WEST COUNTY WASTEWATER

CSO Building Seismic Retrofit and Roof Replacement

PROJECT NO. 18DF201

September 10, 2021

Angela Andrews, Capital Portfolio Manager

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Attachments:

- WCW Seismic Retrofit & Roof Replacement Permit Drawings, dated 08.11.2021

SECTION 00 01 15
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INVITATION TO BID

WEST COUNTY WASTEWATER

CSO Building Seismic Retrofit and Roof Replacement

PROJECT NO. 18DF201

NOTICE IS HEREBY GIVEN THAT the Board of the West County Wastewater (WCW) Richmond, California, invites and will receive sealed bids for furnishing all labor, equipment, materials and services specified for the construction of West County Wastewater Project No. 18DF201, Collections Systems Operations (CSO) Building Seismic Retrofit and Roof Replacement, in conformance with the Contract Documents.

The work covered by this contract will be performed at 2910 Hilltop Dr., Richmond, CA 94806. The Engineer's estimate is $1,446,000. The work includes, but is not limited to, the following:

1. Obtain all necessary permits prior to starting the work, unless otherwise instructed by West County Wastewater staff.
2. Provide all necessary materials, supplies, equipment, services and personnel, to adequately carry out or complete the project.
3. Perform work site cleanup duties, including, but not limited to removing all debris and placing materials, supplies and equipment in an organized manner, prior to leaving the site, each day.
4. Provide installation and roof warranties.
5. Remove and replace the existing built-up roof membrane with SBS modified (cold process).
6. Remove and replace existing metal coping.
7. Remove, store and reinstall existing ventilators and increase the height of the respective curbs.
8. Flash all existing roof penetrations and through-wall scuppers and overflows.

9. Structural upgrade for an ACSE 41-based seismic retrofit of indicated buildings on site.

10. All other work as shown and specified in the Contract Documents.

A mandatory pre-bid site walk will be held onsite at 2910 Hilltop Dr., Richmond, CA 94806. Two separate dates are available: September 20, 2021 at 10 a.m., or September 22, 2021 at 10 a.m. (please attend just one of these site walks**.)**

Proposal schedule:

- September 10, 2021 Publish RFP
- September 20, 2021 Mandatory pre-bid walkthrough at 10 a.m. **(please attend either date)**
- **OR** September 22, 2021 Alternate pre-bid walkthrough at 10 a.m. (**please attend either date)**
- September 29, 2021 RFP questions due
- October 6, 2021 RFP questions answered
- October 13, 2021 Bids due by 2:00 p.m.
- October 20, 2021 Bid selection announcement
- February 15, 2022 Notice to Proceed (NTP) start date
- June 20, 2022 Construction Complete (duration 125 calendar days/ 90 working days)

Bid due date: West County Wastewater will receive sealed bids at the reception area prior to **02:00 p.m., local time, on October 13, 2021,** addressed to **Keith Reynolds, 2910 Hilltop Drive, Richmond, CA 94806**. Bids will be time stamped and will not be accepted after this date and time. Bids will be opened and read publicly at that time and the apparent low bidder will be announced.

Contract Documents may be examined without charge at the West County Wastewater Administrative Offices, 2910 Hilltop Drive, Richmond, CA 94806. Inquiries regarding the RFP, mandatory pre-bid site walk, or other questions about the project may be directed to Keith Reynolds at kreynolds@wcwd.org or (510) 222-6700.

In accordance with SB 854, all participating contractors and subcontractors must be registered with the Public Works Contractor Registration program established by the Department of Industrial Relations.

Notice is hereby given that, pursuant to Part 7, Chapter 1, Article 2, and Section 1770 et. seq. of the Labor Code of the State of California, the successful bidding contractor and its sub-contractors shall pay their labor forces not less than the general prevailing rate of per diem wages as determined by the Director of Industrial Relations, and travel and subsistence pay as such are defined in applicable collective bargaining agreements filed in accordance with Sections 1773.1 and 1773.8 of said Labor Code, for work needed and performed on this Project. Said determinations, in effect at the time of publishing this notice, are on file at the above identified West County Wastewater Administrative Offices and may be examined there, and copies of which are available to any interested party on request. It shall, pursuant to the provisions of Section 1773.2 of said Labor Code, be a requirement of the work for the successful bidding contractor to post and maintain a copy of said wages' determination at the project sited throughout the duration of the work.

Bids to receive consideration must be signed by the bonafide prime contractor who proposes to undertake the work and who is properly licensed in accordance with the Contractor's License Law as provided beginning at Section 7000 of the Business and Professions Code of the State of California. The valid license(s) required for the work are as follows**: Class B (General Contractor)** and **Class C-39 (Roofing Contractor.)** Each bid must be on the forms furnished within the Project Contract and must be accompanied by a certified or cashier's check or bidder's bond for an amount not less than ten percent of the aggregate total bid. All bids must be in a sealed envelope and have clearly marked information on the outside of the envelope (information shall include: the firm's name, address and telephone number, and the title of the RFP).

The Contractor shall be allowed to substitute securities for any funds withheld to ensure performance under this Contract pursuant to Section 22300 of the California Public Contract Code.

West County Wastewater's Board of Directors reserves the right to reject any or all bids for the work and will not be liable for any costs incurred by the Contractor in the preparation and submittal of bids.

West County Wastewater
County of Contra Costa, State of California

END OF SECTION 00 11 16

SECTION 00 21 13

INSTRUCTIONS TO BIDDERS

Subsection

1. Preparation and Submission of Proposals
2. Examination of Documents and Explanation to Bidders
3. Site Inspection and Conditions
4. West County Wastewater's Modification of the Documents
5. Registration of Contractors
6. Schedule of Bid
7. Comparison of Proposals
8. Bidder's Statement of Equipment/Material Manufacturers and Suppliers and Statement of Subcontractors
9. Qualification of Bidders
10. Certification of Completion Requirements
11. Proposal Security
12. Bidder's Modification and Withdrawal of Proposals
13. Substitutions
14. Proposal Opening and Award of Contract
15. Relief of Bidders
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17. Nondiscrimination in Employment
18. Agreement to Assign (Bidders)
19. Plans and Specifications to Successful Bidders
20. Not Used
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Subsection 1. PREPARATION AND SUBMISSION OF PROPOSALS

Proposals shall be submitted on the forms provided. All proposal forms shall be properly executed and all blank spaces shall be filled in. Failure to comply with this requirement may be cause for rejection of the proposal.

The quantities included in the bid proposal are estimates of the work to be completed. West County Wastewater may add work of the same nature to this Contract if the addition is in the best interests of West County Wastewater.

Partial or incomplete proposals will not be considered. Proposals shall be in strict conformity with the approved Contract Documents for Project No. 18DF201, CSO Building Seismic Retrofit and Roof Replacement, and any Addenda thereto.

The bidder shall submit its proposal prior to the stated closing time. Any proposal received after the stated closing time for receipt of proposals will be marked as to date and time received and returned unopened.

Each proposal shall show the full legal name and business address of the bidder, including street address if it differs from its mailing address, and shall be signed with the usual signature of the person or persons authorized to bind the bidder and shall be dated. Proposals by a partnership or joint venture shall list the full names and addresses of all partners or joint venturers. The state of incorporation shall be stated in and the corporate seal shall be affixed to the proposal to which a corporation is a party as a bidder. The name of each signatory shall be typed or otherwise clearly imprinted below each signature. When requested by West County Wastewater, satisfactory evidence of the authority of any signatory on behalf of the bidder shall be furnished.

The preparation of a proposal shall be by and at the expense of the bidder. The bid submitted must not contain any erasure, interlineation or other corrections unless each correction is suitably authenticated by affixing in the margin immediately opposite the correction the signature or signatures of the person or persons submitting the bid.

Changes in or additions to the bid form, recapitulation of the work bid upon, alternative bids or any other modifications of the bid form which are not specifically called for in the Contract Documents may result in rejection of the bid by West County Wastewater, as not being responsive to the Invitation to Bid. No oral or telephonic modification of any bid submitted will be considered.

Each proposal shall be enclosed in a sealed envelope distinctly marked "Proposal" and bearing West County Wastewater's Project Number, title as given, and the name and address of the bidder. Proposals shall either be delivered in accordance with Section 00 11 16 Invitation to Bid, or mailed addressed to West County Wastewater, 2910 Hilltop Drive, Richmond, California 94806, Attention: Keith Reynolds Proposals may be delivered in person to: West County Wastewater, 2910 Hilltop Drive, Richmond, California, during normal business hours, being 08:00 a.m. to 12:00 p.m. and from 01:00 p.m. to 05:00 p.m., Monday through Friday.

Proposals shall be firm for sixty calendar days from and after the stated closing time, or until a Contract is fully executed by West County Wastewater and a bidder, whichever is earlier.

In response to the Invitation to Bid, Section 00 11 16, dated and in accordance with the accompanying Instructions to Bidders, Section 00 21 13, the undersigned hereby proposes to West County Wastewater, to furnish all labor, technical and professional services, supervision, materials, and equipment (other than materials and equipment specified as furnished by West County Wastewater), and to perform all operations necessary and required for construction of West County Wastewater Project No. 18DF201, CSO Building Seismic Retrofit and Roof Replacement, in accordance with the provisions of Sections 00 01 10 through 02 83 00, Technical Specifications and Contract Documents, inclusive of West County Wastewater's Contract Documents for West County Wastewater Project No. 18DF201, and any Addenda thereto, and at the prices stated opposite the respective items set forth in Section 00 41 43, Schedule of Bid, attached hereto.

This Proposal constitutes a firm offer to West County Wastewater which cannot be withdrawn for sixty (60) calendar days froclient m and after the date set for opening of proposals, or until a contract is fully executed by West County Wastewater, whichever is earlier.

It is the intent of West County Wastewater to provide a safe working environment under normal conditions. BECAUSE OF POTENTIALLY HAZARDOUS CONDITIONS SUCH AS POTENTIALLY EXPLOSIVE ATMOSPHERES AND POSSIBLE EXPOSURE TO PATHOGENS, SPECIALIZED EQUIPMENT MAY BE NECESSARY AND STRICT CONFORMANCE WITH SAFETY REGULATIONS WILL BE REQUIRED. THE CONTRACTOR IS HEREBY INFORMED THAT THE MAJORITY OF THE WORK ON THIS PROJECT IS TO BE PERFORMED UNDERWATER AND COULD BE PHYSICALLY DANGEROUS TO WORKERS. THE CONTRACTOR SHALL CAREFULLY INSTRUCT ALL PERSONNEL WORKING ON THIS PROJECT AS TO POTENTIAL DANGERS, WHICH COULD BE POTENTIALLY HAZARDOUS TO WORKERS' HEALTH, AND SHALL PROVIDE SUCH NECESSARY SAFETY EQUIPMENT AND INSTRUCTIONS AS ARE NECESSARY TO PREVENT INJURY TO PERSONNEL AND DAMAGE TO PROPERTY. ALL UNDERWATER WORKERS WILL PROVE PROOF OF THE CORRECT LICENSES AND/OR CERTIFICATIONS FOR THE WORK THEY WILL BE UNDERTAKING. This material should be formally submitted to the prior to the start of work. Workers found to lack proper licenses and/or certifications will not be permitted to work on the project. Attention is further directed to Section 00 72 20, Laws and Regulations.

The undersigned Bidder hereby certifies that it has examined and is fully familiar with all of the provisions of the Contract Documents and any Addenda thereto, has carefully checked all of the words and figures shown on its Schedule of Bid, Section 00 41 13; has carefully reviewed the accuracy of all statements in this Proposal and attachments hereto; and understands and agrees that West County Wastewater will not be responsible for any errors or omissions on the part of the undersigned in preparing this Proposal.

The undersigned Bidder has, by careful examination of the Contract Documents and any Addenda thereto, where applicable, and by examination of the actual site conditions, satisfied itself as to the nature and location of all work, the general and local conditions to be encountered in the performance of any work, the requirements of the Contract, and all other matters which can in any way affect the work or the cost thereof.

The basis of award will be the lowest total bid submitted by a contractor found to be responsive and responsible. Failure to provide three qualified client references for completed public contracts for construction work of a similar size and nature (Ref: Section III-Client References), or a contractor with an EMR rating in excess of 1.1 will cause the contractor to be judged non responsible and his bid rejected.

SAFETY RECORD - EXPERIENCE MODIFICATION RATING

An Experience Modification Rating (EMR) of 1.1 or less, is required. Attach a current dated letter from your insurance company, addressed to WCA, stating your EMR rating for the current year, and the previous year.

If awarded the Contract, the undersigned agrees to execute and deliver to West County Wastewater within ten (10) calendar days after receipt of West County Wastewater's Notice of Award, the Contract and the necessary Performance Bond, Payment Bond, Construction Schedule and policies of insurance in accordance with the Contract Documents.

Attached hereto and by this reference incorporated herein and made a part of this Proposal are the following forms from the Contract Documents, which have been completed and executed by the undersigned Bidder:

Section 00 21 13	Instructions to Bidders
Section 00 41 43	Schedule of Bid
Section 00 43 13	Bid Security Form (Bidder's Bond)
Section 00 43 33	Bidder's Statement of Equipment/Materials Suppliers
Section 00 43 34	Major Equipment Manufacturer Substitutions
Section 00 43 36	Bidder's Statement of Subcontractors
Section 00 45 13	Bidder's Statement of Qualifications
Section 00 45 16	Certificate Regarding Completion Time
Section 00 45 17	Contractor Safety Acknowledgement
Section 00 45 18	Certificate Regarding Inspection of Contract Documents and Site
Section 00 45 19	Non-Collusion Declaration
Section 00 45 26	Workers' Compensation Certification

The undersigned Bidder acknowledges receipt, understanding and full consideration of the following Addenda to the Contract Documents: Addenda No(s). _____.

There is enclosed herewith a proposal security in the form of a Bidder's Bond in favor of, or a certified check, or a cashier's check payable to West County Wastewater in an amount not less than ten (10) percent of the amount of the Proposal total as set forth in the Schedule of Bid, Section 00 41 13, which shall be and remain the property of West County Wastewater in the event of failure of the undersigned to execute and deliver the Contract and to furnish the necessary bonds and certificates and endorsements of insurance in accordance with the Procurement Form Supplements, Section 00 43 00, Representations and Certifications, Section 00 45 00, Contract Forms, Section 00 52 00 and Bond Forms, Section 00 61 00 of the Contract Documents. It is further understood by the undersigned that such failure will cause substantial injury to West County Wastewater, including delay in its construction program, which is not easily reduced to monetary terms; and it is, therefore, agreed that the amount of the Bidder's Proposal security is to be considered as liquidated damages for such injury and will be retained by West County Wastewater in the event of such a failure.

The undersigned Bidder certifies that it is now licensed in accordance with the provisions of the Contractor's License Law of the State of California, and the number of said license is _____, and the classification of said license is _____, and the said license expires_____. The undersigned Bidder certifies that it is now registered with the Public Works Contractor Registration program established by the Department of Industrial Relations, in accordance with SB 854, and the number of said registration is _____, and the said registration expires_____. The undersigned Bidder certifies that its subcontractor(s) is/are now licensed in accordance with the provisions of the Contractor's License Law of the State of California, and the number of said license is _____, and the classification of said license is _____, and the said license(s) expire(s)_____. The undersigned Bidder certifies that its subcontractor(s) is/are now registered with the Public Works Contractor Registration program established by the Department of Industrial Relations, in accordance with SB 854, and the number of said registration(s) is/are _____, _____, and the said registration(s) expire(s)_____, _____.

BIDDER:

_____ _____
Company Name, Business Address

By _____
Authorized Signature

_____ _____
Type or Print Name Title

Dated _____ Corporate Seal, State of Incorporation:
(if Bidder is a Corporation)

Subsection 2. EXAMINATION OF DOCUMENTS AND EXPLANATION TO BIDDERS

Any bidder planning to submit a proposal is responsible for examining with appropriate care the complete Contract Documents, including all Addenda, and is also responsible for being informed with respect to all conditions which might in any way affect the cost or the performance of any work. Failure to do so will be at the sole risk of the bidder, and no relief can be given for errors or omissions by the bidder.

All questions relative to the Contract Documents shall be in writing, submitted in compliance with the timeline provided in Section 00 11 16 and shall be directed to Keith Reynolds West County Wastewater, 2910 Hilltop Drive, Richmond, California 94806. Questions may also be sent via. e-mail to Keith Reynolds, kreynolds@wcwd.org.

Should the bidder find discrepancies in or omissions from the Contract Documents, or should the intent or meaning of the documents appear unclear or contain patent ambiguities, the bidder shall at once notify West County Wastewater of such findings. Questions received less than five calendar days prior to the date for opening of the bids may not be answered. The bidder making such request shall be solely responsible for its timely receipt by West County Wastewater. Replies to such findings may be made in the form of addenda which will be issued simultaneously to all persons who have obtained a copy of the Contract Documents from West County Wastewater. Only questions answered by formal written addenda will be binding.

The bidder confirms it has familiarized itself with the Contract Documents and has found them fit and sufficient for the purpose of preparing its bid. By submission of its bid, the successful bidder agrees that it has familiarized itself with the provisions of Section 00 72 03, Discovery of Errors, Omissions, or Discrepancies in the Contract.

Copies of the Contract Documents, where applicable, are available for examination without charge during normal business hours (08:00 a.m. to 12:00 p.m. and 01:00 p.m. to 05:00 p.m., Monday through Friday) at:

West County Wastewater
2910 Hilltop Drive
Richmond, California 94806

At the time each bidder obtains a copy of the documents, it shall designate the email address to which written addenda are to be sent, the facsimile number to which faxed addenda are to be sent and the telephone number to which telephonic notices are to be made.

Subsection 3. SITE INSPECTION AND CONDITIONS

It is the intent of West County Wastewater to provide a safe working environment under normal conditions. BECAUSE OF POTENTIALLY HAZARDOUS CONDITIONS SUCH AS POTENTIALLY EXPLOSIVE ATMOSPHERES AND POSSIBLE EXPOSURE TO PATHOGENS, SPECIALIZED EQUIPMENT MAY BE NECESSARY AND STRICT CONFORMANCE WITH SAFETY REGULATIONS WILL BE REQUIRED. THE CONTRACTOR IS HEREBY INFORMED THAT THE MAJORITY OF THE WORK ON THIS PROJECT IS TO BE PERFORMED UNDERWATER AND COULD BE PHYSICALLY DANGEROUS TO WORKERS. THE CONTRACTOR SHALL CAREFULLY INSTRUCT ALL PERSONNEL WORKING ON THIS PROJECT AS TO POTENTIAL DANGERS, WHICH COULD BE POTENTIALLY HAZARDOUS TO WORKERS' HEALTH, AND SHALL PROVIDE SUCH NECESSARY SAFETY EQUIPMENT AND INSTRUCTIONS AS ARE NECESSARY TO PREVENT INJURY TO PERSONNEL AND DAMAGE TO PROPERTY. ALL UNDERWATER WORKERS WILL PROVE PROOF OF THE CORRECT LICENSES AND/OR CERTIFICATIONS FOR THE WORK THEY WILL BE UNDERTAKING. This material should be formally submitted to the prior to the start of work. Workers found to lack proper licenses and/or certifications will not be permitted to work on the project. Attention is further directed to Section 00 72 20, Laws and Regulations.

In addition to examination of the Contract Documents, each prospective bidder shall become fully informed regarding all existing and expected conditions and matters which could affect any work or performance of any work in any way, and especially the cost of performing any work. The project may be visited and conditions discussed at the pre-bid conference set forth in Section 00 11 16, Invitation to Bid.

The records of this effort are not part of the Contract, and are made available for inspection solely for the convenience of the prospective bidders. Neither West County Wastewater nor Engineer assumes any responsibility for the sufficiency or accuracy of the investigations made and there is no representation, warranty, or guarantee that the conditions indicated in the report are correct or representative. The prospective bidder may, upon written request, inspect this report at West County Wastewater's Administrative Offices.

Any failure to fully investigate the sites or the foregoing conditions shall not relieve the bidder from responsibility for estimating properly the difficulty or cost of successfully performing any work. Neither West County Wastewater nor any of its representatives or agents assumes any responsibility for any understanding or representation made by West County Wastewater or any of its representatives or agents prior to the execution of a Contract pursuant to the Contract Documents.

Subsection 4. WEST COUNTY WASTEWATER'S MODIFICATION OF THE DOCUMENTS

West County Wastewater may modify any provision or part of the document at any time prior to three calendar days before closing time, provided that the closing time set forth in Section 00 11 16, Invitation to Bid, may be extended by West County Wastewater at any time prior to said closing time. Such revisions, if any, will be in the form of addenda which will be issued as set forth in Section 00 21 13, Subsection 2, Examination of Documents and Explanation to Bidders.

Addenda issued during the time of bidding shall become a part of the documents furnished bidders for the preparation of bids, shall be covered in the bids and shall be made a part of the Contract. Each bid shall include a specific acknowledgment in the space provided for receipt of all Addenda issued during the bidding period. Failure to so acknowledge may result in the bid being rejected as non-responsive. Failure of any bidder to receive such addenda shall not be grounds for non-compliance with the terms of the instructions.

Subsection 5. REGISTRATION OF CONTRACTORS

All bidders shall be licensed under the provisions of Chapter 9, Division 3, or the Business and Professions Code of the State of California to do the type of work contemplated in the project and shall be skilled and regularly engaged in the general class or type of work called for under the Contract.

In accordance with SB 854, all participating contractors and subcontractors must be registered with the Public Works Contractor Registration program established by the Department of Industrial Relations. Each bidder shall set forth in its proposal the number, and date of expiration.

Subsection 6. SCHEDULE OF BID

Bids shall be prepared on the forms contained in Section 00 41 43, Schedule of Bid. The Total Base Bid shall constitute full compensation for furnishing all materials and doing all work indicated on the drawings or herein specified.

Bidders are advised that a potential exists for the performance of extra work and furnishing of materials by the Contractor which is required for the proper completion of the work or construction of the whole of the project as originally contemplated.

Subsection 7. COMPARISON OF PROPOSALS

Proposals will be compared on the basis of the Total Base Bid stated in Section 00 41 43, Schedule of Bid.

For the purpose of initial evaluation of bids, the following will be utilized in resolving arithmetic discrepancies found on the face of the bidding schedule as submitted by bidders:

a. In case of discrepancy between unit price and extended price, the unit price will govern and will be used to correct the extension of unit prices.

b. Apparent errors in addition of lump-sum and extended prices will be corrected.

c. If no monetary symbol ($ or ¢) is entered with a unit price, lump sum, or extension, a dollar sign ($) will be assumed to be the bidder's intent.

Unless the bid is corrected for arithmetic errors as discussed above, then in the event that there is a discrepancy in the proposal between the lump-sum price or extended unit price written in words and indicated in figures, the price written in words shall govern.

West County Wastewater agrees to examine and consider each bid submitted in consideration of the bidder's agreements, as herein above set forth and as set forth in the proposal forms.

Any proposal which, in the opinion of West County Wastewater, is so unbalanced between the various Contract items as to be detrimental to the best interests of West County Wastewater, will be rejected.

Subsection 8. BIDDER'S STATEMENT OF EQUIPMENT/MATERIAL MANUFACTURERS AND SUPPLIERS AND STATEMENT OF SUBCONTRACTORS

In the form entitled Bidder's Statement of Equipment/Material Manufacturers and Suppliers, provided within Section 00 43 33, each bidder must submit the name of each person, company, or firm who will, off the job site, specially fabricate and/or provide materials or equipment proposed to be furnished under the bid.

In the form entitled Bidder's Statement of Subcontractors, provided within Section 00 43 36, the bidder shall submit the name and location of the place of business of each subcontractor who will perform work or labor or render service to the prime contractor in or about the construction of the work or improvement, or a subcontractor licensed by the State of California who under subcontract to the prime contractor specially fabricates and installs a portion of the work or improvement according to detailed drawings contained in the Plans Specifications, in an amount in excess of one-half of one percent of the proposal total or five thousand dollars, whichever is greater, as set forth in the Schedule of Bid, Section 00 41 43. The prime contractor shall indicate the portion which will be done by each such contractor for each such portion as its defined by the subcontractor in its bid.

Failure to list subcontractors in the Bidder's Statement of Subcontractors Section 00 43 36 is an express statement by the bidder that it will perform that portion of the work with its own forces. Any request for substitution of a listed subcontractor must be made as provided in the Public Contract Code Section 4107. The prime contractor may not substitute any person or subcontractor for a listed subcontractor without first obtaining written permission of the West County Wastewater's Board of Directors.

Subsection 9. QUALIFICATION OF BIDDERS

Each bidder shall examine the site and submit with its proposal a financial responsibility, technical ability, and experience statement, substantially in the form included as Section 00 45 13, Bidder's Statement of Financial Responsibility, Technical Ability, and Experience.

If bidder is a corporation, it shall submit its state of incorporation in addition to its business address; if a partnership or joint venture, full names of all partners or joint venturers shall be given in the form included in the Proposal, Section 00 52 00.

West County Wastewater expressly reserves the right to reject any proposal if it determines that the bidder's business and technical organization, financial resources, plant and equipment to be used in performing work, or lack of successful experience in performing work, or lack of successful experience in performing work of similar type and magnitude, is such that it is not in the West County Wastewater's best interest to accept the bidder's proposal.

Contractors or subcontractors who have been determined to have violated any public work laws as set forth in Labor Code Section 1777.7 shall be denied the privilege to bid the work as provided therein.

Subsection 10. CERTIFICATION OF COMPLETION REQUIREMENTS

Each bidder shall submit, as part of its proposal, a completed and executed certificate pertaining to the acceptability of the construction time frame as set forth in Section 00 45 16, Certificate Regarding Completion Time.

The Contract time for this work shall be deemed to start five (5) calendar days from the date of the Notice to Proceed. **At the time of Bid, the Contractor must submit a detailed construction phasing schedule schedule in accordance with Section 00 45 16, CERTIFICATE REGARDING COMPLETION TIME. Notice to Proceed will not be issued until a reasonable construction schedule is submitted to West County Wastewater.**

Subsection 11. PROPOSAL SECURITY

No proposal will be considered unless it is accompanied by proposal security in the form of a certified check or a cashier's check, payable to the order of West County Wastewater, for a sum not less than ten percent of the proposal total as set forth in the Schedule of Bid, Section 00 41 43, or a bidder's bond in the same amount executed as surety by a corporation acceptable to West County Wastewater and authorized to issue such surety bond in the State of California. Such bond shall be in substantial conformity with the form included as Section 00 43 13, Bidder's Bond. Payment of the proposal security in cash is not acceptable.

Within fifteen calendar days after execution of the Contract pursuant to the Contract Documents, and in any event not later than seventy calendar days after the proposal opening, West County Wastewater will return to each bidder the proposal security which accompanied its proposal, except such security which may have been forfeited in accordance with the provisions of the Contract Documents.

Subsection 12. BIDDER'S MODIFICATION AND WITHDRAWAL OF PROPOSALS

A bidder may, without prejudice to itself, modify or withdraw its proposal by written request, provided that the request is received by West County Wastewater prior to the closing time, at the place where the proposals are to be opened. Following withdrawal of its proposal, the bidder may submit a new proposal, provided that such new proposal is received prior to the stated bid opening date as provided in Section 00 11 16, Invitation to Bid.

Subsection 13. SUBSTITUTIONS

Proposals for substitution of materials, methods, and alternatives thereto not specified in the Specifications shall be submitted in writing to West County Wastewater. Failure to submit requests for substitutions will be considered as evidence that the work will be accomplished with materials and by methods specified and in a manner approved by West County Wastewater.

Subsection 14. PROPOSAL OPENING AND AWARD OF CONTRACT

Proposals will be kept unopened until the time stated for opening of proposals. At such time, the contents of the proposal will be made public. No responsibility shall attach to West County Wastewater or any of its officers, employees, or representatives for the premature opening of a proposal. All bidders or their authorized representatives are invited to be present at the proposal opening.

If award is made, it will be based on the lowest responsive, responsible bid whose base bid is the lowest.

The right is reserved, as the interest of West County Wastewater may require, to reject any or all proposals and to waive any informality in proposals received.

Within sixty days after the time of opening of the bids, West County Wastewater will act either to accept a bid, to reject all bids or with the consent of the bidders and their sureties to extend the time in which West County Wastewater may act. The acceptance of a bid will be evidenced by a Notice of Award of Contract in writing, delivered in person or by certified mail to the bidder whose bid is accepted. No other act of West County Wastewater will constitute acceptance of a bid. The Award of Contract shall obligate the bidder whose bid is accepted to furnish performance and payment bonds and evidences of insurance, and to execute the Agreement in the form set forth in the Contract Documents. The Contract will require the completion of the Work according to the Contract Documents.

The Agreement shall be executed by the successful bidder and returned, together with the Contract bonds and evidences of insurance, within the specified time period after receiving written Notice of Award of the Contract. Time is of the essence in this regard. After execution by the owner, one copy of the Agreement shall be returned to Contractor.

The failure of any bidder to whom West County Wastewater may award the Contract, as aforesaid to sign and return to West County Wastewater, the Contract together with the required Performance Bond, Payment Bond, and insurance certificates and endorsements the specified time period, shall entitle West County Wastewater to declare a breach of Contract by such bidder, to award the Contract to another bidder in accordance with the provisions of the Contract Documents, and to declare a forfeiture of the bidder's proposal security accompanying its proposal.

In the event of such failure, West County Wastewater will suffer damage, the amount of which is difficult, if not impossible, to ascertain, and West County Wastewater shall therefore be entitled to retain the amount of such cashier or certified check, submitted by the bidder as proposal security, or to enforce the provisions of the Bidder's Bond in the amount thereof, as liquidated damages for such breach of Contract, as provided by applicable law.

Subsection 15. RELIEF OF BIDDERS

Should a bidder claim a mistake was made in its bid, the bidder shall give West County Wastewater written notice within five calendar days after proposal opening of the alleged mistake, and detail in said notice the circumstances under which the mistake occurred all in accordance with Public Contract Code, Section 5103. Final determination of relief of bidders shall be made by West County

Wastewater's Board. Should West County Wastewater's Board accept the bidder's claim for relief, the bidder will be released from all obligations and further requirements and its proposal security will be returned as applicable.

Subsection 16. BONDS AND INSURANCE POLICIES

All bids or bids shall be accompanied by a cashier's or certified check payable to the order of the West County Wastewater amounting to ten percent (10%) of the bid, or by a bond in said amount and payable to said West County Wastewater signed by the bidder and a corporate surety. Said check shall be forfeited or said bond shall become payable to said Owner in case the bidder depositing same does not, within ten (10) days after written notice that the contract has been awarded to him: (a) enter into a contract with the Owner, and (b) furnish certificates of insurance, a bond of faithful performance and a payment bond as described in the Specifications.

The bidder to whom the contract award is made shall, at the time of execution of the Contract, furnish to West County Wastewater a Performance Bond and a Payment Bond, executed as surety by a corporation acceptable to West County Wastewater and authorized to issue such surety bonds in the State of California. Such bonds shall be substantially in the form included in Section 00 61 13, Performance Bond and Section 00 61 14, Payment Bond. Such Performance Bond and Payment Bond shall be for one hundred percent of the proposal total as set forth in the Schedule of Bid, Section 00 41 43. The entire cost of these bonds shall be borne by the successful bidder.

If the surety on any bond furnished by the Contractor is declared bankrupt, or becomes insolvent, or its right to do business is terminated, or it ceases to meet the requirements of the above paragraph, the Contractor shall, within five calendar days thereafter, notify West County Wastewater and substitute another bond and surety, both of which must be acceptable to West County Wastewater.

Subsection 17. NONDISCRIMINATION IN EMPLOYMENT

Contracts for work under this Proposal will obligate the Contractor and subcontractors not to discriminate in employment practices.

Subsection 18. AGREEMENT TO ASSIGN (BIDDERS)

The bidder's attention is directed to the provisions of Government Code, Section 4552, which requires that in submitting a bid to a public purchasing body, bidders offer to assign all rights arising from violations of antitrust regulations to the public entity if the bid is accepted. In pertinent part, Government Code, Section 4552, reads as follows:

In submitting a bid to a public purchasing body, the bidder offers and agrees that if the bid is accepted, it will assign to the purchasing body all rights, title, and interest in and to causes of action it may have under Section 4 of the Clayton Act (15 U.S.C. Sec 15) or under the Cartwright Act (Chapter 2 [commencing with Section 16700] of Part 2 of Division 7 of the Business and Professions Code), arising from the purchase of goods, materials, or services by the bidder for sale to the purchasing body pursuant to the bid. Such assignment shall be made and become effective at the time the purchasing body tenders final payment to the bidder.

Subsection 19. PLANS AND SPECIFICATIONS TO SUCCESSFUL BIDDERS

The bidder to whom award is made may obtain four (4) sets of Plans and Specifications for the work at no extra costs. Additional sets may be purchased at $50.00 per set. It is the Contractor's responsibility to provide its own set(s) of conformed Plans and Specifications.

Subsection 20. NOT USED

Subsection 21. BID PROTESTS

Any Bid Protest of the proposed award of Contract to the Bidder with the lowest responsive bid must be submitted in writing to West County Wastewater, no later than 5:00 pm on the fifth business day following the date of the bid opening. All Bid Protests shall comply with the following procedures:

1. The initial Bid Protest must contain a complete statement of the basis for the Protest.

2. The Bid Protest must state the facts and refer to the specific portions of the document or the specific statutes that form the basis for the Bid Protest. The Bid Protest must include the name, address and telephone number of the the person representing the protesting party.

3. The party filing the Bid Protest must concurrently transmit a copy of the initial protest to the bidder deemed the lowest bidder.

4. The party filing the protest must have submitted a Bid on the project. A subcontractor of a party filing a bid on the project may not submit a Bid Protest.

5. The procedure and time limits set forth in this Subsection are mandatory and are the Bidder's sole and exclusive remedy in the event of a Bid Protest. The bidder's failure to fully comply with these procedures shall constitute a waiver of any right to further pursue the Bid Protest, including the filing of a challenge of the award pursuant to the California Public Contracts Code, the filing of a claim pursuant to the California Governemtn Code, or filing of any other legal proceedings.

6. West County Wastewater shall review all timely Bid Protests prior to formal award of the Contract. West County Wastewater shall not be required hold an administrative hearing to consider a timely Bid Protest, but may do so at the discretion of the General Manager.

7. These Bid Protest procedures shall not limit West County Wastewater's Board of Directors' ability to reject all bids.

END OF SECTION 00 21 13

SECTION 00 41 43
SCHEDULE OF BID

Schedule of Prices for Construction of Project No. 18DF201, CSO Building Seismic Retrofit and Roof Replacement.

The undersigned bidder hereby offers, in the amount stated below, to furnish all labor, materials, tools, Diffuser & Anode Replacements, in Richmond, California. The undersigned bidder hereby agrees to enter into a Contract for Project No. 18DF201, if this offer is accepted by the West County Wastewater.

Item No.	Description	Quantity	Unit	Unit/LS Price	Amount
1.	Mobilization and demobilization, as described and specified	LS	LS		
2.	Demolition of roof membrane and wood sheathing, as indicated to be replaced or removed, metal flashing, coping, vents, ventilators, framing and anything necessary for the execution of this work.	LS	LS		
3.	Install new metal coping and flashing along top and sides of all parapet walls, for approximately 158 LF, per lineal foot.	158	LF		
4.	Remove and reinstall existing ventilators and increasing height of curbs, for 3 EA, per each.	3	EA		
5.	Install new CMU wall above the roof level of the CSO Building, for 80 LF, per lineal foot.	80	LF		
6.	Furnish and install complete new plywood sheathing deck for CSO Office Building. Work includes but not necessarily limited to nailing, straps, hold downs, bolts, connectors, etc.	1	LS		

7.	Rehabilitate and make seismic upgrades in the existing roof structures for Maintenance Garage and CSO Garage, including but not limited to strengthening of existing plywood sheathing, added nailing, hold downs, bolts, connectors, straps, and blocking.	1	LS		
8.	Furnish and Install new seismic collector at CSO Garage, including but not limited to all anchorages extending into new CSO Office Building CMU Walls, clips, straps, blocking, and appurtenances.	1	LS		
9.	Install new built-up roof membrane with SBS modified (cold process) for approximately 5,200 SF, per square foot.	5,200	SF		
10.	Install flashing at all existing roof penetrations (including hot and cold vents) and through-wall scuppers, rain gutters & leaders and overflows.	1	LS		
11.	Furnish and install tie-down anchors to secure owner's equipment racks and also approximately 10 EA flammable storage cabinets, per each.	10	EA		

Total Base Bid (**Items 1, 2, 3, 4, 5, 6, 7, 8, 9, 10 & 11 <u>ONLY</u>**) all work incidental thereto and connected therewith):

(Enter Bid Numerically)$ _____

Total Base Bid in Words: _____ dollars and

_____ cents

In case of discrepancy between words and figures, the words shall prevail. The basis of contract award shall be the lowest responsive responsible base bid total.

Signed: _____
Bidder

References

Provide a minimum of three (3) client references. To be considered responsive to this requirement references must be for successfully completed underwater work of a similar nature with a construction value of $50,000 of greater. The work must have been performed for a Public Sector entity within California in the last 10 years under a public construction contract. References for which the bidder was a subcontractor on a public contract and the subcontract meets the criteria are to provide the public client's contact information not the general contractor's contract information.
Provide the designated client contact name, title, organization, address, telephone number, and a description of the project that was completed, with a filed notice of completion, under that client's overall direction. Failure to provide three (3) references which meet the qualifying criteria listed above may result in the bidder being disqualified for contract award.

1. Client Name: _____ Pass: ___ Fail: ___
Client Address: _____
Project Name: _____
Project Description: _____
_____
_____
Project Value: _____ Year Completed: _____
Client Contact: _____
Telephone Number: _____ Email: _____

2. Client Name: _____ Pass: ___ Fail: ___
Client Address: _____
Project Name: _____
Project Description: _____
_____
_____
Project Value: _____ Year Completed: _____
Client Contact: _____
Telephone Number: _____ Email: _____

3. Client Name: _____ Pass: ___ Fail: ___
Client Address: _____
Project Name: _____
Project Description: _____
_____
_____
Project Value: _____ Year Completed: _____
Client Contact: _____
Telephone Number: _____ Email: _____

GROUP 00 43 00
PROCUREMENT FORM SUPPLEMENTS

Section

00 43 13 Bid Security Form (Bidder's Bond)

00 43 33 Bidder's Statement of Equipment and Material Suppliers

00 43 34 Major Equipment Manufacturer Substitutions

00 43 36 Bidder's Statement of Subcontractors

00 43 93 Bid Submittal Checklist

SECTION 00 43 13
BID SECURITY FORM
(Bidder's Bond)

We, _____ as Principal, _____ _____ and as Surety, are firmly held and bound unto the West County Wastewater, a municipal district organized and existing under the laws of the state of California, sometimes referred to as WCW, in the sum of $_____ (which is a sum not less than ten percent of the amount of the accompanying Proposal total) for the payment of which we bind ourselves, our heirs, executors, administrators, successors, and assigns jointly and severally, firmly by these presents.

THE CONDITION OF THIS OBLIGATION IS SUCH THAT, WHEREAS, the Principal has submitted to West County Wastewater the accompanying proposal under a public Notice to Contractors inviting sealed bids for West County Wastewater Project No. 18DF201, CSO Building Seismic Retrofit and Roof Replacement, in Richmond, Contra Costa County, California.

NOW, THEREFORE, if the accompanying Proposal of the Principal is accepted and award be made by West County Wastewater to the Principal; and if the Principal withdraws said Proposal within the period specified in said Proposal during which period said Proposal cannot be withdrawn, or if the Principal shall fail, refuse, or neglect for any reason whatsoever within ten calendar days after receipt from West County Wastewater's of Notice of Award of the Contract to enter into the Contract with West County Wastewater in accordance with the Principal's proposal and the Instructions to Bidders, Section 00 21 13, for said Project, and to give bonds with good and sufficient surety, and to furnish the policies of insurance as stated in said proposal and the Instructions to Bidders for said Project, then the sum guaranteed by this Bond is forfeited to the West County Wastewater.

It is agreed between Principal and Surety that such failure or neglect would result in substantial injury to West County Wastewater which is not easily reduced to monetary terms; and it is, therefore, agreed that the amount of the Bidder's Proposal security is to be considered by Principal and Surety as liquidated damages for such injury. In the event suit is brought upon this Bond by West County Wastewater and judgment is recovered, the Surety or Sureties shall pay all costs incurred by west County Wastewater in such suit, including attorneys' fees to be fixed by the court.

Dated _____,

_____

_____
Principal (Authorized Signature)

_____
Business Address

In the presence of:

_____

_____

_____
Business Address

SEAL

_____

_____
Surety (Authorized Signature)

_____
Business Address
of Local Representative

In the presence of:

_____

_____

_____
Business Address of Home Office
of Surety Company

SEAL

SECTION 00 43 33
BIDDER'S STATEMENT OF EQUIPMENT AND MATERIAL SUPPLIERS

The Contractor shall indicate opposite each item of equipment or material listed below, the name of the manufacturer or supplier of the equipment or material proposed to be furnished under the Bid as listed below or for any items exceeding five thousand dollars in value. Failure to comply with this requirement may render the proposal non-responsive and cause its rejection. Awarding of a contract under this Bid Proposal will not imply approval by West County Wastewater of the manufacturers or suppliers listed by the Contractor. West County Wastewater retains the right to reject the equipment or material listed by the Contractor if, in its discretion, the equipment or material does not comply with the Specifications.

The Contractor will not be allowed to propose changes or substitutions in the equipment and materials to be supplied or the manufacturer or supplier of said materials after the opening of the Bid Proposal without first having received written approval of West County Wastewater.

Equipment and/or Material Description	Name of Supplier, Fabricator, or Manufacturer, Location of Corporate Headquarters

Signed _____
Bidder

SECTION 00 43 34
MAJOR EQUIPMENT MANUFACTURER SUBSTITUTIONS

Any Manufacturer, including those not listed as an acceptable manufacturer, may be listed as a substitution.

The Bidder understands that after a contract is awarded, the Owner may, at his sole discretion, select items of any Manufacturer listed in the following substitute tabulation. If awarded the contract, the Bidder agrees to furnish and install any substitutions listed for the price indicated. The BASE BID will then be adjusted accordingly.

The Engineer may require detailed information to be submitted for preliminary evaluation of a substitute Manufacturer. This information could include equipment technical and performance details and other information deemed necessary by the Engineer and/or as described in the contract specification.

If a contract includes items of equipment of any Manufacturer which may require any modification or deviation from the plans, the undersigned agrees to prepare and submit detailed drawings to the Engineer showing all modifications in structures, piping, electrical and mechanical work, required to adapt the plans to the equipment selected. The Bidder further understands that the Engineer will review said detailed drawings of modifications and either approve them or indicate thereon changes necessary to comply with the project requirements. Detailed drawings which are not approved will be revised, then resubmitted to the Engineer for approval. If it is determined by the Engineer that the substitute equipment is not approved, then the original base bid equipment must be provided. The prices listed in the following tabulation are "installed" prices and take into consideration any changes that may be required.

SUBSTITUTION

Equipment Item	Manufacturer	Add (Deduct) From Base Bid

SECTION 00 43 36
BIDDER'S STATEMENT OF SUBCONTRACTORS

In accordance with the requirements of Section 00 21 13, Subsection 8, Instructions to Bidders, the undersigned Bidder submits herewith a list of subcontractors whom it proposes to employ on the work, with the proper firm name and business address of each, and the portion of the work to be done by each with the understanding that failure to name such subcontractors shall be witness that it shall have agreed to perform such portion of the work itself and that it shall not subcontract said portion of the work, and that such subcontracted work listed herein will not be performed by others, without first obtaining written permission of West County Wastewater's Board of Directors pursuant to provisions of Section 4107 of the Public Contract Code.

Subcontractor Name	CSLB Lic. No. & DIR Reg. No.	Business Address	Description of Work to be Done	% of Project

Signed:_____
Bidder

SECTION 00 43 93
BID SUBMITTAL CHECKLIST

Item #	Description	Item Completed
1	Complete the Addenda Acknowledgement section listed on page 5 of the Instructions to Bidders, Section 00 21 13 (*leave the line blank if no addendum has been issued*)	☐
2	Complete the CSLB, DIR and Bidder's information sections listed on page 5 of the Instructions to Bidders, Section 00 21 13	☐
3	Complete the Schedule of Bid Section, Section 00 41 43	☐
4	Complete the sections shown in the Bid Security Form (Bidder's Bond) Section, Section 00 43 13 and provide the bid bond	☐
5	Complete the section shown in the Bidder's Statement of Equipment / Materials Suppliers Section, Section 00 43 33	☐
6	Complete the section shown in the Major Equipment Manufacturer Substitutions Section, Section 00 43 34 (*leave the lines blank if no substitutions are being proposed*)	☐
7	Complete the section shown in the Bidder's Statement of Subcontractors Section, Section 00 43 36 (*leave the lines blank if no subcontractors will be utilized*)	☐
8	Complete the section shown in the Bidder's Statement of Qualifications Section, Section 00 45 13	☐
9	Complete the section shown in the Certificate Regarding Completion Time Section, Section 00 45 16	☐
10	Complete the section shown in the Contractor Safety Acknowledgment Section, Section 00 45 17	☐
11	Complete the section shown in the Certificate Regarding Inspection of Contract Documents and Site Section, Section 00 45 18	☐
12	Complete the section shown in the Noncollusion Declaration Section, Section 00 45 19	☐
13	Complete the section shown in the Workers' Compensation Certification Section, Section 00 45 26	☐

GROUP 00 45 00
REPRESENTATIONS AND CERTIFICATIONS

Section

00 45 10 Instructions to Awardees

00 45 13 Bidder's Statement of Qualifications

00 45 16 Certificate Regarding Completion Time

00 45 17 Contractor Safety Acknowledgement

00 45 18 Certificate Regarding Inspection of Contract Documents and Site

00 45 19 Non-Collusion Declaration

00 45 26 Workers' Compensation Certification

SECTION 00 45 10
INSTRUCTIONS TO AWARDEE

A. Award and Execution of Contract

The successful bidder will be notified in writing by West County Wastewater's of Award of Contract within Sixty (60) calendar days after opening of proposals. Accompanying West County Wastewater's Notice of Award will be the Contract, in duplicate, which the successful bidder will be required to sign and return together with the Performance Bond, Payment Bond, and the required number of copies of insurance certificates and endorsements to West County Wastewater within fourteen (14) calendar days following receipt of such Notice of Award. West County Wastewater will promptly determine whether such Contract, bonds, and insurance certificates and endorsements are as required by the Contract Documents, and upon such determination will forward a fully signed copy of the Contract to the successful bidder. West County Wastewater may issue a Notice to Proceed at any time prior to forwarding the Contract. No work shall be performed at the site prior to the date set forth in the Notice to Proceed. The failure of any bidder to whom West County Wastewater may award the Contract, as aforesaid to sign and return to West County Wastewater, the Contract together with the required Performance Bond, Payment Bond, and insurance certificates and endorsements within the specified time period, shall entitle West County Wastewater to declare a breach of Contract by such bidder, to award the Contract to another bidder in accordance with the provisions of the Contract Documents, and to declare a forfeiture of the bidder's proposal security accompanying its proposal.

B. Bonds and Insurance Policies

The Bidder to whom the contract award is made shall, at the time of execution of the Contract, furnish to West County Wastewater a Performance Bond and a Payment Bond, executed as surety by a corporation acceptable to West County Wastewater and authorized to issue such Surety Bonds in the state of California. Such bonds shall be substantially in the form included in Sections 00 61 13 and 00 61 14 respectively, of the Contract Documents. Such Performance Bond and Payment Bond shall be for one hundred percent of the Proposal total as set forth in the Schedule of Bid, Section 00 41 43. The entire cost of these bonds shall be borne by the successful Bidder.

If the Surety on any bond furnished by the Contractor is declared bankrupt, or becomes insolvent, or its right to do business is terminated, or it ceases to meet the requirements of the above paragraph, the Contractor shall, within five calendar days thereafter, notify West County Wastewater and substitute another bond and surety, both of which must be acceptable to West County Wastewater.

The successful Bidder shall at the time of execution of the Contract deliver to West County Wastewater one copy of policies of insurance obtained in accordance with the requirements of the Contract Documents.

C. Workers' Compensation Statement

The Bidder to whom the Contract Award is made shall, at the time of execution of the Contract, furnish to West County Wastewater a statement certifying compliance with the workers' compensation provision of the California Labor Code. Such certification shall be substantially in the form included in Section 00 45 26 of the Contract Documents.

SECTION 00 45 13
BIDDER'S STATEMENT OF QUALIFICATIONS

The undersigned Bidder submits, as a part of its Bid, the following statements as to its qualifications. The Bidder certifies that all statements and information set forth below are true and accurate.

A. The Bidder has been engaged in the contracting business under its present business name for _____ years.

B. Experience in work of a nature similar in type and magnitude to that set forth in the Contract Documents extends over a period of _____ years.

C. The Bidder, as prime contractor, has satisfactorily completed all contracts awarded to it, except as follows: (Name any and all exceptions and reasons therefore. Bidder shall attach and designate additional pages if necessary.)

