



PUBLIC WORKS DEPARTMENT

SPECIAL PROVISIONS
FOR

**WEBER POINT EVENTS CENTER
SHADE STRUCTURE
REHABILITATION – PHASE 2**

PROJECT NO. - WP22033

BID OPENS: December 22, 2022, 2 P.M.

CONTRACTOR MUST HAVE CLASS “A” LICENSE

WEBER POINT EVENTS CENTRE SHADE STRUCTURE
REHABILITATION – PHASE 2

PROJECT NO. – WP22033

The special provisions contained herein have been prepared by, or under the direct supervision of, the following Registered Engineer:

CIVIL ENGINEERING



SIGNED: _____
Registered Structural Engineer

DATE: 10-31-22

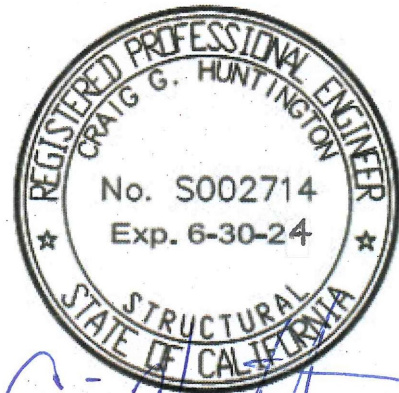


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**SPECIAL PROVISIONS FOR
WEBER POINT EVENTS CENTER SHADE STRUCTURE
REHABILITATION – PHASE 2
PROJECT NO. WP22033**

SPECIAL NOTES

1. Official bid documents including plans and specifications are available online at: http://www.stocktongov.com/services/business/bidflash/pw.html?dept=Public_Works

All bids submitted for this project must conform to the requirements of the official bid documents, including specifications and plans.

SECTION 1 SPECIFICATIONS AND PLANS

1-1.01 Specifications

The work described herein shall be done in accordance with the current City of Stockton, Department of Public Works, Standard Specifications and the current Editions of the State of California, Department of Transportation Standard Specifications and Standard Plans and in accordance with the following Special Provisions. To the extent the California Department of Transportation Standard Specifications implement the STATE CONTRACT ACT they shall not be applicable since the City of Stockton is not subject to said ACT.

In case of conflict or discrepancy between any of the Contract Documents, the order of documents listed below shall be the order of precedence, with the first item listed having the highest precedence:

1. Contract Change Order (Modifications or changes last in time are first in precedence)
2. Contract
3. Project Special Provisions
4. Project Plans
5. City Standard Specification
6. City Standard Drawings
7. Revised Caltrans Standard Specifications
8. Caltrans Standard Specifications
9. Revised Caltrans Standard Plans
10. Caltrans Standard Plans
11. Supplemental Project Information

With regards to discrepancies or conflicts between written dimensions given on drawings and the scaled measurements, the written dimensions shall govern.

With regards to discrepancies or conflicts between large-scale drawings and small-scale drawings, the larger scale shall govern.

With regards to discrepancies or conflicts between detailed drawings and referenced standard drawings or plans, the detailed drawings shall govern.

In the event where provisions of codes, safety orders, contract documents, referenced manufacturer's specifications or industry standards are in conflict, the more restrictive and higher quality shall govern. Should it appear that the work to be done or any of the matters relative thereto are not sufficiently detailed or explained in these specifications, the Special Provisions, or the plans, the Contractor shall apply to the Engineer in writing for such further explanations as may be necessary and shall conform to them as part of the contract. All responses from the Engineer shall also be in writing. In the event of any doubt or question arising respecting the true meaning of these specifications, the Special Provisions or the plans, reference shall be made to the Engineer, whose decision thereon shall be final.

1-1.02 Contractor's Responsibility

The Contractor shall examine carefully the site of the work and the plans and specifications therefore. The Contractor shall investigate to their satisfaction as to conditions to be encountered, the character, quality and quantity of surface, subsurface materials or obstacles to be encountered, the work to be performed, materials to be furnished, and as to the requirements of the bid, plans and specifications of the contract.

1-1.03 Terms and Definitions

Wherever in the Standard Specifications, Special Provisions, Notice to Contractors, Proposal, Contract, or other contract documents the following terms are used, the intent and meaning shall be interpreted as follows:

City or Owner -	City of Stockton
CA-MUTCD -	Latest edition of the California Manual on Uniform Traffic Control Devices and any amendments and revisions thereto
Director -	Director of Public Works, City of Stockton
Standard Specifications -	City of Stockton Latest Standard Plans and Specifications And any amendments and revisions thereto.
Caltrans Specifications -	Current and Latest State of California, Department of Transportation, and any amendments or revisions thereto.
Department -	Department of Public Works, City of Stockton
Engineer -	City Engineer, City of Stockton, acting either directly or through properly authorized Engineer, agents and consultants.
Working Day -	Defined as any eight (8) hour day, except as follows: Saturdays, Sundays, City-observed holidays, and other days the City is closed as shown on the City of Stockton Working Calendar, days on which the Contractor is prevented by inclement weather or conditions resulting immediately there from adverse to the current controlling operation or operations, as determined by the Engineer, from proceeding with at least 75 percent of the normal labor and equipment force engaged on that operation or operations for at least 60 percent of the total daily time being currently spent on the controlling operation or operations.

SECTION 2 PROPOSAL REQUIREMENTS AND CONDITIONS

2-1.01 General

The bidder's attention is directed to the "Notice to Bidder" for the date, time and location of the Pre-Bid meeting, if applicable. Refer to the City of Stockton's Bid Flash webpage: <http://www.stocktongov.com/services/business/bidflash/default.html>

SECTION 3 AWARD AND EXECUTION OF CONTRACT

3-1.01 Addendum and Bid Inquiries

The addendum and bid inquiries will be posted on the City website. An email notification will be issued to all registered plan-holders. It is the contractor's/sub-contractor's sole responsibility to register as a plan holder. If a firm is not registered as a plan holder, they will not receive the notifications about addendum/bid inquiries/other information related to the project. To register as a plan holder, please send an email to Katrina Cooper at Katrina.Cooper@stocktonca.gov referencing the project name. Bid inquiries will not be accepted within 5 calendar days of bid opening date.

3-1.02 Contract Award

Each prospective bidder shall be required to bid on all items. Failure to bid an item shall be just cause for considering the bid as non-responsive. The City reserves the right to reject all bids. The bidders must be responsible, and their bids must be responsive.

If the City awards the Contract, the basis of the award will be the responsible bidder with the **lowest bid** whose proposal complies with all requirements prescribed.

The contract shall be executed by the successful bidder and shall be returned, along with the contract bonds, so that it is received by the City within ten (10) working days after the bidder has received the contract for execution. Failure to do so shall be just cause for forfeiture of the proposal guaranty. The executed contract documents shall be delivered to the following address:

Attention: Amanpreet Grewal
City of Stockton
Public Works Department
1465 S. Lincoln Street
Stockton, CA 95206

3-1.03 Bid Protest

All parties wishing to file a protest shall comply with the procedures set forth below:

All protests regarding the bidding process or award, or intended award, of any contract must be submitted in writing to the City Attorney on or before 5:00 p.m. of the fifth business day following the opening of all bids, unless a different time period is specified in the Notice Inviting Bids or other bid solicitation documents. All protests must be addressed to:

City Attorney
City of Stockton
425 North El Dorado Street, 2nd Floor
Stockton, CA 95202

The party filing the protest must have submitted a bid for the work. A subcontractor of a bidder may not submit a bid protest.

The protest shall contain a complete statement specifying in detail the grounds of the protest and the facts in support thereof. The protest must be hand delivered or send via mail so that the City Attorney receives it within the time period set forth above. The protest documents must include the following:

- A complete statement of the factual and legal basis for the protest;
- The protest must include the name, address and telephone number of the person representing the protesting party; and
- The protesting party must concurrently transmit a copy of the written protest document and any attached documentation to all other bidders who may have a reasonable prospect of receiving the award depending on the outcome of the protest.

The procedure and time limits set forth herein are mandatory and the bidder's sole and exclusive remedy in the event of a protest. No bidder may bring an action or proceeding challenging the bidding process or any award, or intent to award, any contract unless the above procedures are followed. The failure of a party originating a protest to comply with these procedures shall constitute a waiver of any right to further pursue the protest, including filing a government code claim or legal proceeding. The City reserves the right to modify the bid protest procedures in the Notice Inviting Bids or other bid solicitation documents and to require any protesting party to submit additional or clarifying information or documentation in support of any protest.

3-1.04 Contract Execution

The bidder's attention is directed to the provisions in Section 3, "Contract Award and Execution," of the Caltrans Specifications and these Special Provisions for the requirements and conditions concerning award and execution of the contract. Bid protests are to be delivered to the address noted above.

See following page

SECTION 4 BEGINNING OF WORK, TIME OF COMPLETION AND LIQUIDATED DAMAGES

4-1.01 Beginning of Work

The Contractor shall perform and complete the proposed work in a thorough and workmanlike manner, and to furnish and provide in connection therewith all necessary labor, tools, implements, equipment materials and supplies.

Attention is directed to the provisions in Section 8-1.04B, "Standard Start," of the Caltrans Standard Specifications and these Special Provisions.

At no time shall construction begin without receiving notice that the contract has been approved by the City Attorney or an authorized representative. The Contractor shall follow the sequence of construction and progress of work as specified in Section 9-1.02, "Contractor Work Procedure," and Section 9-1.03 Prosecution and Progress" of these Special Provisions.

The Contractor shall diligently prosecute all work items to completion.

4-1.02 Time of Completion

Attention is directed to the provisions in Section 8-1.05, "Time" of the Caltrans Standard Specifications and these Special Provisions.

The contract for the performance of the work and the furnishing of materials shall commence within ten (10) calendar days from the Notice to Proceed date and shall be diligently prosecuted to completion before the expiration of the working days specified in this section from the date of said commencement.

The Contractor shall diligently prosecute the contract work to completion within **One Hundred Seventy-Five (175) working days**. The days to finish the punch list, provided by the City, are included in the Working Days.

Should the Contractor choose to work on a Saturday, Sunday, City Holidays or on a holiday recognized by the labor unions, the Contractor shall reimburse the City of Stockton the actual cost of engineering, inspection, testing, superintendent, and/or other overhead expenses which are directly chargeable to the contract. Should such work be undertaken at the request of the City, reimbursement will not be required.

4-1.03 Working Hours

Normal working hours for all items of work are allowed only during 8:30 AM to 4:30 PM. The Engineer may restrict or alter the hours of work as required.

4-1.04 Liquidated Damages

Attention is directed to the provisions in Section 8-1.10, "Liquidated Damages," of the Caltrans Specifications and these Special Provisions.

The Contractor shall pay liquidated damages to the City of Stockton in the amount of **\$500 (Five Hundred Dollars) per day** for each and every calendar day that the work remains incomplete after expiration of the contract working days specified in these Special Provisions. Liquidated damages assessment applies to base bid and bid alternate if awarded.

In addition, the Contractor shall pay the following sums for the associated liquidated damages:

Failure to provide and/or non-compliance to or violation of accepted construction scheduling and/or phasing, per Section 5-1.08 and 5- 1.12	\$250.00	per each calendar day
Failure to provide and/or non-compliance with accepted Traffic Control Plans per Section 5-1.08	\$250.00	per each calendar day
Failure to provide adequate Project Site Maintenance 24/7, per Sections 5-1.08, and 5-1.17	\$250.00	per each calendar day
Failure to provide appropriate driveway access and pedestrian access, per Section 5-1.09, and 5-1.10	\$250.00	per each half-hour delay
Failure to follow proper procedure for storage of equipment and/or materials in public streets, per Section 5-1.26	\$250.00	per each calendar day/incident
Failure to provide adequate advance notices to RTD, Fire Comm, Police, Schools for sidewalks and lane closures	\$500.00	per each day/incident

4-1.05 CITY OF STOCKTON HOLIDAY SCHEDULE FOR 2022

- Monday, January 17, 2022 Martin Luther King, Jr.'s Birthday
- Monday, February 14, 2022 Lincoln's Birthday Observance
- Monday, February 21, 2022 Washington's Birthday
- Thursday, March 31, 2022..... Cesar Chavez Day
- Monday, May 30, 2022 Memorial Day
- Monday, July 04, 2022 Independence Day Observance
- Monday, September 05, 2022 Labor Day
- Monday, October 10, 2022 Columbus Day
- Friday, November 11, 2022..... Veteran's Day Observance
- Thursday and Friday, Nov 24 and 25, 2022..... Thanksgiving Holidays
- Monday, December 26, 2022..... Christmas Day Observance

Similar holidays are scheduled in year 2023.

Full compensation for any costs required to comply with the provisions in this section shall be considered to be included in the prices paid for the various contract items of work and no additional compensation will be allowed, therefore.

SECTION 5 GENERAL

5-1.01 Understanding of Conditions

Bidders will be required to carefully examine these Special Provisions and attachments to judge for themselves as to the nature of the work to be done and the general conditions relative thereto and the submission of a proposal hereunder shall be considered prima-facie evidence that the bidder has made the necessary investigation and is satisfied with respect to the conditions to be encountered, the character, quantity and quality of the work performed.

