggregate, water, and admixtures.
2. Low cement content.
3. Non-segregating, self-consolidating, free-flowing and excavatable material which will result in a hardened, dense, non-settling fill.
4. Compressive strength at 28 days of 100 to 200 psi, if not otherwise shown or specified.
5. Portland Cement: ASTM C150, Type I – Normal
6. Fine Aggregates: ASTM C33.
7. Water: Clean and not detrimental to concrete.

ITEM	PROPERTIES
Cement Content	75 to 100 lb/cu yd
Fly Ash Content	[None]
Water Content	Flowability and Strength
Air Entrainment	5 to 35 percent
28-Day Compressive Strength	Maximum 200 psi.
Unit Mass (Wet)	80 [100] to 110 [125] pcf
Temperature, Minimum at Point of Delivery	50 °F (10 °C)

### 79-3.02I Sanitary Sewer Manholes

The sanitary sewer manhole and all components including the precast sections; manhole joints; frame and cover; grade rings; and all ancillary items including but not limited to sealants, gaskets, joint seals, and pipe entry connectors must comply with the latest version of the County of Santa Cruz Design Criteria.

Submit shop drawings including all dimensions to the Engineer.

Submit product data sheets for ancillary items including, but not limited to sealants, gaskets, joint seals, pipe entry connectors, and other items.

Submit manufacturer's certificates that certifies that each manhole complies with this specification.

Submit warranty for polymer concrete manholes.

MURRAY STREET BRIDGE AT THE SMALL CRAFT HARBOR, SEISMIC  
RETROFIT/BARRIER REPLACEMENT, CITY PROJECT NO. C409321, FEDERAL NO.  
PROJECT NO. STPLZ 5025(084)

### **79-3.03 CONSTRUCTION**

#### **79-3.03A Product Handling**

Handle and store all pipeline and pipeline related materials as follows:

1. Manufacturer's Recommendations - Except as otherwise authorized by the Engineer, determine and comply with manufacturer's recommendations on product handling, storage, and protection.
2. The Engineer may reject as non-complying such material and products that do not bear identification satisfactory to the Engineer as to manufacturer, grade, quality, and other pertinent information.
3. Provide copies of all equipment delivery tags to the Engineer on a daily basis with delivery tag indicating equipment number, item description, model number, and serial number.
4. Protect materials and equipment from the effects of weather, sunlight, extreme temperatures, etc., when exposure of the materials or equipment to the elements would cause degradation of, or damage to, the material, equipment or coating system. Progress payments for materials and equipment stored on-site will only be made when the materials or equipment are suitably stored.
5. Storage of Equipment: During the interval between the delivery of equipment to the site and installation, safely store all equipment in a way authorized by the Engineer. Equipment must be stored in an enclosed space affording protection from vandalism, weather, dust and mechanical damage and providing favorable temperature, humidity and ventilation conditions to ensure against equipment deterioration.
6. In event of damage, promptly make replacements at no additional cost to the Santa Cruz County Sanitation District and as authorized by the Engineer. Additional time required to secure replacements will not be considered as justification for an extension in the Contract Time of Completion.

#### **79-3.03B Abandonment of Sewer Facilities**

##### **79-3.03B(1) General**

Sewer facilities taken out of service must be abandoned in compliance with the latest Santa Cruz County Design Criteria, unless otherwise specified.

Contractor to provide piping abandonment plan to identify locations specified for pipe abandonment and pipe removal and to provide method to be utilized to abandon pipe, including whether the pipe will be left in place or removed in its entirety.

Contractor to take all necessary precautions to prevent damage to existing facilities or utilities which are to remain in place and be responsible for any damages to existing facilities or utilities, which are caused by the operations. Any damage to existing facilities or utilities to remain caused by your operations must be repaired to acceptance of Engineer. Repair or replace damaged items with new materials as required to restore damaged items or surfaces to a condition equal to and matching that existing before damage or start of work of this contract. If the pipe material contains any hazardous materials, such as asbestos, requiring special handling upon removal, remove and dispose of the material under all applicable federal, state and local regulations.

Provide the Engineer 48-hour notice before abandoning or rerouting sewer facilities.

MURRAY STREET BRIDGE AT THE SMALL CRAFT HARBOR, SEISMIC  
RETROFIT/BARRIER REPLACEMENT, CITY PROJECT NO. C409321, FEDERAL NO.  
PROJECT NO. STPLZ 5025(084)

Reroute the sewer laterals shown on Drawings to the new gravity sewer main. Cut off the sewer lateral at the main and plug the main pipe. Abandon in place the portion of the sewer laterals between the existing gravity sewer main and new gravity sewer main by plugging both ends of the pipe.

### **79-3.03B(2) Pipe Removal**

Where identified on the Drawings, remove and dispose of all pipe material and associated appurtenances. Exposed ends of pipes and fittings to remain in service, shall be securely closed with a 0.5-foot thick tight-fitting plug or wall of commercial quality concrete containing not less than 470 pounds of cement per cubic yard. Refer to the County of Santa Cruz Design Criteria for additional requirements.

### **79-3.03B(3) Installation of CLSM**

The existing force main under the harbor is to be abandoned in place with CLSM.

Before starting work, submit the following:

1. A CLSM mix design
2. Design mix ingredients, proportions, properties, admixtures, and tests.
3. Test results to certify CLSM mix design properties meet or exceed specified requirements.
4. Verify field measurements before installing CLSM to establish quantities required to complete the work.

Where shown, fill pipes greater than 12-inches in diameter abandoned-in-place with CLSM.

1. Place CLSM by chute, pumping or other methods as approved by Engineer, leaving no cavities or voids.
2. Place CLSM in lifts to prevent lateral pressures from exceeding structural capacity of structures and utilities.
3. Place CLSM evenly on both sides of utilities to maintain alignment.
4. Place CLSM to elevations indicated on Drawings without vibration or other means of compaction.
5. Perform inspection and testing according to ASTM C94.
6. Take samples for tests for every 100 cubic yards of CLSM, or fraction thereof, installed each day.
7. Sample, prepare and test four compressive strength test cylinders according to ASTM D4832. Test one specimen at 3 days, one at 7 days, and two at 28 days.
8. Measure temperature at point of delivery when samples are prepared.
9. Further construction proceeding upon placed CLSM will be permitted only after initial set is attained, as measured by ASTM C 403.
10. Perform in place penetration (density) tests using hand held penetrometer to measure penetration resistance of hardened CLSM.
11. Perform tests at locations as directed by Engineer.
12. Submit volume calculations for CLSM placed in each filled segment of piping to verify that pipelines have been completely filled.

Remove spilled and excess CLSM from Project Site and properly dispose of it at your expense.

### **79-3.03B(4) Abandonment or Removal of Sanitary Sewer Manholes**

Remove the manhole frames and covers and any castings. The District may require the existing frames and covers be salvaged and delivered to 2750 Lode Street, Santa Cruz, CA or location specified by Engineer.

To abandon an existing manhole, the structure must be removed to a minimum depth of 5.0 feet below finished grade. Additional removal depth may be required to accommodate new facilities. Drill two (2), 1-inch diameter holes at the bottom and at opposite sides of the manhole wall to prevent entrapment of water. The remaining structure must be backfilled with Type 4 ¾-inch crushed rock.

To remove an existing manhole the entire structure must be removed and backfilled with Type 3 Class 2 Aggregate Base.

All pipelined entering and leaving the structure must be either abandoned in place or removed as indicated in the Drawings.

### **79-3.03C Installation of Pipe, Fittings and Appurtenances**

Install pipe to ensure the system is watertight throughout the component parts, particularly at the pipe joint. All sewer pipeline joints above grade and crossing the Harbor must be fully restrained.

Pipe and fittings must be of the sizes described. Clean pipe interior of all foreign matter before installing and replacing any section of pipe found to be defective or damaged with new acceptable pipe. Handle pipe carefully to prevent gouging or scratching. Handling and Storage: Carefully handle and protect all pipe and fittings against damage to lining and coating/interior and exterior surfaces, impact shocks, and free fall. Provide pipe handling equipment acceptable to the Engineer. Place pipe supported in a manner that will protect the pipe against injury whenever stored at the Site or elsewhere and not directly on rough ground. Handle and store pipe as specified and recommended by the pipe manufacturer. Engineer will not allow pipe being installed where the lining or coating/interior or exterior surfaces show cracks, abrasions, or other damage that may be harmful as determined by the Engineer. Repair damaged lining and coating/interior and exterior surfaces or provide new undamaged pipe. Prepare surfaces and apply repairs per manufacturer's instructions.

Repair or replace all pipe damaged before Substantial Completion at your expense. Fully excavate to expose dents found on the inside of the pipe during inside joint and pipe inspection for inspection by Engineer. Repair damage as required by the Engineer. No compensation will be made for excavation and backfill for damage not needing repair.

Inspect each pipe and fitting to ensure there are no damaged portions of the pipe. Remove or smooth out burrs, gouges, weld splatter, or other small defects before laying the pipe.

Before placing pipe in the trench, thoroughly clean each pipe or fitting of foreign substance that may have collected on or inside the pipe and keep the pipe clean at all times thereafter. Close the openings of all pipes and fittings in the trench during work interruptions.

Provide lifting points no closer than 1/3 and 2/3 points along the length of the pipe section. Select lifting points that when used, do not result in damage to the pipe.

Lay pipe directly on the bedding material. No blocking will be permitted, and provide bedding such that it forms a continuous, solid bearing for the full length of the pipe. Make excavations  
MURRAY STREET BRIDGE AT THE SMALL CRAFT HARBOR, SEISMIC  
RETROFIT/BARRIER REPLACEMENT, CITY PROJECT NO. C409321, FEDERAL NO.  
PROJECT NO. STPLZ 5025(084)

only as needed to facilitate removal of handling devices after the pipe is laid. Form bell holes at the ends of the pipe to prevent point loading at the bells or couplings. Make excavation outside the normal trench section at field joints only as much as needed to permit adequate access to the joints for field connection operations and for application of coating on field joints.

Installation Tolerances: Lay each section of pipe in the order and position shown on the laying diagram and according to the following:

1. Lay each section of pipe to line and grade, within plus or minus 1-inch horizontal deviation and plus or minus 1/2-inch vertical deviation.
2. In addition to the horizontal and vertical tolerances above, lay the pipe so that no high or low points other than those on the laying diagram are introduced.

Where necessary to raise or lower the pipe due to unforeseen obstructions or other causes, the Engineer may change the alignment or the grades, or both. Make change by the deflection of joints, by the use of bevel adapters, or by the use of additional fittings. The deflection in the joint cannot exceed 75 percent of the maximum deflection recommended by the pipe manufacturer or the amount that results in more than 1/8-inch gap at the weld location, whichever is less.

Lay pipe uphill, except for short runs that the Santa Cruz County Sanitation District's Representative may permit, on grades exceeding 10 percent. Block and hold in place pipe that is laid on a downhill grade until sufficient support is furnished by the following pipe to prevent movement. Install all bends installed as indicated.

Leave pipe struts in place for 72 hours after backfilling operations have been fully completed. The Engineer may monitor pipe deflection by measuring pipe inside diameter before struts are removed and 24 hours after struts are removed. For Pipe with flexible linings, deflection must not exceed 3 percent 24 hours after the struts are removed. After the backfill has been completed a minimum of 72 hours, remove and dispose of the struts.

Pipe and Specials Protection: Protect the openings of all pipe and specials (including passholes) where the pipe and specials have been lined in the shop with suitable bulkheads to prevent unauthorized access by persons, animals, water, or undesirable substance(s). Provide at all times means to prevent the pipe from floating. Provide ADS or other such plastic material as temporary shoring to provide access to pass holes and do not place directly against the coating on the pipe.

Pipe Cleanup: As pipe laying progresses, keep the pipe interior free of all debris. Completely clean the interior of the pipe of all sand, dirt, used welding materials, and other debris following completion of pipe laying, coating of joints, and necessary interior repairs, if any, before testing and disinfecting the completed pipeline.

Lay the PVC pipe in perfect conformity to the design line and grade obtained for each pipe by measuring down from a tightly stretched line running parallel with the grade. Lay all pipes continuously uphill.

Install PVC pipe and fittings for underground gravity sewers under ASTM D-2321. Lay bell and spigot pipe with the bell of the pipe upgrade..

MURRAY STREET BRIDGE AT THE SMALL CRAFT HARBOR, SEISMIC  
RETROFIT/BARRIER REPLACEMENT, CITY PROJECT NO. C409321, FEDERAL NO.  
PROJECT NO. STPLZ 5025(084)

### **79-3.03C(1) Welded Joints**

Provide field welded joints under ANSI/AWWA C206 and AWS D1.1. In the event of conflict, AWS D1.1 will govern, except as modified in this section.

Where exterior welds are performed, provide adequate space for welding and inspection of the joints.

When fitting up the ends of pipe to be welded or fitting butt-strap pieces, minor jacking or clamping will be allowed. Cold working the metal with sledges or localized application of heat and working the metal with sledges will not be allowed. Shop fabricate and install special closure butt straps or mitered pieces if field displacement of joints, where butt strap joints are indicated, does not allow proper fit up with the tolerances indicated.

Lap Welded Joints: During installation of welded steel pipe in either straight alignment or on curves, lay the pipe so that at any point around the circumference of the joint there is at least a minimum lap as shown on the Drawings. Hold back the toe of the weld from the nearest point of tangency of the bell radius as shown on the Drawings. Before welding, shim the pipe at the joints to equalize the gap between the bell and the spigot around the joint circumference. Perform the welding in a manner that will maintain the equalized fitup.

Provide butt straps, where used or required, as indicated on the Drawings.

Drape a heat-resistant shield over at least 24 inches of lining and coating beyond the holdback on both sides of the weld or cut during welding and cutting operations to avoid damage by hot weld or torch spatter to the lining and coating by hot weld splatter. On steep grades, use greater shielding or other Engineer-approved measures. Welding grounds must not be attached to the coated part of the pipe. Repair all damage to lining and coating.

After the pipe and pipe joint are properly positioned in the trench, backfill the length of pipe between joints to at least one foot above the top of the pipe. Exercise care during the initial backfilling to prevent movement of the pipe and to prevent any backfill material from being deposited on the joint.

To control temperature stresses, shade the unbackfilled joint areas of the pipe from the direct rays of the sun by the use of properly supported awnings, umbrellas, tarpaulins, or other suitable materials for a minimum period of 2 hours before starting the welding operation and until the weld has been completed. Shading materials at the joint area must not rest directly on the pipe but be supported to allow air circulation around the pipe. Shading of the pipe joints need not be performed when the ambient air temperature is below 45 degrees F.

Shrinkage Control Joints: At intervals not exceeding 500 feet along welded reaches of the pipeline and at the first regular lap-welded field joints outside concrete encasements and structures, lay the pipe with an initial lap of not less than 1-inch greater than the minimum lap dimension. Perform the welding of each such shrinkage control joint when the temperature is approximately the lowest during the 24-hour day, after at least 500 feet of pipe have been laid and the joints have been welded ahead of and in back of the shrinkage control joint, and after backfill has been completed to at least 1-foot above the top of the pipe ahead of and in back of the shrinkage control joint. Where shrinkage control joints occur in a traveled roadway or other inconvenient location, the location of the shrinkage control joint may be adjusted, as acceptable to the Engineer. Temperature control joints must not be welded when the air temperature exceeds 65 degrees F.

MURRAY STREET BRIDGE AT THE SMALL CRAFT HARBOR, SEISMIC  
RETROFIT/BARRIER REPLACEMENT, CITY PROJECT NO. C409321, FEDERAL NO.  
PROJECT NO. STPLZ 5025(084)

Before starting the welding procedure, remove any tack welds or joint stops used to position the pipe during laying operations. Equally distribute around the circumference of the joint annular space between the faying surfaces of the bell and spigot by shimming, jacking, or other suitable means. Make the weld under ANSI/AWWA C206. Where more than one pass is required, peen each pass, except the first and final one, to relieve shrinkage stresses. Remove all dirt, slag, and flux before applying the succeeding bead.

Before butt welding, properly position the pipe and pipe joint in the trench using line up clamps so, in the finished joint, the abutting pipe sections are not misaligned by more than 1/16-inch.

Unless otherwise shown, provide double fillet welded lap joints for field welded joints.

Inspection of Field Welded Joints: The Engineer or an independent testing laboratory paid for by the Santa Cruz County Sanitation District will inspect the joints. Inspection will be as soon as practicable after the welds are completed:

1. Test all double fillet welds on lap welded joints and on butt strap joints by the soap solution method using approximately 40 psi air pressure introduced between the plates through a threaded hole as indicated. Plug weld test holes following successful testing.
2. Fillet welds will be visually inspected and may be tested by the Magnetic Particle Inspection Method according to ASME Section VIII, Division 1, Appendix 6.
3. Butt welds will be visually inspected and may be inspected by radiographic methods according to API Standard 1104.

Following tests of the joint, coat the exterior joint spaces under these Specifications before backfilling.

Repair of Welds: Repair all defective welds to meet the requirements of the applicable sections of these Specifications. Provide the weld repairs complying with your approved written weld repair procedure. Remove defects in welds or defective welds and re-weld that section of the joint. Only remove defective material that is necessary to correct the defect. Check joint after the repair is made by repeating the original test procedure. Repair welds deficient in size by adding weld metal.

### **79-3.03C(2) Flexible Couplings**

Install flexible couplings and flanged coupling adaptors at locations shown. Provide thrust restraint systems under AWWA Manual M11 where shown.

### **79-3.03C(3) Valves**

Handle all valves in a manner to prevent injury or damage to the valve. Thoroughly clean and prepare all joints before installation. Adjust all stem packing and operate each valve before installing to ensure proper operation. Install all valves so the valve stems are plumb and in the locations shown.

#### **79-3.03C(3)(a) Plug Valves**

Not Used

#### **79-3.03C(3)(b) Check Valves**

Not Used

MURRAY STREET BRIDGE AT THE SMALL CRAFT HARBOR, SEISMIC  
RETROFIT/BARRIER REPLACEMENT, CITY PROJECT NO. C409321, FEDERAL NO.  
PROJECT NO. STPLZ 5025(084)

### **79-3.03C(3)(c) Sewer Combination Air/Vacuum Valves**

Combines the operating features of both an air vacuum valve and air release valve, allowing to vent or re-enter system freely in either direction. The inlet size must be greater than 2-inch diameter as shown. The cast iron body and cover must comply with ASTM A126, Class B. The stainless steel orifice and float must comply with ASTM A240. Valve seats must be Buna-N.

1. Install valves per manufacturer requirements and recommendations. Valves must be DeZurik-APCO Series 1700 or approved equal.
2. Install all valves with valve seats level.
3. Install protective strainers upstream of solenoid valves, pressure-reducing valves, and pressure-sustaining valves.

### **79-3.03C(4) Precast Vaults and Lids**

Transport and handle precast concrete units with equipment designed to protect units from damage. Store precast concrete valve vaults according to manufacturer instructions. For installation of the vaults, lids, and access hatches according to the following:

1. Excavate as specified and hand trim for accurate placement of vaults to elevations indicated.
2. Place bedding material level in one continuous layer to a min. compacted depth of 12 inches.
3. Compact bedding material to 95 percent maximum density.
4. Bases for precast concrete structures must be set level so that bedding material fully and uniformly provides support in true alignment with uniform bearing throughout full perimeter.
5. Backfill around sides.
6. Engineer must examine subgrade before placing aggregate base.
7. Compaction Testing: Comply with Field Quality Control requirements
8. When tests indicate work does not meet specified requirements, remove work, replace, and retest at your expense.
9. Adjust doors, frames, and hardware to operate smoothly, freely, and properly, without binding.
10. Thoroughly clean surfaces of grease, oil, or other impurities, touch-up abraded prime coat.

### **79-3.03C(5) Painting**

During scheduled coating periods, daily weather reporting is required (including, but not limited to, air and surface temperature, dew point, relative humidity, rain, snow, mist, fog, and wind. The daily report must also include conditions that have the potential to cause dust, insects, or debris adhere to coating.) Obtain preauthorization before coating and painting; authorization will be weather dependent. At all times, comply with paint manufacturer's published recommendation for environmental conditions in which paint materials can be applied and as approved by the Engineer.

All surface preparation, coating and painting must comply with applicable standards of the National Association of Corrosion Engineers, the Steel Structures Painting Council, the American Concrete Institute, the Forest Products Research Society and the Manufacturer's printed instructions. Material applied before approval of surface must be removed and re-applied to the satisfaction of the Engineer at your expense.

MURRAY STREET BRIDGE AT THE SMALL CRAFT HARBOR, SEISMIC  
RETROFIT/BARRIER REPLACEMENT, CITY PROJECT NO. C409321, FEDERAL NO.  
PROJECT NO. STPLZ 5025(084)



Perform all work by skilled craftsmen qualified to perform the required work with the best standards of practice.

Provide a supervisor at the site during cleaning and application operations. The supervisor must have the authority to sign any change orders, coordinate construction activities and make decisions pertaining to the fulfillment of the contract.

Dust, dirt, oil, grease or any foreign matter that will affect the adhesion or durability of the finish must be removed by washing with clean rags dipped in an approved cleaning solvent and wiped dry with clean rags.

Coatings and painting systems include surface preparation, prime coating and finish coatings. Unless otherwise specified, prime coatings must be field applied. Where prime coatings are shop applied, instruct suppliers to provide the prime coat compatible with the finish coat specified. Any off-site work which does not comply with the specification is subject to rejection by the Engineer.

Shop applied prime coatings which are damaged during transportation, construction or installation must be thoroughly cleaned and touched up in the field as directed by the Engineer. Use repair procedures which ensure the complete protection of all adjacent primer.

The specified repair method and equipment may include wire-brushing, hand or power tool cleaning or dry air blast cleaning. In order to prevent injury to surrounding painted areas blast cleaning may require use of lower air pressure, smaller nozzle and abrasive particle sizes, short blast nozzle distance from surface, shielding and masking. If damage is too extensive, the item must be re-cleaned and coated or painted as directed by the Engineer.

Previously painted surfaces: Repair surface defects. Remove grease, oil and other contaminants as specified for steel surfaces. Scrape carefully to remove deteriorated coatings. Glossy or very hard coatings should be sanded lightly to promote maximum adhesion of the subsequent coating. Surface must be thoroughly dry before coating.

Coating and painting equipment must be designed for application of materials and maintained in first class working condition. Compressors must have suitable traps and filters to remove water and oils from the air. Your equipment is subject to the Engineer's authorization.

Application of the first coat must follow immediately after surface preparation and cleaning and within an eight hour working day. Any cleaned areas not receiving first coat within eight-hour period must be re-cleaned before application of first coat. This may include re- blasting.

Before assembly, all surfaces made inaccessible after assembly must be prepared and receive the coating or paint system specified.

### **79-3.03C(5)(a) Surface Preparation, Metallic Surfaces**

Surface preparation will be based on comparison with: "Pictorial Surface Preparation Standards for Painting Steel Surfaces", SSPC-Vis 1, ASTM Designation D220: "Standard Methods of Evaluating Degree of Rusting on Painted Steel Surfaces", SSPC-Vis 2, ASTM Designation D610; Visual Standard for Surfaces of New Steel Air-blast Cleaned with Sand Abrasive", NACE Standard TM-01-70; and as described below. Measure anchor profile for prepared surfaces by use of a non-destructive instrument such as a Keane-Tator Surface Profile Comparator or Testex Press-O-Film System.

MURRAY STREET BRIDGE AT THE SMALL CRAFT HARBOR, SEISMIC  
RETROFIT/BARRIER REPLACEMENT, CITY PROJECT NO. C409321, FEDERAL NO.  
PROJECT NO. STPLZ 5025(084)

To facilitate inspection, on the first day of abrasive blast cleaning operations, blast clean metal panels to the standard specified. These panels must be equivalent to the supplied plate stock which is to be coated or painted and must have minimum measurements of 8-½-inches by 11-inches. After agreeing a specific panel meets the requirements of the specification, it must be initialed by you and the Engineer and coated with a clear non-changing finish. Utilize panels inspection purposes throughout the duration of blast cleaning operations.

Remove heavy deposits of grease or oil with solvent oil cleaner and neutralize any chemical contamination and/or flushed off before any other surface preparation.

Surfaces scheduled for Near White or Commercial Blast Cleaning must have all welds, edges, and sharp corners ground to a 1/16-inch radius and all weld splatter removed, and sandblasted under Steel Structures Painting Council Specifications, removing mill scale, rust, dirt, paint, or other foreign matter, and slightly roughened to form a suitable anchor pattern for the coating application. Do not leave blasted surfaces overnight before coating. Remove all sand from the surface by brush or industrial vacuum.

All other steel not scheduled for blast cleaning must have all weld splatter removed, and rough edges and rough welds ground, and cleaned by means of hand or power tools, under with Steel Structures Painting Council Specification No. 2 or No. 3, removing all loose mill scale rust, dirt, paint, or other contaminants. Blast cleaning may be used if practical. The remaining mill scale, rust, and paint must be sufficiently abraded to provide for good bonding of the coating.

Field blast cleaning for all surfaces must be dry method unless otherwise directed.

Particle size of abrasives used in blast cleaning must produce a 2 mil (50.0 microns) surface profile or comply with manufacturer recommendations of the specified coating or paint system to be applied.

Abrasive used in blast cleaning operations must be new, washed, graded and free of contaminants that would interfere with adhesion of coating or paint and must not be reused unless authorized.

During blast cleaning operations, exercise caution to ensure that existing coatings or paints are not exposed to abrasion from blast cleaning.

Keep the work area in a clean condition and do not allow permit blasting materials to accumulate as to constitute a nuisance or hazard to performance of work or operation of existing facilities.

Clean blast cleaned surfaces before application of specified coatings or paints by a combination of blowing with clean dry air, brushing/brooming and/or vacuuming as directed by the Engineer.

Clean all welds with a suitable chemical compatible with the specified coating materials.

Specific Surface Preparation: Surface preparation for the specific system must comply with these specifications.

Application SSPC specifications are as follows:

1. Solvent Cleaning (SSPC-SP1): Removal of oil, grease, soil and other contaminants by use of solvents, emulsions, cleaning compounds, steam cleaning or similar materials and methods which involve a solvent or cleaning action.

MURRAY STREET BRIDGE AT THE SMALL CRAFT HARBOR, SEISMIC  
RETROFIT/BARRIER REPLACEMENT, CITY PROJECT NO. C409321, FEDERAL NO.  
PROJECT NO. STPLZ 5025(084)

2. Hand Tool Cleaning (SSPC-SP2): Removal of loose rust, loose mill scale and other detrimental foreign matter to degree specified by hand chipping, scraping, sanding, and wire-brushing.
3. Power Tool Cleaning (SSPC-SP3): Removal of loose rust, loose mill scale and other detrimental foreign matter to degree specified by power wire-brushing, power impact tools or power sanders.
4. White Metal Blast Cleaning (SSPC-SP5): Blast cleaning to a gray-white uniform metallic color until each element of surface is free of all visible residues.
5. Commercial Blast Cleaning (SSPC-SP6): Blast cleaning until at least two-thirds of each element of surface area is free of all visible residues.
6. Brush-off Blast Cleaning (SSPC-SP7): Blast cleaning to remove loose rust, loose mill scale and other detrimental foreign matter to degree specified.
7. Near White Blast Cleaning (SSPC-SP10): Blast cleaning to nearly white metal cleanliness, until at least 95 percent of each element of surface area is free of all visible residues.

### **79-3.03C(5)(b) Coating Application**

Coating and paint application must conform to the requirements of the Steel Structures Painting Council Paint Application Specifications SSPC-PA1, latest revision, for "Shop, Field and Maintenance Painting", and recommended practices of the National Association of Corrosion Engineers, the American Concrete Institute, the Forest Products Research Society and the Manufacturer of the paint and coating materials.

Before applying any paint or finish, thoroughly clean all surfaces and prepare them for painting as specified. All cleaned metal must be primed or painted, as specified, immediately after cleaning to prevent new rusting or oxidation of cleaned surfaces.

Use protective coverings or drop cloths to protect floors, fixtures, and equipment. Exercise care to avoid lapping on glass or hardware. Coatings and paints must be sharply cut to lines and finished surfaces free from defects or blemishes.

#### **Application – Environmental Conditions**

1. Do not paint surfaces that exceed manufacturer specified moisture contents or when none, the following moisture contents:
  - a. Plaster and Gypsum Wallboard: 12 percent.
  - b. Masonry, Concrete and Concrete Block: 8 percent.
  - c. Interior Located Wood: 15 percent.
  - d. Concrete Floors: 7 percent.
2. Do not paint or coat:
  - a. Under dusty conditions.
  - b. When light on surface measures less than 15 foot-candles.
  - c. When ambient or surface temperature is less than 40 degrees F.
  - d. When relative humidity is higher than 85 percent.
  - e. When surface temperature is less than 5 degrees F above dew point.
  - f. When surface temperature exceeds the manufacturer's recommendation.
  - g. When ambient temperature exceeds 90 degrees F, unless manufacturer allows a higher temperature.
3. No coating work allowed under unfavorable weather conditions to wet or damp surfaces or in rain, snow, fog or mist.

MURRAY STREET BRIDGE AT THE SMALL CRAFT HARBOR, SEISMIC  
 RETROFIT/BARRIER REPLACEMENT, CITY PROJECT NO. C409321, FEDERAL NO.  
 PROJECT NO. STPLZ 5025(084)

4. When it is expected the air temperature will drop below 40 degrees F or less than 5 degrees F above the dewpoint within eight hours after application of coating or paint.
  - a. Measure dewpoint by use of an instrument such as a Sling Psychrometer in conjunction with the US Department of Commerce Weather Bureau Psychometric Tables.
  - b. If above conditions are prevalent, delay or postpone coating or painting until conditions are favorable, unless conditions are acceptable to the paint manufacturer for any given coating. Complete the days coating or painting in time to permit the film sufficient drying time to prevent damage by atmospheric conditions.
5. Provide fans, heating devices, or other means recommended by coating manufacturer to prevent formation of condensation or dew on surface of substrate, coating between coats and within curing time following application of last coat.
6. Provide adequate continuous ventilation and sufficient heating facilities to maintain minimum 45 degrees Fahrenheit for 24 hours before, during and 48 hours after application of finishes.

All painting must be well applied, leaving no sags, laps, brush, or other defects. Each coat must thoroughly dry before applying next coat, and all work must be carefully cut into a true line and left smooth and clean. Remove hardware trim and other items as required for proper application of coatings.

All painting must conform to the following general conditions:

1. Thickness of coating in mils means the dry film thickness. The number of coats specified means the minimum number of coats to be used. Additional coatings are required if necessary to obtain the specified film thickness.
2. No coating work allowed under unfavorable weather conditions.
3. Provide prime coats where called for as a part of the painting system. Shop prime coats must conform to the specified painting system for the given item. Coordinate activities so that factory prime items are primed or painted with a coating compatible with the specified finish painting system.
4. Give particular attention to all welds, edges, and corners so as to get full and adequate coverage. Carefully replace damaged shop prime coats or field applied prime coats before finish painting. Surface preparation for replacement of damaged coats must give a clean surface for proper bonding of prime coat. Strip coat surfaces under SSPC PA1 Section 2.1, 6.6. Finish coatings must not be applied until touch-up prime coat has completely dried.
5. Minimum between-coat drying items, as stated in the printed instructions of the coating manufacturer will be carefully observed.
6. Thinning is allowed only if necessary for workability of the coating material under manufacturer's printed instructions. Use only the appropriate thinner.
7. Apply each coat in a similar but different color from the preceding coat, the finish coat to be color selected by the Engineer.

### **79-3.03C(5)(c) Inspection**

Visually inspect concrete, plastic and wood surfaces to ensure specified coverage has been attained. Where destructive testing is deemed necessary, use an instrument such as a Tooke Gage. Check thickness of coatings and paints on metal surfaces with a non-destructive type thickness gauge and follow the guidelines specified in SSPC-PA 2. Test coating integrity with an approved inspection device. Perform holiday detection before application of aluminum or metallic finish coats. Holiday detectors must not exceed the voltage recommended by the manufacturer of the coating system and must follow the guidelines specified in National

MURRAY STREET BRIDGE AT THE SMALL CRAFT HARBOR, SEISMIC  
RETROFIT/BARRIER REPLACEMENT, CITY PROJECT NO. C409321, FEDERAL NO.  
PROJECT NO. STPLZ 5025(084)

Association of Corrosion engineers (NACE) RPO 188. For film thickness between 10 and 20 mils, add a non-sudsing type wetting agent such as Kodak Photo-Flo to the water before wetting the detector sponge. Mark all pinholes and under manufacturer's recommendations and retested. No pinholes or other irregularities will be permitted in the final coating.

In cases of dispute concerning film thickness or holidays, the Engineer's calibrated instruments and measurements predominate. Wide film thickness discrepancies must be measured and verified with a micrometer or other approved measuring instrument.

Furnish, until final acceptance of coating and painting, inspection devices in good working condition for detection of holidays and measurement of dry-film thickness of coating and paint. Also furnish US Department of Commerce; National Bureau of Standards certified thickness calibration plates to test accuracy of dry-film thickness gauge and certified instrumentation to test accuracy of holiday detectors.

Make available dry-film thickness gauges and holiday detectors for the Engineer's use at all times until final acceptance of application. Operate holiday detection devices in the presence of the Engineer.

Acceptable devices for ferrous metal surfaces include but are not limited to Tinker- Razor Model M/1 holiday detector for coatings to 20 mils dry film thickness, Tinker- Razor Models AP and AP/W holiday detectors for coatings in excess of 20 mils dry- film thickness, and Mikrotest or Positest unit for dry-film thickness gauging. Check non- ferrous metal surfaces with an instrument such as an Elcometer "Eddy Current" Tester or DeFelsko Model 252. Operate inspection devices under manufacturer's instructions.

### **79-3.03C(5)(d) Safety and Health Requirements**

General: Provide and require use of personnel protective lifesaving equipment for persons working in or about the project site under regulatory agencies.

Head and Face Protection and Respiratory Devices: Equipment must include protective helmets which must be worn by all persons in the vicinity of the work. In addition, workers engaged in or near construction activities during abrasive blasting must wear eye and face protection devices and air purifying, half-mask or mouthpiece respirator with appropriate filter. Use barrier creams on any exposed areas of skin.