_____

D. The undersigned Bidder submits herewith a statement of its financial responsibility and hereby authorizes the below named banks, companies, and institutions to release financial status information to West County Wastewater for the sole purpose of evaluating financial responsibility in conjunction with the proposal submitted for this Project.

Bank, Surety Company, or Other Institution	Branch of Office Address

_____

E. If your firm has had a contract terminated in the last five (5) years, describe such incident on a separate sheet signed by a firm principal. If not, please provide as part of the bid submission package, a letter, signed by a firm principal, stating your firm has NOT had a contract terminated in the last five (5) years. Termination for default is defined as notice to stop performance due to the Contractor's non-performance or poor performance and the issue of performance was either (a) not litigated due to inaction on the part of the Contractor or (b) litigated and such litigation determined that the Contractor was in default. Submit full details of the terms for default including the other party's name, address, and phone number. Present the Contractor's position on the matter. The Wastewater will evaluate the facts and may, at its sole discretion, reject the bid on the grounds of the past experience. If the firm has not experienced any such termination for default or early termination in the past five (5) years, your firm must clearly also make this indication.

F. The undersigned Bidder submits below a statement describing work similar in character to that anticipated in the proposed contract, which it has previously completed. Work described will be for jobs involving BUILDING STRUCTRUAL, SEISMIC AND ROOFING, and construction with contract amounts over $100,000. All experience listed shall have occurred in the last five years. Failure to complete this section, as required, may result in the bid being rejected as non-responsive. It is the intent of West County Wastewater to evaluate the responsiveness of the Contractor's bid in part based on whether the proposal and information set forth below reflect substantial experience in successful completion of work of the nature and magnitude of this project.

BIDDERS AND SUBCONTRACTOR'S QUALIFYING EXPERIENCE

Project Name & Description	Contract Amount	Performed For			Year Performed
		Organization	Contact Name	Telephone and E-mail Address	

Signed:_____
Bidder

SECTION 00 45 15

ESCROW AGREEMENT FOR SECURITY DEPOSITS IN LIEU OF RETENTION

This Escrow Agreement is made and entered into by and between West County Wastewater, whose address is 2910 Hilltop Drive, Richmond, California, hereinafter called "District," and

_____

whose address is _____,

hereinafter called "Contractor," and _____,

whose address is _____,

hereinafter called "Escrow Agent." For the consideration hereinafter set forth, the District, Contractor, and Escrow Agent agree as follows:

1. Pursuant to Section 22300 of the Public Contract Code of the State of California, the Contractor has the option to deposit securities with the Escrow Agent as a substitute for retention earnings required to be withheld by West County Wastewater pursuant to the Construction Contract entered into between West County Wastewater and the Contractor for Project No. 18DF201, CSO Building Seismic Retrofit and Roof Replacement, in the amount of ($_____) dated _____ (hereinafter referred to as the "Contract"). When the Contractor deposits the securities as a substitute for the Contract earnings, the Escrow Agent shall notify West County Wastewater within ten days of the deposit. The market value of the securities at the time of the substitution shall be at least equal to the cash amount then required to be withheld as retention under the terms of the Contract between West County Wastewater and the Contractor. Securities shall be held in the name of _____ and shall designate the Contractor as the beneficial owner.

2. West County Wastewater shall make progress payments to the Contractor for such funds which otherwise would be withheld from progress payments pursuant to the Contract provisions, provided that the Escrow Agent hold securities in the form and amount specified above.

3. Alternatively, West County Wastewater may make payments directly to the Escrow Agent in the amount of retention for the benefit of West County Wastewater until such time as the escrow created hereunder is terminated.

4. The Contractor shall be responsible for paying all fees for the expenses incurred by the Escrow Agent in administering the escrow account. These expenses and payment terms shall be determined by the Contractor and the Escrow Agent.

5. The interest earned on the securities or the money market accounts held in escrow and all interest earned on that interest shall be for the sole account of the Contractor and shall be subject to withdrawal by the Contractor at any time and from time to time without notice to West County Wastewater.

6. The Contractor shall have the right to withdraw all or any part of the principal in the Escrow Account only by written notice to the Escrow Agent accompanied by written authorization from West County Wastewater to the Escrow Agent that West County Wastewater consents to the withdrawal of the amount sought to be withdrawn by the Contractor.

7. West County Wastewater shall have a right to draw upon the securities in the event of default by the Contractor. Upon seven days written notice to the Escrow Agent from West County Wastewater of the default,

   the Escrow Agent shall immediately convert the securities to cash and shall distribute the cash as instructed by West County Wastewater.

8. Upon receipt of written notification from West County Wastewater certifying that the Contract is final and complete, and that the Contractor has complied with all requirements and procedures applicable to the Contract, the Escrow Agent shall release to the Contractor all securities and interest on deposit less escrow fees and charges of the Escrow Account. The escrow shall be closed immediately upon disbursement of all monies and securities on deposit and payments of fees and charges.

9. The Escrow Agent shall rely on the written notifications from West County Wastewater and the Contractor pursuant to Sections 4 and 6, inclusive, of this Agreement and West County Wastewater and the Contractor shall hold the Escrow Agent harmless from the Escrow Agent's release and disbursement of the securities and interest as set forth above.

10. The names of the persons who are authorized to give written notice or to receive written notice on behalf of West County Wastewater and on behalf of the Contractor in connection with the foregoing, and exemplars of their respective signatures are as follows:

On behalf of West County Wastewater:

_____
Title

_____
Name

_____
Signature

_____
Address

On behalf of the Contractor:

_____
Title

_____
Name

_____
Signature

_____
Address

On behalf of the Escrow Agent:

_____
Title

_____
Name

_____
Signature

_____
Address

At the time the Escrow Agent Account is opened, West County Wastewater and the Contractor shall deliver to the Escrow Agent a fully executed counterpart of this Agreement.

IN WITNESS WHEREOF, the parties have executed this Agreement by their proper officers on the date first set forth above.

West County Wastewater:

_____
Title

_____
Name

_____
Signature

Contractor:

_____
Title

_____
Name

_____
Signature

SECTION 00 45 16

CERTIFICATE REGARDING COMPLETION TIME

I, _____, am the duly authorized representative of _____ ,Contractor, which is submitting a Proposal to which this Certificate is attached for Project No. 18DF201, CSO Building Seismic Retrofit and Roof Replacement. I have the authority to bind _____. Contractor, as to all matters regarding the proposal to which this Certificate is attached.

I hereby certify that I, or Contractor's duly authorized representative have evaluated the required construction completion within One hundred twenty five (125) calendar days from the start date listed on the Notice to Proceed, and that the Contractor's bid contained in this proposal document reflects completing the work within this time frame. The Contract time for this work shall be deemed to start five (5) calendar days from the date of the Notice to Proceed.

I am also aware that in order for my bid to be considered responsive, West County Wastewater requires a detailed construction phasing schedule at the time of Bid. Notice to Proceed will not be issued until a reasonable construction schedule is submitted to West County Wastewater.

By: _____
Contractor

Dated: _____

SECTION 00 45 17

CONTRACTOR SAFETY ACKNOWLEDGMENT

PROJECT NO. 18DF201

PROJECT NAME: CSO Building Seismic Retrofit and Roof Replacement

The Contractor shall be fully responsible for all safety requirements in accordance with State of California Construction Safety Orders (CAL OSHA), and all other safety laws, regulations, specifications, and guidelines required by any other local or federal District.

I have read the above and the CAL OSHA's Construction Safety Orders and understand the safety considerations applicable to this project.

ACKNOWLEDGED BY: Contractor's Name _____

Date: _____ Signature: _____

SECTION 00 45 18

CERTIFICATE REGARDING INSPECTION OF CONTRACT DOCUMENTS AND SITE

I, _____, am the duly authorized representative of _____, Contractor, which is submitting a Proposal to which this Certificate is attached for Project No. 18DF201, CSO Building Seismic Retrofit and Roof Replacement. I have the authority to bind _____, Contractor, as to all matters regarding the Proposal to which this Certificate is attached.

1. I hereby certify that I, or Contractor's duly authorized representative, have examined the Contract Documents pertinent to Project No. 18DF201, including the Instructions to Bidders, General Conditions, Supplementary Conditions, and Technical Specifications.

2. I further certify that I, or Contractor's authorized representative, have examined the site pertinent to Project No. 18DF201, and have examined existing and expected conditions and matters which could affect any work or performance of any work in any way, especially the cost of performing any work.

_____ By: _____
Contractor

Dated: _____

SECTION 00 45 19
NONCOLLUSION DECLARATION

State of California)
) ss.
County of _____)

_____, being first duly sworn, deposes and says that he or she is _____ of _____, the party making the foregoing bid that the bid is not made in the interest of, or on behalf of, any undisclosed person, partnership, company, association, organization, or corporation; that the bid is genuine and not collusive or sham; that the bidder has not directly or indirectly induced or solicited any other bidder to put in a false or sham bid, and has not directly or indirectly colluded, conspired, connived, or agreed with any bidder or anyone else to put in a sham bid, or that anyone shall refrain from bidding; that the bidder has not in any manner, directly or indirectly, sought by agreement, communication, or conference with anyone to fix the bid price of the bidder or any other bidder, or to fix any overhead, profit, or cost element of the bid price, or of that of any other bidder, or to secure any advantage against the public body awarding the contract of anyone interested in the proposed contract; that all statements contained in the bid are true; and, further, that the bidder has not, directly or indirectly, submitted his or her bid price or any breakdown thereof, or the contents thereof, or divulged information or data relative thereto, or paid, and will not pay, any fee to any corporation, partnership, company association, organization, bid depository, or to any member or agent thereof to effectuate a collusive or sham bid.

Acknowledged By:

_____
Company Name

_____
Signature

_____
Title

_____
Date

SECTION 00 45 26
WORKERS' COMPENSATION CERTIFICATION

(AS REQUIRED BY SECTION 1861 OF THE CALIFORNIA LABOR CODE)

I am aware of the provisions of Section 3700 of the Labor Code which require every employer to be insured against liability for workers' compensation or to undertake self-insurance in accordance with the provisions of the Labor Code, and I will comply with such provisions before commencing the performance of the work of this Contract.

Contractor: _____

By: _____

Title: _____

Date: _____

END OF GROUP 00 45 00

GROUP 00 52 00
CONTRACT FORMS

Section

00 52 10 Instructions to Awardees

00 52 13 Contract

SECTION 00 52 10
INSTRUCTIONS TO THE AWARDEE

Award and Execution of Contract

The successful bidder will be notified in writing by West County Wastewater's of Award of Contract within Sixty (60) calendar days after opening of proposals. Accompanying West County Wastewater's Notice of Award will be the Contract, in duplicate, which the successful bidder will be required to sign and return together with the Performance Bond, Payment Bond, and the required number of copies of insurance certificates and endorsements to West County Wastewater within fourteen (14) calendar days following receipt of such Notice of Award. West County Wastewater will promptly determine whether such Contract, bonds, and insurance certificates and endorsements are as required by the Contract Documents, and upon such determination will forward a fully signed copy of the Contract to the successful bidder. West County Wastewater may issue a Notice to Proceed at any time prior to forwarding the Contract. No work shall be performed at the site prior to the date set forth in the Notice to Proceed. The failure of any bidder to whom West County Wastewater may award the Contract, as aforesaid to sign and return to West County Wastewater, the Contract together with the required Performance Bond, Payment Bond, and insurance certificates and endorsements within the specified time period, shall entitle West County Wastewater to declare a breach of Contract by such bidder, to award the Contract to another bidder in accordance with the provisions of the Contract Documents, and to declare a forfeiture of the bidder's proposal security accompanying its proposal.

Bonds and Insurance Policies

The Bidder to whom the contract award is made shall, at the time of execution of the Contract, furnish to West County Wastewater a Performance Bond and a Payment Bond, executed as surety by a corporation acceptable to West County Wastewater and authorized to issue such Surety Bonds in the state of California. Such bonds shall be substantially in the form included in Sections 00 61 13 and 00 61 14 respectively, of the Contract Documents. Such Performance Bond and Payment Bond shall be for one hundred percent of the Proposal total as set forth in the Schedule of Bid, Section 00 41 43. The entire cost of these bonds shall be borne by the successful Bidder.

If the Surety on any bond furnished by the Contractor is declared bankrupt, or becomes insolvent, or its right to do business is terminated, or it ceases to meet the requirements of the above paragraph, the Contractor shall, within five calendar days thereafter, notify West County Wastewater and substitute another bond and surety, both of which must be acceptable to West County Wastewater.

The successful Bidder shall at the time of execution of the Contract deliver to West County Wastewater one copy of policies of insurance obtained in accordance with the requirements of the Contract Documents.

Workers' Compensation Statement

The Bidder to whom the Contract Award is made shall, at the time of execution of the Contract, furnish to West County Wastewater a statement certifying compliance with the workers' compensation provision of the California Labor Code. Such certification shall be substantially in the form included in Section 00 45 26 of the Contract Documents.

SECTION 00 52 13
CONTRACT

This Contract is entered into as of this (_____) day of (_____), 20__, by and between West County Wastewater, a public entity, organized, and existing under the laws of the state of California, and _____, sometimes referred to as the Contractor.

The parties agree as follows:

A. The Contractor, for and in consideration of the payment to be made to the Contractor as hereinafter provided, shall furnish all plant labor, technical and professional services, supervision, materials, and equipment other than such materials and equipment as may be specified to be furnished by West County Wastewater, and perform all operations necessary and required to construct Project No. 18DF201, CSO Building Seismic Retrofit and Roof Replacement, in Richmond, CA, Contra Costa County, California, in strict conformity with the terms and conditions of this Contract, which includes the following:

1. The Contractor's proposal dated _____, in response to West County Wastewater's Notice to Contractors advertised on _____ and _____, relating to West County Wastewater's Contract Documents for Project No. 18DF201, as such Proposal is on file at the office of the West County Wastewater, 2910 Hilltop Drive, Richmond, California.

2. Sections 00 01 10 through 02 83 00 of the Specifications, and the Scope of Work, inclusive of West County Wastewater's Contract Documents for Project No. 18DF201, and Addenda No(s)._____, thereto, and the Notice of Award from West County Wastewater to the Contractor dated_____ all as filed in said office of the West County Wastewater.

   Such Proposal, Contract Documents: Sections 00 01 10 through 07 72 30, the Technical Specifications, the Contract Documents, and all Addenda, and said Notice of Award are by this reference incorporated herein and made a part of the Contract, provided, that if any conflict exists between such Proposal and the other provisions of the Contract, the other provisions of the Contract shall govern unless otherwise mutually agreed in writing by the parties hereto. All Contract Documents shall be construed in accordance with the laws of the State of California.

B. Time of Performance: Time is of the essence in the performance of this Contract. The Contractor shall begin work as provided in the General and Special Conditions of the Project Manual and once work is started, it shall be diligently prosecuted to completion on or before the expiration of the time hereinafter stated:

Bid Item	Completion Required Within:
ALL:	The Contract time for this work shall be deemed to start five (5) calendar days from the date of the Notice to Proceed. The Contractor shall complete the work within One hundred twenty five (125) calendar days. It is further agreed by the parties to the Contract that in case all work called for under the Contract, in all parts and requirements, is not finished or completed on or before the expiration dates or intermediate milestones herein set forth, the Contractor may be assessed liquidated damages specified under Section 00 72 42, Liquidated Damages of the Contract Documents.

C. West County Wastewater, in consideration of the Contractor's performance in accordance with the Contract, will pay to Contractor compensation based upon the prices set forth in the Contractor's Proposal and computed and paid for in accordance with the measurement and payment provisions of Section 00 72 39, Measurement and Payment of the Contract Documents.

D. No oral agreement or conversation with any representative or employee of West County Wastewater either before or after the execution of the Contract, shall affect or modify any of the terms or obligations herein contained. This Contract constitutes the entire agreement between the parties hereto and no changes, alterations, or modifications hereof shall be effective unless in writing and signed by the parties hereto.

E. Contractors are required by law to be licensed and regulated by the Contractor's State License Board. Any questions concerning a contractor may be referred to the Registrar, Contractor's State License Board, 9835 Goethe Road, PO Box 26000 Sacramento, CA 95826.

F. West County Wastewater shall pay the Contractor for completion of the work in accordance with the Contract Documents, the not-to-exceed Contract price of _____ _____ Dollars ($_____) in accordance with the amounts set forth in Section 00 41 43, Schedule of Bid, and based on the total base and any additive bid prices named in the aforementioned Schedule of Bid, in addition to the contingency amount approved by the Board of Directors.

G. Reference is hereby made to the provisions for payment of minimum per diem wages contained in Section 00 11 16, Invitation to Bid. In accordance with said provisions, the Contractor and each subcontractor engaged in the work shall pay each respective employee thereof an amount not less than the per diem wages established by the Department of Industrial Relations. Copies of the prevailing rate of per diem wages are on file at the West County Wastewater Administrative Offices and shall be made available to any interested party on request.

H. Bidders shall promptly notify West County Wastewater, in writing, of all the classifications of labor not listed in the prevailing wage determinations but necessary for the performance of the Work, before bids are submitted.

Dated:_____

CONTRACTOR: _____

Company Name

By: _____

Title: _____

WEST COUNTY

WASTEWATER: By: _____

Title: General Manager

ATTEST: _____

Vice-President of the Board

I hereby approve the form of the foregoing Contract this _____ day of

_____ , 20___.

_____

Board Attorney

GROUP 00 61 00
BOND FORMS

Section

00 61 13 Performance Bond

00 61 14 Payment Bond

SECTION 00 61 13
PERFORMANCE BOND

We,_____, as Principal, and, _____, as Surety, are jointly and severally held and bound unto the West County Wastewater, organized and existing under the laws of the state of California, in the sum of _____dollars ($_____) for the payment of which we jointly and severally bind ourselves, our heirs, executors, administrators and assigns, and successors and assigns, firmly by these presents.

THE CONDITIONS OF THIS BOND ARE SUCH THAT, WHEREAS, on the _____day of _____, the said _____ _____, Principal herein, executed a certain Contract with West County Wastewater, by the terms, conditions, and provisions of which Contract the said _____, Principal herein agrees to construct the CSO Building Seismic Retrofit and Roof Replacement, in Richmond, CA, Contra Costa County, California, all as set forth in said Contract, which Contract as so executed is attached hereto, and by reference is incorporated herein and made a part hereof as fully for all purposes as if here set forth at length.

NOW, THEREFORE, if the Principal herein shall faithfully and truly observe and comply with the terms, conditions, and provisions of said Contract in all respects, and shall well and truly and fully do and perform all matters and things undertaken to be performed under said Contract, upon the terms set forth therein, and within the time prescribed therein, and shall indemnify West County Wastewater against any direct or indirect damages that shall be claimed for injuries to persons or property during the course of any work performed by or on behalf of Principal under said Contract, and until all work under said Contract is accepted and for an additional period of one year after completion and acceptance of said work by West County Wastewater and shall pay all laborers, mechanics, subcontractors, material, men, and all persons who shall supply such Contractor or subcontractor with services or supplies for carrying on such work, and shall perform said Contract according to laws, and shall complete in a satisfactory manner all repairs or replacements resulting from or caused by defective materials and/or faulty workmanship in the prosecution of the work during the one-year warranty period, then this obligation shall be void, otherwise it shall remain in full force and effect. No prepayment or delay in payment and no change, extension, addition, or alteration of any provision of said Contract agreed to between the Principal and West County Wastewater, and no forbearance on the part of West County Wastewater, shall operate to relieve any surety from liability on this Bond, and consent to make such changes, extension, additions, and alternations without further notice to or consent by any Surety is hereby given.

In the event suit is brought upon this bond by West County Wastewater and judgment is entered in its favor, the Surety or Sureties shall pay all costs incurred by West County Wastewater in such suit, including attorneys' fees to be fixed by the court.

Date_____

_____
Company Name

_____
Principal (Authorized Signature)

_____
Business Address

_____
City State

SEE NEXT PAGE FOR ACKNOWLEDGMENT OF PRINCIPAL'S SIGNATURE

[THE REMAINDER OF THIS PAGE HAS BEEN LEFT INTENTIONALLY BLANK]

ACKNOWLEDGMENT OF PRINCIPAL'S SIGNATURE:

A notary public or other officer completing this certificate verifies only the identity of the individual who signed the document to which this certificate is attached, and not the truthfulness, accuracy, or validity of that document.

State of California)
County of _____)

On _____ before me _____, a Notary
(Date) (Printed Name of Notary Public)

Public, personally appeared _____
Name(s) of Signer(s)

_____

who proved to me on the basis of satisfactory evidence to be the person(s) whose name(s) is/are subscribed to the within instrument and acknowledged to me that he/she/they executed the same in his/her/their authorized capacity(ies) and that by his/her/their signature(s) on the instrument the person(s), or the entity upon behalf of which the person(s) acted, executed the instrument.

I Certify under PENALTY OF PERJURY under the laws of the State of California that the foregoing paragraph is true and correct.

WITNESS my hand and official seal.

Signature_____
Signature of Notary Public

Place Notary Seal Above

This Section is OPTIONAL completing this information can deter alteration of the document or fraudulent reattachment of this form to an unintended document

Description of Attached Document
Title or Type of Document:

_____
Document Date_____
Number of Pages_____
Signer(s) other than named within

_____
Capacity(ies) Claimed by Signer(s):
Signer's Name:_____

☐ CORPORATE OFFICER

_____
Title(s)
☐ PARTNER
☐ Limited ☐ General
☐ INDIVIDUAL
☐ ATTORNEY-IN-FACT
☐ TRUSTEE
☐ GUARDIAN / CONSERVATOR
☐ OTHER
Describe_____

SIGNER IS REPRESENTING:

Name of Person(s) or Entity(ies)
_____
_____
_____

Date_____

_____
Company Name

_____
Surety (Authorized Signature)

_____
Business Address

_____
City State

SEE NEXT PAGE FOR ACKNOWLEDGMENT OF SURETY'S SIGNATURE

[THE REMAINDER OF THIS PAGE HAS BEEN LEFT INTENTIONALLY BLANK]

ACKNOWLEDGMENT OF SURETY'S SIGNATURE:

A notary public or other officer completing this certificate verifies only the identity of the individual who signed the document to which this certificate is attached, and not the truthfulness, accuracy, or validity of that document.

State of California)
County of _____)

On _____ before me _____, a Notary
(Date) (Printed Name of Notary Public)

Public, personally appeared _____
Name(s) of Signer(s)
_____

who proved to me on the basis of satisfactory evidence to be the person(s) whose name(s) is/are subscribed to the within instrument and acknowledged to me that he/she/they executed the same in his/her/their authorized capacity(ies) and that by his/her/their signature(s) on the instrument the person(s), or the entity upon behalf of which the person(s) acted, executed the instrument.

I Certify under PENALTY OF PERJURY under the laws of the State of California that the foregoing paragraph is true and correct.

WITNESS my hand and official seal.

Signature_____
Place Notary Seal Above Signature of Notary Public

This Section is OPTIONAL completing this information can deter alteration of the document or fraudulent reattachment of this form to an unintended document

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Title or Type of Document:
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_____
Capacity(ies) Claimed by Signer(s):
Signer's Name:_____

☐ CORPORATE OFFICER
_____
Title(s)
☐ PARTNER
☐ Limited ☐ General
☐ INDIVIDUAL
☐ ATTORNEY-IN-FACT
☐ TRUSTEE
☐ GUARDIAN / CONSERVATOR
☐ OTHER
Describe_____

SIGNER IS REPRESENTING:

Name of Person(s) or Entity(ies)
_____
_____
_____

SECTION 00 61 14
PAYMENT BOND

We, _____, as Principal, and _____, as Surety, are jointly and severally bound unto the West County Wastewater, organized and existing under the laws of the State of California, in the sum of _____ dollars (_____) for the payment of which we jointly and severally bind ourselves, our heirs, executors, administrators and assigns, and successors and assigns, firmly by these presents.

THE CONDITION OF THIS BOND IS SUCH THAT, WHEREAS, on the _____ day of _____, 20__, the said _____ _____, Principal herein, executed a certain Contract with West County Wastewater, by the terms, conditions, and provisions of which Contract the said_____, _____, Principal herein agrees to construct the CSO Building Seismic Retrofit and Roof Replacement, in Richmond, CA, Contra Costa County, California, all as set forth in said Contract, which Contract as so executed is attached hereto, and by reference is incorporated herein and made a part hereof as fully for all purposes as if here set forth at length.

AND WHEREAS, said Contractor is required by the provisions of Chapter 7, Title 15, Sections 3247 though 3252, California Civil Code, to furnish a bond in connection with said Contract, as hereinafter set forth.

THE CONDITIONS OF THIS OBLIGATION ARE SUCH, that if said Contractor, its heirs, executors, administrators, successors, or assigns, or subcontractors, shall fail to pay any of the persons named in Sections 3110, 3111, and 3112 of the California Civil Code, or amounts due under the Unemployment Insurance Code with respect to work or labor performed by any such claimant, or for any amount required to be deducted, withheld, and paid over to the California Franchise Tax Board from the wages and employees of the Contractor and its subcontractors pursuant to Section 18806 of the California Revenue and Taxation Code, with respect to such Contract and warranty work and labor that the surety or sureties will pay for the same, in an amount not exceeding the sum specified in this Bond, and also, in case suit is brought upon the bond, a reasonable attorney's fee, to be fixed by the court.

This Bond shall inure to the benefit of any and all of the persons name in Sections 3110, 3111, and 3112 of the California Civil Code as to give a right of action to such persons or their assigns in any

suit brought upon this Bond in accordance with said Sections 3247 though 3252 of the California Civil Code.

In the event suit is brought upon this Bond and judgment is recovered, the Surety shall pay all costs incurred by West County Wastewater in such suit, including reasonable attorney's fees to be fixed by the court.

No prepayment or delay in payment and no change, extension, addition, or alternation of any provision of said Contract agreed to between the Contractor and West County Wastewater, and no forbearance on the part of West County Wastewater, shall operate to relieve any Surety from liability of this Bond, and consent to make such changes, extensions, additions, and alternations without further notice to or consent by such Surety is hereby given.

Date_____

_____
Company Name

_____
Principal (Authorized Signature)

_____
Business Address

_____
City State

SEE NEXT PAGE FOR ACKNOWLEDGMENT OF PRINCIPAL'S SIGNATURE

[THE REMAINDER OF THIS PAGE HAS BEEN LEFT INTENTIONALLY BLANK]

ACKNOWLEDGMENT OF PRINCIPAL'S SIGNATURE:

A notary public or other officer completing this certificate verifies only the identity of the individual who signed the document to which this certificate is attached, and not the truthfulness, accuracy, or validity of that document.

State of California)
County of _____)

On _____ before me _____, a Notary
(Date) (Printed Name of Notary Public)

Public, personally appeared _____
Name(s) of Signer(s)

_____

who proved to me on the basis of satisfactory evidence to be the person(s) whose name(s) is/are subscribed to the within instrument and acknowledged to me that he/she/they executed the same in his/her/their authorized capacity(ies) and that by his/her/their signature(s) on the instrument the person(s), or the entity upon behalf of which the person(s) acted, executed the instrument.

I Certify under PENALTY OF PERJURY under the laws of the State of California that the foregoing paragraph is true and correct.

WITNESS my hand and official seal.

Signature_____
Signature of Notary Public

Place Notary Seal Above

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Title or Type of Document:

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Number of Pages_____
Signer(s) other than named within

_____
Capacity(ies) Claimed by Signer(s):
Signer's Name:_____

☐ CORPORATE OFFICER

_____
Title(s)
☐ PARTNER
☐ Limited ☐ General
☐ INDIVIDUAL
☐ ATTORNEY-IN-FACT
☐ TRUSTEE
☐ GUARDIAN / CONSERVATOR
☐ OTHER
Describe_____

SIGNER IS REPRESENTING:

Name of Person(s) or Entity(ies)
_____
_____
_____

Date_____

_____
Company Name

_____
Surety (Authorized Signature)

_____
Business Address

_____
City State

SEE NEXT PAGE FOR ACKNOWLEDGMENT OF SURETY'S SIGNATURE

[THE REMAINDER OF THIS PAGE HAS BEEN LEFT INTENTIONALLY BLANK]

ACKNOWLEDGMENT OF SURETY'S SIGNATURE:

A notary public or other officer completing this certificate verifies only the identity of the individual who signed the document to which this certificate is attached, and not the truthfulness, accuracy, or validity of that document.

State of California)
County of _____)

On _____ before me _____, a Notary
(Date) (Printed Name of Notary Public)

Public, personally appeared _____
Name(s) of Signer(s)

_____

who proved to me on the basis of satisfactory evidence to be the person(s) whose name(s) is/are subscribed to the within instrument and acknowledged to me that he/she/they executed the same in his/her/their authorized capacity(ies) and that by his/her/their signature(s) on the instrument the person(s), or the entity upon behalf of which the person(s) acted, executed the instrument.

I Certify under PENALTY OF PERJURY under the laws of the State of California that the foregoing paragraph is true and correct.

WITNESS my hand and official seal.

Signature_____
Signature of Notary Public

Place Notary Seal Above

This Section is OPTIONAL completing this information can deter alteration of the document or fraudulent reattachment of this form to an unintended document

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Document Date_____
Number of Pages_____
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_____
Capacity(ies) Claimed by Signer(s):
Signer's Name:_____

☐ CORPORATE OFFICER

_____
Title(s)
☐ PARTNER
☐ Limited ☐ General
☐ INDIVIDUAL
☐ ATTORNEY-IN-FACT
☐ TRUSTEE
☐ GUARDIAN / CONSERVATOR
☐ OTHER
Describe_____

SIGNER IS REPRESENTING:

Name of Person(s) or Entity(ies)
_____
_____
_____

END OF GROUP 00 61 00

SECTION 00 72 00
GENERAL CONDITIONS

Section	Title
00 72 01	Authority of the Engineer and Contractor's Appeal Procedure
00 72 02	Intent of the Contract
00 72 03	Discovery of Errors, Omissions, or Discrepancies in the Contract
00 72 04	Subcontracts, Subcontractors, and Records Access
00 72 05	Assignment
00 72 06	Waiver of Contract Provisions
00 72 07	Delivery of Notice
00 72 08	Indemnity
00 72 09	Patent Indemnity
00 72 10	Warranty
00 72 11	Differing Site Conditions
00 72 12	Changes and Extra Work
00 72 13	Independent Contractor, Superintendent, and Employees
00 72 14	Contractor's Plant, Construction Equipment, and Facilities
00 72 15	Equipment, Materials, and/or Products, Substitution of Specific Items and Trade Names, Workers' Skills
00 72 16	Contractor-Furnished Documents and Data
00 72 17	Standards and Codes
00 72 18	Safety
00 72 19	Public Access and Safety; Protection of Property
00 72 20	Laws and Regulations
00 72 21	Permits
00 72 22	Records and Accounts
00 72 23	Testing
00 72 24	Publications
00 72 26	Access to Work Areas
00 72 27	Illumination
00 72 28	Inspection and Sample Specimens

Section	Title
00 72 29	Progress
00 72 31	Responsibility for Work; Precautions; Security
00 72 32	Storage of Materials and Equipment
00 72 33	Use of Completed Portions of the Work
00 72 34	Cleaning Up
00 72 35	Progress, Completion, Delays, and Extensions of Time
00 72 36	Termination of Right to Proceed
00 72 37	Optional Termination
00 72 38	Suspension
00 72 39	Measurement and Payment
00 72 40	Progress Payments
00 72 41	Final Payment and Release
00 72 42	Liquidated Damages
00 72 43	Night and Weekend Work
00 72 44	Intoxicating Liquors and Drugs
00 72 45	Meetings
00 72 46	Liens and Stop Notice
00 72 47	No Waiver
00 72 48	Quality of Equipment, Material, Products, and/or Workmanship
00 72 49	West County Wastewater's Ownership of Project Materials and Salvage
00 72 51	Provisions Required by Law Deemed Inserted
00 72 52	Conflict or Inconsistency
00 72 53	Utility and Other Existing Facilities
00 72 54	Surveys, Lines, and Grades
00 72 55	Contract Documents and Record Drawings
00 72 56	Contaminated Soil/Materials
00 72 59	Storm Water Pollution Prevention

GENERAL CONDITIONS

00 72 01 AUTHORITY OF THE ENGINEER AND CONTRACTOR'S APPEAL PROCEDURE

A. Authority of the Engineer

1. The "Engineer" is the Infrastructure and Planning Department Manager of West County Wastewater or the Engineer's duly authorized representative during the life of the Contract. The engineer will observe the work in progress on behalf of West County Wastewater. All questions and requests of the Contractor regarding compensation (including additional compensation), interpretation of the Contract, instructions, or extensions of time, shall be submitted in writing to the Engineer for determination.

2. The Engineer may determine the amount, quality, acceptability, and fitness of all work, materials, and equipment required by the Contract.

3. The Engineer will decide all questions which may arise as to the quality or acceptability of materials furnished and work performed and as to the manner of performance and rate of progress of the work, and the Engineer's decision will be final.

4. The Engineer will decide all questions which may arise as to the coordination and interpretation of the plans and specifications, and the Engineer's decision will be final.

5. The Engineer will decide all questions as to the acceptable fulfillment of the Contract by the Contractor, and the Engineer's decision will be final.

6. The Engineer will decide all questions as to measurement and payment, and the Engineer's decision will be final.

7. The Engineer may reject defective work and materials whenever such rejection may be necessary to assure execution of the Contract in accordance with the intent of the Contract Documents .

8. The Engineer will determine all amounts owing to the Contractor.

9. The Engineer will prepare/issue contract change orders for all authorized changes or approved extra work in the Contract.

10. The Engineer will monitor project schedules and enforce project schedule requirements, and take such measures as may be necessary to maintain overall project schedules.

11. The Engineer may enforce and to make effective such decisions and orders which the Contractor fails to carry out promptly.

12. All determinations and instructions of the Engineer, whether in response to a question or otherwise, will be final unless the Contractor files a written protest with the Engineer as set forth in this Section.

B. Contractor's Responsibilities and Appeal Procedure

1. The Contractor shall be solely responsible for requesting instructions or interpretations as required by the Contract, and any costs and expenses, including attorneys' fees, arising from its failure to do so shall be borne by the Contractor.

2. The Contractor shall proceed without delay to perform the work as directed, instructed, determined, or decided by the Engineer and shall comply promptly with such directions, instructions, determinations, or

decisions. If the Contractor has any objection thereto, the Contractor may, no later than ten calendar days after receiving any such directions, instructions, determinations, or decisions, require that any such direction, instruction, determination, or decision be put in writing. No later than ten calendar days after receipt of any such written determination, the Contractor may file a written protest with the Engineer stating clearly and in detail the Contractor's objections, the reasons therefor, and the nature and amount of additional compensation or extension of time, if any, to which the Contractor contends it will be entitled thereby. The Contractor shall perform the work that the Contractor may contend as being outside the scope of the Contract while the Contractor's protest is being considered. However, unless the Contractor has been ordered by West County Wastewater pursuant to Section 00 72 12.E., Request for Additional Compensation, to perform changes or extra work, Contractor will not be entitled to additional compensation. The Contractor shall prepare daily cost records and obtain an acknowledgment by the Engineer in accordance with 00 72 12C, Cost Plus Change Orders.

3. The Engineer will issue a decision upon each protest. If the Engineer determines that the facts support the protest, the Contract will be modified accordingly, in writing. If the Engineer determines that the facts do not support the protest, the request for modification, the Engineer will deny the request. The Engineer will provide its determination to the Contractor and that determination will be final and conclusive. the Contractor shall at all times proceed with the work in accordance with the direction, instruction, determination, or decision of the Engineer. Unless the Contractor follows the requirements of this Section 00 72 01, the Contractor will be deemed to have waived all grounds for protest of direction, instruction, determination, or decision and all claims for additional compensation, extensions of time, or damages resulting therefrom for which protest could have been made under this Section 00 72 01, and Contractor will also be deemed to have accepted the direction, instruction, determination, or decision.

4. If the Contractor has outstanding claim issues upon acceptance of the contract work by West County Wastewater, the Contractor shall, no later than 30 calendar days after the date of acceptance, submit to the Engineer a written statement of all claims it maintains exist arising under or by virtue of the Contract. No claim will be considered that is not clearly identified in the written statement of claims, and no claim will be recognized for which a notice or protest is not prosecuted as provided in Sections 00 72 11, Differing Site Conditions,; 00 72 12, Changes and Extra Work; 00 72 42, Liquidated Damages; and 00 72 53, Utility and Other Existing Facilities within these General Conditions.

   a. Claims filed by the Contractor must be presented in sufficient detail to enable the Engineer to ascertain each claim's basis and amount. The Engineer will review and consider each claim; however, the Contractor must furnish, within a reasonable time, such further information and details as Engineer requests to ascertain the facts or contentions underlying the Contractor's claim. If the Contractor fails to submit such requested information and details for a claim, that failure will be sufficient to permit West County Wastewater to deny that claim.

   b. Upon final determination of all claims, the Engineer will prepare and issue a final payment in the entire sum found due on the claims.

00 72 02 INTENT OF THE CONTRACT

A. All obligations of West County Wastewater and the Contractor are fully set forth and described in the Contract. All parts of the Contract are intended to be correlative and complementary, and any work required by one part and not mentioned in another part must be performed to the same extent and purpose as though required by all parts.

B. The organization of the Contract Documents into sections, parts, and subsections and the arrangement of the contract plans shall not necessarily control the Contractor in dividing any work among any of its subcontractors or in establishing the extent of work to be performed by any trade or craft. The headings or titles of any article, section, subsection, paragraph, provision, or part of the Contract will not limit or restrict the content, meaning, or effect of such article, section, subsection, paragraph, provision, or part. Titles assigned to the various sections and subsections do not necessarily limit the scope of the topic, but are assigned solely to designate a central theme which may be further addressed by either volumes, parts, sections, or subsections for particular applications. The absence of a reference in any one to other such sections, parts, or subsections will not waive the requirements otherwise applicable to the work in its entirety. All sections of the Specifications and Project Documents are interdependent and applicable to the Project as a whole.

C. Where the words "as shown," "as detailed," "as indicated," or similar words are used in the Contract, such references relate to the Project Documents unless the context clearly indicates a different meaning. Where the words "required," "approved," "determined," "acceptable," "favorably reviewed," "reviewed," "selected," "directed," "equivalent," "equal," "satisfactory," or similar words are used in the Contract, action by the Engineer or West County Wastewater is indicated unless the context indicates otherwise, and the Contractor shall perform all work in accordance therewith. Such action, or failure to act, will not relieve the Contractor of its contractual responsibilities for performing the Contract.

D. The Contractor shall perform the work in accordance with the terms of the Contract. The Specifications and all notes on the Project Documents are directed to the Contractor and Contractor shall perform all work even though phrases such as "the Contractor shall" or "shall be done by the Contractor" are omitted. Where portions of the work are described in general terms, but not in complete detail, the Contractor shall perform the work utilizing skilled trade persons and high quality material. Unless otherwise specified such as deep excavation/shoring, traffic control, or detail design where a registered professional engineer shall be required, the Contractor shall furnish all labor, materials, tools, equipment, and incidentals and do all the work involved in executing the Contract in a timely, satisfactory, and workmanlike manner.

E. The misplacement, addition, or omission of a word or character does not change the intent of any part of the Contract from that set forth in the Contract as a whole.

F. The masculine/feminine pronoun may be used to designate who performs the work and for other purposes and, in all cases, applies equally to all persons. The word "Contractor" as used in the Contract applies to the General Contractor. If the Contractor is a partnership or joint venture, the members of the partnership or joint venture will be jointly and severally liable notwithstanding any agreement as between themselves to the contrary.

00 72 03 DISCOVERY OF ERRORS, OMISSIONS, OR DISCREPANCIES IN THE CONTRACT

A. By execution of the Contract, the Contractor agrees that no request for additional compensation, and/or claim under Government Code Section 900 et seq. will be made against West County Wastewater for any damages in excess of the aggregate sum of $50,000 or five percent (5%) of the construction costs (whichever is greater) for alleged damage that it or its subcontractors may suffer due to the inadequacy of the Contractor's bid on account of any alleged errors, omissions, or other deficiencies in the Contract Documents supplied to it by West County Wastewater. This limitation will not apply to claims for compensation for extra work authorized by West County Wastewater pursuant to Section 00 72 12, Changes and Extra Work, and Section 00 72 11, Differing Site Conditions.

B. If the Contractor discovers any errors, omissions, discrepancies, or conflicts in the Contract, it shall immediately so inform the Engineer in writing. The Engineer will promptly clarify such matters by issuing addenda or change orders. The Engineer's failure or delay to act upon such a notice will not constitute a waiver of any right afforded West County Wastewater or the Engineer in the Contract Documents or constitute an implied approval. Any work affected by such discoveries that the Contractor performs before it receives authorization by West County Wastewater to perform the work shall be at the Contractor's risk.

00 72 04 SUBCONTRACTS, SUBCONTRACTORS, AND RECORDS ACCESS

A. By written agreement, if legally required for validity, the Contractor shall require each subcontractor, to the extent of the work to be performed by the subcontractor, to be bound to the Contractor by the terms of the Contract, and to assume toward the Contractor all of the obligations and responsibilities which the Contractor, by this contract, assumes toward West County Wastewater. Such agreements must preserve and protect the rights of West County Wastewater under the Contract with respect to the work to be performed by the subcontractors so that the subcontractors will not prejudice such rights. Where appropriate, the Contractor shall require such subcontractor to enter into similar agreements with its subcontractors, and for each tier thereafter. The Contractor shall make available to each proposed subcontractor, prior to execution of the subcontract, copies of the Contract Documents for which the subcontractor will be bound by this paragraph of this subsection and identify to the subcontractor any terms and conditions of the proposed subcontract which may be at variance with the Contract.

1. Each subcontractor shall make copies of these Contract Documents , including, but not limited to, the above specific provisions, available to its sub-subcontractors and for each tier thereafter.

2. The Contractor shall give its personal attention to the fulfillment of the Contract and shall keep the work under its control in accordance with the Contract.

B. Neither Contractor nor any subcontractor may enter into any subcontract and the Contractor shall not substitute any person as subcontractor in place of a subcontractor listed in its bid without West County Wastewater's prior written consent. West County Wastewater, at its discretion, may consent to a subcontractor substitution as provided by law. No subcontract may relieve the Contractor of any of its liabilities or obligations under the Contract; the Contractor shall be fully responsible to West County Wastewater for the acts and omissions of its subcontractors at any tier and of persons either directly or indirectly employed by subcontractors in the performance of the Contract. The Contractor shall assure that each subcontractor at any tier fully complies with the provisions of the applicable Workers' Compensation Act or any similar law having application to subcontractor's employees.

C. Unless otherwise provided in the Contract, the Contractor shall at its expense, upon request of the Engineer, furnish the Engineer with one (1) copy of all of its purchase orders and subcontracts, all applicable Documents and specifications, bills of lading, and data, at all tiers, provided that only the prices thereon may be deleted. The Contractor shall ensure that all subcontracts at all tiers contain a provision for furnishing the Contractor with copies of the subcontracts and purchase orders, with the prices thereon deleted. The Contractor shall include Section 00 52 13, Contract, in all subcontracts at all tiers. Failure of the Contractor or any of its subcontractors at any tier to comply with this provision will be considered as grounds for termination of the Contract at the Contractor's expense in accordance with Section 00 72 36, Termination of Right To Proceed.

D. Nothing contained in the Contract creates any contractual relationship between any subcontractor and West County Wastewater.

E. The Contractor shall at all times be responsible for the safety of its subcontractors' employees at any tier and for its subcontractors' plant and equipment at any tier; and Contractor's method of prosecuting the work and shall ensure the compliance, by all subcontractors' employees at any tier, with all local, state, and federal safety regulations and West County Wastewater's Safety Requirements as may be applicable to the performance of the work.

F. The Contractor shall at all times be responsible for the adequacy, efficiency, and sufficiency of its subcontractor at any tier or persons employed by the subcontractors. All workers shall have sufficient knowledge, skill and experience to properly perform the work assigned to them.

G. When a portion of the work subcontracted by the Contractor is not being prosecuted in a manner satisfactory to West County Wastewater, the Contractor shall cause that subcontractor's forces to be removed immediately upon the request of the Engineer and that subcontractor's forces may not again be employed on the work.

00 72 05 ASSIGNMENT

A. The Contractor, its heirs, executors, administrators, or successors may not assign any performance of work under this Contract without the prior written consent of West County Wastewater. West County Wastewater will not provide consent for any proposed assignment that would, by any instrument, relieve the original Contractor or its Surety of their obligations under the Contract.

B. The Contractor may assign monies due or to become due it under the Contract, to the extent permitted by law. West County Wastewater will recognize such an assignment if Contractor provides written notice of the assignment to the Engineer no later than ten calendar days before a payment is due. Any assignment of monies will be subject to all proper set-offs in favor of West County Wastewater and to all deductions provided for in the Contract. All monies withheld, whether assigned or not, will be subject to being used by West County Wastewater for the completion of the work in the event that the Contractor should be in default or for the payment of claims or liens against the work from any source.

00 72 06 WAIVER OF CONTRACT PROVISIONS

A. None of the provisions of the Contract shall be considered waived by West County Wastewater unless such waiver is expressly given in writing by the Engineer. No such waiver shall be a waiver of any past or future default, breach, or modification of any of the terms, provisions, conditions, or covenants of the Contract unless expressly set forth in such waiver.

00 72 07 DELIVERY OF NOTICE

A. The Engineer or West County Wastewater may deliver any written notice under this Contract to the Contractor in person to the Contractor's authorized representative or may mail the notice to the address last given in writing by the Contractor.

B. The Contractor shall mail or deliver to West County Wastewater's authorized representative on this Contract any written notice under this Contract. West County Wastewater's will identify its authorized representative in its award letter.

00 72 08 INDEMNITY

A. The Contractor shall indemnify, defend, and hold harmless West County Wastewater, its officers, directors, employees, representatives, and agents and each of them, from and against any and all suits, actions, legal or administrative proceedings, claims, demands, damages, consequential damages, liabilities, interest, attorneys' fees and costs, and expenses of whatsoever kind or nature whether arising before or after Final Acceptance and in any manner, whether or not well founded in fact or in law and, directly or indirectly caused, occasioned, or contributed to in whole or in part, or claimed to be caused, occasioned, or contributed to in whole or in part, by reason of any act, omission, fault, or negligence whether active or passive of the Contractor or of anyone acting under the Contractor's direction, control, or on the Contractor's behalf in connection with or incident to performance of the Contract. Without limiting the generality of the previous sentence, Contractor's indemnity obligations under this Section 00 72 08 include injury to or death of any person or persons and damage to any property, regardless of where located, including without limitation the property of West County Wastewater, the Contractor's employees, and all other persons. The Contractor's indemnity and hold-harmless obligations set forth in this Section 00 72 08 are not applicable to any liability caused by the active negligence or willful misconduct of West County Wastewater, its officers, directors, employees, representatives, or agents.

B. The Contractor shall include in each agreement with each of its subcontractors at all tiers a provision requiring that the subcontractor indemnify and hold harmless West County Wastewater, its officers, directors, employees, representatives, and agents and each of them, from and against claims, damages, losses, and expenses including, but not limited to, attorneys' fees arising out of or resulting from the performance of the subcontractor's work under the Contract, provided that such claim, damage, loss, or expense is attributable to bodily injury, sickness, disease or death, or to injury to or destruction of property, including loss of use resulting therefrom, to the extent such loss or injury is caused in whole or in part by the negligent acts or omissions of the Subcontractor, anyone directly or indirectly employed by the Subcontractor, or anyone for whose acts the Subcontractor may be liable. The Subcontractor's indemnity and hold-harmless obligations set forth in this Section 00 72 08 are not applicable to any liability caused by the active negligence or willful misconduct of West County Wastewater, its officers, directors, employees, or agents.

00 72 09 PATENT INDEMNITY

A. The Contractor shall pay all licenses, copyrights, fees, and royalties and assume all costs incident to the use and performance of the work, or the incorporation in the work, of any invention, design, process, product, or device which is the subject of patent rights or copyrights held by others. The Contractor shall indemnify, defend, and save harmless West County Wastewater, its officers, directors, employees, representatives, and agents, and each of them, from and against all claims, losses, costs, damages, consequential damages, and expenses, including attorneys' fees, incurred by West County Wastewater, its officers, directors, employees, representatives, and agents as a result of or in connection with any claims or actions based upon infringement or alleged infringement of any patent and/or copyright and arising out of the use of the materials, equipment, and/or products furnished under the Contract by the Contractor, or out of the processes or actions employed by, or on behalf of, the Contractor in connection with the performance of the Contract. The Contractor shall, at its

expense, promptly defend against any such claim or action whether or not well founded in fact or in law, provided that West County Wastewater shall have notified the Contractor upon becoming aware of such claims or actions, and provided further that the Contractor's aforementioned obligations shall not apply to equipment, materials, and/or products furnished or specified by West County Wastewater. The Contractor may, in order to avoid such claims or actions, substitute at its expense non-infringing equipment, materials, and/or products, or to modify at its expense such infringing equipment, materials, and/or products so they become non-infringing, provided that such substituted and modified equipment, materials, and/or products meet all the requirements and are subject to all the provisions of the Contract.