Bidders must be thoroughly competent and capable of satisfactorily performing the work covered by the proposal, and when requested, shall furnish such statements relative to previous experience on similar work, the plan or procedure proposed, and the organization and the equipment available for the contemplated work, and any other as may be deemed necessary by the Project Engineer in determining such competence and capability.

It shall be understood that the Contractor shall be required to perform and complete the proposed work in a thorough, workmanlike and professional manner, and to furnish and provide in connection therewith all necessary labor, tools, equipment, materials and supplies. The Contractor is responsible to take all necessary precautions and use best practices in the industry to perform all work require completing the project.

5-1.02 Location

Weber Point Events Center – 221 N Center St, Stockton, CA 95202

5-1.03 Partial Payment

The five percent (5%) retention withheld of all construction payments will remain with the City until thirty-five (35) calendar days after the date the Notice of Completion is recorded.

5-1.04 Guaranty/Warranty

The work furnished under these specifications shall be guaranteed for a period of one (1) year from date of acceptance by the Engineer thereof against defective materials, equipment and workmanship. Upon receipt of notice from the City of failure of any part of the materials, equipment, or workmanship during the guaranty period, the affected part or parts shall be replaced with new material and/or equipment, and at the expense of the Contractor within two weeks of the Engineer's notification date.

5-1.05 Construction Control

The City reserves the right to order discontinuance of any equipment in use. This will be determined at the discretion of the Engineer on the basis that the use of said equipment would prohibit obtaining the best possible result.

Additional operated equipment may be requested by the Engineer for the above reasons. Failure to comply with the Engineer's request concerning equipment use or removal will be deemed sufficient cause for shutting down all work until the requirements are met. Days lost for this type of shutdown will be charged as workable days.

5-1.06 Inspection

All work under this contract shall be under the control and inspection of the Engineer or his/her appointed representative. The Contractor shall be responsible for notifying the Engineer forty-eight (48) hours in advance of all stages of construction to arrange for inspection. The Contractor/sub-contractor shall report to the Engineer before starting the work on each working day.

5-1.07 Environmental Protection

The Contractor shall be responsible for all applicable permits, licenses and fees required for the construction and completion of the project.

Any Contractor or person engaged in activities that will or may result in pollutants entering the City storm drainage system shall undertake all practicable measures to reduce the introduction of such pollutants. The Contractor shall be fully responsible for removing the materials out of the storm system irrespective of its condition before the construction work.

The Contractor shall follow Caltrans' best management practices regarding environmental protection and comply with all City regulations, ordinances, and City Storm Water Quality Control Criteria Plan. It is available for download at:

<http://www.stocktongov.com/government/departments/municipalUtilities/utilStorm.html>

The Contractor shall winterize the project and apply the proper protected measures at all existing drain inlets within the project boundary and maintain them through the winter season.

Full compensation for furnishing all labor, materials, tools, equipment, and incidentals for doing all work involved in environmental protection shall be included in the various bid items and no additional compensation will be made therefore.

5-1.08 Maintaining Public Convenience and Safety

Attention is directed to Section 7-1.03, "Public Convenience," Section 7-1.04, "Public Safety," and 12, "Temporary Traffic Control," of the Caltrans Standard Specifications and these Special Provisions. Adequate ingress and egress shall be maintained through the site for residents, police, fire, and other emergency vehicles. The Contractor shall provide the City with an Emergency Contacts List which includes the name and telephone number (business, home, and mobile) of three (3) representatives available at all times for the duration of the contract.

All traffic plans shall conform to the applicable provisions of the latest and amended "California Manual on Uniform Traffic Control Devices." The Contractor shall submit a construction area traffic control/detour plan for approval by the Engineer before the commencement of any work. Traffic control/detour plan shall show the placement of signs, barricades, delineators, and other traffic control devices required by Contractor's operation. Contractor shall submit the various scenarios for lane closures from the latest and amended MUTCD that are applicable to this project. Traffic Control plans shall be designed and stamped by a licensed Traffic or Civil Engineer and submitted to the Engineer for review and approval.

The Contractor shall furnish, install, and maintain in good working order all cones, delineators, barricades, arrow boards, direction signs, and flashers until project completion. All safety devices, their maintenance, and use shall conform to the latest requirements of OSHA. It shall be the complete responsibility of the Contractor to protect persons from injury and to avoid property damage. Whenever required, flagmen shall be provided to control traffic. The Contractor shall provide for the proper routing of vehicles and pedestrian traffic in a manner that will hold congestion and delay of such traffic to a practicable minimum by furnishing, installing, and maintaining all necessary temporary signs, barricades and other devices and facilities as approved by the Engineer. As the work progresses, the Contractor shall relocate such devices and facilities as necessary to maintain proper routing. Unless otherwise specified, upon conclusion of the need therefore, all temporary traffic routing devices and facilities shall be removed from the site of the work by the Contractor within 48 hours of completion of construction at that site.

The unit bid price for various bid items, whether used partially, completely or not, includes full compensation for furnishing all labor, materials, tools, equipment, incidentals, overhead and mark-up, and for doing all the work involved in placing, removing, storing, maintaining, moving to new locations, replacing, and disposing of the components of traffic control as specified in the Standard Specifications and these Special Provisions, and as directed by the Engineer.

Full compensation for furnishing, placing, maintaining, and removing temporary traffic striping shall be considered as included in the bid and no separate payment will be made.

Nothing in these Special Provisions shall be construed as relieving the Contractor from his responsibility as provided in this section.

5-1.09 Maintaining Pedestrian Access

When a pedestrian circulation path is temporarily closed by construction, alterations, maintenance operations, or other conditions, an alternate pedestrian access route complying with sections 6D.01, 6D.02, and 6G.05 of the MUTCD shall be provided.

Whenever possible work should be done in a manner that does not create a need to detour pedestrians from existing pedestrian routes. Extra distance and additional pedestrian street crossings add complexity to a trip and increase exposure of risk to accidents. The alternate pedestrian routes shall be accessible and detectable, including warning pedestrians who are blind or have low vision about sidewalk closures. Proximity-actuated audible signs are a preferred means to warn pedestrians who are blind or have low vision about sidewalk closures.

The surface shall be skid-resistant and free of irregularities. Pedestrian walkways shall be maintained in good condition and shall be suitable for wheelchair use. Walkways shall be kept clear of obstructions. The Contractor shall cause the least possible disruption to the affected properties and restore suitable pedestrian access immediately following completion of the active work in progress.

Minor deviations from the requirements of this section, which do not significantly change the cost of the work, may be permitted upon the written request of the Contractor if, in the opinion of the Engineer, public traffic will be better served, and the work expedited. These deviations shall not be adopted by the Contractor until the Engineer has approved them in writing. All other modifications will be made by contract change order.

The Contractor shall cause the least possible disruption to the affected properties and restore suitable pedestrian access immediately following completion of the active work in progress. Minor deviations from the requirements of this section, which do not significantly change the cost of the work, may be permitted upon the written request of the Contractor if, in the opinion of the Engineer, public traffic will be better served and the work expedited. These deviations shall not be adopted by the Contractor until the Engineer has approved them in writing. All other modifications will be made by contract change order.

Full compensation for maintaining pedestrian access shall be included in the contract price for traffic control, and no additional compensation will be allowed.

5-1.10 Encroachment Permit from City, County, Utilities, Railroads and Others

Attention is directed to Section 5-1.20B, "Permits, Licenses, Agreements, and Certifications," of the Caltrans Specifications and these Special Provisions. The following is not an all-inclusive list of the required permits and/or licenses, if applicable:

- Encroachment Permit. City of Stockton encroachment permit not required for this project.
- Building Permit. Contractor shall obtain a City of Stockton building permit and submit all required documents associated with the permit. Building Permit fee will be paid by the City. Building permit must be obtained from the City Permit Center (209-937-8444) before the start of construction.
- Contractor's License. Contractor shall possess a valid California Class A Contractor License at the time of bid and maintain it throughout the duration of the contract.
- Business License. Contractor shall possess a valid City of Stockton business license and pay all required fee associated with it prior to the execution of the contract and maintain it throughout the duration of the contract.

- Construction Notification - Dust Control (if applicable). The Contractor is responsible for the preparation and submittal of the San Joaquin Valley Air Pollution Control District Construction Notification Form. The form and more information can be found at the following web site: <http://www.valleyair.org>.
- Submit the Construction and Demolition (C&D) Debris Recycling Report within 14 days of construction or demolition project completion. The completed form must be accompanied by the official weight tags or receipts verifying the information provided in the report and must be submitted to the City of Stockton Public Works Department, Solid Waste Division, 22 E. Weber Ave. Room 301, Stockton, CA 95202. Failure to provide the C&D Debris Recycling Report form will result in a 5% withholding of the contract amount.
- Construction Water (if applicable). A water meter is required for the use of City water for construction. A similar permit and water meter and its fees are required from California Water Service, if the water is taken from the fire hydrant located in their service area. The Contractor is responsible for obtaining a permit for water from California Water Service, as applicable, for construction water obtained from a City hydrant. This permit shall be approved by the City of Stockton Fire Department and Contractor is required to pay all fees for said permit.

Full compensation for conforming to the provisions in this section including applicable permit fees, shall be considered as included in the prices paid for the various contract items of work involved, and no additional compensation will be allowed.

5-1.11 Schedule

Attention is directed to Section 8-1.02, "Schedule" of the Caltrans Specifications and these Special Provisions. The Contractor shall submit a P6 construction schedule to the Engineer for review and approval. Construction schedule must be approved before the start of any construction.

Full compensation for conforming to the provisions in this section shall be considered as included in the prices paid for the various contract items of work involved, and no additional compensation will be allowed therefore.

5-1.12 Property Preservation/Existing Facilities

The Contractor's attention is directed to Sections 5-1.36, "Property and Facility Preservation," and Section 15, "Existing Facilities," of the Caltrans Specifications.

The Contractor's attention is directed to the existence of certain underground facilities that may require special precautions be taken by the Contractor to protect the health, safety and welfare of workers and of the public. Facilities requiring special precautions include, but are not limited to: conductors of petroleum products, oxygen, chlorine, and toxic or flammable gases, natural gas in pipelines 6 inches or greater in diameter or pipelines operating at pressures greater than 60 pounds per square inch (gage); underground electric supply system conductors or cables, with potential to ground of more than 300 V, either directly buried or in duct or conduit which do not have concentric grounded or other effectively grounded metal shields on sheaths.

The Contractor shall notify the Engineer and the appropriate regional notification center for operators of subsurface installations at least two (2) working days, but not more than fourteen (14) calendar days, prior to performing any excavation or other work close to any underground pipeline, conduit, duct, wire or other structure. Regional notification centers include but are not limited to the following:

Notification Center	Telephone Number
Underground Service Alert-Northern California (USA)	1-800-642-2444 1-800-227-2600
Underground Service Alert-Southern California (USA)	1-800-422-4133 1-800-227-2600

The Contractor shall verify the horizontal and vertical locations of all existing utilities prior to start of construction. The Contractor shall be responsible for the repair and replacement of these or any other facilities damaged during construction. The Contractor shall notify Underground Services Alert (USA) to have existing facilities marked in the field.

If unknown existing facilities are encountered, the Contractor shall notify the Engineer in writing of the situation, request coverage of the work as extra work, and aid the Engineer in determining due diligence.

Payment for complying with this Special Provision shall be included in the various other items of work, and no additional compensation will be allowed therefore.

5-1.13 Site Maintenance and Cleanup

The Contractor shall maintain the work sites in a neat and orderly manner throughout construction. If, in the determination of the Project Inspector, the Contractor has not adequately maintained a clean, neat and orderly work site, the Contractor may be required to pay to the City of Stockton the sum of two hundred fifty dollars (\$250) per day. The work shall be conducted in a manner that will control dust. When ordered to provide dust control, the Contractor shall provide a vacuum sweeper to reduce the dusty conditions to the satisfaction of the Project Engineer. A permit shall be obtained from both the City Permit Center and California Water Service Company for construction water that is obtained from a fire hydrant. During and upon completion of construction, the Contractor shall remove all equipment, debris, and shall leave the site in a neat and clean condition to the satisfaction of the Project Engineer. Full compensation for Site Maintenance and Cleanup shall be considered as included in the price paid for the various items of work and no separate payment will be made, therefore.

5-1.14 Pre-construction Meeting

The Engineer will schedule a pre-construction meeting with the Contractor following award of the contract and prior to commencing. Full compensation for any activity associated with this work shall be included in the prices for the various contract items of work, and no additional compensation will be allowed therefore.