Ventilation: Where ventilation is used to control hazardous exposure, all equipment must be explosion-proof. Ventilation must reduce the concentration of air contaminant to the degree a hazard does not exist. Air circulation and exhausting of solvent vapors must be continued until coatings have fully cured.

Sound Levels: Whenever the occupational noise exposure exceeds maximum allowable sound levels, provide and require the use of approved ear protective devices.

Illumination: Provide adequate illumination while construction activities are in progress, including explosion-proof lights and electrical equipment. Illumination must comply with SSPC-Guide 12. Whenever required by the Engineer, provide additional illumination and necessary supports to cover all areas to be inspected. The level of illumination for inspection purposes will be determined by the Engineer.

MURRAY STREET BRIDGE AT THE SMALL CRAFT HARBOR, SEISMIC  
RETROFIT/BARRIER REPLACEMENT, CITY PROJECT NO. C409321, FEDERAL NO.  
PROJECT NO. STPLZ 5025(084)

Temporary Ladders and Scaffolding: All temporary ladders and scaffolding must comply with applicable safety requirements. Erect them where requested by the Engineer to facilitate inspection and be relocate them as requested by the Engineer.

#### **79-3.03C(5)(e) Preservation**

During construction, protect work against damage by accident or otherwise, and leave the work clean and whole. The work will not be accepted until it is completed and all retouching has been done. All work which is rejected, or for any reason has to be done over, by you at your expense.

#### **79-3.03C(5)(f) Cleaning**

During the progress of the work, all other work must be covered and fully protected from injury or painter's finish, and exercise care to not splatter paint, enamel, etc., on adjacent work. Upon completion of the work, remove all staging, scaffolding and containers from the site or destroy in a manner approved by the Engineer. Name and data plates on equipment must not be painted and must be left clean and legible upon completion of the project. All damage to surfaces resulting from the work of this section must be cleaned, repaired, or refinished to the satisfaction of the Engineer at your expense.

#### **79-3.03C(5)(g) Surfaces Requiring Painting**

In general, the following surfaces are to be coated or painted:

1. All exposed metal surfaces and piping, interior and exterior.
2. All submerged or buried metal, and some submerged concrete and masonry surfaces, as scheduled.
3. All structural and fabricated steel, including tanks and equipment and galvanized structural steel.
4. Equipment furnished without factory finish surfaces.

#### **79-3.03C(5)(h) Surfaces Not Requiring Painting**

Unless otherwise indicated, painting is not required on surfaces in concealed areas and inaccessible areas such as furred spaces, foundation spaces, utility tunnels, pipe spaces, and on buried piping.

Metal surfaces of anodized aluminum, stainless steel, chromium plate, copper, bronze, and similar finished materials will not require painting under this section except as scheduled.

Portions of metal embedded in concrete, except for aluminum surfaces.

Electrical equipment with factory applied finish.

Do not paint moving parts of operating units; mechanical or electrical parts such as valve operators; linkages; sensing devices; and motor shafts, unless otherwise indicated.

Do not paint over required labels or equipment identification, performance rating, name, or nomenclature plates.

#### **79-3.03C(6) Linings and Coatings**

For Fusion Bonded Epoxy, the coating must be applied according to the following requirements:

1. The applicator must be approved in writing by the coating manufacturer.

MURRAY STREET BRIDGE AT THE SMALL CRAFT HARBOR, SEISMIC  
RETROFIT/BARRIER REPLACEMENT, CITY PROJECT NO. C409321, FEDERAL NO.  
PROJECT NO. STPLZ 5025(084)

2. Surfaces must be free of grease, oil, mud, wax, coal tar, chlorides and other deleterious materials. All surface irregularities, welds and weld spatter must be ground smooth to a 1/8 in. (3.18 m) radius. Clean surfaces must be blast cleaned to near-white metal under SSPC-SP-10 or NACE No. 2. The resulting profile must be 1.5 -4.0 mils. Blast cleaned surfaces must be protected from moisture until coated.
3. Remove all oils, oxidation, and contaminants with a suitable solvent such as methyl ethyl ketone. Gasoline and kerosene are not permitted. Remove rust by brushing, grinding, filing or sanding.
4. Field welding is not allowed after fusion bonded coatings have been applied.
5. Except for touch up repair of minor defects, coating must be applied by the fluidized bed process. Substrate to be coated must be heated and cured under the coating manufacturer's recommendations.
6. Minimum dry film thickness must be 12 mils in the exterior and 15 mils on the interior. Liquid touch-up coating must not be applied when the pipe temperature is less than 55 degrees F (13 degrees C).
7. Field welding is not allowed after fusion bonded coatings have been applied.

The coating must be pinhole-free and tested with a low voltage, wet sponge holiday detector. All pinholes should be marked, repaired and retested to ensure a pinhole-free coating.

The applicator must measure the thickness of the coating on the exterior and interior, as applicable, of each piece coated. The applicator must record the results of the testing and submit them to the Engineer through you.

### **79-3.03C(7) Steel Fabricated Specials**

Provide all fittings, closure pieces, bends, reducers, wyes, tees, crosses, outlets, manifolds, and other steel pipe specials, bolts, nuts, gaskets, jointing materials, and all other appurtenances as required to provide a complete and workable installation. Where pipe support details are shown, place the supports ; provided, that the support for all exposed piping is complete and adequate regardless of whether or not supporting devices are specifically shown. Where indicated, provide concrete thrust blocks and welded joints. At all times when the work of installing pipe is not in progress, keep all openings into the pipe and the ends of the pipe in trenches or structures tightly closed to prevent entrance of animals and foreign materials. Take all necessary precautions to prevent the pipe from floating due to water entering the trench, assume full responsibility for damage due to this cause, and restore and replace the pipe, at its own expense, to its specified condition and grade if it is displaced due to floating. Maintain the inside of the pipe free from foreign materials and in a clean and sanitary condition until acceptance by the Santa Cruz County Sanitation District.

Lay the pipe special in a reasonably dry trench. Provide necessary facilities, including slings, for lowering and properly placing the pipe sections in the trench without damage. Lay the pipe and specials to the line and grade indicated and closely joint to form a continuous, uninterrupted flow line. Immediately before placing each section of pipe in final position for jointing, check the bedding for firmness and uniformity of surface.

### **79-3.03C(8) Metal Fabrications**

Verify that field conditions are acceptable and are ready to receive work.

Clean and strip primed steel items to bare metal and aluminum where Site welding is required.

MURRAY STREET BRIDGE AT THE SMALL CRAFT HARBOR, SEISMIC  
RETROFIT/BARRIER REPLACEMENT, CITY PROJECT NO. C409321, FEDERAL NO.  
PROJECT NO. STPLZ 5025(084)

Furnish setting drawings, diagrams, templates, instructions and directions for the installation of anchorages, such as concrete inserts, anchor bolts and miscellaneous items having integral anchors. Supply steel items required to be cast into concrete or embedded in masonry with setting templates to appropriate sections. Coordinate delivery of such items to the project Site.

### **Installation**

Install items plumb and level, accurately fitted, and free from distortion or defects.

Make provisions for erection stresses. Install temporary bracing to maintain alignment until permanent bracing and attachments are installed.

Fastening to In-Place Construction: Provide anchorage devices and fasteners where necessary for securing miscellaneous metal items to in-place construction, including threaded fasteners for concrete and masonry inserts, toggle bolts, through-bolts, lag bolts, wood screws and other connectors as required.

Fit exposed connections accurately together to form tight hairline joints.

Grind joints smooth and touch-up shop paint coat.

Do not weld, cut, or abrade the surfaces of exterior units which have been hot-dipped galvanized after fabrication and are intended for bolted or screwed field connections.

Field-weld components indicated on Drawings and Shop Drawings.

Perform field welding according to AWS D1.1 with regards to procedures of manual shielded metal-arc welding, the appearance and quality of welds made and the methods used in correcting welding work.

Obtain the Engineer's authorization before site cutting or making adjustments not scheduled.

### **Tolerances**

Maximum Variation from Plumb: 1/4 inch per story or for every 12 feet in height, whichever is greater, non-cumulative.

Maximum Variation from Level: 1/16 inch in 3 feet and 1/4 inch in 10 feet.

Maximum Offset from Alignment: 1/4 inch.

Maximum Out-of-Position: 1/4 inch.

### **Field Quality Control**

Welding: Inspect welds according to AWS D1.1.

Replace damaged or improperly functioning hardware.

After erection, touch up welds, abrasions, and damaged finishes with prime paint or galvanizing repair paint to match shop finishes.

Touch up factory-applied finishes according to manufacturer-recommended procedures.

### **Adjusting**

Adjust operating hardware and lubricate as necessary for smooth operation.

MURRAY STREET BRIDGE AT THE SMALL CRAFT HARBOR, SEISMIC  
RETROFIT/BARRIER REPLACEMENT, CITY PROJECT NO. C409321, FEDERAL NO.  
PROJECT NO. STPLZ 5025(084)



### **79-3.03C(9) Truss Bridge**

#### **79-3.03C(9)(a) Fabrication**

The bridge supplier must fabricate the bridge in a structure that is owned or leased by the supplier. No outsourcing of fabrication is permitted. Bridge(s) fabricator must be currently certified by the American Institute of Steel Construction to have the personnel, organization, experience, capability, and commitment to produce fabricated structural steel for the category Advanced "Major Steel Bridges" as set forth in the AISC Certification Program with Fracture Critical Endorsement. Bridge fabricator must also be currently certified by the American Welding Society (AWS) as an AWS Certified Fabricator. Quality control must comply with procedures outlined for AISC certification.

When the collection of water inside a structural tube is a possibility, either during construction or during service, provide a drain hole in the tube at its lowest point to let water out.

Give special attention to developing sufficient weld throats on tubular members. Fillet weld details must comply with AWS D1.1, Section 3.9.2. Unless determined otherwise by testing, the loss factor "Z" for heel welds must comply with AWS Table 2.9. Build fillet welds which run onto the radius of a tube to obtain the full throat thickness. The maximum root openings of fillet welds must not exceed 3/16" under AWS D1.1, Section 5.22. Increase weld size or effective throat dimensions under this same section when applicable (i.e. fit-up gaps > 1/16").

All weld testing must be done by a person qualified under ASNT SNT-TC-1A. All full penetration welds in the chords are to be ultrasonically tested under AWS specifications. All fillet and partial penetration groove welds must be 100 percent visually inspected with 10 percent also being magnetic particle tested under AWS specifications. Submit a written testing report upon completion.

#### **79-3.03C(9)(b) Finishing**

Bare applications of enhanced corrosion resistant steels.

Perform all Blast Cleaning in a dedicated OSHA approved indoor facility. Blast operations must use Best Management Practices and exercise environmentally friendly blast media recovery systems.

To aid in providing a uniformly "weathered" appearance, blast clean all exposed surfaces of steel under Steel Structures Painting Council Surface Preparation Specifications No. 7 Brush-Off Blast Cleaning, SSPC SP7 latest edition.

Exposed surfaces of steel are defined as those surfaces seen from the deck and from outside of the structure. Stringers, floor beams, lower brace diagonals and the inside face of the truss below deck and bottom face of the bottom chord need not be blasted.

#### **79-3.03C(9)(c) Delivery and Erection**

Delivery is made to a location nearest the site which is easily accessible to normal over-the-road tractor/trailer equipment. All trucks delivering bridge materials will need to be unloaded at the time of arrival.

The manufacturer will provide detailed, written instructions in the proper lifting procedures and splicing procedures (if required). Method and sequence of erection is your responsibility. A representative of the bridge supplier must be on-site during the installation of the bridge.

MURRAY STREET BRIDGE AT THE SMALL CRAFT HARBOR, SEISMIC  
RETROFIT/BARRIER REPLACEMENT, CITY PROJECT NO. C409321, FEDERAL NO.  
PROJECT NO. STPLZ 5025(084)

Chord splices must have loose splice plates that are inserted into the tubular chord members. The splice plates must have a splice nut retention device consisting of a capture plate(s) with hexagonal holes held in place by either an angle on each side of the capture plate(s) or C channel(s). Tack welding of splice nuts to splice plates is not acceptable unless an approved Weld Procedure Specification (WPS) can be provided. The sections are then bolted together by bolting through the wall of the tube, nut capture assembly and nut.

The bridge manufacturer must provide written inspection and maintenance procedures to be followed

### **79-3.03C(9)(d) Bearings**

#### **79-3.03C(9)(d)(i) Bearing Devices**

Bridge bearings must consist of a steel setting or slide plate placed on the abutment or grout pad and a fabric reinforced elastomeric pad with Teflon on top of the setting plate. The bridge bearing plate which is welded to the bridge structure must have a stainless-steel plate welded to bottom side acting as a slide surface and bear on bearing pad and setting plate. One end of the bridge will be fixed and will have fully tightened nuts on the anchor bolts. The expansion end will have finger tight only nuts to allow movement under thermal expansion or contraction. Both ends of bridge must have slotted holes to facilitate installation tolerance.

#### **79-3.03C(9)(d)(ii) Elastomeric Bearings**

Bridge must be supplied with a fabric reinforced elastomeric pad. The bridge bearings must sit in a recessed pocket on the concrete abutment. Minimum 28-day strength for the abutment concrete must be a minimum 3,000 PSI. The bearing seat must be a minimum of 16" wide. The step height (from bottom of bearing to top-of-deck) must be determined by the bridge manufacturer.

Bridges must have stainless steel on Teflon slide bearings placed between the bridge bearing plate and the fabric reinforced elastomeric pad. The top slide plate must be large enough to cover the lower Teflon slide surface at both temperature extremes.

#### **79-3.03C(9)(d)(iii) Foundations**

Unless specified otherwise, the bridge manufacturer must determine the number, diameter, minimum grade and finish of all anchor bolts. Design the anchor bolts to resist all horizontal and uplift forces to be transferred by the superstructure to the supporting foundations. Engineering design of the bridge supporting foundations (abutment, pier, bracket and/or footings), including design of anchor bolt embedment length, is the responsibility of the foundation engineer. Provide all materials for (including anchor bolts) and construction of the bridge supporting foundations. Install the anchor bolts under manufacturer's anchor bolt spacing dimensions.

Information as to bridge support reactions and anchor bolt locations will be furnished by the bridge manufacturer after receipt of order and after the bridge design is complete.

### **79-3.03D Temporary Sewage Control and Bypass Pumping**

New SSFM will convey raw wastewater from the existing Lode Street Pump Station to the existing wastewater treatment plant upon New SSFM completion and implementation with no additional pumping required. The transition of flow from the Existing SSFM to New SSFM may require temporary bypass pumping and piping to facilitate the transition within the allotted sewer forcemain shutdown allowance time period. The Contractor shall submit a cutover plan identifying the process for the transition of flow from the Existing SSFM to New SSFM. If

MURRAY STREET BRIDGE AT THE SMALL CRAFT HARBOR, SEISMIC  
RETROFIT/BARRIER REPLACEMENT, CITY PROJECT NO. C409321, FEDERAL NO.  
PROJECT NO. STPLZ 5025(084)

temporary bypass pumping is determined necessary, the Contractor shall comply with this Section.

1. The existing facility continuously pumps wastewater to the City's Wastewater Treatment Facility. The functions of the facility must not be compromised or diminished during activities, except as specified. Plan and prosecute the work such that operation of the pump station and plant is not interrupted.
2. Inadequate conveyance of sewage or temporary bypass pump system malfunctions could potentially result in the spillage or discharge of raw wastewater and sewage. State law allows the Department to impose civil penalties for violation of a term, condition, or requirement of project NPDES Permit, including spillage or discharge of raw wastewater and sewage. Pay these penalties and any costs associated with the cleanup.
3. Spillage or discharge of raw sewage to surface waters or drainage courses is prohibited during construction. Penalties imposed on the Santa Cruz County Sanitation District as a result of any bypass of this type caused by you, your employees or Subcontractors, and legal fees and other expenses to the Santa Cruz County Sanitation District resulting directly or indirectly from the bypass must be paid by you.
4. Contractor is responsible for controlling all leakage resulting from or integral to making all temporary and permanent piping connections and must provide all devices and materials required to control, stop, divert, or dispose of all leakage.
5. To prevent leakage of sewage pressure test temporary force mains as specified during the timeframe it is used, visually inspect the entire length of the force main alignment daily to verify there are no leaks.
6. Plan and prosecute the work such that temporary bypass pumping operations can be initiated complying with the schedule.

Submit a Temporary Sewage Control and Bypass Pumping Plan a minimum of four weeks before the proposed date of temporary pumping and piping activity. Do not construct, install or place in operation temporary process pumping and piping facilities until Engineer has reviewed and approved each planned bypass.

Temporary Sewage Control and Bypass Pumping Plan, at a minimum, must include the following:

1. Name, qualifications, and references of the supplier providing the pumping facilities, including a minimum of three jobs of similar scope and complexity.
2. Description of the pumps to be used, including pump curves and calculation of pumping capacity required.
3. Description of the temporary primary and backup power supply, and estimated fuel consumption for engine-driven pumps and generators.
4. Description of the control equipment, the temporary control panel(s) and the method to be used to operate the pumps.
5. Drawing showing the layout and routing of bypass pumping equipment, piping, and valves with associated sizes and dimensions.
6. Drawing showing the layout and routing of proposed electrical service connections, including conductor types and sizes, conduits and routing, with associated sizes and dimensions.
7. Drawing showing the layout of the force main. The drawing must show details of any portions of the force main routing that is installed below grade.

MURRAY STREET BRIDGE AT THE SMALL CRAFT HARBOR, SEISMIC  
RETROFIT/BARRIER REPLACEMENT, CITY PROJECT NO. C409321, FEDERAL NO.  
PROJECT NO. STPLZ 5025(084)

8. Pump maintenance plan describing regular maintenance to be performed while the pumps are in service and the length of the maintenance period when a pump will be out of service.
9. Contingency plan describing steps to be taken if a pump fails and emergency contact phone numbers. You are to receive and respond to all alarms and notify Santa Cruz County Sanitation District personnel of all alarms.
10. Noise levels at minimum and maximum operating speed.
11. Sewer forcemain shutdown allowance is a maximum of 3-hours per scheduled occurrence. Coordinate with the Santa Cruz County Sanitation District a minimum of 4 weeks before any planned shutdown event.

Before operations, pressure test temporary piping to a pressure no less than 100 psi. Submit test results to Engineer.

Before operations, provide a functional test for the complete temporary pumping system including pumps, valves, alarms, telemetry, and redundancy.

Submit results of field pressure test of temporary piping before startup of temporary pumping operation.

Provide the following items and adhere to the requirements as part of Temporary Sewage Control and Bypass Pumping:

1. Temporary piping, valves, and fittings for temporary pumping equipment.
2. Pipe and couplings rated for a minimum pressure of 100 psi
3. A minimum of one operator for temporary pumping at all times that the pumps are in operation.
4. Route temporary piping to avoid blocking construction and maintenance equipment access.
5. Provide protection for piping and couplings where crossing access points is unavoidable.

### **79-3.03E Trenchless Applications**

Not Used

#### **79-3.03E(1) Quality Assurance**

Not Used

#### **79-3.03E(2) Submittals**

Not Used

#### **79-3.03E(3) Jacked Steel Casing**

Not Used

#### **79-3.03E(4) Installation of Carrier Pipe**

Not Used

### **Ground Water Control:**

Not Used

#### **79-3.03E(5) Documentation Requirements**

Not Used

MURRAY STREET BRIDGE AT THE SMALL CRAFT HARBOR, SEISMIC RETROFIT/BARRIER REPLACEMENT, CITY PROJECT NO. C409321, FEDERAL NO. PROJECT NO. STPLZ 5025(084)

### **79-3.03E(6) As-Built Drawings**

Not Used

### **79-3.03E(7) Excavation and Backfill of Pits**

Not Used

### **79-3.03E(8) Alternative Methods of Installation**

Not Used

### **79-3.03F Cleaning of Pipeline**

All pipelines must be cleaned of all soil, dirt, rocks, and other debris and objectionable material. Clean pipelines by first pulling a tightly fitting cleaning ball or swab through the pipe. After initial cleaning, flush the interior of all piping. Upon completion of flushing, completely drain system at all low points. After the final air test has been satisfactorily completed, clean the sewer using water and a sewer cleaning ball of proper size for the pipe being cleaned. The ball must be designed and constructed for pipe cleaning work. Clean the pipe between the two lowest manholes in the system and work upstream.

Sewer flush trucks that remove all debris and clean with water may be used if authorized.

Before placing pipeline in service, remove all material from sand traps or debris catchers in manholes then remove the sand trap or debris catcher.

Installations that do not conform to the requirements must be reconstructed.

### **79-3.04 PAYMENT**

Not Used

## **79-4 TESTING OF PIPELINE**

### **79-4.01 GENERAL**

#### **79-4.01A Summary**

Section 79-4 includes specifications for leak testing all pipelines and related valves and fittings. Rejected work must be retested, and if still rejected must be repaired or replaced to the satisfaction of the Engineer.

#### **79-4.01B Quality Assurance**

Flow meters must record the actual volume plus or minus 2 percent.

Air and vacuum test gauges must be ANSI B40.1, Grade 3A (plus or minus 0.25 percent of full-scale accuracy), with a dial range approximately twice the required test pressure.

Water test gauges must be ANSI B40.1, Grade 2A (plus or minus 0.5 percent of full scale accuracy), with a dial range approximately twice the required test pressure.

MURRAY STREET BRIDGE AT THE SMALL CRAFT HARBOR, SEISMIC  
RETROFIT/BARRIER REPLACEMENT, CITY PROJECT NO. C409321, FEDERAL NO.  
PROJECT NO. STPLZ 5025(084)

### **79-4.01C Submittals**

Accuracy certification must be by an approved independent testing laboratory for flow meters and test gauges and dated no more than 90 days before actual system testing.

Before testing, provide the following information:

1. All Tests: Describe precautions that will be taken to protect system equipment that might be damaged under test pressures.
2. Air Test: Describe safety devices on air test equipment, and personnel safety precautions during air tests.
3. High or Low Pressure Water Test: Describe the proposed method for disposal of water used in line testing.

### **79-4.02 MATERIALS**

Not Used

### **79-4.03 CONSTRUCTION**

Perform testing in the Engineer's presence after backfill and proper compaction of trenches. Where lines are installed under roadways, perform tests after completion of final subgrade preparation and before application of surface courses. Notify Engineer at least 48 hours before testing by submitting a test form which indicates test date, pipeline to be tested, test requirements, and any additional requirements requested by the Engineer.

Prepare each section for testing, using adequate bracing; protect system equipment susceptible to damage by test pressures; make provision for installation of Engineer's pressure gage in parallel with Contractor's gage, if so requested; and maintain services where required. Water for flushing and testing is available from local fire hydrants and must be coordinated with the Engineer.

#### **79-4.03A Testing of Forcemain**

After completion of the installations, test all piping and pipework associated with the forcemain as specified and furnish all material, equipment, and labor for testing the piping systems. Provide reports of testing activities.

Clean piping and flush each system before pressure or leak tests.

Maintain specified pressures or heads of water for time tabulated, except where indicated to be air or vacuum tested, and the leakage determined. Leakage must not exceed the tabulated values in AWWA C605.

Test pressures must be 100 psi at the low point of the test section, unless otherwise shown.

The pressure must be maintained at all times during the test by restoring it whenever it falls an amount of 5 psi.

If leakage is more than allowable, repair or replace the pipeline and retest it. Do not use paints, asphalts, tars, or other type of pipe compounds to eliminate leaks.

Take all necessary precautions to prevent any joints from drawing while the pipelines and their appurtenances are being tested and repair any damage to the pipes and their appurtenances, or to any other structures, resulting from or caused by these tests.

MURRAY STREET BRIDGE AT THE SMALL CRAFT HARBOR, SEISMIC  
RETROFIT/BARRIER REPLACEMENT, CITY PROJECT NO. C409321, FEDERAL NO.  
PROJECT NO. STPLZ 5025(084)

After a satisfactory test, remove the testing fluid, remove test bulkheads and other test facilities, and restore the pipe coatings.

#### **79-4.03A(1) Test Records**

Provide records of each piping installation during the testing. These records must include:

1. Date of Test
2. Identification of pipeline, or pipeline section, tested or retested
3. Identification of pipeline material
4. Identification of pipe specification
5. Test fluid
6. Test pressure
7. Any Remarks: Leaks identified (type and location), types of repairs, or corrections made
8. Certification by Contractor that the leakage rate measured conformed to the specifications

#### **79-4.03A(2) Testing Requirements**

Test under AWWA 600 as directed. Average test pressure during the leakage test, in pounds per square inch (gauge) where test pressure must be minimum of 100 psi.

#### **79-4.03B Testing of Gravity Sewer Main**

Closed circuit television (CCTV) inspection is required for testing of the gravity sewer main.

After backfilling and prior to final surfacing, test sewer segments as follows:

1. Deflection testing utilizing a deflection gauge (i.e. mandrel) and per any additional methods recommended by pipe manufactures measured under the presence of the Engineer.
2. Sag testing utilizing a calibrated 1/4" diameter steel bar/"sag gage" or approved equal device, mounted in front of the CCTV camera. Sag device must be positioned along the flow line of the pipe to accurately determine the presence of sags. Clean water must be introduced to a depth significant enough to detect.

#### **79-4.03B(1) CCTV Recording**

Prior to permanent surfacing, produce a video recording of the condition of the new line. Notify Engineer at least 72 hours in advance of CCTV. A District Operations Representative must be present for the first CCTV. Obtain District authorization to proceed prior to subsequent CCTV operations.

The video recording of the sewer line must be done when the flow in the upstream pipelines has been bypassed. Recording must be performed immediately after the introduction of clean water at the high point of the line to be videoed.

Using all available NASSCO condition codes, code all observations along the pipeline with NASSCO's PACP codes and supply in a format compatible with GraniteNet (.WMV preferred). The video and report must be exported using the Target Standard: PACP/LACP v6.0 as a NAASCO database (\*.mdb). Submit the data to the County via USB storage device.

Every section of sewer (manhole to manhole or cleanout) must be identified by audio and alphanumeric on the video display and must include:

1. Project Name

MURRAY STREET BRIDGE AT THE SMALL CRAFT HARBOR, SEISMIC  
RETROFIT/BARRIER REPLACEMENT, CITY PROJECT NO. C409321, FEDERAL NO.  
PROJECT NO. STPLZ 5025(084)

2. Municipality
3. Street Name
4. District designated GIS manhole numbers. Contractor must verify with the Engineer manhole IDs for any new manholes installed prior to videoing
5. Sewer diameter and length
6. Date of inspection

Video inspection recordings and reports must be completed per the following requirements:

1. Videos must be continuous from manhole to manhole, no splicing allowed.
2. Videos must accurately indicate distance along the inspection length.
3. Video recording must provide a clear perspective of any defects, sags, or debris left in the pipeline.
4. Picture must indicate orientation of the camera with respect in the invert of the pipe.
5. Recording camera must stop at every lateral and align itself with the centerline of the lateral wye connection and record for a minimum of five seconds. The camera must pan sufficiently at each lateral to allow for a complete inspection of the lateral connection.
6. Flow from laterals along the line being recorded shall require a delay, with recording to continue, for a minimum of 60 seconds to allow the flow from the lateral to properly clear.

The District will review all video recordings within ten (10) working days of receipt.

#### **79-4.03B(2) Department Acceptance**

The District evaluates gravity sewers based on:

1. Visual Inspection Including:
  - 1.1. Leaks
  - 1.2. Mud and/or debris
  - 1.3. Slipped joints and/r noticeable offsets
  - 1.4. Improperly installed fittings
  - 1.5. Any other defects noted through CCTV observation
2. Vertical and horizontal alignment:
  - 2.1. New Construction
    - 2.1.1. No sag may exceed 9% of the pipe diameter
    - 2.1.2. No deflection shall exceed 5% of its inside diameter or manufacture's recommendation, whichever is less, as evidenced by a successful deflection test.

For any portions of work which do not comply with the acceptance criteria, you must submit a corrective action plan which must be authorized by the Engineer. CCTV recording must be repeated after any corrective actions are taken.

#### **79-4.03B(3) Test Records**

Submit a test report with results of each test within 5 days of testing each segment.

#### **79-4.04 PAYMENT**

Not Used

MURRAY STREET BRIDGE AT THE SMALL CRAFT HARBOR, SEISMIC  
RETROFIT/BARRIER REPLACEMENT, CITY PROJECT NO. C409321, FEDERAL NO.  
PROJECT NO. STPLZ 5025(084)



**80 FENCES**

**Add between the 1st and 2nd paragraphs of section 80-1.03:**

Stumps of all trees removed on the O'Neill property in the construction of temporary and permanent fences will be ground out to 2' below grade and original grade reestablished.

**Add to end of section 80-1.04:**

The payment quantity for Temporary Fence (Type CL-6) and Temporary Fence (Type CL-6, Privacy) includes the temporary lockable gates and privacy screens when shown on the plans.

Privacy screens will be full height vinyl coated polyester mesh material with 80% visibility blockage or as directed by the engineer. Color will be forest green.

**Replace *Reserved* in section 80-2.02A with:**

Posts must be treated wood.

**Replace *Class A coating* in the 1st paragraph of section 80-3.02C with:**

Class B coating

**Add to the list in the 4th paragraph of section 80-3.02E:**

- 3. Be medium green.

**Replace Section 80-4.03 RESERVED with:**

**80-4.03 WIRE MESH FENCE (MODIFIED)**

**80-4.03A General**

Furnish and install Wire Mesh Fence (Modified) to match the appearance and quality of the existing wire mesh fence at parcels along the west side of the West Harbor (APN 010-262-66 and APN 010-262-42)

**80-4.03B Materials**

Fence posts and braces will be similar in material and dimension as the existing wire mesh fence and conform to Section 80-2.02C Wood Posts and Braces.

Wire mesh will be similar in material and dimensions as the existing wire mesh fence and conform to Section 80-2.02E Wire Mesh.

Existing material may be reused if in good condition and with approval of the engineer.

**80-4.03C Construction**

Construction will comply with Section 80-2.03 Construction

**80-4.03D Payment**

Not Used

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MURRAY STREET BRIDGE AT THE SMALL CRAFT HARBOR, SEISMIC RETROFIT/BARRIER REPLACEMENT, CITY PROJECT NO. C409321, FEDERAL NO. PROJECT NO. STPLZ 5025(084)

## **DIVISION IX TRAFFIC CONTROL DEVICES**

### **83 RAILINGS AND BARRIERS**

**Replace item 1 in the list in the 2nd paragraph of section 83-2.02C(1)(a) with:**

1. wood line posts.

**Replace item 2 in the list in the 2nd paragraph of section 83-2.02C(1)(a) with:**

2. Wood blocks for line posts.

**Add to section 83-2.02C(1)(a):**

The exposed bolt threads on guardrail beyond the nut that are more than 0.5 inch must be cut off.

**Replace section 83-2.04B with:**

#### **83-2.04B Alternative In-line Terminal Systems**

##### **83-2.04B(1) General**

##### **83-2.04B(1)(a) Summary**

Section 83-2.04B includes specifications for constructing alternative in-line terminal systems.

##### **83-2.04B(1)(b) Definitions**

Not Used

##### **83-2.04B(1)(c) Submittals**

Submit a certificate of compliance for alternative in-line terminal systems.

##### **83-2.04B(1)(d) Quality Assurance**

For each model of alternative in-line terminal system being installed, obtain the manufacturer's check list for the assembly and installation of the alternative in-line terminal systems from the manufacturer's representative or distributor. Notify the Engineer of the alternative in-line terminal systems to be installed at each location before starting installation activities. Complete, sign, and date the check list for each installed in-line terminal system and submit a copy of the completed and signed check list for each installed location, and include the following:

1. Contract number
2. Name of installation Contractor
3. Flare offset used in layout
4. Date of installation

MURRAY STREET BRIDGE AT THE SMALL CRAFT HARBOR, SEISMIC  
RETROFIT/BARRIER REPLACEMENT, CITY PROJECT NO. C409321, FEDERAL NO.  
PROJECT NO. STPLZ 5025(084)

5. Location on the project by post mile, and by station if stationing shown on plans
6. Name and signature of individual completing the checklist.

The Engineer signs and dates the completed check lists, verifying the in-line terminal system at each location was assembled and installed under the manufacturer's instructions and as described.

Use personnel trained by the manufacturer to install in-line terminal systems. A record of training provided by the manufacturer may be requested by the Engineer at any time.

**83-2.04B(2) Materials**

Alternative in-line terminal systems must be the following or a Department-authorized equal:

1. Type MAX-Tension TL-2 Tangent Guardrail End Treatment is a Barrier Systems line of road safety solutions manufactured by Lindsay Corporation. The MAX-Tension is a tangent, re-directive gating guardrail end terminal with a length of 30'-1/2" for a test level 2, and can be flared for an offset of 0 to 2 feet at the head. The MAX-Tension TL-2 terminal can be obtained from the distributor:

Address	Telephone no.
STATEWIDE SAFETY AND SIGNS INC 130 GROBRIC COURT FAIRFIELD CA 94534	(800) 770-2644 (707) 864-9952

2. Type SoftStop terminal systems must be SoftStop End Terminal System TL-2 manufactured by Trinity Highway Products, LLC. The SoftStop terminal system is a tangent, re-directive and gating guardrail end terminal with a length of 38'-3 1/2" for a test level 2, and can be flared for an offset of 0 to 1 feet at the head. The SoftStop terminal can be obtained from the manufacturer at:

Address	Telephone no.
TRINITY HIGHWAY PRODUCTS LLC PO BOX 99 CENTERVILLE UT 84012	(800) 772-7976 (916) 474-9644

**83-2.04B(3) Construction**

Identify each terminal system by painting the type of terminal system in 2-inch-high, neat, black letters and figures on the backside of the rail element between system posts number 4 and 5. Paint must be metallic acrylic resin type spray paint. Before applying terminal system identification, the surface to receive terminal system identification must be free of all dirt, grease, oil, salt, or other contaminants by washing the surface with detergent or other suitable cleaner. Rinse thoroughly with fresh water and allow to fully dry.

Install Type MAX-Tension terminal system under the manufacturer's installation instructions. Use 8-inch plastic or composite blocks. Install W6x8.5 or W6x9 at post positions after Post 1.