00 72 10 WARRANTY

A. The Contractor represents that the work performed pursuant to the Contract will be of the quality specified or of the highest quality if no quality is specified, and will conform to the Specifications, Drawings, samples, and all other parts of the Contract. The Contractor warrants all equipment, material, products, and workmanship furnished and all work performed under the Contract against defects for a period of one year after final acceptance regardless of whether the same were furnished or performed by the Contractor or by any of its subcontractors or suppliers of any tier.

B. The Contractor shall make, at its own expense, all repairs and/or replacements made necessary by defects in the equipment, materials, and/or products and in the workmanship provided by the Contractor or any of its subcontractors that become evident within the warranty period.

C. The Contractor shall, upon receipt of written notice from West County Wastewater of any breach of warranty during the applicable warranty period, redesign, repair or replace the affected item, and the Contractor shall perform such tests as West County Wastewater may require to verify that such redesign, repair, and replacement comply with the requirements of the Contract. West County Wastewater may operate and use such equipment, materials, and/or products until they can, without damage to West County Wastewater, be taken out of service for correction or replacement by the Contractor. The Contractor warrants all redesigned, repaired, or replaced work against defective design, equipment, materials, products, and workmanship for a period of one year from and after the date of satisfactory completion of such redesigned, repaired, or replaced work. West County Wastewater may require that the Contractor perform such repair or replacement work.

D. West County Wastewater also reserves the right to make such repairs or replacements, if, within seven calendar days after mailing a notice in writing to the Contractor and Surety, the Contractor does not make or undertake with due diligence the aforesaid repairs or replacements and Surety within seven calendar days after mailing a notice in writing of such failure of the Contractor neglects to make or undertake with due diligence the aforesaid repairs or replacements itself, provided, however, that in the case of an emergency where in the opinion of West County Wastewater delay would cause hazard to health or serious loss or damage, repair may be made without notice being sent to the Contractor or Surety, and the Contractor shall pay the cost of the repair.

E. All costs including workforce and materials incidental to such redesign, repair, replacement, and testing, including the removal, replacement, and reinstallation of equipment necessary to gain access, and all other costs incurred as the result of a breach of warranty shall be borne by the Contractor whether performed by West County Wastewater or the Contractor.

F. Nothing in this section may be construed to limit, relieve, or release the Contractor's, any subcontractor's, and any equipment, materials, and/or products suppliers', and any other service providers' liability to West County Wastewater for damages sustained as the result of latent defects in the workmanship, equipment, materials, and/or products done and/or furnished by the Contractor, its subcontractors, suppliers and/or other service providers.

G. The Performance Bond shall extend for a period of one year after West County Wastewater's acceptance of the Contract and shall cover the Contractor's obligations resulting from the warranty requirements specified in this Contract.

00 72 11 DIFFERING SITE CONDITIONS

A. The Contractor shall promptly, and before the following conditions are disturbed, notify the Engineer in writing of any:

1. Material that the Contractor believes may be hazardous waste, as defined in Section 25117 of the Health and Safety Code, that is required to be removed to a Class I, Class II, or Class III disposal site in accordance with provisions of existing law.

2. Subsurface or latent physical conditions at the site differing materially from those indicated in the Contract Documents .

3. Unknown physical conditions at the site of any unusual nature, differing materially from those ordinarily encountered and generally recognized as inherent in work of the character provided for in the Contract.

B. If Contractor disturbs or covers differing site conditions as described in Subsection A of this section before Contractor notifies the Engineer of or before the Engineer has had the opportunity to investigate the conditions, Contractor will waive any and all rights to recover additional compensation for increases in the Contractor's cost of, or receive an extension of the time required for, performance of any part of work impacted by such differing site conditions.

C. If Contractor determines that materially differing site conditions may be the basis for a request for additional compensation, the Contractor must follow the requirements of Section 00 72 12, Changes and Extra Work, Subsection E.

D. The Engineer will promptly investigate all claimed differing site conditions, and if the Engineer finds that the conditions: (1) are materially differing site conditions, or that they do involve hazardous waste: and (2) cause a decrease or increase in the Contractor's cost of, or the time required for, performance of any part of the work, the Engineer will issue a change order in accordance with Section 00 72 12, Changes and Extra Work.

E. If a dispute arises between West County Wastewater and the Contractor as to whether site conditions materially differ, or involve hazardous waste, or cause a decrease or increase in the Contractor's cost of, or time required for, performance of any part of the work, the Contractor will not receive an extension of time to meet any scheduled completion date provided for by the Contract, and Contractor shall proceed with all work to be performed under the Contract. If such a dispute arises, the Contractor retains any and all rights provided either by Contract or by law which pertain to the resolution of disputes and protests between the Parties.

00 72 12 CHANGES AND EXTRA WORK

A. General

1. The Engineer may, without invalidating the Contract and without notice to the Contractor's sureties, order changes in the work or extra work and/or furnish materials which may be required for the proper completion of the work or construction of the whole of the Project. The Contractor shall perform the work when so ordered. Any such change or request must be authorized in writing by the Engineer, provided that in the event of an emergency, which the Engineer determines endangers life or property, any work required by reason of such an emergency shall be performed in accordance with oral orders from the Engineer, which will be confirmed in writing as soon as practicable. Any such authorization by the Engineer, whether written or oral, may be accompanied by Documents and data as are necessary to show the extent of such change or extra work.

2. If the Engineer orders emergency work, the Contractor shall keep accurate records of its actual cost in accordance with Subsection 00 72 12.C, Cost Plus Change Orders, until such time as the Parties agree on compensation. Contractor's maintenance of such records does not require West County Wastewater to use the records as the means for determining compensation for the emergency work, and does not preclude the Parties' entry of an agreement for payment for the emergency work on a unit price or lump sum basis. Upon the determination of the compensation due to the Contractor for performing any emergency work, the Contract will be amended in writing by a Contract Change Order.

3. The Contractor shall commence and perform such changed or extra work to meet all requirements set forth in the Contractor's current Construction Schedule. If the Engineer determines that the performance of any such changes or extra work will cause any material change in that schedule, Contractor shall revise the schedule to reflect such change. Contractor shall submit a copy of the revised schedule to the Engineer.

4. If any change causes an increase or decrease in the Contractor's cost of, or any increase in the time required for, performance under the Contract, the Contract will be adjusted through a Contract Change Order. If the Parties agree on the basis of compensation as described in Subsection 00 72 12.B, Agreed Price Change Order, West County Wastewater shall issue a Contract Change Order. If the Parties do not reach agreement on the basis of compensation, the Contractor shall, upon receipt of written direction from the Engineer, proceed with the work in accordance with the provisions of Subsection 00 72 12.C, Cost Plus Change Orders.

5. West County Wastewater may engage another contractor to perform the work if such engagement is in West County Wastewater's best interest.

6. Should the Contractor, prior to opening of the bids, fail to notify West County Wastewater of patent ambiguities in the Contract Documents , the Contractor will not be eligible for an adjustment of the contract price or time extension on the basis of such ambiguities.

B. Agreed Price Change Orders

1. Unless otherwise required, the Contractor shall, no later than five calendar days after receipt of written authorization from the Engineer, submit in writing to the Engineer a proposal for accomplishing the changed or extra work. If the Contractor does not submit a proposal within the five calendar day period, the Engineer shall take into consideration Contractor's delay in submitting the proposal in evaluating any extensions of time requested by Contractor in conjunction with the changed or extra work. Contractor's proposal shall set forth any increase or decrease in cost to West County Wastewater in comparison to such cost had such change or extra work not been authorized. The proposal must state the basis of compensation for all work in connection with any such change or extra work.

2. The Contractor's proposal must contain sufficient detail to permit the Engineer to make a thorough analysis of the proposal. The Contractor's proposed basis for compensation shall be one of the following, which are listed in order of preference:

   a. Contract unit or lump sum prices, if applicable.

   b. New unit or lump sum prices.

   c. Cost plus with a price ceiling.

C. Cost Plus Change Orders

1. If the Contractor does not propose the method of compensation for such work or any part thereof, or if any proposed method is not acceptable, or if a method of compensation cannot be agreed upon, the Contractor shall proceed with the work and compensation will be made on a cost plus basis as set forth below. If at any time after the Contractor commences such work the Parties agree on a method of compensation other than cost plus, compensation will be made in accordance with that agreement.

2. The Contractor shall keep accurate records of the actual cost to the Contractor for the work. The Contractor shall keep the cost records as provided in the following subsections.

3. The Contractor will be paid its direct costs for labor, materials, and equipment used in performing the work as provided in paragraphs 12.C.6a, 12.C.6b, and 12.C.6c.

4. The total of the direct costs computed as provided in paragraphs 12.C.6a, 12.C.6b, and 12.C.6c, will be marked up as specified below. A markup of thirty-three (33) percent to the cost of labor, fifteen (15) percent to the cost of materials, and fifteen (15) percent to the equipment rental.

    a. When extra work is performed by a subcontractor, an additional markup of 5 percent will be added to the total cost of said extra work including all markups specified in this Section. This additional 5 percent markup will fully reimburse the Contractor for additional administrative costs, and West County Wastewater will not be required to pay any additional amount for performance of the extra work by a subcontractor.

5. The markups identified in this Subdivision C constitute full compensation of the Contractor for all profit and overhead costs. Such costs will include all items of expense not specifically designated below in C.6. as cost or equipment rental.

    a. Markups include, but are not limited to, compensation for field overhead, home office overhead, profit, builder's risk insurance, general and auto liability insurance, and performance and payment bond premiums.

        i. Home office overhead includes, but is not limited to:

            01. office rent, utilities, clerical staff, bidding and estimating, officer's salary, advertising, professional association dues, supplies, telephone, office equipment, transportation, staff consultants, and miscellaneous business expenses related to the project.

        ii. Field overhead includes, but is not limited to:

            01. job site utility expenses (including telephone), superintendent, project engineer, office engineer, secretary and other field office staff, field office, field office equipment and supplies, portable toilet, fencing, transportation for field office staff, general project cleanup.

    b. The total payment made as provided is deemed to be the actual costs of such work and constitutes full compensation therefor.

6. Costs for labor, materials, and equipment that are eligible for inclusion in cost plus work, are described below:

    a. Labor - The Contractor will be paid the cost of labor for the workers (including foremen when authorized by Engineer) used in the actual and direct performance of the work. The cost of labor, whether the employer is the Contractor or subcontractor will be the sum of the following:

        i. Actual Wages - The actual wages paid include basic pay, overtime and shift premiums, any employer payments to or on behalf of the workers for health and welfare, pension, vacation, holidays and other miscellaneous payments (e.g. administration, occupational, health and research, annuity trust fund, supplemental unemployment benefits).

        ii. Labor Surcharge – A labor surcharge will be added to the actual wages as defined above. The allowable markup rate shall be as set forth in the California Business and Transportation Wastewater's Department of Transportation publication entitled, Labor Surcharge and Equipment Rental Rates, that is in effect on the date upon which the work is accomplished and which is made a part of the Contract. The labor surcharge will constitute full compensation for all other payments made to, or on behalf of, the workers including workers' compensation insurance with a waiver of subrogation, social security, State unemployment insurance, and Federal unemployment insurance and excluding actual wages as defined above and subsistence and travel allowance as specified below.

        iii. Subsistence and Travel Allowance - The actual subsistence and travel allowance paid to such workers.

b. Materials –The Contractor may be compensated for the cost of materials furnished by the Contractor for use in performing any change or extra work provided use of the materials was as specifically authorized, and the actual use was verified by the Engineer. Compensable charges will be calculated as the net cost to the Contractor delivered at the job. West County Wastewater reserves the right to furnish such materials as it deems advisable, and the Contractor will not be compensated for costs and markup on those materials.

   i. Contractor shall document the use of all materials for extra work with copies of vendor's invoices. Such invoices shall be submitted with the related Daily Extra Work reports or, if not available for submittal with the Daily Extra Work reports, they must be properly identified and promptly transmitted to the Engineer. The vendor's invoices must be submitted to the Engineer no later than 60 days after the date of delivery of the material or within 15 days after the acceptance of the Contract in accordance with Section 00 72 41, Final Payment and Release, or West County Wastewater will establish the cost of such materials at the lowest wholesale prices at which the materials are available in the quantities required, F.O.B. at the required locations of work, less any cash or trade discounts provided.

c. Equipment Rental - The Contractor will be paid for the use of the equipment at the rental rates listed for such equipment in the State of California Department of Transportation publication entitled Labor Surcharge and Equipment Rental Rates in effect on the date upon which the work is accomplished that is a part of the Contract, regardless of ownership and any rental or other agreement for the use of such equipment entered into by the Contractor. If it is deemed necessary by the Engineer to use equipment not listed in that said publication, the Engineer shall established a suitable rental rate for that equipment. The Contractor may furnish any cost data which might assist the Engineer in the establishment of such rental rate.

   i. The rental rates paid as provided above include the cost of fuel, oil, lubrication, supplies, small tools, necessary attachments, repairs and maintenance of any kind, depreciation, storage, insurance, and all incidentals.

   ii. Individual pieces of equipment or tools not listed in the publication which have a replacement value of five hundred dollars ($500) or less, whether or not consumed by use, will be considered to be small tools and no payment will be for that equipment or those tools.

   iii. Rental time will not be allowed while equipment is inoperative due to breakdowns.

   iv. Equipment on the Work - The rental time to be paid for equipment used will be the time the equipment is in operation on the extra work being performed and, in addition, the time required to move the equipment to the location of the extra work and return it to the original location or to another location requiring no more time than required to return it to its original location. Moving time will not be paid for if the equipment is used at the site of the extra work on work other than the extra work. Loading and transporting costs will be allowed, in lieu of moving time, when the equipment is moved by means other than its own power, except that no payment will be made if the equipment is used at the site of the extra work on work other than the extra work. The following shall be used in computing the rental time of equipment on the work:

      01. When hourly rates are listed, less than thirty (30) minutes of operation will be considered to be one-half hour of operation.

      02. When daily rates are listed, less than four hours of operation will be considered one-half day of operation.

   v. Equipment not on the Work - For the use of equipment moved in on the work and used exclusively for extra work, the Contractor will be paid the rental rates listed in the State of California Department of Transportation publication entitled Labor Surcharge and

Equipment Rental Rates is in effect on the date upon which the work is performed and which is a part of the Contract, or determined as provided in this subsection, and for the cost of transporting the equipment to the location of the work and its return to its original location, all in accordance with the following provisions:

01. The Contractor and the Engineer shall agree in advance as to the original location of the equipment to be hauled to the location of the work.

02. West County Wastewater will pay the costs of loading and unloading such equipment.

03. The cost of transporting equipment shall not exceed the applicable minimum established rates of the Public Utilities Commission.

04. The rental period begins at the time the equipment is unloaded at the site of the extra work and will include each day that the equipment is at the site of the extra work, excluding Saturdays, Sundays, and West County Wastewater-observed holidays and days of temporary suspension of the work unless the equipment is used to perform the extra work on such days. The rental period terminates at the end of the day on which the Engineer directs the Contractor to discontinue the use of the equipment. The rental time to be paid per day will be in accordance with the following:

Hours Equipment is in Operation	Hours to be Paid
0.5	4.25
1.0	4.50
1.5	4.75
2.0	5.00
2.5	5.25
3.0	5.50
3.5	5.75
4.0	6.00
4.5	6.25
5.0	6.50
5.5	6.75
6.0	7.00
6.5	7.25
7.0	7.50
7.5	7.75
8.0	8.00

- The hours to be paid for equipment that is operated less than eight hours due to breakdowns will not exceed eight hours less the number of hours the equipment is inoperative due to breakdowns.

- When hourly rates are listed, less than 30 minutes of operation will be considered one-half (½) hour of operation.

- When daily rates are listed, payment for one-half (½) day will be made if the equipment is not used. If the equipment is used, payment will be made for one day.

- The minimum rental time to be paid for the entire rental period on an hourly basis will not be less than eight 8 hours or if on a daily basis not less than one day.

- If the Contractor opts to return the equipment to a location other than its original location, West County Wastewater will pay the cost of transportation in accordance with the above provisions, providing that the payment does not exceed the cost of moving the equipment to the work.

- West County Wastewater will not pay for transporting, loading, and unloading equipment if the equipment is used on the work in any other way than upon extra work.

vi. If the Contractor elects to move equipment to perform the work before the equipment is used or elects to delay the return of the equipment to its original location, West County Wastewater will not compensate the Contractor for the time the equipment is idle before and after it has been used on the extra work.

d. Bonds - The markups referred to in this subsection shall include full compensation for all additional bonding costs the Contractor may incur as a result of the extra work. No additional percentage increase will be allowed to these markups for bonding costs.

e. Contractor shall remove, repair or reconstruct defective work performed under cost plus procedures to the satisfaction of the Engineer at no additional cost to West County Wastewater.

7. The Contractor shall maintain its cost records and records of its subcontractors and special forces to provide a clear distinction between the costs of other operations and the direct costs of extra work paid for in accordance with this Section 00 72 12, Changes and Extra Work. Contractor must document its performance of extra work on a daily basis in accordance with the following:

a. The Contractor shall furnish the Engineer with completed daily extra work reports, on forms furnished by West County Wastewater, for each day's work Contractor contends is payable on an extra work basis. The daily extra work reports must itemize the materials used, the direct cost of applicable labor, and the charges for equipment used, whether furnished by the Contractor, subcontractor, or other forces. The daily extra work report itemizations for labor must provide names or identifications and classifications of all workers, the hourly rate of pay, and hours worked on extra work. Itemized equipment records must provide the size, type, and identification number of equipment and hours operated for extra work.

b. All daily extra work reports shall be signed by the Contractor or its authorized representative.

c. The Engineer will compare its records with the completed daily extra work reports furnished by the Contractor and make any necessary adjustments. When the daily extra work reports are agreed upon and signed by both parties, the reports will be the basis of payment for the work performed. These reports may be adjusted based upon later audits that may be performed by West County Wastewater.

D. The quantities set forth in Section 00 41 43, Schedule of Bid, are approximations only. If there is a variation in the estimated quantity by more than 150 percent or less than 50 percent of the bid quantity, either West County Wastewater or the Contractor may notify the other party of its intention to renegotiate the contract unit price with respect to those quantities outside of the permitted range of 50 percent below to 150 percent above the bid quantity.

1. Any estimated quantity from a maximum of 150 percent of the bid quantity to a minimum of 50 percent of the bid quantity will be paid for at the contract unit price. Such quantities will be determined by the Engineer at the Engineer's discretion in accordance with the applicable measurement provisions of the Contract using such methods as the Engineer considers appropriate for the class of work to be measured, including, but not limited to, the method of average end area computed from cross sections grid system or topographic contours. If the Engineer determines it to be necessary, prismoidal corrections, or corrections for curvature in alignment, will be employed. The planimeter shall be considered an instrument of accuracy adapted to measurement of areas. The dividing limits, lines, or planes between adjacent items or

classes or excavation, concrete, or other types of work, where not specifically set forth in the Contract, will be as determined by the Engineer.

E. Requests for Additional Compensation

1. Unless the Contractor has been ordered by West County Wastewater to perform changes or extra work pursuant to Section 00 72 12, Changes and Extra Work, West County Wastewater will not consider payment of additional compensation to the Contractor unless the Contractor follows the procedures set forth in this subsection. For the purposes of the Contract, a request for additional compensation means any request for compensation in excess of the contract amount (as amended by addenda and/or change orders) arising out of the conduct of the work and includes, but is not limited to, requests for compensation arising out of changed site conditions, delays occasioned by the owner or third parties, and such other compensation arising out of interference with the work which is not the responsibility of the Contractor.

2. Immediately upon learning of a condition, occurrence, or circumstance that potentially will give rise to a request for additional compensation the Contractor must notify the Engineer of that condition, occurrence or circumstance. If the Contractor's initial notification is oral, it must confirm the notification in writing no later than five calendar days after the oral notification. The Contractor may not proceed with the work involving a potential request for additional compensation without notifying the Engineer of the subject conditions, occurrence or circumstance unless an emergency exists or unless it is impossible to notify the Engineer without creating an unreasonable delay in the work.

3. No later than 14 calendar days after learning of such condition, occurrence or circumstance, the Contractor shall submit to the Engineer a detailed written statement setting forth the causes of extra costs, potential and/or actual incurred costs as well as engineering and technical data supporting the request for additional compensation. The Contractor shall submit sufficient data to reasonably enable the Engineer to make a thorough analysis and investigation regarding the request for additional compensation. If the Contractor cannot reasonably provide the detailed statement within the 14 calendar day period, Contractor must provide such data as it can be reasonably provide. The Contractor shall request from the Engineer, before the expiration of the five (5) calendar day period, an extension for a specific period of time in which to file the required documentation supporting the request for additional compensation.

4. Without modifying or waiving any of the Contractor's obligations set forth in paragraph 3 above, the Contractor must submit to the Engineer a detailed written statement setting forth the final costs and any supplemental engineering and technical data related to any requests for additional compensation no later than 60 days after the date of substantial completion of the work. If the Contractor determines that extraordinary circumstances exist, the date for submission of final costs and technical backup may be extended by written agreement with West County Wastewater. This statement of final costs and supplemental reporting data must be sufficiently detailed to enable the Engineer to thoroughly analyze and make a reasonable determination regarding the request for additional compensation. If the Contractor fails to immediately notify the Engineer of a condition, occurrence or circumstance that potentially will give rise to a request for additional compensation or to make reasonable efforts to provide an adequate initial submittal within the 14 calendar day period, or any extension of that period agreed to by the Engineer as set forth in paragraph 3 above, and/or failure of the Contractor to provide such statement of final costs and technical submittals within 60 days of the date of substantial completion, or by such date as that period may be extended, will be a waiver by the Contractor of any and all rights to additional compensation for such conditions, occurrences, or circumstances for which costs and other required data has not been timely submitted. The waiver by the Contractor of its rights to compensation due to failure to comply with the requirements of this General Condition shall operate as a waiver of all rights of the Contractor under the Contract, at law, and in equity to receive additional compensation whether through the Government Code claims process or otherwise.

00 72 13 INDEPENDENT CONTRACTOR, SUPERINTENDENT, AND EMPLOYEES

A. The Contractor is an independent Contractor performing work under the Contract, maintaining complete control over its employees and all of its subcontractors. The Contractor shall perform all work in an orderly, timely, and workmanlike manner, enforce strict discipline and order among its employees, and assure strict discipline and order by its subcontractors in complying with the Contract Documents .

B. Before starting work, the Contractor shall designate in writing its authorized representative who will have the authority to represent and act for the Contractor. The Contractor shall provide a clear written definition of the scope of the authorized representative and assistant's authority to act for the Contractor, and shall specify any and all limitations of such authority. The Contractor's representative shall be present or be duly represented at the site of work at all times when work is actually in progress. When work is suspended, Contractor shall make arrangements acceptable to the Engineer for performing any emergency work that may be required. The Contractor's authorized representative must be supported by competent assistants, as necessary, and the authorized representative and its assistants must be satisfactory to the Engineer. West County Wastewater reserves the right to have the Contractor remove the authorized representative from the project and replace the representative with another person who is acceptable to the Engineer. All requirements, instructions, and other communications given to the authorized representative by the Engineer are as binding as if given to the Contractor. Before starting work, the Contractor shall give West County Wastewater a written list of the addresses and telephone numbers where the Contractor's project manager, project superintendent, and foremen can be reached during hours when the work is not in progress.

1. Contractor's authorized representative must be present or be duly represented at the Project site at all times while work is actually in progress. When work is not in progress and during periods when work is suspended, the Contractor shall make arrangements acceptable to the Engineer for one or more persons to be contacted for any emergency work which may be required.

2. The Contractor shall employ only competent and skilled workers to perform any work in numbers sufficient to carry the work to satisfactory completion within the time limits specified or required to meet approved construction schedules. The Contractor shall maintain satisfactory conduct of its employees at the jobsites.

3. Each machine or unit of equipment shall be operated by an operator competent in handling the particular make of machine or unit or equipment in use, at a speed or rate of production not to exceed that recommended by the manufacturer.

C. If any subcontractor or person employed by the Contractor appears to the Engineer to be incompetent, or be under the influence of alcohol or illegal drugs, or to act in an unsafe, disorderly, or improper manner, the Engineer may require that such person not again be employed on the work. However, nothing contained in this paragraph will shift the responsibility for supervision of persons employed by the Contractor from the Contractor or require the Engineer to take any action with regard to an employee of the Contractor or subcontractor who is subject to discipline.

D. The Contractor shall maintain labor relations in such manner and by such methods as will provide for harmony among workers. The Contractor shall assure that its subcontractors of all tiers comply with the provisions set forth in this Section. Failure of the Contractor or any of its subcontractors at any tier to comply with this provision will be grounds for termination of the Contract in accordance with Section 00 72 36, Termination of Right to Proceed.

00 72 14 CONTRACTOR'S PLANT, CONSTRUCTION EQUIPMENT, AND FACILITIES

A. The Contractor shall provide and ensure the use of, on any work, only such construction plant and equipment capable of producing the quality and quantity of work and materials required by the Contract and within the time or times specified. Before proceeding with any contract work or with erection of any facilities including but not limited to temporary structures, machinery, equipment, offices, warehouses, and camps, the Contractor shall, at its expense, furnish the Engineer with such information and Documents relative to such equipment, plant, and facilities as the Engineer may request. Upon written order of the Engineer, the Contractor shall promptly remove unsatisfactory equipment and facilities from the site and shall discontinue operation of unsatisfactory plant.

B. The Contractor shall furnish and maintain such potable water supplies and proper sanitation facilities as it determines necessary for its forces at the jobsite.

C. The Contractor shall maintain all portions of the jobsite in a neat, clean, and sanitary condition at all times. The Contractor shall furnish toilets where needed for use of its employees and shall strictly enforce their use.

1. The Contractor may not make use of West County Wastewater's existing sanitary facilities.

00 72 15 EQUIPMENT, MATERIALS, AND/OR PRODUCTS, SUBSTITUTION OF SPECIFIC ITEMS AND TRADE NAMES, WORKERS' SKILLS

A. The work, unless otherwise permitted or approved by the Engineer, must be completed with the incorporated use of equipment, materials, and/or products where specified. Substitutions and equal alternatives will be permitted as provided in this Section; however, neither the request for substitution nor the offer of alternatives obligates West County Wastewater to assent to any such request or offer. If the Contractor fails to either submit requests for substitutions or to offer alternatives within the required times provided in this General Condition, West County
Wastewater will presume that the work will be accomplished with the trade-named equipment, materials, and/or products as identified in the Technical Specifications and/or the Project Documents .

1. Unless otherwise provided in the Contract, all equipment, materials, and/or products incorporated into the work must be new and, where not specified, must be of the highest quality of the respective kinds for the intended use, and all workmanship must meet or exceed applicable construction industry standards and practices. If equipment, materials, and/or products are designated by listing named manufacturers of particular equipment, materials, and/or products followed by the words "or equal," then the Contractor may furnish the named equipment, materials, and/or products or any equal equipment, materials, and/or products. The first-named manufacturer of particular equipment, materials, and/or products is the basis for the design shown on the Project Documents . A subsequently-named manufacturer or particular equipment, materials, and/or products has been determined to be an acceptable substitution but may require modifications in the Project's design and its ultimate construction to accommodate its use. If such subsequently-named items are selected by the Contractor for incorporation into the work, the Contractor assumes all costs required for modifications to the equipment, materials, and/or products, and Project design and construction as may be required for said items' use. The Engineer will permit substitutions for an unnamed "equal" item of material if the Contractor complies with the procedures set forth in Paragraph B of this Section. If a Contractor makes use of an unnamed "equal" product as a substitute for a specifically-named material or product, the Contractor will assume all costs required to make the necessary revisions or modifications to accommodate the use of the unnamed product.

2. Before beginning the work and no later than 35 days after award of the Contract, the Contractor shall submit a List of Materials to the Engineer for review. The List must include all items of equipment, materials, and/or products to be incorporated into the work and the names of suppliers with whom purchase orders have been placed. The names on the List must be arranged in the same order as in the specifications, and the List must contain sufficient data to identify precisely the items of equipment, materials, and/or products that the Contractor proposes to furnish. The List must include specification or Project Drawing references. Once the submission is determined to be acceptable to the Engineer, the Engineer will return it to the Contractor.

3. If the Contractor is required to furnish sample specimens of materials, the Contractor shall comply with the provisions of 00 72 28, Inspection and Sample Specimens.

B. Substitution for equipment, materials, and/or products specified will only be permitted when the proposed unnamed "equal" product or material to be furnished is both equal in quality and utility and after the Contractor has complied with the following provisions: (1) The Engineer shall review all proposed substitutions. (2) The Engineer must approve each substitution in writing prior to its incorporation into the work. (3) Unless otherwise authorized in writing by West County Wastewater, the Contractor shall, no later than 35 days after award and prior to placing any purchase orders, but no later than 30 days before it requires approval of any such alternative item, submit to West County Wastewater sufficient data, drawings, samples, literature, or other detailed information as will demonstrate to the Engineer that the proposed substitute is equal in quality and utility to the equipment, materials and/or products specified. Contractor shall submit a side-by-side comparison of the proposed equipment specification to the contract specification.

1. Within 30 calendar days following receipt of all requested information from the Contractor, the Engineer will determine whether the proposed alternative is equal in quality and utility and meets the requirements of the Contract and will inform the Contractor in writing of this determination. The Contractor will bear the burden of substantiating the quality and utility of alternatives, and the Contractor shall furnish all

necessary information requested and required by the Engineer. The Engineer will be the sole judge as to the quality and utility of alternative equipment, materials, and/or products, and the Engineer's decision will be final. Acceptance by the Engineer of a substitution will not relieve the Contractor from complying with the requirements of the Project Documents and Specifications. Acceptance by the Engineer will not relieve the Contractor from full responsibility for the efficiency, sufficiency, and quality and performance of the substitute equipment, materials, and/or products, in the same manner and degree as equipment, materials, and/or products specified by name.

2. Failure of the Contractor to submit proposed substitutions for review in the manner described above and within the time prescribed will be sufficient cause for rejection by West County Wastewater of the proposed substitutions.

3. The Engineer is not restricted to basic issues as performance and durability in determining whether a proposed product is equal in quality and utility, but may consider any other issues that the Engineer, in its discretion , deems appropriate. Issues that may be considered in making this determination may include, but are not limited to, factors such as comparable performance, reliability, efficiency of operation, ease of operation, adaptability, ease of maintenance, capital costs, life-cycle costs, operational characteristics, costs of training personnel, maintenance history, warranties, problems created by the resulting overall warranty system, availability of qualified service, availability of parts, the history of any supplier and compatibility with existing facilities.

4. No one factor or group of factors, including such issues as savings on capital costs, will be determinative of whether the proposed product or material is equal in quality and utility. The decision of the Engineer will be based on those factors deemed by the Engineer to be relevant and any data, drawings, samples, literature, or other detailed information furnished by the Contractor with respect to the proposed substitution.

5. Each decision as to whether a product or material is equal in quality and utility will be made by the Engineer on a case-by-case basis.

6. The Contractor will pay any and all costs, including consultant costs, incurred by West County Wastewater with respect to the proposed substitution that exceed the costs inherent in the normal and reasonable review of Documents and other standard data, information, and Documents concerning any proposed substitution. The Contractor's responsibility for this cost will not depend upon whether the Engineer approves the substitution.

C. Unless otherwise provided in the Contract, the title and interest in the right to the use of all water, and the title to all soil, stone, gravel, sand, minerals, timber, and all other materials developed or obtained within the Project limits from operations by the Contractor or any of its subcontractors, of any of their representatives or employees, and the right to use or dispose of the same are reserved to West County Wastewater where located within its boundaries; and neither the Contractor nor any of its subcontractors, nor any of their representatives or employees, will have any right, title, or interest in or to any such substances or materials.

1. All material used under the Contract after it has been attached or affixed to the work or soil and after partial payment has been made therefor will become the property of West County Wastewater.

2. In the event that the Contractor or any of its subcontractors or any of their representatives or employees discovers any Indian relics or items that may possess archaeological or historical value, the Contractor shall immediately notify the Engineer and await the Engineer's decision before proceeding with any work. The Contractor will have no property right in such relics and items.

3. The Contractor shall satisfy himself as to the quantity of acceptable materials or products which may be produced or obtained at local sources, and West County Wastewater will not assume any responsibility as to the quantities or quality of acceptable materials or products available.

4. The Contractor, with the permission of the Engineer, may use in the proposed construction such stone, gravel, sand, or other material found in the excavation that the Engineer determines is suitable.

5. Existing equipment, materials, and/or products to be salvaged will shall remain the property of West County Wastewater. The Contractor shall refurbish as required any salvage to be reinstalled in the work before reinstallation. The Contractor shall carefully remove and handle other work to be salvaged to avoid damage and shall deliver such work to storage at a location designated by the Engineer.

00 72 16 CONTRACTOR-FURNISHED DOCUMENTS AND DATA

A. No later than 30 days after receiving the Notice to Proceed (NTP), the Contractor shall submit at its own expense Shop Documents and details of all structural and reinforcing steel, equipment, electrical controls, structural fabrications, pipe, pipe joints, special pipe sections, and other appurtenances. The Engineer must find acceptable a Shop Drawing or detail before the item or items shown are manufactured or used in the work. The acceptance of Documents by the Engineer applies for general design only and will not relieve the Contractor of its responsibility for errors or omissions contained therein. Acceptance by the Engineer will not relieve the Contractor of its obligation to meet safety requirements and all other requirements of law. The Engineer will begin reviewing the Contractor's submittals only after the NTP is issued by West County Wastewater except for some unusual long lead items which may require submittals prior to issuance of the NTP.

B. The Contractor bears full responsibility for shop drawing submittal and coordination; this responsibility may not be delegated in whole or in part to subcontractors or suppliers. Any designation of work "by others" shown on Shop Documents means that the Contractor shall be responsible for the work shown rather than the subcontractor or supplier who has prepared the Shop Drawings.

C. Submittals must permit data to be identified with the applicable Specification paragraph. The data must clearly demonstrate compliance with the Project Documents and Specifications and must relate to the specific equipment to be furnished. Where manufacturer's standard Documents are employed, they must be clearly marked to show what portions of the data are applicable to this Project.

D. The Engineer's review of shop-drawing submittals is primarily intended to provide for completion for West County Wastewater of a Project in full conformance with the Project Documents and Specifications, unmarred by field corrections, and within the time provided. In addition to this primary objective, shop-drawing review is secondarily intended to assist the Contractor in its procurement of equipment that will meet all requirements of the Project Documents and Specifications, will fit the structures detailed on the Project Documents, will be complete with respect to piping, electrical, and control connections, will have the proper functional characteristics, and will become an integral part of a complete operating facility. Acceptance of Shop Documents and submittals does not constitute a change to the Contract requirements.

E. Where the Contractor is required by these Specifications to make submittals, they must be submitted to the Engineer with a letter of transmittal and in a sufficient number of copies to allow a distribution of at least one (1) copy to all parties needing a copy to carry out the provisions of the Specifications, including three (3) copies to be retained by the Engineer. The Engineer shall identify the appropriate number of such copies required at the time of the preconstruction conference.

F. The Engineer will return the appropriate number of copies of each of the Contractor's submissions and all appurtenant data within 21 days of receipt, with one of the following notations:

1. Resubmittal not required; correction, if any, noted.

2. Correct and resubmit corrections noted.

G. Returned copies of Documents marked with Notation "1" permit the Contractor to proceed with the operations covered by such returned copies, provided that such operations will be subject to the comments, if any, shown on such returned copies.

H. The Contractor shall correct, as necessary and required, returned copies of Documents marked with Notation "2" and shall submit them in the same manner as before.

I. When the Engineer determines that a submittal is acceptable, the Engineer will retain three copies and will return all other copies to the Contractor. When submittals are not accepted, the Engineer will retain only two

copies and will return all others to the Contractor. The Parties intend that the Contractor make a complete and acceptable submission to the Engineer at least by the second submission of data. West County Wastewater may deduct monies from payments due the Contractor to cover additional costs of the Engineer's review of submittals beyond the second submission.

J. The Engineer's determination that a submittal is acceptable will not constitute acceptance by the Engineer of any responsibility for the accuracy, coordination, and completeness of the Shop Documents or the items of equipment represented on the Drawings. The Contractor shall be solely responsible for the accuracy, coordination, and completeness of Shop Drawings, and this responsibility will include back checking comments, corrections, and modifications from the Engineer's review before fabrication.

K. Supplemental, specific requirements for Shop Documents and details are contained in the applicable technical sections of these Specifications.

L. The Contractor shall provide sufficient copies of schedules and Shop Documents to the Engineer for review to provide three copies for the Engineer's files, and such additional copies as the Contractor may desire for its own office files and/or for distribution by it to subcontractors or vendors. Exceptions will be noted in specific sections of the Technical Specifications.

M. The Contractor shall submit all Shop Documents and supporting data, catalogs, and schedules as its instruments, and the Contractor will be responsible for their accuracy and completeness. These submittals may be prepared by the Contractor, subcontractors, or suppliers, but the Contractor must ascertain, before submitting them to the Engineer, that submittals meet all of the requirements of the Contract, while conforming to structural, space, and access conditions at the point of installation. The Contractor shall check all submittals before submitting them to the Engineer.

N. The Engineer will check and review schedules, drawings, etc., submitted by the Contractor only for general design conformance with the concept of the Project and compliance with the Contract.

O. Shop Documents may not be used to order products' fabrication or delivery for construction or installation unless they have been submitted to and determined to be acceptable by the Engineer.

P. Determination by the Engineer that any drawings, method of work, or any information regarding materials and equipment the Contractor proposes to furnish are acceptable will not relieve the Contractor of its responsibility for any errors therein and will not constitute an assumption of risks or liability by the Design Engineer or West County Wastewater, or any officer or employee thereof, and the Contractor shall have no recourse against West County Wastewater under the Contract on account of the failure or partial failure or inefficiency or insufficiency of any plan or method of work or material and equipment so accepted. Such acceptance shall mean merely that the Engineer has no objection to the Contractor using, upon its own full responsibility, the plan or method of work proposed or furnishing the materials and equipment proposed.

00 72 17 STANDARDS AND CODES

A. The Contractor shall construct all work in full accordance with the requirements of local building codes, the National Board of Fire Underwriters, the Pacific Fire Rating Bureau, the State Fire Marshall, the Safety Orders issued by the Division of Industrial Safety of the State of California, and all other prevailing codes and regulations having jurisdiction over construction included in the Contract Documents .

B. Where references are made in the Contract to the respective standards and codes in accordance with which work is to be performed or tested, the edition or revision of such standards and codes in effect on the date of the Notice to Contractors shall apply, unless otherwise specified in the Technical Specifications; references to such standards and codes is solely for technical information. Nothing in these specifications is to be construed to permit work not conforming to governing codes. In case of conflict between referenced standards and codes or between standard(s) or code(s), and the requirements of the Contract, the Engineer will determine which will govern. For purposes of bidding, it is assumed that the more restrictive one is required.

00 72 18 SAFETY

A. The Contractor will be solely and completely responsible for conditions on the jobsite, including safety of all persons and property during performance of the work. This requirement will not be limited to normal working hours. The Contractor shall promptly and fully comply with and carry out safety requirements as prescribed by federal, state, or local laws or regulations and industry standards.

B. The services of the Engineer in conducting review and inspection of the Contractor's performance is not intended to include review of the adequacy of the Contractor's work methods, equipment, bracing or scaffolding, or safety measures, in, on, or near the construction site.

C. The Contractor shall take such measures as may be necessary or required to assure that the safety and health of the employees and of the public may be safeguarded.

D. THE CONTRACTOR ACKNOWLEDGES THAT WORK ON THIS PROJECT COULD BE PHYSICALLY DANGEROUS TO WORKERS. THE CONTRACTOR SHALL CAREFULLY INSTRUCT ALL PERSONNEL WORKING ON THIS PROJECT AS TO POTENTIAL DANGERS, WHICH COULD BE POTENTIALLY HAZARDOUS TO WORKERS' HEALTH, AND SHALL PROVIDE SUCH NECESSARY SAFETY EQUIPMENT AND INSTRUCTIONS AS ARE NECESSARY TO PREVENT INJURY TO PERSONNEL AND DAMAGE TO PROPERTY. THE CONTRACTOR SHALL EXERCISE SPECIAL CARE RELATIVE TO WORK UNDERGROUND.

E. The conveyance and treatment of raw sewage and its by-products can introduce pathogenic organisms which may cause diseases such as salmonellosis, typhoid fever, paratyphoid fever, bacillary dysentery, cholera, infectious hepatitis, polio, amoebic dysentery, and others.

F. The Contractor shall direct and control the work assigned and shall assure that all workers on the Project understand the hazards of the work involved and the safe work procedures required for each job. The Contractor shall assure that its subcontractors of all tiers shall, without expense to West County Wastewater, comply with this safety responsibility. No work may proceed until each worker and subcontractor understands the scope of the work and all safety rules and work procedures to be followed. The Contractor may not allow a new employee or new subcontractor to begin work on West County Wastewater projects without a full and proper safety orientation.

G. Use of alcoholic beverages and/or nonprescription drugs are strictly prohibited. Workers who use prescription drugs that interfere with workers ability to work safely are prohibited from the work site.

H. The Contractor is advised that, in certain locations and under certain conditions, the work may take longer and may require special equipment in order to properly conform to safety regulations. In such cases, no additional compensation will be allowed the Contractor therefor.

I. The Contractor’s personnel shall wear hard hats at all times while on the project work site, except in offices or vehicles.

J. Before starting work, the Contractor shall submit a written safety program for West County Wastewater's review. The objective of the safety program will be accident prevention. Such program shall include, but not be limited to, the following:

1. An organization chart and accompanying narrative which describes the responsibility for employee and public safety of those individuals who control each phase of operations and set forth in writing the policies and procedures to be followed by all personnel. The chart shall also show the Contractor's internal lines of communication (including subcontractors) for the program.

2. The designation of a competent person.

3. A specific program for communication between the Contractor and West County Wastewater on safety matters. The Contractor shall also designate one person with whom official contact can be made by West County Wastewater on safety matters.

4. Evidence that the Contractor has become thoroughly familiar with the potential hazards of the work and applicable federal and state regulations. This will be in the form of a signed affidavit per Section 00 45 17 titled Contractor Safety Acknowledgment.

5. Specific safety procedures and guidelines for conduct of the work.

K. West County Wastewater's review, comment upon, and/or acceptance of the Contractor's safety program and/or plan will not negate Contractor's obligations for safety or place any responsibility upon West County Wastewater for such safety. Any review comments and/or acceptance will not limit the Contractor's obligations to undertake any action which may be necessary or required to establish and maintain safe working conditions at the site.

L. The Contractor shall promptly comply with any directive from West County Wastewater in connection with safety. West County Wastewater may stop the work if West County Wastewater reasonably believes that there is an imminent danger to safety. West County Wastewater may also require the Contractor to revise the Contractor's safety program and/or plan to eliminate future occurrences of the imminent danger. West County Wastewater's reservation of these rights to be exercised in its sole discretion and will not constitute obligations of West County Wastewater to monitor or enforce the Contractor's safety program, plan, and/or method of operation. West County Wastewater's exercise of these rights will not provide any basis for any request by the Contractor for delay damages, extra compensation, and/or additional compensation to complete the work.

M. It is the intent of West County Wastewater that the Contractor provide a safe working environment under normal conditions. HOWEVER, BECAUSE OF POTENTIALLY HAZARDOUS CONDITIONS SUCH AS CONFINED SPACES, POTENTIALLY EXPLOSIVE ATMOSPHERES, HANDLING OF CERTAIN CHEMICALS, POSSIBLE EXPOSURE TO PATHOGENS, ETC., SPECIALIZED EQUIPMENT MAY BE NECESSARY AND STRICT CONFORMANCE WITH SAFETY REGULATIONS WILL BE REQUIRED.

N. The Contractor shall keep adequate first aid facilities and supplies available and shall provide for instruction in first aid.

O. The Contractor shall assure that its subcontractors of all tiers shall, without expense to West County Wastewater, comply with this Section and the provisions of Section 00 72 14, Contractor's Plant, Construction Equipment, and Facilities.

00 72 19 PUBLIC ACCESS AND SAFETY; PROTECTION OF PROPERTY

A. The design of the facilities included in this Project has been based on the concept that the structures are not accessible to and usable by the handicapped and the general public. Consequently, stairs, landings, platforms, railings, ladders, exits, and the like, for treatment facilities were designed to conform only to the requirements for industrial use by authorized persons.

B. The Contractor will be responsible for the work and protection thereof, and for preventing injuries to persons and damage to the work and property and utilities on or about the work, until completion and final acceptance of the work. The Contractor will not be relieved of any of its responsibility because of the Engineer's discretion to give permission or directions relating to any part of the work, by any such permission or directions given, or by failure of the Engineer to give such permission or directions.

C. The Contractor shall provide and maintain all necessary safety equipment such as fences, barriers, signs, lights, walkways, guards, and fire-prevention and fire-fighting equipment and shall take such other action as is required to fulfill its obligations under this Section.

D. The Contractor shall conduct its operations so as not to close or obstruct any portion of any railroad, highway, road, or other property until permits therefor have been obtained from the governmental or other authorities having jurisdiction thereof. If any of the above are required to be kept open and will be damaged or rendered unsafe by the Contractor's operations, the Contractor shall, at its expense, make such repairs and provide such temporary guards, bridges, lights, and other signals as necessary or required for public safety and as will be acceptable to the governmental or other authorities having jurisdiction thereof. Fences which interfere with any work may, upon prior written approval of West County Wastewater, be removed by the Contractor but must

then be restored to their original condition prior to final acceptance. Such removal and restoration shall be performed by and at the expense of the Contractor.

E. Unless otherwise specifically provided in the Contract, the Contractor shall not perform any work that may affect any pipeline, telephone, telegraphic, or electric transmission line, irrigation ditch, or other structure, nor enter upon the rights-of-way or lands appurtenant thereto, until notified by the owners that West County Wastewater has obtained proper authority to do so from the owners of such property or improvements. Thereafter and before it begins such work, the Contractor shall give such owners convenient access and reasonable cooperation in the Contractor's removal, shoring of, support of , or otherwise protecting such lines, ditches, and structures and for replacing same.

1. The Contractor shall exercise care to prevent damage to adjacent walks, streets, culverts, and gutters; where the Contractor's equipment will pass over these obstructions, it shall place suitable planking.

2. The Contractor will not be entitled to any extension of time or any extra compensation on account of any postponement, interference, or delay caused by any such line, ditch, or structure being on or adjacent to the site of work except as provided in Section 00 72 11, Differing Site Conditions.

3. The Contractor shall preserve and protect all cultivated and planted areas, and vegetation such as trees, plants, shrubs, and grass on or adjacent to the premises, which, as determined by the Engineer, do not reasonably interfere with the performance of work. The Contractor must compensate the owner for damage to any such areas and vegetation and for unauthorized cutting of trees and vegetation, including without limitation, damage arising from the performance of its work through operation of equipment or stockpiling of materials. All costs in connection with any repairs or restoration necessary or required by reason of any such damage or unauthorized cutting shall be borne by the Contractor.

00 72 20 LAWS AND REGULATIONS

A. The Contractor shall keep itself fully informed of, and shall observe and comply with, all laws, ordinances, and regulations which in any manner affect those engaged or employed on any work, or the materials and equipment used in any work or, which in any way affect the performance of any work, and of all orders and decrees of agencies having any jurisdiction or authority over work performed under the Contract.

B. If the Contractor discovers any discrepancy or inconsistency between the Contract and any such law, ordinance, regulation, order, or decree, the Contractor shall immediately report the same in writing to West County Wastewater. The Contractor shall be responsible for compliance by its subcontractors of all tiers with the provisions of this Section.

1. The Contractor is particularly directed to Part 7, Chapter 1, Section 2, Sections 1770 et seq. of the Labor Code of the State of California. Reference is hereby made to the provisions for minimum per diem wages contained in Section 00 11 16, Invitation to Bid.

C. The Contractor and each subcontractor engaged in the work shall pay each respective employee thereof an amount not less than the general prevailing rate of per diem wages established in compliance with Section 1770 et seq. of the Labor Code of the State of California and as determined by the Director of Industrial Relations to be effective and applicable for the various crafts, trades or type of worker needed or required to execute the contracts. In accordance with Section 1770 of said Labor Code, nothing otherwise provided under Article 2 of said Code shall prohibit the payment of wage rates to any worker in excess of such prevailing rates of wages as determined by the Director of the Department of Industrial Relations. However, should the Contractor or a subcontractor have a contractual relationship with workers whereby per diem rates of wages are paid in excess of such determined prevailing rates of wages, the Contractor or subcontractor shall identify and submit a certified listing of such workers and the amounts payable prior to beginning construction operations applicable thereto in accordance with this General Condition.

1. Failure of the Contractor or any subcontractor to certify and list workers and actual wages in excess of those effective as determined by the Director of Industrial Relations will constitute an express statement by the Contractor or such subcontractor that actual wages will be as determined by the Director of

Industrial Relations and will be paid to all workers and be applicable to all work required and ordered under the Contract.