5-1.15 Submittals

The following is a list of anticipated submittals for the project and is provided to aid the Contractor in determining the scope of work, but is not intended to be all-inclusive. Additional submittals may be required:

NO.	SUBMITTAL	DEADLINE
1	DAS 140	Prior to Notice to Proceed
2	DAS 142	Prior to Notice to Proceed
3	Local Hire Employment Ordinance – Good Faith Effort	Prior to Notice to Proceed
4	Monthly Local Employment Ordinance Compliance Report	During Construction
5	Emergency Contacts / Authorized Representatives	Prior to Notice to Proceed
6	Project Schedule (Critical Path Method)	Within 20 Days of Contract Execution
7	Construction and Demolition Debris Recycling Report	Post Construction
8	City of Stockton Business License	Prior to Notice to Proceed
9	City of Stockton Building Permit & all other applicable permits	Prior to Notice to Proceed
10	Public Notifications - Flyers, News Release letter, etc. (if applicable)	Prior to Notice to Proceed

11 <u>Structural Steel:</u>		
11.1	Shop Fabrication Drawings (if applicable)	Within 20 Days of Contract Execution
11.2	Product Data	Within 20 Days of Contract Execution
11.3	Welding Procedure (if applicable)	Within 20 Days of Contract Execution
12 <u>Steel Cables:</u>		
12.1	Proof of Qualification	With Bid
13 <u>Painting:</u>		
13.1	Product Data	Within 20 Days of Contract Execution
13.2	Preliminary Color Samples	Within 30 Days of Contract Execution
13.3	Field Samples Execution	Within 20 Days of Contract Execution
13.4	Manufacturer's Warranty	Within 20 Days of Contract Execution
14 <u>Tension Membrane Roof:</u>		
14.1	Product Data	Within 20 Days of Contract Execution
14.2	Installation & Stressing Procedure	Within 20 Days of Contract Execution
14.3	Proofs of Compliance	Within 20 Days of Contract Execution
14.4	Proofs of Qualification	With Bid
14.5	Fabric Sample	Within 20 Days of Contract Execution
14.6	Biaxial Test Report	Within 20 Days of Contract Execution

The Contractor shall transmit each submittal to the Engineer for review and approval with the submittal form approved by the Engineer. Submittals shall be sequentially numbered on the submittal form. Resubmittals shall be identified with the original number and a sequential resubmittal suffix letter. The original submittal shall be numbered X. The first resubmittal shall be numbered X-a and so on. Identify on the form the date of the submittal, Contractor, Subcontractor or supplier; pertinent drawing and detail number, and/or special provision number, as appropriate. The Contractor shall sign the form certifying that review, approval, verification of Products required (if any), field dimensions, adjacent construction work, and coordination of information is in accordance with the requirements of the work and contract documents. Any incomplete submittals will be returned for resubmittal.

Schedule submittals to expedite the Project, and deliver to Engineer at the Engineer's office, see Section 10-9.02, "Contractor Work Procedure," of these Special Provisions.

For each submittal for review, allow four (4) calendar days excluding delivery time to and from the Contractor. Identify variations from Contract Documents and Product or system limitations that may be detrimental to successful performance of the completed Work. When revised for resubmission, identify all changes made since previous submission. Distribute copies of reviewed submittals as appropriate. Instruct parties to promptly report any inability to comply with requirements.

Submittals not requested either in the Contract Documents or in writing from the Engineer will not be recognized or processed.

Within ten (10) calendar days after Contract Award, submit all required submittals for review and approval.

Except as may otherwise be indicated herein, the Engineer will return prints of each submittal to the Contractor with their comments noted on the submittal. The Contractor shall make complete and acceptable submittals to the Engineer by the second submission of a submittal item. The City reserves the right to withhold monies due to the Contractor to cover additional costs of the Engineer's review beyond the second submittal.

If a submittal is returned to the Contractor marked "NO EXCEPTIONS TAKEN," formal revision and resubmission of said submittal will not be required.

If a submittal is returned to the Contractor marked "MAKE CORRECTIONS NOTED," formal revision and resubmission of said submittal will be required.

Full compensation for conforming to the requirements of this section shall be considered included in the various bid items of work and no additional compensation will be considered therefore.

5-1.16 As-Built/Record Drawings

The Contractor shall maintain a complete set of drawings on site for the purpose of keeping up to date all field modifications. This plan set shall be available for review by the project Inspector or the Engineer. These plans shall be provided to the Inspector after the completion of construction at the Post Construction Meeting and prior to the final payment. All revision, modifications and/or changes shall be marked clearly. Notes and dimensions shall be in red and be clear and legible. These plans will be used by the Design Engineer to mark up the original plan sheets with the revisions made during construction.

Full compensation for conforming to the provisions in this section shall be considered as included in the prices paid for the various contract items of work involved, and no additional compensation will be allowed therefore.

5-1.17 Unsatisfactory Progress

If the number of working days charged to the contract exceeds 75 percent of the working days in the current time of completion and the percent working days elapsed exceeds the percent work completed by more than 15 percentage points, the City will withhold 10 percent of the amount due on the current monthly estimate.

The percent working days elapsed will be determined from the number of working days charged to the contract divided by the number of contract working days in the current time of completion, expressed as a percentage. The number of contract working days in the current time of completion shall consist of the original contract working days increased or decreased by time adjustments approved by the Engineer.

The percent work completed will be determined by the Engineer from the sum of payments made to date plus the amount due on the current monthly estimate, divided by the current total estimated value of the work, expressed as a percentage.

When the percent of working days elapsed minus the percent of work completed is less than or equal to 15 percentage points, the funds withheld shall be returned to the Contractor with the next monthly progress payment.

Funds kept or withheld from payment, due to the failure of the Contractor to comply with the provisions of the contract, will not be subject to the requirements of Public Contract Code 7107 or to the payment of interest pursuant to Public Contract Code Section 10261.5.

5-1.18 Noise Control Requirements

Noise control shall conform to the provisions in Section 14-8-02, "Noise Control," of the Caltrans Specifications and these Special Provisions. Nothing in the Caltrans Specifications or these Special Provisions voids the Contractor's public safety responsibilities or relieves the Contractor from the responsibility to comply with other ordinances regulating noise level.

The noise level from the Contractor's operations, between the hours of 8:00 p.m. and 6:00 a.m., shall not exceed 86 dBa at a distance of fifty (50) feet. This requirement shall not relieve the Contractor from responsibility for complying with other ordinances regulating noise level.

The noise level requirement shall apply to the 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 the Contractor. The use of loud sound signals shall be avoided in favor of light warnings except those required by safety laws for the protection of personnel.

Full compensation for conforming to the requirements of this section shall be considered as included in the prices paid for the various contract items of work involved, and no additional compensation will be allowed therefore.

5-1.19 Dust Control

Dust control shall conform to any requirements set forth in the San Joaquin Valley Air Pollution Control District Construction Notification Form, see Section 5-1.11, "Permits," of these Special Provisions and Section 14-11.04, "Dust Control," of the Caltrans Specifications.

Use of water except for recycled, reclaimed, or other non-potable water for the purpose of dust control or other construction use is prohibited, unless for health or safety purposes. All dust control operations shall be performed by the Contractor using a vacuum sweeper at the time, location and in the amount ordered by the Engineer. The application of either water or dust palliative shall always be under the control of the Engineer. Watering shall conform to the provisions of Section 10-6, "Watering," of the Caltrans Specifications and these Special Provisions.

Full compensation for conforming to the requirements of this section shall be considered as included in the prices paid for the various contract items of work involved, and no additional compensation will be allowed.

5-1.20 Relations with California Regional Water Quality Control Board

This project lies within the boundaries of the Central Valley Regional Water Quality Control Board (RWQCB). The State Water Resources Control Board (SWRCB) has issued to the City a permit that governs storm water and non-storm water discharges from City properties, facilities, and activities. The City's permit is entitled "Order No. R5-2007-0173, NPDES No. CAS083470, Waste Discharge Requirements City of Stockton and County of San Joaquin Stormwater Discharges From Municipal Separate Storm Sewer System San Joaquin County Copies of the permit may be obtained at: <http://www.stocktongov.com/government/departments/municipalUtilities/util.html>

The NPDES permits that regulate this project, as referenced above, are collectively referred to in this section as the "permits." This project shall conform to the permits and modifications thereto. The Contractor shall maintain copies of the permits at the project site and shall make them available during construction.

The Contractor shall know and comply with provisions of Federal, State, and local regulations and requirements that govern the Contractor's operations and storm water and non-storm water discharges from the project site and areas of disturbance outside the project limits during construction. Attention is directed to Sections 7-1.02, "Laws" 5-1.36, "Property and Facility Preservation," 7-1.05, "Indemnification," of the Caltrans Specifications.

The Contractor shall notify the Engineer immediately upon request from the regulatory agencies to enter, inspect, sample, monitor, or otherwise access the project site or the Contractor's records pertaining to water pollution control work. The Contractor and the City shall provide copies of correspondence, notices of violation, enforcement actions, or proposed fines by regulatory agencies to the requesting regulatory agency.

Full compensation for conforming to the requirements of this section shall be considered as included in the prices paid for the various contract items of work involved, and no additional compensation will be allowed.

5-1.21 Increased or Decreased Quantities

The City reserves the right to make such alterations, deviations, additions to, or omissions from the plans and specifications, including the right to increase or decrease the quantity of any item or portion of the work or to omit any item or portion of the work, as may be deemed by the Engineer to be necessary or advisable and to require such extra work as may be determined by the Engineer to be required for the proper completion or construction of the whole work contemplated, without adjustment in the unit price as bid. Section 9-1.06B and Section 9-1.06C of the Caltrans Standard Specifications shall not apply.

5-1.22 Changes and Extra Work

New and unforeseen work will be considered as extra work when determined by the Engineer that the work is not covered by any of the various items for which there is a bid price or by combinations of those items. In the event portions of this work are determined by the Engineer to be covered by some of the various items for which there is a bid price or combinations of those items, the remaining portion of the work will be classed as extra work. Extra work also includes work specifically designated as extra work in the plans or specifications.

Any such extra work will be outlined in a contract change order, which will specify the work to be done in connection with the change made, adjustment of contract time, if any, and the basis of compensation for such work. A contract change order will not become effective until approved by the City Manager and / or City Council.

The Contractor shall do the extra work and furnish labor and equipment therefore upon receipt of an approved contract change order or other written order of the Engineer. In the absence of an approved contract change order or other written order of the Engineer, the Contractor shall not be entitled to payment for the extra work.

If, in the opinion of the Engineer, such work cannot reasonably be performed concurrently with other items of work, and if a controlling item of work is delayed thereby, an adjustment of contract time will be made.

Payment for extra work required to be performed pursuant to the provisions in this section, in the absence of an executed contract change order, will be made by force account as provided in Section 9-1.04 "Force Account" of the Caltrans Specifications; or as agreed to by the Contractor and the Engineer.

5-1.23 Notice of Potential Claim

The Contractor shall not be entitled to the payment of any additional compensation for any cause, or for the happening of any event, thing, or occurrence, including any act or failure to act, by the Engineer, unless s/he has given the Engineer due written notice of potential claim as hereinafter specified, provided, however, that compliance with this section shall not be a prerequisite for matters within the scope of the protest provisions under "Changes" or "Time of Completion" or within the notice provisions in "Liquidated Damages" not to any claim which is based on differences in measurements or errors of computation as to Contract quantities. The written notice of potential claim shall set forth the items and reasons which the Contractor believes to be eligible for additional compensation, the description of work, the nature of the additional costs and the total amount of the potential claim. If based on an act or failure to act by the Engineer, written notice for potential claim must be given to the Engineer prior to the Contractor commencing work; in all other cases, written notice for potential claims must be given to the Engineer within fifteen (15) days after the happening of the event, thing or occurrence giving rise to the potential claim.

It is the intention of this section that potential differences between the parties of this Contract be brought to the attention of the Engineer at the earliest possible time appropriate action may be taken and settlement may be reached. The Contractor hereby agrees that s/he shall have no right to additional compensation for any claim that may be based on any act or failure to act by the Engineer or any event, thing or occurrence for which no written notice of potential claim was filed.

5-1.24 Stop Notice Withholds

Section 9-1.16E(4) "Stop Notice Withholds" of the Caltrans Specifications is amended to read as follows:

"The City of Stockton, by and through the Department of Public Works, may at its option and at any time retain out of any amounts due the Contractor, sums sufficient to cover claims, filed pursuant to Section 3179 et seq. of the Code of Civil Procedures."

SECTION 6 BLANK

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See following page

SECTION 9 MEASUREMENT AND PAYMENT

9-1.01 General

Attention is directed to Section 9 "Payment" of the Caltrans Specifications, and these Special Provisions. All measurements and payments for this work shall conform to all applicable provisions on Section 7 of these Special Provisions and Section 9 "Payment" of the Caltrans Specifications.

Payment for those items of work required to complete the work as specified herein, but not shown as separate bid items on the bid schedule, shall be deemed as included in the other items of work, and no additional compensation will be allowed therefore.

All materials designated to be removed shall become the property of the Contractor, unless otherwise noted, and shall be disposed in accordance with local, State, and Federal laws and ordinances.

Full compensation for disposal of materials and performing the work in these Special Provisions shall be included in the prices paid for the various contract items of work, and no additional compensation will be allowed therefore.

9-1.02 Payments

BID ITEM LIST

Item No.	Description	Quantity	Unit	Unit Cost	Total Cost
1.	Shade Structure Rehabilitation (as per approved plans & specification)	1	LS		
2.	Patterning & Detailing	1	LS	\$28,890.00	\$28,890.00
TOTAL BID					

Each bidder shall bid each item on the Base Bid Schedule. Failure to bid an item shall be just cause for considering the bid as non-responsive. The City reserves the right to include or delete any Schedule or portion thereof, or to reject all bids.