MURRAY STREET BRIDGE AT THE SMALL CRAFT HARBOR, SEISMIC  
RETROFIT/BARRIER REPLACEMENT, CITY PROJECT NO. C409321, FEDERAL NO.  
PROJECT NO. STPLZ 5025(084)



**84 MARKINGS**

**Replace Reserved in section 84-9.03B of the RSS with:**

Residue from the removal of painted or thermoplastic traffic stripes and pavement markings contains lead from the paint or thermoplastic. The average lead concentrations are less than 1,000 mg/kg total lead and 5 mg/L soluble lead. This residue:

1. Is a nonhazardous waste
2. Does not contain heavy metals in concentrations exceeding the thresholds established by the Health and Safety Code and 22 CA Code of Regs
3. Is not regulated under the Federal Resource Conservation and Recovery Act (RCRA), 42 USC § 6901 et seq.

Management of this material exposes workers to health hazards that must be addressed in your lead compliance plan.

^^

**DIVISION X ELECTRICAL WORK**

**87 ELECTRICAL SYSTEMS**

**87-1 GENERAL**

**Add to end of section 87-1.01A with:**

Bid items:

6" HDPE CONDUIT HORIZONTAL DIRECTION DRILLING METHOD (PG&E)

6" HDPE CONDUIT (PG&E)

6" HDPE CONDUIT (COMCAST)

Will conform to the requirements of section 87.

**Replace *Not Used* in section 87-1.02 with:**

**87-1.02 MATERIALS**

Materials used for:

6" HDPE CONDUIT HORIZONTAL DIRECTION DRILLING METHOD (PG&E)

6" HDPE CONDUIT (PG&E)

6" HDPE CONDUIT (COMCAST)

Will conform to the requirements of section 86.

^^

**Replace section 88 with:**  
**88 SANITARY SEWER FORCEMAIN ELECTRICAL AND INSTRUMENTATION**  
**88-1 GENERAL**

**88-1.01 GENERAL**

**88-1.01A Summary**

Section 88-1 includes general specifications for electrical work for furnishing electrical equipment and materials.

Where requirements differ between UL, NEMA, NFPA or other applicable standards, the more stringent governs.

Concrete, excavation, backfill, and steel reinforcement required for encasement, installation, or construction of work of various items in Section 88 is included as a part of the work under the respective sections, including duct banks, manholes, handholes, equipment housekeeping pads, and light pole bases.

Obtain permits and pay inspection fees as required to complete the work.

Determine quantities required to complete work. Submit the quantities as part of the schedule of values.

The schedule of values must include type, size, and installation method for:

1. Service and Control Pedestal
2. Utility Service/Coordination
3. Electrical Site Work
4. SCADA Integration

**88-1.01B Definitions**

**AEIC:** Association of Edison Illuminating Companies.

**ASTM:** American Society of Testing and Materials.

**NEMA 250:** Enclosure for Electrical Equipment (1000 Volts Maximum).

**88-1.01C Submittals**

**88-1.01C(1) General**

Comply with section 79-1.01C.

Custom-prepare Shop Drawings. Drawings or data indicating "optional" or "as required" equipment will not be accepted. Cross out options not proposed or delete from the Shop Drawings.

Include with each submittal a copy of the specification section, with addenda updates included, and all referenced and applicable sections included, with each paragraph check-marked to indicate specification compliance or marked to indicate requested deviations from specification requirements. Check marks (√) denote full compliance with a paragraph as a whole. If deviations from the specifications are indicated, and therefore requested by you, each deviation must be underlined and denoted by a number in the margin to the right of the identified paragraph, referenced to a detailed written explanation of the reasons for requesting the

MURRAY STREET BRIDGE AT THE SMALL CRAFT HARBOR, SEISMIC  
RETROFIT/BARRIER REPLACEMENT, CITY PROJECT NO. C409321, FEDERAL NO.  
PROJECT NO. STPLZ 5025(084)

deviation. The Engineer will be the final authority for determining acceptability of requested deviations. The remaining portions of the paragraph not underlined will signify compliance on your part of with the specifications. Failure to include a copy of the marked-up specification sections, along with justifications for any requested deviations to the specification requirements, with the submittal is sufficient cause for rejection of the entire submittal with no further consideration.

### **88-1.01C(2) Shop Drawings**

Shop drawings must include:

1. Complete material lists stating manufacturer and brand name of each item or class of material.
2. Shop Drawings for grounding work not specifically indicated
3. Front, side, rear elevations, and top views with dimensional data
4. Location of conduit entrances and access plates
5. Component data
6. Connection diagrams, terminal numbers, internal wiring diagrams, conductor size, and cable numbers
7. Method of anchoring, seismic requirements, weight
8. Types of materials and finish
9. Nameplates
10. Temperature limitations, as applicable
11. Voltage requirement, phase, and current, as applicable
12. Front and rear access requirements
13. Test reports
14. Grounding requirements

### **88-1.01C(3) Catalog Cuts**

Submit catalog cuts or photocopies of applicable pages of bulletins or brochures for mass produced, non-custom manufactured material.

Stamp the catalog data sheets in order to indicate the Project name, applicable specifications section and paragraph, model number, and options.

### **88-1.01C(4) Materials and Equipment Schedules**

Within 30 Days of the start date in the Notice to Proceed, deliver to the Engineer a complete list of materials, equipment, apparatus, and fixtures proposed for use.

Include in the list the type, size, name of manufacturers, catalog number, and other information as required to identify the item.

### **88-1.01C(5) Facility Operation and Maintenance Manuals**

Submit complete operation and maintenance manual for equipment under the following:

1. Operating instructions and start-up procedures including receiving and installation requirements.
2. Maintenance instructions listing preventive and corrective maintenance procedures. Corrective maintenance procedures must identify the most probable failures and the appropriate repairs. Test measurement levels must be referenced to specific test points on the installed equipment.

MURRAY STREET BRIDGE AT THE SMALL CRAFT HARBOR, SEISMIC  
RETROFIT/BARRIER REPLACEMENT, CITY PROJECT NO. C409321, FEDERAL NO.  
PROJECT NO. STPLZ 5025(084)



3. Furnish spare parts data for each item of material and equipment specified. The equipment data must include the following:
  - a. A list and itemized price breakdown of spare parts recommended for stocking.
  - b. The parts selected must be those which, in the manufacturer's judgment, will be involved in the majority of maintenance difficulties encountered.
4. Control schematics, ladder diagrams and interconnection drawings.
5. Catalog cuts and technical manuals for all components of the system. Provide original technical manuals as published by the manufacturers. Photocopies will not be acceptable.
6. Copy of all guarantees and warranties issued for the various items of equipment, showing all dates of expiration.
7. Copies of all factory and field test results.
8. Final copies of all shop and submittal drawings, incorporating manufacturing and field changes. Where drawings are larger than 11 by 17 inches, provide the full-size drawings neatly folded and installed in 8.5 by 11-inch top loading clear plastic sheet protectors. In addition, provide copies of these drawings reduced to 11 by 17-inch sheet size.
9. Where AutoCAD electronic files are required per other sections, provide CD-ROM with electronic files of all drawings.
10. All irrelevant information on equipment and materials which are in the O&M manuals must be crossed out with a bold black marker.

#### **88-1.01D As-built Drawings**

Prepare as-built drawings, including but not limited to showing invert and top elevations and routing of duct banks and exact location of concealed below-grade electrical installations, and color coding of each individual control conductor.

Maintain as-built drawings and update in conjunction with construction progress of installation. As-built drawings shall be a full-sized set of drawings marked to reflect deviations, modifications and changes.

#### **88-1.01E Identification for Electrical Systems**

##### **88-1.02E(1) General**

Provide danger, caution, and warning signs and equipment identification markings under applicable federal, state, OSHA, and NEC requirements.

##### **88-1.01E(2) Local Disconnect Switches**

Legibly mark each local disconnect switch for motors and equipment in order to indicate its purpose, unless the purpose is indicated by the location and arrangement.

##### **88-1.02E(3) Warning Signs**

Mark entrances to rooms and other guarded locations operating at 600 volts nominal or less that contain live parts with conspicuous signs prohibiting unqualified persons from entering.

Buildings, rooms, or enclosures containing exposed live parts or exposed conductors operating at greater than 600 volts nominal must be lockable. Provide permanent and conspicuous warning signs reading as follows: DANGER – HIGH VOLTAGE – KEEP OUT.

Mark indoor electrical installations open to unqualified persons and contain metal-enclosed switchgear, unit substations, transformers, and other similar associated equipment over 600 volts nominal, with appropriate caution signs.

For Outside Branch Circuits and Feeders over 600 Volts, post warning signs in plain view where unauthorized persons might come in contact with live parts: WARNING – HIGH VOLTAGE – KEEP OUT.

#### **88-1.02E(4) Isolating Switches**

Provide isolating switches not interlocked with an approved circuit-interrupting device with a sign warning against opening them under load.

#### **88-1.01F Utility Coordination**

Contact the serving utility and verify compliance with requirements before construction. [Notify the Engineer of any submittals. Include in the notification the date and contents of submittals.](#)

Coordinate schedules and payments for work by utilities.

Coordinate and schedule pre-construction utility coordination meeting with utility service representative within thirty (30) days of contract approval. [Notify the Engineer of any meeting in advance.](#)

Submit serving utility application on behalf of [the District](#). The [District](#) does not pay for work by utilities.

Where conduits and conductors in the work are indicated to be larger, heavier schedule, or have greater protective coating than utility requirements, provide the larger size, heavier schedule, or greater protection.

Provide electrical service as indicated and as required by the serving utility.

Verify and provide service conduits, fittings, transformer pad, grounding devices, and service wires not provided by the serving utility.

Verify with the utility the exact location of each service point and type of service, and pay charges levied by the serving utilities as part of the work.

#### **88-1.01G Area Designations**

Designations for raceway system enclosures must comply with the requirements of [section 88-6](#).

Designations for electrical work specifically specified in other Sections must comply with the requirements of those Sections unless otherwise specified.

Designations for electrical work not included above must be NEMA 4X.

Installations in hazardous locations must conform strictly to the requirements of the indicated Class, Group, and Division.

Comply with the listed Material Requirements:

1. Provide sealing fittings in chlorine and hydrofluosilicic (HFS) acid areas.
2. Construct NEMA 4X enclosures of Type 304 or 316 stainless steel, except in chlorine and HFS areas where non-metallic enclosures must be provided.

MURRAY STREET BRIDGE AT THE SMALL CRAFT HARBOR, SEISMIC  
RETROFIT/BARRIER REPLACEMENT, CITY PROJECT NO. C409321, FEDERAL NO.  
PROJECT NO. STPLZ 5025(084)

3. Do not coat NEMA 4X enclosures.
4. Construct NEMA 7 enclosures of cast aluminum where used with aluminum conduit, and of cast iron when used with galvanized steel conduit.
5. Do not coat NEMA 7 and 9 enclosures.
6. Construct NEMA 1, 3R, and 12 enclosures of steel, and prime and factory coated with ANSI 61 light grey paint.

### **88-1.01H Tests**

Perform factory and field tests specified, as required by the Engineer, and as required by other authorities having jurisdiction.

Furnish necessary testing equipment.

Pay the costs of the tests, including replacement parts and labor, due to damage resulting from damaged equipment or from testing and correction of a faulty installation.

Where test reporting is indicated, submit proof-of-design test reports for mass-produced equipment with the Shop Drawings.

Submit factory performance test reports for custom-manufactured equipment for authorization before shipment.

Submit field test reports for review before Substantial Completion.

Remove and replace equipment or material that fails a test, or, if the Engineer approves, repair and retested for compliance.

Corrections to equipment or materials with a factory warranty must be as recommended by the manufacturer and performed in a manner that does not void the warranty.

### **88-1.02 MATERIALS**

#### **88-1.02A General**

Provide new equipment and materials and materials of experienced and reputable manufacturers in the industry.

Provide equipment and materials listed by UL and bearing the UL label, where UL requirements apply.

Furnish equipment and material materials of the same manufacturer. Equipment and materials must be of industrial grade standard of construction.

Provide Temperature Ratings of Equipment terminations and lugs rated for use with 75 degree C conductors. Wire sizes in the contract documents are based on NEC ampacity tables using the 75 degree C ratings. Provide equipment and materials suitable for storage, installation and operation in an ambient of 0°C to 50°C up to an elevation of 3,300 feet above sea level, except where more stringent conditions are stated in individual equipment specifications.

Furnish factory finished electrical equipment, wireways and panels with manufacturer's standard primer and enamel topcoats, unless stated otherwise in the individual equipment specifications. Provide 1 pint of the equipment manufacturer's touch-up paint per 500 square feet of painted surface for repair of damaged enamel topcoats.

MURRAY STREET BRIDGE AT THE SMALL CRAFT HARBOR, SEISMIC  
RETROFIT/BARRIER REPLACEMENT, CITY PROJECT NO. C409321, FEDERAL NO.  
PROJECT NO. STPLZ 5025(084)

## **88-1.02B Mounting Hardware**

### **88-1.02B(1) Nuts, Bolts and Washers**

Provide nuts, bolts, and washers constructed of stainless steel.

All Areas: Anchor bolts and screws must be Type 316 ASTM A276 stainless steel. Nuts must be hex Type 316 stainless steel, ASTM A194, Grade 8M, or ASTM F594, Type 316 stainless steel.

Calculations and design must be under section 88-8.

### **88-1.02B(2) Threaded Rods**

Provide threaded rods for trapeze supports constructed from continuous threaded, 3/8-inch diameter minimum.

All Areas: ASTM A276, Type 304 stainless steel.

### **88-1.02B(3) Struts**

Construct struts for mounting of conduits and equipment of 304 stainless steel.

Where contact with concrete or dissimilar metals may cause galvanic corrosion, use suitable non-metallic insulators in order to prevent corrosion.

Strut Manufacturer must be Unistrut; B-Line or equal.

### **88-1.02B(4) End Caps**

Provide plastic protective end caps for all exposed strut ends below 8' above finish floor.

End Caps Manufacturer must be Unistrut, Model P2860, or equal.

### **88-1.02B(5) Anchors**

Provide stainless steel expansion anchors for attaching equipment to concrete walls, floors, and ceilings.

Wood plugs will not be accepted.

Anchor Manufacturer must be "Power-Bolt" or "Power-Stud" as manufactured by Power Fasteners, Inc.; similar by Star or equal.

## **88-1.02C Electrical Identification**

### **88-1.02C(1) Nameplates**

Fabricate nameplates from white-letter, black-face laminated plastic engraving stock, such as Formica Type ES-1 or equal.

Securely fasten each nameplate, using fasteners constructed of brass, cadmium-plated steel, or stainless steel, and screwed into inserts or tapped holes as required.

Provide engraved characters of the block style, with no characters smaller than 1/8-inch top to bottom.

Provide nameplates for field mounted devices and instruments, such as pressure switches, limit switches, flow meters, etc. Identify the name of the device and its unique identifier:

MURRAY STREET BRIDGE AT THE SMALL CRAFT HARBOR, SEISMIC  
RETROFIT/BARRIER REPLACEMENT, CITY PROJECT NO. C409321, FEDERAL NO.  
PROJECT NO. STPLZ 5025(084)

<b>Examples:</b>	<b>Level Switch High</b>	<b>Pressure Switch High</b>
	LSH-1	PSH-1

Where it is impractical to attach laminated nameplates to field devices, provide 19-gauge, 2-inch square brass tags with 1/4-inch black filled engraving. Provide Seton Standard Brass Valve tags or equal. Attach tags with No. 16 brass jack chain.

**88-1.02C(2) Conductor and Equipment Identification**

Heat shrink sleeve markers manufacturer must be Brady Permasleeve or approved equal.

**88-1.02D Protective Matting**

Provide full-width, high-voltage switchboard matting in front of indoor switchgear, indoor service equipment, panelboards and motor control centers.

For 600-volt equipment, provide matting that is 1/4-inch thick and 36-inches wide.

Matting Manufacturer must be W.H.Salisbury and Company; Mats, Inc.; Rhino, or equal.

**88-1.03 CONSTRUCTION**

**88-1.03A General**

Provide materials and provisions required for a complete and operable system, even if not required explicitly by the contract documents.

Typical provisions include terminal lugs not furnished with vendor-supplied equipment, compression connectors for cables, splices, junction and terminal boxes, and control wiring required by vendor-furnished equipment to connect with other equipment described in the contract documents.

The plans diagrammatically show the desired location and arrangement of outlets, conduit runs, equipment, and must be used as closely as possible.

Determine exact locations in the field, based on the physical size and arrangement of equipment, finished elevations, and other obstructions.

Install materials and equipment in strict accordance with the printed recommendations of the manufacturer, and using workers skilled in the work.

Coordinate installation in the field with other trades in order to avoid interferences.

Fully protect materials and equipment against damage from any cause.

Cover materials and equipment, both in storage and during construction, so no finished surfaces will be damaged, marred, or splattered with water, foam, plaster, or paint.

Keep moving parts clean and dry.

Replace or refinish damaged materials or equipment, including faceplates of panels and switchboard sections, as part of the work.

Provide incoming utility power equipment in conformance with the utility's requirements.

MURRAY STREET BRIDGE AT THE SMALL CRAFT HARBOR, SEISMIC  
 RETROFIT/BARRIER REPLACEMENT, CITY PROJECT NO. C409321, FEDERAL NO.  
 PROJECT NO. STPLZ 5025(084)

### **88-1.03B Conduits**

Where conduit development drawings or "home runs" are indicated, route the conduits under those requirements.

Provide exposed or encased routings as indicated, except conceal conduit in finished areas unless indicated otherwise.

Size conduits encased in a slab for conduit OD not to exceed 1/3 of the slab thickness, and lay out and space as to not impede concrete flow.

Install conduit and equipment as to avoid obstructions, to preserve headroom, and to keep openings and passageways clear.

Locate luminaires, switches, convenience outlets, and similar items within finished rooms as indicated.

Where exact locations are not indicated, locations will be determined by the Engineer.

If equipment is installed without instruction and must be moved, the cost of moving must be included as part of the work.

Adjust luminaire locations in order to avoid obstructions and to minimize shadows.

### **88-1.03C Circuits**

Wherever conduits and wiring for lighting and receptacles are not indicated, it is your responsibility to provide lighting and receptacle-related conduits and wiring as required, based on the actual installed fixture layout and the circuit designations as indicated.

Provide No. 12 AWG minimum wiring, and 3/4-inch minimum conduits (exposed) and one-inch minimum conduits (encased).

Where circuits are combined in the same raceway, de-rate conductor ampacities under NEC requirements.

### **88-1.03D Core Drilling**

Perform core drilling as required for the installation of raceways through concrete walls and floors.

Base the locations of floor penetrations, as may be required, on field conditions.

Verify exact core drilling locations based on equipment actually furnished as well as exact field placement.

To the extent possible, identify the existence and locations of encased raceways and other piping in existing walls and floors with the [District](#) before any core drilling activities.

Repair damage to encased conduits, wiring, and piping as part of the work.

### **88-1.0E Concrete Housekeeping Pads**

Provide concrete housekeeping pads for indoor floor-standing electrical equipment.

Housekeeping pads must be provided with  $\frac{3}{4}$ " chamfered edges.

Extend housekeeping pads for equipment, including future units, 3-1/2 inches above the surrounding finished floor or grade, and 4 inches larger in both dimensions than the equipment, unless otherwise indicated.

Provide concrete housekeeping curbs for conduit stub-ups in indoor locations not concealed by equipment enclosures.

Extend housekeeping curbs to 3-1/2 inches above the finished floor or grade.

#### **88-1.03F Equipment Anchoring and Restraints**

Floor-supported, wall, or ceiling-hung equipment and raceways must be anchored in place by methods that will meet seismic requirements in the area where the Project is located. Support and anchorage requirements must comply with 88-8.

If the supported equipment is a panel or cabinet enclosed within removable side plates, match supported equipment in physical appearance and dimensions.

Provide leveling channels anchored to the concrete pad for MCC's, switchgear and other electrical equipment mounted on housekeeping pads.

Anchoring methods and leveling criteria in the printed recommendations of the equipment manufacturers are a part of the work of this Contract. Submit recommendations as Shop Drawings.

#### **88-1.03G Equipment Identification**

Provide nameplates for panelboards, control and instrumentation panels, starters, switches, and pushbutton stations.

In addition to nameplates, equip control devices with standard collar-type legend plates.

Identify control devices within enclosures as indicated and similar to the subparagraph above.

Provide suitable inscribed finish plates for toggle switches that control loads out of sight of switches and for multi-switch locations of more than 2 switches.

Use equipment names and tag numbers, where indicated, on nameplates.

Provide typewritten circuit directories for panelboards, that accurately reflect the loads connected to each circuit.

Label termination points on terminal blocks by identifiers on the blocks. Provide identifiers that have been preprinted by the terminal manufacturer or custom-printed. Hand-lettered markers will not be accepted.

Provide arc-flash labels for all distribution equipment, stand-alone disconnects, starters, and VFDs. Fill in all values as required by NFPA 70E, and as calculated as part of the Protective Device Study. Verify that all settings as prescribed by the approved Protective Device Study have been implemented in the field.

#### **88-1.03H Cleaning**

Before final acceptance, thoroughly clean the electrical work of cement, plaster, and other materials.

Remove temporary tags, markings, stickers, and the like.

MURRAY STREET BRIDGE AT THE SMALL CRAFT HARBOR, SEISMIC  
RETROFIT/BARRIER REPLACEMENT, CITY PROJECT NO. C409321, FEDERAL NO.  
PROJECT NO. STPLZ 5025(084)

Remove oil and grease spots with a non-flammable cleaning solvent by carefully wiping and scraping cracks and corners.

Apply touch-up paint to scratches on panels and cabinets.

Vacuum clean electrical cabinets and enclosures. Do not use compressed air to clean cabinets.

#### 88-1.04 PAYMENT

Not Used

## 88-2 ELECTRICAL TESTS

### 88-2.01 GENERAL

#### 88-2.01A Summary

Section 88-2 includes specifications for testing, commissioning, and demonstrating that the electrical work satisfies the criteria of these specifications and functions as required by the contract documents.

Electrical testing indicated and functional testing of power and controls not tested [required elsewhere](#). This scope may require the you to activate circuits, shutdown circuits, run equipment, make electrical measurements, replace blown fuses, and install temporary jumpers, etc.

Carry out tests indicated for individual items of materials and equipment in other Sections. Testing must be done under the manufacturer's instructions, these specifications, and applicable NETA Acceptance Testing Specifications, NEMA, ANSI, NFPA, and ASTM Standards.

Commissioning must only be attempted as a function of normal [system](#) operation in which [system](#) process flows and levels are routine and equipment operates automatically in response to flow and level parameters or computer command, as applicable. Simulation of process parameters will be considered only on receipt of a written request by you.

Safety practices must include, but are not limited to, the following requirements:

1. Occupational Safety and Health Act.
2. Accident Prevention Manual for Industrial Operations, National Safety Council.
3. Applicable state and local safety operating procedures.
4. [District's](#) safety practices.
5. National Fire Protection Association - NFPA 70E
6. American National Standards for Personnel Protection

Perform all tests with apparatus de-energized. Exceptions must be thoroughly reviewed to identify safety hazards and devise adequate safeguards.

The testing firm must have a designated safety representative on the project to supervise the testing operations with respect to safety.

#### 88-2.01B Submittals

Comply with section 79-1.01C.

MURRAY STREET BRIDGE AT THE SMALL CRAFT HARBOR, SEISMIC  
RETROFIT/BARRIER REPLACEMENT, CITY PROJECT NO. C409321, FEDERAL NO.  
PROJECT NO. STPLZ 5025(084)



Submit complete system test procedures for review. Test procedures must include but not be limited to:

1. Detailed procedures in sufficient detail to verify conformance with these specifications.
2. Incorporation of the Test Record Sheets included at the end of this Section.
3. Detailed comprehensive testing schedule including:
  - a. Each major piece of electrical distribution equipment.
  - b. Each major electrical subsystem.
  - c. Duration of each test.
  - d. Milestone test completion date.
  - e. Ambient Conditions at time of test
  - f. Date of test results submittals following completion of the tests.
  - g. Names and qualifications of the individuals responsible for performing the testing.

Following completion of the test submit the completed test results to the Engineer for review. The results must include a dedicated section with the “as-left” settings of all devices, relays, circuit breakers, etc.

Test result must be submitted in one submittal

Test reports must be based on NETA’s latest Acceptance Testing Specifications having a sign-off, pass/fail data filed for each line item covered by NETA’s Acceptance Testing Specifications latest edition.

### **88-2.01C Quality Assurance**

Testing must comply with NEC (NFPA 70) 2020 Edition.

Where shown the latest standards of the following organizations apply:

1. ANSI
2. IEEE
3. NETA

Testing organization must :

1. Be corporately and financially independent of the supplier, producer and installer of the equipment
2. Meet Federal OSHA criteria for accreditation of testing laboratories, Title 29, Part 1907, 1910 and 1936. Membership in the National Electrical Testing Association constitutes proof of meeting criteria.
3. Provide all materials, equipment, labor and technical supervision to perform inspections and tests.

MURRAY STREET BRIDGE AT THE SMALL CRAFT HARBOR, SEISMIC  
RETROFIT/BARRIER REPLACEMENT, CITY PROJECT NO. C409321, FEDERAL NO.  
PROJECT NO. STPLZ 5025(084)

### **88-2.01D District Acceptance**

Testing organization must be corporately and financially independent of the supplier, producer and installer of the equipment.

Testing organization must meet Federal OSHA criteria for accreditation of testing laboratories, Title 29, Part 1907, 1910 and 1936. Membership in the National Electrical Testing Association constitutes proof of meeting such criteria.

Testing organization must provide all materials, equipment, labor and technical supervision to perform inspections and tests.

### **88-2.01E Pre-Energization and Operating Tests**

The complete electrical system must be performance tested when first installed on-site. Each protective, switching, and control circuit must be adjusted in accordance with the recommendations of the protective device study and tested by actual operation using current injection or equivalent methods as necessary to ensure that each and every circuit operates correctly to the satisfaction of the authority having jurisdiction.

1. Instrument Transformers. All instrument transformers must be tested to verify correct polarity and burden.
2. Switching Circuits. Each switching circuit must be observed to operate the associated equipment being switched.
3. Control and Signal Circuits. Each control or signal circuit must be observed to perform its proper control function or produce a correct signal output.
4. Acceptance Tests. Perform complete acceptance tests, after the station installation is completed, on all assemblies, equipment, conductors, and control and protective systems, as applicable, to verify the integrity of all the systems.

Test Report. A test report covering the results of the tests required in the Pre-Energization and Operating Deliver tests to the authority having jurisdiction before energization. Acceptance Testing must be under NETA ATS, Electrical Power Equipment and Systems.

### **88-2.02 MATERIALS**

Not Used

### **88-2.03 CONSTRUCTION**

#### **88-2.03A General**

Perform Electrical Tests after electrical installation is 100% completed.

#### **88-2.03B Lighting and Receptacles**

Switching, include remote control, if present in system. Circuitry is in accordance with panel schedules. Check all interior and exterior lighting for proper operation.

Test ground interrupter (GFI) receptacles and circuit breakers for proper operation by methods sanctioned by the receptacle manufacturer.

#### **88-2.03C Switchgear and Switchboard Assemblies**

##### **88-2.03C(1) Visual and Mechanical Inspection**

Visual and mechanical inspection must comply with the following:

1. Inspect for physical, electrical and mechanical condition.

MURRAY STREET BRIDGE AT THE SMALL CRAFT HARBOR, SEISMIC  
RETROFIT/BARRIER REPLACEMENT, CITY PROJECT NO. C409321, FEDERAL NO.  
PROJECT NO. STPLZ 5025(084)

2. Compare equipment nameplate information with latest one-line diagram and report discrepancies.
3. Check for proper anchorage, required area clearances, physical damage and proper alignment.
4. Inspect all doors, panels and sections for paint, dents, scratches, fit and missing hardware.
5. Verify that fuse and/or circuit breaker sizes and types correspond to plans.
6. Verify that current and potential transformer ratios correspond to plans.
7. Inspect all bus connections for high resistance. Use low-resistance ohmmeter or check tightness of bolted bus joints by using a calibrated torque wrench.
  - a. Refer to manufacturer's instructions or NETA ATS Table 100.12.
8. Test all electrical and mechanical interlock systems for proper operation and sequencing.
9. Closure attempt must be made on locked open devices. Opening attempt must be made on locked closed devices.
10. Clean entire switchgear using manufacturer's approved methods and materials.
11. Inspect insulators for evidence of physical damage or contaminated surfaces.
12. Verify proper barrier and shutter installation and operation.
  - a. Lubrication
  - b. Verify appropriate contact lubricant on moving current carrying parts.
13. Verify appropriate lubrication on moving and sliding surfaces.
14. Exercise all active components.
15. Inspect all mechanical indicating devices for proper operation.

### **88-2.03C(2) Electrical Tests**

Electrical test must comply with the following:

1. Perform ground-resistance tests under Grounding Systems Section.
2. Perform insulation-resistance test on control wiring. Do not perform this test on wiring connected to solid-state components.
3. Perform control wiring performance test. Use the elementary diagrams to identify each remote control and protective device. Conduct tests to verify satisfactory performance of each control feature.
4. Perform secondary voltage energization test on all control power circuits and potential circuits as detailed below. Check voltage levels at each point on terminal boards and at each terminal on devices.
5. Perform current injection tests on the entire current circuit in each section of switchgear.
  - a. Perform current test by primary injection, where possible, with magnitudes so a minimum of 1.0 ampere flows in the secondary circuit.
  - b. Where primary injection is impractical, utilize secondary injection with a minimum current of 1.0 ampere.
  - c. Test current at each device.
6. Determine accuracy of all meters per Metering and Instrumentation Section. Verify multipliers.
7. Control Power Transformers - Dry Type
  - a. Inspect for physical damage, cracked insulation, broken leads, tightness of connections, defective wiring and overall general condition.

MURRAY STREET BRIDGE AT THE SMALL CRAFT HARBOR, SEISMIC  
 RETROFIT/BARRIER REPLACEMENT, CITY PROJECT NO. C409321, FEDERAL NO.  
 PROJECT NO. STPLZ 5025(084)

- b. Verify proper primary and secondary fuse ratings or circuit breakers.
  - c. Verify proper interlock function and contact operation.
  - d. Perform insulation-resistance tests. Perform measurement from winding-to-winding and windings-to-ground. Test voltage and minimum resistances must be under NETA ATS, Table 100.1. Results must be temperature corrected under NETA ATS, Table 100.14.
  - e. Perform secondary wiring integrity test. Disconnect transformer at secondary terminals and connect secondary wiring to proper secondary voltage. Check potential at all devices.
  - f. Verify proper secondary voltage by energizing primary winding with system voltage. Measure secondary voltage with the secondary wiring disconnected.
8. Test circuit breakers in accordance with Circuit Breaker paragraphs.

### **88-2.03C(3) Test Values**

Bolt-torque levels must be under NETA ATS Table 100.12, unless otherwise specified by manufacturer.

Perform insulation-resistance test under NETA ATS, Table 100.1. Values of insulation resistance less than this table or manufacture's minimum should be investigated.

### **88-2.03D Low Voltage Cables - 600V Maximum**

#### **88-2.03D(1) Visual and Mechanical Inspection**

Visual and mechanical inspection must comply with the following:

1. Compare cable data with the plans and specifications.
2. Inspect exposed sections of cables for physical damage and proper connection in accordance with single-line diagram.
3. Inspect bolted electrical connections for high resistance using one of the following methods:
  - a. Use of low-resistance ohmmeter
  - b. Verify tightness of accessible bolted electrical connections by calibrated torque-wrench method under manufacturer's published data or NETA ATS, Table 100.12.
4. Inspect compression-applied connectors for correct cable match and indentation.
5. Inspect for correct identification, arrangements, and cable color coding.
6. Inspect cable jacket insulation and condition.

#### **88-2.03D(2) Electrical Tests**

Perform insulation-resistance test on each conductor with respect to ground and adjacent conductors. Applied potential must be 500 volts dc for 300 volt rated cable and 1000 volts dc for 600 volt rated cable. Test duration must be one minute. Electrical test must comply with the following:

1. Test motor feeders with motors disconnected and controller open.
2. Test and verify motor control circuits for proper operation with control stations and overcurrent devices connected.

3. Test panelboard feeders with feeder breaker open and panel-board connected. If a lighting transformer is associated with the panelboard, it must be connected and the test made for both primary and secondary sides.
4. Test conductors of main lighting feeders, including lighting panel with branch circuits open.

Before performing insulation resistance tests on cables, verify that they are not connected to a solid-state device.

1. Equipment must be disconnected to avoid damage during before testing.
2. Notify Engineer if minimum insulation values cannot be obtained.

Perform resistance measurements through all bolted connections with low-resistance ohmmeter, if applicable.

Perform continuity test to insure correct cable connection.

### **88-2.03D(3) Test Values – Visual and Mechanical**

Compare bolted connection resistance to values of similar connections. Investigate values which deviate from those of similar bolted connections by more than 50 percent of the lowest value.

Bolt-torque levels should be under NETA ATS, Table 100.12 unless otherwise specified by the manufacturer.

### **88-2.03D(4) Test Values – Electrical**

Compare bolted connection resistance values to values of similar connections. Investigate values which deviate from those of similar bolted connections by more than 50 percent of the lowest value.

Insulation-resistance values must be under manufacturer's published data. In the absence of manufacturer's published data, use NETA ATS Table 100.1. Investigate values of insulation resistance less than this table or manufacturer's instructions to determine cause of deviations.

Cable must exhibit continuity.

Investigate deviations in resistance between parallel conductors to determine cause of deviations.

### **88-2.03E Circuit Breakers - Low Voltage - Insulated Case**

#### **88-2.03E(1) Visual and Mechanical Inspection**

Visual and Mechanical inspection must comply with the following:

1. Check circuit breaker for proper mounting and compare nameplate data to the plans and specifications.
2. Operate circuit breaker to ensure smooth operation.
3. Inspect case for cracks or other defects.
4. Verify tightness of accessible bolted electrical connections by calibrated torque-wrench method under manufacturer's published data or NETA ATS- 2017, Table 100.12.

#### **88-2.03E(2) Electrical Tests**

Electrical test must comply with the following:

MURRAY STREET BRIDGE AT THE SMALL CRAFT HARBOR, SEISMIC  
RETROFIT/BARRIER REPLACEMENT, CITY PROJECT NO. C409321, FEDERAL NO.  
PROJECT NO. STPLZ 5025(084)

1. Perform a contact-resistance test.
2. Perform insulation-resistance test on each conductor with respect to ground and adjacent conductors. Applied potential must be 500 volts dc for 300 volt rated cable and 1000 volts dc for 600 volt rated cable. Test duration must be one minute.