2. The possibility of labor cost increases within the periods of time established and specified for completion of the Project is one of the elements to be considered by bidding Contractors and their subcontractors. West County Wastewater will not, at any instance of increase thereof, whether initiated by contractors, subcontractors, particular bargaining agreements, Director of Industrial Relations determinations, or otherwise, consider such as the basis of a request for additional compensation to West County Wastewater for work bid as specified and shown.

    a. The Contractor shall comply with the provisions of Article 2, Chapter 1, Part 7, Division 2 (commencing with Section 1770), of the Labor Code, and in particular, Section 1775. In accordance with Section 1775, the Contractor shall forfeit to West County Wastewater or the Division of Labor Standards, as a penalty, up to $50 per each calendar day or portion thereof, for each worker paid less than the prevailing rates for such work or craft in which such worker is employed for any work done under the Contract by him/her or by any subcontractor under the Contractor in violation of the provisions of the Labor Code and in particular, Labor Code Sections 1770 to 1780, inclusive. The amount of the daily penalty will be as determined by the Labor Commissioner in accordance with Section 1775. In addition to such penalty and pursuant to said Section 1775, the difference between the prevailing wage rates and the amount paid to each worker for each calendar day or portion thereof for which each worker was paid less than the prevailing wage rate shall be paid to each worker by the Contractor.

    b. Where prevailing wage determinations have been predetermined to change during the Contract (beyond expiration dates as indicated on the forms), the Contractor shall obtain such changes from the Prevailing Wage Unit, Division of Labor Statistics and Research, Department of Industrial Relations, 525 Golden Gate Avenue, San Francisco, California 94102, telephone (415) 557-0561, and deliver a copy of the same to the Engineer.

    c. If a Contractor intends to use a craft or classification not shown on the general prevailing wage determinations, the Contractor may be required to pay the wage rate of the craft or classification most closely related to it as shown in the general determinations effective at the time of bid opening.

3. The Contractor stipulates and agrees that pursuant to the provisions of Labor Code, Sections 1810 and 1813, eight hours labor shall constitute a legal day's work, and no worker shall be required or permitted to work more than eight hours in any one calendar day and 40 hours in any one calendar week, except as provided below. Nothing in this provision may be construed to relate to wage determination or in any way affect contractual provisions related to compensation.

    a. As a penalty, the Contractor shall forfeit to West County Wastewater or the Division of Labor Standards $25 for each worker employed in the execution of the Contract by it or by any subcontractor, for each calendar day during which any worker is required or permitted to labor more than eight hours in any one calendar day and 40 hours in any one calendar week in violation of the provisions of the Labor Code of the State of California and in particular, Section 1810 to Section 1815 thereof, inclusive, except that work performed by employees of Contractors in excess of eight hours per day and 40 hours during any one week will be permitted upon compensation for all hours worked in excess of eight hours per day at not less than one and one-half (1-1/2) times the basic rate of pay, as provided in said Labor Code, Section 1815.

4. Payroll Records: The Contractor and subcontractor's attention is directed to the provisions of Section 1776 of the Labor Code of the State of California and to the requirements therein pertaining to the keeping, availability, and filing of accurate payroll records of all journeymen, apprentices, and other workers performing work under this Contract. The Contractor shall comply with the requirements of said section.

    a. Prior to each monthly progress payment, the Contractor shall deliver to the Engineer copies of certified payrolls of its and all subcontractors' forces performing work at the jobsite (or sites established primarily for the work), for labor compliance purposes, and Extra/Force Account

considerations. Such records shall be kept current on an effective day or period basis and in form acceptable to the Engineer. At a minimum, the form shall include the following information:

i. Employee identification by name.

ii. Employee's address and social security number.

iii. Employee's craft and classification (in accordance with Director of Industrial Relations' wage determinations).

iv. Employee's actual per diem wages (in compliance with Section 00 11 16, Invitation to Bid, and this Section 00 72 20, Laws and Regulations).

v. Employee's subsistence and travel allowance (as applicable).

vi. Employee's straight time and overtime hours worked each day and week.

vii. Itemized deductions made from employee's wages.

viii. Apprentices and ratio of apprentices to journeymen.

ix. Contractor's or subcontractor's firm or company name, date or period for which applicable wage rates and allowances are effective, and the employer's signature.

b. The certified payroll records shall be kept on forms provided by the Division of Labor Standards Enforcement, or shall contain the same information as the forms provided by the Division in addition to the above-listed information.

c. The Contractor shall inform West County Wastewater of the location of the above payroll records, including the street address, city and county, and shall, within five (5) working days, provide a notice of change of location and address.

d. The Contractor shall have ten (10) days in which to comply subsequent to receipt of written notice specifying in what respects the Contractor must comply with the provisions of California Code of Labor Section 1776. In the event that the Contractor fails to comply within the ten-day period, the Contractor shall, as a penalty to the state or to West County Wastewater, forfeit twenty-five dollars ($25) for each calendar day, or portion thereof, for each worker, until strict compliance is effectuated. Upon the request of the Division of Apprenticeship Standards, or the Division of Labor Standards Enforcement, these penalties shall be withheld from progress payments then due.

e. Any copy of records made available for inspection as copies and furnished upon request to the public or any public Wastewater by West County Wastewater shall be marked or obliterated in such a manner as to prevent disclosure of an individual's name, address, and social security number.

f. Compliance with the above provisions of 00 72 20 and California Code of Labor Section 1776 shall be the responsibility of the Contractor.

5. Apprentices: The Contractor shall comply with the provisions of Section 1777.5 and 1777.6 of the California Labor Code in regard to employment of apprentices.

6. Labor Discrimination: Attention is directed to Section 1735 of the Labor Code, which reads as follows:

a. No discrimination shall be made in the employment of persons upon public works because of race, religious creed, color, national origin, ancestry, physical disability, mental disability, medical condition, marital status, or sex of such persons, except as provided in Section 12940 of the

Government Code, and every contractor for public works violating this Section is subject to all the penalties imposed for violation of this Chapter.

7. As required by Section 1773.8 of the California Labor Code, the Contractor shall pay travel and subsistence payments to each worker needed to execute the work, as such travel and subsistence payments are defined in any applicable collective bargaining agreements filed in accordance with this section.

8. The Contractor shall comply with all applicable federal, state, and local laws, ordinances, rules, and regulations, and lawful orders of all authorities having jurisdiction for the safety of persons and protection of property, as more particularly described under Sections 00 72 18, Safety, Sanitary, and Medical Requirements, and 00 72 19, Public Access and Safety; Protection of Property of this document.

9. Lateral and Subjacent Support: Attention is directed to Section 832 of the Civil Code of the State of California relating to lateral and subjacent supports. Wherever structures or improvements adjacent to the excavation may be damaged by such excavation, the Contractor shall comply with this law. As provided in Labor Code, Section 6707, a separate bid item is provided for costs of shoring and bracing of excavations five feet or more in depth.

10. The Contractor shall comply with Sections 25102 through 27001 of Title 27, California Code of Regulations The Contractor shall warn all persons at the work site of their exposure to chemicals known to the State to cause cancer or birth defects or other reproductive harm. The Contractor shall be responsible for compliance by its subcontractors with this Section.

11. The Contractor shall comply with Bay Area Air Quality Management District Regulation 11, Rule 2, as it applies to the demolition, renovation, or removal or any building elements and to the disposal of any asbestos-containing waste material.

    a. No regulated asbestos-containing material (RACM) may be stripped or removed unless Contractor has provided at least one on-site representative and certified that that representative is familiar with the provisions of Regulation 11, Rule 2, as it pertains to demolition and renovation and the means of compliance. The representative must be present during all removal and/or stripping of RACM. Contractor shall provide evidence as required under 11-2-303.9 of the Regulation that the required training of the representative has been completed.

    b. The Contractor shall comply with all state laws and regulations regarding asbestos and asbestos-related work, including, but not limited to, the provisions of Labor Code Sections 6501.5 through 6510.

    c. The Contractor shall so perform its work as not to discharge into the atmosphere from any source whatsoever smoke, dust, or other air contaminants in violation of the laws, rules, and regulations of the governmental entities having jurisdiction.

D. Project Labor Stabilization Agreement

All Contracts for which the Contract Price is more than $1,000,000 are subject to the provisions of the Project Labor Stabilization Agreement—West County Wastewater ("PLSA"), effective January 1, 2021, which is set forth fully in these General Conditions. Contractor shall comply with the provisions of the PLSA and shall execute the Agreement to be Bound by the PLSA in the form set forth in Addendum A to the PLSA.

E. Agreement to Assign (Contractors and Subcontractors)

1. The Contractor's and subcontractors' attention is directed to the provisions of Government Code, Section 4552, which requires that, in entering into a public works contract or subcontract, contractors and subcontractors agree to assign to the purchasing body all rights arising from violations of antitrust regulations. In pertinent part, Government Code, Section 4552, reads as follows:

"In submitting a bid to a public purchasing body, the bidder offers and agrees that if the bid is accepted, it will assign to the purchasing body all rights, title, and interest in and to all causes of action it may have under Section 4 of the Clayton Act (15 U.S.C. Sec. 15) or under the Cartwright Act (Chapter 2 (commencing with Section 16700) of Part 2 of Division 7 of the Business and Professions Code), arising from purchases of goods, materials, or services by the bidder for sale to the purchasing body pursuant to the bid. Such assignment shall be made and become effective at the time the purchasing body tenders final payment to the bidder."

F. The Contractor's attention is directed to the provisions of Health and Safety Code, Section 7050.5, relating to the discovery of human remains. Upon any such discovery, Contractor shall not further excavate or disturb the site. The Contractor shall immediately notify West County Wastewater and the Contra Costa County Sheriff-Coroner's Office of any such find and shall comply with all other applicable laws and regulations.

G. The Contractor's attention is directed to the provisions of Health and Safety Code, Section 7050.5 and Public Resources Code, Sections 5097.5, 5097.94, 5097.98, and 5097.99, relating to the excavation, removal, destruction, injury, and defacement of historic or prehistoric ruins, burial grounds, archeological or vertebrate paleontological sites, or any other archeological, paleontological or historical feature. The Contractor shall immediately stop work in the area of any archeological discovery and notify West County Wastewater and comply with all other laws and regulations upon discovery of any such remains in the construction site. Compensation to the Contractor, if any, for lost time or changes in construction to avoid the find will be determined in accordance with changed conditions or change order provisions of the Contract.

H. Claims and Actions Against Public Entities and Employees

1. The Contractor's and subcontractors' attention is directed to Government Code Section 900 et seq., dealing with claims and actions against public entities and employees. Nothing contained in this Contract, including but not limited to Section 00 72 12, Changes and Extra Work, Subsection E, is intended to modify or remove the requirements set forth in these Government Code sections.

2. If the Contractor intends to file a claim with West County Wastewater for compensation in excess of the Contract amount or for the return of liquidated damages, the claim must be in writing and include all Documents necessary to substantiate the claim. These Documents may include invoices, cost breakdowns, and other documentation explaining the details of how the Contractor calculated the amount claimed. The claim must be filed on or before the date of final payment. Nothing in this subdivision will extend the time limit or supersede notice requirements otherwise provided by this Contract or by law relating to requests for extra compensation or extensions of time.

3. For claims of less than fifty thousand dollars ($50,000), West County Wastewater will respond in writing to any written claim within 45 days of receipt of the claim, or may request, in writing, within 30 days of receipt of the claim, any additional documentation supporting the claim or relating to defenses or claims West County Wastewater may have against the Contractor.

    a. If additional information is thereafter required by West County Wastewater, it shall be requested and provided by the Contractor pursuant to this subdivision within 20 days of the request from West County Wastewater or as otherwise mutually agreed upon by West County Wastewater and the Contractor.

    b. West County Wastewater's written response to the claim, as further documented, shall be submitted to the Contractor within 15 days after receipt of the further documentation or within a period of time no greater than that taken by the Contractor in producing the additional information, whichever is greater.

4. For claims of over fifty thousand dollars ($50,000) and less than or equal to three hundred seventy-five thousand dollars ($375,000), West County Wastewater shall respond in writing to all written claims within 60 days of receipt of the claim, or may request, in writing, within 30 days of receipt of the claim, any additional documentation supporting the claim or relating to defenses or claims West County Wastewater may have against the Contractor.

a. If additional information is, thereafter, required, it shall be requested and provided pursuant to this subdivision within 30 days of the request by West County Wastewater or otherwise mutually agreed upon by West County Wastewater and the Contractor.

b. West County Wastewater's written response to the claim, as further documented, shall be submitted to the Contractor within 30 days after receipt of the further documentation, or within a period of time no greater than that taken by the Contractor in producing the additional information or requested documentation, whichever is greater.

5. If the Contractor disputes West County Wastewater's written response, or if West County Wastewater fails to respond within the time prescribed, the Contractor may so notify West County Wastewater, in writing, either within fifteen (15) days of receipt of West County Wastewater's response or within fifteen (15) days of the West County Wastewater's failure to respond within the time prescribed, respectively, and demand an informal conference to meet and confer for settlement of the issues in dispute. Upon a demand, West County Wastewater shall schedule a meet and confer conference within (thirty) 30 days for settlement of the dispute.

6. If following the meet and confer conference the claim or any portion remains in dispute, the Contractor may file a claim pursuant to Chapter 1 (commencing with Section 900) and Chapter 2 (commencing with Section 910) of Part 3 of Division 3.6 of Title 1 of the Government Code. For purposes of those provisions, the running of the period of time within which a claim must be filed shall be tolled from the time the Contractor submits its written claim pursuant to paragraph 2 above until the time the said claim is denied pursuant to the procedures set forth herein, including any period of time utilized by the meet and confer conference.

00 72 21 PERMITS

A. West County Wastewater's Permits, Easements, and Agreements

1. The Contractor's attention is directed to the Project Documents and to any parcel numbers appearing thereon which relate to an easement, permit, or agreement acquired by West County Wastewater for rights-of-way and land use to perform the work and which is contained in the easements, permits, and agreements on file at the West County Wastewater Administrative Offices, identified in Section 00 11 16, Invitation to Bid of the Contract Documents .

2. All work within the various private and public properties shown containing a parcel number must be accomplished in conformance with any specific conditions, instructions, and/or requirements or the respective easement, permit, or agreement.

3. Where the conditions and/or requirements of such easements, permits, or agreements are greater than the conditions and/or requirements of West County Wastewater's Standard Specifications or supplementary conditions and/or requirements prescribed in other portions of the Contract, the conditions and/or requirements of such easements, permits, or agreements will govern.

4. West County Wastewater will, at its expense, provide the appropriate easements for the work included in the Contract. West County Wastewater-provided easements will be shown in the Contract Documents . West County Wastewater may provide additional land for working space, haul roads, and for storage of materials and equipment. If West County Wastewater provides additional land, that land will be shown in the Project Documents or Specifications. The Contractor may use portions of such easements and land as approved, for working space, haul roads, and for storage of materials and equipment. If the Contractor finds it necessary or advantageous to use any additional land for any purpose whatever, the Contractor shall, at its expense, provide for the use of such land.

B. Construction Permits and Licenses

1. The Contractor shall obtain and pay for all construction permits and licenses necessary for the performance of the Contract and shall give all public notices necessary for the lawful performance of the Contract.

2. Where West County Wastewater has secured Project right-of-way by obtaining the required permits, easements, or agreements as stated in 00 72 21A, and said permit, easement, or agreement requires a subsequent contingent construction permit, inspection, or other related requirements, the Contractor shall meet these additional requirements. The inspection fees charged by regulatory agencies for such subsequent contingent permits shall be paid by the West County Wastewater. However, if the inspection fee is charged as a result of Contractor's noncompliance with the permit requirements, such inspection fee shall be paid by the Contractor.

C. Taxes

1. The Contractor shall pay all taxes, levies, duties, and assessments of every nature due and payable by the Contractor in connection with any work under the Contract, shall make any and all payroll deductions required by law, and shall indemnify and hold harmless West County Wastewater from any liability on account of any and all such taxes, levies, duties, assessments, and deductions.

00 72 22 RECORDS AND ACCOUNTS

A. The Contractor shall, at its expense, keep and maintain such records and accounts in connection with the performance of the Contract, and will furnish to West County Wastewater upon request, that provide an accurate written allocation of the total amount of the price paid for the performance of the work under the Contract to the various elements of the work, as may be required by West County Wastewater for accounting purposes and for public record. Such records and accounts shall remain accessible to West County Wastewater for a period of not less than three years beyond the date of formal acceptance as provided under Section 00 72 41, Final Payment and Release.

00 72 23 TESTING

A. Contractor shall perform or arrange for performance of testing of materials or work as specified herein or by testing organizations approved by West County Wastewater.

1. General. Where the Specifications require work to be specially tested or approved, the work may be tested only in the presence of the Engineer after timely notice of its readiness for inspection and test, and the work after testing may be covered up only upon the consent of the Engineer.

   a. The results of any tests made are for the information of the Engineer. Regardless of any test results, the Contractor is solely responsible for the quality of workmanship and materials and for compliance with the requirements of the Project Documents and Specifications.

   b. Except as specifically required under detailed materials specifications for shop testing and inspection, all tests of materials furnished by the Contractor where tests will be made by the Engineer will be done in accordance with commonly-recognized standards of national organizations. The Contractor shall furnish such samples of all materials as required by the Engineer without charge. No material may be used unless it has been determined to be acceptable by the Engineer.

   c. Where such inspection and testing is to be conducted by an independent laboratory or Wastewater, the sample(s) of materials to be tested will be selected by such laboratory or Wastewater, or the Engineer, not by the Contractor.

   d. Water for curing concrete will be provided from a source approved by the Engineer and shall be furnished and disposed of by the Contractor.

   e. All piping must be pneumatically or hydraulically tested for tightness.

   f. Where water testing of piping is required, the Contractor shall furnish and dispose of the water which is required for testing of piping and dispose of it in accordance with applicable regulations.

2. Costs of Testing

a. The Contractor shall be responsible for arranging, and shall pay for, all off-site tests of materials required. The Engineer, unless specified otherwise in Technical Specifications, may witness all off-site tests, and the Contractor shall furnish adequate notice of when tests will be made.

b. The Contractor shall be responsible for arranging, and shall pay for, all on-site tests, except those tests specifically noted to be performed and paid for by West County Wastewater. The Engineer may witness all on-site tests performed by the Contractor, and the Contractor shall furnish adequate notice of when tests will be made.

c. When, in the opinion of the Engineer, additional tests or inspections are required because of the manner in which the Contractor executes its work, West County Wastewater will pay for the additional tests and expenses, but the amounts paid will be deducted from the Contract price. Examples of such additional tests and inspections are: tests of materials substituted for previously-accepted materials or substituted for specified materials or retests made necessary by non-compliance of material with the requirements of the Specifications.

00 72 24 PUBLICATIONS

A. No publications or advertisements concerning the subject matter of the Contract may be made by or on behalf of the Contractor, its subcontractors, or suppliers, without the prior written authorization of West County Wastewater.

B. No advertising signs may be erected at the site of the work.

00 72 25 (NOT USED)

00 72 26 ACCESS TO WORK AREAS

A. West County Wastewater and its officers, agents, employees, and any other duly authorized representatives and employees, and all duly authorized representatives of governmental agencies having jurisdiction over work areas or any part thereof shall at all reasonable times, for the purpose of determining compliance with Contract requirements, have access to the areas and the premises used by the Contractor. The Contractor shall also arrange for West County Wastewater, and its officers, agents, employees, and any other duly authorized representatives and employees, to have access at all reasonable times to all places where equipment or materials are being manufactured, produced, or fabricated for use under the Contract.

B. The Contractor's attention is drawn to the fact that during the course of the work of this Contract, existing sewerage facilities will be used and maintained by West County Wastewater's personnel. The Contractor shall coordinate its work in such a way as to interfere as little as possible with the routine work of existing facility operation consistent with the necessity for making the connections as specified and as shown on the Project Drawings. Contractor's work force will be excluded from access to and use of existing facilities except in direct pursuit of the work of this Contract without the prior approval of the Engineer. The Contractor shall provide safe access at all times to all existing facilities for operating personnel and equipment.

00 72 27 ILLUMINATION

A. Should any work be performed at night as provided under Section 00 72 43, Night and Weekend Work, or where daylight is shut off or obscured, the Contractor shall, at its expense, provide artificial light sufficient to permit work to be carried on efficiently, satisfactorily, and safely, and to permit thorough inspection. The Contractor shall also assure that access to the place of work is clearly illuminated. The Contractor shall install and maintain all wiring for electric light and power in accordance with all applicable standards, securely fastened in place at all points, and kept as far as possible from other electrical wires, telephone wires, signal wires, and wires used for firing blasts.

00 72 28 INSPECTION AND SAMPLE SPECIMENS

A. Unless otherwise provided in the Contract, all equipment, materials, and work will be subject to inspection and testing by the Engineer. The Engineer may reject equipment, materials, and work not in accordance with the

Contract. Rejected work must be satisfactorily corrected; rejected equipment must be satisfactorily repaired or replaced with satisfactory equipment; and rejected material must be replaced with satisfactory material, all in accordance with the Contract. The Contractor shall promptly segregate and remove rejected materials and equipment from the premises. All such correction, repair, replacement, and removal must be performed by and at the expense of the Contractor.

B. The Engineer will perform inspections so as not to delay the work unreasonably, and the Contractor shall perform its work in such manner as not to delay inspection unreasonably. The Contractor shall give the Engineer reasonable advance notice of operations requiring special inspections or tests, and it may request inspection of a portion of any work at any time by reasonable advance notice to the Engineer. The Contractor shall, at its expense, furnish promptly all facilities, labor, and materials necessary and required for such inspection and tests.

C. The Contractor will bear any additional inspection costs resulting from its failure to have a portion of work ready for inspection at the time requested by it for inspection, or from inspection of any previously rejected portion of work where the defects requiring such rejection were caused by the Contractor. The costs may be deducted, in whole or in part, from any monies due or that may become due to the Contractor under the Contract.

D. The Contractor shall furnish the Engineer with all reasonable facilities for the Engineer's safety and convenience in inspecting work, at all times and at all places where inspection may take place. If the Engineer finds that conditions are unsafe for inspection at a particular location, the Engineer may, upon notice to the Contractor, refuse to inspect in that location until the unsafe conditions are corrected. The Contractor shall bear any additional costs resulting from the Engineer's determination, including any costs incurred to permit subsequent inspection of any portion of work covered or completed at the location before correction of the conditions, whether or not that work is found to meet Contract requirements.

E. The Engineer may inspect materials and finished articles to be incorporated into any work at the place of production, manufacture, or shipment. When the Engineer is to perform such an inspection, no such materials or finished articles may be shipped from the place of inspection or incorporated in any work prior to inspection or without the written approval of the Engineer. Equipment, materials, and work not in conformity with the Contract must be corrected or replaced with satisfactory equipment and materials by and at the expense of the Contractor so as to conform to the Contract as determined by the Engineer.

F. Inspections by the Engineer of equipment, materials, or work do not constitute acceptance by West County Wastewater of such equipment, materials or work. Any such inspections, tests or waivers will not relieve the Contractor of its responsibility for meeting the requirements of the Contract.

G. Where required in the Contract, or whenever requested by the Engineer, the Contractor shall, at its expense, promptly furnish to the Engineer sample specimens of materials to be incorporated into any work. The Contractor shall submit samples in an orderly sequence so that dependent materials or equipment can be assembled and reviewed without causing delays in the work. Samples of material from natural sources must be taken in the presence of the Engineer; otherwise, the sample will not be considered for testing. The Contractor shall tag or securely label samples and samples shall fully identified as to manufacturer, type, size or capacity, lot, and date, all as applicable and by reference to the applicable section and paragraph of the Contract. Materials for which samples are required may not be used in any work until approved in writing by the Engineer. Materials incorporated in any work must conform to such samples as the Engineer determines meet the requirements of the Contract. Samples will be returned to the Contractor only at the discretion of the Engineer.

00 72 29 PROGRESS

A. The construction plant and equipment provided by the Contractor, its labor force, and its methods and organization for handling work, must achieve the necessary quality of work and rate of progress required by the Contract.

B. If at any time during the progress of work, the Contractor's actual progress, as determined by the Engineer, is inadequate to meet the requirements of the Contract, the Engineer may notify the Contractor of such imminent or actual noncompliance with the Contract. The Contractor shall thereupon take such steps as may be necessary to improve its progress including, but not limited to, an increase in the labor force, the number of shifts, and/or

overtime operations, days of work and/or the amount of construction equipment, all without additional cost to West County Wastewater. Neither such notice by the Engineer nor the Engineer's failure to issue such notice will relieve the Contractor from its obligations to achieve the quality of work and rate or progress required by the Contract.

C. The Contractor's failure to comply with the Engineer's instructions pursuant to the Contract may be grounds for the Engineer's determination that the Contractor is not prosecuting work with such diligence as will assure completion within the times specified. Upon such determination, West County Wastewater may terminate the Contractor's right to proceed with the performance of the Contract, or any separable part thereof, in accordance with Section 00 72 36, Termination of Right to Proceed.. Such termination will be without prejudice to any other remedies available to West County Wastewater.

D. In the event of a dispute between the Parties as to performance of the work, the interpretation of this Contract, or payment or nonpayment of work performed, the parties shall attempt to resolve the dispute. If the dispute is not resolved and West County Wastewater has not terminated the Contract in accordance with Section 00 72 36, Termination of Right to Proceed, then the Contractor shall continue the work diligently to completion and will neither rescind this Contract nor stop the progress of the work. In the event any litigation is commenced with respect to this Contract, such litigation will not suspend Contractor's obligation to continue performance of the work hereunder.

00 72 30 (NOT USED)

00 72 31 RESPONSIBILITY FOR WORK; PRECAUTIONS; SECURITY

A. The Contractor bears all responsibility for material and skilled application of all work furnished and performed under this Contract, including any Amendments to this Contract. At the completion of this Contract, the construction must constitute a complete and operable facility. In the event an error or omission is discovered in the Contract during the course of the work, the Contractor shall promptly notify the Engineer in writing. If the Engineer determines that remedial measures are necessary requiring extra work clearly outside the scope of the Contract work, the Parties will negotiate a Change Order in accordance with Section 00 72 12, Changes and Extra Work.

1. The Contractor will bear any and all risk of loss of, or damage to, any work and all materials and equipment until final acceptance under the Contract, unless such loss or damage results from the active negligence of West County Wastewater or any Act of God as defined herein.

B. As provided in Sections 7105 California Public Contract Code, the Contractor will not bear responsibility for the cost of repairing or restoring damage to the work if the damage is determined to have been proximately caused by an Act of God, in excess of five percent of the contracted amount, provided that the work damaged was built in accordance with accepted and applicable building standards and the Project Documents and Specifications of West County Wastewater. For purposes of this section, the term "Acts of God" shall include only the following occurrences or conditions and effects: earthquakes in excess of a magnitude of 3.5 on the Richter Scale and tidal waves. The Contractor shall promptly take all necessary precautions against any conditions created during the performance of the Contract which involve a risk of bodily harm to others or a risk of damage to work or to property, including the property of West County Wastewater. The Contractor shall inspect all work, materials, and equipment to discover any such conditions.

C. Existing fences may enclose some or all portions of the Project site. The fences are for the protection and security of existing facilities. While it may be necessary for the Contractor to remove some of the fences for the installation of new structures, fences, and pipelines, the Contractor's operations may not reduce the present protection and security. If the present fences are removed, an equivalent temporary continuous perimeter protection shall be provided, and new fence shall be installed in the locations shown, prior to completion of the work.

D. The Contractor may not assume that any fence or other existing enclosure about existing facilities provide appropriate security for either equipment, plant, or materials intended to be employed or incorporated in the work.

E. The Contractor shall assume all liability for its failure to comply with the foregoing regardless of any right the Engineer may have to inspect the Contractor's work.

00 72 32 STORAGE OF MATERIALS AND EQUIPMENT

A. The Contractor shall, at its expense, store all materials and equipment as specified in the Contract or, where not specified, in such a manner as to assure the preservation of their quality and fitness, and so as to facilitate prompt inspection by the Engineer.

00 72 33 USE OF COMPLETED PORTIONS OF THE WORK

A. Partial Beneficial Use. "Partial beneficial use" means the use of a portion of the Contract work by West County Wastewater before that portion of work is to be put in service and before acceptance of the Contract by West County Wastewater. The portion of the contract work is usually a system or facility which can be operated or used independently from other systems or facilities included in the Contract and is not required for the proper operation of other systems or facilities.

1. West County Wastewater may, at any time, in a written order to the Contractor (1) declare that West County Wastewater intends to use a specified part of the work, which in West County Wastewater's opinion is sufficiently complete to permit use of said work, (2) enclose a tentative list of items remaining to be completed or corrected within the area designated for partial beneficial use, and (3) fix the date of commencement of partial beneficial use.

2. The warranty period for a part of the work which is specified for partial beneficial use will start on the date which is fixed for commencement of partial beneficial use.

3. If, as a result of the Contractor's failure to comply with the provisions of the Contract, such partial beneficial use proves to be unsatisfactory to West County Wastewater, West County Wastewater may continue such use until such portion of work can, without adversely affecting West County Wastewater, be taken out of service for correction of defects, errors, omissions, or replacement of unsatisfactory materials or equipment, as necessary for such work to comply with the Contract. The time for the Contractor to complete of corrections or replacements may not exceed six months from the date of acceptance of the Contract, unless otherwise agreed in writing by the Parties.

4. The Contractor may not use any portions of the work that have been accepted for partial beneficial use nor any facilities which existed prior to the date it commenced work on the Project unless the Engineer approves such use in writing. Where the Contractor's written request is granted for the use of portions of the work located at facilities declared as being subject to partial beneficial use, the Contractor shall properly use and maintain, and upon completion of the Contractor's use and at the Contractor's expense, recondition said portions of the work or facilities to the satisfaction of West County Wastewater.

B. Substantial Completion. "Substantial completion" means construction sufficiently completed in accordance with the Contract so that West County Wastewater can occupy or utilize all portions and all systems of the work for all of the uses for which said work was intended, including seven continuous days of successful operation of the entire system.

1. When the Contractor determines that the work is substantially completed, the Contractor shall prepare and submit to West County Wastewater a list of items to be completed or corrected and request an inspection for substantial completion. The Contractor's failure to include any items on the list does not alter the Contractor's responsibility to complete all work in accordance with the Contract. If West County Wastewater determines on the basis of the inspection that all portions and all systems of the work are substantially complete, West County Wastewater will prepare a certificate of substantial completion which will: (1) establish the date of substantial completion of the work; (2) state the responsibilities of West County Wastewater and the Contractor for security, maintenance, operation, and insurance; and (3) fix the time within which the Contractor must complete the items listed in the certificate. West County Wastewater shall submit the Certificate of Substantial Completion to the Contractor.

2. Approval by West County Wastewater of a Certificate of Substantial Completion will not constitute acceptance of the work nor start the warranty period. Approval of a Certificate of Substantial Completion will fix the date for lowering the amount of liquidated damages to the value specified in the Contract for the period after substantial completion.

00 72 34 CLEANING UP

A. The Contractor shall, at all times, keep the premises occupied by it in relation to this Contract, in a neat, clean, and safe condition and at all times provide reasonable access to the premises. The Contractor shall, at a minimum, conduct daily inspections to verify its compliance with this Section.

B. During the progress of the work, the Contractor shall:

1. Retain all stored items in an orderly arrangement allowing maximum access, not impeding drainage or traffic, and providing the required protection of material.

2. Provide adequate storage of all items awaiting removal from the jobsite, observing all requirements for fire protection and protection of the environment.

3. Remove any accumulation of scrap, debris, waste material, and other items not required for construction of this work.

4. Dispose of existing materials and equipment to be demolished and removed and all trash such as broken concrete, wood blocking, shipping containers, etc., resulting from the contract work off the premises occupied by the Contractor, including West County Wastewater property, at the Contractor's expense. Contractor may not use West County Wastewater-leased dumpsters and other disposal containers on West County Wastewater's property except for those specifically provided by the Contractor.

5. Maintain all excavation, embankments, haul roads, permanent access roads, Plant site, waste disposal areas, borrow areas, and all other work areas within contract work limits free from dust, as determined by the Engineer. Industry-accepted methods of dust control suitable for the area involved, such as sprinkling, chemical treatment, light bituminous treatment, or similar methods, are permitted. West County Wastewater will not make any separate payment to the Contractor for dust control.

C. If the Contractor fails to comply with any of the foregoing provisions, West County Wastewater will transmit written notification of noncompliance to Contractor. If, the Contractor fails to comply within five days after the written notification West County Wastewater may undertake cleanup at the Contractor's expense.

D. Upon its completion of any portion of any work, the Contractor shall promptly remove all of its equipment, temporary structures, and surplus construction and other materials not to be used at or near the same location during later stages of work. Upon completion of any work and before final inspection is made, the Contractor shall, unless otherwise specifically directed by the Engineer:

1. Remove from the job site all plant, buildings, tools, surplus materials, equipment, forms, rubbish, scrap, debris, and waste.

2. Hose down all paved areas on the site. Completely remove all resultant debris.

3. Visually inspect all interior surfaces, and remove all traces of soil, waste material, smudges, and other foreign matter. Remove all traces of splashed materials from adjacent surfaces. Remove all paint droppings, spots, stains, and dirt from finished surfaces. Use only approved cleaning materials and equipment.

4. Restore any improved area used for the Contractor's work or material storage to its condition at the time the Contractor moved onto the site or to the satisfaction of the Engineer.

5. Schedule final cleaning and improvement restoration to enable West County Wastewater to accept a completely clean and restored project.

00 72 35 PROGRESS, COMPLETION, DELAYS, AND EXTENSIONS OF TIME

A. The time limits stated in the Contract are of the essence of the Contract. By executing the Contract, the Contractor confirms that the time limits set forth in the Contract, including interim or milestone dates, are reasonable periods for the performance of the work. The Contractor will not be entitled to extensions of time limits during the progress of the work unless it demonstrates that: (1) the delay is occasioned by an act or neglect of West County Wastewater; or (2) the delay in the completion of the work arises from unforeseeable causes beyond the control and without fault or negligence of both the Contractor and its subcontractors or suppliers. Such unforeseeable causes may include: acts of God; acts of a public enemy; acts of a governmental entity not occasioned by the Contractor's, subcontractor's or supplier's conduct; acts of another contractor in performance of a contract with West County Wastewater; fires; floods; epidemics; quarantine restrictions; freight embargoes; unusually severe weather; or other delays of subcontractors or suppliers arising from unforeseeable causes beyond the control and without the fault or negligence of both the Contractor and such subcontractors or suppliers.

B. If the Contractor seeks an extension of time for the completion of any phase of the work, the Contractor must file with the Engineer a written request for an extension of time for the portion of the work so delayed no later than ten days after the onset of the delay, and the request must fully state the reasons for the delay. When such a request is received, the Engineer will ascertain the reasons for and the extent of such delay. If the Engineer determines that the facts justify an extension of time, the Parties will modify the Contract accordingly, in writing. The Engineer will deny any request that is determined not to justify an extension of time. The Engineer will provide the Contractor with the factual findings regarding either determination of a request for time extension. The Engineer's findings will be final unless the Contractor files a protest under Section 00 72 1, Authority of the Engineer and Contractor's Appeal Procedure. West County Wastewater will not a time extension for any portion of any delay unless the Contractor has timely made the required written request and the Engineer finds justification for the request.

C. West County Wastewater may make changes to the work or suspend the work. Regardless of the number of such changes made by West County Wastewater, such changes or suspensions are within the contemplation of the Parties and will not be a basis for compensable delay to the Contractor.

D. No time extensions except for a delay that:

1. impacts the Project's critical path,

2. consumes all available float, slack time, or schedule contingency within the construction schedule (the time between the Contractor's scheduled early completion date and the Contract completion date), and

3. extends work beyond the Contract completion date.

E. Float, slack time, or schedule contingency within the construction schedule is not for the exclusive use nor benefit of the West County Wastewater or the Contractor but is a resource available to both parties as needed.

00 72 36 TERMINATION OF RIGHT TO PROCEED

A. If the Contractor refuses or fails, except in cases for which extension of time is provided, to supply enough properly skilled workers, proper equipment and proper appliances or proper materials for the work, or if it should fail to make prompt payments to subcontractors or for material or labor, or disregard laws, ordinances, or the instructions of the Engineer, or otherwise be guilty of a substantial violation of any provision of this contract, then West County Wastewater, upon certification of the Engineer that sufficient cause exists to justify such action, may without prejudice to any other right or remedy serve written notice upon the Contractor and Surety of its intention to terminate the performance of the Contractor and of the reasons for such termination. Unless Contractor ceases the cause for such intention to terminate and makes satisfactory arrangement for correction no later than seven days after West County Wastewater serves the notice, the Contractor's right to proceed with the work will terminate. If Contractor: (1) is terminated pursuant to this Section 00 72 36; (2)is

adjudged as bankrupt:(3) makes a general assignment for the benefit of its creditors; or (4) has a receiver should be appointed on account of its insolvency, West County Wastewater shall serve notice thereof upon the Surety and Contractor. No later than seven days after service of this notice by West County Wastewater, the Surety may perform the Contract. However, if the Surety does not commence performance of the Contract within the period mentioned in the preceding sentence, West County Wastewater may take possession of the premises and of all materials, tools, equipment, and appliances on the premises and finish the work by whatever method West County Wastewater may deem expedient. In that instance, the Contractor will not receive any further payment until the work is complete. If the unpaid balance of the Contract price exceeds the expense of finishing the work, including compensation for additional managerial and administrative services performed by or for West County Wastewater, West County Wastewater shall pay such excess to the Contractor. If such expense exceeds the unpaid balance, the Contractor and Surety shall pay the difference to West County Wastewater. The Engineer shall certify the expense incurred by West County Wastewater and the damage incurred through the Contractor's default. Service of any notices under this Section 00 72 36 hereunder will be complete upon the deposit of the notice in the United States mail, postage prepaid, addressed to the address of the Contractor and Surety as shown on records on file with West County Wastewater.

B. Termination of the Contractor under this Section 0072 36 will not limit any other remedies available to West County Wastewater.

C. Upon receipt of any written notice of termination of right to proceed, the Contractor shall, at its expense, for the work affected by the termination:

1. Assist West County Wastewater in making an inventory of all materials and equipment in storage at the site, en route to the site, and on order from suppliers.

2. Assign to West County Wastewater any subcontracts, supply contracts, and equipment rental agreements so designated by West County Wastewater.

3. Remove from the site all construction materials, equipment, and plant listed in the inventory other than any construction materials, equipment, and plant which are designated in writing by West County Wastewater to be used by West County Wastewater in completing the work.

00 72 37 TERMINATION FOR CONVENIENCE

A. Including, but not limited to, because of termination in the event of national emergency pursuant to Section 4410 et. seq. of the Government Code of the State of California, West County Wastewater may, at its option, cancel and terminate the Contract in whole or in part at any time by written notice of termination to the Contractor, whether or not the Contractor is in default.

B. Upon any such cancellation and termination, the Contractor will not be entitled to assert claims for damages, including loss of anticipated profits, on account of the cancellation and termination. The Contractor's sole remedy in such event will be the payment of the Contractor by West County Wastewater in accordance with subparagraph B.2, below. Any such payment will be made subject to the survival, in full force and effect, of the provisions of the Contract which by their nature survive final acceptance under the Contract to the extent provided in such provisions.

1. Upon receipt of any such notice, the Contractor shall, unless the notice requires otherwise:

a. Immediately discontinue work on the date and to the extent specified in the notice.

b. Place no further orders or subcontracts for materials, services, or facilities, other than as may be necessary or required for completion of such portion of work under the Contract that is not terminated.

c. Promptly make every reasonable effort to obtain cancellation upon terms satisfactory to West County Wastewater of all orders and subcontracts to the extent they relate to the performance of work terminated.

d. Assist West County Wastewater as specifically requested, in writing, in the maintenance, protection, and disposition of property acquired by West County Wastewater under the Contract.

2. Upon any termination for convenience, West County Wastewater will pay the Contractor an amount determined in accordance with the following (without duplication of any item):

a. All amounts due and not previously paid to the Contractor for work completed in accordance with the Contract prior to the notice, and for work thereafter completed as specified in the notice.

b. The cost of settling and paying claims arising out of the termination of work under subcontracts or orders as provided in subparagraph B.1.c, above.

c. The reasonable costs incurred pursuant to subparagraph B.1.d, above.

d. Any other reasonable costs incidental to the termination of work.

e. The foregoing amounts will include a reasonable sum, under all of the circumstances, as profit for any work performed by the Contractor.

00 72 38 SUSPENSION

A. West County Wastewater may, in its sole discretion, suspend at any time the performance of all or any portion of work to be performed under the Contract by notice in writing to the Contractor. . Upon such notice, West County Wastewater shall designate the amount and type of plant, labor, and equipment to be committed to the Project. During the period of suspension, the Contractor shall use its best efforts to utilize its plant, labor, and equipment in such a manner as to minimize costs associated with suspension.

1. Upon receipt of such notice, the Contractor shall, unless the notice requires otherwise:

a. Immediately discontinue work on the date and to the extent specified in the notice.

b. Place no further orders or subcontracts for material, services, or facilities with respect to suspended work other than to the extent required in the notice.

c. Promptly make every reasonable effort to obtain suspension upon terms satisfactory to West County Wastewater of all orders, subcontracts, and rental agreements to the extent that they relate to the performance of the work suspended.

d. Unless otherwise specifically stated in the notice, the Contractor shall continue to protect and maintain the Project including those portions on which work has been suspended.

2. As full compensation for a period of suspension, the Contractor will be reimbursed for the following costs, reasonably incurred, without duplication of any item, to the extent that such costs directly result from the suspension of work:

a. A standby charge to be paid to the Contractor during the period of suspension of work which will be sufficient to compensate the Contractor for keeping, to the extent required in the notice, its organization and equipment committed to the Project in a standby status.

b. All reasonable costs associated with mobilization and demobilization of the Contractor's plant, forces, and equipment.

c. A reasonably supported amount to reimburse the Contractor for the cost of maintaining and protecting that portion of the Project upon which work has been suspended.

d. If, as a result of any such suspension of work, the cost to the Contractor for subsequently performing work is increased or decreased, West County Wastewater will adjust the cost of performing the remaining portion of the work.

B. Upon its receipt of notice to resume suspended work, the Contractor shall immediately resume work on the suspended work to the extent required in the notice. The Contractor shall file with West County Wastewater any request for a time extension or compensation for costs incurred during the suspension no later than ten days after its receipt of the notice to resume work, and the Contractor shall also submit for review a revised construction schedule.

00 72 39 MEASUREMENT AND PAYMENT

A. Where the weight of parts and items furnished by Contractor relates to measurement and payment under the Contract, unless otherwise provided in the Contract, the Engineer will decide the method to be used in determining the weight of the parts and items, such as the use of shipping weights, scale weights, manufacturers' weights, catalog weights, or computed weights. West County Wastewater will pay Contractor only on the basis of net weight which will exclude the weight of all tare, packing, blocking, shop welds, and the weight of materials which are required to be placed or applied at the site of construction, such as grout, wedges, and caulking materials. The Contractor shall, if required by the Engineer, and at its expense, furnish scales and provide assistance for weighing and measuring such materials without additional charge.

B. Wherever the measurement and payment provisions of the Contract provide that payment for the item(s) listed therein will be made at the Contract-unit price or at Contract lump-sum price, whichever is set forth in Section 00 41 43, Schedule of Bid, payment under such provisions will fully compensate Contractor for all work referred to in the applicable provision, including but not limited to the following: all labor, supervision, tools, materials, equipment, the performance of all operations, all other direct expenses and items of overhead, general and administrative expense, and profit for the applicable Contract item.

C. Wherever in the Contract it is provided that the Contractor shall perform certain work "at its expense" or "without charge," or that certain work "will not be paid for separately," the quoted words mean that the Contractor may not recover any additional compensation from West County Wastewater for such work. The cost of such work will, unless otherwise specified, be considered as inherently included in the payment for other items of work identified in Section 00 41 43, Schedule of Bid.

00 72 40 PROGRESS PAYMENTS

A. Unless otherwise provided in the Specifications, West County Wastewater shall make monthly progress payments as the work proceeds. Such payments will be made in accordance with estimates of the amount and value of work satisfactorily performed by the Contractor up to the time of each estimate.

1. Prior to preparation of the first estimate for a progress payment, the Contractor shall submit for review by the Engineer a detailed cost breakdown of the work under each bid item awarded. Bond and insurance costs will not be a separate item of cost for this purpose but shall be included in mobilization/demobilization.

2. Partial payments for mobilization/demobilization costs will be as follows:

a. West County Wastewater shall pay thirty-five percent (35%) of the amount bid for mobilization/ demobilization or 1.75 percent of the original contract amount, whichever is less, in each of the first two progress payments.

b. West County Wastewater shall pay the balance of the amount bid for mobilization/demobilization upon the completion of all work on the project.

B. In most instances, the Contractor will not be compensated for materials and equipment delivered to the site until after they are incorporated in the work. If the Engineer determines that the progress of the work will benefit by the delivery to the site of certain materials and equipment in advance of their actual requirement, and if such materials and equipment are delivered in accordance with the following conditions, the Contractor may be paid a

portion of the cost of the materials and equipment in progress payments. The conditions for such partial payments are as follows:

1. The Contractor shall, no later than four weeks prior to the delivery of materials and equipment for which it seeks partial payment, submit a list of such materials and equipment for review by the Engineer.

2. The Engineer must review and accept shop Documents and technical data for such materials and equipment prior to delivery.

3. Upon delivery, the Contractor shall submit written evidence, satisfactory to the Engineer, that the Contractor is the unconditional owner of such materials, free from all claims, liens, and security interest, and a bill of sale or other equivalent document with warranty of title to such materials and equipment.

4. Title to the delivered material will be vested in West County Wastewater at it is delivered to the site. The Contractor shall, notwithstanding such transfer of title to West County Wastewater, be responsible for such materials and equipment until they have been completely installed, tested, and accepted.

5. Such equipment and materials must be properly stored or stockpiled to the satisfaction of the Engineer. The Contractor shall at its own cost replace any materials and equipment damaged or lost.

6. Contractor shall assure that stored or stockpiled materials are available for inspection by the Engineer.

7. If any defects are discovered in delivered material, whether caused by defective manufacture or damage occurring during delivery or storage (including storage at West County Wastewater or the construction site), the Contractor shall remove such materials and replace them with suitable material at its expense.

8. The Contractor's insurance must include coverage for such material against theft, fire, vandalism and malicious mischief.

9. The maximum portion of cost to be included in progress payments for materials and/or equipment qualifying under this section will be 75 percent of the total cost of the delivered materials and/or equipment eligible for partial payment. The payment will not exceed the bid price or assigned value for the item of work for which the material and/or equipment is furnished, and the accumulated total payment for all material delivered but not yet incorporated into the work will not exceed ten percent of the total value of the Contract.

10. In estimating progress payments, the Engineer may use the unit prices bid by the Contractor. In the event that there are no unit bid prices, or the bid unit prices do not, in the opinion of the Engineer, represent the actual value of the equipment and materials furnished, the Engineer may estimate progress payments based on prices reflecting the actual value.

11. Nothing in this subparagraph B will relieve the Contractor of its responsibility for incorporating the materials in the work in conformity with the Contract.

C. If the Engineer does not accept the initial detailed cost breakdown, the Contractor shall submit additional cost breakdowns until the Engineer determines that the cost breakdown is acceptable. The approved breakdown will then become the basis for partial payment determination. The Contractor shall make progress payment estimates and submit them to the Engineer for review and concurrence. Once West County Wastewater has agreed to the items of cost, the Contractor shall prepare a progress payment request on a form furnished by West County Wastewater and submit the request for payment. The burden of requesting payment is on the Contractor. West County Wastewater will not pay for a separate item of cost unless that item of cost is included in a progress payment request by the Contractor.

D. West County Wastewater shall retain five percent of the cumulative estimated amount of each progress payment until the final acceptance of all work under the Contract pursuant to Section 00 72 41, Final Payment and Release. The Contractor may substitute securities for any monies otherwise to be retained pursuant to Section 22300 of the California Public Contract Code. If the Contractor opts to substitute securities pursuant to Section 22300, it shall execute the Escrow Agreement for Security Deposits in Lieu of Retentions in the form contained

in Section 00 45 15, of the Contract Documents . Any payments otherwise payable under the Contract may be withheld, in whole or in part, by West County Wastewater as may be necessary to protect West County Wastewater from loss because of:

1. Defective work which is not remedied;

2. Third party claims filed or reasonable evidence indicating probable filing of such claims against the Contractor;

3. Failure of the Contractor to make payments properly to subcontractors or for labor, materials, or equipment;

4. The existence of reasonable evidence that the work cannot be completed for the unpaid balance of the contract sum;

5. Failure of the Contractor to submit an acceptable construction schedule or failure to update the schedule.

6. Damage to West County Wastewater or another contractor;

7. The existence of reasonable evidence that the work will not be completed within the time provided for in the Contract; or

8. Contractor's failure or inability to obtain or maintain insurance coverage and bonds as required by the Contract throughout the course of the job; or

9. Persistent failure to carry out the work in accordance with the Contract.

10. Failure to deliver copies of certified payrolls, as specified in this Section 00 72 20, Laws and Regulations.

11. In addition, West County Wastewater may deduct from payments otherwise due the Contractor any amounts West County Wastewater may be currently or in the future authorized to retain pursuant to federal, state, or local laws or regulations, any amounts due to West County Wastewater from the Contractor, and any other amounts which West County Wastewater is otherwise authorized to retain as specified in Section 00 73 00, Supplementary Conditions.