Official bid documents, including plans and specifications, are available on the City of Stockton website at: <http://www.stocktongov.com/services/business/bidflash/default.html>

All bids submitted for this project must conform to the requirements of the official bid documents, including plans and specifications.

Schedule of Measurement and Payment

1. Shade Structure Rehabilitation (as per approved plans): paid by lump sum. Includes providing all labor, tools, materials, transportation, equipment, fuel, and power required to successfully complete the Weber Point Events Center Shade Structure Rehabilitation – Phase 2 project & other associated work as indicated on the plans, in the specifications, and as required by the Engineer.

2. Patterning & Detailing: paid by lump sum. Contractor shall hire Huntington Design Associates, Inc. independently to provide Patterning & Detailing Services. Huntington Design Associates, Inc. patterning & detailing services will include the following:

- Preparing fabric template drawings and fabrication details for 84 different fabric panels fabricated into 8 different subassemblies.
- Prepare shop fabrication details for aluminum clamp bars at all connections to masts and other fabric “corners”.
- Prepare shop fabrication details for aluminum U-straps.
- Determine fabrication length and prestress forces for 12 cat eye cables.

Please Note: Patterning & Detailing bid item shall be set at \$28,890.00, as the fee paid to Huntington Design Associates, Inc. for providing Patterning & Detailing Services.

SECTION 10 ATTACHMENTS

- **Division 5 – Section 05 12 00 – Structural Steel**
- **Division 5 – Section 05 19 10 – Steel Cables**
- **Division 9 – Section 09 96 10 – Painting**
- **Division 13 – Section 13 31 23 – Tension Membrane Roof**

See following page

DIVISION 5
SECTION 05 12 00 – STRUCTURAL STEEL

PART 1 **GENERAL**

1.01 Related Documents

- A. All Drawings and General Requirements and Special Conditions of the Contract apply to work of this section.
- B. In the event of conflict between any of the provisions of these documents, including the Drawings and this section of the specification, the requirements of the most stringent shall govern.

1.02 Summary

- A. Description of Work.
 - 1. Miscellaneous steel fabrications, as shown on the drawings.
 - 2. Preparation, prime, and finish painting of all steel per Specification Section 09 96 10.
 - 3. Erection engineering of the steel work.
 - 4. Erection of all steel components.
 - 5. All welds to the steel work covered in this section, including tack welds and/or welds of attaching material or components not covered in this section.
 - 6. Repair of existing structural steel welds, as indicated on the drawings.
- B. Responsibilities of the Steel Sub-Contractor
 - 1. The Sub-Contractor shall provide all the fabricated structural steel, including transport to the site.
 - 2. The Sub-Contractor shall perform the Work in accordance with the Construction Manager's Project Schedule.
 - 3. The Sub-Contractor shall engineer the erection of the structural steel to accommodate the Project Schedule and the use of the facility during Construction.
 - 4. The Sub-Contractor shall erect the structural steel.
 - 5. The Sub-Contractor shall prepare and prime, and finish paint the steel per specification Section 09 96 10 "Painting", including field touch up.
 - 6. The Sub-Contractor shall be solely responsible for the safe execution of the work in the shop and in the field.
 - 7. The Sub-Contractor shall be responsible to coordinate the work with that of all other trades, including locating, detailing and fabricating penetrations through steel members for other work.
- C. Related Sections: The following Sections contain requirements that relate to this Section:
 - 1. City of Stockton Public Works Department Special Provisions.
 - 2. Division 5 Section 05 19 10 "Steel Cables" for wire rope cables.
 - 3. Division 9 Section 09 96 10 "Painting" for surface preparation and coating requirements
 - 4. Division 13 Section 13 31 23 "Tension Membrane Roof" for fabric membrane.

1.03 Performance Requirements

A. Erection Engineering

The Sub-Contractor shall be solely responsible for the design and engineering of any shoring towers, temporary braces, and/or temporary guys including the foundation and/or anchorage thereof that may be required to execute the work.

1.04 Submittals

A. General:

Submit each item in this Article according to the Special Provisions of this specification.

The Engineer shall review the Sub-Contractor's submittals for general compliance with the Contract Documents for strength and serviceability only, this review shall not be for accuracy of dimensions, fit-up, constructability, or for coordination of shop drawings.

B. Product Data for each type of product specified.

C. Shop Drawings:

1. The Sub-Contractor shall submit shop drawings to the Engineer for review in accordance with the General Conditions of the Contract. The Sub-Contractor shall budget sufficient time in his schedule to allow for the Engineer's review of shop drawings.
2. The Sub-Contractor should allow in his schedule for the likelihood that some shop drawing submittals will have to be submitted more than once for review of the Engineer.
3. Submitted drawings shall show all structural steel required for the work, whether or not indicated on the Drawings.
4. The shop drawings shall clearly identify all steel surfaces that are to be painted and indicate surface preparation. Surface preparation of faying surfaces for slip-critical connections shall be indicated.
5. The shop drawings shall show all fabrication and erection dimensions and details including cuts, copes, camber, connection holes, threaded fasteners, bolts, studs, and spacing.
6. Shop drawings shall clearly identify all material types, grades, and products.
7. Indicate type, size, and length of bolts, distinguishing between shop and field bolts. Identify high-strength bolted slip-critical, direct-tension, or tensioned shear/bearing connections.
8. The shop drawings shall show all welds, both shop and field, by the currently recommended AWS symbols and show size, length, and type of each weld.
9. The Sub-Contractor shall not fabricate any material until after the Engineer's review of erection plans and details nor proceed with any work for which such drawings are required until they have been reviewed by the Engineer.
10. 1. Update all shop and erection drawings as required through the fabrication and erection of the work. Upon completion of erection, submit a complete of "as-built" drawing files to the Engineer for record purposes.

D. Weld Procedures and Sequences:

Submit all weld procedures and weldment weld sequences. Weld procedures and sequences shall be prepared by the fabricator in accordance with the requirements of AWS D1.1 and submitted for the record as demonstration of compliance with the provisions of AWS. Weld procedures and sequences will not be reviewed for technical content by the Engineer and will not be returned to the Sub-Contractor. Submittal of this material shall in no way diminish the Sub-Contractor's sole responsibility for the determination of appropriate means, methods, sequences and procedures for the welding work.

E. All work indicated and/or specified on shop drawings and other required submittals shall be deemed to be within the scope of the Contract, unless specifically noted otherwise. The Engineer's review and acceptance of shop drawings and all other submittals which show, specify or otherwise indicate work which is deemed additional to the scope of the work shall in no way entitle the Sub-Contractor to additional compensation.

1.05 Quality Assurance

- A. The steel fabricator shall have not less than five (5) years continuous experience in the fabrication of structural steel of similar or greater complexity.
- B. Codes and Standards: Work must comply with the latest edition of the following standard specifications and codes with modifications as specified herein. In the event of conflict between any of the pertinent codes and regulations and the requirements of the referenced standards or these Specifications, the provisions of the more stringent shall govern.
1. The California State Building Code 2019 with current amendments.
 2. American Institute of Steel Construction (AISC) Publications and Standards –as referenced herein.
 - a. AISC 360-16 “Specification for Structural Steel Buildings”, except as modified herein and as shown on the Drawings.
 - b. “Code of Standard Practice for Steel Buildings and Bridges” except as modified by provisions noted herein and as shown on the Drawings.
 3. ASTM A 6 (ASTM A 6M) "Specification for General Requirements for Rolled Steel Plates, Shapes, Sheet Piling, and Bars for Structural Use."
 4. Research Council on Structural Connections' (RCSC) " Specification for Structural Joints High-Strength Bolts." 2009.
 5. American Welding Society - "Structural Welding Code ANSI/AWS D1.1" as referenced herein.
 6. American Welding Society - "Structural Welding Code, Reinforcing Steel, ANSI/AWS D1.4"
 7. Steel Structure Painting Council - Painting Manual, Vol. 1 and 2.
 8. American Society for Testing and Materials (ASTM) - as referenced herein.
 9. ASCE/SEI 37-14 “Design Loads on Structures during Construction”, published by the American Society of Civil Engineers.
- C. Welding Standards: Comply with applicable provisions of AWS D1.1 "Structural Welding Code--Steel."
Qualify processes and welding operators in accordance with AWS "Standard Qualification Procedure".
- a. Provide certification that welders to be employed in the work have passed AWS qualification tests in the for the positions, weld types, techniques and equipment they will be using in the work and are currently certified.
 - b. If re-certification is required, retesting is the Sub-Contractor's responsibility.
- D. Testing and Inspection of Steel Work: Per Provision 2.06 of this specification, testing and inspection of the structural steel in the shop and in the field for the Owner's quality assurance will be performed by an independent Testing Agency, retained and paid for by the Owner. The Sub-Contractor shall not rely on the Owner's Testing Agency for his quality control.
The Sub-Contractor shall furnish to the Testing Agency, as part of the cost of the Work, the following:
- a. A complete set of approved erection drawings and shop drawings.
 - b. Cutting lists, order sheets, material bills and shipping bills and schedules.
 - c. A complete set of all welding procedures and sequences prepared in accordance with AWS requirements.
 - d. Current certificates for all welding operators.
 - e. A copy of the fabrication shop's quality control procedures manual.

The Sub-Contractor shall make all repairs to defective work to the satisfaction of the requirements of the Contract Documents and at no additional cost to the Owner.

The Inspector shall submit reports of his inspection and test findings to the Engineer, and the Owner or his representative. He shall record all defects found with subsequent repair operations and submit reports to the Engineer.

The work of the Inspector shall in no way relieve the Sub-Contractor of his responsibility to comply with all requirements of the Contract Documents, nor shall the work of the Inspector relieve the Sub-Contractor's responsibility for quality control of the work either in the shop or in the field.

1.06 Rejection And Replacement

- A. In the event of damage to the steel, immediately make all repairs and replacements necessary to the approval of the Engineer and at no additional cost to the Owner.
- B. Any materials or welding rejected by the Engineer or the Testing Agency Inspector either in the shop, mill or field including bolts and other purchased items, must be promptly repaired or replaced to meet the requirements of the Contract Documents at no additional cost to the Owner.

1.07 Connections

- A. Member splices shall not be allowed except where shown on the Drawings.

PART 2 PRODUCTS

2.01 Materials

- A. Steel Rolled Shapes:
 - 1. ASTM A992, minimum yield 50 ksi (345 MPa) unless noted as Gr.65.
- B. Structural Steel Plates and Bars:
High-Strength, Low-Alloy Columbium-Vanadium Steel: ASTM A 572 (ASTM A 572M), Unless indicated otherwise on the Drawings: Grade 50, $F_y \text{ min}=50 \text{ ksi}$ (345 MPa).
- C. HSS, Hollow Structural Sections (square, rectangular, & round): ASTM A500, Grade B.
- D. Welding Consumables: Comply with AWS requirements.
 - 1. For all steel other than Gr.65, welding electrodes shall be E70XX, low hydrogen for all connections as necessary to achieve notch toughness of finished welds as specified for the base metal.
 - 2. For all steel Gr.65, welding electrodes shall be E80XX, low hydrogen for all connections as necessary to achieve notch toughness of finished welds as specified for the base metal.

2.02 Grout

- A. Nonmetallic, Shrinkage-Resistant Grout: Premixed, nonmetallic, noncorrosive, nonstaining grout containing selected silica sands, portland cement, shrinkage compensating agents, plasticizing and water-reducing agents, complying with ASTM C 1107, of consistency suitable for application, and a 30-minute working time.
- B. Minimum grout strength at 28 days shall be $f'c=8,000 \text{ psi}$.

2.03 Fabrication

- A. Fabricate and assemble structural steel in shop to greatest extent possible. Fabricate structural steel according to AISC specifications referenced in this Section and in Shop Drawings.
1. All members when finished shall be true and free of twists, bends, and open joints between the component parts. Members shall be thoroughly straightened in the shop by methods which will not injure them, before being worked on in any way.
 2. Camber structural steel members where indicated.
 3. Identify high-strength structural steel according to ASTM A 6 (ASTM A 6M) and maintain markings until steel has been erected.
 4. Member splices between workpoint connections are not permitted except where specifically shown on the Drawings.
 5. Connections shall be as indicated on the Drawings.
 6. All members and weldments shall be piece marked with metal tags adhered or welded to the piece.
 7. Hollow Structural Members: All hollow structural members, round and/or tubes, shall be completely sealed airtight with welded plates with the exception of those that are to be hot dipped galvanized.
 8. Fabricate for delivery in a sequence that will expedite erection and minimize field handling of structural steel.
 9. Complete structural steel assemblies, including welding of units, before initiation of shop-priming operations.
 10. Dimensional tolerances and verifications shall be as defined in the fabricator's dimensional control plan for the Work.
- B. Thermal Cutting: Perform thermal cutting by machine to greatest extent possible.
1. Manual thermal cutting shall be done only with a mechanically-guided torch.
 2. The use of thermal-cut holes for bolted connections will under no circumstances be permitted, and violation of this clause will be sufficient cause for the rejection of any pieces in which thermal cut holes exist.
 3. Thermal cutting of structural steel in the field is not allowed except with the written consent and approval of the Engineer.
- C. Finishing:
1. Clean and repair all cut edges by welding and/or grinding to remove all gouges, cuts burrs and jags to meet the requirements of AWS D1.1.
 2. Re-entrant cuts shall have as large a radius as possible without over cutting.
 3. Seal weld seams, joints, and crevices of all work to received high performance coating.
- D. Shear Connectors:
1. Prepare steel surfaces as recommended by manufacturer of shear connectors.
 2. Use automatic end welding of headed-stud shear connectors according to AWS D1.1 and manufacturer's printed instructions.
 3. Other steel studs, such as those welded to embedment weldments shall be arranged as shown on the Drawings.
- E. Holes: Provide holes required for securing other work to structural steel framing and for passage of other work through steel framing members, as shown on Shop Drawings.
1. All pin connections shall have bored or reamed pin holes.
 2. Pin-hole diameters shall not be greater than 0.05" (1.25 mm) larger than the pin diameter with finish, unless otherwise noted on the drawings.
 3. Cut, drill, or punch bolt holes perpendicular to metal surfaces. Do not flame-cut holes or enlarge holes by burning. Drill holes in bearing plates.
 4. Weld threaded nuts to framing and other specialty items as indicated to receive other work.
 5. Note provisions of 2.03 C applies to material edges at holes in material subject to axial tension.