### **88-2.03E(3) Test Values**

Compare contact resistance or millivolt drop values to adjacent poles and similar breakers. Investigate deviations of more than fifty percent (50%). Investigate values of resistance less than this table or manufacturer's instructions to determine cause of deviations.

Insulation resistance must not be less than 100 megohms.

For integrally-fused circuit breakers, trip times may be substantially longer if tested with the fuses replaced by solid links (shorting bars).

### **88-2.03F Circuit Breakers - Low Voltage - Power**

#### **88-2.03F(1) Visual and Mechanical Inspection**

Visual and Mechanical inspection must comply with the following:

1. Inspect for physical damage and compare nameplate data with the plans and specifications.
2. Perform mechanical operation test under manufacturer's instructions.
3. Check cell fit and element alignment and proper operation of racking interlocks.
4. Bolt-torque levels should be under NETA ATS, Table 100.12 unless otherwise specified by the manufacturer.
5. Check arc chutes for damage.
6. Clean entire circuit breaker using approved methods and materials.
7. Lubricate as required.

#### **88-2.03F(2) Electrical Tests**

Electrical test must comply with the following:

1. Perform a contact-resistance test.
2. Perform an insulation-resistance test at 1000 volts dc from pole-to-pole and from each pole-to-ground with breaker closed and across open contacts of each phase.
3. Determine long-time minimum pickup current by primary current injection.
4. Determine long-time delay by primary injection.
5. Determine short-time pickup and delay by primary current injection.
6. Determine ground-fault pickup and delay by primary current injection.
7. Determine instantaneous pickup value by primary current injection.
8. Make adjustments for final settings in accordance with breaker setting sheet.
9. Activate auxiliary protective devices, such as ground-fault or under voltage relays, to ensure operation of shunt trip devices. Check the operation of electrically-operated breakers in their cubicle.
10. Check charging mechanism.

#### **88-2.03F(3) Test Values**

Compare contact resistance or millivolt drop values to adjacent poles and similar breakers. Investigate deviations of more than fifty percent (50%).

Insulation resistance must not be less than 100 megohms. Investigate values less than 100 megohms.

Trip characteristics of breakers when adjusted to setting sheet parameters must fall within manufacturer's published time-current tolerance band.

### **88-2.03G Metering and Instrumentation**

#### **88-2.03G(1) Visual and Mechanical Inspection**

Visual and Mechanical inspection must comply with the following:

1. Examine all devices for broken parts, shipping damage, and tightness of connections.
2. Verify that meter types, scales, and connections are in accordance with the plans and specifications.

#### **88-2.03G(2) Electrical Tests**

Electrical test must comply with the following:

1. Determine accuracy of meters at 25/50/75/100% of full scale for each metered parameter.
2. Calibrate meters to one-half percent (0.5%).
3. Verify all instrument multipliers.

### **88-2.03H Grounding Systems**

#### **88-2.03H(1) Visual and Mechanical Inspection**

Visual and Mechanical inspection must comply with the following:

1. Inspect ground system for compliance with the contract documents and NFPA 70 National Electrical Code Article 250.
2. Inspect physical and mechanical conditions.
3. Inspect bolted electrical connection for high resistance using one or more of the following methods:
4. Use of low-resistance ohmmeter
5. Verify tightness of accessible bolted electrical connections by calibrated torque-wrench methods under manufacturer published data and NETA ATS Table 100.12.
6. Inspect anchorage.

#### **88-2.03H(2) Electrical Tests**

Electrical test must comply with the following:

1. Perform ground-impedance measurements utilizing the fall-of-potential method per ANSI/IEEE Standard 81 "IEEE Guide for Measuring Earth Resistivity, Ground Impedance, and Earth Surface Potentials of a Ground System." Instrumentation utilized must be as defined in Section 12 of the referenced guide and be specifically designed for ground impedance testing. Provide sufficient spacing so that plotted curves flatten in the 62% area of the distance between the item under test and the current electrode.
2. Perform point-to-point tests to determine the resistance between the main grounding system and all major electrical equipment frames, system neutral, and derived neutral points.

### **88-2.03H(3) Test Values**

Compare bolted connection resistance values to values of similar connections. Investigate values which deviate from those of similar bolted connections by more than 50 percent of the lowest value.

The resistance between the main grounding electrode and ground must be no greater than five ohms for large commercial or industrial systems and one ohm or less for generating or transmission station grounds unless otherwise specified by the [District](#). (Reference ANSI/IEEE Standard 142).

Investigate point-to-point resistance values that exceed 0.5 ohm.

### **88-2.03I Test Record Sheets**

[Use the](#) test record sheets [in Attachment A](#) to record testing of electrical equipment and of the electrical installation as required by these specifications.

#### **88-2.04 PAYMENT**

Not Used

## **88-3 INDUSTRIAL CONTROL PANELS**

### **88-3.01 GENERAL**

#### **88-3.01A Summary**

Section 88-3 includes specifications for providing complete industrial control panels and/or local control stations as indicated.

This section also specifies miscellaneous electrical devices used throughout this project. These devices are not limited to use within industrial control panels or local control stations.

Industrial control panels and/or local control stations must comply with the requirements of NEC (including Article 409), NEMA, and UL.

#### **88-3.01B Submittals**

Comply with section 79-1.01C.

Submit ladder diagrams and written descriptions explaining ladder diagram operation and system operation.

Include catalog cuts of control equipment including enclosures, overcurrent devices, relays, pilot devices, terminations, and wire troughs.

#### **88-3.01C Quality Assurance**

Not Used

### **88-3.02 MATERIALS**

#### **88-3.02A General**

Provide the equipment, panels and stations to satisfy the functional requirements in the relevant mechanical equipment and Instrumentation and Control specifications and the Electrical Elementary Schematics. Each panel and station must be fabricated with UL labeled components. Equipment not specifically indicated as being work of other Sections must be

MURRAY STREET BRIDGE AT THE SMALL CRAFT HARBOR, SEISMIC  
RETROFIT/BARRIER REPLACEMENT, CITY PROJECT NO. C409321, FEDERAL NO.  
PROJECT NO. STPLZ 5025(084)



provided under this Section. All equipment, panels and stations must be wired under this Section.

The controls must be 120 V maximum. Where the electrical power supply is 240 V, single phase or 480 V, 3 phase, provide the station with a fused control power transformer. Provide control conductors under [section 88-4](#).

Provide each panel and/or station with identified terminal strips for the connection of external conductors. Provide sufficient terminal blocks to connect 25 percent additional conductors for future use. Identify termination points in accordance with Shop Drawings. The panels and/or stations must be the source of power for all 120 VAC solenoid valves interconnected with the panels and/or stations. Equipment associated with the panels and/or stations must be ready for service after connection of conductors to equipment, controls, panels and/or stations.

Wiring to door-mounted devices must be extra flexible and anchored to doors using wire anchors cemented in place. Guard exposed terminals of door-mounted devices to prevent accidental personnel contact with energized terminals.

Enclosures must comply with the following:

1. In finished rooms, enclosures must be NEMA 12 steel enclosures painted with ANSI 61 exterior and white interior.
2. Outdoors in non-hazardous areas, enclosures must be NEMA 3R unless specifically called out on the electrical site plan or specific electrical or equipment specifications
3. In hazardous areas, enclosures must be cast aluminum NEMA 7 and UL listed for use in hazardous or classified locations.
4. Enclosures must be freestanding, pedestal-mounted, or equipment skid-mounted, as indicated. Mount internal control components on a removable mounting pan. Mounting pan must be finished white.
5. Provide outdoor mounted enclosures with thermostatically-controlled heaters. Operate heaters at ½ rated voltage (240 volt heaters must be sized and operated at 120 volts).
6. Provide screened weep holes for draining condensation.

Identification of panel-mounted devices, conductors, and electrical components must be [with these specifications](#).

Mount panel-mounted devices a minimum of 3-feet above finished floor elevation, but not higher than 6'-6" above finished floor, unless noted otherwise.

### **88-3.02B Panel/Station Components**

Pushbuttons, selector switches, and pilot lights must be the heavy-duty, oil-tight type, sized to 30-mm. Miniature style devices are not acceptable. Devices must be as manufactured by Allen Bradley, EATON, Square-D, or equal and comply with the following:

1. Lens colors must be Green for "run," "open," or "on"; and Red for "stopped," "closed," or "off"; and amber for alarm.
2. Pilot lights must be full voltage, push-to-test LED cluster type.
3. Provide hazardous location type pilot devices in classified locations.

Relays must be 3 PDT with 10 amp contacts, plug-in type with indicating light, rectangular blades and provided with sockets for screw-type termination and hold-down clips. Relays must be as manufactured by Square-D, Idec, or equal.

Elapsed time meters must be non-resettable type, read to a maximum of 99999.9 hours and as manufactured by GE, EATON, or equal.

Terminal strips must be provided for every panel and must be the flanged fork or ring lug type suitable for No. 12 AWG stranded wire minimum. Provide 25 percent spare terminals in each panel.

Time delay relays must be combination on delay and off delay (selectable) with adjustable timing ranges. Provide socket with screw terminal connections and retaining strap. Time delay relays must be Square D, Idec, EATON, or equal.

### **88-3.02C Factory Testing**

Each panel/station must be factory assembled and tested for sequence of operation before delivery.

### **88-3.02D Spare Parts**

Provide a minimum of 10 percent spare lamps (minimum 2) and one spare lens for each color pilot lamp in each panel.

### **88-3.03 CONSTRUCTION**

Panels/stations must be installed [under these specifications](#), and [under](#) manufacturer's instructions.

Protect panels/stations at the site from loss, damage, and the effects of weather. Store panels/stations in an indoor, dry location. Provide heating in areas subject to corrosion and humidity.

Panels/station interiors and exteriors must be cleaned, and coatings must be touched up to match original finish on completion of the work.

Conduit, conductors, and terminations must be installed [under these specifications](#).

Each panel/station must be tested again for functional operation in the field after the connection of external conductors and before equipment startup.

### **88-3.04 PAYMENT**

Not Used

## **88-4 WIRE AND CABLING**

### **88-4.01 GENERAL**

#### **88-4.01A Summary**

Section 88-4 includes specifications for wiring and cabling.

Provide wire and cable, complete and operable [as described](#).

#### **88-4.01B Submittals**

Comply with section 79-1.01C.

MURRAY STREET BRIDGE AT THE SMALL CRAFT HARBOR, SEISMIC  
RETROFIT/BARRIER REPLACEMENT, CITY PROJECT NO. C409321, FEDERAL NO.  
PROJECT NO. STPLZ 5025(084)

Submit Shop Drawings.

Submit catalog cuts and material list for each conductor type. Indicate insulation material, conductor material, voltage rating, manufacturer and other data pertinent to the specific cable, such as type shielding, number of pairs and applicable standards.

Submit cable test results [under these specifications](#). **88-4.03C Field Quality Control**

Cable Assembly and Testing: Cable assembly and testing must comply with applicable requirements of ICEA Publication No. S-95-658/NEMA WC70 - Ethylene-Propylene-Rubber Insulated Wire and Cable for the Transmission and Distribution of Electrical Energy.

Submit factory test results under [section 79-1.01C](#), before shipment of cable. The following field tests (in addition to the tests specified in [section 88-2](#) shall be the minimum requirements:

1. Insulation resistance testing, using a DC megohmmeter, must be performed on cables operating at more than 2,000 volts to ground. Time-resistance readings must be taken and recorded at intervals of 30 seconds and one minute. Time-resistance voltage levels must be per the cable manufacturer's instructions.
2. Power cable rated at 600 volts must be tested for insulation resistance between phases and from each phase to a ground using a megohmmeter.
3. Field testing must be done after cable is installed in the raceways.
4. Test results must be submitted for review and acceptance.
5. Cables failing the tests must be replaced with a new cable or be repaired. Repair methods must be as recommended by the cable manufacturer and performed by persons certified by the industry.

Continuity Test: Control and instrumentation cable must be tested for continuity, polarity, undesirable ground, and origination. Such tests must be performed after installation and before placing cable in service.

#### **88-4.02 MATERIALS**

##### **88-4.02A General**

Not Used

##### **88-4.02B Delivery, Storage and Handling**

Protect all cables from damage at all times.

Protect cable ends from water entry under the manufacturer's recommended procedures. Cable ends must not be left open in manholes or other locations subject to submergence. If the cable ends become submerged before splicing or termination, replace the cables in their entirety.

Pull cables into raceways under the manufacturer's requirements. Under no circumstances should cable pulling tensions exceed the manufacturer's written instructions.

Limit pulling tensions on raceway cables to recommended by the cable manufacturer. Wire pulling lubricant, where needed, must be UL approved.

##### **88-4.02C General Low Voltage Cable**

Conductors, include grounding conductors, must be stranded copper. Aluminum conductor and/or solid conductor wire and cable will not be permitted. Insulation must bear the UL label,

MURRAY STREET BRIDGE AT THE SMALL CRAFT HARBOR, SEISMIC  
RETROFIT/BARRIER REPLACEMENT, CITY PROJECT NO. C409321, FEDERAL NO.  
PROJECT NO. STPLZ 5025(084)

the manufacturer's trademark, and identify the type, voltage, and conductor size. Conductors except flexible cords and cables, fixture wires, and conductors that form an integral part of equipment such as motors and controllers must conform to the requirements of Article 310 of the National Electric Code, latest edition, for current carrying capacity. Flexible cords and cables must conform to Article 400, and fixture wires must conform to Article 402. Wiring must have wire markers at each end.

#### **88-4.02D Low Voltage Power and Lighting Conductors**

Wire rated for 600 volts in duct or conduit for power and lighting circuits must be single conductor, Class B Type XHHW-2 cross-linked polyethylene conforming to UL-44 - UL Standard for Thermoset-Insulated Wires and Cables. THHN/THWN wire are not permitted to be used for any power or control wiring in this project, except as specifically permitted within control panels [under section 88-14](#)

Size conductors for feeders as defined in Article 100 of the NEC to prevent a voltage drop exceeding 3 percent at the farthest outlet of power, heating, and lighting loads, or combinations of such loads, and where the maximum total voltage drop on both feeders and branch circuits to the farthest connected load does not exceed 5 percent.

Wiring for 600-volt class power and lighting must be as manufactured by Okonite, General Cable, Southwire, or equal.

#### **88-4.02E Low Voltage Control Conductors**

Low voltage control wire in duct or conduit must be the same type as power and lighting wire indicated above.

Control wiring must be No.14 AWG.

Control wires inside panels and cabinets must be machine tool grade type MTW, UL approved, rated for 90 degrees C at dry locations, and be as manufactured by American, General Cable, or equal.

Multi-Conductor Cable: Where multi-conductor cable is [shown](#), provide type TC, multi-conductor cable assemblies with an overall heat, moisture, and sunlight resistant PVC jacket. Conductor insulation must be color coded per ICEA-S-58-679, method 1, colored compounds with tracers.

#### **88-4.02F Instrument Cable**

Instrumentation cable must be rated at 300 volts, minimum.

Individual conductors must be No. 16 AWG stranded, tinned copper. Insulation must be color coded polyethylene: black-clear for 2 conductor cable and black-red-clear for 3 conductor cable.

Instrumentation cables must be composed of the individual conductors, an aluminum polyester foil shield, a No. 18 or larger AWG stranded, tinned copper drain wire, and a PVC outer jacket with a thickness of 0.047-inches. Single pair, No. 16 AWG, twisted, shielded cable must be Belden Part No. 8719, similar by General Cable, or equal. Single triad, No. 16 AWG, twisted, shielded cable must be Belden Part No. 8618, similar by General Cable, or equal.

MURRAY STREET BRIDGE AT THE SMALL CRAFT HARBOR, SEISMIC  
RETROFIT/BARRIER REPLACEMENT, CITY PROJECT NO. C409321, FEDERAL NO.  
PROJECT NO. STPLZ 5025(084)

### **88-4.02G Cable Splices and Terminations**

Where cable lugs are required for power cable terminations, utilize compression lugs as manufactured by 3M Scotchlok 30000 and 31100 Series, Penn Union HBBLU and BLU, Burndy Hylug, or equal. Utilize compression tools as recommended by the manufacturer. Pressure type, twist-on connectors (wire nuts) will not be acceptable.

Pre-insulated fork tongue lugs must be as manufactured by Thomas & Betts, Burndy, or equal.

General purpose insulating tape must be Scotch No. 33, Plymouth Slip-knot, or equal. High temperature tape must be polyvinyl as manufactured by Plymouth, 3M, or equal.

Labels for coding 600-volt wiring must be computer printable or pre-printed, self-laminating, self-sticking, as manufactured by W.H. Brady, 3M, or equal.

Stress cone material for make-up of medium voltage shielded cable must be as manufactured by Raychem, 3M, or equal.

Shielded power cable must be spliced using kits specifically designed to splice medium voltage, shielded power cables. Design splice kits for continuous submergence. Heat shrink splice kits must be as manufactured by Raychem "Type HVS", or equal. "Cold" shrink splice kits must be as manufactured by 3M "5760 Series", or equal. Train personnel by the splice kit manufacturer for proper installation of the splices, and submit certification of training as a shop drawing. A certified trainee must perform the splice work.

#### **88-4.03 CONSTRUCTION**

##### **88-4.03A General**

Provide, terminate and test all power, control, and instrumentation conductors.

As a minimum, provide the number of control wires listed in the conduit schedule or [as shown](#). Treat excess wires as spares for future use.

Conductors must not be pulled into any raceway until raceway has been cleared of moisture and debris.

Instrumentation wire must not be run in the same raceway with power and control wiring except where specifically indicated.

Wire in panels, cabinets, and wireways must be neatly grouped using nylon tie straps, and neatly fanned out to terminals.

Single conductor cable in cable trays must be No. 1/0 or larger and of a type listed and marked for use in cable trays. Tray cable smaller than 1/0 must be multi-conductor, with outer jacket.

##### **88-4.03B Field Assembly**

###### **88-4.03B(1) General**

Properly tape and insulate wire taps and splices according to their respective classes.

In general, there must be no cable splices in underground manholes or pullboxes. If splices are necessary, splice the cables using submersible cable splices, suitable for continuous submergence. Splices in underground manholes and pullboxes may be made only with authorization.

Terminate stranded conductors directly on equipment box lugs making sure that conductor strands are confined within lug. Use forked-tongue lugs where equipment box lugs have not been provided.

Excess control and instrumentation wires must be long enough to terminate at any terminal block in the enclosure, be properly taped, be identified with origin, and be neatly coiled.

#### **88-4.03B(2) Control Wire and Cable**

Control conductors must be spliced or terminated only at the locations indicated and only on terminal strips or terminal lugs of vendor furnished equipment.

In motor control centers, and control panels, control wire and spare wire must be terminated to terminal strips.

Provide as a minimum the number of control wires listed in the conduit schedule or as in the contract documents. Treat excess wires as spares.

#### **88-4.03B(3) Instrumentation Wire and Cable**

Ground shielded instrumentation cables at one end only, preferably the receiving end on a 4 - 20 mA system.

Two and 3 conductor shielded cables installed in conduit runs which exceed available standard cable lengths may be spliced in pullboxes with authorization. Such cable runs must have only one splice per conductor.

#### **88-4.03B(4) Power Wire and Cable**

120/208-volt, 120/240-volt, and 480/277-volt branch circuit conductors may be spliced in suitable fittings at locations determined by you. Splice and terminate cables rated above 2,000 volts only at equipment terminals indicated.

Wrap splices to motor leads in motor terminal boxes with mastic material to form a mold and then tape them with a minimum of 2 layers of varnished cambric tape over-taped with a minimum of 2 layers of high temperature tape.

Terminate shielded power cable with pre-assembled stress cones in a manner approved by the cable and terminal manufacturer. Submit the proposed termination procedure as a Shop Drawing.

VFD shielded power cables must have the shield grounded at all locations where it is exposed.

#### **88-4.03C Identification**

##### **88-4.03C(1) Cable Identification**

##### **88-4.03C(1)(i) General**

Identify wire and cable for proper control of circuits and equipment and to reduce maintenance effort. Install identification at every termination point.

##### **88-4.03C(1)(ii) Identification Numbers**

Assign to each control and instrumentation wire and cable a unique identification number. Assign numbers to conductors having common terminals and show them on "as built" drawings. Identification numbers must appear within 3-inches of conductor terminals. "Control and

Instrumentation Conductors" are defined as any conductor used for control, interlock, alarm, annunciator, or signal purposes.

Assign multiconductor cable a number which must be attached to the cable at intermediate pull boxes and at stub-up locations beneath free-standing equipment. It is expected that the cable number will form a part of the individual wire number. Individual control conductors and instrumentation cable must be identified at pull points as described above. The instrumentation cable numbers must incorporate the loop numbers assigned in the contract documents.

Color Coding of Power Wire: Provide color coding throughout the entire network of feeders and circuits (600 volts and below) as follows:

Phase	240/120 Volts	208/120 Volts	240 Volts	480/277 Volts
Phase A	Black	Black	Black	Brown
Phase B	Red	Red	Red	Orange
Phase C	---	Blue	Blue	Yellow
Neutral	White	White	White	Gray
Ground	Green	Green	Green	Green

Insulated ground wire must be green, and neutral must be gray. Color coding and phasing must be consistent throughout the Site, but bars at panelboards, switchboards, and motor control centers must be connected Phase A-B-C, top to bottom, or left to right, facing connecting lugs.

Use color coding tape where colored insulation is not available. Colored identification tape may be used on conductors between the local disconnect and the load, where permitted by the NEC. Any phase changes necessary for proper rotation must be made at the driven equipment where colored insulation is used. Phase changes may be made on the load side of the local disconnect, where phase colors are identified using tape.

General purpose AC control cable must be red. General purpose DC control cable must be blue.

Terminate spare cable on terminal screws and identify them with a unique number as well as with destination.

Identify terminal strips by computer printable [plastic snap in labels](#).

#### 88-4.04 PAYMENT

Not Used

## 88-5 GROUNDING

### 88-5.01 GENERAL

#### 88-5.01A Summary

Section 88-5 includes specifications for grounding of electrical systems.

Like materials must be the end material of one manufacturer in order to achieve standardization of appearance, operation, maintenance, spare parts, and manufacturer's services.

MURRAY STREET BRIDGE AT THE SMALL CRAFT HARBOR, SEISMIC  
RETROFIT/BARRIER REPLACEMENT, CITY PROJECT NO. C409321, FEDERAL NO.  
PROJECT NO. STPLZ 5025(084)

### **88-5.01B Submittals**

Comply with section 79-1.01C.

Submit manufacturer's material information for connectors, clamps, and all grounding system components, showing compliance with the requirements of this Section.

#### **88-5.02 MATERIALS**

### **88-5.02A General**

Components of the grounding electrode system must be manufactured under UL 467 - Standard for Safety Grounding and Bonding Equipment, and must conform to the applicable requirements of National Electrical Code Article 250 and local codes.

Grounding loop conductors must be bare annealed copper conductors.

Conductors must be No. 2/0 unless indicated otherwise.

### **88-5.02B Ground Rods**

Unless indicated otherwise, provide ground rods minimum of 3/4 inch in diameter, 10 feet long, and with a uniform covering of electrolytic copper metallurgically bonded to a rigid steel core. Provide corrosion-resistant copper-to-steel bond.

The rods must conform to UL 467 and be of the sectional type, joined by threaded copper alloy couplings.

Buried, concrete-encased, or otherwise inaccessible cable-to-cable and cable-to-ground rod connections using exothermic welds must be as manufactured by Cadweld or Thermoweld or equal.

Alternatively, non-reversible, compression connectors may be used for inaccessible grounding connections, constructed of high-copper alloy, and manufactured specifically for the particular grounding application. The connectors must be Burndy "Hyground", similar by Thomas and Betts, or equal.

Exposed grounding connectors must be of the compression type (connector-to-cable), constructed of high-copper alloy, and manufactured specifically for the particular grounding application and must be as manufactured by Burndy or O.Z. Gedney or equal.

Use grounding clamps to bond each separately-derived system to the grounding electrode conductors.

Equipment Grounding Circuit Conductors must:

1. Be the same type and insulation as the load circuit conductors.
2. Be the minimum size must be as indicated. Where not indicated, sizes must conform to Table 250.122 of the National Electrical Code.
3. Have an equipment grounding wires as well as being equipment grounding conductors themselves if Metallic conduit systems.

Grounding Materials must be as manufactured by Copperweld, Thermoweld, OZ Gedney, or equal

MURRAY STREET BRIDGE AT THE SMALL CRAFT HARBOR, SEISMIC  
RETROFIT/BARRIER REPLACEMENT, CITY PROJECT NO. C409321, FEDERAL NO.  
PROJECT NO. STPLZ 5025(084)



## 88-5.03 CONSTRUCTION

### 88-5.03A General

Provide a separate grounding conductor, securely grounded in each raceway independent of raceway material.

Provide a separate grounding conductor for each motor and connect at motor box. Provide a supplemental ground connection for motor shaft grounding rings, where applicable.

Do not use bolts for securing the motor box to the frame or the cover for grounding connectors.

Sizes must be as indicated on the Conduit Schedule and under NEC Article 250.

Route the conductors inside the raceway.

Provide a grounding-type bushing for secondary feeder conduits that originate from the secondary section of each MCC section, switchboard, or panelboard.

Individually bond the raceway to the ground bus in the secondary section.

Provide a green insulated wire as grounding jumper from the ground screw to a box grounding screw, and, for grounding type devices, to the equipment grounding conductor.

Provide a separate grounding conductor in each individual raceway for parallel feeders. Connect the parallel ground conductors together at each end of the parallel run, as required by the NEC.

Interconnect the secondary switchgear MCC or panelboard neutral bus to the ground bus in the secondary switchgear compartment only at the service entrance point. For wye connected, 3 phase, separately derived systems with 3 wire distribution, connect the transformer neutral to the grounding electrode system at the transformer. Connections must be under the NEC.

Provide the duct bank ground system as indicated, including trenching, splices, ground rods, and connections to equipment and structures.

Measure ground impedance under IEEE STD 81 after installation but before connecting the electrode to the remaining grounding system. Provide additional grounding system testing [under section 88-2](#).

#### Low Voltage Grounded System (600V or less)

1. A low-voltage grounded system is defined as a system where the local power supply is a transformer, with the transformer secondary grounded.
2. Grounding system connections for a premises-wired system supplied by a grounded AC service must be provided with a grounding electrode connector connected to the grounded service conductor at each service, under the NEC.
3. The grounded circuit conductor must not be used for grounding non-current-carrying parts of equipment, raceways, and other enclosures except where specifically listed and permitted by the NEC.

### 88-5.03B Embedded Ground Connections

Underground and grounding connections embedded in concrete must be UL-listed ground grid connectors.

MURRAY STREET BRIDGE AT THE SMALL CRAFT HARBOR, SEISMIC  
RETROFIT/BARRIER REPLACEMENT, CITY PROJECT NO. C409321, FEDERAL NO.  
PROJECT NO. STPLZ 5025(084)

The connection must be made under manufacturer's instructions.

Do not conceal or cover ground connections until written [authorization](#).

### **88-5.03C Ground Ring**

Furnish trenching and materials as necessary to install the ground ring as indicated.

The bonding conductor must be in direct contact with the earth and of the indicated size.

Provide a minimum burial depth of 36 inches or as [shown](#), whichever is greater.

Re-compact disturbed soils to their original density in 6-inch lifts.

### **88-5.03D Duct Bank Ground**

Embed a grounding conductor in every duct bank as indicated. The ground conductor must be terminated at the ground grid at each end of the duct bank. Where no ground grid is installed, terminate at a suitable grounding electrode conductor near the end of the duct bank under the NEC.

### **88-5.03E Ground Rods**

Provide ground rods at the indicated locations.

A single electrode that does not have resistance-to-ground of 5 ohms or less must be augmented by additional electrodes to obtain this value.

Take the resistance-to-ground measurement during dry weather, a minimum of 48 hours after a rainfall.

Rods forming an individual ground array must be equal in length.

### **88-5.03F Instrumentation Shield Grounding**

Shielded instrumentation cable must have its shield grounded at one end only unless the authorized Shop Drawings indicate that the shield will be grounded at both ends.

The grounding point must be at the control panel or at the receiving end of the signal carried by the cable.

The termination of the shield drain wire must be on its own terminal screw.

Jumper together the terminal screws, using manufactured terminal block jumpers or a No. 14 green insulated conductor.

Connect the ground bus via a green No. 12 conductor to the main ground bus for the panel.

### **88-5.04 PAYMENT**

Not Used

## **88-6 ELECTRICAL RACEWAY SYSTEMS**

### **88-6.01 GENERAL**

#### **88-6.01A Summary**

Section 88-6 includes specifications for providing electrical raceway systems, complete and in place, as described in the contract documents.

MURRAY STREET BRIDGE AT THE SMALL CRAFT HARBOR, SEISMIC  
RETROFIT/BARRIER REPLACEMENT, CITY PROJECT NO. C409321, FEDERAL NO.  
PROJECT NO. STPLZ 5025(084)

If that individual equipment loads provided are larger than described in the contract documents, revise raceways, conductors, starters, overload elements, and branch circuit protectors as necessary in order to control and protect the increased connected load in conformance to NEC requirements as part of the work.

#### **88-6.01B Submittals**

Comply with section 79-1.01C.

Submit complete catalog cuts of raceways, fittings, boxes, supports, and mounting hardware, marked where applicable to show proposed materials and finishes.

#### **88-6.02 MATERIALS**

##### **88-6.02A General**

Pull and junction boxes, fittings, and other indicated enclosures dedicated to the raceway system must comply with the requirements of this Section.

Electrical Metallic Tubing (EMT) or Intermediate conduit (IMC) will not be accepted.

##### **88-6.02B Conduit**

###### **88-6.02B(1) Rigid Galvanized Steel (RGS) Conduit**

Provide conduit manufactured from mild steel, hot-dip galvanized inside and out, and manufactured under NEMA C80.1 – Electrical Rigid Steel Conduit, and UL-6 – Electrical Rigid Metal Conduit - Steel.

Rigid galvanized steel conduit must be as manufactured by Allied Tube & Conduit, Wheatland Tube, or equal.

###### **88-6.02B(2) PVC Rigid Non-Metallic Conduit**

Provide rigid non-metallic conduit manufactured from Schedule 40 or 80 PVC, as indicated, and sunlight-resistant and under NEMA TC-2 - Electrical Plastic Tubing and Conduit, and UL-651 - Standard for Rigid Non-metallic Conduit.

Polyvinylchloride rigid non-metallic conduit must be as manufactured by Carlon, Cantex, or equal.

###### **88-6.02B(3) Rigid PVC-Coated Galvanized Steel (RPGS) Conduit**

The conduit must meet the requirements for RGS conduit as specified above.

Bond a PVC coating to the outer surface of the galvanized conduit.

Ensure that the bond between the coating and the conduit surface is greater than the tensile strength of the coating.

Provide the inside surfaces and threads of the conduit with a 2-mil urethane coating.

Provide a PVC coating thickness not less than 40 mils.

The PVC-coated RGS must be manufactured under the following standards:

1. UL-6
2. ANSI C80.1

MURRAY STREET BRIDGE AT THE SMALL CRAFT HARBOR, SEISMIC  
RETROFIT/BARRIER REPLACEMENT, CITY PROJECT NO. C409321, FEDERAL NO.  
PROJECT NO. STPLZ 5025(084)

### 3. NEMA RN1 - PVC Externally Coated Galvanized Rigid Steel Conduit and Intermediate Metal Conduit

Rigid PVC-coated galvanized steel conduit must be as manufactured by Robroy Industries, O'Kote, Thomas & Betts, or equal.

#### **88-6.02B(3) Liquid-Tight Flexible Conduit**

Provide liquid-tight flexible conduit constructed of a flexible galvanized metal core with a sunlight-resistant thermoplastic outer jacket.

Provide liquid-tight flexible conduit manufactured under the requirements of UL-360 - Steel Conduits, Liquid-Tight Flexible.

Liquid-tight flexible conduit must be as manufactured by Anaconda, Sealtite, Electriflex, Liguatite, or equal.

#### **88-6.02C Fittings and Boxes**

##### **88-6.02C(1) General**

For use with metallic conduit, provide cast and malleable FD type iron boxes and fittings of the threaded type with 5 full threads.

Fittings and boxes must comply with the following:

1. Provide fittings and boxes with neoprene gaskets and non-magnetic stainless steel screws.
2. Attach covers by means of holes tapped into the body of the fitting.
3. Covers for fittings attached by means of clips or clamps will not be accepted.
4. Provide surface-mounted switches and receptacles must be housed in FS or FD-type weatherproof conduit fittings. Bell type are not permitted.
5. Provide boxes larger than standard cast or malleable types manufactured of Type 304 or Type 316 stainless steel, NEMA 4X.

In outdoor areas, terminate conduit in rain-tight hubs. Boxes must be as manufactured by Myers, O.Z. Gedney, Appleton, or equal. In other than outdoor areas, provide sealed locknuts and bushings.

In hazardous locations, provide conduit, fittings, and boxes suitable for the indicated Class and Division. Provide conduits terminated in NEMA 7 boxes with a male bushing, inside the box. Boxes must be as manufactured by Adalet Type PEM or equal.

##### **88-6.02C(2) Malleable Iron Fittings and Boxes**

For use with galvanized steel conduit, provide fittings and boxes constructed of malleable iron or gray-iron alloy with zinc plating and as manufactured by Crouse-Hinds (EATON) Form 5, Equivalent by O.Z. Gedney, Equivalent by Appleton or equal.

##### **88-6.02C(3) PVC Fittings and Boxes**

For use with rigid non-metallic conduit, provide fittings manufactured of solvent-welded PVC.

Provide boxes manufactured of PVC or fiberglass reinforced polyester (FRP). Boxes must be as manufactured by Hoffman, Crouse-Hinds (EATON), or equal.

Provide welding solvent as required for the installation of non-metallic conduit and fittings.