E. West County Wastewater will retain an amount from any payment otherwise due the Contractor in an amount not to exceed twice the value of repairs, corrections, or replacements as required by the Contract to assure that the Contractor completes such repairs, corrections, or replacements. The Contractor will receive payments of such retained amounts when the repair, correction, or replacement work is completed.

F. The Contractor may prevent withholding of additional amounts of the Progress Payment by, (1) correcting such defects in workmanship or materials as may exist, (2) curing any default existing in any of the conditions of the Contract, or (3) paying, satisfying, or discharging any claim of West County Wastewater or any other person against the Contractor arising out of or in any way connected with the work to be performed under the Contract. The Engineer may, in its sole discretion determine whether conditions exist as set forth above to justify withholding payment(s), in whole or in part, and/or whether the Contractor has properly remedied such claims, defects, or failures.

G. If the Contractor does not promptly meet its obligations under this section after its receipt of a written notice from the Engineer, West County Wastewater may discharge such obligations and deduct all costs in connection with discharging Contractor's obligations from payments(s) to the Contractor. If the amount which may be withheld from payment(s) is insufficient to meet such costs, or if any claim or charge against the Contractor is discharged by West County Wastewater after the final contract payment is made, Contractor and its Sureties shall promptly pay West County Wastewater all costs it incurred, regardless of when such claim arose or whether such claim imposed a lien upon the Project.

H. Contractor's shall submit progress payment requests in writing on or about the 25th day of each calendar month, and West County Wastewater shall pay the Contractor within 21 days after the Engineer verifies that the request has been properly filed and submitted and is properly supported. The Contractor's progress estimates will not be required to be made by strict measurement, but may be made by measurement or by estimation or partly by one method and partly by another.

I. Pursuant to Section 9204 of the Public Contract Code, West County Wastewater will pay interest on progress payments held over sixty (60) calendar days from the date of submission so long as the Engineer determines that Contractor's request for payment was properly filed and submitted. A request for payment may not be determined to be properly filed or submitted until West County Wastewater determines that the Record Documents are current The date of submission for a progress payment is the date on which West County Wastewater's representative signs the progress payment request form in the space provided for the resident engineer. This signature will verify that the request has been properly filed and submitted.

J. West County Wastewater will deem the Contractor's submission of an invoice without the proper, required accompanying submittals, or with incorrect calculations, or in a format not acceptable to West County Wastewater, as a disputed request for payment and not a properly submitted request for payment. West County Wastewater will return such invoices to the Contractor for resubmittal.

K. The Contractor need not make a progress estimate or payment when, in the Engineer's judgment, the total value of the work performed since the last estimate amounts to less than five thousand dollars ($5,000).

L. All equipment, materials, and work covered by progress payments will, upon payment, become the property of West County Wastewater. However, this subdivision does not connote acceptance of any work and does not relieve the Contractor from its sole responsibility for all equipment, materials, and work upon which payments have been made, including the restoration of any damaged work until final acceptance thereof other than as provided in Section 00 72 33, Use of Completed Portions of the Work, and does not waive West County Wastewater's right to require fulfillment of all of the terms of the Contract.

00 72 41 FINAL PAYMENT AND RELEASE

A. When the Contractor deems that its obligations under the Contract have been fulfilled, the Contractor shall, in writing, so notify the Engineer. Upon receipt of the notice, the Engineer will, in company with the Contractor, inspect the work that has been performed. If the Engineer determines that all work which, by the terms and conditions of the Contract, is to be performed, has been satisfactorily performed, the Engineer will recommend acceptance of the work. After acceptance of the work by West County Wastewater, West County Wastewater will cause to be filed in the office of the Engineer and the office of the County Recorder of Contra Costa County, in accordance with Section 4005 of the Government Code of the State of California, a notice of completion of all work under the Contract. Upon expiration of the statutory period for filing of liens and stop notices and provided no liens or stop notices have been filed, West County Wastewater will pay to the Contractor the amount remaining due after deducting from such amount all such amounts as will have been previously paid to the Contractor under the Contract, and also any amounts which, by the terms of the Contract, West County Wastewater is or may be authorized or required to reserve or retain. All prior progress payments, being estimates, will be subject to adjustment in the final payment.

B. The Contractor is obligated to provide West County Wastewater with a release of all claims arising out of work related to undisputed contract amounts. Final payment shall be subject to the Contractor executing a release in favor of West County Wastewater, its directors, officers, representatives, agents, and employees as to all claims of and liability to the Contractor or any third party for anything done or furnished for, or in relation to, any work related to undisputed contract amounts; and for any act or omission of West County Wastewater, its directors, officers, representatives, agents and employees, respectively, or of any person relating to or affecting any work related to such final payment.

C. Claims by the Contractor for additional compensation or damages remaining in dispute as set forth in the final payment release will be excluded from the terms of the release. West County Wastewater may withhold from the final payment up to one hundred fifty percent (150%) of the estimated value of claims by West County Wastewater or third parties against the Contractor, including but not limited to claims regarding amounts previously paid to the Contractor by West County Wastewater.

D. The release signed by the Contractor as part of the final payment shall be in substantially the following form:

Final Payment and Release

Project Name _____

West County Wastewater Project Number_____

The acceptance by Contractor of the final contract payment in the sum of $_____ covering undisputed contract amounts releases West County Wastewater, West County Wastewater's directors, officers, representatives, agents, and employees, respectively, from all claims of and liability to the Contractor (except as set forth below), including claims of the Contractor as the successor in interest by assignment or otherwise, to claims of laborers, mechanics, subcontractors, consultants, and material men and including claims by laborers, mechanics, subcontractors, consultants, and material men as successors in interest by assignment, or otherwise, arising out of the work performed under the Contract which are related to said undisputed Contract amounts. This Release will be effective as to all claims of the Contractor arising out of or in connection with the performance of the work under this Contract with respect to said undisputed Contract amounts, including tort claims, which are known to the Contractor or reasonably should have been known to the Contractor at the date of the signing of this Release. The Contractor's acceptance of the final contract payment described above waives all claims described herein and any entitlement by Contractor to additional payment arising out of the Contract, except as to those claims by the Contractor and their respective estimated dollar amounts listed below. The Contractor acknowledges that the amounts set forth below are good faith estimates and may be subject to reasonable modification. It is intended that this Release be construed in accordance with the limitations set forth in California Public Contract Code, Section §7100.

DESCRIPTION OF DISPUTED CLAIM	ESTIMATED AMOUNT OF DISPUTED CLAIM
_____	$ _____
_____	
_____	

Signed:_____

By: _____
(typed or printed)

Title_____

Company Name:_____ Dated:_____

E. West County Wastewater may elect to issue final payments directly to subcontractors, or to issue joint check payments, payable to the Contractor and subcontractor involved. Contractor shall verify the correctness of any final payments to be made to subcontractors by West County Wastewater and shall acknowledge the same in writing to West County Wastewater no later than five days of a written request therefor from West County Wastewater. If the Contractor disputes the correctness of any final payment to be made to a subcontractor, the Contractor shall so notify West County Wastewater, in writing, of the matters in dispute and the amounts thereof. The notice must be in a writing delivered to West County Wastewater no later than five days after the date of a written request from West County Wastewater. West County Wastewater shall make such payments in accordance with estimates made by the Contractor and/or subcontractor and approved by the Engineer of the amount and value of work satisfactorily performed by the subcontractor. Amounts paid to the subcontractor will be deducted from any amounts due the Contractor under the terms of the Contract and any change or extra work orders. However, to the extent that the Contractor disputes any portion or all of the estimated payment due a subcontractor, West County Wastewater shall withhold from the payment to the subcontractor an amount not to exceed 150 percent (150%) of the disputed amount. If the entire amount due the subcontractor is disputed by the Contractor, then up to 150 percent (150%) of this entire amount may be deducted from payments to Contractor until the dispute is resolved.

F. If West County Wastewater elects to issue final payments to a subcontractor or subcontractors or to issue joint check payments, West County Wastewater may request, as part of its payment to the subcontractor or subcontractors involved, that the subcontractor or subcontractors sign a Conditional Waiver and Release Upon Final Payment to the subcontractor which shall be in substantially the following form:

Conditional Waiver and Release Upon Final Payment to Subcontractor

Upon receipt by the undersigned of a check from West County Wastewater in the sum of $_____ payable to _____ and when the check has been properly endorsed and has been paid by the bank upon which it is drawn, this document releases any mechanic's lien, stop notice, or bond right the undersigned has on this Contract. This release covers the final payment of the undersigned for all labor, services, equipment, or material furnished on the job, except for disputed claims for additional work described in the attached sheet, if any, in the amount of $___.

Before any recipient of this document relies on it, said party should verify evidence of payment to the undersigned.

Dated: _____ _____
Company Name

By:_____

Title:_____

00 72 42 LIQUIDATED DAMAGES

A. If the Contractor fails to complete the work in a manner satisfactory to West County Wastewater on or before the dates of completion agreed upon and fixed in this Contract or as duly extended as provided in this Contract, the Contractor, pursuant to the provisions of this Contract and California Government Code Section 53069.85, shall pay to West County Wastewater the sum set forth under Section 00 73 21, Amount of Liquidated Damages, for each calendar day of such delay. The Parties acknowledge that this daily Amount of Liquidated Damages is a reasonable estimate of future damages as of the date of this Contract, and the Parties further acknowledge that the sum specified as liquidated damages is not manifestly unreasonable under the circumstances existing at the time the Contract was made. West County Wastewater may deduct said sums from the payments due the Contractor each month. If the payments due the contractor are less than the amount of such liquidated damages, said damages shall be deducted from any other monies due or to be due the Contractor. The Contractor or its Surety shall pay the balance to West County Wastewater.

B. This liquidated damages provision is intended to apply only to the normal administrative, construction, engineering, supervision, design, redesign, operation, and other analogous costs associated with delays in projects similar to the project involved herein. This liquidated damages provision shall not apply to other damages, including consequential damages other than as specified above nor shall preclude West County Wastewater from seeking said other damages not covered by the liquidated damages provision. Specifically, this liquidated damages provision shall not apply to or include consequential damages resulting from the delay itself, as opposed to the direct-cost-type damages described above, incurred as a result of typical day-to-day project costs normally associated with on-going work. These excluded consequential and other damages shall include, but not be limited to, first- and third-party claims for torts, claims of inverse condemnation, environmental costs and claims, and/or regulatory fees or fines imposed in whole or in part due to Contractor's failure to complete the work in the manner, including time, as set forth in the Contract.

00 72 43 NIGHT AND WEEKEND WORK

A. The Contractor may be required to perform the work at night if the Engineer at any time determines that it is necessary for the progress of the work, or if emergencies arise. The Contractor shall promptly comply with any such requirements that are made in writing by the Engineer. The Contractor may be permitted to work at night if it obtains the approval of the Engineer to do so in order to maintain the required progress or protect the work from the elements. When required, ordered, or permitted to work at night, the Contractor shall provide sufficient and satisfactory lighting and other facilities for the work. For night work, the Contractor shall employ a crew

organized and prepared for regular and continuous night work. The Contractor will not be entitled to any additional payment for performing night work, and compensation for such work will be included in the Contract price.

B. The Contractor may not work on weekends except:

1. to perform usual protective work, such as pumping;
2. for work done in case of emergency threatening injury to persons or property; or
3. when, in the sole judgment of the Engineer, the work will be of advantage to the West County Wastewater.

C. Before the Contractor performs night and weekend work, it must first obtain all necessary permits from all entities having jurisdiction (for example noise ordinances) prior to starting such work.

00 72 44 INTOXICATING LIQUORS AND DRUGS

A. The Contractor may not sell and shall neither permit nor suffer the introduction or use of intoxicating liquors or non-prescribed illegal narcotics or drugs upon or about the work.

00 72 45 MEETINGS

A. The Parties shall hold a pre-construction meeting after the award of the Contract to resolve any remaining pre-construction submittal issues as required by the Contract, and discuss various administrative items (including, but not limited to: the overall project construction schedule, the frequency of progress meetings, and the length of the look-ahead schedules). At this meeting, West County Wastewater may request that the Contractor provide it with certified payroll forms containing the classifications of workers who will be employed on the project and the wage each classification will be paid. The Contractor shall also be prepared to discuss all of the referenced items, as well as the methods of implementing the various work items.

B. the Project Manager will, no less often that once per month, conduct progress meetings for the purpose of discussing and resolving matters concerning the various elements of the work. The Contractor shall furnish look-ahead schedules at each of the progress meetings.

C. West County Wastewater may notify the Contractor regarding other meetings which the Contractor and subcontractors may be required to attend.

D. The time and place for the meetings described above and the names or titles of persons and subcontractors required to be present will be as directed by the Project Manager. The Contractor shall comply with these attendance requirements and shall also require, if needed, its subcontractors to comply.

00 72 46 LIENS AND STOP NOTICE

A. If at any time any notices of lien are filed for labor performed or materials or equipment manufactured, furnished, or delivered to or for the work, the Contractor shall at its own cost and expense promptly discharge, remove, or otherwise dispose of the same. Until such discharge, removal, or disposition, the Engineer may retain from any monies payable to the Contractor an amount which, in the Engineer's sole judgment, is necessary to satisfy such liens and pay the costs and expenses, including attorneys' fees, of defending any actions brought to enforce the same or otherwise incurred in connection with the notice of lien.

B. If West County Wastewater is served with a Stop Notice as provided pursuant to Civil Code sections 9350 through 9510 before the expiration of the period for service of a Stop Notice, West County Wastewater shall, until the discharge thereof, withhold from the monies under its control as much of monies otherwise due or to become due the Contractor as is sufficient to answer the claim stated in such Stop Notice and to provide for the reasonable cost of any litigation thereunder. However, if the Engineer, in its discretion, permits Contractor to file with West County Wastewater the bond referred to in Section 9364 of the Civil Code, West County Wastewater will not withhold such moneys thereafter on account of such Stop Notice. The monies which West County Wastewater withholds will be a minimum of 125% of the face value of the Stop Notice.

00 72 47 NO WAIVER

Neither inspections by the Engineer, nor any order, measurement, approval, determination, decision, or certificate by the Engineer, nor any order by West County Wastewater for the payment of money, nor any payment for or use, occupancy, possession, or acceptance of the whole or any part of the work by West County Wastewater, nor any extension of time, nor any other act or omission of West County Wastewater or of the Engineer will be: (1) an acceptance by West County Wastewater of any defective or improper work, materials, or equipment nor operate as a waiver of any requirement or provision of the Contract; (2) a waiver by West County Wastewater of any remedy, power, or right reserved to West County Wastewater under the Contract; or (3) a waiver of any right to damages for breach of Contract. Any and all rights and/or remedies provided for in the Contract are cumulative; and, in addition to each and every other right and remedy provided for herein or by law, West County Wastewater reserves the right to seek a writ of injunction against any breach or threatened breach of the Contract by the Contractor, by its subcontractors, or by any other person or persons.

00 72 48 QUALITY OF EQUIPMENT, MATERIAL, PRODUCTS, AND/OR WORKMANSHIP

A. The Contractor shall furnish all equipment, materials, and/or products required to complete the work, except those equipment, materials, and/or products that are designated in the Contract Documents to be furnished by West County Wastewater.

1. Only equipment, materials, and/or products meeting the requirements of the Contract Documents may be incorporated in the work. The equipment, materials, and/or products furnished and used by Contractor must shall be new and must be manufactured, handled, and installed in a workmanlike manner to ensure a completed project in accordance with the Contract Documents . The Contractor shall deliver manufacturers' warranties, guarantees, instruction sheets, and parts lists which are furnished with certain equipment, materials, and/or products incorporated in the work to the Engineer before the Contract will be accepted.

2. If no detailed specifications for certain equipment, materials and/or products are set forth in the Contract, the Contractor shall furnish such equipment, materials, and/or products in conformance with the latest standards, specifications, manuals or codes of an acceptable technical society, organization or association, or to the laws or regulations of any applicable governmental authority, whether such reference be specific or by implication, in effect at the time of opening of bids. In general, the work performed shall be in full conformity and harmony with the intent prescribed in Section 00 72 02, Intent of the Contract.

B. The Engineer may disapprove or reject work, whether in place or not, which the Engineer believes to be defective, or that the Engineer believes will not produce a completed project that conforms to the Contract Documents or that will prejudice the integrity of the design concept of the completed project as a functioning whole as indicated by the Contract Documents . The Contractor shall immediately remove such equipment, materials, and/or products from the work site unless otherwise directed by the Engineer. The Contractor shall not use rejected equipment, materials, and/or products, the defects of which have been subsequently corrected, in the work unless the Engineer has approved such use in writing. If the Contractor fails to comply promptly with any order of the Engineer made under the provisions in this Article, the Engineer may cause the removal and replacement of rejected work including equipment, materials, and/or products. The Engineer may deduct the costs incurred due to the failure of the Contractor to remove and replace rejected work from any monies due or to become due the Contractor.

1. The lack of disapproval or rejection by the Engineer of any part of the work or any of the equipment, materials, and/or products supplied in connection with that work does not create any automatic acceptance of any such part of the work or any such equipment, materials, products, and/or workmanship.

00 72 49 WEST COUNTY WASTEWATER'S OWNERSHIP OF PROJECT MATERIALS AND SALVAGE

A. Unless otherwise provided in the Contract, West County Wastewater reserves all title and interest in the right to the use of all water, the title to all soil, stone, gravel, sand, minerals, timber, and all other materials developed or obtained within the Project limits from operations by the Contractor or any of its subcontractors, any of their representatives or employees, and the right to use or dispose of the same. Neither the Contractor nor any of its

subcontractors, nor any of their representatives or employees, shall have any right, title, or interest in or to any part of such materials or substances.

1. All material used under the Contract after it has been attached or affixed to the work or soil and for which partial payment has been made therefor will be the property of West County Wastewater.

B. The Contractor shall satisfy itself as to the quantity of materials that meet the specifications that may be produced or obtained at local sources, and West County Wastewater is not responsibility with regard to the quantities or quality of materials available.

1. The Contractor, with the written permission of the Engineer, may use in the proposed construction such stone, gravel, sand, or other material that the Engineer determines is suitable for use as may be found at the project site.

2. Existing items to be salvaged shall remain the property of West County Wastewater. Contractor shall refurbish as required items to be reinstalled in the work before reinstallation. Items the Contractor seeks to be salvage must be carefully removed and handled in such a manner as to avoid damage and shall be delivered to storage at a location designated by the Engineer.

00 72 50 (NOT USED)

00 72 51 PROVISIONS REQUIRED BY LAW DEEMED INSERTED

A. Each and every provision of law and clause required by law to be inserted in the Contract is deemed to be inserted herein, and the Contract is to be read and enforced as though they were included in full herein. If through mistake or otherwise any such provision is not inserted, or is not correctly inserted, then upon the application of either party, the Contract shall be physically amended to make such insertion.

00 72 52 CONFLICT OR INCONSISTENCY

A. Unless otherwise noted below, conflicts or inconsistencies between parts of the Contract will be resolved by the Engineer with a change order or an addendum, if necessary and if the order of precedence set forth below does not apply. Addenda and change orders bearing the most recent date prevail over addenda or change orders bearing earlier dates. Any reference to addenda-changed specifications or Documents will be considered as modified accordingly.

B. In resolving conflicts, errors, or discrepancies, the order of precedence shall be as follows:

1. Change Orders/Addenda (most recent in time takes precedence)

2. Contract and Bond Forms

3. Technical Specifications (Division 20 and above if required)

4. Technical Specifications (Division 1 through 16 as required)

5. Special Conditions

6. Project Drawings

7. General Conditions

8. Instructions to Bidders

9. Bid Forms

10. Notice to Contractors

C. Reference specifications will bear the same order of precedence as the document in which they are referenced. For example, a reference to West County Wastewater's Standard Specifications contained in the Technical Specifications will have the same order of precedence as the applicable Technical Specification. A reference to an Appendix contained in the Technical Specifications will have the same order of precedence as the applicable Technical Specification. If a reference specification is mentioned in more than one part of the Contract, the part with the highest order of precedence will govern.

D. With reference to the Project Drawings:

1. Figures govern over scaled dimensions.

2. Project-specific Documents govern over general and typical drawings.

3. Addenda/Change Order Documents govern over Project Drawings.

4. Project Documents govern over standard drawings.

E. The Contractor shall resolve any conflicts between the requirements contained in permits from other agencies and the Contract to the satisfaction of the Engineer. When there is a conflict between the requirement(s) as specified in the Contract and as required by other agencies, the more restrictive requirement(s) prevail.

00 72 53 UTILITY AND OTHER EXISTING FACILITIES

A. The location of known existing utilities and pipelines are shown on the Project Documents in their approximate locations. Some of the locations include multiple conduits. The Contractor shall exercise care in avoiding damage to those facilities which are to remain in service after the completion of the construction of the facility that is the subject of the Contract, and the Contractor will be responsible to repair such facilities if they are damaged. The Contractor shall also exercise care in maintaining those pipes and facilities required for continuing operation of the existing facilities that will be abandoned until they are abandoned . Not all utilities or obstructions may be shown and the locations indicated may be inaccurate.

B. The Contractor must discover all existing underground installations before excavating or trenching by contacting all local utilities 48 hours in advance, and by prospecting. Contractor shall notify Underground Service Alert no less than 48 hours before it commences any excavation work.

C. When the excavation work approaches the approximate location of underground utilities, the Contractor shall determine the exact location of such utilities by careful probing or hand digging. When uncovered, the Contractor shall provide adequate protection for the existing installation.

D. The Contractor shall exercise extreme caution in working in any area adjacent to existing sewerage facilities. The Contractor shall maintain all existing facilities in service until the new work is ready for full time operation and is placed in service. The Contractor's construction of the connections between the existing facilities and the new facilities must be at times and during periods acceptable to West County Wastewater. The Contractor shall advise the Engineer in writing of its proposed construction schedule for these connections at no later than five days before commencing work on such connections.

E. The Contractor shall, before trenching or excavating for any pipe or structures, uncover and completely expose all piping where crossings, interferences, or connections are shown on the Project Documents to determine actual elevations. Contractor shall lay new pipelines at such grade as to clear all existing facilities which are to remain in service for any period after the construction of the pipe being laid. If the Contractor does not expose all required utilities, it may not recover any additional compensation for work necessary to avoid interferences or for repair to damaged utilities. The Contractor use extreme caution in performing excavations around underground electrical ducts and conduits to prevent injury to workers or damage to the electrical ducts or conduits.

F. Notwithstanding any other provision of this Contract between the West County Wastewater and the Contractor:

1. Except as provided below, in accordance with Section 4215 of the California Government Code, West County Wastewater shall assume the responsibility between the Parties for the timely removal, relocation, or protection of existing main or trunk line utility facilities located on the site of the construction project covered by the Contract if such utilities are not identified by West County Wastewater in the Project Documents and Specifications and made a part of the Notice to Contractors. West County Wastewater will not be responsible to indicate the presence of existing service laterals or appurtenances whenever the presence of such utilities on the site of the construction project can be inferred from the presence of other visible facilities, such as buildings, meter and junction boxes on or adjacent to the site of construction. West County Wastewater will compensate the Contractor for the costs of locating and repairing damage and removing or relocating utility facilities that are not indicated in the Project Documents and Specifications or that may be inferred from the presence of other visible facilities provided that the Contractor exercises reasonable care.

2. The owner of the utility will determine whether it will perform repairs or relocation work or will permit the Contractor to perform such repairs or relocation work at a reasonable price.

3. West County Wastewater will not assess liquidated damages upon the Contractor for delay in completing the Project when such delay was caused by the failure of West County Wastewater to show existing utilities or other existing facilities, excluding service laterals.

G. If interferences between existing utilities and proposed work occurs at locations other than those shown on the Project Drawings, the Contractor shall notify the Engineer, and the Engineer will supply a method for correcting the interference. West County Wastewater will pay the Contractor to correct interferences not shown on the Project Documents in accordance with the provisions of Section 00 72 11, Differing Site Conditions.

H. Planned utility service shutdowns of any portion of the treatment plant or collection system must be accomplished during periods of minimum use. In some cases this may require night or weekend work. The Contractor shall program its work so that service will be restored in the minimum possible time, and shall cooperate with West County Wastewater to reduce shutdowns of utility systems to a minimum. No utility interruption may occur without the prior approval of the Engineer and the utility involved.

00 72 54 SURVEYS, LINES, AND GRADES

A. The Contractor shall perform all work under the Contract to the lines and grades shown on the Project Drawings, unless directed otherwise by the Engineer.

1. The Contractor shall use three consecutive points on the same slope in order to detect any variation from a straight grade. If any discrepancy occurs, the Contractor shall immediately notify the Engineer. If this discrepancy is not reported at the time of discovery to the Engineer, the Contractor shall correct any error in the finished work at no cost to West County Wastewater.

2. West County Wastewater may make any survey to accurately measure quantities for payment to the Contractor.

3. West County Wastewater may interrupt the Contractor's work schedule in order to have lines or grades checked on any work in progress. The Contractor will not receive a time extension for such interruptions, provided that the interruptions do not exceed a reasonable amount of time under the specific circumstances involved.

00 72 55 CONTRACT DOCUMENTS AND RECORD DRAWINGS

A. The Contractor may obtain from West County Wastewater, at no extra cost, up to four copies of the Contract Documents as specified in Subsection 19 of Section 00 21 13. The Contract Documents include Section 00 01 10, Table of Contents; Section 00 01 15, List of Drawings; Section 00 11 16, Invitation to Bid; Section 00 21 13, Instructions to Bidders; Section 00 41 43 Bid Forms; Section 00 43 00, Procurement Form Supplements; Section 00 45 00, Representations and Certifications; Section 00 52 00, Contract Forms; Section 00 61 00, Bond Forms;

Section 00 72 00, General Conditions; Section 00 73 00, Supplementary Conditions; Technical Specifications; Project Drawings; and any addenda thereto.

B. The Contractor shall keep on the work site a copy of the Contract Documents and shall at all times give the Engineer access thereto. Any Documents included in the detailed Specifications shall be regarded as part thereto and of the Contract. Anything mentioned in these Specifications and not shown on the Project Drawings, or shown on the Project Documents and not mentioned in these Specifications, will be construed as if shown or mentioned in both. The Engineer will furnish from time to time such detail drawings, plans, profiles, and information as it may consider necessary for the Contractor's guidance. The Contractor shall assure its work complies with the provisions of the Contract Documents irrespective of the inspection given the work during its progress by the Engineer. Any failure by the Contractor to observe the requirements contained in the Contract Documents will be sufficient cause for the Engineer to reject the work at any time before its acceptance.

C. The Contractor shall maintain, at the jobsite, one record set of Project Documents in good order and clearly marked to show any deviations made from the Project Drawings, including concealed construction and utility features which are revealed during the course of construction. The Contractor shall update its marked prints at least once each week and shall make the prints available for the Engineer's review for currency before developing partial payment estimates. Upon completion of the work, the Contractor shall deliver the marked set of prints to the Engineer.

D. For Documents that depict the detail requirement for equipment to be assembled and wired in the factory, such as motor control centers and the like, the Contractor must update the Record Documents by identifying those portions that are superseded by change order Documents or final shop drawings, and by including appropriate reference information describing the change orders by number and the shop Documents by manufacturer, drawing, and revision numbers.

E. West County Wastewater will not approve the Contractor's requests for partial payments if the updated set of Documents is not in good order or is not kept current. West County Wastewater will not approve any request for final payment unless the Contractor delivers the complete and correct Record Documents to the Engineer.

00 72 56 CONTAMINATED SOIL/MATERIALS

A. Contaminated soils and materials include, but not be limited to, pollutants and/or materials defined as hazardous substances or hazardous wastes under the Resource Conservation and Recovery Act (RCRA), the Comprehensive Environmental Response Compensation and Liability Act (CERCLA), the Hazardous Substances Account Act (Health and Safety Code Section 25300 and following), the Hazardous Waste Control Act (Health and Safety Code Section 25100 and following), or are defined as pollutants or contaminants under any other applicable state and federal laws and regulations. Contaminated soils and materials include, but not be limited to, friable asbestos, PCBs, petroleum products and its byproducts, and waste oil, among other substances.

B. Contractor shall notify West County Wastewater in person or by telephone within two hours of its discovery of any contaminated soil or materials on or beneath the jobsite, including in buildings and related structures that could be impacted by the construction project as discovered by the Contractor, its personnel, agents, representatives, consultants, or any other persons working under the direction and control of the Contractor. In addition, the Contractor shall deliver written notice of the same to West County Wastewater by the Contractor no later than 24 hours after discovery. Contractor shall require that like provisions be inserted in all contracts with its subcontractors and tiers of subcontractors. Inclusion of such provisions in subcontractors does relieve the Contractor from the obligation and responsibility to assure compliance with the provisions of this general condition.

C. The Contractor and its subcontractors must immediately cease any and all work at the location of the discovery of the contaminated soil or materials until further notice from West County Wastewater or the Engineer.

D. If the Contract Documents specifically direct the Contractor to perform appropriate cleanup work with respect to the contaminants discovered, the Contractor shall proceed with that work. In addition, the Contractor shall notify West County Wastewater of the discovery of the contaminants as set forth above. Further, if the contaminants substantially vary from the description in the Contract Documents as to type of material, quality

of materials, level of concentration or toxicity, location, as to the materials' affect on groundwater, or vary in any other substantial manner from the description as set forth in the Contract Documents , the Contractor shall immediately cease operations and notify West County Wastewater as set forth above.

E. All work done by the Contractor with respect to cleanup, removal, and remedial actions concerning the contaminated soils or materials must be done in compliance with the law. The Contractor shall provide all required notices to the County Environmental Health Hazard Materials Section and other appropriate governmental agencies, including the State Department of Toxic Substances Control and the Regional Water Quality Control Board-San Francisco Bay Region, among others. The Contractor or any subcontractor doing such work for the Contractor must have the appropriate certification, licenses, and permits before commencing any cleanup, removal, and/or remedial work. West County Wastewater will not be responsible for any negligence of or the violation of any laws, rules, regulations, or ordinances by the Contractor or any of the Contractor's subcontractors, agents, consultants, employees, or representatives in performing such cleanup, removal, and remedial work.

F. If any of the cleanup, removal, containment, or remediation work substantially impacts the community, including, but not limited to, creating traffic, odor, and health issues, West County Wastewater may direct the Contractor to revise its manner of operations to reduce or eliminate the adverse effects.

00 72 57 Not used

00 72 58 Not used

00 72 59 STORM WATER POLLUTION PREVENTION

A. General

1. Prevention - The Contractor shall prevent the pollution of storm drain systems and creeks on or near the construction project site(s) resulting from the construction operation. The Contractor shall keep pollution out of storm drains by reducing the possibility of the accidental discharge of materials and wastes, by reducing erosion and sedimentation, and by any other action as required. The Contractor shall train all employees and subcontractors on the storm water pollution prevention requirements contained in these Specifications and ensure that all employees and subcontractors are aware of the consequences as described in subsection A.3. below. The Contractor shall include appropriate subcontract provisions to ensure that these requirements are met by all subcontractors.

2. Notification - If the Contractor causes or permits the spillage or overflow of any sewage, oil, or petroleum product, hazardous substance, contaminant, or waste that may result in the fluid or substance being discharged directly or indirectly into any storm drains, creeks, wetlands, or other manmade or natural waterways, the Contractor shall notify West County Wastewater as soon as possible to the extent notification can be provided without substantially impeding cleanup or other emergency measures. The Contractor shall make such notification no later than one hour after the Contractor learns of the occurrence.

3. Cleanup – The Contractor shall, immediately upon learning of such spillage, overflow, or discharge, the Contractor shall eliminate the cause of the spillage, overflow, or discharge and take action to minimize any damages. The Contractor shall also immediately implement a cleanup program. The cleanup, including sampling and testing required by regulatory agencies to determine the nature and level of contamination, must be performed and completed to the satisfaction of the regulatory agencies involved and West County Wastewater, at the Contractor's expense. Any fines, penalties, and/or subsequent actions imposed upon West County Wastewater and/or the Contractor by regulatory agencies related to the spillage, overflow, or discharge and any subsequent monitoring, testing, and reporting, as required by regulatory agencies, shall also be at the Contractor's expense. The Contractor shall keep a stockpile of spill cleanup materials, such as rags or absorbents, readily accessible on site. The quantity of cleanup materials are an appropriate factor in determining the risk of an occurrence of a spill, overflow or discharge.

B. Management of Nonhazardous Material and/or Waste

1. Designated Area - The Contractor shall propose designated areas of the Project site, for approval by the Engineer, suitable for material delivery, storage, and waste collection that to the maximum extent practicable are near construction entrances and away from catch basins, gutters, drainage courses, and creeks.

2. Backfill or Excavated Material - The Contractor may not allow backfill or excavated material to enter the storm drains or creeks. When rain is forecast within 24 hours or during wet weather, the Contractor may be required to cover such material with a tarpaulin and to surround the material with sand bags.

3. Street Sweeping - At least once per week or more frequently as directed by the Engineer, the Contractor shall clean and sweep roadways and on-site paved areas of all materials attributed to or involved in the work. The Contractor may not use water to flush down streets in place of street sweeping.

4. Disposal - At the end of each working day, the Contractor shall collect and properly dispose of all scrap, debris, and waste material. These materials may be stored in the Contractor's yard in stockpiles or placed in dumpsters. The Contractor shall inspect dumpsters for leaks and replace or repair any dumpsters that leak. The Contractor may not discharge onsite water from cleaning dumpsters. The Contractor shall arrange for regular waste collection before dumpsters overflow.

C. Management of Hazardous Material and/or Waste

1. Storage - The Contractor shall label and store all hazardous materials, such as pesticides, paints, thinners, solvents, and fuels, and all hazardous wastes, such as waste oil and antifreeze, in accordance with all applicable state and federal regulations. The Contractor shall store all hazardous materials and all hazardous wastes in accordance with secondary containment regulations. All such materials and wastes must be covered, as needed, to avoid the pollution of rainwater with hazardous constituents, which may require the management of collected rain water as a hazardous waste. The Contractor shall keep an accurate, up-to-date inventory, including Material Safety Data Sheets (MSDSs), of hazardous materials and hazardous wastes stored on site.

2. Usage - When rain is forecast within 24 hours or during wet weather, the Contractor shall refrain from applying chemicals in outside areas. The Contractor shall follow material manufacturer's instructions regarding use, protective equipment, ventilation, flammability, and mixing of chemicals. The Contractor shall post warning signs in areas treated with chemicals.

3. Disposal - The Contractor shall arrange for regular hazardous waste collection to comply with time limits for storage of hazardous wastes. The Contractor shall dispose of hazardous waste in accordance with Section 00 72 56, Contaminated Soil/Materials. The Contractor may not wash any spilled material into streets, gutters, storm drains, or creeks and may not bury spilled hazardous materials. The Contractor shall report any spill of hazardous materials to West County Wastewater in accordance with Section A.2 above.

D. Vehicle/Equipment Cleaning, Maintenance, and Fueling

1. General - The Contractor shall inspect vehicles and equipment arriving on site for leaking fluids and shall promptly repair any leaking vehicles and equipment. The Contractor shall use drip pans to catch leaks until it makes repairs.

   a. The Contractor shall comply with federal, state, and city requirements for above-ground storage tanks.

2. Cleaning - The Contractor shall clean vehicles or equipment with water only in a designated, bermed area that will not allow rinse water to run off site into streets, gutters, storm drains, or creeks. The Contractor may not use soaps, solvents, degreasers, steam-cleaning equipment, or equivalent methods for this cleaning.

3. Maintenance and Fueling - The Contractor must perform maintenance and fueling of vehicles or equipment in areas that will not allow run-on of storm water or runoff of spills to storm drains and will provide for confined clean-up. Examples are working in bermed areas or utilizing drip pans. The Contractor may not contaminate the soils or groundwater with such maintenance and fueling activities.

    a. The Contractor shall use secondary containment, such as a drip pan, to catch leaks or spills any time that vehicle or equipment fluids are dispensed, changed, or poured, and shall clean up leaks and spills of vehicle or equipment fluids immediately and dispose of the waste and cleanup materials as hazardous waste, as described in Section C.3 above.

E. Dewatering Operations

1. Sediment Control - The Contractor shall route water through a control measure, such as a sediment trap, sediment basin, or Baker tank, to remove settleable solids prior to discharging the water to a storm drain system. The Contractor shall place straw bales in front of storm drain inlets as required, and it may be required on a case-by-case basis to filter the water following the control measure. The control measure must be approved in advance by the Engineer. If the Engineer determines that the dewatering operation will not generate an appreciable amount of settleable solids, the Engineer may waive the control measure requirement.

2. Contaminated Groundwater - If the project is within an area of known groundwater contamination or if contamination is found, water from dewatering operations must be tested prior to discharge. If the water quality meets Regional Water Quality Control Board (RWQCB) standards, it may be discharged to a storm drain or creek. Otherwise, the water must be hauled off-site for proper disposal.

F. Paving or Oiling Operations

1. When rain is forecast within 24 hours or during wet weather, the Engineer may direct the Contractor not to pave or oil the street. The Engineer may direct the Contractor to protect drainage courses by using control measures, such as earth dikes, straw bales, and sand bags, to divert runoff or trap and filter sediment.

2. The Contractor shall prevent saw-cut slurry from entering catch basins and storm drains by limiting the area over which the slurry spreads.

3. The Contractor shall cover catch basins and manholes when paving or applying seal coat, tack coat, slurry seal, or fog seal.

4. The Contractor may not sweep or wash down excess sand (placed as part of a sand seal or to absorb excess oil) into gutters, storm drains, or creeks. The Contractor shall either collect the sand and return it to the stockpile or dispose of it in a trash container.

G. Concrete, Grout, and Mortar Waste Management

1. Concrete Truck/Equipment Washout - The Contractor may not wash out concrete trucks or equipment into streets, gutters, storm drains, or creeks. The Contractor shall wash out concrete trucks and equipment off-site or in a designated area on-site where the water will flow onto dirt or into a temporary pit in a dirt area. The Contractor shall allow the water to percolate into the soil and dispose of the hardened concrete in a trash container. If no suitable dirt area is available, the Contractor shall collect the wash water and remove it off site.

2. Exposed Aggregate Concrete Wash Water - The Contractor shall drain water from washing exposed aggregate concrete to a dirt area. If no suitable dirt area is available, the Contractor shall filter the wash water through straw bales or equivalent material before discharging it to a storm drain. The Contractor shall collect sweepings from exposed aggregate concrete for disposal.

H. Paint Disposal and Clean-up

1. Disposal of Unused Paint - The Contractor shall carefully use, store and dispose of paint, solvents, chemicals, and waste materials in compliance with all applicable state and federal regulations. The Contractor may not dispose of paint to sanitary sewer systems or storm drains. The Contractor shall utilize other recycling and disposal services as follows:

    a. "Recycling Centers" and "Waste Disposals" as may be listed in the yellow pages.

    b. Local household hazardous waste facility if appropriate.

        i. The Contractor may dispose of small amounts of leftover latex (water-based) paint by applying the paint to the surface of an item to be discarded and allowing it to dry thoroughly, then disposing of it in a dumpster.

        ii. The Contractor shall store these materials and conduct cleaning of painting equipment and tools in a designated area that will not allow run-on of storm water or runoff of spills. The Contractor may not allow wash water from cleaning painting equipment and tools into streets, gutters, storm drains, or creeks.

2. Disposal of Paint Clean-up Waste - The Contractor shall remove as much excess paint as possible from brushes, rollers, and equipment before starting cleanup.

    a. The Contractor may not discharge cleaning wastes from oil-based paints, buckets, brushes or tools to the sanitary sewer system. The Contractor shall retain a certified waste hauler to recycle or to dispose of cleaning wastes from oil-based paints at the Contractor's expense.

    b. The Contractor may discharge very small amounts of cleaning wastes from brushes, rollers, buckets, and tools contaminated with latex (water-based) paints to the sanitary sewer system provided they do not contain additives with pollutants of concern (e.g., mercury, tributyltin). Brushes, rollers, and tools containing latex paints may be washed over a sink with plenty of water. Buckets containing latex paints must first be emptied into the original can or discarded as specified in paragraph 1 above. If excessive amounts of paint or solvent are found in the wastewater discharged, the Contractor may be subject to enforcement action by West County Wastewater in accordance with West County Wastewater's Codes.

    c. The Contractor may not discharge any of these paint clean-up wastes to storm drains, streets, gutters, or creeks.

    d. Waste Disposal - The Contractor shall dispose of waste thinner, solvent, and sludge from the cleaning of equipment and tools as hazardous waste, as described in Subsection C.3 above. The Contractor shall dispose of excess thinners, solvents, and oil- and water-based paint as hazardous waste.

I. Contaminated Soil - If the project is within an area of known soil contamination or evidence of soil contamination is found, the Contractor shall comply with the requirements of Section 00 72 56, Contaminated Soil/Materials.

END OF GROUP 00 72 00

SECTION 00 73 00
SUPPLEMENTARY CONDITIONS

Section	Title
00 73 01	Insurance Coverage Requirements
00 73 02	Preconstruction Conference
00 73 03	Surveys
00 73 04	Progress Schedule and Holidays
00 73 05	Responsibility
00 73 06	Conflicts, Errors, Discrepancies
00 73 07	Clean up and Restoration
00 73 08	Commencement, Prosecution, and Completion
00 73 09	Existing Utilities and Sewerage Facilities
00 73 10	Inspection by Others
00 73 11	Salvaged Material
00 73 12	Disposal of Material
00 73 13	Potential Hazards and Safety
00 73 14	Explosive
00 73 15	Dust Control
00 73 16	Fire Prevention
00 73 17	Air Pollution
00 73 18	Title to Materials Found
00 73 19	Final Acceptance
00 73 20	Attorneys' Fees
00 73 21	Amount of Liquidated Damages
00 73 22	Percentage of Progress Payments to be Retained
00 73 23	Amount of Minimum Progress Payment
00 73 24	Retention for Repairs
00 73 25	Connections to Existing Facilities
00 73 26	Certification of Labor Charges
00 73 27	Sole Source Items
00 73 28	Partial Payment for Materials and Equipment Delivered
00 73 29	Maintaining Existing Utilities
00 73 30	Permits, Easements and Agreements
00 73 31	Parking and Employee Identification
00 73 32	Work During Disputes and Litigation
00 73 33	Submittals
00 73 34	Extensions of Time for Delay Due to Inclement Weather
00 73 35	Erosion Control
00 73 36	Standard Details
00 73 37	Drawings and Project Manual
00 73 38	Initial Start-up and Operation of Facilities
00 73 39	Responsibility for Spare Parts & Special Tools

00 73 40 Manuals, Operating Instructions and Affidavits
00 73 41 Record Plans
00 73 42 Joint Survey to Establish Preconstruction Conditions
00 73 43 Construction Constraints
00 73 44 Traffic Control
00 73 45 Work Hours
00 73 46 Federal, State and Local Requirements
00 73 47 Apprentices
00 73 48 Labor, Wages and Wage Determinations

00 73 01 INSURANCE COVERAGE REQUIREMENTS

A. Insurance: On or before beginning the Project, the Contractor, at its own cost and expense, shall carry, maintain for the duration of the Project, and provide proof thereof in a form that is acceptable to West County Wastewater the insurance specified in subsections (1) through (5) below with insurers and under forms of insurance satisfactory in all respects to West County Wastewater. The Contractor shall not allow any subcontractor, professional or otherwise, to commence work on any subcontract until all insurance required of the Contractor has also been obtained for said subcontractor, or until West County Wastewater has approved the insurance status of the Contractor's subcontractor.

1. Commercial General Liability: Insurance Services Office Form CG 00 01, including products and completed operations, with limits of no less than five million dollars ($5,000,000) per occurrence for bodily injury, personal injury, and property damage. If a general aggregate limit applies, either the general aggregate limit shall apply separately to this project or the general aggregate limit shall be twice the required occurrence limit. The Contractor, at the Contractor's own cost and expense, shall maintain Commercial General Liability Insurance for the period covered by this Contract for risks associated with the Project.

2. Automobile Liability: Insurance Services Office Form Number CA 0001 covering Code 1 (any vehicle), with limits no less than five million dollars ($5,000,000) per accident. Such coverage shall include but shall not be limited to, protection against claims arising from bodily and personal injury, including death resulting therefrom, and damage to property resulting from activities contemplated under this Contract, including the use of owned and non-owned automobiles.

3. Workers' Compensation: Worker's Compensation Insurance as required by the State of California , with statutory limits, and Employer's Liability Insurance with limits of not less than one million dollars ($1,000,000) per accident for bodily injury or disease for any and all persons employed directly or indirectly by the Contractor. In the alternative, the Contractor may rely on a self-insurance program to meet these requirements as long as the program of self-insurance complies fully with the provisions of the California Labor Code. In such case, excess Worker's Compensation Insurance with limits of not less than five million dollar ($5,000,000) shall be maintained. The insurer, if insurance is provided, and the Contractor, if a program of self-insurance is provided, shall waive all rights of subrogation against West County Wastewater for loss arising from worker injuries sustained under this Contract. The worker’s compensation policy shall be endorsed with a waiver of subrogation in favor of West County Wastewater for all work performed by the Contractor, its employees, agents and subcontractors.

4. Builder’s Risk: (Course of Construction) insurance covering all risks of loss less policy exclusions, with limits equal to the completed value of the project and no coinsurance penalty provisions.

5. Professional Liability. If applicable (for design/build), the Contractor, at the Contractor's own cost and expense, shall maintain for the period covered by this Contract professional liability insurance for licensed professionals performing the work in an amount not less than one million dollars ($1,000,000) and a $2,000,000 policy aggregate covering the licensed professionals' errors and omissions, as follows:

    a. Any deductible shall not exceed $5,000 per claim.

    b. Notice of cancellation or non-renewal must be received by West County Wastewater at least thirty days prior to such change.

    c. The following provisions shall apply if the professional liability coverages are written on a claims made form:

        i. The retroactive date of the policy must be shown and must be before the date for the commencement of the Project.

        ii. Insurance must be maintained and evidence of insurance must be provided for at least five years after completion of the Project if reasonably available.

        iii. If coverage is canceled or not renewed and it is not replaced with another claims made policy form with a retroactive date as provided under 00 73 2 A.(5) (c) (i) above, the Contractor must provide extended reporting coverage on the expiring policy for a minimum of five years after completion of the Project.

        iv. A copy of the claim reporting requirements, including any extended reporting period provisions, must be submitted to West County Wastewater prior to the commencement of the Project.

        v. If the services involve lead based paint or asbestos identification/ remediation, the Contractors Pollution Liability.

6. Contractor's Pollution Legal Liability and/or Asbestos Legal Liability and/or Errors and Omissions (if project involves environmental hazards) with limits no less than $1,000,000 per occurrence or claim, and $2,000,000 policy aggregate.

7. Each of the following shall be included in the insurance coverage or added as an endorsement to the policy:

    a. West County Wastewater, its subsidiary districts, its officers, employees, agents and volunteers shall be covered as additional insureds as respects each of the following:

        i. Liability arising out of automobiles owned, leased, hired, or borrowed by or on behalf of the Contractor.

ii. Liability arising out of work or operations performed by or on behalf of the Contractor, including materials, parts, or equipment furnished in connection with such work or operations and the insured's general supervision of or by the Contractor.

iii. Liability arising out of premises owned, occupied or used by the Contractor.

b. General liability coverage can be provided in the form of an endorsement to the Contractor's insurance (at least as broad as ISO Form CG 20 10, 11 85 or both CG 20 10 and CG 20 37 forms if later revisions used.).

c. The coverage shall contain no special limitations on the scope of protection afforded to West County Wastewater, its subsidiary districts, its officers, employees, agents and volunteers.

d. The insurance policy form shall provide coverage on an occurrence basis, and not on the basis of claims made.

e. The insurance must cover complete contractual liability. This may be provided by amending the definition of "incidental contract" to include any written agreement.

f. Any explosion, collapse, and underground property damage exclusion must be deleted.

g. An endorsement must state that coverage is primary insurance and that no other insurance or self-insured retention carried by West County Wastewater will be called upon to contribute to a loss under the coverage.

h. The policy must contain a cross liability or severability of interests clause.

i. Any failure of the Contractor to comply with reporting provisions of the policy shall not affect coverage provided to West County Wastewater and its subsidiary districts, its officers, employees, agents and volunteers.

j. Broad form property damage liability must be afforded. A deductible that does not exceed $250,000 may be provided.

k. Insurance is to be placed with California-admitted insurers, and carrier(s) must be rated "A: VII" or above in the Best's Rating Guide unless otherwise acceptable to West County Wastewater.

l. Notice of cancellation or non-renewal must be received by West County Wastewater at least thirty days prior to such change.