- F. HSS, tubes, pipes, built-up box sections, and other hollow structural members shall be completely sealed air-tight with welds in the shop prior to finishing.
- G. All members and weldments shall be piece marked with metal tags adhered or welded to the piece. Submit details of marking.

2.04 Shop Connections

- A. All bolt holes shall be either drilled, punched, or reamed. All plies to be bolted in a connection should be drilled in matching patterns, verified for fit-up and then match marked to assure fit-up of the bolt pattern at connections in the field.
- B. Shop Bolting: Install and tighten high-strength bolts according to RCSC's "Specification for Structural Joints Using High-Strength Bolts."
 - 1. Connection Type: Slip-critical, direct-tension, or tensioned shear/bearing connections unless indicated as snug tightened.
- C. Welded Connections:
 - 1. Operators - Welds will be made only by operators who have been previously qualified by tests, as prescribed AWS D1.1 to perform the type of work required.
 - 2. All welders involved in the Work will be assigned an identifying symbol or mark. Each welder will be required to mark or stamp his symbol on each weldment completed for identification. The Sub-Contractor shall maintain a record of welders employed, date of qualification and symbol or identification mark assigned to each.
 - 3. Welding equipment shall be of sufficient capacity and maintained in good working condition, capable of adjustment in a full range of current settings. Welding cables shall be of adequate size for the currents involved and grounding methods shall be such as to ensure proper machine operation.
 - 4. No welding shall begin until joint elements are clamped in proper alignment and adjusted to dimensions shown on the drawings with allowance for any weld shrinkage that is expected. Welding procedures sequences shall be such as to minimize residual stresses and distortion.
 - 5. Heavy sections and those weldments having a high degree of restraint must be welded in a sequence with the proper preheat such that no permanent distortion or undue residual stress occurs.
 - 6. Field welding shall in general not be permitted and shall be only performed where explicitly shown on the Drawings.
 - 7. All welding shall be done in accordance with the reference specifications, with the following modifications and additions:
 - a. All shop welding shall be done by either submerged arc welding, flux-core, or manual shielded metal-arc welding pursuant to the requirements of AWS D1.1, or other welding process approved by the Engineer.
 - b. All field welding, where allowed, shall be performed by manual shielded metal-arc welding to AWS D1.1.
 - c. All groove and butt welds shall have complete penetration unless otherwise specified on the Drawings.
 - d. The minimum preheat and interpass temperatures shall be maintained during all welding operations per AWS D1.1.
 - e. Heavy sections and those weldments having a high degree of restraint must be welded in a sequence with the proper preheat such that no permanent distortion occurs. Submit a welding sequence for review for these types of connection.
 - f. Assemble and weld built-up sections by methods that will maintain true alignment of axes without warp.

2.05 Shop Finish Preparation

- A. Shop prime and finish steel surfaces per Specification Section 09 96 00, except the following:
 - 1. Surfaces embedded in concrete or mortar. Extend priming of partially embedded members to a depth of 3 inches (76 mm).
 - 2. Surfaces to be field welded. Do not paint within 2 inches (50 mm) of field welds
 - 3. Faying surfaces to be high-strength bolted in slip-critical connections. Provide special preparation and primer for these surfaces.
 - 4. Surfaces to receive sprayed-on fireproofing.
 - 5. Galvanized surfaces.
- B. Minimum Surface Preparation: Thoroughly clean all steel surfaces (whether to receive paint or not) of all loose mill scale, loose rust, spatter, slag and flux deposit, oil dirt, grease and other foreign matter. Use the following methods of cleaning:
 - 1. All grease and oil shall be removed in accordance with SSPC- SP 1, "Solvent Cleaning".
 - 2. Surface Preparation for all painted surfaces shall be per Specification Section 09 96 00.
- C. Process structural steel indicated for galvanizing according to ASTM A 123.

2.06 Source Quality Control

- A. Testing and inspection of the structural steel for the Owner's quality assurance will be performed by an independent Testing Agency, retained and paid for by the Owner.
- B. Testing and Inspection of Welding.
 - 1. All welds shall be visually inspected by the Inspector.
 - 2. In addition to visual inspection, welded connections other than fillet welds shall be inspected and/or tested by non-destructive testing (NDT) methods by the Testing Agency.
 - 3. Non-destructive test methods shall include the following:
 - a. Liquid Penetrant Inspection: ASTM E 165.
 - b. Magnetic Particle Inspection: ASTM E 709; performed on root pass and on finished weld. Cracks or zones of incomplete fusion or penetration will not be accepted.
 - c. Ultrasonic Inspection: ASTM E 164. Use this method for complete penetration and/or groove welds, tee or corner welds.
 - 4. When requested, submit specimens of welded joints and weld metal to the Testing Agency for testing.

PART 3 EXECUTION

3.01 Examination

- A. Inspection of the Site: The Steel Sub-Contractor must examine areas and conditions under which structural steel is to be erected and notify the Construction Manager in writing of conditions detrimental to proper and timely completion of work. Do not proceed with work until unsatisfactory conditions have been corrected in a manner acceptable to the Steel Erector and the Engineer.

3.02 Preparation

- A. Provide temporary shores, guys, braces, jacks, and other supports during erection to keep structural steel secure, plumb, and in alignment against temporary construction loads and loads equal in intensity to design loads. Temporary bracing shall be left in place as long as may be required for safety. The bracing shall be located so it does not interfere with the erection and installation of subsequent members and can be removed as required during construction. Coordinate with other sub-contractors to minimize interference with the general progress of their work. Remove temporary supports when permanent structural steel, connections, and bracing are in place, unless otherwise indicated.

B. The structure is designed to be self-supporting and stable after erection is completed. It is the Sub-Contractor's sole responsibility to determine erection procedures, sequencing and temporary bracing; to determine the adequacy and strength of any parts of the structure being used as temporary supports or tie-downs; and to ensure the safety of the building and its component parts during erection, except as specifically directed in writing by the Engineer or the Owner. This includes the addition of whatever temporary bracing, guys, shoring, or tie-downs that might be necessary. Such materials shall be removed by the Sub-Contractor and remain his property after completion of the project.

3.03 Erection

- A. The steel erector shall employ a competent superintendent to supervise all work of erection. This superintendent shall be present at all times during this phase of the work.
- B. Coordinate erection activities with the other contractors to minimize impact on other work on site. Allow access to the steel work by other trades.
- C. Set structural steel accurately in locations and to elevations indicated.
- D. Base and Bearing Plates: Clean concrete and masonry bearing surfaces of bond-reducing materials and roughen surfaces prior to setting base and bearing plates. Clean bottom surface of base and bearing plates.
 - 1. Set base and bearing plates for structural members on wedges, shims, or setting nuts as required.
 - 2. Tighten anchor bolts after supported members have been positioned and plumbed. Do not remove wedges or shims but, if protruding, cut off flush with edge of base or bearing plate prior to packing with grout.
 - 3. Pack grout solidly between bearing surfaces and plates so no voids remain. Finish exposed surfaces, protect installed materials, and allow to cure.
 - a. Comply with manufacturer's instructions for proprietary grout materials.
- E. Align and adjust various members forming part of complete frame or structure before permanently fastening. Before assembly, clean bearing surfaces and other surfaces that will be in permanent contact. Perform necessary adjustments to compensate for discrepancies in elevations and alignment.
- F. Splice members only where indicated.
- G. Remove erection bolts on welded, architecturally exposed structural steel; and grind smooth at exposed surfaces. Do not fill holes with plug welds. Install bolts snug tight to fill holes when approved by Architect.
- H. Do not use thermal cutting during erection.

3.04 Field Connections

- A. Field install and tighten high-strength bolts according to RCSC's "Specification for Structural Joints Using High-Strength Bolts."
 - 1. Bolts: Gr. A325 high-strength bolts, unless otherwise indicated.
 - 2. Bolts: Gr. A490 high-strength bolts, where specifically indicated.
 - 3. Connection Type: Slip-critical connections unless otherwise indicated.
 - 4. Recommended procedure for installing assembling bolt groups:
 - a. Assemble joint using drifts to obtain correct alignment.
 - b. Fit bolts.
 - c. Use hardened washers under the turned part. Lubricate bolts to prevent nuts seizing on the bolts. Lubricate with a liquid high-pressure lubricant and apply only to the outstanding threads after the bolts have been inserted through the steel work, taking care to prevent lubricant getting between the plies of the joint.
 - d. Tighten bolts sufficiently in an appropriate sequence to bring joint surfaces into uniformly close contact.

- e. Where indicated pretension bolts to the appropriate levels using “twist-off” bolts, load indicator washers, turn-of-the-nut, or other suitable means. If turn of the nut method of pre-tensioning bolts is used, demonstrate to the satisfaction of the Testing Agency that the desired bolt tensions are achieved for the various combinations of bolt sizes, lengths and connection plies.
 - f. Mark each bolted connection when all bolts in the connection are pre-tensioned. Do not touch-up paint until bolts have been inspected by the Testing Agency. The Testing Agency will mark connections which have been inspected.
- B. Field Welded Connections: Only make field welded connections where previously approved by the Engineer. When field welds are approved or specified by the Engineer, comply with all requirements of section 2.04 C of this specification.
- 1. Comply with AISC specifications referenced in this Section for bearing, adequacy of temporary connections, alignment, and removal of paint on surfaces adjacent to field welds.
 - 2. Assemble and weld built-up sections by methods that will maintain true alignment of axes without warp.
 - 3. 100% of field welds other than fillet welds shall be inspected and NDT tested by the Testing Agency per provisions of paragraph 2.06. Inform the Testing Agency of all field welding activities in advance.

3.05 Field Quality Assurance

- A. Testing and inspection of the structural steel for the Owner's quality assurance will be performed by an independent Testing Agency, retained and paid for by the Owner. The Sub-Contractor shall not rely on the Owner's Testing Agency for his quality control.
- The work of the Inspector shall in no way relieve the Sub-Contractor of his responsibility to comply with all requirements of the Contract Documents, nor shall the work of the Inspector relieve the Sub-Contractor's responsibility for quality control of the work either in the shop or in the field.

3.06 Cleaning And Touchup Paint

- A. Clean-up: Remove all lugs, erection brackets, erection bolts, guys and other equipment not indicated as part of the finished structure and restore or repair finishes. Repair any holes or abraded or damaged areas to concrete structure, glazing, metals, or finishes, per requirements of division 1 and other pertinent specification sections.
- 1. Particular care shall be taken during handling, shipping and erection to maintain all visible surfaces clean without stains or objectionable soiling.
 - 2. Protect all visible painted surfaces from staining agents.
 - 3. Should visible steel surfaces be soiled or stained as a consequence of erection and handling, upon completion of the steel work the Steel Sub-Contractor shall be responsible to clean all visible surfaces of the finished steel to the satisfaction of the Engineer.
- B. Touchup Painting: All shop painting requirements shall apply to field touch up painting. See Section 09 96 10.

End of Section 05 12 00

DIVISION 5
SECTION 05 19 10 – STEEL CABLES

PART 1 – GENERAL

1.01 Related Documents

- B. All Drawings and General Requirements and Special Conditions of the Contract apply to work of this section.
- B. All Division 01 Specifications apply to work of this section.
- C. In the event of conflict between any of the provisions of these documents, including the Drawings and this section of the specification, the requirements of the most stringent shall govern.

1.02 Description Of Work:

- A. Manufacture and supply of finished cable assemblies with all end fittings.
- C. Manufacture, fabrication and supply of all cast or machined cable clamp connections including welded steel attachments indicated on the Drawings.
- D. Erection and stressing of the primary structure cables and associated hardware.
- D. Responsibilities of Cable Sub-Contractor:
 - 1. The Sub-Contractor shall provide all cable assemblies and cable connection castings, including transport to the site.
 - 2. The Sub-Contractor shall be responsible for detailing all cable assemblies and cast connections based upon the designs shown of the Drawings.
 - 3. The Sub-Contractor shall perform the Work in accordance with the Construction Manager's Project Schedule.
- 4. The Sub-Contractor shall be solely responsible for the safe execution of the work in the shop and in the field.
- E. Related Work Described Elsewhere:
 - 1. City of Stockton Public Works Department Special Provisions.
 - 2. Tension Membrane Roof– Specification Section 13 31 23.
 - 2. Structural Steel - Specification Section 05 12 00.
 - a. Specification Section 05 12 00 applies to all welding of cable connections.