MURRAY STREET BRIDGE AT THE SMALL CRAFT HARBOR, SEISMIC  
RETROFIT/BARRIER REPLACEMENT, CITY PROJECT NO. C409321, FEDERAL NO.  
PROJECT NO. STPLZ 5025(084)

#### **88-6.02C(4) PVC-Coated RGS Fittings**

For use with PVC-coated RGS, provide PVC-coated coated the materials of the same manufacturer as the conduit.

Provide male and female threads and internal surfaces with a 2-mil urethane coating.

#### **88-6.02C(5) Stainless Steel Boxes**

Provide stainless steel boxes with PVC-coated RGS conduit and where indicated.

Provide NEMA 4X stainless steel boxes, constructed of Type 304 stainless steel.

Provide stainless steel of a minimum of 14-gauge thickness, with a brushed finish.

Door Hinges must comply with the following:

Provide doors with full-length stainless steel piano hinges.

Non-hinged boxes will not be accepted. Stainless steel boxes must be as manufactured by Hoffman, Rittal, or equal.

#### **88-6.02C(6) Sheet Steel Boxes**

Sheet steel boxes must be galvanized steel outlet and switch boxes. Sheet steel boxes must be as manufactured by Raco, Steel City, Appleton Electric, or equal.

#### **88-6.02D Hazardous Locations**

Conform with NEC Articles 501 and 502 for areas identified as "Hazardous Areas".

Provide threaded cast boxes and fittings for junction boxes and pull boxes in Class I and Class II areas. Unless otherwise indicated, boxes and fittings must be UL listed for installation in Class I, Groups A, B, C, and D and Class II, Groups E, F, and G.

Fixture hangers for pendant-mounted lighting fixtures must conform to Class I, Division 1 and Class II Division 1 requirements.

Provide conduit seals with sealing compound and fiber in Class I, Division I location within 18 inches of each conduit entering an enclosure containing electrical devices except for hermetically sealed switches and receptacles. Provide a conduit seal for each conduit leaving the hazardous location.

Flexible connections to motors and other vibrating equipment in Class I, Division I locations must be made with flexible fittings approved for Class I locations.

#### **88-6.02E Wireway**

##### **88-6.02E(1) General**

Provide wireway of the lay-in type and NEMA-rated for the area in which it is to be installed under the requirements of [these specifications](#).

Separate power, control, signal and communications cables by grounded metallic dividers in wireways or run in separate wireways.

##### **88-6.02E(2) Fittings and Covers**

Provide fittings and sections with non-magnetic stainless steel screws.

MURRAY STREET BRIDGE AT THE SMALL CRAFT HARBOR, SEISMIC  
RETROFIT/BARRIER REPLACEMENT, CITY PROJECT NO. C409321, FEDERAL NO.  
PROJECT NO. STPLZ 5025(084)

Attach covers by hinges and clamps to the bodies.

Covers attached by means of clips or screws will not be accepted.

Provide covers and bodies constructed of aluminum or minimum 14-gauge steel.

### **88-6.02E(3) Grounding**

Ground the steel and aluminum wireway bodies.

Provide steel dividers with steel wireways or aluminum dividers with aluminum wireways, and ground by means of an individual grounding conductor.

Non-metallic dividers will not be accepted.

### **88-6.02E(4) Terminations**

In indoor and outdoor areas, terminate conduit in rain-tight hubs must be as manufactured by Myers, O.Z. Gedney, or equal.

#### **88-6.03 CONSTRUCTION**

##### **88-6.03A General**

Run wiring in raceway unless indicated otherwise.

Install raceways between equipment as indicated.

Provide raceway systems electrically and mechanically complete before conductors are installed.

Bends and Offsets must comply with the following:

1. Provide bends and offsets smooth and symmetrical, and accomplished with tools designed for this purpose.
2. Provide factory elbows wherever possible.

Combined Raceways must comply with the following:

1. Raceways other than those containing power conductors may be combined in strict accordance with the NEC and with prior written authorization.
2. In general, combine only raceways containing the same type (control, signal, and the like) and voltage of conductors/cables, or dedicated conduits from one source to one device/equipment, under the NEC.
3. Permission from the Engineer does not relieve you of responsibility to meet national, state and local requirements.
4. Do not combine wiring for redundant systems into single raceways.

Routing must comply with the following:

1. Where raceway routings are indicated, follow those routings to the extent possible.
2. Where raceways are indicated but routing is not indicated, such as home runs or on conduit developments and schedules, raceway routing is your choice and provided in strict accordance with the NEC as well as customary installation practice.
3. Provide the raceway encased, exposed, concealed, or under-floor as indicated, except conceal conduit in finished areas unless specifically indicated otherwise.

MURRAY STREET BRIDGE AT THE SMALL CRAFT HARBOR, SEISMIC  
RETROFIT/BARRIER REPLACEMENT, CITY PROJECT NO. C409321, FEDERAL NO.  
PROJECT NO. STPLZ 5025(084)

4. Adjust routings in order to avoid obstructions.

Coordination must comply with the following:

1. Coordinate between trades before installing the raceways.
2. The lack of such coordination is not justification for extra compensation, and the [District](#) does not pay any costs for removal and re-installation to resolve conflicts.

Install exposed raceways parallel or perpendicular to structural beams.

Expansion Fittings must comply with the following:

1. Install expansion fittings with external bonding jumpers wherever exposed raceways cross building expansion joints.
2. Install expansion/deflection fittings where conduit movement is expected in more than one dimension, and where conduits transition out of structures in locations where differential settlement may occur.
3. Encased Expansion Fittings
  - a. Install encased expansion fittings wherever encased conduits cross building expansion joints.
  - b. Deflection type fittings must not be required for encased conduits crossing an expansion joint within a single structure.
4. Provide expansion and expansion/deflection fittings constructed of the same material as the raceway to which they are installed.

Install expansion fittings with bonding jumpers wherever raceways cross building expansion joints.

Install exposed raceways at least 1/2 inch from walls or ceilings except that at locations above finished grade where damp conditions do not prevail, install exposed raceways at least 1/4 inch from the face of walls or ceilings by the use of clamp backs or struts.

Wherever contact with concrete or dissimilar metals can produce galvanic corrosion of equipment, provide a means of suitable insulation in order to prevent such corrosion.

#### **88-6.03B Conduit**

Provide exposed conduit manufactured of rigid galvanized steel, except as follows and unless indicated otherwise:

1. In Class I, Div I or Div II hazardous locations, provide PVC-coated RGS or Schedule 80 PVC conduit as indicated on the conduit schedule
2. For conduit containing only grounding system bonding conductors, provide Schedule 80 PVC conduit.

Power conduit encased in concrete must be constructed of Schedule 40 PVC.

Analog control or instrumentation conduit must be RGS.

Concrete Encasement:

MURRAY STREET BRIDGE AT THE SMALL CRAFT HARBOR, SEISMIC  
RETROFIT/BARRIER REPLACEMENT, CITY PROJECT NO. C409321, FEDERAL NO.  
PROJECT NO. STPLZ 5025(084)

1. Where PVC or RGS conduit is stubbed up from a concrete encasement, provide a PVC-coated RGS elbow.
2. The conduit must emerge from the concrete in a direction perpendicular to the surface whenever possible.
3. Do not encase conduit in the bottom floor slab below grade.

Size:

1. Provide exposed conduit of 3/4-inch minimum trade size.
2. Provide encased conduit of one-inch minimum trade size.

Install supports at distances required by the NEC.

Concrete cover for conduit and fittings must not be less than 1-1/2 inches for concrete exposed to earth or weather, or less than 3/4 inch for concrete not exposed to weather or in contact with the ground.

Penetrations:

1. Provide conduit passing through walls or floors with plastic sleeves.
2. Perform core drilling under these specifications .
3. Conduits passing through a slab, wall, or beam must not significantly impair the strength of the construction.

Conduits embedded within a slab, wall, or beam (other than those merely passing through) must meet the following requirements:

1. Conduits with their fittings embedded within a column must not displace greater than 4 percent of the gross area of cross section;
2. Conduits must not be larger in outside dimension than 1/3 the overall thickness of the slab, wall, or beam in which it is embedded; and,
3. Conduits must not be spaced closer than 3 outside diameters on centers.

Place the conduit such that cutting, bending, or displacing reinforcement from its proper location will not be required.

Coat threads with a conductive lubricant before assembly.

Joints:

1. Provide joints tight, thoroughly grounded, secure, and free of obstructions in the pipe.
2. Adequately ream the conduit in order to prevent damage to the wires and cables inside.
3. Use strap-wrenches and vises to install the conduit, in order to prevent wrench marks on the conduit.
4. Replace conduit with wrench marks.
5. Where installed in chemical or fuel containment areas, the conduit must not have joints or fittings located below the top of the containment area to prevent entry of chemicals or fuel into the conduit system.

Slope:

1. Wherever possible, slope the conduit runs to drain at one or both ends of the run.

MURRAY STREET BRIDGE AT THE SMALL CRAFT HARBOR, SEISMIC  
RETROFIT/BARRIER REPLACEMENT, CITY PROJECT NO. C409321, FEDERAL NO.  
PROJECT NO. STPLZ 5025(084)



2. Wherever conduit enters a substructure below grade, slope the conduit in order to drain water away from the structure.
3. Take extreme care in order to avoid pockets or depressions in the conduit.

Where conduits from duct banks enter building walls below grade, transition to PVC-coated RGS at least 12" outside the wall. Installation of PVC-coated rigid steel conduit through a core-drilled hole in an exterior wall below-grade must utilize a sealing device as manufactured by Link Seal, or equal.

#### Connections:

1. Make connections to lay-in-type grid lighting fixtures by using flexible metal conduit not exceeding 4 feet in length.
2. Make connections to motors and other equipment subject to vibration by using liquid-tight flexible conduit not exceeding 3 feet in length.
3. Provide equipment subject to vibration that is normally provided with wiring leads with a cast junction box for the make-up of connections.

Provide conduit seal fittings in hazardous classified locations, in strict accordance with the NEC.

Provide conduit, fittings, and boxes required in hazardous classified areas suitably rated for the area, and provide in strict accordance with NEC requirements.

Duct sealant must be foam duct sealant such as Polywater FST or equal. Provide duct sealant at the following locations:

1. Where required by NEC Article 300.7.
2. In areas where chlorine gas or fumes from sodium hypochlorite exist to prevent passage of gas through the raceway system.

#### Empty Conduits:

1. Tag empty conduits at both ends to indicate the final destination.
2. Where it is not possible to tag the conduit, identify the destination by means of a durable marking on an adjacent surface.
3. Install a pull-cord in each empty conduit in floors, panels, manholes, equipment, and the like.
4. Install a removable plug on empty conduits that terminate below grade, in vaults, manholes, handholes, and junction or pullboxes.

#### Identification of Conduits:

1. Identify conduits at ends and at pulling points.
2. Identification must be the unique conduit number assigned in the contract documents.
3. Other than 120 VAC panelboard circuits, if a conduit has not been assigned a unique number in the contract documents, assign a unique number following the numbering scheme used in the contract documents.
4. Assign a unique number to 120 VAC panelboard circuits, similar to the cable numbering scheme used in the contract documents.
5. Provide conduit identification by a stamped or engraved non-corroding metal tag attached to the conduit bushing.

MURRAY STREET BRIDGE AT THE SMALL CRAFT HARBOR, SEISMIC  
RETROFIT/BARRIER REPLACEMENT, CITY PROJECT NO. C409321, FEDERAL NO.  
PROJECT NO. STPLZ 5025(084)

6. Provide an engraved phenolic nameplate or a computer printed self-adhesive label attached to the equipment or enclosure inside which the conduit terminates.
7. Markings with a pen or paint will not be accepted.

Identification of Pullboxes and Junction Boxes:

1. Identify pullboxes and junction boxes.
  2. Identification must be the unique conduit number assigned in the contract documents, or if not assigned a unique number you must assign one following the numbering scheme used in the contract documents.
  3. Provide box identification by a stamped or engraved non-corroding metal tag or an engraved phenolic nameplate, in accordance with the requirements of Section 26 00 00 – Electrical Work, General, and attach to the box or enclosure.
1. Markings with a pen or paint will not be accepted.

Provide conduit for data cables under the equipment manufacturer's instructions, especially regarding separation from low- and medium-voltage power raceways.

**88-6.04 PAYMENT**

Not Used

## **88-7 UNDERGROUND RACEWAY SYSTEMS**

### **88-7.01 GENERAL**

#### **88-7.01A Summary**

Section 88-7 includes specifications for providing underground raceway systems, complete and in place, under the contract documents.

Pullboxes and fittings dedicated to the underground raceway system must comply with the requirements of this Section.

#### **88-7.01B Submittals**

Comply with section 79-1.01C.

Submit complete catalog cuts of all raceways, fittings, pullboxes, marked where applicable in order to show proposed materials and finishes.

#### **88-7.02 MATERIALS**

##### **88-7.02A Pullboxes**

###### **88-7.02A(1) General**

Equip pullboxes with pulling-in irons, opposite and below each ductway entrance.

Provide pullboxes with closed bottoms; open-bottom pullboxes will not be accepted.

Provide PVC ductbank conduits with end bells.

Precast Pullboxes must be as manufactured by Jensen Precast, Old Castle, U.S. Precast or equal.

MURRAY STREET BRIDGE AT THE SMALL CRAFT HARBOR, SEISMIC  
RETROFIT/BARRIER REPLACEMENT, CITY PROJECT NO. C409321, FEDERAL NO.  
PROJECT NO. STPLZ 5025(084)

### **88-7.02A(2) Frames and Covers**

Provide traffic-type covers with an H-20 loading, except as otherwise indicated

Identify pullbox covers as "ELECTRIC" by providing raised letters cast into the covers.

Provide frost-proof and water-tight grey iron frames and covers with solid lids and inner lids, and with 28-inch clear openings.

Bolt the covers and lids to cast-in-place steel frames using corrosion-resistant hardware.

Factory-prime the frames.

Provide covers constructed of cast-iron, and provide pick holes.

Provide frames with a 1/2-inch drilled and tapped hole and lug in order to accommodate a No. 4/0 AWG bare stranded copper conductor connected to a ground rod and the ground conductor of power cables passing through the pullboxes.

### **88-7.02A(3) Brackets**

Provide non-metallic, non-conductive brackets and stanchions in pullboxes as required for racking wiring through the pullboxes. Attach to pullboxes walls using stainless steel anchors and hardware.

Brackets and stanchions must be as manufactured by Underground Devices, Inc., or equal.

### **88-7.03 CONSTRUCTION**

#### **88-7.03A General**

Install underground raceways between pullboxes as indicated.

Raceway systems must be electrically and mechanically complete before conductors are installed.

Provide bends and offsets smooth and symmetrical, and fabricated with tools designed for this purpose.

Use factory elbows wherever possible.

To the extent possible, follow the raceway routings as [shown](#).

Adjust the indicated routings as necessary in order to avoid obstructions.

#### Coordination with Other Trades

1. Coordinate with other trades before installation of raceways.
2. The lack of coordination is not be justification for extra compensation.
3. Perform removal and re-installation to resolve conflicts as part of the work.

#### **88-7.03B Ductbanks**

Install ductbanks under the following criteria:

1. Assemble the duct using high-impact, non-metallic spacers and saddles in order to provide conduits with vertical and horizontal separation.
2. Set the plastic spacers every 5 feet.

MURRAY STREET BRIDGE AT THE SMALL CRAFT HARBOR, SEISMIC  
RETROFIT/BARRIER REPLACEMENT, CITY PROJECT NO. C409321, FEDERAL NO.  
PROJECT NO. STPLZ 5025(084)

3. Anchor the duct array every 5 feet in order to prevent movement during the placement of concrete.
4. Lay the duct on a grade line of at least 3 inches per 100 feet, sloping towards pullboxes.
5. Install the duct and adjust the pullbox depths such that the top of the concrete envelope is a minimum of 18 inches below grade and a minimum of 24 inches below roadways.
6. Accomplish changes in direction of the duct envelope by more than 10 degrees horizontally or vertically by using bends with a minimum radius 24 times the duct diameter.
7. Stagger duct couplings a minimum of 6 inches.
8. Provide select backfill or sand for the bottom of the trench.
9. Cleaning
  - a. Clean each bore of the completed ductbank by drawing through it a standard flexible mandrel, one foot long and 1/4 inch smaller than the nominal size of the duct.
  - b. After passing the mandrel, draw through a wire brush and swab.
10. For spare raceways not indicated to contain conductors, provide a 1/8-inch polypropylene pull cord installed throughout the entire length of the raceway.

Grout duct entrances smooth, and terminate ducts with flush end bells.

Assemble sections of pre-fabricated pullboxes using waterproof mastic, and set on a 8-inch bed of gravel as recommended by the manufacturer or as required by field conditions.

Provide watertight ductbank penetrations through walls of pullboxes, and building walls below grade.

Terminate concrete-encased ductbanks at building foundations.

Where ducts enter buildings, provide duct sealant in every duct at the building-end of the duct run to prevent water or condensation entry from the duct bank into the building.

Ductbanks must be as manufactured by Polywater FST, FST-MINI or equal.

When duct enters the building on a concrete slab on grade, do not encase the duct but transition to rigid steel PVC-coated conduits on stub-ups.

Sealing must be as manufactured by Link Seal or equal and comply with the following:

1. Where an underground conduit enters a structure through a concrete roof or a membrane-waterproofed wall or floor, provide a sealing device.
2. Use the sealing device with rigid steel conduit.
3. Transition from PVC to rigid steel conduit before building entry.

#### **88-7.04 PAYMENT**

Not Used

## 88-8 SEISMIC RESTRAINTS AND SUPPORTS

### 88-8.01 GENERAL

#### 88-8.01A Summary

Section 88-8 includes specifications for providing seismic restraint devices for electrical systems, complete and operable, under the contract documents.

#### 88-8.01B Submittals

Comply with section 79-1.01C.

Submit seismic anchoring calculations with equipment and raceway submittals. Calculations and determination of anchor types must be performed and stamped by a licensed structural engineer registered in the State of California. Engineer must either be employed by the equipment manufacturer or the equipment manufacturer must hire an independent consultant to perform these services.

Submit equipment anchoring methods. Include anchoring locations, anchor types and minimum anchor embedment depths.

Submit catalog cuts and material list for each anchor type.

Submit recommended torque values for bolting.

### 88-8.02 MATERIALS

#### 88-8.02A Seismic Anchoring and Restraints

##### 88-8.02A(1) Equipment Anchors

Securely anchor electrical equipment. Anchoring must have the capability of withstanding seismic forces per ASCE 7-05, Minimum Design Loads for Buildings and Other Structures, Chapter 13, with SDS = 0.686, IP = 1.5, RP = 2.5, and ap = 1.0.

##### 88-8.02A(2) Raceway Supports:

Seismically support raceways (conduit, cable tray, busway, etc.) 2.5 inches inside diameter and larger and suspended 12 inches or more from the top of the raceway to the bottom of the support for the hanger. Raceway supports must have the capability of withstanding seismic forces per ASCE 7-05, Minimum Design Loads for Buildings and Other Structures, Chapter 13, with SDS = 0.686, IP = 1.5, RP = 2.5, and ap = 1.0.

Seismically supported raceway systems must currently be pre-approved by the California Office of Statewide Health Planning and Development.

#### 88-8.02B Mounting Hardware

##### 88-8.02B(1) Miscellaneous Hardware

Provide nuts, bolts, and washers constructed of stainless steel.

Anchor bolts and screws must be Type 316 ASTM A276 stainless steel. Nuts must be hex Type 316 stainless steel, ASTM A194, Grade 8M, or ASTM F594, Type 316 stainless steel.

Provide threaded rods for trapeze supports constructed from continuous threaded galvanized steel, 3/8-inch diameter minimum.

Threaded Rods must be ASTM A276, Type 304 stainless steel.

MURRAY STREET BRIDGE AT THE SMALL CRAFT HARBOR, SEISMIC  
RETROFIT/BARRIER REPLACEMENT, CITY PROJECT NO. C409321, FEDERAL NO.  
PROJECT NO. STPLZ 5025(084)

### **88-8.02B(2) Struts**

Construct struts for mounting of conduits and equipment of 304 stainless steel.

Where contact with concrete or dissimilar metals may cause galvanic corrosion, use suitable non-metallic insulators in order to prevent such corrosion.

Aluminum strut for free-standing support frames are not permitted.

Struts must be as manufactured by Unistrut; B-Line, or equal.

### **88-8.02B(3) End Caps**

Provide plastic protective end caps for all exposed strut ends.

End Caps must be as manufactured by Unistrut, Model P2860, or equal.

### **88-8.02B(4) Anchors**

Provide stainless steel expansion anchors for attaching equipment to concrete walls, floors, and ceilings.

Wood plugs will not be accepted.

Anchor must be "Power-Bolt" or "Power-Stud" as manufactured by Power Fasteners, Inc.; similar by Star, or equal.

### **88-8.03 CONSTRUCTION**

Provide and install equipment anchors and raceway supports in accordance with the final shop drawings and under manufacturer's instructions. Properly torque all bolts to the recommended values.

### **88-8.04 PAYMENT**

Not Used

## **88-9 ELECTRICAL UTILITY SERVICE**

### **88-9.01 GENERAL**

#### **88-9.01A Summary**

##### **88-9.01A(1) General**

Section 88-9 includes specifications for coordinating with the utility companies to provide service including connecting to utilities and providing utility service to the facilities.

You are the point of contact with PG&E. The Engineer must be copied on all correspondence with PG&E.

##### **88-9.01A(2) Scheduling**

Schedule and coordinate the work of subcontractors, suppliers, and other individuals or entities performing or furnishing any of your work.

Before bidding, contact the utilities to determine the work and materials that will be required from you, and all fees and permits that will be required, so that all utility systems furnished by you will be included in the bid.

MURRAY STREET BRIDGE AT THE SMALL CRAFT HARBOR, SEISMIC  
RETROFIT/BARRIER REPLACEMENT, CITY PROJECT NO. C409321, FEDERAL NO.  
PROJECT NO. STPLZ 5025(084)

Before start of work, make arrangements for temporary telephone and electrical service as required.

Before starting work, coordinate electric service entrance requirements with local electric utility to ensure that the installation will be complete as specified in these contract documents.

Before starting work, coordinate underground conduit installations with other work to eliminate conflicts and avoid interferences with other underground systems.

### **88-9.01B Definitions**

For the purposes of providing materials and installing electrical work the following definitions are to be used.

Outdoor area: Exterior locations where the equipment is normally exposed to the weather and including below grade structures, such as vaults, manholes, handholes and in-ground pump stations.

Hazardous areas: Class I, II or III areas as defined in NFPA 70.

Shop fabricated: Manufactured or assembled equipment for which a UL test procedure has not been established.

### **88-9.01C Submittals**

Comply with section 79-1.01C.

Submit certification that the intended installation has been coordinated with the utility company.

Include a narrative description of the utility's requirements and points of connection, names, and telephone numbers for contacts at the utilities.

### **88-9.01D Quality Assurance**

Referenced Standards:

1. American Institute of Steel Construction (AISC):
2. Steel Construction Manual.
3. American National Standards Institute (ANSI).
4. ASTM International (ASTM):
5. A36/A36M, Standard Specification for Carbon Structural Steel.
6. A123/A123M, Standard Specification for Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products.
7. A153/A153M, Standard Specification for Zinc Coating (Hot-Dip) on Iron and Steel Hardware.
8. Institute of Electrical and Electronics Engineers, Inc. (IEEE):
9. C2, National Electrical Safety Code (NESC).
10. National Fire Protection Association (NFPA):
11. 70, National Electrical Code (NEC).
12. National Electrical Manufacturers Association (NEMA)
13. Underwriters Laboratories, Inc. (UL).
14. Materials to be listed by a Nationally Recognized Testing Laboratory (NRTL) under applicable material standards.
15. Applicable material standards including, but not limited to, ANSI, FM, IEEE, NEMA and UL.

MURRAY STREET BRIDGE AT THE SMALL CRAFT HARBOR, SEISMIC  
RETROFIT/BARRIER REPLACEMENT, CITY PROJECT NO. C409321, FEDERAL NO.  
PROJECT NO. STPLZ 5025(084)

16. NRTL includes, but is not limited to, CSA Group Testing and Certification (CS), FM Approvals LLC (FM), Intertek Testing Services NA, Inc. (ETL), and Underwriters Laboratories, Inc. (UL).
17. PG&E Utility UG-1 Greenbook.

#### **88-9.02 MATERIALS**

Materials and equipment used must be listed or labeled by UL, or other equivalent recognized independent testing laboratory.

#### **88-9.03 CONSTRUCTION**

##### **88-9.03A General**

The facility will be service from existing overhead 12 kV PG&E service utility lines. A PG&E-owned transformer steps the incoming 12 kV down to 120/240V.

Coordinate and obtain inspections and final installation approval from the serving utilities and other authorities having jurisdiction.

##### **88-9.03B Electrical Service:**

Provide all Work and materials for providing temporary the permanent electrical service.

All fees and costs associated with the permanent electric service will be paid by the owner.

All fees and costs associated with temporary construction power shall be paid by the Contractor.

Provide electrical ducts, raceways, conductors, and connections indicated on the Drawings, and all other Work and materials required for a complete electrical service including but not limited to:

Completion of all PG&E service requirements.

Construction of the primary service trench from the PG&E Service Pole to pullbox and the new utility transformer.

Installation of new secondary conduits and service trench.

PG&E will provide and terminate the primary service conductors.

Coordination with PG&E for all PG&E inspection activities.

Providing personnel, including equipment manufacturers, as required to perform all acceptance testing required by PG&E:

#### **88-9.04 PAYMENT**

Not Used

## **88-10 CONTROL STRATEGIES**

### **88-10.01 GENERAL**

#### **88-10.01A Summary**

Section 88-10 includes specifications for providing [the Controller](#) Based Control System application programming [and configuration](#) required to implement the control strategies [as](#) described [below for a](#) complete and operable Instrumentation and Control Process System. [The](#)

MURRAY STREET BRIDGE AT THE SMALL CRAFT HARBOR, SEISMIC RETROFIT/BARRIER REPLACEMENT, CITY PROJECT NO. C409321, FEDERAL NO. PROJECT NO. STPLZ 5025(084)



controller programming and SCADA integration will be performed as part of this contract by the Counties sole source SCADA integrator, Telstar Instrument Inc. This station will be integrated into the Counties existing Samsara cloud based SCADA system.

The control strategies are intended to describe the general operation of the systems and processes required to be installed or modified as part of this project. The control strategies are not intended to be all-inclusive operational procedures for the operation of the complete facility. Make refinements, modifications, and additions to these strategies as required.

Control Strategy General Description: The control strategy general description provides a narrative of the process, its related equipment, as well as the function, the philosophy and methodology of the process control. It provides guidelines for programming the control functions. The general description together with the I/O shown on the P&IDs and other section of the strategy comprise the design criteria of the process control system.

#### **88-10.01B Definitions**

**Local:** Means “in the field” i.e. at the physical location of the equipment. Local control means at the equipment or control from the MCC starter panel.

**Remote:** Means away from the equipment. Remote control means ability to control the equipment at the control panel/controller or from the HMI away from the equipment or away from the MCC.

**Local Control Panel (CP-X):** refers to the presence of a field-situated panel, which serves as a control location. Usually this panel contains the controller.

**Local Display:** Refers to the display of equipment status or process variable at a location in the field, local to the equipment.

**Local Interlock:** Refers to the presence of field control logic in which the status of other equipment directly effects the operation and control of the equipment being controlled.

**Control Systems Alarms and Status:** Variable or status data to be alarmed in the Control Room.

**Local Alarms:** Alarms announced in the field.

**Set Points:** Values which are adjustable at the Engineer (supervisor) level displays without requiring any software configuration. These values are not adjustable by the operator from the display station. Whenever a LOCAL/REMOTE set point selection is provided, in LOCAL, the set point is adjustable from the equipment. In REMOTE, the set point is adjustable from a REMOTE set point input.

#### **88-10.01C Submittals**

Comply with section 79-1.01C.

Furnish submittals under the requirements of section 88-11.

#### **88-10.01D Quality Assurance**

Test the control strategies as part of the factory and field acceptance tests and under the requirements specified in section 88-11.

MURRAY STREET BRIDGE AT THE SMALL CRAFT HARBOR, SEISMIC  
RETROFIT/BARRIER REPLACEMENT, CITY PROJECT NO. C409321, FEDERAL NO.  
PROJECT NO. STPLZ 5025(084)

## 88-10.02 MATERIALS

Not Used

## 88-10.03 CONSTRUCTION

### 88-10.03A General

A new [Samsara Industrial Gateway IG41](#) will be installed and configured at the Murray Street flow monitoring station. Data related to flow, flow totalization, various power monitoring parameters and level alarms from the leak containment vault will be locally processed and transmitted to the [District's existing Samsara cloud based SCADA application. The IG412 programming and SCADA integration will be performed as part of this contract by the District's sole source SCADA integrator, Telstar Instrument Inc.](#)

### 88-10.03B CS-01 Alarm Handling

Configuration requirements for generating and handling alarms must be based on [the District preference](#) and this description. Those alarms listed and/or shown must be configured and provided with preassigned, adjustable setpoints. Only individuals with a sufficient security level can adjust setpoints. Each alarm must be operator settable via the SCADA system with enable/disable selection functionality.

All alarms must be displayed on the current alarm summary display. Alarms which have occurred, but have not been acknowledged must blink on and off on the display. Acknowledged alarms must not blink. Point and click targets or function key assignments must be provided for SILENCE, ACKNOWLEDGE ALL, and ACKNOWLEDGE.

An alarm must be kept on the alarm summary display page until it is cleared. The display list must list alarms sequentially with the most recent alarms at the top of the list. Each alarm must be displayed with its tag number, a brief description, along with time and date of occurrence.

### 88-10.03C CS-02 Analog Scaling and Alarms

All analog inputs must be scaled within the [IG41](#) to engineering units. All analogs should be scaled [to match the outputs of the related instruments](#). Coordinate exact scales with the [District](#) via submittal before startup. As much as practical, keep all analogs with as much precision as is available within the [IG41](#). In general, all analogs must be scaled to 4-digit precision.

Test analog inputs to make sure the input is within range (i.e. between 4 and 20mA). Inputs not within range must generate a transducer failure alarm.

Analog alarms with enable/disable options must be generated for High GAC Differential Pressure conditions, and adjustable setpoints for the setpoints & delays must be provided.

### 88-10.03D CS-03 Indications

All indications, alarms, and statuses shown on the Contract Drawings and others required to operate the system shall be provided in an organized & logical fashion. Analog & setpoints shall be shown & available for the operators to view. Operators signed on with appropriate security level shall be permitted to change a setpoint. SCADA graphics shall depict the process flow as illustrated on P&IDs.

The [IG41 configuration](#) and graphics setup shall meet the intent of the Contract Drawings. The following additional program functions shall be provided (minimum):

Loss of Signal or Out of Range alarms.

MURRAY STREET BRIDGE AT THE SMALL CRAFT HARBOR, SEISMIC  
RETROFIT/BARRIER REPLACEMENT, CITY PROJECT NO. C409321, FEDERAL NO.  
PROJECT NO. STPLZ 5025(084)

All Enable/Disable points, setpoints, and delay timer registers shall be adjustable from the Operator Interface Terminal (OIT) and SCADA screens.

Tagname and I/O point designations for [controllers](#) shall match those listed on the Contract Drawings. Unique descriptions shall be provided for all new or modified tagnames.

For each Flow AI signal, provide the following [controller](#) and SCADA setup:

1. Flow (forward direction of bi-directional flowmeter)
2. Backwash Flow (reverse direction of bi-directional flowmeter)

### **88-10.03E CS-04 Flow Totalization**

Flow totalization will be performed within the local [controller](#).

[Flow through the meter shall be totalized in three \(3\) separate floating-point \(32-bit\) tags \(registers\):](#)

- [1. Daily \(reset at owner-determined clock hour, likely midnight\)](#)
- [2. Resettable \(reset with a control bit\)](#)
- [3. Non-resettable. The daily totals shall be stored locally for the last 30 days. At the daily reset time, the 30 days of data shall be moved down one register. The oldest data point, day 30, is overwritten with the day 29 value, and so on.](#)

### **88-10.04 PAYMENT**

Not Used

## **88-11 INSTRUMENTATION AND CONTROL FOR PROCESS SYSTEMS**

### **88-11.01 GENERAL**

#### **88-11.01A Summary**

##### **88-11.01A(1) General**

Section 88-11 includes specifications for providing Instrumentation and Control System (I&CS) complete and operable, under the contract documents.

Additional information necessary to complete the work is included on the plans and in other sections of the specifications.

The requirements of this Section apply to every component of the I&CS unless indicated otherwise.

Perform a complete take-off from all plans and specifications in order to determine accurate quantities of equipment and materials.

Without limiting the generality of other requirements of these specifications, all work specified must conform to or exceed the applicable requirements of the referenced documents to the extent that the requirements are not in conflict with the provisions of this Section; provided, that where such documents have been adopted as a code or ordinance by the public agency having jurisdiction, such code or ordinance must take precedence.

MURRAY STREET BRIDGE AT THE SMALL CRAFT HARBOR, SEISMIC  
RETROFIT/BARRIER REPLACEMENT, CITY PROJECT NO. C409321, FEDERAL NO.  
PROJECT NO. STPLZ 5025(084)

The I&CS work must conform to or exceed the applicable regulations, standards, specifications, and codes which are referenced [below](#), and current as of the date of the final inspection for this Contract, including, but not limited to, those which are established by the following sources:

1. The International Society of Automation (ISA)
2. National Electrical Code (NEC)
3. National Fire Protection Association (NFPA)
4. Institute of Electrical and Electronic Engineers (IEEE)
5. Occupational Safety and Health Administration (OSHA)
6. American National Standards Institute (ANSI)
7. National Electrical Manufacturers Association (NEA)
8. Insulated Cable Engineers Association (ICEA)
9. Local Power and Telephone Companies
10. Local Authorities having jurisdiction over the work
11. Federal Communication Commission (FCC)
12. Underwriter Laboratory (UL)

Where the requirements in these specifications or on the plans are greater or more rigid than the mandatory requirements referenced above, the applicable specifications or plans will govern.

In the case of conflict between any mandatory requirements and specifications or plans, the mandatory requirement must be followed in each case, but only after submitting such proposed changes for approval.

Nothing contained in these specifications or shown on the plans will be so construed to conflict with any national, state, municipal, or local laws or regulations governing the installation of work specified, and all such acts, ordinances, and regulations, including the National Electrical Code, are hereby incorporated and made a part of these specifications. Satisfy all such requirements at no additional expense to the [District](#).