8. Deductibles and Self-Insured Retentions. During the period covered by this Contract, upon express written authorization of West County Wastewater, the Contractor may

increase such deductibles or self-insured retentions with respect to West County Wastewater, its subsidiary districts, its officers, employees, agents and volunteers. West County Wastewater may condition approval of an increase in deductible or self-insured retention levels upon a requirement that the Contractor procure a bond guaranteeing payment of losses and related investigations, claim administration, and defense expenses that is satisfactory in all respects to each of them.

9. Notice of Reduction in Coverage. If any coverage required under 00 73 2. A. (1), (2), (3), (4), (5) or (6) of this Contract is reduced, limited, or materially affected in any other manner, at any time during the period that insurance coverage is required under this Contract, the Contractor shall provide written notice to West County Wastewater at the Contractor's earliest possible opportunity and in no case later than five days after the Contractor is notified of the change in coverage.

10. Verification of Insurance. The Contractor shall submit acceptable proof of insurance, along with all endorsements that implement the insurance coverage required by West County Wastewater. Proof of insurance may be provided by an accurate Certificate of Insurance that identifies all insurance coverage actually in force, although it may exceed the amounts or coverages required by West County Wastewater. The original Certificate of Insurance, and signed endorsements shall be provided to West County Wastewater prior to performance of the work.

11. Builder's Risk (Course of Construction) Insurance. The Contractor may submit evidence of Builder's Risk insurance in the form of Course of Construction coverage. Such coverage shall name West County Wastewater as a loss payee as their interest may appear. If the project does not involve new or major reconstruction, at the option of West County Wastewater, an Installation Floater may be acceptable. For such projects, a Property Installation Floater shall provide property damage coverage for any building, structure, machinery or equipment damaged, impaired, broken, or destroyed during the performance of the Work, including during transit, installation, and testing at the project site.

12. Any exceptions to the above requirements, limits or conditions are to be made in the sole and exclusive discretion of West County Wastewater, by and through West County Wastewater's General Manager.

13. Contractor shall require and verify that all subcontractors maintain insurance meeting all the requirements stated herein.

14. Verification of Coverage. Contractor shall furnish West County Wastewater with original certificates and amendatory endorsements, or copies of the applicable insurance language, effecting coverage required by this contract. All certificates and endorsements are to be received and approved by West County Wastwater before work commences. However, failure to obtain the required documents prior to the work beginning shall not waive the Contractor's obligation to provide them. West County Wastewater reserves the right to require complete, certified copies of all required

insurance policies, including endorsements, required by these specifications at any time.

15. Special Risks or Circumstances. West Coutny Wastewater reserves the right to modify these requirements, including limits, based on the nature of the risk, prior experience, insurer, coverage, or other circumstances.

B. Indemnification

1. The Contractor and its sureties shall indemnify and hold harmless West County Wastewater, the Board, each member of the Board, and West County Wastewater's officers, agents and employees from all liability and claims of any kind, subject to the limitations set forth by law, including attorney's fees, arisfsing out of or in connection with the work to be performed, including but not limited to:

   a. Liability or claims resulting directly or indirectly from the negligence or carelessness of the Contractor or its agents in the performance of the work, or in guarding or maintaining the same, or from any improper materials, implements, or appliances used in its construction, or by or on account of any act or omission of the Contractor or its agents.

   b. Liability or claims arising directly or indirectly from or based on the violation of any law, ordinance, regulation, order, or decree, whether by the Contractor or its agents.

   c. Liability or claims arising directly or indirectly from the use or manufacture by the Contractor, its agents, or West County Wastewater in the performance of the work of any copyrighted or non-copyrighted composition, secret process, patented or unpatented invention, article or appliance, unless otherwise specifically stipulated in the Contract.

   d. Liability or claims arising directly or indirectly from the breach of any warranties, whether express or implied, made to the West County Wastewater or any other parties by the Contractor or its agents.

   e. Liability or claims arising directly or indirectly from the willful misconduct of the Contractor or its agents.

   f. Liabilities or claims arising directly or indirectly from any breach or default of the obligations assumed herein by the Contractor.

   g. Liabilities or claims arising directly or indirectly from injuries, sickness, disease or death of employees of Contractor or his subcontractors, suppliers, or vendors in connection with or incident to their Contract or the work to be performed hereunder.

2. Said duty to indemnify shall not be affected or in any way diminished by the fact that West County Wastewater, the Board, any member of the Board, or West County Wastewater's officers, agents or employees may have jointly caused or contributed to the liability or claim by their acts, omissions, conduct, or negligence. The indemnification obligation under this Article shall not be limited in any way by any limitation of the amount or type of damages, compensation, or benefits payable by or for the Contractor or any such subcontractor or other person or organization under the Worker's Compensation Act, Disability Benefit Act, or other employee benefit act.

3. The duty of the Contractor and its sureties to defend, indemnify and hold harmless as set forth above, shall include but not be limited to the duty to defend as set forth in Section 2778 of the California Civil Code, provided, however, that nothing herein shall be construed to require the Contractor to indemnify West County Wastewater, its subsidiary districts, its officers, employees, agents and volunteers against any responsibility for liability in contravention of Section 2782 of the California Civil Code. The duty to defend shall include but not be limited to any costs and expenses for attorney's fees, consultants, expert witnesses, court costs and all incidental and consequential damages or costs from claims or litigation.

4. The Contractor and its sureties expressly and specifically agree to waive any and all subrogation rights they may have against West County Wastewater, its subsidiary districts, officers, employees, agents and volunteers which any insurer of Contractor may acquire by virtue of the payment of any loss. Contractor agrees to obtain any endorsement that may be necessary to affect this waiver of subrogation. Indemnification and waiver of subrogation contained in this section shall remain operative and in full force and effect regardless of any termination of this Contract.

00 73 02 PRECONSTRUCTION CONFERENCE

A. The purpose of the preconstruction conference shall be to review the Contractor's preconstruction submittals, as required by the Contract, and to execute a West County Wastewater construction permit and discuss various administrative items.

B. At the time and place established for the preconstruction conference, the Contractor shall:

1. Execute and secure a West County Wastewater construction permit for the work under Contract. This permit is for record purposes only, and no fee, therefore, will be charged to the Contractor.
2. File with the West County Wastewater's written Payroll Listing of labor costs in accordance with Section 00 73 26, Certification of Labor Charges.
3. Present the construction schedule and methods of implementing the work.

00 73 03 SURVEYS

A. The Engineer will furnish only a basic reference line, a beginning point on this line, and a bench mark from which the Contractor shall established such other control and reference point as he may need and as will be required to properly lay out the work. Monuments for principal control points shall be set by the Contractor and shall be protected by the Contractor from disturbance. If the monuments are disturbed, any work that is governed by these monuments shall be held in abeyance until the monuments are reestablished by the Contractor. Contractor shall engage a registered civil engineer or licensed land surveyor subject to approval of the Engineer for this work. The accuracy of all the Contractor's stakes, alignments, and grades is the responsibility of the Contractor. However, the Engineer has the discretionary right to check the Contractor's stakes, alignments, and grades at any time. Where such discretion is to be exercised by the Engineer, he will notify the Contractor of his intention, stating the time at which the checking will commence. Any part of the work in progress, the results of which are predicated directly upon the Contractor's stakes, alignments, or grades to be checked, shall be held in abeyance until the Engineer has notified the Contractor that the checking has been completed.

00 73 04 PROGRESS SCHEDULE AND HOLIDAYS

A. The following are the official 2022 holidays of the West County Wastewater and work shall not be scheduled for these days:
   January 1, "New Year's Day"
   January 17, "Martin Luther King Day"
   February 21, "President's Day"
   May 30, "Memorial Day"
   July 4, "Independence Day"
   September 5, "Labor Day"
   November 11, "Veteran's Day"
   November 24, "Thanksgiving Day"
   November 25, "Day After Thanksgiving"
   December 26, "Christmas Day Observed"

B. Construction Progress Documentation

A Construction Project Schedule must be submitted within 15 days of Notice to Proceed, which will be used to monitor the progress throughout the project. Subsequently, montly schedule updates must be submitted with each progress payment application. The Construction Project Schedule must include the following:

1. The Project Schedule shall be performed by a computer software program. The software program, such as: Microsoft Project, Oracle Primavera, or equal. The Contractor shall provide an electronic copy in .PDF format, as well as the original computer software format.
2. The schedule shall depict all significant construction activities, including: submittals, submittal review, all activities with a dollar value greater than one percent of the total

contract amount (or $25,000 per task, whichever is less.) Activity durations shall be broken down such that no activity is longer than 15 working days (except for fabrication and delivery activities)

3. All activities shall have at least one predecessor and one successor (except for first and last activity.)
4. All task constraints must be "As Soon As Possible" (except for date fixed milestones beyond your control, such as a District Board Meeting.)
5. At least four milestones activities (with a duration 0) must be included, such as: 1. Notice to Proceed (NTP) 2. Work Start Date, 3. at least one activity approximately in the middle of the project, and 4. Project Completion.
6. All activities must be sorted by earliest start date.
7. Include the critical path, calculated by the computer software program utilizing the critical path method (CPM.) A manually generated critical path will not be accepted. (Refer to "The Use of CPM in Construction, a Manual for Contractors," published by the Associated General Contractors of America.)
8. The scheduled duration of each activity shall be based on the work being performed during the normal 40-hour work week with allowances made for holidays, closure days and normal weather conditions.
9. Any float or unused time, between the project's contract completion date and completion date in Project Schedule, will belong to the project and not to any of the parties to the contract.
10. In addition to the Monthly Project Schedule updates, a 3-week look ahead schedule shall be provided at each construction progress meeting.

00 73 05 RESPONSIBILITY

The Contractor shall assume responsibility for all new material and skilled application of all work furnished and performed under this Contract including any Amendments thereto. At the completion of this Contact, the construction shall constitute a complete and operable facility. In the event an error or omission is discovered in the Drawings or Specifications during the course of the work, the Engineer shall be promptly notified in writing. If the Engineer determines that remedial measures are necessary requiring extra work clearly outside the scope of the Contract work, a Change Order will be negotiated in accordance with Section 00 72 12, Changes and Extra Work.

00 73 06 CONFLICTS, ERRORS, DISCREPANCIES

In the case of conflicts errors, or discrepancies in any of the Contract Documents, the order of precedence shall be as follows:

1. Change Orders/Addenda (most recent in time takes precedence)
2. Contract and Bond Forms
3. Technical Specifications (Division 20 and above if required)
4. Technical Specifications (Division 1 through 16 as required)
5. Supplementary Conditions
6. Project Drawings
7. General Conditions
8. Instructions to Bidders
9. Bid Forms
10. Notice to Contractors

00 73 07 CLEAN UP AND RESTORATION

A. Upon completion of the work, remove from the site the equipment, all debris, unused materials, temporary construction buildings, and other miscellaneous items resulting from or used in the operations. Replace or repair any facility which has been damaged during the construction work. Restore the site as nearly as possible to its original condition.

1. Throughout the construction period, maintain the Contract working area neat and clean as described in this section.
2. Make final cleanup and restore landscaping for acceptance.
3. In addition to requirements of this section, comply with all requirements for cleaning up as described in various other sections of this Specification.

B. Quality Assurance

1. Inspection: As a minimum, conduct weekly inspections to verify that requirements of this section are being met.

C. Cleaning Materials and Equipment: Provide all required personnel, equipment, and materials needed to maintain the work area neat and clean.

D. Progress Cleaning- General

1. Retain all stored items in an orderly arrangement allowing maximum access, not impeding drainage or traffic, and providing the required protection of material.

2. Provide adequate storage for all items awaiting removal from the jobsite, observing all requirements for fire protection and protection of the environment.

3. Remove any accumulation of scrap, debris, waste material, and other items not required for construction of this work.

4. Mechanically clean all roadways affected by the work daily.

00 73 08 COMMENCEMENT, PROSECUTION, AND COMPLETION

The Contractor shall commence work within **five calendar days** from the date on the Notice to Proceed. Once work is started, it shall be diligently prosecuted to completion on or before the expiration of the time hereinafter stated.

Bid Item	Completion Required Within:
All Items	The Contract time for this project shall be deemed to start five calendar days from the date on the Notice to Proceed.

The Contractor shall coordinate the work to incorporate the project scope, as specified in Section 01 11 00, Work Covered by Contract Documents.

The Contractor shall furnish sufficient forces, construction plant, and equipment, and shall work such hours, including extra shifts and overtime operations, and shall furnish such other necessaries so as to assure the prosecution of the work.

At least two working days in advance of the actual date of commencement of initial operations at the jobsite, the Contractor shall give West County Wastewater written notice of its intent to commence the work under this Contract.

At least two working days in advance of any excavation work for this Project, the Contractor shall give telephone notice of its intent to occupy the jobsite and its schedule of anticipated operations to prosecute the work to:

Underground Service Alert (USA)
Phone: (800) 642-2444

Prior to commencing any excavation work required under this Contract and, pursuant to Section 6705 of the Labor Code of the State of California, the Contractor shall submit, for West County Wastewater approval, a detailed plan showing the design of shoring, bracing, sloping, or other provisions to be made for worker protection from the hazard of caving ground during such excavations.

The Contractor shall furnish West County Wastewater with a copy of all construction permits and auxiliary agreements as may be required and as may be secured by the Contractor regarding methods and appliances specially approved by jurisdictional agencies or private parties with which West County Wastewater has acquired previous permit, easement, or agreement for the work. Such copies of Contractor-secured permits and agreements shall be delivered to the Project Manager, Keith Reynolds at kreynolds@wcwd.org and must receive approval of the Project Manager at least 14 calendar days prior to prosecution of any work covered thereunder. Failure to provide copies of permits within the required time period shall result in forfeiture of permit fee reimbursement by West County Wastwater.

Pursuant to provisions under Section 00 72 35, Progress, Completion, Delays, and Extensions of Time, the Contractor shall notify the Engineer in writing of any causes which lead to an unavoidable delay in the commencement of the work within ten calendar days after any occurrence of such delays.

At the time and place established for the preconstruction conference, the Contractor shall file with West County Wastewater the written certifications prescribed under Section 00 73 26, Certification of Labor Charges to verify charges for any extra work which may be ordered and documented in a Daily Extra Work Report in accordance with Section 00 72 12, Changes and Extra Work.

00 73 09 EXISTING UTILITIES AND SEWERAGE FACILITIES

A. Notwithstanding any other provision of this Contract between West County Wastewater and the Contractor:

1. In accordance with the provisions of Section 4215 of the California Government Code, in any contract to which West County Wastewater is a party, West County Wastewater shall assume the responsibility between the parties to the contract for the timely removal, relocation, or protection of existing utility facilities except for service laterals, and appurtenances located on the site of any construction project that are a subject of the Contract if such utilities are not identified by West County Wastwater in

the Plans and Specifications and made a part of the Invitation to Bid. West County Wastewater will compensate the Contractor for the costs of locating and repairing damage not due to the failure of the Contractor to exercise reasonable care, and removing or relocating such utility facilities which are not indicated in the Plans and Specifications with reasonable accuracy.

2. The Contractor shall not be assessed liquidated damages for delay in completion of the Project when such delay was caused by the failure of West County Wastewater or the owner of the utility to provide for removal or relocation of such utility facilities except for service laterals, and appurtenances which are not identified by West County Wastewater in the Plans.

3. Nothing herein shall be deemed to require West County Wastewater to indicate the presence of existing service laterals or appurtenances whenever the presence of such utilities on the site of the construction project can be inferred from the presence of other visible facilities, such as buildings, meter and junction boxes on or adjacent to the site of the construction; provided, however, nothing herein shall relieve West County Wastewater from identifying utility relocations in the Plans and Specifications except for service laterals, and appurtenances.

4. The owner of the utility shall have the sole discretion to perform repairs or relocation work or permit the Contractor to do such repairs or relocation work at a reasonable price.

5. The Contractor is hereby notified that existing water, gas, electrical, CATV, and telephone service laterals are not shown on the project drawings. The Contractor shall include in his bid, an allowance to locate, cross, and protect these services. Full compensation for this work along with the cost of locating, crossing and protecting main or trunk lines shall be included in the prices bid for the various contract bid items of work and no additional and no additional compensation will be allowed therefor.

B. The location of known existing utilities and pipelines are shown on the Contract Drawings in their approximate locations. Some of the locations include multiple conduits. The Contractor shall exercise care in avoiding damage to those facilities which are to remain in service subsequent to the construction of the particular new facility involved, and it will be held responsible for their repair if damaged. The Contractor shall also exercise care in maintaining those pipes and facilities required for the continuing operation of the existing facilities until such time as they can be abandoned. There is no guarantee that all utilities or obstructions are shown or that the locations indicated are accurate.

1. The Contractor shall be responsible for discovery of all existing underground installations in advance of excavating of trenching, by contacting all local utilities 48 hours in advance, and by prospecting. Contractor shall notify Underground Service Alert 48 hours prior to any excavation work.

2. When the excavation work approaches the approximate location of underground utilities, the exact location shall be determined by careful probing or hand digging. When uncovered, adequate protection shall be provided for the existing installation.

3. The Contractor shall exercise extreme caution in working in the area adjacent to existing sewerage facilities. It is essential that all the existing facilities be maintained in service until the new work is ready for full time operation, and the new work is placed in service. Construction of the connections between the existing facilities and the new facilities shall be at times and during periods acceptable to West County Wastewater. The Contractor shall advise the Engineer in writing of its proposed construction schedule for these connections at least five calendar days in advance.

4. The Contractor shall uncover and completely expose all piping where crossings, interferences, or connections are shown on the Drawings, prior to trenching or excavating for any pipe or structures, to determine actual elevations. New pipelines shall be laid to such grade as to clear all existing facilities which are to remain in service for any period subsequent to the construction of the run of pipe involved. If the Contractor does not expose all required utilities, it shall not be entitled to additional compensation for work necessary to avoid interferences or for repair to damaged utilities. Excavations around underground electrical ducts and conduits shall be performed using extreme caution to prevent injury to workers or damage to the electrical ducts or conduits.

5. If interferences occur at locations other than those shown on the Drawings, the Contractor shall notify the Engineer, and method for correcting said interference will be supplied by the Engineer. Payment for correction of interferences not shown on the Drawings will be in accordance with the provisions of section 00 72 11, Differing Site Conditions.

C. Perpendicular Crossings of Existing Utilities under Pressure: The work under this Contract includes excavations which may be perpendicular to existing high pressure utilities. The Contractor shall comply with the following provisions to protect the existing utilities:

1. The Contract shall contact the owner of the utility pipeline and request that the approximate location be marked in the field.

2. After the location is marked, the Contractor shall hold a safety meeting with the representative of the pipeline company and the Contractor's field personnel. The approximate location of the pipeline and the procedure to be used in exposing the pipeline shall be reviewed.

3. The Contractor shall arrange for a pipeline company representative to be present when the excavation is started and while exposing the pipeline.

4. The Contractor shall perform the exploratory excavations at least five working days in advance of the time the new sewer will be installed in the area of the utility pipeline.

5. The Contractor shall not commence excavation if the field location marks are absent or if the pipeline representative is not present.

6. The Contractor shall exercise caution while excavating in the area which has been marked:

   a. The Contractor shall thoroughly probe the area before beginning excavation with machines and during the continuance of the excavation.

   b. When the pipeline is found by probing, the pipeline shall be completely exposed by hand throughout the limits of required excavations before excavation by machine continues.

7. The Contractor shall arrange with the owner of the utility pipeline to repair any damage done to the pipeline at no cost to West County Wastewater.

D. Parallel Excavations Near Utilities under Pressure: The work under this Contract includes excavations which may be parallel to and near existing high pressure utilities. The Contractor shall comply with the following provisions to protect the existing utilities:

1. The Contractor shall contact the owner of the utility pipeline and request that the approximate location be marked in the field.

2. After the location is marked, the Contractor shall hold a safety meeting with the representative of the pipeline company and the Contractor's field personnel. The approximate location of the pipeline, the procedures to be used in exposing the pipeline, and the schedule for exposing the pipeline shall be reviewed.

3. The Contractor shall arrange for a pipeline company representative to be present when the excavation is started and while exposing the pipeline.

4. The Contractor shall not commence excavation if the field location marks are absent of it the pipeline representative is not present.

5. The Contractor shall exercise caution while excavating in the area which has been marked.

6. The existing pipeline shall be exposed every 50 to 100 feet by the Contractor at locations where the catch point of a sloped trench would be within five feet of the centerline of the existing pipeline.

7. The Contractor shall perform the exploratory excavations at least fourteen working days in advance of the time that the new sewer will be installed in the area of the utility pipeline.

8. If the location of the existing pipeline is found by exploratory excavations to be consistently outside of the future excavation and the soil is stable, the Contractor may proceed with machine excavations:

    a. The Contractor shall be cognizant in that the existing utility pipeline is near the excavation.

    b. The Contractor shall take due caution while performing excavation operations.

    c. If the utility pipeline is exposed during excavation operations, the Contractor shall contact the Engineer.

    d. The Contractor shall stop excavating and contact the Engineer if the soil becomes unstable.

9. If through exploratory excavations, the Contractor finds the location of the existing pipeline is within the future excavation, the Contractor shall contact the Engineer.

10. The Contractor shall arrange with the owner of the utility pipeline to repair any damage done to the pipeline at no cost to West County Wastewater.

00 73 10 INSPECTION BY OTHERS

Work may be inspected at any time by appropriate federal, state, and local agencies having jurisdiction.

00 73 11 SALVAGED MATERIAL

Existing materials and equipment to be salvaged shall remain the property of West County Wastewater. Salvaged materials to be reinstalled in the work (if any) shall be refurbished as specified before reinstallation. Other material to be salvaged shall be carefully removed and handled in such a manner as to avoid damage and shall be delivered to West County Wastewater at a location within the Water Quality and Resource Recovery Plant (WQRRP) as designated by the Engineer.

00 73 12 DISPOSAL OF MATERIAL

Existing materials and equipment to be demolished, removed, and disposed of, as noted in the Drawings, and all trash such as broken concrete, wood blocking, shipping containers, etc., resulting from the Contract work shall be disposed of at the Contractor's expense.

00 73 13 POTENTIAL HAZARDS AND SAFETY

The conveyance and treatment of raw sewage and its by-products can introduce pathogenic organisms which may cause diseases such as salmonellosis, typhoid fever, paratyphoid fever, bacillary dysentery, cholera, infectious hepatitis, polio, amoebic dysentery, and others.

The Contractor is advised that, in certain locations and under certain conditions, the work may take longer and may require special equipment in order to properly conform to safety regulations. In such cases, no additional compensation will be allowed the Contractor therefor.

The Contractor's personnel shall wear hard hats at all times while on the project area.

Work under this Contract may be in areas where approved protective respiratory equipment is required pursuant to Cal/OSHA General Industrial Safety Order, Section 5144.

The Contractor shall prepare and submit its safety program for the Project work to the Engineer for the Engineer's review as required in Section 00 72 18, Safety.

The Contractor's authorized representative shall have a working knowledge of, and be responsible for, all state and federal safety regulations applicable to the Project.

00 73 14 EXPLOSIVE

The use of explosives on the work is prohibited except certain approved types of cartridge-actuated fastening tools.

00 73 15 DUST CONTROL

The Contractor, for the duration of the Contract, shall maintain all excavation, embankments, haul roads, permanent access roads, project site, waste disposal areas, borrow areas, and all other work areas within Contact work limits free from dust, as determined by the Engineer. Industry-accepted methods of dust control suitable for the area involved, such as sprinkling, chemical treatment, light bituminous treatment, or similar methods, will be permitted. No separate payment will be made to the Contractor for dust control.

00 73 16 FIRE PREVENTION

The Contractor shall not permit unauthorized fires either within or adjacent to the limits of the Project, and it shall be liable for all damage from fire due directly or indirectly to its own activities or to those of its employees or of its subcontractors or their employees. The Contractor,

at its expense, shall conform to all federal, state, and local laws and regulations pertaining to burning, fire prevention and control within or adjacent to the Project. A copy of each required permit shall be furnished to West County Wastewater.

The Contractor's forces or equipment may be required to fight fires in the vicinity, regardless of cause. West County Wastewater will not assume any responsibility for payment for fighting fire when such is ordered by government authority.

Burning or welding operations near any combustible material will require the presence of a firewatch observer equipped with a portable fire extinguisher.

00 73 17 AIR POLLUTION

The Contractor shall so perform its work as not to discharge into the atmosphere from any source whatever smoke, dust, or other air contaminants in violation of the laws, rules, and regulations of the governmental entities having jurisdiction.

00 73 18 TITLE TO MATERIALS FOUND

Unless otherwise provided in the Contract, the title and interest in the right to the use of all water, and the title to all soil, stone, gravel, sand, minerals, timber, and all other materials developed or obtained in the excavation or other operations by the Contractor or any of its subcontractors, or any of their representatives or employees, and the right to use or dispose of the same are hereby expressly reserved by West County Wastewater and neither the Contractor nor any of its subcontractors, nor any of their representatives or employees, shall have any right, title, or interest in or to any part thereof; neither shall they, nor any of them, assert or make any claim thereto. The Contractor shall as determined by West County Wastewater, be permitted to use in its work, without charge, any such materials which meet the requirements of the Contract and as to which West County Wastewater will have the right to use and consume without payment to a third party.

In the event that any Indian relics or items with archeological or historical value are discovered by the Contractor or any of its subcontractors or any of their representatives or employees, the Contractor shall immediately notify the Engineer. The Contractor shall have no property rights to such relics and items.

00 73 19 FINAL ACCEPTANCE

Whenever, as determined by the Engineer in accordance with Section 00 72 41, Final Payment and Release, the Contractor has fulfilled its obligations under the contract, the Engineer will recommend acceptance of the work. After acceptance of the work by West County Wastwater, West County Wastewater will file the Notice of Completion in accordance with Section 4005 of the Government Code. Such notice will constitute "Final Acceptance."

00 73 20 ATTORNEY'S FEES

In case any litigation is commenced with respect to this Contract, the prevailing party shall be entitled to recover from the other party, in addition to amounts found due and owing, costs of suit and reasonable expenses and fees, including reasonable attorneys' fees, incurred by the prevailing party in such litigation, all to be taxed as costs and included in any judgment rendered.

00 73 21 AMOUNT OF LIQUIDATED DAMAGES

The amount of liquidated damages for inexcusable delays to be assessed under Section 00 72 42, Liquidated Damages, shall be $500 for each calendar day of delay beyond each of the required completion dates listed in the Contract.

00 73 22 PERCENTAGE OF PROGRESS PAYMENTS TO BE RETAINED

The percentage of estimated value to be retained under Section 00 72 40, Progress Payments, shall be five percent.

The Contractor shall be allowed to substitute securities for any monies withheld to ensure performance under this Contract pursuant to Section 22300 of the California Public Contract Code. The Contractor shall execute the Escrow Agreement for Security Deposits in Lieu of Retentions in the form contained in Section 00 45 15 of the contract Documents, if applicable.

00 73 23 AMOUNT OF MINIMUM PROGRESS PAYMENT

No progress payment will be made when, in the judgment of the Engineer, the total value of the work done since the last estimate amounts to less than $5,000 as set forth in Section 00 72 40, Progress Payments.

00 73 24 RETENTION FOR REPAIRS

West County Wastewater will retain an amount from any payment due the Contractor equal to twice the value of repairs, corrections, or replacements as provided herein to assure that the Contractor completes such repairs, corrections, or replacements. The Contractor shall receive payments of such retained amounts as the repair, correction, or replacement work is completed.

00 73 25 CONNECTIONS TO EXISTING FACILITIES

The Contractor is required to connect to certain existing facilities as indicated on the Drawings; however, the Contractor must give five calendar days advance notice and receive prior approval of the Engineer for all such connections, whether such connections are "live" or "inactive."

The Contractor shall at all times conduct its operation so as to interfere as little as possible with existing works.

All work of connecting with, cutting into, and reconstructing existing pipes or structures shall be planned to interfere with the operation of the existing facilities for the shortest possible time

when the demands on the facilities best permit such interference, even though it may be necessary to work outside of normal working hours to meet these requirements. Before starting work which will interfere with the operation of existing facilities, the Contractor shall do all possible preparatory work and shall see that all tools, materials, and equipment are made ready and at hand. No connections shall be made without West County Wastewater's prior approval as specified herein.

The Contractor shall make such minor modifications in the work relating to existing structures as may be necessary, without additional compensation.

The Contractor shall have no claim for additional compensation by reason of delay or inconvenience in adapting its operations to meet the above requirements.

All materials and equipment associated with or to be incorporated into the work as herein specified shall be preassembled, prefabricated, precut, or otherwise prepared to the maximum practical degree. It shall be the Contractor's responsibility to fulfill all requirements of the work within the allotted shutdown periods.

00 73 26 CERTIFICATION OF LABOR CHARGES

A. At the time and place established for the preconstruction conference in accordance with 00 73 02 Preconstruction Conference, the Contractor shall file with the Engineer the following written certifications prescribed hereunder either by state law or for West County Wastewater's use to verify charges for any Extra and/or Force Account work which may be ordered and documented in a Daily Work Report.

   1. Certificate showing the amount(s) of Workers' Compensation Insurance applicable to forces under its supervision and, in accordance with Section 1861 of the Labor Code of the State of California, endorsed thereon as follows:

      a. "I am aware of the provisions of Section 3700 of the Labor Code of the State of California which requires every employer to be insured against liability for workers' compensation or to undertake self-insurance in accordance with such provisions before commencing the performance of the work of this Contract."

      b. Contract title, date, and signature of Contractor.

B. The Contractor and subcontractor's attention is directed to the provisions of Section 1776 of the Labor Code of the State of California and to the requirements thereon pertaining to the keeping, availability, and filing of accurate payroll records of all journeymen, apprentices, and other workers performing work under this Contract.

C. Prior to each monthly progress payment, the Contractor shall deliver to the Engineer copies of certified payrolls of its and all subcontractors' forces performing work at the jobsite (or Plant sites established primarily for the work), for labor compliance purposes, and Extra/Force Account considerations. Such records shall be kept current on an effective day

or period basis and in form acceptable to the Engineer. At a minimum, the form shall include the following information:

1. Employee identification by name.
2. Employee's address and social security number.
3. Employee's craft and classification (in accordance with Director of Industrial Relations' wage determinations).
4. Employee's actual per diem wages (in compliance with Section 00 11 16 Invitation to Bid, and Section 00 72 20, Laws and Regulations).
5. Employee's subsistence and travel allowance (as applicable).
6. Contractor's or subcontractor's firm or company name, date or period for which applicable wage rates and allowances are effective, and the employer's signature.

00 73 27 SOLE SOURCE ITEMS

Some products or manufacturers may be specified as the only items allowed. Such items may have been chosen for reasons of durability or appearance. As provided in Section 00 72 15, Equipment, Materials, and/or Products, Substitution of Specific Items and Trade Names, Worker's Skills, no substitutions for these items will be reviewed by the Engineer.

00 73 28 PARTIAL PAYMENT FOR MATERIALS AND EQUIPMENT DELIVERED

Generally, the Contractor will not be compensated for materials and equipment delivered to the site until after they are incorporated in the work. If the Engineer determines that the progress of the work will benefit by the delivery to the site of certain materials and equipment in advance of their actual requirement, and if such materials and equipment are delivered in accordance with the following conditions, a portion of the cost of the materials and equipment may be included in progress payments, as specified under Section 00 72 40, Progress Payments. The conditions for such partial payments are as follows:

At least four weeks prior to the delivery of such materials and equipment, the Contractor shall submit a list of such materials and equipment for review on the acceptability for partial payments. Shop drawings and technical data for such materials and equipment must be reviewed and accepted prior to delivery. Upon delivery, the Contractor shall submit written evidence, satisfactory to the Engineer, that the Contractor is the unconditional owner of such materials. free from all claims, liens, and security interest, and a bill of sale or other equivalent document with warranty of title to such materials and equipment.

Title to the delivered material shall be vested in West County Wastewater at the time of delivery to the site. The Contractor shall, however, not withstanding such transfer of title to West County Wastewater be absolutely responsible to West County Wastewater for such materials and equipment until the same shall have been completely installed, tested, and accepted. Such equipment and materials shall be properly stored or stockpiled to the satisfaction of the Engineer. The Contractor shall at its own cost replace any materials and equipment damaged or lost.

Stored or stockpiled materials shall be available for inspection by the Engineer or other authorized agent of West County Wastewater.

After delivery of material, if any defects are discovered, whether caused by defective manufacture or damage occurring during delivery or storage (including storage at West County Wastewater or the construction site), the materials shall be removed and replaced with suitable material at the Contractor's expense. The Contractor's insurance shall include coverage for such material against theft, fire, vandalism, and malicious mischief.
The maximum portion of cost to be included in progress payments for materials and/or equipment qualifying under this section will be seventy five percent of the total cost of the delivered materials and/or .equipment eligible for such partial payment. The payment will in no case exceed the bid price or assigned value for the item of work for which the material and/or equipment are furnished and the accumulated total payment for all material delivered but not yet incorporated into the work will in no case exceed ten percent of the total value of the Contract.

For sewer pipe the payment for material delivered but not yet installed in the work shall be limited to a maximum of 1,500 linear feet or the amount of footage which the Contractor has proved capable of laying in five working days , whichever is less. In estimating progress payments, the Engineer may use the unit prices bid by the Contractor in his proposal. In the event that there are no unit bid prices, or the bid unit process do not, in the opinion of the Engineer , represent the actual value of the equipment and materials furnished, the Engineer may estimate progressive payments based on prices reflecting such actual value.

Nothing in the above conditions shall relieve the Contractor of its responsibility for incorporating the materials in the work in conformity with the Contract Documents.

00 73 29 MAINTAINING EXISTING UTILITIES

The Contractor shall provide standby power if the power supply is disconnected during business hours. Flow in the West County Wastewater's existing sewers shall not be restricted or dammed for any period of time without the approval of West County Wastewter. Any rerouting and/or bypass pumping of existing flows shall be made at the Contractor's expense. The Contractor shall submit to the Engineer for approval plans for rerouting, bypassing and/or handling of existing sewage flows during construction at least fourteen (14) days prior to such work.

00 73 30 PERMITS, EASEMENTS, AND AGREEMENTS

Attention is directed to Section 00 72 21, Permits. The Contractor will obtain all necessary permits, including an Encroachment Permit. West County Wastewater will reimburse the Contractor for the necessary permit and inspection fees. The contractor must pay re-inspection of the same item and any citation/fine/fees resulting from contractor's negligence or lack of completion.

00 73 31 PARKING AND EMPLOYEE IDENTIFICATION

Contractor vehicles shall not park in such a way as to impede traffic. Contractor vehicles shall not park in employee-designated parking spots. Contractor vehicles are permitted to park in public parking spots at West County Wastewater properties and in designated locations as agreed upon.

00 73 32 WORKING DURING DISPUTES AND LITIGATION

In the event of a dispute between the parties as to performance of the work, the interpretation of this Contract, or payment or nonpayment of work performed, parties shall attempt to resolve the dispute. If the dispute is not resolved, Contractor agrees to continue the work diligently to completion and will neither rescind this Contract nor stop the progress of the work, but will submit such controversy to determination in accordance with the terms of the Contract Documents. In the event any litigation is commenced with respect to this Contract, such litigation shall not serve to suspend Contractor's obligation to continue performance of the work.

00 73 33 SUBMITTALS

A. Where the Contractor is required by these Contract Specifications to make submittals, they shall be made to the Engineer with a letter of transmittal and in sufficient number of copies to allow a distribution of at least one copy to all parties needing a copy to carry out the provisions of the Specifications, allowing for two copies to be retained by the Engineer.

B. When submittals are favorably reviewed, the Engineer will retain two copies and will return all other copies to the Contractor. When submittals are not favorably reviewed, the Engineer will retain only two copies and will return all others to the Contractor.

C. In addition to those specifically required, the Contractor shall submit drawings and information describing materials and equipment in sufficient detail to determine whether the materials and equipment conform to the specifications.

D. Submittals shall comply with Section 00 72 16, Contractor Furnished Drawings and Data.

E. The Contractor shall verify that the material and equipment described in each submittal conform to the requirements of the specifications and drawings.

F. The Contractor may authorize a material or equipment supplier to deal directly with the Engineer with regard to a submittal only after it has been officially submitted by the Contractor. In all cases, however, the Contractor retains full responsibility for the accuracy and completeness of information contained in the submittals and its proper processing.

G. Key submittal schedules shall be shown on the Construction Project Schedule. Contractor shall provide adequate time for processing and reviewing, and should anticipate the potential for re-submittals where such is likely. The date a submittal is required to maintain project schedule shall be shown on the transmittal. Unreasonable dates and dates

inconsistent with the schedule will not be accepted or honored. No allowances will be made for delays occasioned by the Contractor's failure to follow submittal requirements. In no case will there be compensation for any delay due to submittals.

H. Transmittal Form: The submittals shall be accompanied by a transmittal form. At a minimum, the transmittal form shall include the following information:
   a. Name and address of Contractor.
   b. Date and submittal/transmittal number.
   c. Project name, project number and name of Engineer to review.
   d. Item number, item description, and name of supplier.
   e. Identification of any deviations from the specified requirements.
   f. Signature of Contractor.
   g. A signature line for the Engineer to indicate approval.

00 73 34 EXTENSIONS OF TIME FOR DELAY DUE TO INCLEMENT WEATHER

Inclement weather is any weather condition or conditions resulting immediately therefrom, causing the Contractor to suspend construction operations or preventing the Contractor from proceeding with at least 75 percent of the normal labor and equipment force engaged on the work, for all project sites combined.

Should the Contractor prepare to begin work at the regular starting time at the beginning of any regular work shift on any day on which inclement weather, or the conditions resulting from the weather, or the condition of the work prevents work from beginning at the usual starting time, and the crew is dismissed as a result thereof, the Contract will not be charged for a working day whether or not conditions change thereafter during the day, and the major portion of the day could be considered to be suitable for such construction operations.

00 73 35 EROSION CONTROL

Non-paved areas disturbed during construction shall be revegetated by hydroseeding upon completion of construction to prevent soil erosion. Vegetation shall be established prior to final completion. Attention is directed to Section 00 72 59 Storm Water Pollution Prevention.

00 73 36 STANDARD DETAILS

Standard Details shall mean the West County Wastewater's Standard Details, which are available at no cost from West County Wastewater.

00 73 37 DRAWINGS AND PROJECT MANUAL

A. The Contractor may obtain from West County Wastewater, free of charge, four copies of the Drawings and Project Contact Documents. Additional sets may be procured at cost of $50 each.

B. The Contact Documents shall include the bidding conditions and requirements, Contract forms, conditions, Specifications, Supplements, Addenda, and clarifications thereto.

C. The Contractor shall keep on the work site a copy of the Contract Documents and Drawings and shall at all times give the Engineer access thereto. Any drawings included in the detailed Specifications shall be regarded as part thereto and of the Contract. Anything mentioned in these Specifications and not shown on the Drawings, or shown on the Drawings and not mentioned in these Specifications, shall be of like effect as though shown or mentioned in both. The Engineer will furnish from time to time such detail drawings, plans, profiles, and information as he may consider necessary for the Contractor's guidance, unless otherwise provided in the Proposal or detail Specifications. It shall be the duty of the Contractor to see that the provisions of these Specifications are complied with in detail irrespective of the inspection given the work during its progress by the authorized official or his representatives. Any failure on the part of the Contractor to observe the Specifications will be sufficient cause for the rejection of the work at any time before its acceptance. Only "favorably reviewed" Shop Drawings shall be used for construction.

D. Wherever Military Specifications (MIL), ANSI, ASTM, AASHTO, AISC, AWS, AWWA, Federal Specifications (FS), Manufacturer's Standardization Society (MSS), or other specifications are referred to in these Specifications without designation of year, the reference is to the current or revised specification effective at the time of receiving proposals.

E. In all cases where reference is made to the requirements of such organizations as American Society for Testing and Materials, copies of the requirements referred to are on file with the Design Engineer and may be seen at his office.

F. Wherever the following terms are used, the intent and meanings shall be as follows:

Abbreviation	Stands For
AASHTO	American Association of State Highway and Transportation Officials
ACI	American Concrete Institute
ABMA	American Boiler Manufacturers Association
ADC	Air Diffusion Council
AGA	American Gas Association
AGMA	American Gear Manufacturers Association
AISC	American Institute of Steel Construction
AISI	American Iron and Steel Institute
AITC	American Institute of Timber Construction
AMCA	Air Moving and Conditioning Association
ANSI	American National Standard Institute (formerly United States of American Standards Institute)
APA	American Plywood Association
API	American Petroleum Institute
AREA	American Railway Engineering Association

ASCE	American Society of Civil Engineers
ASME	American Society of Mechanical Engineers
ASTM	American Society of Testing and Materials
AWPA	American Wood Preservers Association
AWS	American Welding Society
AWWA	American Water Works Association
CAGI	Compressed Air and Gas Institute
Cal/OSHA	State of California Department of Industrial Relations, Division of Industrial Safety
CARB	California Air Resources Board
CBR	California Bearing Ratio
CISPI	Cast Iron Soil Pipe Institute
CMMA	Crane Manufacturers Association of America
CTI	Cooling Tower Institute
DFPA	Douglas Fir Plywood Association
EIA	Electronic Industries Association
EPA	U. S. Environmental Protection Wastewater
ETL	Electrical Testing Laboratory
FPS	Fluid Power Society
FS	Federal Specifications
HI	Hydraulic Institute
HMI	Hoist Manufacturers Institute
IAPMO	International Association of Plumbing and Mechanical Officials
ICBO	International Conference of Building Officials
IEEE	Institute of Electrical and Electronic Engineers
IES	Illuminating Engineering Society
IPCE	International Power Cable Engineers Association
ISA	Instrument Society of America
NBS	National Bureau of Standards
NEC	National Electric Code
NEMA	National Electrical Manufacturers Association
NFPA	National Fire Protection Association
NSF	National Sanitary Foundation
OSHA	Occupational Safety and Health Act
SMACNA	Sheet Metal and Air Conditioning Contractors National Association
SSPC	Structural Steel Painting Council
UBC	Uniform Building Code
UL	Underwriters Laboratories

00 73 38 INITIAL START-UP AND OPERATION OF FACILITIES

During the construction of this Project, use of the newly constructed facilities prior to overall acceptance may be necessary to ensure that the entire facility can be constructed. Initial lubrication of all equipment, and all lubrication and maintenance and such staff as required for test operation shall be provided by the Contractor until West County Wastewater assumes

operation. After assuming operation, West County Wastewater will supply operating personnel and will pay for electricity, chemicals and lubricants. The Contractor shall train West County Wastewater's operating personnel in the proper operation and control of the new facilities as specified herein. The Contractor shall also furnish all such mechanical and electrical workers as required to make adjustments and maintain the operating equipment until acceptance. Maintenance of operating equipment shall include adjustments, replacements and modifications as required. The Contractor shall initially lubricate all equipment and furnish West County Wastewater with a lubricant schedule indicating the type of lubricant needed, amounts and frequency of application. Use of facilities will in no way constitute acceptance of the facilities being used. The Contractor shall notify West County Wastewater at least thirty calendar days before any West County Wastewater-furnished lubricants, fuel, chemicals, gas or power will be required for the initial operating periods.

The cost of all labor, material and equipment required to be furnished by the Contractor as part of the initial start-up operation shall be included in the lump-sum bid amounts.

00 73 39 RESPONSIBILITY FOR SPARE PARTS AND SPECIAL TOOLS

The Contractor and Vendor shall provide all spare parts required for the first year's operation. The Contractor and Vendor shall provide all special tools required to assemble, disassemble and maintain all equipment provided under this contract.

00 73 40 MANUALS, OPERATING INSTRUCTIONS AND AFFIDAVITS

A. Manuals and Instructions. The Contractor shall deliver to the Engineer six (6) sets of acceptable manufacturer's operation and maintenance instructions covering each item of mechanical, electrical and instrumentation equipment or equipment assembly provided under this Contract. All information shall be submitted, reviewed and approved as received and prior to installation of the equipment. Submittal and review of the above information shall be handled in a manner similar to shop drawings as specified in Section 00 72 15, Contractor-Furnished Drawings and Data.

B. Operation and maintenance instructions shall include, as a minimum, the following data for each item of mechanical, electrical and instrumentation equipment:
   1. An itemized list of all data provided.
   2. Name and location of the manufacturer, the manufacturer's local representative, the nearest suppliers and spare parts warehouse.
   3. Recommended installation, adjustment, start up, calibration and troubleshooting procedures.
   4. Recommended lubrication, lubrication intervals and an estimate of yearly quantity needed.
   5. Recommended step-by-step procedures for all modes of operation.
   6. Complete internal and connection wiring diagrams.
   7. Recommended preventative maintenance procedures and schedule.

8. Complete parts lists, by generic title and identification number, with exploded views of each assembly.
9. Recommended spare parts and special tools.
10. Disassembly, overhaul and reassembly instructions.

C. Following completion of an item, instructions and procedures shall be modified by the Contractor to reflect field changes.

D. Before final acceptance of the Project, the Contractor shall bind all six (6) sets of operation and maintenance instructions in appropriately labeled, expanding post-type binders. Each completed binder shall only contain material which can be held with the posts in the non-expanding position. A complete table of contents listing all items and their location in the set shall be included in each binder. For ready reference, the Contractor shall compile a complete list of manufacturer's local representatives for each item provided.

E. Affidavits. The Contractor shall provide field service by equipment manufacturers as a part of this Project, as required in the Technical Specifications. Equipment shall not be considered ready for operation until after the authorized factory-trained and qualified manufacturer's representative for the specific equipment has checked and adjusted the equipment and certified by written affidavit that the equipment has been properly installed, tested, adjusted, lubricated and calibrated and is ready for full time operation. Acceptable affidavits shall be submitted prior to completion of work. Affidavits shall contain the following specific wording:

"the (Name of the Equipment) has been properly installed, tested, adjusted, lubricated and is ready for full time operation. The installation has been inspected and has been found to be in conformance with our (the manufacturer's) standards and requirements."

00 73 41 RECORD PLANS

The Contractor shall maintain, at the jobsite, one record set of contract drawings in good order and clearly marked to show any deviations which have been made from the Contract Drawings, including concealed construction and utility features which are revealed during the course of construction. Marked prints shall be updated at least once each week and shall be available to the Engineer for review as to currency prior to developing partial payment estimates. Upon completion of the work, the marked set of prints shall be delivered to the Engineer.

Requests for partial payments will not be approved if the record set of drawings is not in good order or is not kept current. Request for final payment will not be approved until the complete and correct "as-built" record drawings are delivered to the Engineer.

00 73 42 JOINT SURVEY TO ESTABLISH PRECONSTRUCTION CONDITIONS

A. West County Wastewater intends to engage to perform preconstruction examinations and make an overall evaluation of the condition of structures, roads, and road crossings in the vicinity of the work, as applicable, which might be damaged during construction. Participation by the Contractor in the examination is required.

B. The examination of existing buildings, structures, roads, and other improvements located in the zone of influence of the construction operations, will be performed jointly by West County Wastewater, and the Contractor, and the property owners under supervision of West County Wastewater. The scope of each examination shall include road damage, cracks in structures, settlement, leakage, and other visible signs of damage.

C. Records of all observations will be prepared by West County Wastewater, including survey measurements, sketches, notes, photographs, and video tapes when deemed necessary.

D. The above records, photographs and video tapes are intended for use as indisputable evidence in ascertaining the extent of any damage which may occur as a result of the Contractor's operations and are for the protection of the Contractor and West County Wastewater. They will be a means of determining whether and to what extent damage resulting from the Contractor's operations occurred during the contract work.

E. The Contractor shall take adequate precautions to prevent damage to existing buildings, structures, detour roads, road crossings, and other improvements during the prosecution of the work.

F. The West County Wastewater-funded joint survey does not relieve the responsibility of the Contractor to conduct any additional preconstruction surveys or any periodic or continuous monitoring of structures or improvements during construction activities which may be required because of the Contractor's construction techniques or work sequence. The Contractor shall conduct the additional preconstruction survey or construction monitoring as identified by the Contractor without additional compensation from West County Wastewater.

00 73 43 CONSTRUCTION CONSTRAINTS

It is the Contractor's responsibility to protect existing improvements, provide for safe and smooth traffic flow, minimize disruptions and noise, and ensure that the work is done with as little inconvenience to West County Wastewater and to the public as possible. The Contractor shall, at its own expense, restore any and all existing improvements equal to its preconstruction condition or better.

00 73 44 TRAFFIC CONTROL

Contractor shall coordinate with the agency having jurisdiction over the right of way. Contractor's construction vehicles shall not block or impede public access.

If the Contractor needs any traffic rerouting or restriction to facilitate its work, it shall acquire a written permit, through the offices of the City of Richmond. No traffic restriction or rerouting shall be initiated prior to the Engineer's receipt of such permit and all conditions prescribed therefore. In accordance with Section 00 73 30 Permits, Easements and Agreements, West County Wastewater will Reimburse the Contractor for the necessary permit and fees. The Contractor must pay re-inspection of the same, and any fines as part of Contractor's negligence.