1.03 Quality Assurance:

- A. Codes and Standards:

Work must comply with the latest edition of the following standard specifications and codes with modifications as specified herein. Note that some of the requirements specified herein significantly exceed the minimums required for compliance with these standards:

- 1. The California State Building Code 2019 amendments.
- 2. AISC 360-10 "Specification for Structural Steel Buildings", except as modified herein, published by the American Society of Civil Engineers.

3. ASCE 19 -16 " Structural Applications of Steel Cables for Buildings".
4. Research Council on Structural Connections - "Specifications for Structural Joints Using High-Strength Bolts".
5. American Institute of Steel Construction (AISC) –as referenced herein.
6. American Society for Testing and Materials (ASTM) - as referenced herein.
7. ASCE/SEI 37-14 "Design Loads on Structures during Construction", published by the American Society of Civil Engineers.

In the event of conflict between pertinent codes and regulations and the requirements of the referenced standards or these Specifications, the provisions of the more stringent shall govern.

- B. Qualifications of Manufacturers: Cable and casting manufacturers shall be qualified and have at least 5 years continuous experience in the manufacture of materials of similar quality.
- C. Qualifications for Welding Work: See specification section 05 12 00.
- D. Testing and Inspection of Cable Assemblies:
 1. Cable prestretch and final length documentation. Provide documentation of prestretch and marking for all cable assemblies.
 2. Modulus of stands and wire ropes per A586 per EN 1993-11 for every production batch.

1.04. Submittals:

- A. Review of shop drawings and all other submittals shall be limited to review for general compliance with the strength and serviceability requirements of the Construction Documents and for architectural appearance. This review shall not be for accuracy of dimensions, for fit-up, constructability, or for coordination with other of the Cable Sub-Contractor's shop drawings.
- B. Proofs of Qualification:

Submit with bid evidence satisfactory to Owner that the cable fabricator and cable structure erector are qualified for the Work.
- C. Marking:
 1. Submit details of proposed method of piece marking the cable components for identification and verification of proper placement in the work. Marks shall be placed in positions that can be checked after erection. See Section 05 12 00, paragraph 2.03 I. for requirements.
 2. Provide workpoint and orientation marking on cables as specified.

1.05 Product Handling:

- A. Protection: Use all means necessary to protect structural cable assemblies, components and finishes before, during, and after fabrication, shipping deployment on site and erection to the point of turnover of the completed cable structure to the Construction Manager.
- B. Erection: Provide all spools, guides, supports, blocking, and other temporary protection for handling, deploying, and erecting the cables.

1.06 Rejection And Replacement:

- A. In the event of damage to materials, immediately make all repairs and replacements necessary to the approval of the Engineer and at no additional cost to Owner.
- B. Any materials or welding rejected by the Engineer or the Testing Agency Inspector either in the shop, mill or field including castings, must be promptly repaired or replaced to meet the requirements of the Construction Documents at no additional cost to Owner.

1.07. Connections:

- A. Cable splices shall not be allowed except where shown on the Drawings.
- B. Cable Connections to structural steel. The Cable Sub-Contractor shall coordinate with the Steel Sub-Contractor (see Specification Section 05 12 00) and verify with the Construction Manager and the Engineer all final pin hole diameters, edge distances and boss plate thickness with the cable fittings and connections.
- C. Connections jacks, erection aids, temporary platforms. Design and provision of connections for all temporary erection work is the responsibility of the Cable Sub-Contractor. Coordinate with the Steel Sub-Contractor (see Specification Section 05 12 00) and verify with the Construction Manager.

1.08 Substitutions To Construction Documents:

See Special Provisions of this specification.

1.09 Performance Requirements

- E. Connections
 - 1. Shop drawings submitted by the Sub-Contractor showing substitutions or Sub-Contractor designs not previously reviewed by the Engineer in accordance with paragraph 1.08 shall be subject to rejection.
 - 2. The Engineer's review of the detailed connection drawings shall be for compliance with strength and serviceability requirements only, and shall not be for accuracy of dimensions, for fit-up, constructability or for coordination of shop drawings.
- F. Erection Engineering
 - 1. The Sub-Contractor shall be solely responsible for the sequence, procedure, means, and methods of erection as well as safe erection of the work. The Sub-Contractor shall be solely responsible for compliance with all pertinent statutes, regulations and/or ordinances with respect to the erection of the work.
 - 2. The Sub-Contractor shall be responsible to develop a detailed erection sequence and plan. The Sub-Contractor shall analyze the structure at various stages in his erection to ensure stability of the structure and/or its sub-assemblies as well as ensure that neither temporary nor permanent components of the structure, both new and existing, are over-stressed including the appropriate concurrent environmental loads from wind and snow.
 - 3. The Sub-Contractor shall be solely responsible for the design and engineering of any shoring towers, temporary braces, and/or temporary guys including the foundation and/or anchorage thereof that may be required to execute the work

PART 2 – PRODUCTS

2.01 Welding Consumables & Electrodes:

See Specification Section 05 12 00.

2.02 Cables Assemblies And Connectors:

Scope: All structural strand, wire ropes, and their permanently attached end fittings shall conform to ASCE 19 " Structural Applications of Steel Cables for Buildings".

A. Cables, General:

1. All open spiral strand indicated on the Drawings shall conform to ASTM A586 "Standard Specification for Zinc-coated Parallel and Helical Wire Structural Strand". Zinc coating shall be class A for inner and outer wires unless specifically noted otherwise. Alternatively, outer wires may be given a galfan coating with a minimum weight of at least 300g/m².
2. All wire rope indicated on the Drawings shall conform to ASTM A603 "Standard Specification for Zinc-coated Steel Wire Rope". Zinc coating shall be class A for inner and outer wires unless specifically noted otherwise.
3. Same cable types as identified on the Drawings shall have the same modulus of elasticity, plus or minus 2%.
4. Cables shall be completely free of grease and foreign materials.
5. All completed cable assemblies greater than 12 mm (0.5") diameter shall be pre-stretched per ASTM A586 to 55% of their minimum specified breaking strength. Cable assemblies with breaking strengths greater than 8,350 kN (1,880 kip), pre-stretch need not exceed 4,600 kN (1,030 kip).
5. Cut lengths of all cables greater than 12 mm (0.5") diameter shall be determined so that the length of cable assembly shall be within $\pm 0.02\%$ of the theoretical length after pre-stretching, except that lengths less than 15 m (50') shall have tolerance of ± 3 mm (0.118").
5. Mark all finished cable assemblies greater than 12 mm (0.5") as follows:
 - a. Mark with a continuous longitudinal paint stripe with the end connections in their proper relative orientation to facilitate installation of the assembly without twist. The paint stripe should be no more than 3 mm (1/8") in width.
 - b. Mark all intermediate workpoints along cable with clear painted targets to the same tolerance as the cable length between workpoints.
 - c. Mark the ends of all clamps and saddles with a transverse paint stripe for use in aligning and positioning clamps and saddles. The paint stripe should be no more than 3 mm (1/8") in width.
6. Touch up all damage to zinc coating in the field with zinc cold galvanizing to protect the exposed steel and to match color of finish.

B. Sockets, End fittings:

1. Cable sockets and clevises shall be cast or forged steel conforming to ASTM 148M in the grade required to satisfy specified requirements. These end fittings shall be splattered or swaged on the cable as indicated on the Drawings.
2. All sockets, end fittings and clevises, including pins and other component hardware, shall be designed to withstand 100% of the minimum specified breaking strength connected cable without permanent deformation and shall not in any way impair the load carrying capacity or efficiency of the cable.
3. All cast steel cable fittings shall be tested and inspected per paragraph 2.06.D and shall have minimum Charpy V-notch value of 27 Joules at -40°C & 40 Joules at +20°C. See ASTM A 781M.

4. All fittings, pins, nuts, sockets, clevises shall be galvanized or zinc metalized:
 - a. Hot dipped to Class A or B-1 per ASTM A153, or
 - b. Mechanically galvanized to Class 50 per ASTM B 695, or
 - c. Electrogalvanized for equivalent zinc thickness.
5. Spelter sockets shall be designed specifically for zinc or resin socketing.
6. Resin for speltering cable sockets shall be polyester resin such as WIRELOCK® or equivalent in accordance with EN 13411-4.
7. Zinc for speltering cable sockets shall be at least equal to the grade designated as "high grade" in ASTM B6. Speltering per 2.05.C.8 may be employed for all speltered sockets.
8. Touch up all damage to zinc coating in the field with zinc cold galvanizing to protect the exposed steel and to match color and finish of zinc coating.

2.03 Other Materials:

All other materials, not specifically described but required for a complete and proper installation of structural steel, shall be provided and shall be new, free from rust, first quality of their respective kinds, and subject to the acceptance by the Engineer.

PART 3 - EXECUTION

3.01 Examination

Inspection of the Site: The Sub-Contractor must examine areas and conditions under which cables are to be erected and notify the Construction Manager in writing of conditions detrimental to proper and timely completion of work. Do not proceed with work until unsatisfactory conditions have been corrected in a manner acceptable to the Sub-Contractor's erector and the Engineer.

3.02 General:

- A. Spool completed cable assemblies on spools for transport to the site as needed to assure cable assembly is protected and undamaged in transport, handling and storage on site.
- B. All cable assemblies shall be piece marked.

END OF SECTION 05 19 10

DIVISION 9
SECTION 09 96 10 – PAINTING

PART 1 GENERAL

1.01 Summary

- A. Related Documents:
 - 1. All Drawings and General Requirements and Special Conditions of the Contract apply to work of this section.
 - 2. In the event of conflict between any of the provisions of these documents, including the Drawings and this section of the Specification, the requirements of the most stringent shall govern.
- B. Section Includes:
 - 1. Field application of paints and coatings.
 - 2. Unless otherwise specified or shown, paint all surfaces and items which are exposed to view, with the exception of wire rope, aluminum components, gasketing, concrete, and fabric.
 - 3. Surface preparation.

1.02 Submittals

- A. Product Data:
 - 1. Materials List: Complete list of proposed manufacturers and products.
 - 2. Manufacturer's Specifications: Manufacturer's technical information for each product, including paint analysis and application instructions.
 - 3. Material safety data sheets for each product.
- B. Samples:
 - 1. Preliminary Samples: 8-1/2" x 11" samples of each color, texture and sheen on glossy card stock.
 - 2. Field Samples: After preliminary samples have been approved, apply minimum 30" x 30" field samples at locations designated by Project Manager for final approval.
- C. Manufacturer's Warranty:
 - Twenty-year limited warranty.

1.03 Quality Assurance

- A. Applicator Qualifications: Company specializing in performing the work of this section with minimum 3 years successful experience in work of similar scope.
- B. Manufacturer's Instructions: Perform painting work in accordance with manufacturer's written instructions and recommendations.
- C. Comply with paint manufacturer's instructions on temperature and humidity conditions under which materials can be applied.

1.04 Maintenance Stock

Provide 2 full gallons of finish coat used on the Project.

PART 2 PRODUCTS

2.01 Paint Products

- A. Primer Coat: Sherwin Williams Macropoxy 646-100 or approved equal.
- B. Mid Coat: Sherwin Williams Macropoxy 646 or approved equal.
- C. Finish Coat: Sherwin Williams Hi-Solids Polyurethane or approved equal.

2.02 Materials

- A. Material Quality:
 - 1. Provide premium quality materials. Materials not bearing manufacturer's identification as a premium-grade product are not acceptable.
 - 2. Should manufacturer's specifications or product names change, provide its current equal or better product.
 - 3. Primer and undercoats are to be of same manufacturer as final coat.
 - 4. Materials left from previous jobs are not acceptable.
 - 5. Use only thinners approved by paint manufacturer and use only within recommended limits.
 - 6. Solvents: Non-petroleum based, as recommended by paint manufacturer for the use intended.
- B. Finish Coat Coordination: Provide finish coats which are compatible with prime paints used.
 - 1. Upon request from other trades, furnish information on characteristics of finish materials proposed for use.
 - 2. Provide barrier coats over incompatible primers or remove and reprime.
 - 3. Notify Owner in writing of any problems anticipated in use of specified coating systems with substrates primed by others.

2.03 Colors

- A. General: Paint color shall be as approved by Owner
- B. Finish coat colors shall be factory mixed.

PART 3 EXECUTION

3.01 Examination

- C. Examine areas and conditions under which painting work is to be applied.
- D. Do not paint over dirt, rust, scale, grease, oil, dust, moisture, scuffed or damaged surfaces, or conditions detrimental to a durable paint life.
- E. Starting work indicates acceptance of conditions of surfaces and within any particular area.