The plans and specifications are complementary to each other; what is called for by one is as binding as if called for by both. If a conflict between plans and specifications is discovered, report to the Engineer as soon as possible for resolution. Should a conflict exist between the plans, specifications, and/or mandatory requirements (i.e., codes, ordinances, etc.), it will be assumed that the more expensive method has been estimated, unless such alternate has been agreed to before submission of bids.

#### **88-11.01A(2) Coordination**

Examine the plans and specifications [and before starting](#) work, obtain a ruling from the Engineer any conflicts between divisions.

Provide work plan and identify methodologies for equipment installation with provision made for the most expeditious means to complete the work.

Treat any item or subject omitted from these specifications, but which is mentioned or reasonably specified on the plans and pertains to the instrumentation and control system, as being integral to the overall system. Provide such specified items or subjects.

Do not cut structural members without prior authorization.

MURRAY STREET BRIDGE AT THE SMALL CRAFT HARBOR, SEISMIC  
RETROFIT/BARRIER REPLACEMENT, CITY PROJECT NO. C409321, FEDERAL NO.  
PROJECT NO. STPLZ 5025(084)

Coordinate their work with other trades, and the [Engineer](#).

Determine cable lengths for manufacturer supplied equipment and devices with integrated cables.

### **88-11.01A(3) Field Conditions**

The I&CS must be designed and constructed for satisfactory operation and long, low maintenance service under the following environmental conditions:

1. Remote stand alone utility service pedestal with [controller](#) and communication to central plant
2. Ambient temperature range: -18° through 60° C
3. Thermal shock: 1.0° (1.8° F) per minute maximum
4. Relative humidity: 95 percent maximum non-condensing.
5. Unless specified otherwise, provide equipment and instrumentation suitable for continuous operation at an elevation of 5000 feet above sea level.

### **88-11.01B Definitions**

**System Supplier:** The System Supplier is a single firm, corporation, or other entity assuming full responsibility through the Contractor to perform all engineering and to select, furnish, program, configure, integrate, supervise the installation and connections, test, calibrate, and place into operation all instrumentation, controls, communication hardware and software. The System Supplier must specialize and have an experienced engineering and technical staff in the design, integration, and supply of systems similar to the one in these contract documents.

**AI/AO:** Analog Input/Output.

**CMMS:** Computerized Maintenance Management System.

**DI/DO:** Digital Input/Output.

**FOC:** Fiber Optic Cable

**HMI:** Human Machine Interface.

**HSE:** High Speed Ethernet.

**I/O:** Input/Output Signals.

**LAN:** Local Area Network.

**LIMS:** Laboratory Information Management System.

**MM:** Multimode (Fiber).

**OIT:** Operator Interface Terminal

**OPC:** OLE for Process Control (communication interface driver).

**PID:** Proportional, Integral and Derivative Process Controller.

**PS:** Pump Station.

MURRAY STREET BRIDGE AT THE SMALL CRAFT HARBOR, SEISMIC  
RETROFIT/BARRIER REPLACEMENT, CITY PROJECT NO. C409321, FEDERAL NO.  
PROJECT NO. STPLZ 5025(084)

**RAM:** Random Access Memory.

**SCADA:** Supervisory Control and Data Acquisition.

**SM:** Single Mode (Fiber Optic)

**UPS:** Uninterruptible Power Supply

**WAN:** Wide Area Network.

**WTP:** Water Treatment Plant

**WWTP:** Wastewater Treatment Plant

### **88-11.01C Submittals**

#### **88-11.01C(1) Submittals**

Comply with section 79-1.01C.

Coordinate the I&CS part of the work so that a complete instrumentation and control system will be provided and will be supported by accurate Shop Drawings and as-built drawings.

The submittals and their schedules must be under the requirements listed below. Any incomplete submittal will be rejected and returned without comments.

Interface between instruments, float switches, flowmeters and other equipment related to the I&CS must be included in the shop drawing submittal.

Shop drawing must be submitted in paper and electronic (PDF) format and must include, but is not be limited to:

1. Equipment descriptive data, including equipment tag as identified in the contract documents.
2. Full manufacturer's part number indicating all selected options.
3. Equipment installation, service manuals, operation/maintenance manuals and recommended spare parts lists.
4. Schematics and interconnecting wiring diagrams.
5. Records of conductor identification, field terminals, changes, etc.
6. Instrumentation and control panel shop drawings, face layouts, schematics and point-to-point wiring diagrams.
7. Ethernet network control system architecture drawings complete with wiring identification numbers.
8. Records of as-built information for the control system components.

**Symbols and Nomenclature:** In these contract documents, systems, meters, instruments, and other elements are represented schematically, and are designated by symbols as derived from Instrument Society of America Standard ISA S5.1 - Instrumentation Symbols and Identification. The nomenclature and numbers designated in the specifications and on the plans must be employed exclusively throughout Shop Drawings, and similar materials. Do not replace other symbols, designations, or nomenclature unique to the manufacturer's standard methods.

Shop Drawings must include the letter head or title block of the System Supplier. The title block must include, as a minimum, the System Supplier's registered business name and address, project name, drawing name, revision level, and personnel responsible for the content of the drawing.

MURRAY STREET BRIDGE AT THE SMALL CRAFT HARBOR, SEISMIC  
RETROFIT/BARRIER REPLACEMENT, CITY PROJECT NO. C409321, FEDERAL NO.  
PROJECT NO. STPLZ 5025(084)

1. Organization of the Shop Drawing submittals must be compatible with eventual submittals for later inclusion in the Technical Manual. Submittals not so organized will not be accepted.
2. For a project with multiple sites provide a separate and unique set of drawings for each site.
3. Drawings that require more than one sheet due to space limitation or continuation in the subject of the drawings (e.g. loop diagrams, etc.) must be given the same drawing number but with different sheet number (e.g. sheet 1 of x, sheet 2 of x, etc.).
4. Each submittal must include a complete index appearing in the front of each bound submittal volume. Drawings and/or system groups must be separated by labeled tags. The organization of the initial shop drawing submittal required above must be compatible to eventual inclusion with the Technical Manuals submittal and must include final alterations reflecting as-built conditions.
5. Interfaces between new and existing instruments, motor starters, control valves, variable speed drives, flow meters, chemical feeders, panels, and other equipment related to the I&CS must be included in the Shop Drawing submittal.

### **88-11.01C(2) Field Instrument Submittal**

Submit for approval a complete field and process instrument submittal.

The submittal must include a complete index which lists each device by tag number, type, and manufacturer in accordance with the specified data sheets provided in this contract. A separate manufacturer technical brochure or catalog sheet must be included with each specified instrument data sheet. If, within a single system or loop, a single instrument is employed more than once, one manufacturer brochure or catalog sheet may cover multiple identical uses of that instrument in that system. Each manufacturer brochure or catalog sheet must include a list of tag numbers for which it applies. System groups must be separated by labeled tags. Special options and features which are furnished must be identified.

### **88-11.01C(3) System Hardware Submittal**

Submit for approval a complete system hardware submittal. This submittal must be submitted together with the submittal for the System Architecture, and Communication Diagrams submittal and the Project-Wide Wiring Diagrams and Panel Drawings submittal specified below.

The submittal must be for the hardware specified under [sections 88-13 and 88-14](#).

The submittal must include a complete index which lists each device by type and manufacturer under the contract documents. A separate manufacturer technical data sheet or brochure must be included for each hardware component. If, within a single system a single component is employed more than once, one manufacturer technical data sheet or brochure may cover multiple identical uses of that component in that system. Special options and features which are furnished must be identified.

The submittal must include load calculations and size of the various UPS systems to demonstrate that the UPS is able to accommodate present and future load requirements, as well as overload capacity requirements.

Spare Parts and Tools List: A list of spare parts and tools must be submitted, covering items which are specified and furnished under this Contract. The list must include the name, address, and phone number of manufacturer and manufacturer's local service representative of these

MURRAY STREET BRIDGE AT THE SMALL CRAFT HARBOR, SEISMIC  
RETROFIT/BARRIER REPLACEMENT, CITY PROJECT NO. C409321, FEDERAL NO.  
PROJECT NO. STPLZ 5025(084)



parts. The list must also include recommended spare parts and tools, quantities and prices from which the [District](#) will select the "Additional Recommended Spare Parts and Tools".

## **88-11.01C(4) Project-Wide Wiring Diagrams and Panel Drawings Submittal**

### **88-11.01C(4)(i) General**

Submit for approval a complete set of project-wide wiring diagrams (PWWD) and panel drawings. The PWWD and panel drawings must be a singular complete hard copy bound package and accompanied with a PDF on a CD. This submittal must be submitted together with the System Hardware submittal and the System Architecture and Communication Diagrams submittal specified.

The PWWD and panel drawings must be submitted as a single and comprehensive set of drawings. The submittal must include a complete index in the front of each part of the submittal. The drawings must be indexed by systems, sites, or process areas. Diagrams must be tagged in a manner consistent with the contract documents and must include the following:

Project-Wide Wiring Diagrams: The PWWD must define and document the contents of each analog and discrete monitoring, alarming, hardware interlock, and control functions associated with equipment provided. The PWWD must also cover equipment existing, and [District](#)-furnished equipment. The PWWD must also include both field and panel wiring diagrams.

Drawings showing definitive diagram for every analog and discrete instrumentation loop system. These diagrams must show and identify each component in each loop or system using legend and symbols from the standards in the contract documents. The wiring diagrams must be presented on an 11"x17" drawing with no more than 10 loops per drawing.

In general, loops must be grouped and organized by [controller](#) (if used) and the I/O cards within the [controller](#). Each I/O card must be presented on a separate sheets and on the right side of the drawing. The type of card, part number and its slot location must be identified. Each I/O must be identified as well as its location on the card and its address. Existing, spare, and future I/Os must also be shown. Power supply wiring to the card/loops, wire colors, and terminal numbers must be shown on the wiring diagrams. The I/O cards, the loops and any device in the loop must be shown together. Each loop must be complete, including the source/destination within new or existing panels, devices in the loop, field connection panels or field junction boxes, field and [controller](#) interface terminal blocks and wire numbers.

In addition wiring diagrams must show the following details:

1. Functional name of each loop
2. Reference name, drawing, and loop diagram numbers for any signal continuing off the wiring diagram sheet.
3. MCC panel, circuit, and breaker numbers for power feeds to the loops and instrumentation.
4. Wiring type, size and color
5. Designation, and if applicable, terminal assignments associated with every manhole, pull box, junction box, conduit in which wiring is to be located, and panel through which the loop circuits pass.
6. Vendor panel, instrument panel, conduit, junction boxes, equipment and [controller](#) terminations, termination identification wire numbers and colors, power circuits, and ground identifications.

MURRAY STREET BRIDGE AT THE SMALL CRAFT HARBOR, SEISMIC  
RETROFIT/BARRIER REPLACEMENT, CITY PROJECT NO. C409321, FEDERAL NO.  
PROJECT NO. STPLZ 5025(084)



Develop wiring diagrams for loops in equipment vendor-supplied packages, equipment provided [by you](#), and [District](#)-furnished equipment.

#### **88-11.01C(4)(ii) Panel Wiring Diagrams**

Prepare panel wiring and/or piping diagrams in concert with the PWWD and to include the following information:

1. Name of panel
2. Power distribution schematic diagrams associated with each panel or system (120VAC, 24VDC and other DC systems, control circuits). The schematic diagram must show source of power for the panel (circuit breaker panel and breaker) and fuses, and all power backup system distribution.
3. Schematic diagrams for control circuits under ANSI standards. The diagrams must show complete details on the circuit interrelationship of all devices within and outside each Control Panel. Including primary measurement and control devices.
4. Communication diagrams for the equipment inside the panel.
5. Interfaces with existing control and monitoring systems. Furnish all necessary diagrams that depict any and all modifications made to existing measurement and control circuits, equipment and wiring. It is the responsibility of the System Supplier to ascertain actual field conditions of the existing circuits, equipment and wiring. You may request copies of as built drawings and data that the [District](#) can provide that show such existing conditions. Lack of such drawings does not alleviate the contractual responsibility to ascertain and implement interfaces and modifications to existing measurement and control circuits, equipment and wiring.
6. Surge protection and signal and safety grounding circuits
7. Wiring type and piping size and material
8. Terminal block numbers and wire numbers

#### **88-11.01C(4)(iii) Panel Drawings**

Prepare and submit panel drawings, including console, and cabinet layout drawings, for each panel and include the following information:

1. Name of Panel.
2. Panel Dimensions; front, side, and plan views and layout to scale.
3. Arrangement of internally and externally mounted instruments and equipment to scale.  
Note: Control panel layouts shown are diagrammatic.
4. Location of terminal blocks, electrical devices, and conduit entry locations.
5. Tag number or item number and functional name of items mounted in and on panel, console, or cabinet.
6. Nameplate legend which includes text, letter size, and colors to be used.
7. Complete and detailed Bills of Materials must include all items within a panel and must be presented on the panel layout drawing. The bill of material list must include quantity, description, manufacturer, and part number.
8. Panel mounting information, including conduit entrance location.
9. Communication hardware installation, such as radio, mast and antenna.
10. Assembly and construction drawings must include dimensions, identification of all components, construction material and gauge, surface preparation and finish data, panel door locks and hinge mechanism, nameplates, and the like.

MURRAY STREET BRIDGE AT THE SMALL CRAFT HARBOR, SEISMIC  
RETROFIT/BARRIER REPLACEMENT, CITY PROJECT NO. C409321, FEDERAL NO.  
PROJECT NO. STPLZ 5025(084)

These drawings must include enough other details to define exactly the style, the contents, and overall appearance of the panel assembly.

**88-11.01C(5) Factory Test Procedure Submittal:**

Submit for approval a comprehensive factory acceptance test (FAT) procedure later than 60 calendar days before the Factory Acceptance Test date.

Develop and submit a factory test procedures to show that the integrated system hardware and software is fully operational and in compliance with the requirements of the contract documents.

1. The FAT procedures must include the following tests to be conducted:
2. Hardware review and inventory
3. Central computer systems start-up
4. Security
5. Navigation and operator's commands
6. Database definition and configuration
7. Graphic displays and editing function
8. Monitoring and alarm features and functions
9. Trending functions
10. Reports and report system functions
11. Redundancy( if required) and backup
12. Network Communication and access from all the network nodes
13. [Controller](#) functionality – I/O processing

Procedure Format: The test procedure must have a table of contents and each procedure must be provided on a separate sheet or sheets. The following must be provided for each procedure:

1. Test number
2. The purpose of the test
3. The procedure
4. The expected result
5. Space to indicate "Pass" and "Fail" and explanation
6. Space for sign-off Signature for the Contractor/System Supplier, the Engineer, the [District](#), and DATE
7. Space to provide comments and punch list items

**88-11.01C(6) Closeout Submittals**

In addition to the requirements [section 79-1.01C](#), provide the following information:

1. Information in the Technical Manual must be based on the authorized Shop Drawing submittals as modified for conditions encountered in the field during the work. The Technical Manuals must contain the as-built drawings and information.
2. The Technical Manuals must include installation, connection, operating, calibration, set points (e.g., pressure, pump control, time delays, etc.) adjustment, test, troubleshooting, maintenance, and overhaul instructions in complete detail.
3. The Manuals must have the following material organized in volumes and divided by subject and tabs. The Technical Manual must have the following organization for each process (the number and the enumeration of the sections must be project specific):
  - a. Section A - Process and Instrumentation Diagrams (as built copy)
  - b. Section B - System Architecture and Communication System Block Diagrams

MURRAY STREET BRIDGE AT THE SMALL CRAFT HARBOR, SEISMIC  
RETROFIT/BARRIER REPLACEMENT, CITY PROJECT NO. C409321, FEDERAL NO.  
PROJECT NO. STPLZ 5025(084)

- c. Section C - Wiring Diagrams. Provide a separate set of drawings for each site. Arrange each set in a separate tab (drawings must also be provided in PDF).
- d. Section D – Functional design report. It must include a copy of the site graphic displays and description how the site is controlled and any special control strategies specific for each site. Special control functions in the server must also be included. Calibration, set points (e.g., pressure, pump control, time delays, etc.) must also be included.
- e. Section E - Instrument Data Sheets and corresponding manufacturer’s data sheet/catalog cuts/brochure that was used in the hardware submittal and the operation and maintenance/user manual.
- f. Section F - Calibration Documentation
- g. Section G – Communication survey and test results
- h. Section H - Loop, Commissioning and Performance Test Results

**88-11.01C(7) Maintenance Material Submittals**

Provide the specified spare parts and tools. In addition, The Engineer and the [District](#) will select from the priced list of “Additional Recommended Spare Parts” in the Hardware Equipment Submittal. Furnish these parts and will be paid for them from the corresponding allowance item in the Bid. The total price will not exceed the amount of the allowance item.

Furnish a priced list of special tools required to calibrate and maintain the instrumentation provided from which the Engineer or the [District](#) will select the needed tools. After approval furnish tools on that list. The cost of these tools will be included in the allowance.

**88-11.01D Quality Assurance**

**88-11.01D(1) General**

Factory Acceptance Tests (FAT):

1. Before shipment, the I&CS including all panels, integrated SCADA system, [controllers](#), peripherals, communications equipment, etc. provided under this section, must be assembled, connected, and all software loaded for a full functional factory acceptance test (FAT) of the integrated system. Existing equipment is not required to be included in this test.
2. In preparation for the FAT, check, troubleshoot, debug and test the I&CS before arrival of the Engineer in order for the I&CS to be ready for the FAT, minimize testing time, and minimize re-testing during the visit. Similar testing must be performed even if the Engineer chooses not to witness the FAT.
3. Allow the Engineer and [District](#) to inspect the I&CS and witness the functional testing of the system at the site of assembly and integration of the system.
4. Allow a minimum of 21 Days notification before testing. No shipments allowed without authorization. A successful completion of the test is a prerequisite to the shipment of the system.
5. The factory test will be witnessed by the Engineer. Pay and provide for travel, food, and lodging for all the test witnesses if testing is located more than 150 miles from project location.

MURRAY STREET BRIDGE AT THE SMALL CRAFT HARBOR, SEISMIC RETROFIT/BARRIER REPLACEMENT, CITY PROJECT NO. C409321, FEDERAL NO. PROJECT NO. STPLZ 5025(084)

6. The factory acceptance test must be conducted at the place where the system was engineered, fabricated, assembled, and programmed.
7. It is considered reasonable that once scheduled, the system will be ready for the test and the test will be successfully completed in one session. If during the test, at the opinion of the Engineer and in accordance with the test procedure, the system is not ready for the test or has failed, and the Engineer and the [District](#) must extend their stay or leave and arrive at another date, the [District](#) may withhold monies due you to cover additional costs of the Engineer's time, travel, food, and lodging and associated project cost.
8. During the factory acceptance test, your Project Manager and software engineers (HMI application software and [controller](#) programming) who worked on the I&CS must be available on the premises where the test is being conducted for explanation, demonstration or corrections.
9. After the successful completion of the test, the Engineer will generate a punch list. The list may include items that must be corrected or addressed before the shipment of the system, and/or items that must be corrected later in the field during installation and startup.

For field tests, see 88-11.03 of this Section which delineates all the tests required to be performed in the field in order to demonstrate compliance with the contract documents.

Provide and assign to the [District](#) all user software and hardware licenses. Computer and software system must be purchased on behalf of the [District](#) who must also be designated as the licensee. Each software package must be provided with a "Site License" or with as many licenses as a "Site License" includes (site is defined as the name of the [District](#)). Include in the bid price all license fees.

Provide the proper number of software licenses for all the servers, workstations, and laptops to provide concurrent and simultaneous user operation.

Before final acceptance of the I&CS System and related equipment, propose and present in writing to the [District](#) a one-year maintenance contract and quotation which will become effective on the expiration of the warranty. The maintenance contract is an option that the [District](#) may purchase from the System Supplier. The contract must offer different maintenance, site visit and help-desk with options each with its respective cost.

## **88-11.01D(2) Field Quality Control**

### **88-11.01D(2)(i) General**

Devices provided must be initially calibrated by the manufacturer at the manufacturer's facility before shipment. Following installation, field calibrate the devices according to the manufacturer's recommended procedures to verify operational readiness and ability to meet the indicated functional and tolerance requirements.

Each instrument must be field tested, inspected, and adjusted to the indicated performance requirement in accordance its manufacturer's specifications and instructions. Any instrument which fails to meet any contract requirement, or, in the absence of a contract requirement, any published manufacturer performance specification for functional and operational parameters, must be repaired or replaced, at the discretion of the Engineer.

Calibration Points: During bench and field calibration each instrument must be calibrated at least at 0, 25, 50, 75, and 100 percent of span using test instruments to simulate inputs and

MURRAY STREET BRIDGE AT THE SMALL CRAFT HARBOR, SEISMIC  
RETROFIT/BARRIER REPLACEMENT, CITY PROJECT NO. C409321, FEDERAL NO.  
PROJECT NO. STPLZ 5025(084)

outputs. The test instruments must have accuracies traceable to National Institute of Standards and Testing.

**Bench Calibration:** Instruments that have been bench-calibrated by the manufacturer must be verified in the field after installation to determine whether any of the calibrations are in need of adjustment.

**Field Calibration:** Instruments which were not bench-calibrated must be calibrated in the field to insure proper operation in accordance with the instrument loop diagrams or specification data sheets.

**Analyzer Calibration:** Each analyzer system must be calibrated and tested as a workable system after installation. Testing procedures must be directed by the manufacturers' technical representatives. Samples and sample gases must be furnished by the manufacturers.

**Calibration Sheets:** Each instrument calibration sheet must provide the following information and a space for sign-off on individual items and on the completed unit:

1. Project name
2. Loop number and site or process name and number
3. Tag number
4. Manufacturer
5. Model number
6. Serial number
7. Calibration range
8. Calibration data: Input, output, and error at 0 percent, 50 percent, and 100 percent of span
9. Switch setting, contact action, and dead-band for discrete elements
10. Space for comments
11. Space for sign-off by System Supplier and when applicable by the manufacturer and date
12. Test equipment used and associated serial numbers
13. Calibration Tags: A calibration and testing tag must be attached to each piece of equipment or system at a location determined by the Engineer. Require the System Supplier sign the calibration sheet when calibration is complete. The Engineer will sign the calibration sheet when the calibration and testing has been accepted.
14. Loop Testing: Test newly installed loops for continuity and functionality. The up-to-date wiring diagrams must be used as reference. The Engineer and/or the [District](#) must witness the loop testing.

Notify the Engineer of scheduled tests minimum of 30 calendar days before the estimated completion date of installation and wiring of the I&CS. After the Engineer's review of the submitted loop diagrams for correctness and compliance with the specifications, loop testing can proceed. The loop testing must be witnessed by the Engineer and/or the [District](#).

**Control Valve Tests:** Control valves, cylinders, drives and connecting linkages must be stroked from the operator interface units as well as local control devices and adjusted to verify proper control action, hand switch action, limit switch settings, torque settings, remote control actions, and remote feedback of valve status and position. Check control valve actions and positioner settings with the valves in place to insure that no changes have occurred since the bench calibration.

MURRAY STREET BRIDGE AT THE SMALL CRAFT HARBOR, SEISMIC  
RETROFIT/BARRIER REPLACEMENT, CITY PROJECT NO. C409321, FEDERAL NO.  
PROJECT NO. STPLZ 5025(084)

Interlocks: Hardware and software interlocks between the instrumentation and the motor control circuits, control circuits of variable-speed controllers, and packaged equipment controls must be checked to the maximum extent possible.

#### **88-11.01D(2)(ii) Loop Validation**

Control loops must be checked under simulated operating conditions by impressing input signals at the primary control elements and observing appropriate responses of the respective control and monitoring elements, final control elements, and the HMI displays associated with the [controller](#) or DCS. Actual signals must be used wherever available. Following any necessary corrections, retest the loops.

Accuracy tolerances for each analog network are defined as the root-mean-square (RMS) summation of individual component accuracy requirements. Individual component accuracy requirements must be as indicated by contract requirements or by published manufacturer accuracy specifications, whenever contract accuracy requirements are not indicated. Test each analog loop by applying simulated analog or discrete inputs to the first element of an analog loop. For loops which incorporate analog elements, simulated sensor inputs corresponding to 0, 25, 50, 75, and 100 percent of span must be applied, and the resulting element outputs monitored to verify compliance to calculated RMS summation accuracy tolerance requirements. Apply continuously variable analog inputs to verify the proper operation and setting of discrete devices. Provisional settings must be made on controllers and alarms during analog loop tests. Document analog loop test data, including calculated RMS summation system accuracy tolerance, on the loop validation sheets. The validation sheets must be included in the O&M Manuals.

#### **88-11.01D(2)(iii) Loop Validation and Certification Sheets:**

Loop Validation: Prepare loop validation sheets for each loop covering each active instrumentation and control device except simple hand switches and lights. Loop validation sheets must form the basis for operational tests and documentation. Each loop validation sheet must cite the following information and provide spaces for sign-off on individual items and on the complete loop by the System Supplier:

1. Project name
2. Loop number
3. Tag number, description, manufacturer, and model number for each element
4. Installation bulletin number
5. Specification sheet number
6. Loop description number
7. Adjustment check
8. Space for comments
9. Space for loop sign-off by the System Supplier and date
10. Space for Engineer witness signature and date

#### **88-11.01D(2)(iv) Loop Certification**

A certified copy of each loop test validation sheet signed by the System Supplier and the Engineer as a witness, with test data entered, must be submitted to the Engineer together with a clear and unequivocal statement that the loops have been tested and the instrumentation in the loop has been successfully calibrated, inspected, and tested.



### **88-11.01D(2)(v) Manufacturer's Services**

Provide job site visits and services of a manufacturer's technical field representative for supervision of the following:

1. Oversee installation: Supervise installation and connection of all instruments, elements, and components of every system, including connection of instrument signals to primary measurement elements and to final control elements such as VFD, smart starters, pumps, valves, engines and chemical feeders
2. Verify that installed instrument and software meet manufacturer's instructions
3. Certify installation and reconfirm manufacturer's accuracy statement
4. Oversee loop testing, prepare loop validation sheets, and certify loop testing
5. Certify when testing is completed.
6. Training the [District's](#) personnel

### **88-11.01D(3) Operational Validation**

Where possible, system pre-commissioning activities must include the use of the actual process to establish service conditions that simulate, to the greatest extent possible, normal final control element operating conditions in terms of applied process loads, operating ranges, and environmental conditions. Test final control elements, [controllers](#), control panels, and ancillary equipment under startup and steady state operating conditions to verify that proper and stable control is achieved using motor control center and local field mounted control circuits. Hardwired and software control circuit interlocks and alarms must be operational.

Test the control of final control elements and ancillary equipment using both manual and automatic (where provided) control circuits. The stable steady state operation of final control elements running under the control of process controllers must be assured by adjusting the controllers as required to eliminate oscillatory final control element operation. Verify the transient stability of final control elements operating under the control of controllers by applying control signal disturbances, monitoring the amplitude and decay rate of control parameter oscillations (if any), and making necessary controller adjustments as required to eliminate excessive oscillatory amplitudes and decay rates.

Pre-commissioning must also include the testing of remote sites to verify compliance with all functional requirements and communication specified. The testing must include manual and automatic control modes, fail-safe and backup control modes, and [controller](#) interlocks and control strategies provided by the System Supplier.

Loop and Equipment Tuning: Controllers incorporating proportional, integral and/or derivative control circuits must be optimally tuned, experimentally, by applying control signal disturbances and adjusting the gain, reset, or rate settings as required to achieve a proper response. Compare measured final control element variable position/speed set point settings to measured final control element position/speed values at 0, 25, 50, 75, and 100 percent of span and the results checked against indicated accuracy tolerances.

Pre-commissioning Validation Sheets: Document pre-commissioning on test forms as follows:

The validation form, which must include:

1. Project name
2. Loop number

MURRAY STREET BRIDGE AT THE SMALL CRAFT HARBOR, SEISMIC  
RETROFIT/BARRIER REPLACEMENT, CITY PROJECT NO. C409321, FEDERAL NO.  
PROJECT NO. STPLZ 5025(084)

3. Loop and function description
4. Tag number, description, manufacturer, and data sheet number for each component.
5. Pre-Commissioning Certification - A statement certifying that the contract requirements have been met. It must also include a listing of instrumentation and control system maintenance and repair activities conducted during the pre-commissioning testing. Acceptance of the instrumentation and control system testing must be provided in writing by the Engineer before the performance testing may start. Final acceptance of the control system will be based on plant completion as stated in the General Conditions.
6. Space for sign-off and date by the CONTRACTOR, the System Supplier, and the Engineer.

#### **88-11.01D(4) Commissioning**

##### **88-11.01D(4)(i) General**

Commissioning is the verification that the complete work functions on an extended basis are in full conformance with the Contract requirements.

As part of the commissioning, the entire I&CS must operate continuously without failure for 30 consecutive days (see test details below).

Submit a report/letter states that Contract requirements have been met and the I&CS is ready (2) weeks before energizing any system to allow inspections by Engineer.

The entire I&CS must go through a final 30-day acceptance test. For the purpose of this Contract, the terms "Final Acceptance Test" and "Final Performance Test" are synonymous and are used interchangeably. The 30-day test must be successfully completed before the date of and as a condition to substantial completion of the entire project work. During the testing period, all system functions must be exercised, and any system interruption and accompanying component, subsystem, software, or program failure must be logged for cause of failure, as well as time of occurrence and duration of each failure.

In addition to the requirements of Division 01, furnish support staff as required to operate the system and to satisfy the repair or replacement requirements. Provide a competently programmer on call during all normal working days and hours from the start of the acceptance test until final acceptance of the system. The on-call programmers must be ready to respond within two hours of the notification of the problem.

##### **88-11.01D(4)(ii) Testing**

The entire I&CS must be tested and must include, but not limited to the following:

1. Verify instrument calibration and provide written report.
2. Verify signal levels and wiring connections to control panels for all instrumentation and control equipment.
3. Function check and adjust under operational conditions the instruments and control equipment.
4. Coordinate instruments and control equipment supplier's service personnel as required for complete system testing.
5. Make provision to be available and coordinate with the Plant Control System programming team, and the commissioning team to check the sensor signals from source to destination.
6. Instruct plant personnel in correct method of operation of instruments and control equipment.

MURRAY STREET BRIDGE AT THE SMALL CRAFT HARBOR, SEISMIC  
RETROFIT/BARRIER REPLACEMENT, CITY PROJECT NO. C409321, FEDERAL NO.  
PROJECT NO. STPLZ 5025(084)



7. Order plant personnel at hand-over as to final adjustment of the system for correct operation of plant.

Failure of the system during the testing is considered as indicating that part of the I&CS does not meet the requirements of the specifications and corrective action must be required before restarting the acceptance test.

#### **88-11.01D(4)(iii) Reporting**

Each time a technician is required to respond to a malfunction in the I&CS he/she must complete a report which must include details concerning the nature of the complaint or malfunction and the resulting repair action required and taken. If a malfunction occurs which clears itself or which the operator on duty is able to correct, no report is required (logged as specified above). Each report must be submitted within 24 hours to the Engineer.

#### **88-11.02 MATERIALS**

##### **88-11.02A General**

###### **88-11.02A(1) Standard and Current Technology**

All I&CS hardware, software, materials, and equipment furnished under this contract must be new, free from defects, and must be standard materials and technology produced by manufacturers regularly engaged in the manufacture of these materials. Meters, instruments, and other components must be the most recent field-proven models marketed by their manufacturers at the time of submittal of the Shop Drawings unless otherwise required to match existing equipment.

Submit a Substitute Item Request Form if discontinued or upgraded material or other cases where changing technology requires changes in equipment or software.

###### **88-11.02A(2) Adverse Environmental Impact**

No component of an instrumentation system can contain liquid mercury.

Hardware Commonality and Modularity: Furnish instruments which utilize a common measurement principle by a single manufacturer. Panel mounted instruments must have matching style and general appearance. Instruments performing similar functions must be of the same type, model, or class, and must be from a single manufacturer. All equipment must be of modular design to facilitate interchangeability of parts to assure ease of servicing and expandability.

Instrument and Loop Power: Power requirements and input/output connections for components must be verified. Power for transmitted signals must, in general, originate in and be supplied by the control panel devices. The use of "2 wire" transmitters is preferred, and use of "4 wire" transmitters must be minimized. Provide individual loop or redundant power supplies as specified and/or as required by the manufacturer's instrument load characteristics to ensure sufficient power to each loop component. Mount power supplies within control panels or in the field at the point of application.

###### **88-11.02A(3) Loop Isolators and Converters**

Resolve any signal level incompatibilities where required.

#### **88-11.02A(4) Signal Levels**

Analog measurements and control signals must be as indicated, and unless otherwise indicated, must vary in direct linear proportion to the measured variable. Electrical signals outside control panels must be 4 to 20 milliamperes DC except as indicated. Signals within enclosures may be 1 to 5 volts DC. Electric signals must be electrically or optically isolated from other signals. Pneumatic signals must be 3 to 15 psig with 3 psig equal to 0 percent and 15 psig equal to 100 percent.

#### **88-11.02A(5) Alternative Equipment and Methods**

Equipment or methods requiring redesign of any project details are not acceptable without prior written authorization. Any proposal for approval of alternative equipment or methods must include evidence of improved performance, operational advantage, and maintenance enhancement over the equipment or method indicated, or must include evidence that an indicated component is not available.

#### **88-11.02B Delivery, Storage and Handling**

##### **88-11.02B(1) Shipping**

After completion of shop assembly, factory test, and approval, pack the tested I&CS equipment, cabinets, panels, and computer hardware in protective crates and enclose them in heavy duty polyethylene envelopes or secured sheeting to provide complete protection from damage, dust, and moisture. Place dehumidifiers inside the polyethylene coverings. The equipment must then be skid-mounted for final transport. Provide lifting rings for moving without removing protective covering. Show boxed weight on shipping tags together with instructions for unloading, transporting, storing, and handling at the Site.

##### **88-11.02B(2) Special Instructions**

Special instructions for proper field handling, storage, and installation required by the manufacturer must be securely attached to each piece of equipment before packaging and shipment.