If required, the Contractor shall submit a detailed traffic plan for rerouting and/or restricting traffic to the City of Richmond for approval before any work can be started under the Contract. The traffic plan shall show locations of flagmen, signs and barriers relative to the working area. As a minimum, the traffic plan and lane closures shall be in accordance with the State Department of Transportation (Caltrans) current standards. The Contractor shall provide three copies of the City of Richmond-approved traffic plans to the West County Wastewater prior to the start of work.

00 73 45 WORK HOURS

Early morning, night time and weekend work will require approval from West County Wastewater.

00 73 46 FEDERAL, STATE AND LOCAL REQUIREMENTS

The Contractor shall keep fully informed of laws, ordinances, and requirements of the Federal, State of California, Contra Costa County and West County Wastewater which, in any manner, affect the performance of the work or those persons engaged therein, and of all orders and decrees of governmental bodies or officials having any authority or jurisdiction over the same. The Contractor shall observe and comply with and shall cause all its agents, employees and subcontractors to observe and comply with all such ordinances, regulations, laws, orders, and decrees.

All construction and materials, and the like, shall be furnished, installed, or constructed as the case may be, by the Contractor in full accordance with the requirements of local building codes, the National Board of Fire Underwriters, the Pacific Fire Rating Bureau, the State Fire Marshall, the Safety Orders issued by the Division of Industrial Safety of the State of California, and all other prevailing codes and regulations having jurisdiction over construction of the structure.

The Contractor's authorized representative shall have a working knowledge of, and be responsible for, all state and federal safety regulations applicable to the Project.

00 73 47 APPRENTICES

The Contractor shall comply with the provisions of Section 1777.5 and 1777.6 of the California Labor Code in regard to employment of apprentices.

00 73 48 LABOR, WAGES, AND WAGE DETERMINATIONS

Pursuant to section 1770 *et seq.* of the Labor Code of the State of California, the Director of Industrial Relations has ascertained the general prevailing rate of per diem wages and the rates for overtime and holiday work in the locality in which the work is to be performed for each craft, classification or type of worker needed to execute the contract which will be awarded to the successful bidder. Copies are on file with and available upon request from the Engineer and may also be obtained the website of the Division of Labor Statistics and Research, California Department of Industrial Relations located at www.dir.ca.gov. The successful bidder shall post a copy thereof at each job site. The requirement to pay these wage rates is further detailed in Part IV, Section E (2) of General Conditions. It shall be mandatory upon the bidder to whom the Contract is awarded, and upon any subcontractor under him to comply with all Labor Code provisions, which include, but are not limited to the payment of not less than the said specified rates to all workers employed by them in the execution of the Contract, employment of apprentices, hours of labor and debarment of contractors and subcontractors. The Federal minimum wage rates (Davis-Bacon) for this project as predetermined by the United States Secretary of Labor are set forth at the federal government website as called out below. The Federal minimum wage rates may also be examined at the offices described above where project plans, special provisions, and proposal forms may be seen. Addenda to modify the Federal minimum wage rates, if necessary, will be issued to holders of these Contract Documents. Future effective general prevailing wage rates, which have been predetermined and are on file with the California Department of Industrial Relations are referenced but not printed in the general prevailing wage rates. Attention is directed to the Federal minimum wage rate requirements included with these specifications in the supplemental conditions and also available at the federal web site Wage Determination Online (http://www.wdol.gov) go to the California, Contra Costa County file references. If there is a difference between the minimum wage rates predetermined by the Secretary of Labor and the general prevailing wage rates determined by the Director of the California Department of Industrial Relations for similar classifications of labor, the Contractor and subcontractors shall pay not less than the higher wage rate. The Department will not accept lower State wage rates not specifically included in the Federal minimum wage determinations. This includes "helper" (or other classifications based on hours of experience) or any other classification not appearing in the Federal wage determinations. Where Federal wage determinations do not contain the State wage rate determination otherwise available for use by the Contractor and subcontractors, the Contractor and subcontractors shall pay not less than the Federal minimum wage rate, which most closely approximates the duties of the employees in question.

END OF GROUP 00 73 00

DIVISION 01:
GENERAL REQUIREMENTS

SECTION	TITLE
01 11 00	WORK COVERED BY CONTRACT DOCUMENTS
01 51 10	TEMPORARY FACILITIES
01 51 11	WATER SUPPLY AND ELECTRICAL POWER
01 51 12	COMPRESSED AIR
01 51 13	CONTRACTOR'S FIELD OFFICE
01 51 14	PORTABLE SANITARY FACILITIES
01 51 15	STAGING AREA
01 71 13	MOBILIZATION
01 89 13	SITE PREPARATION

SECTION 01 11 00
WORK COVERED BY CONTRACT DOCUMENTS

A. Furnish all labor, materials, equipment, services, temporary controls, construction facilities, temporary facilities and all general conditions, general requirements and incidentals required to complete the Work in its entirely as described in the Contract Documents.

B. The Work covered by the contract comprises the construction of the Marine Outfall Diffuser & Anode Replacements, including all associated civil, mechanical, structural, electrical, and controls work as indicated on the Drawings and as specified. The Work includes, but is not limited to:

1. Obtain all necessary permits prior to starting the work, unless otherwise instructed by West County Wastewater staff.

2. Provide all necessary materials, supplies, equipment, services and personnel, to adequately carry out or complete the project.

3. Perform work site cleanup duties, including, but not limited to removing all debris and placing materials, supplies and equipment in an organized manner, prior to leaving the site, each day.

4. Provide installation and roof warranties.

5. Remove and replace the existing built-up roof membrane with SBS modified (cold process).

6. Remove and replace existing metal coping.

7. Remove, store and reinstall existing ventilators and increase the height of the respective curbs.

8. Flash all existing roof penetrations and through-wall scuppers and overflows.

9. Structural upgrade for an ACSE 41-based seismic retrofit of indicated buildings on site.

10. All other work as shown and specified in the Contract Documents.

SECTION 01 51 10
TEMPORARY FACILITIES

The Contractor shall provide all temporary facilities required for the completion of the work.

SECTION 01 51 11
WATER SUPPLY AND ELECTRIC POWER

The Contractor shall arrange for its own services for water and electricity for the completion of the work.

SECTION 01 51 12
COMPRESSED AIR

The Contractor shall provide its own source of compressed air as may be required.

SECTION 01 51 13
CONTRACTOR'S FIELD OFFICE

The Contractor shall submit to West County Agency for approval, a site plan showing the proposed location for any contractor field office location and acquire any necessary permits. The Contractor shall make its own arrangements for phone service.

SECTION 01 51 14
PORTABLE SANITARY FACILITIES

The Contractor shall provide portable sanitary facilities for its employees. Employees of the Contractor shall not use West County Agency's Sanitary facilities.

SECTION 01 51 15
STAGING AREA

A. The Contractor shall submit to West County Agency for approval, a site plan showing the proposed staging area location, and acquire any necessary permits. The Contractor shall make its own arrangements for phone service. The staging area shall be used for storage of construction spoils, materials, equipment and portable sanitary facilities. This area shall be maintained, secured and kept clean at all times.

B. A security fence shall be constructed around the staging area. At completion of the work, remove fence from the site and restore the area to equal or better condition.

C. Contractor shall not dump waste oil, rubbish, or other similar materials on the ground. Equipment leaking oil or other objectionable materials must be repaired or removed.

SECTION 01 71 13
MOBILIZATION

A. Contractor shall Provide all materials and equipment required to accomplish the work as specified.
B. Contractor shall Deliver all equipment and materials to project site.
C. Contractor shall Provide any additional staging area, as required, and field office as approved by the Engineer.

SECTION 01 89 13
SITE PREPARATION

PART 1.00 - GENERAL

1.01 DESCRIPTION

A. Perform all site preparation activities, as shown or specified, including but not limited to the following:
1. Clearing and grubbing.
2. Stripping topsoil.
3. Disposing of waste material.
4. Stockpiling reusable material.

1.02 EXISTING CONDITIONS

A. The RFP Attachments indicate the existing conditions of the site, where known.

B. Locations of existing underground utilities indicated in the RFP Attachments is the best information available, but with no representation that the information is complete or accurate or that lines other than shown may not be present. Refer to the heading "PROTECTION" for details of requirements of identification and locations of these utilities.

C. All information relative to existing conditions is offered to assist the Contractor in evaluation of the Work, but with no specific representation, either expressed or implied, as to completeness or accuracy. The Contractor shall be responsible for any deductions or conclusions made on the basis of this information and that of any additional site inspections, if made.

1.03 PROTECTION

A. Maintain in service and protect from damage all existing utilities as specified in Section 00 73 09, Existing Utilities and Sewerage Facilities and as noted on the Drawings.

B. Before commencing any site preparation or demolition activity, contact all municipal service departments, service companies and other utilities affected, and arrange to have the lines that are within the construction area accurately located and identified with appropriate surface marks as specified in Section 00 73 09.

C. Conduct site preparation operations to insure safety of all persons and to prevent damage to existing structures and utilities, trees, and other vegetation to be left in place, construction in progress and other property.

D. Conduct demolition operations and remove debris off-site to suitable disposal areas in a manner to ensure maximum safety and minimum interference with operations of others, private and public. This includes, but is not limited to, the removal of existing curbs and gutters and asphalt concrete paving.

E. Do not close or obstruct streets, walks, and other facilities occupied and used by West County Agency or the public, without prior written permission by the City as appropriate.

F. Repair all damage to streets, roads, highways, shoulders, ditches, embankments, culverts, bridges and other public or private property, regardless of location or character, which may be caused by transporting equipment, materials. At the Contractor's expense, make satisfactory and acceptable arrangements with the owner of or the agency having jurisdiction over the damaged property concerning its repair or replacement or payment of costs incurred in connection with the damage.

G. Protect existing facilities from rain or water damage during construction.

1.04 SEQUENCING AND SCHEDULING

A. Do not place fill material over subgrade that is covered with ice or water. Stop all operations and protect existing facility when inclement weather could saturate the soil, or damage existing facility.

B. Perform all demolition operations and remove all debris in areas scheduled for earthwork operations under the Contract prior to the start of such earthwork operations.

C. Remove and dispose of off-site the following items: existing sewer pipe; fittings; excess soil; pavement; and concrete curb. Do not stockpile waste materials on-site.

DIVISION 02:
EXISTING CONDITIONS

SECTION	TITLE
02 41 00	DEMOLITION
02 82 00	ASBESTOS REMEDIATION **(NOT USED)**
02 83 00	LEAD REMEDIATION **(NOT USED)**

SECTION 02 41 00
DEMOLITION

PART 1.00 - GENERAL

1.01 WORK INCLUDED

A. Demolition of the existing roofing and portions of the existing plywood and joists at the roof.

PART 2.00 - PRODUCTS

2.01 MATERIALS

A. The materials to be salvaged, stored or removed as part of the Work of this Project are defined in the following:

   a. Remove and dispose of off-site the following items: excess soil; pavement; and concrete curb. Do not stockpile waste materials on-site.

B. Refer to Earthwork, Section 31 00 00 for a definition of Class V Material (suitable native material) for use on the Project.

C. Refer to Earthwork, Section 31 00 00 for criteria for Concrete Fill.

PART 3.00 - EXECUTION

3.01 INSTRUCTIONS

A. Before commencing any site preparation or demolition activity, contact all municipal service departments, service companies and other utilities affected, and arrange to have the lines that are within the construction area accurately located and identified with appropriate surface marks.

B. Conduct demolition operations and remove debris off-site to suitable disposal areas in a manner to ensure maximum safety and minimum interference with operations of others, private and public. This includes, but is not limited to, the removal of existing curbs and gutters and asphalt concrete paving.

C. Perform all demolition operations and remove all debris in areas scheduled for earthwork operations under the Contract prior to the start of earthwork operations.

D. In general, the Contractor shall remove all debris resulting from removal / demolition work as it accumulates. Upon completion of the removal / demolition work, all materials, equipment, and rubbish of every sort shall be removed and the premises left neat and orderly.

E. All materials resulting from removal or demolition operations become the property of the Contractor. Remove and dispose of materials off-site per governing regulations and codes as the Work progresses. Do not accumulate or sell removed materials.

END OF SECTION 02 41 00

SECTION 02 82 00
ASBESTOS REMEDIATION (NOT USED)

SECTION 02 83 00
LEAD REMEDIATION (NOT USED)

END OF GENERAL REQUIREMENTS DIVISION 2
EXISTING REQUIREMENTS

DIVISION 03:
CONCRETE

SECTION	TITLE
03 11 00	CONCRETE FORMWORK
03 15 00	CONCRETE ACCESSORIES
03 15 13	WATER STOP
03 20 00	CONCRETE REINFORCING
03 21 16	EPOXY-COATED REINFORCEMENT STEEL BARS (Not Used)
03 30 00	CAST-IN PLACE CONCRETE
03 34 00	LOW DENSITY CONCRETE (Not Used)
03 35 29	TOOLED CONCRETE (Not Used)
03 39 00	CONCRETE CURING
03 40 00	PRECAST CONCRETE (Not Used)
03 60 00	GROUT
03 64 23	EPOXY INJECTION SYSTEM (Not Used)
03 70 00	MASS CONCRETE (Not Used)

SECTION 03 11 00
CONCRETE FORMWORK

PART 1.00 - GENERAL

1.01 WORK INCLUDED
A. Formwork, shoring, bracing and anchorage.
B. Concrete reinforcement and accessories.

1.02 REFERENCES
A. ACI 301 - Specifications of Structural Concrete for Buildings.
B. ASTM A615 - Deformed and Plain Billet-Steel for Concrete Reinforcement.
C. ASTM C33 - Concrete Aggregates.
D. ASTM C94 - Ready-Mixed Concrete.
E. ASTM C150 - Portland Cement.
F. Caltrans Standard Specifications, 2010 Edition, Section 90.

1.03 QUALITY ASSURANCE
A. Perform work in accordance with ACI 301.
B. Concrete cylinder and slump sampling and testing will be performed by West County Wastewater at their discretion and at no cost to the Contractor.

1.04 SUBMITTALS
A. Submit proposed mix design for each class of concrete to West County Wastewater and Engineer for review prior to commencement of work, per the General Conditions.

PART 2.00 - PRODUCTS

2.01 FORM MATERIALS
A. Conform to ACI 301.
B. Plywood Forms: Douglas Fir B-B, Class 1, Exterior 5/8" min thick, sound undamaged sheets.
C. Lumber: Douglas Fir species; standard grade; with grade stamp clearly visible.

PART 3.00 – EXECUTION

3.01 FORMWORK ERECTION
A. Verify lines, levels and measurement before proceeding with formwork.
B. Hand trim sides and bottom of earth forms; remove loose dirt.
C. Align form joints.
D. Do not apply form release agent where concrete surfaces receive applied coatings which may be affected by agent.
E. Coordinate work of other Sections in forming and setting openings, slots, recesses, chases, sleeves, bolts, anchors and other inserts.

3.02 PLACING CONCRETE

A. Notify Engineer a minimum of two (2) working days prior to commencement of concrete operations.

B. Transport concrete from batching plant to place of final deposit within one hour in concrete mixing trucks.

C. Vibrate concrete so that all parts of forms are filled and so that no voids remain. Work concrete thoroughly around all reinforcement.

D. Bring surfaces to proper grade, strike off and finish to a smooth level surface.

3.03 REMOVAL OF FORMS

A. Curing of concrete shall be continuous for a period of seven (7) days at temperatures of 60 degrees F and above, and longer for periods at lower temperatures, as necessary.

B. Remove forms to ensure safety of the members. In general, forms shall be kept in original state for 7 days or when the cylinder compression test exceeds 2,500 psi. The Engineer shall review 7 day compression test and inform the Contractor of the results. If specifically accepted by the Engineer, the forms may be removed earlier than 7 days after the pour.

3.04 FINISHES

A. Trowel finish surfaces.

B. Where concrete work is in traffic, trowel finish surface and provide a light broom finish

END OF SECTION 03 11 00

SECTION 03 15 00
CONCRETE ACCESSORIES

PART 1.00 - GENERAL

1.01 SECTION INCLUDES
A. Joint fillers.
B. Joint sealing compound.
C. Elastomeric joint seals.
D. Plastic pads, spacers, and fillers.

1.02 RELATED SECTIONS
A. Waterstops are specified in Section 03 15 13 – Waterstops

1.03 REFERENCES
A. ASTM C272 – Test Method for Water Absorption of Core Materials for Structural Sandwich Constructions
B. ASTM C578 – Specification for Rigid, Cellular Polystyrene Thermal Insulation
C. ASTM C920 – Specification for Elastomeric Joint Sealant
D. ASTM D994 – Specification for Preformed Expansion Joint Filler for Concrete (Bituminous Type)
E. ASTM D1190 – Specification for Concrete Joint Sealer, Hot-Applied Elastic Type
F. ASTM D1621 – Test Method for Compressive Properties of Rigid Cellular Plastics
G. ASTM D1622 – Test Method for Apparent Density of Rigid Cellular Plastics
H. ASTM D1751 – Specification for Preformed Expansion Joint Filler for Concrete Paving and Structural Construction (Nonextruding and Resilient Bituminous Types)
I. ASTM D2628 – Specification for Preformed Polychloroprene Elastomeric Joint Seals for Concrete Pavements
J. ASTM D3405 – Specification for Joint Sealants, Hot-Applied, for Concrete and Asphalt Pavements
K. ASTM D3406 – Specification for Joint Sealant, Hot-Applied, Elastomeric-Type, for Portland Cement Concrete Pavements
L. ASTM D3542 – Specification for Preformed Polychloroprene Elastomeric Joint Seals for Bridges
M. ASTM E84 – Test Method for Surface Burning Characteristics of Building Materials

1.04 RELATED SECTIONS
A. General: Refer to Section 00 73 33, Submittals.
B. Shop Drawings: Submit drawings showing locations of all joints to be filled and sealed.

C. Product Data: Submit manufacturers' product data of joint fillers, sealing compounds, elastomeric joint seals, and plastic materials, verifying compliance with specified requirements.

D. Samples: Submit 12-inch long sample of joint filler and elastomeric joint seals and one pint can of sealing compound.

PART 2.00 - PRODUCTS

2.01 MATERIALS

A. Joint Filler: Premolded, of sizes and thickness indicated, conforming to ASTM D994 or ASTM D1751, as applicable.

B. Joint Sealing Compound: Concrete joint sealant, conforming to ASTM C920 (Type S or M, Class 25, Use T), ASTM D1190, ASTM D3405, or ASTM D3406, as applicable, for sealing of expansion (isolation) and contraction (control) joints in slabs and at junctions of slabs and vertical surfaces.

Color of joint sealant shall be as selected by the Project Manager from manufacturer's standards

a. For asphalt pavements, provide ASTM D3405 sealant only. For concrete pavements and roadways, provide ASTM C920 or ASTM D3406 sealant.

C. Elastomeric Joint Seals: Preformed solid or multi-web design, virgin crystallization-resistant polychloropene (neoprene) conforming with ASTM D2628 or ASTM D3542, as applicable.

Seals shall be designed to function in a compressed installation mode.

a. Lubricant Adhesive: ASTM D2628 or ASTM D3542, as applicable.

D. Plastic Pads, Spacers, and Fillers: Extruded closed-cell polystyrene rigid board meeting requirements of ASTM C758, Type V, with the following physical properties:

a. Minimum weight and density when tested in accordance ASTM D1622: 3.0 pounds per cubic foot.
b. Minimum compressive strength when tested in accordance ASTM D1621: 100 pounds per square inch.
c. Maximum water absorption when tested in accordance ASTM C272: 0.10 percent by volume.
d. Maximum allowable flame spread when tested in accordance ASTM E84: 10 flame-spread index (UBC Class I).

PART 3.00 – EXECUTION

3.01 EXAMINATION

A. Verify that joint surfaces are dry to the extent necessary for successful sealant application and long service life as recommended by the sealant manufacturer.

B. Verify also that ambient and concrete-surface temperatures and humidity are within the ranges recommended by the manufacturer for successful sealant application.

3.02 PREPARATION

A. Thoroughly clean joints free of dirt, debris, dust, and laitance.

B. Prime joint surfaces, where required, as recommended by the manufacturer of the joint sealing compound or elastomeric joint seal, as applicable.

C. Mix multi-component sealing compound as recommended by the manufacturer.

3.03 INSTALLATION

A. Installation/Application Requirements: Joint fillers and sealing compounds shall be installed in accordance with the respective manufacturers' installation and application instructions. Comply also with ASTM D1190, ASTM D3405 and ASTM D3406, as applicable. Coordinate the placement of joint fillers and securing them in position with the with work of Section 03 11 00, Concrete Formwork.

B. Expansion (Isolation) Joints:

   a. Provide premolded joint filler to full depth of slabs, less ½ inch. Install joint filler with top edge ½ inch below the surface, and tool adjacent concrete edges to a ¼-inch radius. Use steel pins to hold material in place during placing and floating of concrete. Finished joints shall be tight and leakproof.

   b. After a minimum of 28 days after slabs have been placed and finished, fill expansion joints with joint sealing compound to 1/8 inch below surface of slabs. No traffic shall be permitted to travel over sealed joints until sealing compound has properly cured.

C. Contraction (Control) Joints: Saw-cut contraction joints and weakened plane joints shall be filled with joint sealing compound in areas and locations indicated. Joints shall be filled and tooled flush to within 1/16 inch of the slab surface.

D. Roadway and Bridge: Provide elastomeric joint seals as applicable to the conditions. Install as indicated and in accordance with the manufacturer's installation instructions and recommendations.

E. Plastic Pads, Spacers, and Fillers: Install as indicated over or against clean surfaces. Apply adhesive where required to hold material in place.

END OF SECTION 03 15 00

SECTION 03 15 13
WATER STOP

PART 1.00 - GENERAL

1.01 SECTION INCLUDES

A. The Contract shall furnish and securely install expanding rubber waterstops for each manhole, where necessary. The work includes cleaning of concrete surfaces and installation of expanding rubber waterstops.

1.02 REFERENCES

A. ASTM D412, Standard Test Methods for Vulcanized Rubber and Thermoplastic Elastomers-Tension

B. ASTM D2240, Standard Test Method for Rubber Property – Durometer Hardness.

1.03 SUBMITTALS

A. Submit waterstop and adhesive product data in accordance with Submittals, Section 00 73 33

1.04 DELIVERY, STORAGE, AND HANDLING

A. Deliver the waterstop materials to the project site in the manufacturer's unpacked contains with all labels intact and legible at time of use. Materials shall be stored in a secure, indoor, dry area. Maintain the waterstops in a dry condition during delivery, storage, handling, installation, and concealment

PART 2.00 - PRODUCTS

2.01 MATERIALS

A. Hydrophilic Rubber Waterstop:

a. The waterstop shall have the minimum performance standard of:

Property	**ASTM Standard**	**Results**
Tensile Strength (MPa)	D412	0.98
Elongation	D412	550
Hardness (HS)	D2240	30 Durometer Type A
The time period to maximum volume expansion is 35 days.		

b. Materials approved for use are:

i. Adeka Corporation; MC-2010M.
ii. Adeka Corporation; KM-3030M.
iii. Adeka Corporation; P2010 (except in contact with potable water).
iv. Adeka Corporation; KC Series.

B. Adhesive:

a. The adhesive shall be 3M-2141 as manufactured by the 3M Company, Adeka Corporation H-1000 Ultra Bond, or approved equal.

PART 3.00 – EXECUTION

3.01 GENERAL

A. Coordinate as required with other trades and project specifications to ensure proper execution of the water stop installation.

B. The components and installation procedures shall be in accordance with the manufacturer's printed specifications and recommendations. Installation shall be performed by skilled workers who are trained in procedures and methods required for proper performance of the waterstop.

3.02 EXAMINATION

A. Examine the concrete surface and correct any surface imperfections which may prevent proper installation and performance of the waterstop. The finished concrete surface, prior to surface preparation, shall be equal to a steel trowel finish.

3.03 SURFACE PREPARATION

A. Concrete surfaces shall be clean and free of dirt, saw dust, laitance, grease, form oils, form release agents, or other contamination to ensure proper adhesion of the waterstop to the concrete surface. Use a wire brush to lightly roughen the surface. Remove al concrete dust with a soft brush.

3.04 WATERSTOP PLACEMENT

A. Measure and cut an exact length of waterstop. Splices are not permitted in the waterstop in vertical wall joints of structures. Splices in horizontal joints are acceptable; however, only one (1) splice is permitted in twenty-five (25) feet. Splice of waterstops in horizontal joints shall be made by butting and gluing the ends of the waterstop with an approved adhesive.

B. Refer to the manufacturer's recommendations for minimum clearance to a concrete face. Unless a greater clearance is recommended by the manufacturer, the minimum clearance shall be two (2) inches. Use the greater clearance if the recommended clearance is more than two (2) inches.

C. Using a brush, apply a uniform coat of adhesive to the concrete surface along the line of placement. Apply a uniform coat of adhesive to the waterstop. Gaps in the glue application shall not be permitted.

D. After the adhesive has dried to a tack condition (about fifteen [15] minutes in the summer and thirty [30] minutes in the winter), firmly press the waterstop to the concrete surface. When installing the waterstop on curved surfaces such as pipes, temporary bands (for example, wire or rope) may be used to assist in securing the waterstop to the surface. Any temporary means of securing the waterstop shall be removed prior to placing concrete or grout.

E. Concrete placement within twelve (12) hours is required. The waterstop shall be protected from water and from displacement prior to concrete placement. During

concrete placement, the Contractor shall visually observe the waterstop to ensure proper placement and alignment.

END OF SECTION 03 15 13

SECTION 03 20 00
CONCRETE REINFORCING

PART 1.00 - GENERAL

1.01 WORK INCLUDED
A. Concrete reinforcement.

1.02 REFERENCES
A. ASTM A82 – Plain Steel Wire for Concrete Reinforcement.
B. ASTM A184/A184M – Welded Deformed Steel Bar Mats for Concrete Reinforcement.
C. ASTM A615/A615M - Deformed and Plain Billet-Steel for Concrete Reinforcement.
D. ACI 301 – Specifications for Structural Concrete for Buildings.
E. ACI 318 – Building Code Requirements for Reinforced Concrete.
F. Concrete Reinforcing Steel Institute (CRSI) "Manual of Standard Practice".

1.03 QUALITY ASSURANCE
A. Perform work in accordance with ACI 301, 318 and the CSRI's Manual of Standard Practice.

1.04 SUBMITTALS
A. Submit the following in accordance with Submittals, Section 00 73 33:
   a. Proposed concrete reinforcement plan
   b. Product data for steel utilized for reinforcement

PART 2.00 - PRODUCTS

2.01 GENERAL
A. The Contractor shall provide steel reinforcement as specified.

2.02 STEEL
A. Material

Steel Reinforcement Characteristics Table						
Imperial Bar Size	**Bar Grade**	**Weight per unit length**	**Mass per unit length**	**Nominal Diameter**	**Nominal Area**	**Min. Yield Strength**
#4	60	0.668 lb/ft	0.996 kg/m	0.500 in / 12.7 mm	0.2 in^2 / 129 mm^2	60,000 lb/in^2
#5	60	1.043 lb/ft	1.556 kg/m	0.625 in / 15.9 mm	0.2 in^2 / 200 mm^2	60,000 lb/in^2
#6	60	1.502 lb/ft	2.24 kg/m	0.500 in / 19.1 mm	0.2 in^2 / 284 mm^2	60,000 lb/in^2

PART 3.00 – EXECUTION

3.05 STEEL REINFORCEMENT ITEMS

C. Plain-Steel Welded Wire Reinforcement: ASTM A185, fabricated from as-drawn steel wire into flat sheets.

D. Reinforcing Bars: ASTM A615 / A615M, Grade 60; deformed.

E. Steel Bar Mats: ASTM A184 / A184M; with ASTM A615 / A615M, Grade 60, deformed bars; assembled with clips

F. Plan Steel Wire: ASTM A82

G. Joint Dowel Bars: Plain steel bars, ASTM A615 / A615M, Grade 60. Cut bars true to length with ends square and free of burrs.

H. Tie Bars: ASTM A615 / A615M, Grade 60, deformed.

I. Bar Supports: Bolsters, chairs, spacers, and other devices for spacing, supporting, and fastening reinforcing bars, welded wire reinforcement, and dowels in place. Manufacture bar supports according to Concrete Reinforcing Steel Institute's "Manual of Standard Practice" from steel wire, plastic, or precast concrete of greater compressive strength than concrete, and as follows:

   a. Equip wire bar supports with sand plates or horizontal runners where base material will not support chair legs.

3.06 PLACING STEEL REINFORCEMENT

F. Comply with Concrete Reinforcing Steel Institute's recommended practice for "Placing Reinforcing Bars" for placing and supporting reinforcement.

G. Clean reinforcement of loose rust and mill scale, earth, ice, or other bond-reducing materials.

H. Arrange, spaces, and securely tie bars and bar supports to hold reinforcement in position during concrete placement. Maintain minimum cover to reinforcement.

I. Install welded wire fabric in lengths as long as practicable. Lap adjoining pieces at least one full mesh and lace splices with wire. Offset laps of adjoining widths to prevent continuous laps in either direction.

END OF SECTION 03 20 00

SECTION 03 21 16
EPOXY-COATED REINFORCEMENT STEEL BARS

(Not Used)

SECTION 03 30 00
CAST-IN PLACE CONCRETE

PART 1.00 - GENERAL

1.01 GENERAL

Work of this Section shall conform to requirements of Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification sections.

1.02 SCOPE

Provide all labor, materials, equipment, services and transportation required to complete all concrete work as shown on Drawings, as specified herein, and as required by the job conditions. This Specification is not intended to address the particular requirements of Architectural Concrete.

1.03 RELATED WORK SPECIFIED IN OTHER SECTIONS

Submittals	Division 1
Quality Control	Division 1
Quality Assurance: Structural Testing and Inspection	Section 01 45 00
Concrete Formwork	Section 03 10 00
Concrete Reinforcement and Embedded Assemblies	Section 03 20 00
Concrete Curing	Section 03 39 00
Thermal and Moisture Protection	Division 7

1.04 CODES AND STANDARDS

A. Building Code: Concrete work shall conform to the requirements of the Building Code identified on the Structural General Notes, and OSHA requirements, except where more stringent conditions or criteria occur in the standards referenced below and on the Drawings.

B. Standards:

1. ACI 117 – Standard Specifications for Tolerances for Concrete Construction and Materials except as modified by more stringent requirements in the Project Specifications and/or Drawings.
2. ACI 237 – Self Consolidating Concrete.
3. ACI 301 – Specifications for Structural Concrete.

4. ACI 318 – Building Code Requirements for Structural Concrete and Commentary.
5. American Concrete Institute "Manual of Concrete Practice", various committee reports as referenced herein.
6. American Society for Testing and Materials "ASTM Standards in Building Codes", various standards as referenced herein.
7. AASHTO T318 – Standard Method of Test for Water Content of Freshly Mixed Concrete Using Microwave Oven Drying.

C. Definitions:

1. The term "Contract Documents" in this Specification is defined as the design Drawings and the specifications.
2. The term "SER" in this Specification is defined as the Structural Engineer of Record for the structure in its final condition.
3. The term "Design Professionals" in this Specification is defined as the Owner's Architect and SER.
4. The term "Contractor" in this Specification is defined to include any of the following: General Contractor and their sub-contractors, Construction Manager, Concrete Contractor and their sub-contractors.
5. The term "Testing Agency" in this Specification is defined as an independent testing and inspection service engaged by the Owner for quality assurance testing and inspection of structural construction in accordance with applicable building code provisions and any additional activities listed in the Contract Documents.
6. The terms "for record" and "submit for record" in this Specification are defined as Contractor submittals that do not require a response from the Design Professionals.
7. The term "Working Days" in this Specification is defined as Monday through Friday, excluding federal or state holidays.
8. The term "Delegated Design" in this Specification is defined as a scope of work that meets performance and design criteria established in the Contract Documents and is to be completed by the Contractor's licensed engineer.

1.05 CONTRACTOR QUALIFICATIONS

A. The work of this section shall be performed by a company specializing in the type of concrete work required for this Project, and shall be performed by skilled workmen thoroughly experienced in the necessary crafts.

B. Contractor's testing agency services: Required as specified in Division 1, and herein.

1.06 SUBMITTALS

A. Required Submittals - Where the SUBMITTALS section of this Specification is in conflict with Division 1 Submittals, the more stringent requirements for the Contractor apply. Required submittal items are listed here; see below for detailed requirements. Do not submit items not requested. Reproduction of structural drawings for shop drawings is not permitted.

(1) Submittal Schedule
(2) Mix Designs
(3) Concrete Travel Times to the Project Site
(4) Hot and Cold Weather Procedures
(5) Product Data
(6) Concrete Joint Locations
(7) Comprehensive Layout Drawings
(8) Preconstruction Survey
(9) Structural Repairs
(10) Patching Defective Concrete Finishes
(11) Conduit and Pipes Embedded in Concrete
(12) Hazardous Materials Notification

1. **Submittal Schedule**: The contractor shall submit for action a schedule at least twenty (20) working days prior to commencing submittals.

a) This schedule shall include a list, in order of date to be submitted, of all drawings and other required submittal items scheduled to be submitted. The schedule shall list the proposed submittals for each week, as well as their formats. Once shop drawing submissions have commenced any modification or addition to this schedule must be submitted for action at least twenty (20) working days before the modification or addition is proposed to take place.

b) If at any time the total number of shop drawings received in any one week period exceeds the amount in the approved schedule by more than 10% for that week, the Design Professionals have the right to add two days to the average turnaround time for each 20% increment in excess of the scheduled quantity for that week's submissions. For example if the weekly total exceeds the schedule by 10% to 20%, two days may be added; if it is

exceeded by 21% to 40%, four days may be added. The return dates for subsequent submittals may be extended based on the additional review time stated above.

c) For the purposes of developing a schedule, assume the following review rate, Shop drawings – 10 full size sheets per week.

9. **Mix Designs**: Submit for action concrete mix designs for each type and strength of concrete required for this Project at least thirty (30) days before placing concrete.

a) Mix designs shall be prepared or reviewed by an approved independent testing agency retained by the Contractor in accordance with requirements of ACI 301 and ACI 318 and shall be coordinated with design requirements and Contract Documents.

b) Before submitting to Testing Agency, submit complete mix design data for each separate mix to be used on the Project in a single submittal.

c) Provide a completed "Concrete Mix Design Submittal Form" (attached to the end of this Specification Section) for each proposed concrete mix.

d) Mix materials shall be from the same production facility that will be used for this Project.

e) Mix Design data shall include but not be limited to the following:

i. Locations on the Project where each mix design is to be used corresponding to Structural General Notes on the Drawings.
ii. Design Compressive Strength: As indicated on the Drawings.
iii. Proportions: ACI 301 and ACI 318.
iv. Gradation and quality of each type of ingredient including fresh (wet) unit weight, aggregates sieve analysis.
v. Water/cementitious material ratio.
vi. Evaluation and classification fly ash in accordance with ASTM D 5759.
vii. Report of chemical analysis of fly ash in accordance with ASTM C 618.
viii. Classification of slag cement in accordance with ASTM C 989.

ix. Slump: ASTM C 143.

x. Certification and test results of the total water soluble chloride ion content of the design mix - AASHTO T260 or ASTM C 1218 at age between 28 and 42 days.

xi. Air content of freshly mixed concrete by the pressure method, ASTM C 231, or the volumetric method, ASTM C 173.

xii. Density of Concrete: ASTM C 138.

xiii. Design strength at 28, 56 or 90 days, as indicated on Contract Documents: ASTM C 39.

(1) Document strength based on basis of previous field experience or trial mixtures per ACI 301. Proportioning by water-cement ratio alone, with no test results per the trial mixtures procedure is not permitted.

(2) Submit strength test records, mix design materials, conditions, and proportions for concrete used for record of tests, standard deviation calculation, and determination of required average compressive strength. Test records to support proposed mixtures shall be no more than 24 months old and use current cement aggregate sources. Test records to establish standard deviation may be older if necessary to have the required number of samples.

(3) If early concrete strengths are required, Contractor shall submit trial mixture results as required.

xiv. Manufacturer's product data for each type of admixture.

xv. Manufacturer’s certification that all admixtures used are compatible with each other.

xvi. All information indicating compliance with Contract Documents including method of placement and method of curing.

xvii. Normalweight Concrete: Density per ASTM C 138. Design the mix to produce the strength, modulus of elasticity and density as indicated on the Contract Documents.

xviii. Certification from a qualified testing agency indicating absence of potential for deleterious expansion of concrete due to alkali reactivity of the aggregate as

determined by testing per ASTM C1260 in accordance with ASTM C 33. If potential for deleterious expansion exists, expansion reduction and mitigation measures per the guidelines of ASTM C1778 or US Army COE CRD-C662 shall be submitted for review by the SER.

10. **Concrete Travel Times to the Project Site:** Submit for record.
11. **Hot and Cold Weather Procedures**: Submit for record written procedures for placement of concrete in hot and cold weather conditions. Hot and Cold weather are as defined in the Concrete Placement section of this Specification.
12. **Product Data**: Submit for action product data clearly marked to indicate locations to be used and all technical information which specifies full compliance with this section and Contract Documents, including published application instructions, product characteristics, compatibility, and limitations for each of the following:

    a) Bonding agents.
    b) Curing compound and liquid sealer densifier. Submit for record to Design Professionals a written statement guaranteeing that the compound will not leave discoloration on concrete to be left exposed, or affect the bond for paint or other applied finishes. Include provision in written statement that in the event of failure of applied finishes to bond to membrane cured concrete, to remove the curing compound and leave suitable surfaces for bonding such finishes.
    c) Absorptive covers and moisture retaining covers.
    d) Vapor Retarder: See Division 7, Thermal and Moisture Protection.
    e) Self-leveling concrete topping.
    f) Grout: Submittal of grout by manufacturers not listed herein must be accompanied by independent certification of ASTM C 1107 compliance without modification of standard methods.
    g) Other products proposed by Contractor.

13. **Concrete Joint Locations**: Submit for action plans indicating locations and details of construction joints, contraction joints, waterstops, sleeves, embedments, etc. that interact with the joints. Contractor to coordinate joint location with reinforcement shop drawings. Reinforcement shop drawings shall indicate additional reinforcement bars where required at construction joints.

Joint locations for concrete slabs to receive a terrazzo or similar finish subject to reflective cracking must be coordinated with layout of finish drawings.

14. **Comprehensive Layout Drawings:** Submit for action comprehensive layout drawings (a single drawing per area/element):

    a) Drawings shall show openings in structural members, including floor slab, shear walls, columns and beams.
    b) Drawings shall consolidate the work of all trades and shall be coordinated by the Contractor.
    c) Drawings shall show concrete accessories and embedded items, including fabrication details of items to be placed (exclusive of reinforcement).
    d) Submit with or prior to reinforcement and formwork submittals for same element/area.

15. **Preconstruction Survey**: Submit for record. Where interface with existing construction occurs, before related shop drawings are prepared survey the existing construction and submit the survey prepared by a professional surveyor employed by the Contractor to the Design Professionals.
16. **Structural Repairs**: Submit for action procedures, intended locations, and product information. Alterations to design shall be sealed and signed by a **Professional** Engineer licensed in the state where the project is located.
17. **Patching Defective Concrete Finishes**: Submit for action procedures, intended locations, and product information.
18. **Conduit and Pipes Embedded in Concrete:** Submit for action layout of embedded conduit and pipes.
19. **Hazardous Materials Notification**: Submit for record. In the event no product or material is available that does not contain hazardous materials as determined by the Owner, a "Material Safety Data Sheet" (MSDS) equivalent to OSHA Form 20 shall be submitted for that proposed product or material prior to installation.

B. Submittal Process

1. Submittal of shop drawings and other submittals by the Contractor shall constitute Contractor's representation that the Contractor has verified all quantities, dimensions, specified performance criteria, installation requirements, materials, catalog numbers and similar data with respect

thereto and reviewed or coordinated each drawing with other Drawings and other trades. The Contractor shall place their shop drawing stamp on all submittals confirming the above.

2. Shop drawings: Submit in complete packages so that individual parts and the assembled unit may be reviewed together. This Specification Section and the applicable Drawings used in the development of the shop drawings shall be referenced on each shop drawing to facilitate checking.
3. The Contractor shall submit to the Design Professionals one (1) electronic copy for shop drawing review. The naming convention of each drawing must follow the submittal numbering system and include the submittal number, Specification number, revision number and drawing number in the prefix of the drawing name.
4. The Contractor shall allow at least **ten (10)** working days between receipt and release by the SER for the review of shop drawings and submittals.
5. All modifications or revisions to submittals and shop drawings must be clouded, with an appropriate revision number clearly indicated. The following shall automatically be considered cause for rejection of the modification or revision whether or not the drawing has been approved by the Design Professionals:

    a) Failure to specifically cloud modifications
    b) Unapproved revisions to previous submittals
    c) Unapproved departure from Contract Documents

6. Resubmittals: Completely address previous comments prior to resubmitting a drawing. Resubmit only those drawings that require resubmittal. Do not include new content not previously reviewed.
7. Resubmittals Compensation: The Contractor shall compensate the Design Professionals for submittals that must be reviewed more than twice due to Contractors' errors. The Contractor shall compensate the Design Professionals at standard billing rates plus out-of-pocket expenses incurred at cost + 10%.
8. The Contractor shall deliver to the Design Professionals at the completion of the job two (2) copies of the electronic version of the final as-built shop drawings on a CD-ROM or other media acceptable to the Design Professionals.

C. SER Submittal Review

1. The Design Professionals' review and approval of shop drawings and other submittals shall be for general conformance with the design intent of the work and with the information given in the Contract Documents only and will not in any way relieve the Contractor or the Contractor's Engineer from:

   a) Conforming to the Contract Documents.
   b) Coordination with other trades.
   c) Responsibility for all required detailing and proper fitting of construction work.
   d) The necessity of furnishing material and workmanship required by Drawings and Specifications which may not be indicated on the shop drawings.
   e) Control or charge of construction means, methods, techniques, sequences or procedures, for safety precautions and programs in connection with the work.

2. TYPE 1 – Structural Submittal Review Stamp: For shop drawings for building elements designed by the SER, the responses on the shop drawing review stamp used by the SER require one of the following actions:

   a) APPROVED indicates that the SER has found that the information presented on the shop or erection drawing appears to conform to the requirements of the Contract Documents. Fabrication, manufacture or construction of the elements of work shown in the shop drawing may proceed, provided that work is in compliance with the Contract Documents.
   b) APPROVED AS NOTED indicates that the SER requires the shop or erection drawing to be corrected to reflect the notes and comments shown. Fabrication, manufacture or construction of the elements of work shown in the shop drawing may proceed, provided that work is in compliance with the notations shown on the shop drawings and the Contract Documents. Promptly resubmit the corrected shop or erection drawing for record.
   c) REVISE and RESUBMIT indicates that the SER requires resubmission of the shop or erection drawing after correction per notes and comments. None of the elements of work shown on the shop drawing shall be fabricated, manufactured or constructed until the Contractor has received a returned shop drawing marked Approved or Approved as Noted.
   d) NOT APPROVED indicates that the shop or erection drawing does not conform to the Contract Documents and must be

extensively revised before re-submittal. None of the elements of work shown on the shop drawing shall be fabricated, manufactured or constructed until the Contractor has received a returned shop drawing marked Approved or Approved as Noted.

2. TYPE 2 – Delegated Design Review Stamp: For submittals for building elements which are not designed by the SER but are delegated design items, or for items that do not form part of the completed structural system but impose loads on the structure, or for construction items or activities which have an effect on the final structure. The responses on the stamp used by the SER require one of the following actions:

   a) NO EXCEPTIONS indicates that the SER has found that the information presented on the submittal appears to conform to the requirements of the Contract Documents. Fabrication, manufacture or construction of the elements of work shown in the shop drawing may proceed, provided that work is in compliance with the Contract Documents.
   b) EXCEPTIONS NOTED indicates that the SER requires the submittal be corrected to reflect the notes and comments shown. Fabrication, manufacture or construction of the elements of work shown in the shop drawing may proceed, provided that work is in compliance with the notations shown on the shop drawings and the Contract Documents. Promptly resubmit the corrected document for record.
   c) REJECTED indicates that the SER requires resubmission of the submittal after correction per notes and comments. None of the elements of work shown on the shop drawing shall be fabricated, manufactured or constructed. Contractor to revise and resubmit until SER response of No Exceptions or Exceptions Noted is received.

D. Substitution Request

1. Requests for any departure from Contract Documents must be submitted in writing by the Contractor and accepted in writing by the Design Professionals, prior to receipt of submittals.
2. All substitutions must be requested using the structural substitution request form included at the end of this section. Acceptance using the structural substitution request form indicates acceptability of the

structural concept only. Contractor must submit shop drawings reflecting accepted substitutions for review in accordance with this Specification. The structural substitution request form, even if accepted, does not constitute a change order.

3. Accepted substitutions or modifications shall be coordinated and incorporated in the work at the sole expense of the Contractor.
4. The acceptance by the Design Professionals of a specific and isolated request by the Contractor to deviate from these requirements does not constitute a waiving of that requirement for other elements of, or locations in the project, unless specifically addressed as such and permitted by the Design Professionals in writing.
5. Compensation for Additional Services: Should additional work by Design Professionals such as design, documentation, meetings and/or site visits be required which are necessitated for the review and/or incorporation of the Contractor-requested substitution, including indirect effects on other portions of the work, the Contractor is responsible for paying for additional work performed by the Design Professionals at the standard billing rates plus out-of-pocket expenses incurred at cost + 10%. Additional costs for testing and inspection by the Owner shall also be compensated by the Contractor.
6. Contractor is responsible for means and methods and any impacts on other portions of the work that may arise from this substitution.

E. Request for Information (RFI)

1. RFIs shall be submitted by the Contractor. RFIs submitted by other entities will be returned with no response.
2. Limit RFI to one subject.
3. Submit RFI immediately upon discovery of the need for interpretation or clarification of the Contract Documents. Submit RFI within timeframe so as not to delay the Construction Schedule while allowing the full response time described below.
4. The response time for answering an RFI depends on the category in which it is assigned.

    a) Upon receipt by the SER, each RFI will be assigned to one of the following categories:

        i. No cost clarification
        ii. Shown in Contract Documents

iii. Change to be issued in future document revision
iv. Previously answered
v. Information needs to be provided by others
vi. Request for corrective field work
vii. Request for substitution

b) RFIs in the first five categories listed above will be turned around by the SER on average of **five (5)** working days.
c) RFIs in the last two categories listed above will be immediately rejected and must be submitted as submittals or requests for substitution.

1.07 DELIVERY, STORAGE, AND HANDLING

A. Comply with General Conditions and Division 1.

B. Storage:

1. Store materials in accordance with ACI 304R.
2. Store cement in weather-tight buildings, bins or silos that will exclude moisture and contaminates.
3. Store admixtures to avoid contamination, evaporation, damage, and in accordance with manufacturer's temperature and other recommendations.
4. Keep packaged material in original containers with seals unbroken and labels intact until time of use.

C. Handling:

1. Handle fine and coarse aggregates as separate ingredients.
2. Arrange aggregate stockpiles to avoid excessive segregation, and prevent contamination with other materials or with other sizes of like aggregates.
3. Do not use frozen or partially frozen aggregates.
4. Allow sand to drain until it has reached relatively uniform moisture content before use.
5. Protect liquid admixtures from freezing and temperature changes that would adversely affect characteristics, and in accordance with manufacturer's recommendations.

1.08 PRE-CONCRETE CONFERENCE

A. At least 30 working days prior to the start of concrete construction, the Contractor shall hold a meeting to review the proposed concrete mix designs and to determine the procedures for producing proper concrete construction. The Contractor shall notify the Design Professionals of the meeting and require responsible representatives of every party who is concerned with the concrete Work to attend the conference, including but not limited to the following:

1. Contractor's superintendent.
2. Testing Agency representative responsible for field quality control.
3. Concrete subcontractor.
4. Ready-mix concrete producer.
5. Admixture manufacturer(s).
6. Architect.
7. Structural Engineer.

B. Minutes of the meeting shall be recorded and distributed by the Contractor to all parties concerned within five working days of the meeting. One copy of the minutes shall also be furnished to the following:

1. Design Professionals.
2. Owner's Representative.

C. The minutes shall include a statement by the concrete contractor and admixture manufacturer(s) indicating that the proposed mix design and placing, finishing, and curing techniques can produce the concrete properties and quality required by these Specifications.

1.09 QUALITY ASSURANCE BY OWNER'S TESTING AGENCY

A. See Section 01 45 00.

1.10 QUALITY CONTROL BY CONTRACTOR

A. The Contractor shall provide a program of quality control to ensure that the minimum standards specified herein are attained.

B. The Owner's general review during construction and activities of the Testing Agency are undertaken to inform the Owner of performance by the Contractor but shall in no way replace or augment the Contractor's quality control program or relieve the Contractor of total responsibility for quality control.

C. The Contractor shall immediately notify the Design Professionals of any deficiencies in the work which are departures from the Contract Documents. The Contractor shall propose corrective actions and their recommendations in writing and submit them for review by the Design Professionals. After proposed corrective action is accepted by the Design Professionals and Owner, the Contractor shall correct the deficiency at no cost to the Owner. Where the Contractor requests that the Design Professionals develop the corrective actions or review corrective actions developed by others, the Design Professional shall be compensated as outlined in the OBSERVATIONS AND CORRECTIONS BY DESIGN PROFESSIONALS section of this Specification.