3.02 Preparation

- A. Perform preparation and cleaning procedures in accordance with paint manufacturer's instructions and as specified for substrate condition.
- B. Remove hardware, accessories, and items in place and not to be painted, or provide protection prior to surface preparation and painting. Reinstall removed items after painting.
- C. Remove oil and grease prior to mechanical cleaning.
- D. All areas of rust on steel surfaces to be removed by spot grinding with a wire wheel.
- E. All surfaces to be painted are to be thoroughly cleaned by power washing.
- F. Schedule cleaning so contaminants from cleaning process do not fall onto wet, newly painted surfaces.
- G. Moisture Content: Do not paint over surfaces where moisture content exceeds manufacturer's instructions.
- H. Ferrous Metals:
 - 1. Bare Surfaces: Clean of oil, dirt, loose mill scale, and other foreign substances.
 - 2. Galvanized Surfaces: Clean free of oil and surface contaminants using etching solution, and rinse with water to neutralize

3.03 Application

- A. Apply paint in accordance with manufacturer's instructions. Use applicators and techniques best suited for substrate and type of material being applied.
 - 1. Apply additional coats when stains or blemishes show through final coat, until paint is a uniform finish, color and appearance.
 - 2. Ensure dry film thickness at corners and crevices is equivalent to that of flat surfaces.
- B. Scheduling Painting: Apply first coat to surfaces that have been cleaned, pretreated or otherwise prepared for paint as soon as practicable after preparation.
 - 1. Do not apply materials in areas where dust is being generated, or will be generated, before coatings are thoroughly dry.
 - 2. Allow time between successive coats to permit proper drying.
 - 3. Do not recoat until paint feels firm and does not deform or feel sticky under moderate thumb pressure.
- C. Minimum Coating Thickness: Apply materials at not less than manufacturer's recommended spreading rate, to achieve a total dry film thickness (DFT) as recommended by coating manufacturer.
- D. Finish Coats: Provide even texture. Leave no laps, irregularity in texture, skid marks, or other surface imperfections. Opaque Finishes: Provide opaque, uniform finish, color and coverage. Cloudiness, spotting, holidays, brush marks, runs, sags, ropiness or other surface imperfections are not acceptable.
- E. Completed Work: Match approved samples for color, texture and coverage. Remove, refinish or repaint work not accepted.

3.04 Cleaning

- A. Remove discarded paint materials, rubbish, cans and rags from site at end of each workday.
 - 1. Keep flammable materials in approved labeled containers in a well-ventilated area.
 - 2. Cover containers of coatings or solvent products when not in use.

- B. Protection: Protect work of other trades, whether to be painted or not. Correct damage by cleaning, repairing, replacing, or repainting, as acceptable to Owner.
 - 1. Clean paint-spattered surfaces immediately by proper methods of washing and scraping. Do not damage or scratch finished surfaces.
 - 2. Provide "Wet Paint" signs to protect new painted finishes.
 - 3. Remove temporary protective wrappings, provided by others for protection of their work, after completion of painting operations.
 - 4. Do not cover operating mechanical or electrical equipment.

- C. Repair: At completion of work by other trades, touch up and restore damaged surfaces or defaced painted surfaces.

END OF SECTION 09 96 10

DIVISION 13
SECTION 13 31 23 – TENSION MEMBRANE ROOF

PART 1 - GENERAL

1.01 Related Documents

- E. All Drawings and General Requirements and Special Conditions of the Contract apply to work of this section.
- B. In the event of conflict between any of the provisions of these documents, including the Drawings and this section of the specification, the requirements of the most stringent shall govern.

1.02 Description of Work:

- A. Perform all work, including furnishing all labor, material and equipment necessary for the fabrication, installation and stressing of the tensioned membrane roof system, complete as shown on the Drawings, inferable there from, and specified in accordance with the requirements of the Contract Documents. Work is to include, but not necessarily be limited to, the supply, fabrication, shipment and installation of the following principal items:
 - 1. Coated fabric tensioned membrane for the roof as shown on the Drawings.
 - 2. Clamping system, including molded rubber elements.
- B. Related Work Described Elsewhere:
 - 1. City of Stockton Public Works Department Special Provisions
 - 2. Steel Cables– Specification Section 05 19 10
 - 3. Structural Steel - Specification Section 05 12 10.

1.03 Qualifications:

- A. Supply and installation of the tension membrane roof is limited to firms with proven experience with manufacturing, fabrication and installation of tensioned membrane roofs of a comparable size and nature to that specified herein.
- B. The Sub-Contractor shall have substantial experience with tensioned fabric structures.
- C. The Sub-Contractor and the Sub-Contractor's personnel who will be actively in charge of the day-to-day activities of the project shall have experience with three or more permanent tensioned membrane structures exceeding 600 square meters (6,000 square feet) in plan area. Such experience shall include management of a contract of similar scope, i.e. the supply, fabrication and installation of membrane, membrane connections, associated cables and hardware.

1.04 Responsibility

- A. The intent of these specifications is that the Sub-Contractor shall be responsible for the quality and workmanship of all items specified herein.

1.05 Codes, Standards, Regulations, And Ordinances

- A. General: The Sub-Contractor will perform the Work in accordance with the most recent edition of the Codes and Standards noted herein.
- B. Standards: Except as otherwise shown or noted, all work shall comply with the requirements of the latest editions of the following standards. See Section 05 12 01 for standards relating to structural steel. In case of conflict between the referenced standards and the project specifications, the more stringent shall govern:
 - 1. American Society for Testing and Materials Standards
 - a. ASTM B209, Specification for Aluminum and Aluminum-Alloy Sheet and Plate
 - b. ASTM B308, Specification for Aluminum-Alloy 6061-T6 Standard Structural Shapes
 - c. ASTM D4851, Test Methods for Coated and Laminated Fabrics for Architectural Use
 - d. ASTM E84, Test Methods for Surface Burning Characteristics of Building Materials
 - e. ASTM E108, Test Methods for Fire Test of Roof Coverings
 - f. ASTM E136, Test Method for Behavior of Materials in a Vertical Tube Furnace at 750°C
 - g. ASTM E424, Test Methods Solar Energy Transmittance and Reflectance (Terrestrial) of Sheet Materials
 - h. ASTM F593, Specification for Stainless Steel Bolts, Hex Cap Screws, and Studs.
 - i. ASTM F594, Specification for Stainless Steel Nuts
 - 2. Aluminum Association "Specifications for Aluminum Structures", all sections.
 - 3. American Welding Society: AWS D1.2 "Structural Welding Code - Aluminum".
 - 4. American Society of Civil Engineers, ASCE, Standards
 - a. ASCE 19 16 "Structural Applications of Steel Cables for Buildings"
 - b. ASCE 55 16 "Tensile Membrane Structures"
 - 5. Other standards as cited herein.

1.06 Submittals:

- A. Product Data: Submit data for proprietary materials and items, including bolts, coated fabric, fasteners, cables, cable fittings, pins and other materials. Include manufacturer's certifications, mill certifications, and laboratory test reports where required.
- B. All work indicated or specified on shop drawings and other required submittals shall be deemed to be within the scope of the Contract, unless specifically noted otherwise. Review and acceptance of shop drawings and all other submittals which show, specify, or otherwise indicate work which is considered by the Sub-Contractor to be additional to the scope of the Work shall in no way change the scope of the Contract nor entitle the Sub-Contractor to additional compensation.
- C. The Sub-contractor shall provide an installation and stressing procedure which details the methods, sequence of installation, and stressing of the fabric membrane.
- D. Proofs of Compliance: The Sub-Contractor shall submit certificates from the producers of all material and fasteners, certifying that the material meets the minimum requirements specified.
- E. Proofs of Qualification: Submit evidence satisfactory to the Engineer that the fabric membrane fabricator and installer are qualified for the work in accordance with the requirements of paragraph 1.4 of this Specification Section.
- F. Submit one 36 in. square sample of membrane material to be used for review of color and finish.
- G. Test Reports: Submit copies of test reports as follows:
 - 1. Bi-axial testing performed per paragraph 3.01.B.

- H. Schedule of On-Site Activities: The Sub-Contractor will provide and maintain a detailed schedule of on-site activities or tasks indicating the portions of the site required to execute the scheduled tasks including areas for storage and marshaling components, the expected duration of tasks, and access requirements.
- I. Membrane Repair Manual and Kit: Upon substantial performance of the Work, submit two (2) copies of a repair manual for the tensioned membrane roof to the Owner.
 - 1. The manual shall include a schedule for routine inspection, an inspection checklist, instructions for emergency repair, use of emergency repair materials, and copies of warranties as specified elsewhere.
 - 2. Provide a repair kit at the site for emergency repair.

The instructions for use of all repair kit materials and emergency equipment shall be included in the repair manual with one copy included in the repair kit.

1.07 Examination of Site

- A. The Sub-Contractor will examine all existing surface conditions, areas of general site conditions before commencing the work of this section. The Sub-Contractor will immediately report any unsatisfactory conditions to the Owner in writing.

1.08 Review of The Work

- A. Access to the Work: The Owner, the Engineer, the Construction Manager, and their representatives shall at all times have access to the Work wherever it is in preparation or in progress. The Sub-Contractor will provide facilities for such access when it is reasonable to do so.

1.09 Roof Erection Control and Verification

- A. General Requirements: The Sub-Contractor shall continuously monitor the installation of the tensioned fabric system to ensure that it is constructed in accordance with the Drawings and to ensure that construction loading neither damages nor over-stresses any part of the membrane or its supporting steel structure.
- B. The Sub-Contractor shall implement controls and procedures, including stress measurements of the membrane, to assure that the following monitoring is completed:
 - 1. All roof system installation activity occurs in accordance with a pre-established installation plan which indicates a detailed sequence of work and which assures that the membrane stresses are monitored and are uniformly and progressively developed.
 - 2. A reaction plan is in place which assures that should fabric membrane over-stresses occur as installation takes place, an immediate response is made to reduce the stresses to within acceptable levels.
 - 3. Provision is made so that in case of high winds during the period when the fabric membrane is attached to the structure but is not yet tensioned out, the fabric will not be damaged by the action of such winds.
 - 4. In its final configuration, the roof system develops the specified uniform membrane prestress at the specified geometry.

1.10 Final Inspection

Perform final inspection of installed tension membrane surfaces and boundaries per paragraph 3. 4. Submit inspection report to the for the record.

1.11 Testing and Inspection

- A. The Owner for his quality assurance may at his expense retain an independent Testing Agency to inspect the work. The Sub-Contractor shall not rely on the Owner's Testing Agency for his quality control.

- B. The Sub-Contractor will supply the Testing Agency, as part of the cost of the Work, the following:
 - 1. A complete set of approved erection drawings and shop drawings.
 - 2. Cutting lists, order sheets, material bills and shipping bills and schedules.
 - 3. Representative sample pieces required by the Testing Agency for testing.
 - 4. Manufacturer's literature for all products to be utilized in the work.
 - 5. Details of proposed processes and procedures to be used in executing the work.
 - 6. Schedule of the shop and fieldwork.
 - 7. Full and ample means and assistance for inspection of all procedures and work product during various stages in the fabrication and installation process and proper facilities and access, including scaffolding, temporary work platforms, etc. for inspection of the work in the shop and in the field.

- C. The Sub-Contractor shall make all repairs to defective work or replace non-conforming materials to the satisfaction of the requirements of the Contract Documents, at no additional cost to the Owner.

1.12 Warranties

- A. See Specification Section 01 74 00.

- B. Project Installation Warranty: Submit written agreement signed by the Sub-Contractor, the installer, and the membrane manufacturer, guaranteeing to correct failures of materials, products, and workmanship for a 3-year period from the date of substantial completion of the Project, without reducing or otherwise limiting other rights to correction which the may have under the Contract Documents.

- B. Manufacturer's Product Warranty: Submit manufacturer's standard limited warranty for the tension membrane roof materials, signed by the manufacturer's authorized official, guaranteeing to correct failures of the product which might occur during the warranty period, without reducing or otherwise limiting any other rights to correction which they may have under the Contract Documents.

PART 2 PRODUCTS

2.01 General

- A. Any materials or operation specified by reference to published specifications of the manufacturer, fabricator, the American Society of Testing and Materials (ASTM) and other published standards, shall comply with the requirements of the standard listed. In case of conflict between the referenced specifications and the project specifications, the one having the more stringent requirements shall govern.
- B. See Section 05 12 00 structural steel materials, fabrication, and related products.

2.02 PVC Polyester Composite Membrane Materials

- A. All tension membranes shall be a polyester fabric coated with polyvinyl chloride and a PVDF topcoat.
- B. Fabric shall be Preconstraint TX30-II, as manufactured by Serge Ferrari, or approved equal
- C. All coated tension membrane materials, fabric and composite shall have the performance characteristics outlined herein. Submit manufacturers certificates of compliance:
 - 1. Life expectancy in this application shall be in excess of 30 years.
 - 2. The material shall be warranted for a period of 20 years.
- D. Manufacturer's Products:
 - 1. The Sub-Contractor will obtain primary materials from only one manufacturer.
 - 2. The Sub-Contractor will use only one type of fabric for the entire fabric membrane work, including reinforcements and sealing strips.
- E. Coated Fabric Performance: Each type of coated fabric and composite mesh employed in the Work shall meet the following requirements. Submit certificates of compliance, test methods are noted:

- 1. Strip Tensile N/cm ASTM D4851
 - Dry Warp 480 lb./in.
 - Dry Fill 480 lb./in.
- 2. Trapezoidal Tear ASTM D4851
 - Warp 80 lb.
 - Fill 75 lb.
- 3. Coating adhesion and peel strength ASTM D4851

Dry or Wet, minimum: 13 lb./in.
- 4. Lap Joint Static Load: Pass at stress indicated lbs/in fabric with 2 in. lap joint, 4 hours (min.) ASTM D 4851 strip tensile test sample with joint, static load at value indicated. Pass if no failure, slippage, peel, de-lamination, or pucker of joint in the period of 4 hours.