##### **88-11.02B(3) Tagging**

Provide a permanent stainless steel or other non-corrosive material tag marked with the instrument or equipment tag number on each piece of equipment in the I&CS. Prominently display identification on the outside of the package.

##### **88-11.02B(4) Storage**

Assure proper handling and on-site storage of instrumentation and control equipment under the System Supplier's recommendations. Deliver all equipment and materials to the job site and store in a location which will not interfere with the operations of other contractors or the [District](#). Equipment must not be stored outdoors. Storage and handling will be performed in manners which will afford maximum protection to the equipment and materials.

Store equipment in dry shelters, including in-line equipment, and adequately protect against mechanical damage. If any apparatus has been damaged, repair the damage. If any apparatus has been subject to possible damage by water, thoroughly dried it out and put it through tests as directed by the Engineer. If tests reveal defects, replace the equipment.

### **88-11.02B(5) Handling**

Use all means necessary to protect the installation and to protect materials and installed work of all other trades.

Repair or replace any damage to the materials and/or installed work to the satisfaction of the [District](#) at no additional cost to the [District](#).

#### **88-11.03 CONSTRUCTION**

### **88-11.03A General**

Through the use of a single System Supplier and qualified electrical and mechanical installers, you are responsible to the [District](#) for the implementation of the I&CS and the integration of the I&CS with other required instrumentation and control devices.

Due to the complexities associated with the interfacing of numerous control system devices, it is the intent of these specifications that the System Supplier will be responsible to you for the integration of the I&CS with existing systems and devices provided under this and other sections with the objective of providing a completely integrated control system free of signal incompatibilities.

As a minimum, implementation of the I&CS must include the following work:

Integrate the I&CS with existing SCADA system provided under this and other sections

Prepare the required I&CS submittals

Design and develop loop diagrams including those associated with equipment provided under other sections.

Design and develop control panel drawings

Field verify existing conditions

Prepare factory and field test submittals

Prepare training plan

Prepare spare parts submittal

Obtain hardware and software

Configure and factory test the I&CS

Terminate signals inside control and network panels; terminate communication and network devices and nodes

Supervise and coordinate installation and termination of field signals, power, and utilities associated with the I&CS. Resolve signal, power, or functional incompatibilities between the I&CS and new and existing interfacing devices.

Loop test in accordance with the loop diagrams. Validate and certify loops

1. Oversee, document, and certify system commissioning
2. Conduct system performance test
3. Prepare technical manuals
4. Conduct training classes
5. Prepare I&CS as-built final construction drawings

Any Instrumentation Supplier responsibilities in addition to the list above are at your discretion and the Instrumentation Supplier. Additional requirements in this section and throughout [section 88](#) stated to be the your responsibility may be performed by the Instrumentation Supplier if the you and Instrumentation Supplier so agree.

MURRAY STREET BRIDGE AT THE SMALL CRAFT HARBOR, SEISMIC  
RETROFIT/BARRIER REPLACEMENT, CITY PROJECT NO. C409321, FEDERAL NO.  
PROJECT NO. STPLZ 5025(084)

All systems and instrumentation, must be installed, connected, calibrated, tested, started, and placed into operation in accordance with the contract documents and under [section 88](#) and the manufacturers' instructions. Coordinate the installation with the Engineer. This includes final integration in concert with equipment specified and provided by others.

Employ installers who are skilled and experienced in the installation and connection of all I&CS equipment.

Equipment Locations: The monitoring and control system configurations described in the contract documents are diagrammatic. The locations of equipment are approximate unless dimensioned. The exact locations and routing of wiring and cables are governed by structural conditions and physical interferences and by the location of electrical terminations on equipment. Locate and install equipment so that it will be readily accessible for operation and maintenance. Where project conditions require reasonable changes in approximated locations and arrangements, or when the [District](#) exercises the right to require changes in location of equipment which do not impact material quantities or cause material rework, make changes without additional cost to the [District](#).

Review the existing job site conditions and examine all shop drawings for the various items of equipment in order to determine exact routing and final terminations for all wiring and cables.

The contract documents identify conduits and instruments required to make a complete I&CS. Provide any reasonable additional or different type connections as required by parts of the I&CS' specific installation requirements, or as practical.

#### **88-11.03B Conduit, Cables and Field Wiring**

Provide conduits, process equipment control wiring, 4 to 20 mA signal circuits, signal wiring to field instruments and to control panels, [controller](#) input and output wiring, and other field wiring and cables without delay to the work.

Supervise and coordinate installation and termination and identification of field signals, power, and utilities associated with the I&CS. Resolve signal, power, or functional incompatibilities between the I&CS and new and existing interfacing devices.

#### **88-11.03C Equipment Connections and Installations**

Anchor instruments, control panels, and equipment by methods that comply with seismic requirements applicable to the Site. Provided appropriate mounting stands and bracket materials and workmanship must comply with requirements of the contract documents.

Existing Instruments to be removed and reinstalled must be cleaned, reconditioned, and recalibrated by an authorized service facility of the instrument manufacturer. Provide certification of this work before reinstallation of each instrument.

The contract documents show necessary conduit and instruments required to make a complete instrumentation. Provide any additional or different type connections as required by the instruments and specific installation requirements. Additions and changes, including the proposed method of installation, must be submitted for approval before starting that work. Changes will not be a basis of claims for change order work or delay.

Field Connection Panels and Interface Terminal Blocks: Where field I/O wiring has to be extended to a control panel or from enclosures or devices removed, provide separate

MURRAY STREET BRIDGE AT THE SMALL CRAFT HARBOR, SEISMIC  
RETROFIT/BARRIER REPLACEMENT, CITY PROJECT NO. C409321, FEDERAL NO.  
PROJECT NO. STPLZ 5025(084)

enclosures or junction boxes with interface terminal blocks that will serve as a field connection panel (FCP). Show the FCP and the terminal block on the project-wide wiring diagrams.

Surface mount conduits and/or raceways in building interior locations on walls or ceilings wherever possible and run perpendicular and parallel to building lines. Conduits must not be routed on floors in areas subject to foot traffic. In exterior locations, route conduit below grade.

Arrange wires and cables in a neat manner, securely support them in cable groups and connect them from terminal to terminal without splices unless otherwise authorized. Protect wiring from sharp edges and corners.

Run signal and 24VDC low voltage wiring in a separate conduit from power and 120-volt control wiring.

Terminate field wiring at terminal blocks in the control panel. Field wiring must not be wired directly to equipment in the control panel, except communication and specialty cables must be wired directly to their respective equipment.

Mark wires clearly with an identification wire number labels of a permanent nature.

Connectors must be, as a minimum, water tight.

Install flexible cables and capillary tubing in flexible conduits. The lengths must be sufficient to withdraw the element for periodic maintenance.

Differential pressure elements must have 3 valve manifolds.

Verify the correctness of each installation, including polarity of electric power and signal connections. Certify in writing all discrepancies have been corrected for each loop or system checked out. In addition, make sure process connections are free of leaks.

### **88-11.03D Sealing Wall and Floor Openings**

Seal all conduit and cable entries passing through outside walls of buildings, through partition walls separating electrical rooms from other areas, through fire separations, and through floors above grade.

Sealing material must be fire resistant and not contain any compounds which will chemically affect the wiring jacket or insulating material. Cable penetrations through fire separations, if required, are to be sealed. Acceptable methods are Canstrut "Fire Stop", Electrovert "Multi-Cable Transit" or Dow Corning RTV Silicone Foam.

Cable transit blocks (with knock out blocks) are also acceptable as long as they have capability to be sealed.

### **88-11.03E Sleeves**

Provide sleeves of galvanized steel pipe with machine cut ends of ample size to accommodate conduits passing through walls, partitions, ceilings, floors, etc.

The sleeve ends are to be flush with the finish on both sides for wall, partitions and ceilings. For floors, the ends must extend 4" above finished floor level.

Fill the space between the sleeve and the conduit with fire stop material and caulked around the top and bottom with approved permanently resilient, non-flammable and weatherproof silicone base compound. Ensure that the seal is compatible with the floor and ceiling finishes.

Locate the sleeves and position exactly before construction of the walls and floors.

### **88-11.03F Tagging Standards for Devices and Wiring**

Tag all devices, wires and I/O using the assigned loop, equipment or device tag name. Where tag naming and numbering is not defined, the Engineer will provide naming and numbering that is consistent with the plant naming conventions.

### **88-11.03G Training**

#### **88-11.03G(1) General**

Train [District](#) personnel on the I&CS operation, maintenance, calibration, and repair of equipment provided under this Contract. The training must be by qualified instructors. The training courses must be given on-site to a minimum of Four (4) people of the [District's](#) personnel. Provide all instruction, tools and training material.

Design these courses to provide the operations, maintenance and supervisory personnel with training in routine and preventive maintenance of all the I&CS including instrumentation, communication, [controllers](#) software, and HMI. The training course must include instruction on the use of all maintenance equipment and special tools provided under the contract.

#### **88-11.03G(2) Instructions**

The training must be performed by qualified instructors. The training must be performed by qualified representatives of the equipment manufacturers and be specific to each piece of equipment.

#### **88-11.03G(3) Training Manuals and Material**

Use the authorized Training syllabus and Training Manuals to develop training material. Design the training material to provide the operations, maintenance and supervisory personnel with training in routine operation procedures, and preventive maintenance and troubleshooting of the I&CS, [controller](#)s and the computer monitoring and control systems.

#### **88-11.03G(4) Schedule**

Perform training on-site during the calibration, loop and functional testing of the I&CS before the 30-day Final Acceptance Test. Schedule the training sessions a minimum of 30 days in advance of when the courses are to start. The Engineer will review the course outline for suitability and provide comments to incorporate. Coordinate with the [District](#) the schedule of the classes. The [District](#) may videotape the training sessions for later use. Due to possible limited availability of the [District's](#) staff, provide the number of identical courses/sessions of each of the following training courses as indicated, each up to four (4) people of the [District's](#) staff.

Training Subjects, Duration, and Agenda: The training must include operation and maintenance procedures, troubleshooting with necessary test equipment, and changing set points, and calibration for that specific piece of equipment. During the course, provide hands-on experience with the system equipment. Maintenance classes must stress troubleshooting, repair, calibration, and other technical aspects of the I&CS and the [controllers](#). Operator classes must stress operational theory and use of the I&CS and the [controllers](#).

MURRAY STREET BRIDGE AT THE SMALL CRAFT HARBOR, SEISMIC  
RETROFIT/BARRIER REPLACEMENT, CITY PROJECT NO. C409321, FEDERAL NO.  
PROJECT NO. STPLZ 5025(084)

### **88-11.03G(5) Field Instruments**

Training Duration must be an average of two (0.5) hours per each type of instrument.

Subjects to include are - installation, setup, configuration, maintenance, calibration, and troubleshooting:

1. Level devices
2. Flow measuring device and transmitter
3. Uninterruptible power supply (UPS)

#### **88-11.04 PAYMENT**

Not Used

## **88-12 LEVEL DETECTION**

### **88-12.01 GENERAL**

#### **88-12.01A Summary**

Section 88-12 includes specifications for providing level detection switches, complete and operable, under the contract documents.

#### **88-12.01B Definitions**

Not Used

#### **88-12.01C Submittals**

Comply with section 79-1.01C.

Provide submittals under [section 88-11.](#)

#### **88-12.01D Quality Assurance**

Training and level detection switches must be handled, installed, calibrated, loop-tested, pre-commissioned, and performance tested under [section 88-11.](#)

#### **88-12.01E Quality Control**

Level detection switches shall be handled, installed, calibrated, loop-tested, pre-commissioned, and performance tested under [section 88-11.](#) Manufacturer's service, supervision, and training shall also be under [section 88-11.](#)

#### **88-12.02 MATERIALS**

Tipping float type level switch must be as manufactured by MAGNETROL T10, FLYGT ENM-10, KARI, SIEMENS, or equal.

Tipping float level switch consists of a switch, a moving float, and a connecting cable that is anchored at the midpoint of a differential band. As the level rises and falls the float rights itself or inverts causing switching actions. Protect the cable anchoring point by strain relief.

The hermetically sealed switches must have a SPDT output with a minimum rating of 10 Amps at 120 VAC.

The float switch must be mercury-free and under the manufacturer's instructions for the intended service and installation application and as indicated in the data sheet.

MURRAY STREET BRIDGE AT THE SMALL CRAFT HARBOR, SEISMIC  
RETROFIT/BARRIER REPLACEMENT, CITY PROJECT NO. C409321, FEDERAL NO.  
PROJECT NO. STPLZ 5025(084)

**88-12.03 CONSTRUCTION**

Not Used

**88-12.04 PAYMENT**

Not Used

**88-13 [SAMSARA](#) BASED CONTROL SYSTEM HARDWARE**

**88-13.01 GENERAL**

**88-13.01A Summary**

Section 88-13 includes specifications for providing the [controller](#)-based control system (PBCS) hardware for the I&CS, complete and operable, under the contract documents. The PBCS must be furnished complete with all system software as required for a functional system that integrates with the existing system.

The System Supplier is responsible for selecting, sizing, and providing the correct and necessary type and quantity of hardware for the entire PBCS and for [the controller](#). The necessary hardware and software shall include but not limited to:

1. [Samsara IG41 with](#) input/output (I/O) modules [as required for the IO shown on the P&IDs](#)
2. Interconnecting cables
3. Accessories
4. Adapters and cards
5. All appurtenances for proper operation of the PBCS and to meet the functional requirements specified, and as shown on the system architecture diagram or network diagram.

**88-13.01B Definitions**

Not Used

**88-13.01C Submittals**

**88-13.01C(1) General**

Comply with section 79-1.01C.

Provided submittals under [section 88-11](#).

**88-13.01C(2) Closeout**

Provide and register the [District](#) with all user software and hardware licenses. Additional contract, agreements and licenses requirements must be under [section 88-11](#).

**88-13.01C(3) Maintenance Material Submittals**

Furnish sufficient spare parts and supplies necessary to support the operation and maintain the system.

As a minimum, the spare parts listed below are required to be furnished under this contract:

1. One (1) [IG41 with IO to match that provided for the project](#).



## **88-13.01D Quality Control**

### **88-13.01D(1) General**

Provide the [District](#) with training on the subjects of use, maintenance, operation, troubleshooting and repair of all the components of the [controllers](#) and the rest of the PBCS hardware. Specifically tailor the training to this project and the hardware and the installation. Conduct all training on-site unless another location is authorized. Hardware training subjects and the allocated hours for each class must be under [section 88-11](#).

### **88-13.01D(2) Warranty**

Guarantee the performance of all the new [controllers](#) and the programming software for them as specified in the specifications.

Guarantee all parts, material labor, travel, subsistence, or other expenses incurred in providing services and service visits during the warranty period. Replace equipment, software, and materials that do not achieve their intended purpose to attain compliance, at no additional cost to the [District](#).

Guarantee and special corrections of defects and software upgrade requirements and warranty must be under [section 88-11](#).

## **88-13.02 MATERIALS**

### **88-13.02A [Industrial Gateway](#)**

#### **88-13.02A(1) General**

[The industrial gateway must be Samsara IG41 \(or currently supported model\), no equal allowed.](#)

Furnish all necessary hardware, software, interconnecting cables, all accessories, and all appurtenances as described or as required for proper operation of the [system](#).

All [components and](#) materials and equipment furnished must be standard off-the shelf commercially available materials, and the material of a single manufacturer.

#### **88-13.02A(2) Performance**

Design and construct the [system](#) for satisfactory operation and long, low maintenance service under the following environmental conditions:

1. Ambient temperature range: [-30°C](#) through [70°C](#)
2. [Ingress Protection IP20](#)
3. Relative humidity: 95 percent maximum non-condensing

#### **88-13.02A(3) [System](#) Growth Provisions**

Provide all equipment and resources, including [IG41](#), I/O cards and implementation services, so project memory and I/O growth can be implemented into the PBCS without any additional cost to the [District](#).

The I/O points included in the 20 percent project I/O growth requirement must be termed "implemented spare I/O" (wired to field terminals). The 20 percent implemented spare I/O is 20 percent of each type of the total project I/O listed and may be implemented in any one or more I/O cards and racks at the direction of the [District](#) at any time throughout the duration of the

project until the start of factory testing. Subsequent to factory testing the unused implemented I/O, if any, must be delivered to the [District](#) as spare I/O.

Implementable spare I/Os means that each of these I/O must also be wired to the field interface terminals.

Future and Spare Signal (i.e. the source of inputs or final control elements for DO and AO are not yet known or available in the field). The percent of additional terminals for future signals (not implemented) must be in accordance with the requirements specified in [section 88-3](#).

#### **88-13.02A(4) Controller System Software and Programming**

[System programming and SCADA integration of the counties Samsara cloud based application will be provided by the counties sole SCADA integrator, Telstar Instrument, as a part of this contract. They may be reached at \(925\) 671-2888.](#)

#### **88-13.03 CONSTRUCTION**

Not Used

#### **88-13.04 PAYMENT**

Not Used

### **88-14 CONTROL PANEL**

#### **88-14.01 GENERAL**

##### **88-14.01A Summary**

Section 88-14 includes specifications for providing control panels for the [controller](#)-based control system, complete and operable contract documents.

The System Supplier is responsible for selecting, sizing, and providing the required type and quantity of the panels for each process control applications. The hardware and responsibilities must include but not limited to:

1. The selection of all accessories, materials and methods of fabrication not specifically covered by these specifications, but which are necessary to complete the fabrication of the panels. Installation of all equipment must be performed in accordance with good engineering and industry best practices.
2. Mounting enclosures.
3. Locating and mounting interior/exterior instrumentation, hardware and equipment in the control panel.
4. Field interface terminal blocks
5. Terminating panel internal wiring and signals.
6. Terminating communication and network cabling and wiring.

##### **88-14.01B Definitions**

Not Used

##### **88-14.01C Submittals**

Comply with section 79-1.01C.

Submittals must be provided in accordance with the requirements specified in [Section 88-11](#).

MURRAY STREET BRIDGE AT THE SMALL CRAFT HARBOR, SEISMIC  
RETROFIT/BARRIER REPLACEMENT, CITY PROJECT NO. C409321, FEDERAL NO.  
PROJECT NO. STPLZ 5025(084)

Control panels, wall mounted and free-standing, must be provided with mounting and anchoring calculations signed by a California Registered Structural Engineer.

### **88-14.01D Quality Assurance**

Reference Standards:

1. NFPA 70, National Electric Code
2. ANSI/UL 1449, Fourth Edition, Safety Surge Protective Devices
3. IEEE C62.41.1, Guide on the Surge Environment in Low-Voltage (1000V and Less) AC Power Circuits
4. IEEE C62.45, Recommended Practice on Surge Testing for Equipment Connect to Low-Voltage (1000V and Less) AC Power Circuits
5. UL 1283, Safety Electromagnetic Interference Filters
6. NFPA 70, National Electric Code
7. National Standards Institute (ANSI) / Institute of Electrical and Electronic Engineers (IEEE):
8. C62.90.2, IEEE trial use standard withstand capability of relay systems to radiated electromagnetic interference from transceivers.
9. C62.41, IEEE recommended practice on surge voltages in low-voltage AC power circuits.
10. C62.45, IEEE guide on surge testing for equipment connected to low-voltage AC power circuits.
11. Underwriters Laboratories, Inc. (UL):
12. UL 508, Industrial control panels.
13. UL 1283, Safety-electromagnetic interference filters.
14. UL 1449, Surge protective devices.
15. Electronic Industries Association (EIA):
16. TIA-232-E, interface between data terminal equipment and data circuit-terminating equipment employing serial binary data interchange.
17. 422-A, electrical characteristics of balanced voltage digital interface circuits.
18. International Organization for Standardization (ISO) 9001, quality systems-model for quality assurance in design, development, production, installation, and servicing.
19. National Electrical Manufacturers Association (NEMA):
20. ICS 1 - General Standards for Industrial Control and Systems.
21. ICS 3 - Industrial Systems.
22. ICS 4 - Terminal Blocks for Industrial Use.
23. ICS 6 - Enclosures for Industrial Controls and Systems.
24. LS1 - Low Voltage Surge Protection Devices.
25. Publication No. 250 - Enclosures for Electrical Equipment (1000 V Maximum).
26. NEMA IA 2.2 - Programmable Controllers - Equipment Requirements and Tests.
27. NEMA IA 2.3 - Programmable Controllers - Programming Languages.
28. NEMA ICS 3 - Industrial Control and Systems: Factory Built Assemblies.
29. NEMA ICS 6 - Industrial Control and Systems: Enclosures.
30. National Fire Protection Association (NFPA).

Each control panel, including panels for service entrance equipment, must meet all UL listing and labeling requirements including UL Standard 508 and UL Standard 508A and must be UL labeled accordingly.

Perform factory and field tests under [section 88-11](#).

MURRAY STREET BRIDGE AT THE SMALL CRAFT HARBOR, SEISMIC  
RETROFIT/BARRIER REPLACEMENT, CITY PROJECT NO. C409321, FEDERAL NO.  
PROJECT NO. STPLZ 5025(084)

### **88-14.01E Quality Control**

Perform calibration and testing under [section 88-11](#).

#### **88-14.02 MATERIALS**

### **88-14.02A General**

All control panel assemblies for [controller](#)'s, Remote I/O, analyzer systems, communication systems, etc., must be mounted within NEMA-rated enclosure suitable and designed for the process application, as [shown](#).

Reference [plans](#) for control panel layouts and material requirements. The control panel layouts shown are diagrammatic. The control panel submittal shop drawing must reflect the accurate layout of the equipment in the panel. It is not the intent of this specification to completely specify all details of the design and construction of each panel.

Control panels must be either freestanding, pedestal-mounted or equipment skid-mounted.

The enclosures must be suitable for carrying the weight of the equipment mounted inside the panel and on the doors without any distortion or warping. Supply all equipment and components mounted on or within panels unless otherwise noted. Spare space must be kept clear of wiring, etc., to furnish contiguous clear space for future additions.

When required, [controller](#)-based control system panel assemblies must be mounted in existing enclosures.

Review the available space in the field or in the existing panel to determine the proper size of back panel suitable to accommodate the required equipment for the facility.

Environmental Suitability and NEMA Rating must comply with:

1. Indoor and outdoor control panels and instrument enclosures must be suitable for operation in the ambient conditions associated with the locations designated in the contract documents.
2. Provide heating, cooling, and dehumidifying equipment required to maintain instrumentation devices 20-percent within the minimums and maximums of their rated environmental operating ranges. Provide power wiring for these heating, cooling and dehumidifying devices.
3. Enclosures must be suitable for the environment that they are installed. Panel instruments and equipment in hazardous areas must be suitable for use in the particular hazardous or classified location in which it is to be installed.
4. Control panels must be sized to adequately dissipate heat generated by equipment mounted in or on the panel.

Enclosure ratings must comply with:

1. NEMA 12: Suitable for enclosures located in the, Electrical Room, and Control Room.
2. NEMA 4X: Suitable for enclosures located outdoors and in damp and corrosive process areas.
3. NEMA 7X (explosion proof and corrosion resistant): Suitable for enclosures located in classified areas.
4. ALL modifications to the panel enclosure including device penetrations must not compromise the enclosure rating.

MURRAY STREET BRIDGE AT THE SMALL CRAFT HARBOR, SEISMIC  
RETROFIT/BARRIER REPLACEMENT, CITY PROJECT NO. C409321, FEDERAL NO.  
PROJECT NO. STPLZ 5025(084)

### **88-14.02B Enclosure Construction**

Enclosures must be as manufactured by must be Hoffman, Tesco, Eletromate or equal.

Wall mounted type enclosure must be constructed of a minimum of 14-gauge or 12-gauge, depending of the size of the enclosure, application, environment, and the project requirements.

Floor mounted free-standing enclosures must be made of 12-gauge, depending of the size of the enclosure, application, and the project requirements.

Continuously welded and ground smooth seams. Corners must be welded and ground smooth.

Each enclosure must have a heavy gauge, continuous piano hinge pin which must support each door.

Provide door and body stiffeners where required. Weld the stiffeners to the inside of enclosures to prevent deformation due to the weight of face-mounted instruments.

Seal doors with a closed cell neoprene gasket.

The interior rear and sides of each enclosure must have steel mounting channels for supporting mounting panels.

Provide enclosures with external mounting feet when shown, as well as door clamps, hasp and staple for padlocking, data pocket, and closed-cell oil-resistant gasket. Removable lifting lugs to facilitate handling must be provided on large enclosures.

Each enclosure must be provided with a removable back panel. Depending on the size of the enclosure more than one back panel may be required. Removable side panels must be provided as required for additional mounting space.

Non-stainless-steel enclosures must have an ANSI 61 gray polyester urethane powder coating electrostatically finish applied to inside and outside surfaces. Enclosure interior, and back and side panels must be white.

Stainless Steel enclosures must be Type 316 and have a brush finish.

Ventilation, Louvers, and Vents must comply with:

1. All enclosures rated NEMA 12 must be provided with ventilation louvers, exhaust fan and thermostat. Seal the perimeters of the louver plate with a gasket. Louver must be of the same material and finish as the enclosure, and sized for effective heat rejection.
2. All Control Panels installed outside or inside non-air-conditioned environments must have an integral heater c/w thermostat.
3. All enclosures must be provided with a corrosion inhibitor size per manufacture recommendations.
4. Provide each panel enclosure with a data pocket for storing wiring diagrams, operation manuals and other documentation inside the enclosure.

Provide additional panel accessories to meet the specifications, such as floor stand and mounting kits, door handle and lock kits (common key must be provided for all doors), 3-point latch, etc. Provide panels with front access only. Doors must be key/pad lockable (as required) and fitted with 3-point heavy duty latching assemblies.

MURRAY STREET BRIDGE AT THE SMALL CRAFT HARBOR, SEISMIC  
RETROFIT/BARRIER REPLACEMENT, CITY PROJECT NO. C409321, FEDERAL NO.  
PROJECT NO. STPLZ 5025(084)

Instruments Mounting must comply with:

1. Equipment mounted at the rear of enclosure must be installed to allow for commissioning adjustments, operation and servicing requirements. Arrange components and wiring to meet UL requirements.
2. Spare space must be kept clear of wiring, etc., to furnish maximum space for future additions.
3. For front mounted hardware, cutouts and holes may be cut or drilled by any standard method that does not cause deformation. Burrs must be ground smooth. Mounting the instruments must not degrade the NEMA rating of the enclosure.
4. Provide each enclosure with interior nameplates to identify equipment tags and functions.

### **88-14.02C Electrical Requirements**

#### **88-14.02C(i) General**

The main power supply to the control panel controls must be 120 VAC, 60 Hz. Provide the main power supply from an external source and provide a step-down transformer as required to power the panel.

Isolate each source of foreign voltage by providing disconnect type terminal blocks Weidler or equal.

Provide wireways, wire, and electrical fittings and components for 120V and 24VDC circuits to instruments and other electrical devices in the panel for a complete and operable installation. Wiring methods and materials for all panels must be under the NEC requirements.

The circuits for 24VDC must run in separate wireways from the 120 VAC circuits.

If required by the contract documents, the control panel must be the source of power for any 120 VAC solenoid valves interconnected with the control panel.

#### **88-14.02C(ii) Wiring and Accessories**

Run all wiring in enclosed plastic wireways such as Panduit. Size all wireways so that the total cross-sectional area of the insulated wire and cable does not exceed forty (40%) percent of the cross-sectional area of the wireway.

Provide a minimum clearance of 1.5" between wireways and any point of wire termination.

Control wiring to be a minimum of #14 AWG tinned stranded copper; insulation rated at 600V.

Wiring for power distribution must be a minimum of #12 AWG tinned stranded copper; insulation rated at 600 V.

Analog wiring to be a minimum of #16 single pair copper 300V CIC white/black cable with overall foil shield and the drain wire. The black wire must be positive and white wire must be negative. Drain wires must be clipped in the field and terminated on individual green/yellow terminal blocks in the control panel. The shield must be grounded at only one end in the control panel grounding terminals, and cut back and insulated at the instrument end.

Label all wiring entering or leaving the enclosure with permanent marking identification.

MURRAY STREET BRIDGE AT THE SMALL CRAFT HARBOR, SEISMIC  
RETROFIT/BARRIER REPLACEMENT, CITY PROJECT NO. C409321, FEDERAL NO.  
PROJECT NO. STPLZ 5025(084)

### **88-14.02C(iii) Terminal Blocks**

Provide the control panel with sufficient terminal blocks for the connection of external field conductors, signals, and power and for use inside the panel for power distribution and for future expansion. In order to facilitate easy and safe loop maintenance, each analog input loop must have a disconnect with test plugs built into its field terminal block.

Spare Terminal Blocks for Signals: Provide sufficient spare terminal blocks to connect additional signals for future use (implemented and future spares). Implemented spare signals must be wired to terminal blocks and the percent of these terminals must be under the growth requirements specified in [section 88-13](#). For future signals (i.e. the source of inputs or final control elements are not yet known or available in the field), provide 25-percent spare terminals in the panel for each type of actual I/O in the [controller](#). The number of terminals must take in account the types of I/O for which spares are provided (Three (3) terminal for each AI or AO must be provided).

Spare Terminal Blocks for Power and Other Applications: In addition to the spare terminals for signals, provide spare terminals for 3 additional power distribution and grounding applications circuits.

Terminal blocks for all wiring must be modular terminals, DIN rail mounted strap screw type rated at 15 amperes at 600VAC and suitable for No. 12 AWG. stranded wire.

Identify each terminal block within an enclosure with a unique machine printed terminal block number. Cabinet chassis grounding terminal blocks to be identified by the electrical ground symbol.

Connections to screw terminals must be locking fork tongue insulated crimp type wire connectors equal to Panduit PAN-TERM series or T&B STA-KON series.

Terminals must be Weidmuller terminal blocks listed below or equal:

1. WDU4 Feed through Terminal Block.
2. WPE4 Ground Block.
3. WTR4 Disconnect terminal.
4. WDK4N Two Level Terminal Block.
5. WTR 4/SI LED Fused Terminal Block - for 24 V DC rated circuits c/w all required fuses.
6. WTR 6/2 SI LED Fused Terminal Block - for 120 V AC rated circuits c/w all required fuses.
7. WAP End Bracket.

Provide a group of terminals for each of 120 V AC hot and neutral and 24 V DC positive and negative power. Distribution wiring to have a thermal magnetic circuit breaker upstream of all major blocks of loads, adequately sized to protect the connected load while not causing nuisance tripping. Provide nickel-plated terminals for all high-capacity applications in excess of 15 A.

Provide Weidmuller disconnect type terminal blocks c/w fuses for each load or loop powered instrument from the control panels.

### **88-14.02C(iv) Electrical Hardware Accessories**

The control panel must be equipped with minimum provisions listed below:

MURRAY STREET BRIDGE AT THE SMALL CRAFT HARBOR, SEISMIC  
RETROFIT/BARRIER REPLACEMENT, CITY PROJECT NO. C409321, FEDERAL NO.  
PROJECT NO. STPLZ 5025(084)

1. Duplex 15-amp, 120 VAC GCFI type receptacles for service and maintenance use. The receptacle must be 2-pole, 3-wire grounding, and heavy-duty industrial grade by Hubbell, Leviton, or equal.
2. Simplex 15-amp 120 VAC GCFI type receptacle dedicated for a powering an uninterruptible power supply (UPS). The receptacle must be color coded, 2-pole, 3-wire grounding, heavy duty industrial grade by Hubbell, Leviton, or equal.
3. A 120 VAC LED light strip lamp with guards and a toggle switch (Hoffman Panelite LED Series, or equal) mounted on the top of the enclosure or on the part the side or back panel must be provided for panel lighting. A separate fuse/circuit breaker must be provided for the lamp mounted inside and in the top of the back-of-panel area. Provide (2) two lamps for Control Panels longer than 72-inches
4. A one (1)-inch by eight (8)-inch copper grounding bus mounted in each Control Panel including grounding lugs, suitable for termination of up to #2 AWG copper grounding conductor. The grounded bus must be bonded to the ground.
  - a. The grounding bus must be complete with solderless connector for one 2 AWG bare stranded copper cable and with tapped holes to accommodate ground connections from various devices in the enclosure.
  - b. Provide ground connections for different AWG wires and shield connection clamps by Phoenix Contact, or equal.
  - c. Provide separate ground buses for analog and discrete/digital signals. Provide the copper cable and connect it to a system ground loop.
  - d. Bond each enclosure door to the grounding lug.
5. Provide Hoffman 120 VAC Heater and thermostat. Heater must be DAH1001A and thermostat must be Stego model KTO-011, or equal, if required.
6. Provide ventilation system sized for heat dissipation. The ventilation system must be by Hoffman or equal, Cooling kit with removable filter or equal.

#### **88-14.02C(v) Circuit Breakers, Fuses, and Disconnects**

Provide circuit breakers, fuses and disconnects installed in the control panel to protect against fault current the 120 VAC and 24 VDC branch circuits. Install circuit breakers as disconnects of external power feeds for control circuits from outside the enclosure and branch circuits within the enclosure.

The circuit breakers, fuses and disconnects must also allow disconnecting the power from these instruments in a safe manner. Clearly identify each circuit breaker and fuse by a unique service nametag.

The fuses must be DIN rail mounted with fuse holder terminal block and have a blown fuse indicator light. Fuse holders must comply with:

1. The fuse holders for 120 VAC applications must have a neon light indicator. Provide Entrelec part number 0115-661.21, or equal.
2. The fuse holders for 24 VDC applications must have an LED indicator light. Provide Entrelec part number 0115-663.23, or equal.

The circuit breakers must be DIN rail mounted type. The 120 VAC breakers must by Square D model QUO-120 and QUO-115, amperage rating as required, or equal. Circuit breakers must comply with:

MURRAY STREET BRIDGE AT THE SMALL CRAFT HARBOR, SEISMIC  
RETROFIT/BARRIER REPLACEMENT, CITY PROJECT NO. C409321, FEDERAL NO.  
PROJECT NO. STPLZ 5025(084)



1. 20-Amp main circuit breaker for the 120 VAC control panel power supply and the distribution of the power.
2. 15-Amp circuit breaker for the duplex 15-amp, 120 VAC GCFI type receptacle for service and maintenance, and the LED light.
3. 15-Amp circuit breaker (or as required by the UPS manufacturer) for the dedicated simplex GCFI type receptacle for UPS.
4. 15-Amp circuit breaker for the heater and thermostat and ventilation fan.
5. 5-Amp fuse, 120 VAC for each of the 120 VAC power input circuits to the two(2) redundant 24 VDC power supplies

#### **88-14.02C(vi) Uninterrupted Power Supply**

Provide an uninterruptible AC power supply (UPS) system for each control panel to back up the power for the panel if utility power fails. The UPS must be a “smart” type, use on-line, high frequency, double-conversion technology. The batteries must be integral to the UPS enclosure.

The continuous output capacity of the UPS must be at least 1,000 VA. and sufficient to supply the computers, interface and peripheral equipment (present and future) with regulated AC power for a minimum of thirty (30) minutes from batteries only. Additional batteries or larger UPS size must be provided to meet the specified backup time.

Submit load calculations and size each UPS to justify the selection of present and future load requirements, as well as overload and inrush capacity requirements.

Features and Options must comply with:

1. Input Power Range: 120 VAC, 60 Hertz  $\pm$  5 Hertz.
2. Output Power Range: 120 VAC,  $\pm$  3 percent of nominal, 60 Hertz  $\pm$  0.5 percent.
3. Output Receptacles: Minimum of six (6) built-in outlets.
4. Overload Capacity: The UPS must have the ability to supply 110 percent of system requirements for 10 seconds, without degradation of the service life.
5. Operating Temperature: 0-to-40 degree C.
6. Protection: Protect the UPS output (IEEE standards) from lightning, surges overload, and short circuit. Protect the input by a circuit breaker, sized under manufacturer’s instructions.
7. Battery: Lead acid type, maintenance free, sealed suspended electrolyte, and leak-proof. Recharge Time (with half load): three (3) hours.
8. Alarms and Status: Provide the UPS with a relay output card in a combination with a network management card (NMC) to provide a common dry contact output that represents the health/status of the UPS and battery functions (i.e. low battery, UPS on batteries, UPS fault, batteries failed on battery self-test). Configure the NMC to provide the above alarms/status listed above.

Power supply must be as Manufactured by Schneider Electric APC - model Smart-UPS with communication and relay interface cards, or equal.

#### **88-14.02C(vii) 24VDC Power Supplies**

Provide control panels with redundant power supplies which must be configured in a fault-tolerant manner to prevent interruption of service on failure and interruption of service necessitated by the replacement of a power supply.

MURRAY STREET BRIDGE AT THE SMALL CRAFT HARBOR, SEISMIC  
RETROFIT/BARRIER REPLACEMENT, CITY PROJECT NO. C409321, FEDERAL NO.  
PROJECT NO. STPLZ 5025(084)

Size the power supplies to meet the control panel requirement and the instruments and loops they support. Power supplies must have an excess rated capacity of 40 percent. The failure of a power supply must be alarmed at the SCADA System.

The failure of a power supply must generate a dry relay contact output that can be used as an input to the [controller](#)/ SCADA system.

Power supplies must be Phoenix Contact 24 VDC Quint series, or equal.

#### **88-14.02D Electrical Components**

##### **88-14.02D(i) General Purpose Relays**

General purpose relays in the control panels must be compact plug-in type with contacts rated 10-Amps at 120 VAC; or 24 VDC.

Quantity and form of contacts must be as required by the application.

The relay must have a minimum of two (2)-form C contacts (double pole-double throw), except when used as interpose relay for the [controller](#)'s DO modules.

Interpose relay for the [controller](#)'s DO modules must have a minimum of one (1)-form C (single pole single throw) contacts. Each relay must be provided with a neon light to indicate energized state.

The relay socket and mounting must be a standard DIN rail mount with pullover wire spring.

Relays must be IDEC compact relays 2213, or equal.

##### **88-14.02D(ii) Interposing Relays**

Provide additional relays when the number or type of contacts required exceed the contact capacity and/or rating of the specified relays and timers, and when higher contact rating is required in order to interface with starter circuits or other equipment.

The interpose relays must be as the general-purpose relays specified above.

##### **88-14.02D(iii) Time Delay Relays**

Time delay relays must be plug-in electronic type with on-delay or off-delay actuation as required. Output contacts must be double-pole double-throw (DPDT) rated 10-Amps at 120 VAC minimum. Each unit must include an adjustable time delay with a time range scale. Operating temperature range of the units must be -20 to +120 degrees F minimum and each device must be rated for 10,000,000 mechanical operations and 500,000 electrical operations.

Provide Idec RTE multi-function series, Schneider Electric, or equal.

##### **88-14.02D(vi) Indicating Pilot Lights**

Indicating lights must be ultra-bright multiple LED cluster lamps, push-to-test full voltage and be heavy-duty, oil-tight construction. Operators must be nickel or chrome plated. Each light must have a screwed-on prismatic lens approximately 1-inch in diameter. Miniature style devices are not acceptable.

Lens colors must be GREEN for "run," "open," or "on"; RED for "stopped," "closed," or "off"; and AMBER for alarm.

MURRAY STREET BRIDGE AT THE SMALL CRAFT HARBOR, SEISMIC  
RETROFIT/BARRIER REPLACEMENT, CITY PROJECT NO. C409321, FEDERAL NO.  
PROJECT NO. STPLZ 5025(084)

Indicating lights must be as manufactured by Square D Company, Class 9001 Type K, General Electric Company Type CR104P, or equal. Each light must have a factory-engraved legend plate, as described in the contract documents.

#### **88-14.02D(vii) Selector and Pushbutton Switches**

Selector and pushbutton switches must be rated 10-amperes at 600 volts; heavy-duty, oil-tight construction; and have the number of positions and poles required. Miniature style devices are not acceptable. Operators must be nickel or chrome plated. Switches must be Square D Company, Class 9001 Type K, General Electric Company Type CR104P, or equal. Each switch must have a factory-engraved legend plate as shown on the contract documents.

#### **88-14.02D(viii) Signal Isolators, Conditioners and Converters**

Provide signal isolators conditioners and converters as required to resolve any signal level incompatibilities, to ensure adjacent component impedance match where feedback paths may be generated, or to maintain loop integrity during the removal of a loop component.

Signal isolators, integrators and converters must be 24 VDC or 120 VAC powered as applicable, and DIN rail mounted. Isolators must be by Phoenix Contact, or equal.

#### **88-14.02E Spare Parts**

Crate control panels for shipment using a heavy framework and skids as required and cushioned to protect the finish and the instruments during shipment. Provide sufficient cushioning material to protect interior hardware that could be damaged due to mechanical vibrations.

Provide each panel unit with removable lifting lugs to facilitate handling.

#### **88-14.03 CONSTRUCTION**

##### **88-14.03A General**

Control panels must be installed under [section 88-11 at locations shown](#).

All conduit and cable entrance must be from bottom entry only, unless otherwise [shown](#).

##### **88-14.03B Wire Installation Requirements**

Wiring methods and materials for panels must be under the NEC requirements and industry best practices.

Wires must be neatly grouped using nylon tie straps and fanned out to terminals. Wiring run from components on a swing out panel to other components on a fixed panel must be made up in tied bundles. Tie these bundles with nylon wire ties and secure them to panels at both sides of the hinge loop so that conductors are not strained at the terminals.

Wiring run to control devices on the front panels must be tied together at short intervals with nylon wire ties and secured to the inside face of the panel using adhesive mounts.

##### **88-14.03C Wire Terminations**

Wire spare I/O to a terminal strip and clearly marked.

Terminate all field wiring at a terminal block in the enclosure. Field wiring must be terminated first at the field interface terminal block and then wired to the devices/instrument or [controller](#) inside the panel. Except for antenna cable, Cat 5e cables and other specialty cables, such as

MURRAY STREET BRIDGE AT THE SMALL CRAFT HARBOR, SEISMIC  
RETROFIT/BARRIER REPLACEMENT, CITY PROJECT NO. C409321, FEDERAL NO.  
PROJECT NO. STPLZ 5025(084)

thermocouples and data cables, field wiring must not be wired directly to the panel mounted device.

Mount terminals and fuses for each conductor and shield drain wire of a twisted shielded pair or triad cable consecutively next to each other.

Group terminal blocks based on their function and voltage. Locate each group of terminal blocks in the panel to provide easy access, safety, practicality, and minimization of internal wiring.

Group terminal blocks for 24 VDC signals separate from the power and other 120 VAC terminals.

Terminal blocks for 24 VDC signals must be grouped separate from the 24VDC power as well. Likewise, terminal blocks for 120 VAC power and distribution must be grouped separate from the 120 VAC terminals for control signals.

Tag each terminal and wire connection in accordance with the authorized shop drawings or Facility standard tagging/numbering, if available.

#### **88-14.03D Mounting Heights**

Unless otherwise specified or a conflict exists, mount all control panels and field boxes 75" to top of cover.

#### **88-14.03E Identification**

Provide nameplates for each device on or within the panels and enclosures. Nameplates must be:

1. Black laminated with white lettering
2. Minimum 1" x 3" in size
3. Lettering size of 1/4"
4. Three lines maximum

Securely fasten nameplates in a visible location and mechanically attach them with self-tapping stainless-steel screws to the panel door. The nameplate must indicate panel name as [shown](#).

If more than one power source is present in a panel, a separate warning nameplate with red face and white core, must be mechanically attached with self-tapping screws to the panel door. The nameplate must indicate the number of power sources and their origin.

Identify all instruments within the panel.

Provide a list of all circuit breakers and fuses laminated in plastic [and locate it within](#) each associated enclosure. Identify all wires.

#### **88-14.03F Adjustments**

##### **88-14.03F(1) General**

Not Used

##### **88-14.03F(2) Analog Loops**

Whenever an existing analog loop is modified, ensure that the integrity and isolation of the loop is maintained and the shield is grounded correctly. In modifying the analog loop, also modify the

MURRAY STREET BRIDGE AT THE SMALL CRAFT HARBOR, SEISMIC  
RETROFIT/BARRIER REPLACEMENT, CITY PROJECT NO. C409321, FEDERAL NO.  
PROJECT NO. STPLZ 5025(084)

24 VDC to that loop so that the power supply source of that loop is part of the control panel and backed up by the UPS in it.

### **88-14.03F(3) Field Connection Panels and Interface Terminal Blocks**

Where field I/O wiring has to be extended to the control panel from enclosures removed or modified, provide separate enclosures/field connection panel (FCP), as required, to which field I/O are wired, and from which the signals must be wired to the control panel.

#### **88-14.04 PAYMENT**

Not Used

## **88-15 TESTING CALIBRATION AND INSTALLATION VERIFICATION**

### **88-15.01 GENERAL**

#### **88-15.01A Summary**

Section 88-15 includes specifications for providing all necessary testing, instrument calibration, and installation verification, for each system and piece of equipment complete with written reports before system completion. After system completion (or part thereof), start commissioning and start-up activities as specified in [section 88-16](#).

Conform to the general requirements of [section 88-2](#) regarding testing of the instrumentation and control equipment and coordinate instrumentation and control work to facilitate testing of other equipment. Use test forms and requirements as detailed in [section 88-16](#).

[Section 88-11 applies](#) for general instrumentation and control requirements related to testing, calibration, and installation verification.

Coordinate testing and commissioning activities with Prime Contractor, supplier of process equipment representatives and Engineer.

#### **88-15.01B Definitions**

Not Used

#### **88-15.01C Submittals**

Comply with section 79-1.01C.

Provide submittals under the requirements specified in [section 88-11](#).

Furnish all Instrumentation and Control Test Forms as required by [section 88-11.01C\(6\)](#).

#### **88-15.01D Quality Assurance**

Not Used

#### **88-15.02 MATERIALS**

Not Used

#### **88-15.03 CONSTRUCTION**

##### **88-15.03A General**

Not Used

MURRAY STREET BRIDGE AT THE SMALL CRAFT HARBOR, SEISMIC  
RETROFIT/BARRIER REPLACEMENT, CITY PROJECT NO. C409321, FEDERAL NO.  
PROJECT NO. STPLZ 5025(084)

### **88-15.03B Testing**

Before the completion of the work, perform comprehensive testing of the installation. Include the following activities:

1. Wire insulation tests.
2. Wire continuity tests including associated terminations.
3. Grounding system continuity and isolation tests.
4. Any other testing necessary to verify the operation of equipment and installation work.

Provide the services of a manufacturer's representative for equipment to assist with any of the equipment tests to be performed. Repair and replace any components, incorrect wiring, or systems found to be defective or deficient during the tests.

Provide a detailed test schedules to Engineer for review and approval as part of the Quality Control plan.

The participation in testing activities and use of the equipment during testing periods by [District](#) is to be allowed provided it does not adversely affect specified testing requirements. This participation does not relieve you of any of the obligations stipulated.

Before starting any testing, ensure that all spare parts, expendables, and test equipment pertinent to the system being tested are on site. Test equipment must include all necessary multi-meters, process instrument calibrators for 4-20 mA loops, 24 VDC devices and signal generators or simulators. Test equipment will be provided by you and will remain your property at the end of all testing.

### **88-15.03C Calibration**

Calibrate and adjust all instrumentation to verify correct operation, range adjustment, compensation, scaling, etc. Provide instrument calibration services for all individual components such as signal transmitters, analyzers, transducers, power supplies, and like equipment where appropriate.

Provide certified calibration reports for each instrument. In the reports, include, but do not limit information as:

1. Device tag number.
2. Equipment description.
3. Service application.
4. Process variable measurement range.
5. Description of calibration equipment used.
6. "As found" calibration data.
7. "As left" calibration data.
8. Date, name, and signature of technician.

Include calibration reports in the operating and maintenance manuals.

### **88-15.03D Installation Verification**

When the system installation has been completed (or part thereof), perform detailed verification checks for all systems supplied and installed as part of the scope. In the checks and reviews, include the following:

MURRAY STREET BRIDGE AT THE SMALL CRAFT HARBOR, SEISMIC  
RETROFIT/BARRIER REPLACEMENT, CITY PROJECT NO. C409321, FEDERAL NO.  
PROJECT NO. STPLZ 5025(084)

1. Certify that the equipment has been installed as shown and according to recommended installation procedures. Report any discrepancies.
2. Certify that the equipment power and grounding requirements have been satisfied, reporting any discrepancies to the Engineer. For the grounding system, include an itemized check of each instrument circuit to verify the correct isolation of all shields and instrument grounds.
3. Certify that all terminations to the equipment are properly installed. Report any discrepancies to the Engineer.
4. Certify that all wiring continuity (whether new or existing) has been verified.
5. Certify that all process taps and instrument connections have been performed according to the requirements detailed and as shown.
6. Certify that the installation (or part thereof as completed) is ready for commissioning and start-up.
7. Witnessed Functional Acceptance Test must be done on the complete control system. During this test, execute component by component and loop by loop tests. The correct results have to be verified in the field and on the associated control components. Perform the test using approved procedures and must be signed off on satisfactory completion.

Undertake any corrective action found to be necessary during the course of the verification checkout and review.

Report any discoveries of defects or deficiencies in writing for any equipment supplied by the District.

Allow for the participation of the District's personnel in the verification checks. This participation does not relieve you of any of the obligations.

Prepare the various reports and certificates described. Forward three (3) copies of each report or certificate to the Engineer. Clearly identify any discrepancies which require action on the part of the Engineer.

### **88-15.03E Field Instrumentation Checklist**

The following is a minimum checklist for all field-mounted devices:

1. Instrument cables and the individual conductors are tagged and identified.
2. Instrument cables are terminated on approved termination blocks.
3. Conductors are terminated in an approved manner on termination blocks and at connection points on the instrument.
4. Where required plug and receptacles have been used to connect field devices.
5. Termination boxes and junction boxes are identified and tagged.
6. Instrument cables are supported and strapped.
7. Field Instruments (flow meter, level transmitter, etc.) are tagged and identified.
8. Instruments are bonded to ground, and signal shield is not bonded to ground except at the host controller. (Signal shield is continuous and not bonded to any other signal shields in the field or field JB).
9. Instruments are adequately supported.
10. Instruments are located free of mechanical damage.
11. Instruments are new.
12. Instruments are free of dents, scratches, cracks, breaks, defects and damage.
13. Instruments are rated for the environment in which they are placed (indoor, corrosive, classified, outdoor, etc.).

MURRAY STREET BRIDGE AT THE SMALL CRAFT HARBOR, SEISMIC  
RETROFIT/BARRIER REPLACEMENT, CITY PROJECT NO. C409321, FEDERAL NO.  
PROJECT NO. STPLZ 5025(084)

14. Flexible connections or fittings are used to connect to the instruments.
15. Fittings for connections are water tight and secure.
16. Instrument control wiring is separated from power wiring.
17. Instrument control cable is shielded, twisted or configured in an approved manner to minimize electromagnetic and electrostatic interference.
18. Instruments are tested, calibrated and adjusted to operate within prescribed parameters.
19. 'Loop check sheets' and 'instrument calibration sheets' have been completed for each device.
20. Exact Instrument location has been authorized.
21. All equipment will bear the UL label.
22. Wiring at different voltage levels within the same panel or termination box are segregated by an effective barrier.
23. A minimum clearance of 2" is provided between the wire-way and any point of wire termination.

**88-15.04 PAYMENT**

Not Used

**88-16 INSTRUMENTATION AND CONTROL TEST FORMS**

**88-16.01 GENERAL**

**88-16.01A Summary**

Section 88-16 includes specifications for providing all necessary commissioning and start-up testing to verify the operation of all the systems as described after the installation is completed.

The System Supplier, under your direction, will coordinate and schedule all activities associated with testing and commissioning under [section 88-11](#).

**88-16.01B Definitions**

Not Used

**88-16.01C Submittals**

Comply with section 79-1.01C.

Provide submittals under the requirements specified in [section 88-11](#).

Furnish all Instrumentation and Control Test Forms as required by [section 88-11.01C\(6\)](#).

**88-16.01D Quality Assurance**

Use only the forms [provided in Attachment B](#) to perform loop testing.

Provide a coordinated commissioning and start-up program. The overall program will be presented to the [District](#) and Engineer for approval before testing and commissioning activities as part of the shop drawings approval process.

**88-16.02 MATERIALS**

Not Used

**88-16.03 CONSTRUCTION**

Not Used

MURRAY STREET BRIDGE AT THE SMALL CRAFT HARBOR, SEISMIC  
RETROFIT/BARRIER REPLACEMENT, CITY PROJECT NO. C409321, FEDERAL NO.  
PROJECT NO. STPLZ 5025(084)



88-16.04 PAYMENT

Not Used

MURRAY STREET BRIDGE AT THE SMALL CRAFT HARBOR, SEISMIC  
RETROFIT/BARRIER REPLACEMENT, CITY PROJECT NO. C409321, FEDERAL NO.  
PROJECT NO. STPLZ 5025(084)

SP-303

**ATTACHMENT A**

**ELECTRICAL TESTS**

Sheet No.	Title
1	Insulation Resistance (Power, Control Wire, and Cable) Test Record
2	Insulation Resistance (Instrument Wire and Cable) Test Record
3	Ground Electrode Testing Test Record





**GROUND ELECTRODE TESTING  
TEST RECORD**

TYPE OF GROUND ROD: \_\_\_\_\_ NO. OF GROUND RODS: \_\_\_\_\_  
 DIAMETER OF GROUND ROD: \_\_\_\_\_ (IN) LENGTH OF GROUND RODS \_\_\_\_\_  
 SOIL TYPE: \_\_\_\_\_ SOIL CONDITION: \_\_\_\_\_  
 CONNECTING CONDUCTOR SIZE: \_\_\_\_\_ CONNECTING CONDUCTOR TYPE: \_\_\_\_\_  
 GROUND TESTER MAKE: \_\_\_\_\_ MODEL: \_\_\_\_\_  
 LAST CALIBRATION DATE: \_\_\_\_\_  
 WEATHER: \_\_\_\_\_ TEMP.: \_\_\_\_\_ °C \_\_\_\_\_ °F % HUMIDITY: \_\_\_\_\_ DATE: \_\_\_\_\_  
 TEST EQUIPMENT USED: \_\_\_\_\_

NOTES:

1. Conduct Fall-of-potential before utility ground connection and no less than 72 hours after the last rain fall.
2. The resultant readings shall be tabulated and graphed to show the point of inflection to determine the actual station resistance.
3. Ground point of inflection shall not exceed 5 ohms.

DISTANCE IN FEET (GROUND ELECTRODE TO P)	PERCENT OF OVERALL DISTANCE	RESISTANCE READING (ohms)	Overpot.
30			
60			
90			
120			
150			
180			
210			
240			
270			
300			

\*Minimum acceptable values

\_\_\_\_\_ RESULTS (ohms)

-----  
DISTRIBUTION:

CONTRACTOR/Date \_\_\_\_\_

## **ATTACHMENT B**

### **TEST FORM NUMBER AND DESCRIPTION**

88-2-A LOOP WIRING AND INSULATION RESISTANCE TEST DATA FORM

88-2-B FIELD SWITCH CALIBRATION TEST DATA FORM

88-2-C TRANSMITTER CALIBRATION TEST DATA FORM

88-2-D MISCELLANEOUS INSTRUMENT CALIBRATION TEST DATA FORM

88-2-E INDIVIDUAL LOOP TEST DATA FORM

88-2-F VISUAL AND MECHANICAL INSPECTION FORM

88-2-G I/O POINT CHECKOUT TEST FORM

88-2-H FACTORY TEST FORM

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**17830-A: LOOP WIRING AND INSULATION RESISTANCE TEST DATA FORM**

LOOP TAG: \_\_\_\_\_

List each conductor of all cables associated with a loop in table below. Ensure end devices are disconnected prior to making measurements. Perform continuity measurements with a 4,000 count DVM. Perform insulation resistance measurements with an insulation tester with energization voltage of 250V DC or less. Do not use a high voltage or hand-crank megohmmeter for this test.

Submit up to 5% of conductor recorded retest results when requested by the Engineer.

CABLE NO.	CONDUCTOR NO. (OR COLOUR)	CONTINUITY RESISTANCE <sup>A</sup>	SHIELD CONTINUITY INSULATION RESISTANCE <sup>B</sup>

A Continuity Test: Connect ohm meter leads between conductors 1 and 2 and jumper opposite ends together. Record resistance in table. Repeat procedure between conductors 1 and 3, and 4, etc. and finally between conductor 1 and cable shield. Any deviation of  $\pm 2$  ohms between any reading and the average of a particular run indicates a poor conductor. Take corrective action before continuing with the loop test.

B Insulation Test: With all conductors open, measure the insulation resistance between conductor 1 and shield. Repeat procedure for each conductor and record reading.

CERTIFIED \_\_\_\_\_  
*Contractor's Representative*

DATE \_\_\_\_\_

WITNESSED \_\_\_\_\_  
*Owner's Representative*

DATE \_\_\_\_\_

MURRAY STREET BRIDGE AT THE SMALL CRAFT HARBOR, SEISMIC  
RETROFIT/BARRIER REPLACEMENT, CITY PROJECT NO. C409321, FEDERAL NO.  
PROJECT NO. STPLZ 5025(084)



**17830-B: FIELD SWITCH CALIBRATION TEST DATA FORM**

TAG NO. AND DESCRIPTION: \_\_\_\_\_

MAKE AND MODEL NO.: \_\_\_\_\_

SERIAL NO.: \_\_\_\_\_

INPUT: \_\_\_\_\_

RANGE: \_\_\_\_\_

SETPOINT(S): \_\_\_\_\_

Simulate process variable (flow, pressure, temperature, etc.) and set desired setpoint(s). Run through entire range of switch and calculate deadband.

Perform two tests per device or switch and record results.

SETPOINT	TRIP POINT (EU)		DEADBAND	
	INCREASE INPUT	DECREASE INPUT	CALCULATED	REQUIRED

CERTIFIED \_\_\_\_\_  
*Contractor's Representative*

DATE \_\_\_\_\_

WITNESSED \_\_\_\_\_  
*Owner's Representative*

DATE \_\_\_\_\_

MURRAY STREET BRIDGE AT THE SMALL CRAFT HARBOR, SEISMIC  
 RETROFIT/BARRIER REPLACEMENT, CITY PROJECT NO. C409321, FEDERAL NO.  
 PROJECT NO. STPLZ 5025(084)

**17830-C: TRANSMITTER CALIBRATION TEST DATA FORM**

TAG NO. AND DESCRIPTION: \_\_\_\_\_

MAKE AND MODEL NO.: \_\_\_\_\_

SERIAL NO.: \_\_\_\_\_

INPUT: \_\_\_\_\_

SUPPRESSION: \_\_\_\_\_

RANGE: \_\_\_\_\_

SCALE: \_\_\_\_\_

Simulate process variable (flow, pressure, temperature, etc.) and measure output with appropriate meter.

% OF RANGE	INPUT	OUTPUT		% DEVIATION
		EXPECTED	ACTUAL	
0				
25				
50				
75				
100				
75				
50				
25				
0				

NOTE: If transmitter includes integral switches include Form 16900-G for each switch.

CERTIFIED \_\_\_\_\_  
*Contractor's Representative*

DATE \_\_\_\_\_

WITNESSED \_\_\_\_\_  
*Owner's Representative*

DATE \_\_\_\_\_

MURRAY STREET BRIDGE AT THE SMALL CRAFT HARBOR, SEISMIC  
 RETROFIT/BARRIER REPLACEMENT, CITY PROJECT NO. C409321, FEDERAL NO.  
 PROJECT NO. STPLZ 5025(084)

**17830-D: MISCELLANEOUS INSTRUMENT CALIBRATION TEST DATA FORM**

TAG NO. AND DESCRIPTION: \_\_\_\_\_  
 MAKE AND MODEL NO.: \_\_\_\_\_  
 SERIAL NO.: \_\_\_\_\_  
 SERVICE: \_\_\_\_\_  
 INPUT: \_\_\_\_\_  
 DATA SHEET: \_\_\_\_\_  
 SUPPRESSION: \_\_\_\_\_  
 RANGE: \_\_\_\_\_  
 SCALE: \_\_\_\_\_

	TEST 1				TEST 2			
TEST METHOD								
	INPUT		OUTPUT		INPUT		OUTPUT	
PROCESS	INC.	DEC.	INC.	DEC.	INC.	DEC.	INC.	DEC.
TEST POINT 1								
TEST POINT 2								
TEST POINT 3								
TEST POINT 4								
TEST POINT 5								
COMMENTS								
GRAPHS								

CERTIFIED \_\_\_\_\_  
*Contractor's Representative*

DATE \_\_\_\_\_

WITNESSED \_\_\_\_\_  
*Owner's Representative*

DATE \_\_\_\_\_

MURRAY STREET BRIDGE AT THE SMALL CRAFT HARBOR, SEISMIC  
 RETROFIT/BARRIER REPLACEMENT, CITY PROJECT NO. C409321, FEDERAL NO.  
 PROJECT NO. STPLZ 5025(084)

**17830-E: INDIVIDUAL LOOP TEST DATA FORM**

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LOOP NO.: \_\_\_\_\_

DESCRIPTION: \_\_\_\_\_  
*Give complete description of loop's function using tag numbers where appropriate*

P & ID NO.: *Attach copy of P & ID*

1. Wiring tested (*attach test Form 17830 -A or equivalent*).
2. Instruments calibrated (*attach test Forms 17830-I through K*).
3. List step-by-step procedures for testing loop parameters. Test loop with instruments, including transmitters and control valves, connected and functioning. If it is not possible to produce a real process variable, then a simulated signal may be used with the Engineer's approval.
4. List step-by-step procedures for testing loop failure action. This testing to include loop operation upon loss of motive air supply, modulating control air signal, modulating control electrical signal and solenoid energizing power.
5. Sort all test forms associated with the P & ID in ascending order by loop number (*attach all associated instrument loop diagrams and interconnecting wiring diagrams*).

CERTIFIED \_\_\_\_\_  
*Contractor's Representative*

DATE \_\_\_\_\_

WITNESSED \_\_\_\_\_  
*Corporation's Representative*

DATE \_\_\_\_\_

**17830-F: VISUAL AND MECHANICAL INSPECTION FORM**

<b>Equipment Name:</b> _____	<b>Location:</b> _____
Manufacturer: _____	Series#: _____
Model #: _____	U.L. #: _____
Voltage: _____	Phase: _____
Amperage: _____	Service: _____
Bus Type: _____	Bus Bracing: _____
Vertical Bus: _____	Horizontal Bus: _____
Ground Bus: _____	Neutral Bus: _____
Enclosure: _____	Environ. Rating: _____

**Inspection Checklist**

Check: **A** – Acceptable, **R** - Needs Repair or Replacement, **NA** – Not Applicable

	<b>Accept</b>	<b>Repair</b>	<b>NA</b>
1. Tighten All Bolts and Screws .....	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2. Tighten All Wiring and Buss Connections.....	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3. Verify All Breakers and Fuses Have Proper Rating.....	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
4. Check Bus Bracing and Clearance .....	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
5. Check Main Grounding Connection and Size.....	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
6. Inspect Ground Bus Bonding .....	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
7. Check Equipment Grounds.....	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
8. Check Conduit Grounds and Bushings.....	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
9. Inspect Neutral Bus and Connections .....	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
10. Check Heaters and Thermostats .....	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
11. Check Ventilation and Filters .....	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
12. Check for Broken or Damaged Devices .....	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
13. Check Door and Panel Alignment.....	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
14. Inspect Anchorage .....	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
15. Check for Proper Clearances and Working Space .....	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
16. Remove All Dirt and Dust Accumulation.....	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
17. Inspect All Paint Surfaces .....	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
18. Check for Proper Wire Color Codes .....	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
19. Inspect all Wiring for Wire Labels .....	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
20. Check for Proper Wire Terminations .....	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
21. Check for Proper Wire Sizes.....	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
22. Inspect All Devices for Nameplates .....	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
23. Check if Drawings Match Equipment.....	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
24. Check Accuracy of Operation & Maintenance.....	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

**Tested by:** \_\_\_\_\_

**Witnessed by:** \_\_\_\_\_ **Date:** \_\_\_\_/\_\_\_\_/\_\_\_\_

MURRAY STREET BRIDGE AT THE SMALL CRAFT HARBOR, SEISMIC  
 RETROFIT/BARRIER REPLACEMENT, CITY PROJECT NO. C409321, FEDERAL NO.  
 PROJECT NO. STPLZ 5025(084)



**17830-H: FACTORY TEST FORM (MCC BUCKET / CONTROL PANEL / PEDESTAL CHECKOUT FORM)**

**Manufacturer:** \_\_\_\_\_ **Location:** \_\_\_\_\_  
 \_\_\_\_\_ **Job No.:** \_\_\_\_\_  
**Telephone #:** \_\_\_\_\_ **Fax #:** \_\_\_\_\_

**MCC Bucket / Control Panel / Pedestal:** \_\_\_\_\_ **Test Result**

**OVERALL PANEL INSPECTION**

- |  | <u>Pass</u>              | <u>Fail</u>              |
|--|--------------------------|--------------------------|
| 1. All front panel and back panel components counted securely.....                 | <input type="checkbox"/> | <input type="checkbox"/> |
| 2. All wiring terminated and labeled correctly.....                                | <input type="checkbox"/> | <input type="checkbox"/> |
| 3. All components, wiring, and labeling accurately reflected on the drawings. .... | <input type="checkbox"/> | <input type="checkbox"/> |

**POWER-UP INSPECTION**

- |  |                          |                          |
|--|--------------------------|--------------------------|
| 1. Voltage levels on load side of circuit breakers.....        | <input type="checkbox"/> | <input type="checkbox"/> |
| 2. Voltage levels at the DC terminals of the power supply..... | <input type="checkbox"/> | <input type="checkbox"/> |
| 3. Voltage levels at the DC power distribution terminals.....  | <input type="checkbox"/> | <input type="checkbox"/> |

**POWER DISTRIBUTION AND GENERAL COMPONENT TESTING**

- |   |                          |                          |
|---|--------------------------|--------------------------|
| 1. Power distribution to the appropriate components.....                            | <input type="checkbox"/> | <input type="checkbox"/> |
| 2. Operation of the ancillary components such as receptacles, work lights, etc. ... | <input type="checkbox"/> | <input type="checkbox"/> |

**CONTROL COMPONENTS CHECKS**

- |   |                          |                          |
|---|--------------------------|--------------------------|
| 1. Operators (push buttons, selector switches, pilot lights)..... | <input type="checkbox"/> | <input type="checkbox"/> |
| 2. Inputs from External Sources.....                              | <input type="checkbox"/> | <input type="checkbox"/> |
| 3. Outputs to External Sources.....                               | <input type="checkbox"/> | <input type="checkbox"/> |
| 4. Relay Logic.....   | <input type="checkbox"/> | <input type="checkbox"/> |
| 5. PLC I/O and Program Verification.....                          | <input type="checkbox"/> | <input type="checkbox"/> |
| 6. O/I Display Verification.....                                  | <input type="checkbox"/> | <input type="checkbox"/> |

**Notes:**

1. For relay logic checks, each rung of the elementary or loop diagram is to be highlighted in yellow as they are verified for correct control functions.
2. For PLC I/O and program verification, the control strategies shall be highlighted in yellow as each logic function is tested.

**Tested by:** \_\_\_\_\_

**Witnessed by:** \_\_\_\_\_

**Date:** \_\_\_\_ / \_\_\_\_ / \_\_\_\_

AA

MURRAY STREET BRIDGE AT THE SMALL CRAFT HARBOR, SEISMIC RETROFIT/BARRIER REPLACEMENT, CITY PROJECT NO. C409321, FEDERAL NO. PROJECT NO. STPLZ 5025(084)

# DIVISION XI MATERIALS

## 90 CONCRETE

### Add to section 90-1.02H:

Concrete at Bents 4, 5, 6, 7, 8 and 9 below elevation 15.0 excluding concrete within piles is in a corrosive environment.

For concrete at Bents 4, 5, 6, 7, 8 and 9 below elevation 15.0 excluding concrete within piles the cementitious material must be composed of one of the following, by weight:

1. 20 percent natural pozzolan or fly ash with a CaO content of up to 10 percent, 5 percent silica fume, and 75 percent portland cement
2. 12 percent silica fume, metakaolin, or UFFA, and 88 percent portland cement
3. 50 percent GGBFS and 50 percent portland cement

For concrete at Bents 4, 5, 6, 7, 8 and 9 below elevation 15.0 excluding concrete within piles, the ratio of the quantity of free water to the quantity of cementitious material must not exceed 0.40.

^^



## **96 GEOSYNTHETICS**

**Add to section 96-1.02B:**

Filter fabric must be Class A.