Dry, room temp. Warp & Fill: 100 % of spec'd dry strip tensile strength
Wet, room temp. Warp & Fill: 100 % of spec'd wet strip tensile strength

- 5. Optical properties of material
 - Transmittance: 8% +2%
 - Reflectance: 84% +4%
- 6. Spread of Flame Pass NFPA 701, small scale

2.03 Synthetic Rubber Padding, Seals and Gaskets

- A. All synthetic rubber materials for padding, gasketing, seals and similar uses shall be neoprene, as specified below. All materials shall be homogeneous, free from defects or foreign matter, and shall be compounded and cured to meet the requirements herein specified. These requirements shall apply to sheets, moldings, extrusions and field applied compounds.
- B. Neoprene materials shall contain at least 50% basic rubber hydrocarbons by weight, and shall contain no crude or reclaimed rubber.
- C. Cured materials shall have a quality equivalent to the following properties when tested as indicated, using standard ASTM test samples:
 - 1. Hardness, durometer A (min.) 40 to 60 D2240
 - 2. Tensile strength (min.) 600 psi D412, Method A
 - 3. Elongation (min.) 200% D412, Method A
 - 4. Compression Set (max.) 30% @ 100'C D395 Method B, 70 hrs.
 - 5. Heat aging, change from original D865, 70 hrs.@ 100'C
 - a. hardness (max.) + 10 points Shore A
 - b. loss of tensile strength (max.) -15%
 - c. loss of elongation (max.) -40%
 - d. change in width or length(max.) -2% Sample: 1" x 2" x .080 (25 x 50 x2mm)
 - 6. Flame resistance D635 must not propagate flame
 - 7. Brittleness at low temperature D747 -60'C
 - 8. Ozone resistance No cracks D1149 70'C (30,000 pp
 - 9. Resistance to oil aging, 70 hrs. D471, 20% @100'C, immersion in ASTM oil #3
 - 10. Tear Resistance 150 lbs./linear in.(min.) D624 (die C)

2.08 Clamps, Fasteners and Hardware

- A. Scope: All clamp plates, keder extrusions, and fasteners used to secure clamp system to the perimeter and cables, all fasteners to assemble clamp systems, and all miscellaneous hardware and fasteners as required to complete the work specified herein and as shown on the drawings.
- B. Hardware: Unless otherwise specified on the drawings, the following materials will be used for the applications listed:
 - 1. All fasteners shall be stainless steel; bolts and threaded studs shall be high strength ASTM F593 Alloy 316, condition CW1, Fy 95 ksi, Fu 110 ksi. Nuts shall be lock nuts complying with ASTM F594 same alloy and condition as the bolt.

2. All fasteners penetrating watertight seals shall have sealing hats and/or washers as required.
- C. Aluminum: Clamps, plates, keder and extruded sections shall be 6061-T6 alloy with minimum yield stress of 35 ksi (245 MPa)
1. Sheet, Clamps, Plates and extrusions shall be clear anodized per MIL-A-8625C, Type 2, Class 1.
 2. Dimensional tolerance shall be as established by ANSI H35.2-1978.
- D. Stainless Steel: Miscellaneous stainless steel sheet and hardware shall be of AISI type 316.

PART 3 – EXECUTION

3.01 Engineering And Detailing

- A. Patterning and Dimensional Detailing: The Contractor shall retain Huntington Design Associates to provide compensated fabric cutting patterns and details for the Sub-contractor's use in fabricating tensioned membrane roof elements. Subcontractor shall fabricate the following elements in accordance with these cutting patterns and details:
1. Fabric membrane geometry and seam locations
 - a. Fabric reinforcements, edge ropes, and other details.
 - b. Wire rope cables
 - c. Clamp bars, U-straps, turnbuckles, and all other miscellaneous hardware and fasteners.
- B. Biaxial Testing: The Sub-Contractor shall perform biaxial testing of representative samples of the tension membrane materials in order to determine its elastic properties, the set and stretch and pattern compensation for each of the materials employed in the Work.
1. At least two samples shall be tested, where the total number of test samples shall be determined by the Sub-Contractor based upon the variability of the test results and experience with the manufacturer's product.
 2. The biaxial test stress sequence shall be developed by the Sub-Contractor to establish compensation for fabric patterns with consideration of the installation procedure and stressing sequence of the tensioned fabric membrane.
 3. Submit bi-axial test reports for the record.
- C. Tension Membrane Clamps and Field Joints:
1. The Sub-Contractor will detail the tension membrane fastening, clamp system, and all field joints including keder extrusions, straps, fasteners and all sealing strips, closures, and covers per the general arrangement shown on the Drawings.
 2. Spacers between membrane clamps and supports will be provided as required so that the clamp curvature is smooth.
 3. All membrane field joints shall be 100% watertight without the use of surface-applied caulking. Cover flaps and closure strips over clamping shall be considered part of the sealing.
 4. Unless otherwise noted, all components of the clamp system will be rounded to 0.25 inch (6 mm) radius in areas of fabric contact to prevent development of stress concentrations in the fabric.
 5. Bolts, nuts and bolt heads shall be covered by metal, so that closure strips and cover flaps bearing foot traffic will be protected by hard cover or padding so that roof foot traffic can be supported without the bolt, nut or bolt head damaging the closure fabric.

6. The clamp system is an interlocking design to insure alignment at the ends of components to prevent the development of stress concentrations in the fabric during installation and the service life of the structure.
7. All clamps and field joints in the fabric membrane and shall be detailed to resist the maximum permitted membrane stress without permanent deformation of any part or component.
8. Aluminum clamp bars and extrusions shall be fabricated curved to the clamp line profiles

3.02 Fabrication

A. See paragraph 2.3 of this Specification Section for Cable Assemblies.

B. Tension Membrane Panels:

1. Panels bounded by field joints or edges shall be as identified on the Drawings. Each panel shall be shop fabricated as a one-piece fabric assembly.
2. Areas at corners and other areas of possible stress concentrations will be reinforced with bias reinforcing patches.
3. The Sub-Contractor will plan and assemble the sections so as to keep warp splices and repairs to a minimum. Warp splices shall be limited to one per 2,150 ft² (200 m²).
4. All structural lap joints shall be heat "welded" to develop the tensile strength of the coated fabric in the warp or fill.
5. All structural lap joints shall be at least 76 mm (3 in.) and shall be made in accordance with best industry standards. Complete and continuous fusion of the faying surfaces of the lap shall be achieved.
6. All membrane splices and seams will be arranged shingle fashion for optimal shedding of water.
7. All membrane sections will be rolled on pipes or carefully folded over appropriate padding, covered and padded in such a manner so as to prevent creasing, crushing and abrasion of membrane during shipment and prior to installation.
8. Provide continuous M3 membrane wear strips where steel cables are in contact the surface of the membrane.
9. Factory patches are not allowed except to repair minor damage, cuts, tears and abraisions (4") at panel edges where the patch cannot be seen in the installation.
 - a. All patches shall be executed to achieve 100% of the virgin coated membrane's strength properties.
 - b. All patches shall be neat, clean and carefully made to maintain the best possible appearance.

C. Packaging Tension Membrane Panels

1. Each unique fabric panel shall have a packaging plan and a unpacking deployment plan designed by the Sub-Contractor. The packaging plan shall indicate placement of all padding and protective materials. The packing plans shall submitted to the Engineer for the record.
2. Fabricated fabric panels shall be rolled and packaged in a manner to protect the fabric membrane during shipping and storage prior to installation as well as prevent flex-fold damage to the fabric in packing, shipping, unpacking, and deployment of the panels in the field.
3. All "folding" shall be over 4" diameter closed cell foam pads to prevent crimping fabric yarns and flex-fold damage.
4. Packaging shall avoid folding folds wherever possible. Where unavoidable, a system of padding shall be employed to prevent crimping and kinking the fabric in packaging and in deployment in the field.

3.03 Installation of Tensioned Membrane Roof System

- A. See Section 05 12 01 for installation information related to structural steel.
- B. Weather Conditions: The Sub-Contractor will proceed with installation of the tensioned membrane and associated work only when existing and forecast weather conditions will permit work to be performed in accordance with established procedures and an appropriate degree of safety. The Sub-Contractor will proceed only when willing to guarantee the work as required without additional reservations or restrictions. All mutual decisions or agreements to proceed with the work under unfavorable weather conditions must be recorded in writing stating the reasons for proceeding and the name of the person or persons involved in the decision. Under no condition will the Sub-Contractor be required to erect in weather conditions not approved by him.
- C. Preparation: Prior to start of installation, the Sub-Contractor will check all surfaces to be in contact with the fabric membrane. All edges are to be smooth and well rounded as indicated on the Drawings before proceeding. Potential causes for snagging or tearing of the tensioned membrane during installation and service of the membrane structure must be removed. Non-complying work by others will be brought to the and the Construction Manager's attention.
- D. At all times, either creasing or folding of the around sharp corners shall be avoided. The membrane shall not be abraded in any manner; for example, by pulling tools across it or by dragging the across rough surfaces. The surface upon which any membrane is placed shall be relatively smooth and free of projections and sharp or irregular objects. Heed the manufacturer's directions regarding the treatment of the membrane during installation.
- E. At all times, worker and personnel on the roof tensioned membrane surface shall wear appropriate soled shoes, cleaned prior to accessing the surface so as to not scratch or abrade the tension membrane.
- F. The tensioned membrane shall be installed and prestressed to the tensions identified on the Drawings in such a way that it will be free of architectural or structurally objectionable wrinkles.
- G. The tension membrane roof system as installed shall be 100% watertight.
- H. Patching and Repairs:
 - 1. Installation of the fabric panels shall be made with due care and appropriate protection to limit flex-fold damage, abrasion, cuts, and tears.
 - 2. Small damaged areas, maximum dimension in any direction 100 mm (4 in), in the roof fabric shall be patched.
 - 3. No more than one field patch in 6,700 ft² (622 m²) shall be allowed.
 - 4. No more than one field patch per fabric panel.
 - 5. No more than five field patches in Work shall be allowed.
 - 6. Notwithstanding the above noted limitations, if in the opinion of the Sub-Contractor a temporary patch is necessary for the integrity of the fabric membrane, he may install it providing that a permanent repair approved by the Engineer is made prior to completion of the work.
 - 7. All field patches shall be executed to achieve 100% of the virgin coated fabric's strength properties.
 - 8. All patches shall be neat, clean and carefully made to maintain the best possible appearance. If appearance is in question, the opinion of the Engineer shall be final.
 - 6. All patches shall be circular or oblong ovals.

I. Synthetic Rubber Gaskets:

1. Care shall be taken not to cut or rip rubber gaskets during installation.
2. Splices in synthetic rubber gaskets shall be vulcanized or scarfed and cemented using a one or two part cement. All cutting specified shall be done using approved equipment and in conformance with approved techniques.
3. All caulking shall be with a one part urethane equal to that produced by Mameco, Cleveland, Ohio; or Sikaflex-1A by Sika Company, Lyndhurst, New Jersey; or approved equal.
4. Where lap splices are used, tapered synthetic rubber shims shall be used under all clamps; shims shall be cemented to base material.
5. Lap splices shall be arranged so as to shed water by "shingling".

J. Aluminum work shall be accurately aligned and set to correct position. Installation tolerances for structural aluminum shall be the same as specified in the AISC Code of Standard Practice, based on standard temperature of 70°F (21°C).

K. Cleaning: All tensioned membranes shall be clean without objectionable stains or soiling at the completion of the Work.

1. Care shall be taken during erection to assure the tensioned membrane top and bottom surfaces are as clean as possible,
2. Protect all membrane materials from staining agents.
3. The Sub-Contractor shall be responsible to clean the tensioned membrane surfaces, roof fabric top and bottom surfaces and exterior surfaces, as well as associated hardware, steel and finished surfaces to the satisfaction of the Engineer upon completion of the Work.

3.04 Inspection of Tension Membranes

- A. Perform a detailed inspection of the installed fabric membranes upon substantial completion of the work.
- B. Inspect the fabric membrane surfaces for cuts, abrasions, holes, damage, or discontinuities in the base fabric that could initiate tear propagation. Repair all damaged areas.
- C. Inspection shall be sufficiently comprehensive and detailed to locate and repair all fabric membrane damage with a dimension greater than or equal to 12 mm (0.5 in.)
- D. Inspect clamping, supporting steel and the fabric membrane boundaries for discontinuities, sharp edges and other features which may damage the fabric membrane. Correct all problems identified.
- E. Review fabric membrane proximity to structural components, fixtures or other items which could damage the fabric if it came in contact with the item or surface. Identify all problems and provide written notice reporting all findings.
- F. Provide a written inspection report, detailing the extent of inspection and the repairs made.
- G.

END OF SECTION 13 31 23