D. Where SCC is used, the Ready Mix Producer shall have a Quality Control Representative on site during placements until mix consistency and stability is established.

1.11 OBSERVATIONS AND CORRECTIONS BY DESIGN PROFESSIONALS

A. Observations: The Design Professionals will observe the construction for general compliance with the provisions of the Contract Documents during various phases of construction.

B. Corrections by Design Professionals: See Part 3 - CORRECTIVE MEASURES section of this Specification.

1.12 PERMITS AND WARRANTY

A. Permits: The Contractor shall apply for, procure, renew, maintain, and pay for all permits required by City, State, or other governing authorities, necessary to execute work under this Contract. Contractor shall furnish copies of all permits to the Owner and Design Professionals.

B. Warranty: Comply with General Conditions, agreeing to repair or replace specified materials or work that has failed within the warranty period. Failures include but are not limited to the following:

1. Oily, waxy or loose residue which may interfere with the bonding or discoloration of various applied Architectural finish materials.
2. Discoloration of concrete surfaces scheduled to remain exposed as a finish.
3. Areas which show surface failure or defects.
4. Areas which puddle water.
5. Areas which are not properly prepared to receive Architectural finish materials. If necessary, the Contractor, at his own expense, shall have the Testing Agency perform appropriate tests for bond and discoloration.
6. Patches that become crazed, cracked or sound hollow when tapped.
7. Self-leveling concrete topping that has cracked, spalled and/or not performed in accordance with manufacturer's design criteria.

PART 2 - PRODUCTS

2.01 CONCRETE MATERIALS AND PRODUCTION

A. Portland Cement:

1. ASTM C150, Type II
2. ASTM C150, Type III, High-early Strength Portland Cement may be used subject to review and approval of the SER. The specified 28-day concrete compressive strength shall occur within 7 days for concrete using Type III Portland Cement.
3. Provide the same brand of Portland Cement a single source throughout the project, as required to meet Design Professionals' requirements.

B. Aggregates for Normalweight Concrete:

1. ASTM C 33
2. Fine Aggregate: Natural sand, or sand prepared from stone or gravel, clean, hard, durable, uncoated and free from silt, loam and clay.
3. **Provide aggregates from a single source throughout the project for exposed concrete.**
4. The acceptability of aggregates for the work will depend on proof that their potential alkali reactivity is not deleterious to the concrete.

5. Do not use fine or coarse aggregates that contain substances that cause spalling.
6. Maximum coarse aggregate size shall conform to the requirements as specified in ACI 301 but shall not exceed the following:

   Size no. 57 (25mm max) for footings, drilled piers and caissons
   Size no. 67 (20mm max) for all other locations
   Size no. 467 or 457 for non-reinforced concrete at locations noted on Drawings.

7. Contractor shall furnish concrete with maximum 3/8" (10mm) aggregate at no additional cost to the Owner if areas of high reinforcement density require it for placement and consolidation.

C. Water: ASTM C 1602. Clean, and free from injurious amounts of oil, acids, alkali, salts, organic material, or other deleterious materials.

D. Supplementary Cementitious Material

1. Fly Ash: ASTM C 618, Class C or Class F.
2. Slag Cement: ASTM C 989.
3. Silica Fume (Microsilica): ASTM C1240.

   a) Acceptable Products:

      i. Force 10,000 D by GCP Applied Technologies, Inc.
      ii. Eucon MSA by Euclid Chemical Company
      iii. MasterLife SF 100 by BASF Coroporation
      iv. Sikacrete 950 DP by Sika Corporation

4. Metakaolin: ASTM C 618, Class N.

   a) Acceptable Products:

      i. MetaMax by BASF Kaolin, part of BASF Corporation
      ii. HRMK 100 by GCP Applied Technologies, Inc.
      iii. Sikacrete M-100 by Sika Corporation

5. The fly ash or natural pozzolan supplier shall have an effective quality control program in place to guard against contamination of the fly ash and assure compliance with Specifications.
6. Supplementary Cementitious Materials shall be from one source throughout the project. Substitution of sources will be acceptable only if testing of concrete mixes containing the substituted material show similar test results and if the color of concrete produced with the substituted material matches the color of previously poured concrete to the satisfaction of the Architect.

E. Ready Mixed Concrete:

1. Shall be batch-mixed and transported in accordance with ASTM C 94.

2.02 CONCRETE MIX DESIGN

A. Concrete Strength:

1. Shall be as indicated on the Structural Drawings
2. Where concrete strength is not indicated on the drawings, the minimum concrete strength for exposure classes as defined in ACI 318 are as follows:

a) F0, S0, W0, C0, C1 = 2500 psi
b) F1 = 3500 psi
c) S1, W1 = 4000 psi
d) F2, S2, S3, = 4500 psi
e) F3, C2 = 5000 psi

B. Concrete Density (Unit Weight):

1. Shall be as indicated on the Structural Drawings

C. Air Entrainment

1. For concrete exposed to freeze/thaw cycles and/or deicing chemicals (ACI 318 Exposure Classes F1, F2, F3), and concrete intended to be watertight, provide entrained air content of 6% ± 1.5%, unless specified

otherwise. This includes, but is not limited to, concrete at the following locations:

a) Concrete at the exterior of the structure with at least one surface exposed to weather, such as exterior face of grade beams, foundation walls, exterior walls and parapets, exposed columns and edge beams.
b) Floor framing and ramps in parking garages.
c) Loading docks.
d) Balconies and terraces with no waterproofing membrane.

2. For lightweight concrete less than 120 pcf (19 kN/m³) density, air content may be up to 7% regardless of exposure condition.
3. For concrete with a specified compressive strength (f'c) greater than 5000 psi (35MPa), required air content may be reduced to 5% ± 1.5%.
4. Entrained air content noted above shall occur at point of delivery.
5. No entrained air content is required for foundations with no surface exposed to weather.
6. All interior steel trowel finished, normal weight slabs shall have a maximum air content of 3%.

E. Water-Cementitious Material Ratio (w/cm) for Normalweight Concrete

1. The total combined weight of Portland cement and all other supplementary cementitious material shall be used to determine the w/cm.
2. The w/cm shall not exceed the values indicated below, including any water added to meet specified slump in accordance with the requirements of ASTM C 94.
3. Based on Exposure Class, as defined in ACI 318, the following maximum w/cm shall be provided:

a) Exposure Class F0, S0, W0, C0, C1, no maximum
b) Exposure Class F1, max w/cm=0.55
c) Exposure Class S1, W1, max w/cm=0.50
d) Exposure Class F2, S2, S3, max w/cm=0.45
e) Exposure Class F3, C2, max w/cm=0.40

4. Concrete used in slab on grade shall have a maximum w/cm ratio of 0.45.

F. Slump

1. Concrete design mixes shall be proportioned to meet the following slump limitations. Slump should be measured as described in the Testing Agency responsibilities:

a) Concrete with high range or mid range water-reducing admixture: Concrete slump prior to addition of high range water-reducing admixture shall not exceed 3" +/- 1" (75mm) for normalweight concrete and 4" +/- 1" (100mm) for lightweight concrete. After addition of water-reducing admixture, the concrete shall have a maximum slump of 9" +/- 1" (225mm) unless otherwise approved by the SER.
b) Concrete without a water-reducing admixture: Slump shall not exceed 4" +/- 1".

G. Chloride Ion Content

1. The total water-soluble chloride ion content of the mix including all constituents shall not exceed the limits defined in ACI 318 unless corrosion inhibiting admixtures are added to the mixture to offset the additional chloride.
2. If the specified level of water-soluble chloride ion content cannot be maintained, appropriate level of corrosion inhibiting admixture shall be added to the mix in accordance with the manufacturer's recommendation to offset the excess amount of chloride at no additional cost to the Owner.

2.03 ADMIXTURES

A. General:

1. Admixtures specified below can be used only when established in the mix design with Design Professionals' prior written approval.
2. Each admixture approved by Design Professionals shall be used in strict compliance with manufacturer's published instructions.

3. Concrete supplier shall certify all admixtures to be compatible with each other. (See Submittals Section in Part 1)

B. Air Entraining Admixture:

1. ASTM C 260
2. Acceptable Products:

a) MasterAir Series by BASF Corporation
b) Darex Series or Daravair Series by GCP Applied Technologies, Inc.
c) EUCON AEA –92 or EUCON Air Series by Euclid Chemical Company
d) AIR Series or AEA-14 by Sika Corporation

C. Water-Reducing Admixture:

1. ASTM C 494, Type A
2. Acceptable Products:

a) MasterPozzolith Series by BASF Corporation
b) EUCON NW or EUCON WR 91 by Euclid Chemical Company
c) WRDA Series, Zyla Series or Mira Series by GCP Applied Technologies, Inc.
d) Plastocrete Series by Sika Corporation

D. Retarding Admixture:

1. ASTM C 494, Type B
2. Acceptable Products:

a) MasterSet R Series or MasterSet DELVO Series by BASF Corporation
b) EUCON RETARDER 100 by Euclid Chemical Company
c) Daratard 17 by GCP Applied Technologies, Inc.
d) Plastiment Series by Sika Corporation

E. Non Corrosive Accelerating Admixture:

1. ASTM C 494, Type C
2. Acceptable Products:

    a) MasterSet FP 20 or MasterSet NC 534 by BASF Corporation
    b) ACCELGUARD 80, ACCELGUARD NCA or ACCELGUARD 90 by Euclid Chemical Company
    c) Daraset" Series, Polarset, or DCI by GCP Applied Technologies, Inc.
    d) Sikaset Series or Rapid-1 by Sika Corporation

F. Water-Reducing and Retarding Admixture:

1. ASTM C 494, Type D
2. Acceptable Products:

    a) MasterSet R Series or MasterSet DELVO Series by BASF Corporation
    b) EUCON RETARDER 75 or EUCON DS by Euclid Chemical Company
    c) Daratard 17 or Recovery Series by GCP Applied Technologies, Inc.
    d) Plastiment Series by Sika Corporation

G. Water-Reducing and Accelerating Admixture:

1. ASTM C 494, Type E
2. Acceptable Products:

    a) MasterSet FP 20 by BASF Corporation
    b) ACCELGUARD 80 or ACCELGUARD 90 by Euclid Chemical Company
    c) Libricon NCA by GCP Applied Technologies, Inc.
    d) Sikaset NC by Sika Corporation

H. Mid-Range Water-Reducing Admixture:

1. ASTM C 494, Type A
2. Acceptable Products:

a) MasterPolyheed Series by BASF Corporation
b) Daracem or Mira by GCP Applied Technologies, Inc.
c) Sikaplast Series or Sikament Series by Sika Corporation
d) Eucon MR or Eucon MRX by Euclid Chemical Company

I. High-Range Water-Reducing Admixture:

1. ASTM C 494, Type F
2. Acceptable Products:

a) MasterGlenium Series by BASF Corporation
b) EUCON 37 or PLASTOL SERIES by Euclid Chemical Company
c) Daracem or ADVA Series by GCP Applied Technologies, Inc.
d) Viscocrete Series or Sikament Series by Sika Corporation

J. High-Range Water-Reducing Admixture for production of Control Flow Concrete:

1. ASTM C494 Type A and F and ASTM C1017 Type I
2. Acceptable Product:

a) CONCERA SA8080 by GCP Applied Technologies, Inc.

K. High-Range Water-Reducing and Retarding Admixture:

1. ASTM C 494, Type G
2. Acceptable Products:

a) EUCON 537 by Euclid Chemical Company
b) Daracem Series or Adva Series by GCP Applied Technologies, Inc.

L. Workability Retaining Admixture:

1. ASTM C494, Type S
2. Acceptable Products:

a) MasterSure Z-60 by BASF Corporation
b) Visco Flow-2020 by Sika Corporation

M. Permeability-Reducing Admixture:

1. ASTM C494, Type S
2. Shall be a Portland cement based crystalline capillary waterproofing admixture that reacts in concrete to form non-soluble crystalline hydration products in the capillary pores of concrete,
3. Acceptable Products:

a) MasterLife 300D by BASF Corporation
b) Eucon Vandex AM-10 by Euclid Chemical Company
c) Admix C-Series by Xypex

N. Viscosity Modifying Admixture (VMA) for Self-Consolidating Concrete (SCC):

1. ASTM C 494, Type S
2. Acceptable Products:

a) MasterMatrix VMA Seriesby BASF Corporation
b) V-MAR3 by GCP Applied Technologies, Inc.
c) EUCON ABS or EUCON WO or VISCTROL by Euclid Chemical Company
d) Sika Stabilizer-4R by Sika Corporation

O. Corrosion Inhibiting Admixtures:

1. Calcium Nitrite Based: ASTM C 1582 and ASTM C 494, Type C, 30% + 2% solution

a) Acceptable Products:

i. DCI or DCI-Sby GCP Applied Technologies, Inc.
ii. MasterLife CI 30 by BASF Corporation
iii. EUCON CIA by Euclid Chemical Company
iv. Sika-CNI by Sika Corporation

2. Amine Carboxylate Based: ASTM C 1582, which includes ASTM C-494 amine carboxylate

    a) Acceptable Product:

        i. MCI 2005, MCI 2005 NS, MCI 2006 or MCI 2006 NS by Cortec Corporation

3. Amino Alcohol Based:

    a) Acceptable Product:

        i. FerroGard 901 by Sika Corporation
        ii. MasterLife CI 222 by BASF Corporation

P. Shrinkage Reducing/Compensating Admixtures:

1. ASTM C 494, Type S
2. Acceptable Products:

    a) Eclipse Floor 200 or Eclipse 4500 (for use with air-entrained concrete) by GCP Applied Technologies, Inc.
    b) Conex or EUCON SRA Floor or EUCON SRA-XT (for use with air-entrained concrete) by Euclid Chemical Company
    c) MasterLife SRA Series or MasterLife CRA 007 by BASF Corporation
    d) SikaControl 75 by Sika Corporation
    e) PREVent-C by PremierCPG

Q. Alkali-Silica Reaction Inhibiting Admixture:

1. ASTM C 494, Type S
2. Shall contain a nominal lithium nitrate content of 30 percent.
3. Dosage to be determined in accordance with US Army COE CRD-C662
4. Acceptable Products:

    a) MasterLife ASR 30 by BASF Corporation

b) Eucon Integral ARC by Euclid Chemical Company
c) RASIR by GCP Applied Technologies

2.04 ADHESIVES

A. Epoxy Bonding Agent for bonding hardened concrete to hardened concrete (existing concrete damp or dry, at least 28 days old, no surface water):

1. ASTM C 881 Type IV, Grade 1, 2 or 3, Class B or C as appropriate for field temperature conditions.
2. Acceptable Products:

a) Acceptable Product: Dural 452 Series by Euclid Chemical Company
b) Rezi-Weld 1000 by W. R. Meadows
c) Sure Bond J58 by Dayton Superior

B. Epoxy Bonding Agent for bonding freshly mixed concrete to hardened concrete (existing concrete damp or dry, less than 28 days old, no surface water):

1. ASTM C 881, Type V, Grade 1, 2, or 3, Class B or C as appropriate for field temperature conditions.
2. Acceptable Products:

a) Dural 452 Gel or 452 MV by Euclid Chemical Company
b) Sikadur 32 Hi-Mod by Sika Corporation
c) Rezi-Weld 1000 by W. R. Meadows
d) Sure Bond J58 by Dayton Superior

C. Anti-Corrosive Epoxy Modified Cementitious Bonding Compound and Corrosion Protection of Reinforcement (bonding agent for existing concrete saturated surface dry, no surface water):

This adhesive shall be a water-based epoxy/cementitious compound for adhesion and corrosion protection of reinforcing members (20 hour maximum open time).

1. Acceptable Products:

a) DURALPREP AC by Euclid Chemical Company
b) ARMATEC 110 EpoCem by Sika Corporation
c) MasterEmaco P124 by BASF Corporation
d) Perma Prime 3C by Dayton Superior

2.05 CURING COMPOUNDS AND SEALERS

A. Interaction with finishes:

1. See architectural Drawings for finish material applied over concrete.
2. Use only curing and sealer compounds that are compatible with finish, waterproofing or roofing material.

B. Curing and Sealing Compound (VOC Compliant, 350 g/l) :

1. ASTM C1315, Type I, Class A and/or ASTM C 309, Type 1, Class A or B
2. Water based acrylic, clear, 25% solids curing and sealing compound.
3. Acceptable Products:

a) Super Diamond Clear VOX by Euclid Chemical Company
b) Cure & Seal 1315 J22WB by Dayton Superior
c) VOCOMP-25 by W. R. Meadows
d) Dress & Seal WB 30 or Lumiseal WB by Laticrete International, Inc.

C. Curing Compound-Dissipating/Strippable (VOC Compliant, 350 g/l):

1. ASTM C 309, Type I, Class A or B
2. Water based resin, clear curing compound that begins to dissipate when exposed to UV light and traffic.
3. Acceptable Products:

a) Kurez DR VOX by Euclid Chemical Company
b) Clear Resin Cure J11W by Dayton Superior
c) 1100 by W. R. Meadows

D. Surface Applied Vapor Emission Mitigation

1. Shall conform to state and federal VOC regulaions with zero VOC content.
2. Shall provide a 15 year warranty against flooring failure due to negative-side moisture vapor migration of moisture-born alkalinity.
3. Acceptable Products:

e) CS2000 by Creteseal

E. Liquid Densifier/Sealer:

1. The liquid densifier compound shall be a silicate based compound that penetrates and chemically hardens concrete surfaces.
2. Acceptable Products:

a) Euco Diamond Hard by Euclid Chemical Company
b) Acceptable Product: Dayton Superior “Densifier J13”
c) MasterKure HD 200WB by BASF Corporation
d) Liqui-Hard by W. R. Meadows

F. Evaporation Retarder:

1. Acceptable Products:

a) MasterKure ER50 by BASF Corporation
b) Eucobar by Euclid Chemical Company
c) Sika Film by Sika Corporation

2.06 DRY SHAKE HARDENERS

A. Mineral Aggregate Hardener:

1. The specified mineral aggregate hardener shall be a factory-blended mixture of specially processed graded non-metallic aggregate.
2. Acceptable Products:

a) Euclid Chemical Company, "Surflex" to be used with “Kurez DR VOX”

b) MasterTop 100 to be used with "MasterKure CC 200WB by BASF Corporation
c) Quartzplate FF to be used with Dress & Seal WB 30 by Laticrete International, Inc.

B. Non-Oxidizing Metallic Hardener:

1. The specified non-oxidizing metallic floor hardener shall be a mixture of specially processed non-rusting aggregates.
2. Acceptable Products:

a) Euclid Chemical Company, "Diamond-Plate" to be used with "Kurez DR VOX"
b) MasterTop 210COR to be used with "MasterKure CC 200WB by BASF Corporation
c) Emeryplate FF to be used with Lumiseal WB by Laticrete International, Inc.

2.07 MISCELLANEOUS CONCRETE AND CONCRETE RELATED PRODUCTS

A. Cementitious Non-Shrink Grout:

1. Provide pre-packaged high-precision, non-shrink, non metallic grout.
2. See General Notes for grout minimum compressive strength.
3. ASTM C 1107
4. Acceptable Products:

a) MasterFlow 928 by BASF Corporation
b) Dry Pack Grout or HI-FLOW GROUT by Euclid Chemical Company
c) Five Star Grout by Five Star Products
d) Sikagrout 328 by Sika Corporation
e) Duragrout by Latticrete International, Inc.

B. Self-Leveling Concrete Topping - Underlayment for Interior Applications:

1. Use self-leveling underlayment concrete formulated to level concrete floors without shrinking, cracking or spalling, and capable of being placed from feathered edge to 1" (25mm) thickness without aggregate

in one pour. If greater than 1" (25mm) thickness is required, aggregate shall be extended with aggregate in accordance with manufacturer's requirements. Appropriate primer shall be utilized for all underlayment applications.

2. Acceptable Products:

   a) K-15 by Ardex
   b) Flo-Top or Super Flo-Top by Euclid Chemical Company
   c) Sika Level Series by Sika Corporation

C. Moisture-Retaining Covers:

1. ASTM C171
2. A naturally colored, non-woven polypropylene fabric with a non-perforated reflective polyethylene coating containing stabilizers to resist degradation from ultraviolet light. Fabric shall exhibit low permeability and high moisture retention.

3. Acceptable Products:

   a) Hydracure S-16 by PNA Construction Technologies, Inc.
   b) Transguard 4000 by Amorlon a Division of Reef Industries , Inc.
   c) UltraCure NCF by Sika Corporation
   d) Top Cure by Transhield

D. Vapor Retarder: See Division 7, Thermal and Moisture Protection

1. Minimum 15-mil thick polyolefin membrane
2. Manufactured with prime virgin resins
3. Water Vapor Retarder: ASTM E 1745, meets or exceeds Class A
4. Water Vapor Transmission Rate: ASTM E 96, 0.008 gr./ft2/hr. (0.086 gr./m²/hr) or lower
5. Permeance Rating: ASTM E 96, 0.03 Perms or lower for new material and after conditioning tests in accordance with applicable sections of ASTM E 154
6. Puncture Resistance: ASTM E 1745,minimum 2200 grams
7. Tensile Strength: ASTM E 1745, minimum 45.0 lbs./in (8.0 kg/cm).
8. Acceptable products:

a) Floprufe 120 by GCP Applied Technologies, Inc.
b) Perminator by W. R. Meadows
c) Stego Wrap by Stego Industry LLC
d) Raven Vapor Block 15 by Raven Industries
e) Husky Yellow Guard 15 Mil by Poly-America]

2.08 CONCRETE REPAIR MATERIALS

A. Polymer-Modified Repair Mortar

1. The following patching mortars may be used when color match of the adjacent concrete is not required. Prior approval by the Design Professionals is required.
2. Acceptable Products-Horizontal Surfaces:

a) Tammspatch II or Tamms Thin Patch by Euclid Chemical Company
b) Sikatop 122 Plus by Sika Corporation
c) Meadow-Patch T1 or T2 or Meadow-Crete GPS by W. R. Meadows
d) Duracrete by Laticrete International, Inc.

3. Acceptable Products-Vertical and Overhead Surfaces:

a) MasterEmaco N400 by BASF Corporation
b) Verticoat, Vertacoat Supreme or Dualtop Gel by Euclid Chemical Company
c) SikaTop 123 Plus by Sika Corporation
d) Meadow-Crete GPS by W. R. Meadows

B. Crack Repair:

a) Euco Qwikstitch or Dural 50 LM by Euclid Chemical Company
b) MasterSeal 630 by BASF Corporation
c) T78 Methyl Methacrylate Crack Sealer by Transpo Industries, Inc.

C. High Strength Flowing Repair Concrete:

1. For forming and pouring large volume repairs, provide shrinkage compensated repair concrete with integral corrosion inhibitor.
2. Minimum compressive strength 8000 psi (56MPa) @ 28-days
3. Prior approval by the Design Professionals is required for cold weather applications
4. Acceptable Products:

    a) Eucocrete by Euclid Chemical Company
    b) MasterEmaco S 466 CI by BASF Corporation
    c) Meadow-Crete FNP by W. R. Meadows

D. Epoxy Injection:

1. ASTM C881
2. Acceptable Products:

    a) MasterInject 1380 by BASF Corporation
    b) Dural Injection Gel by Euclid Chemical Company
    c) Sikadur 35 LV LPL by Sika Corporation
    d) Rezi-Weld LV State by W. R.Meadows

E. Pressure-Injected Foam Resin:

1. Acceptable Products:

    a) De Neef Sealform PURe by GCP Applied Technologies
    b) Crack-Pac Flex-H2O by Simpson Strong-Tie
    c) SikaFix HH LV by Sika Corporation

F. Semi Rigid Joint Filler:

1. Acceptable Products:

    a) MasterSeal CR 190 by BASF Corporation
    b) Euco 700 or Qwikjoint UVR by Euclid Chemical Company
    c) MM-80 by Metzger/McGuire
    d) Rezi-Weld Flex by W. R, Meadows

G. Methyl Methacrylate (MMA)

1. Acceptable Products:

a) MasterSeal 630 by BASF Corporation
b) Transpo Industries, Inc. "T-78 Methyl Methacrylate Polymer Crack Healer/Sealer"
c) MMA #884 by Epoxy Systems
d)

H. Sealant:

1. Silicone or Polyurethane Sealant (as selected based on project requirements such as loading, traffic, bond, coatings, etc.).
2. Joint to be routed and cleaned per manufacturer's written directions.
3. Acceptable Products:

a) MasterSeal Sealants by BASF Corporation
b) Sikaflex-1C SL and Loadflex 524 EZ by Sika Corporation
c) Pourthane NS by W. R. Meadows
d) Eucolastic 1NS by Euclid Chemical Company

PART 3 - EXECUTION

3.01 TOLERANCES

A. Work shall conform to all requirements of ACI 117 except as modified by more stringent requirements in the Project Specifications and/or Drawings.

3.02 PREPARATION

A. Subgrade:

1. Dampen subgrades not covered with membrane by sprinkling immediately before placing concrete.

a) Omit when subgrade is already damp.

2. Do not place on water-saturated subgrade unless placing can be done without damage to subgrade (surface is stable) and loading the subgrade does not drive free water to the surface.
3. Do not place concrete on frozen ground.

B. Forms:

1. Coordinate with Section 031000 Concrete Formwork.
2. Remove dirt, sawdust, nails and other foreign material from formed space.
3. Dampen wood forms by sprinkling immediately before placing.
4. Cool metal forms by sprinkling immediately before placing.

C. Concrete Accessories:

1. Coordinate with Section 031000 Concrete Formwork.

D. Dewatering:

1. Remove water from concrete formwork.
2. Divert any flowing water to sump and remove by pumping.
3. Refer to Division 1 for additional dewatering requirements.

E. Vapor Retarder Placement: See Division 7, Thermal and Moisture Protection.

1. Vapor retarder installation shall be in accordance with manufacturer's instructions and ASTM E 1643.
2. Place vapor retarder under slabs-on-grade in position with longest dimension parallel with direction of pour.
3. Joints: Lap 6" (150mm) minimum and seal with manufacturer's recommended mastic or pressure-sensitive tape.
4. Prevent damage to moisture barrier.
5. If moisture barrier is damaged, place a piece of moisture barrier over damaged area (6" (150mm) larger all around) and tape in place with type of tape recommended by moisture barrier manufacturer.
6. Seal laps and intersections of walls with compatible trowel mastic or pressure-sensitive sealing tape.
7. Seal around pipes and other penetrations with compatible trowel mastic.

8. The vapor barrier installation must be approved prior to concrete placement.

3.03 JOINTS IN CONCRETE

A. Locate construction and contraction joints as indicated on Drawings and on approved joint location submittal.

1. Do not use contraction joints in framed floors or composite slabs.
2. Locate and install construction joints so they do not impair strength or appearance of the structure, as acceptable to Design Professionals.
3. Coordinate location of construction and contraction joints with locations of joints in finish materials where they exist.

    a) Construction and contraction joints in slabs or slab on grade with terrazzo finish must be reviewed and approved by the Design Professionals.

4. Maximum joint spacing shall be 15’-0”.

B. Construction Joints:

1. Construction joints shall be located within the central third of the span. Any concrete spilling over or through the bulkhead shall be removed at the completion of the pour. All surfaces of the concrete shall have reinforcing extending through the joint.
2. Horizontal Joints: Horizontal construction joints other than those shown on the Drawings will not be permitted unless approved by the Architect.
3. Joint Preparation: Forms shall be removed in time to permit roughening of construction joints of structural members by chipping and wire brushing to remove all loose and foreign material and roughen as indicated on the Drawings. The existing concrete at joints shall either be (a) dampened to the point that the surface is saturated, but all standing water has been removed, promptly followed by placement and vibration of fresh concrete, or (b) not required to be dampened, with one of the specified bonding compounds applied as appropriate for the joint condition, following manufacturer recommendations, with placement and vibration of fresh concrete to follow while the epoxy bonding agent is still tacky. Joints without epoxy bonding agent

require fresh concrete with slump 7 inches (180mm) or greater at horizontal joints, and fresh concrete confined to maintain pressure against the joint at vertical joints. Where such conditions are not present, or where applying water to dampen the surface is impractical, use epoxy bonding agent suitable for dry surfaces

C. Isolation Joints:

1. Interrupt structural continuity resulting from bond, reinforcement or keyway at points of contact between slabs-on-grade and vertical surfaces, such as column pedestals, foundation walls and other locations, as indicated.

D. Contraction Joints in Floor Slabs-on-Grade:

1. Maximum slab area controlled by jointing is 400 square feet (35 square meters).
2. Space joints at 36 times slab thickness unless a smaller spacing is indicated on the Drawings, located to conform to bay spacing wherever possible (at column centerlines, half bays, third bays).
3. Contraction joints can be provided by sawcuts, formed joints or appropriately detailed construction joints.
4. Sawcuts shall be made as soon as possible after slab finishing as may be safely done without dislodging aggregate. The Soff-Cut saw shall be used to a depth of ¼ of slab thickness immediately after final finishing. Conventional saw shall be used as soon as possible after final finish without raveling to a depth as indicated on the Drawings.
5. Where contraction joints coincide with construction joints, detail joint as indicated on Drawings.

E. Joint Fillers: Coordinate with Section 032000 Concrete Reinforcement and Embedded Assemblies and Division 7 requirements.

3.04 MIXING

A. Measurement of Materials: Conforming to ASTM C 94.

B. Mixing: All concrete shall be ready-mixed conforming to ASTM C 94 except as follows:

1. Provide concrete materials, proportions and properties as herein specified in lieu of ASTM C 94.
2. Water, beyond that required by the mix design, shall not be added at the Project site. Addition of water at the Project site shall be made only in the presence of the Testing Agency.
3. Furnish delivery ticket with each load of concrete delivered to the site to the Contractor conforming to the requirements of ASTM C 94.

C. High range water reducing agents (superplasticizer), if added at the batch plant, may be added again at the Project site.

1. If superplasticizers are added at the batch plant, the concrete mix design must account for the delivery time, workability, finishability, and setting time required on the jobsite for proper placing and finishing procedures.
2. If the superplasticizer is redosed at the jobsite in air entrained concrete, air content must be checked after mixing.

D. Discharge of the concrete shall be completed within 1-1/2 hours , after the introduction of the mixing water to the cement and aggregates or the introduction of the cement to the aggregates. If the 1-1/2 hour limit cannot be achieved due to project location or other project specific conditions, hydration control measures to extend the proper workability up to 4 hours maximum can be proposed for approval by the SER. The increased time period along with redosing of the high range water reducer and/or use of hydration controlling/workability retaining admixtures should be agreed upon at the pre-concrete conference.

3.05 CONCRETE PLACEMENT

A. Prior to Concrete Placement:

1. Mechanical vibrators are required and must be available for placing concrete.
2. Remove debris from space to be occupied with concrete.
3. Notify Design Professionals and Testing Agency 48 hours prior to starting concrete placement.
4. Approved mix designs must be maintained on file in Contractor's Field Office.

5. Reinforcement and accessories shall be in proper locations, clean, free of loose scale, dirt or other foreign coatings that may reduce bond to concrete, and in accordance with Section 032000 and Drawings.
6. Do not place concrete having a slump outside of allowable slump range.
7. Place concrete before initial set has occurred, but in no event after it has been discharged from the mixer more than 30 minutes. All concrete shall be placed upon clean, damp surfaces, free from puddled water, or upon properly consolidated fills or upon Controlled Low-Strength Material with a strength between 50 and 1200 psi. Placement upon soft mud or dry earth is not permitted.
8. Unless adequate protection is provided, concrete shall not be placed during rain.
9. Rain water shall not be allowed to increase mixing water or to damage the surface finish.
10. At surfaces left exposed to view, do not use equipment in placing and finishing concrete that contain aluminum in the finishing edges that come in contact with the concrete surface.
11. Keep subgrade moisture uniform without puddles or dry areas.
12. Place vapor retarder directly below slabs on grade as specified in Contract Documents.

B. For Conduits and Pipes Embedded in Concrete:

1. For concrete slab, wall, beam or column, conform to requirements of ACI 318. For variations from these requirements, submit a written request for Design Professionals' review and response.
2. Conduits and pipes shall not be embedded in concrete slabs on steel deck without approval of Design Professional.
3. Provide sleeves for pipes passing vertically through concrete.
4. Do not embed aluminum materials.
5. Do not cut, bend or displace the reinforcement to facilitate placement of embedded pipes and conduits.

C. Pumping: Pumping shall be done in strict accordance with ACI 304.2R.

D. Placing Concrete in Forms:

1. Clean and prepare forms as specified in Section 031000/Concrete Formwork.
2. Place concrete continuously without interruption between predetermined construction and contraction joints in walls.

3. Deposit concrete in forms in horizontal layers no deeper than 24" (600mm) and in a manner to avoid inclined construction joints.
4. Where placement consists of several layers, place each layer while preceding layer is still plastic to avoid cold joints.
5. Consolidate placed concrete by mechanical vibrating equipment supplemented by hand-spading, rodding or tamping.

    a) Use equipment and procedures for consolidation of concrete in accordance with ACI 309R.

6. Do not use vibrators to move fresh concrete laterally inside forms from discharge point; shift discharge point as needed.
7. Insert and withdraw vibrators vertically at uniformly spaced locations no farther than the visible effectiveness of the machine.
8. Place vibrators to rapidly penetrate placed layer and at least 6" (150mm) into preceding layer.
9. Do not insert vibrators into lower layers of concrete that have begun to set.
10. At each insertion, limit duration of vibration to time necessary to consolidate concrete and complete embedment of reinforcement and other embedded items without causing segregation of mix.
11. Do not vibrate Self-Consolidating Concrete (SCC).

E. Placing Concrete Slabs:

1. Place concrete continuously without interruption between predetermined construction and contraction joints in floors.

    a) Place slabs on grade by the long strip cast method. Refer to ACI 302.1R for recommended methods of placement.

2. Deposit and consolidate concrete slabs in a continuous operation, within limits of construction joints, until completing placement of a panel or section.
3. Consolidate concrete during placing operations so that concrete is thoroughly worked around reinforcement, other embedded items and into corners.
4. Bring slab surfaces to correct level with a straightedge and strike off.

a) Use highway straight edges, bullfloats or darbies to smooth surface free of humps or hollows.
b) Do not disturb slab surfaces prior to beginning finishing operations.

5. Maintain reinforcing in proper position on chairs during concrete placement.
6. Do not place materials on slabs or impose loads during period of setting.

F. Placing Concrete at Construction Joints:

1. To secure full bond at construction joints, surfaces to receive concrete in a subsequent placement shall be left in a roughened state or intentionally roughened by raking while plastic or brushing and chipping immediately after removal.
2. Before new concrete is placed in contact, surfaces of hardened concrete already placed shall be thoroughly cleaned of foreign materials and laitance.
3. At hardened concrete at joints where no bonding agents are used, dampen concrete to achieve a saturated surface dry condition. Leave no standing water. Place and vibrate concrete (slump 7 inches (180mm) or greater) against horizontal joints. Place and vibrate flowing concrete (slump 8 to 10 inches (200 to 250mm)) while maintaining pressure against vertical joints by confinement.
4. At hardened concrete with joints not meeting conditions required for no bonding agents, apply appropriate specified bonding agent for conditions present including age and moisture per manufacturer's specifications. Place new concrete while the bonding agent is still tacky.

G. Cold-Weather Placement:

1. Protect concrete work from physical damage or reduced strength which could be caused by frost, freezing actions, or low temperatures, in compliance with ACI 306R and as specified in this section.
2. When air temperature has fallen to or is expected to fall below 40°F (4°C), uniformly heat water and aggregates before mixing to obtain a concrete mixture temperature of not less than 50°F (10°C), and not more than 80°F (27°C), at point of placement.
3. Do not use frozen materials or materials containing ice or snow.

a) Do not place concrete on frozen subgrade or on subgrade containing frozen materials.

4. Remove frost, snow and ice from forms, reinforcement and other embedments immediately prior to concrete placement.
5. Use only the specified non-corrosive accelerating admixture previously approved as part of the cold weather mixture. Addition of calcium chloride, salt, thiocyanates or admixtures containing more than 0.05 percent chloride ions is not permitted.
6. Freeze Resistant Concrete per ASTM C1622 and Chapter 9 of ACI 212.3R may be used if approved by SER. The contractor shall prepare a plan for placing, finishing and curing procedures that assure the specified hardened properties are achieved.

H. Hot-Weather Placement:

1. Hot weather is defined as air temperature which exceeds 90°F (32°C) or any combination of high temperature, low humidity and/or high wind velocity which causes a rate of evaporation in excess of 0.2 pounds per square feet per hour (1.0 kg/m² per hour) as determined by ACI 305R.
2. When hot weather conditions exist that would impair quality and strength of concrete, place concrete in compliance with ACI 305R and as specified in this section.
3. Cool ingredients before mixing to maintain concrete temperature at time of placement below 95°F (35°C).
4. Mixing water may be chilled, or chopped ice may be used to control temperature, provided water equivalent of ice is calculated to total amount of mixing water.
5. Use of liquid nitrogen to cool concrete is Contractor's option.
6. Fog spray forms, reinforcement, and subgrade just before pouring concrete.
7. When concrete placement will occur late in the day and reinforcing steel will be heated by the sun, cover reinforcing steel with water-soaked burlap so that steel temperature will not exceed ambient air temperature immediately before embedding in concrete.
8. When concrete operations must be performed in direct sun, wind, high temperatures, low relative humidity, or other adverse placing conditions, the specified evaporation retarder shall be applied one or more times during the finishing operation to prevent plastic cracking.

3.06 CONCRETE FINISHES

A. General:

1. Comply with recommendations for concrete finishing established by ACI 302.1R and ACI 304R.
2. Comply with dimensional tolerance limitations given by ACI 117.
3. For shored floor or slab on grade construction: Floor flatness/floor levelness tolerance compliance testing is to be performed prior to the removal of shores and forms but not later than **[72]** hours of concrete placement by Testing Agency.
4. See architectural Drawings for locations of the various finishes listed below.
5. Comply with the specified overall SOF_F and SOF_L values listed below:

    a) The specified overall area shall be each individual floor.
    b) F_F/F_L shall be measured in accordance with ASTM E 1155.
    c) The specified minimum local values of MLF_F/MLF_L shall be 3/5 of the SOF_F/SOF_L values listed below.
    d) If an individual test section measures less than either of the specified minimum local MLF_F/ MLF_L numbers, that section may be rejected and remedial measures may be required as specified in CONCRETE SURFACE REPAIRS.
    e) If the composite value of the test surface measures less than either of the specified overall SOF_F/SOF_L numbers, then the entire slab may be rejected and remedial measures may be required.
    f) F_L numbers shall only apply to supported slabs if the tested with all of the original shoring in place, prior to shoring removal/reshoring.
    g) F_L numbers shall not apply to unshored slabs or shored slabs with camber.

B. Finish for monolithic slab surfaces to receive concrete floor topping or mortar setting beds for tile and other bonded applied cementitious finish flooring material, as indicated on architectural Drawings:

1. Scratch Finish.

a) Finish surface to overall value of SOF_F=20 and SOF_L=15.
b) Slope surfaces uniformly to drains where required.
c) After leveling, roughen surface before final set with stiff brushes, brooms, or rakes.

C. Finishes for Pedestrian Sidewalks and Ramps, Exterior Platforms, Steps, as indicated on architectural Drawings:

1. Sidewalks and Curbs: Light-to-medium broom finish applied with fiber-bristle broom perpendicular to direction of main traffic route immediately after float finishing.
2. Ramps: Scored finish as applied perpendicular to direction of main traffic route immediately after float finishing.
3. Finish surface to overall value of SOF_F=20 and SOF_L=15.
4. Texture shall be approved by the Design Professionals from sample panels.

D. Finish for interior floor slab surfaces exposed to view and slab surfaces to be covered with resilient flooring, carpet, paint or another thin film-finish coating system, as indicated on architectural Drawings:

1. Trowel Finish.

a) After floating, begin first trowel-finish operation using a power-driven trowel.
b) Begin final troweling when surface produces a ringing sound as trowel is moved over surface.
c) The final hand-troweling operation shall result in a smooth surface, free of trowel marks, uniform in texture and appearance.
d) Grind smooth any surface defects that would telegraph through applied floor covering system.

2. Finish surface to overall value of SOF_F=25 and SOF_L=20.
3. Floor Slopes: Where drains occur, slope floor slabs uniformly to drains, maintaining scheduled slab thickness.
4. Floor Edges at Expansion Joints: Tool edges minimum 3/8" (10mm).
5. Defects: Remove defects of sufficient magnitude to show through floor covering by grinding.
6. Floor Hardener: Use only where scheduled and in accordance with manufacturer's published instructions.

7. Dry Cement: Shall not be used during finishing.

E. Finishes for Parking Garage Deck, Ramps, Loading Docks:

1. Highway straight edge immediately after screeding concrete.
2. Finish surface to overall values of SOF_F=20 and SOF_L=15.
3. For Slabs Not Receiving Deck Coating: Medium broom finish with ridges not to exceed 1/8" (3mm) in height. Texture shall be as approved by the Design Professionals from sample panels.
4. For Slabs Scheduled to Receive Deck Coating: Smooth floated finish which must be verified with coating manufacturer before finishing the slab.

    a) Coordinate with deck coating specified in Division 7.

5. Auto Ramps: Rough texture applied perpendicular to direction of traffic. Texture shall be as approved by the Design Professionals from sample panels.

F. Finishes Equipment and Housekeeping Pads

1. Coordinate finish surface to meet equipment manufacturer requirements, if any, for flatness and levelness.

G. Tolerances at Slab Discontinuities

1. Within 2 ft (600mm) of slab boundaries, construction joints, isolation joints, block-outs, penetrations or other similar discontinuities, where required for travel paths, installation of finishes and partitions, or any other requirements indicated in the Contract Documents, the following equivalent straightedge tolerances shall apply:

    a) Specified local MLF_F = 12, use ¼” (6mm) over 4 ft (1200mm), no offset greater than 1/16” (2mm)
    b) Specified local MLF_F = 15, use 1/8” (3mm) over 4 ft (1200mm), no offset greater than 1/32” (0.8mm)

H. Dry Shake Finish:

1. Non-slip aggregate where indicated on Drawings.
2. Non-oxidizing metallic hardener on loading docks at a rate of 1.5 lbs. per sq. ft. (7.3 kg/m²) and in other locations so noted on the Drawings.
3. Mineral aggregate hardener at a rate of 1.2 lbs. per sq. ft. (5.8 kg/m²) where noted on the Drawings.
4. Final finish type, method and tolerance as applicable by location and use.
5. Dry shake finish will be applied only where scheduled and in accordance with the manufacturer's published instructions and the methods and procedures agreed upon at the pre-installation conference.

I. Rough Formed Finish:

1. Acceptable for formed concrete surfaces not exposed-to-view in the finish work or by other construction, unless otherwise indicated.
2. Concrete surface shall have texture imparted by form-facing material used, with tie holes and defective areas repaired and patched, and fins and other projections exceeding 1/4” (6mm) in height rubbed down or chipped off.

J. Architectural Concrete Finish:

1. Using self-consolidating concrete, provide smooth, uniform finish upon form removal with no patching, stoning or other form of repair except washing permitted unless otherwise noted for walls, columns and other surfaces exposed to view. The surface shall match the approved jobsite mock-up panel.

K. Smooth Formed Finish:

1. Required for formed concrete surfaces exposed to view, or scheduled to be covered with a coating material applied directly to concrete, or a covering material applied directly to concrete, such as waterproofing, dampproofing, veneer plaster, painting, or other similar system, as indicated on architectural Drawings:
2. Surface is an as-cast concrete surface obtained with selected form-facing material, arranged in an orderly and symmetrical manner with a minimum of seams.
3. Repair and patch tie holes and defects. Remove fins and other projections completely.

L. Smooth Rubbed Finish:

1. "Smooth Rubbed" finish shall consist of a finish free of fins, joint marks smoothed off, blemishes removed and surfaces left smooth and unmarred.
2. Provide smooth rubbed finish to scheduled concrete surfaces, as indicated on architectural Drawings, which have received smooth form finish treatment not later than one day after form removal.
3. Moisten concrete surfaces and rub with carborundum brick or other abrasive until a uniform color and texture is produced.

    a) Do not apply cement grout other than that created by the rubbing process.

M. Grout-Cleaned Finish:

1. Provide grout-cleaned finish on scheduled concrete surfaces, as indicated on architectural Drawings, that have received smooth-formed finish treatment.
2. Combine one part Portland Cement to one and one-half parts fine sand by volume, and a 50:50 mixture of acrylic or styrene butadiene-based bonding admixture and water to form the consistency of thick paint.
3. Blend standard Portland Cement and white Portland Cement in amounts determined by trial patches so that final color of dry grout will match adjacent surfaces.
4. Thoroughly wet concrete surfaces, apply grout to coat surfaces, and fill small holes.
5. Remove excess grout by scraping and rubbing with clean burlap.
6. Keep surface damp by fog spray for at least 36 hours after rubbing.

N. Unformed Surfaces:

1. At tops of walls, horizontal offsets, and similar unformed surfaces adjacent to formed surfaces, strike-off smooth and finish with a texture matching adjacent formed surfaces.
2. Continue final surface treatment of formed surfaces uniformly across adjacent unformed surfaces, unless otherwise indicated.

3.07 CURING AND PROTECTION

A. See Section 03 39 00

3.08 CONCRETE REPAIRS

A. Perform patching and repairs in accordance with ACI 301.

B. Contractor shall submit patching and repair methods and materials for review by Design Professionals.

C. When complete, all patches and repairs shall match color and texture of adjoining surfaces.

D. At surfaces that are exposed to view, prepare test areas at inconspicuous locations for review by Design Professionals to verify repair color and texture match before proceeding with repair.

E. Apply all patching and repair materials in accordance with manufacturer's specifications.

F. Repairing Cracks In Formed and Unformed Surfaces:

1. Contractor shall notify Design Professionals of all cracks wider than 0.02" (0.50mm) and all cracks wider than 0.01" (0.25mm) that occur in a group of at least three cracks within twelve inches (300mm), in concrete. If Design Professionals deem repairs necessary, Contractor shall be responsible for repairing all such cracks per Design Professionals recommendation at no expense to the Owner. Repairs will generally require one or more of the following: Epoxy Injection, Semi-Rigid Epoxy, Pressure Injected Foam Resin, Methyl Methacrylate and/or Sealant with joint routed and cleaned. See Concrete Repair Materials section of this Specification for acceptable products

G. Repairing Formed Surfaces

1. Immediately after stripping forms, patch all honeycombing, defective joints, voids, etc. before the concrete is thoroughly dry.
2. Remove all burrs, fins, and ridges before the concrete is thoroughly dry.
3. Remove stains from rust, grease and oils, from release agents, etc.
4. Remove and replace concrete having defective surfaces if defects cannot be repaired to satisfaction of the Design Professionals.

    a) Surface defects, include color and texture irregularities, cracks as defined above, spalls, air bubbles, honeycomb, rock pockets, fins and other projections on the surface, and stains and other discolorations that cannot be removed by cleaning.
    b) Chip away defective areas, honeycomb, rock pockets, voids over 1/4" (6mm) in any dimension and holes left by tie rods and bolts, down to solid concrete but in no case to a depth less than 1" (25mm) and saw-cut edges to prevent feather edging of fill material.

5. Repair concealed formed surfaces, where possible, containing defects that affect the durability of concrete. If defects cannot be repaired, remove and replace concrete.
6. Clean out form tie holes and fill with dry pack mortar or precast cone plugs secured in place with bonding agent.
7. If honeycombing exposes reinforcement, chip to provide clear space at least 3/4" (20mm) wide all around steel to allow proper bond.

H. Repairing Unformed Surfaces:

1. High and Low areas in concrete surfaces which are in excess of specified tolerances shall be leveled or ground-smooth.

    a) Correct high areas by grinding after concrete has cured at least 14 days.
    b) Correct low areas by applying leveling material. Finish leveling material as specified in this section.

2. Repair surfaces containing defects that affect durability of concrete.

a) Surface defects include crazing, cracks as defined above, spalling, popouts, honeycombs, rock pockets, and other objectionable conditions.

3. Repair defective areas, except random cracks and single holes not exceeding 1" (25mm) in diameter, by cutting out and replacing with fresh concrete.

a) Remove defective areas with clean, square cuts and expose reinforcing steel with at least 3/4" (20mm) clearance all around.

I. Filling In: Fill in holes and openings left in concrete for passage of work by other trades, unless otherwise shown or directed, after work of other trades is in place.

3.09 EVALUATION AND ACCEPTANCE OF CONCRETE

A. In accordance with ACI 301, except where otherwise specified.

B. If, at any time during construction, the concrete resulting from the approved mix design deviates from Specification requirements for any reason, such as lack of workability, or insufficient strength, the Contractor shall have his laboratory verify the deficiency and modify the mix design, until the specified concrete is obtained. Modified mix to be submitted for approval per Part 1 - SUBMITTALS.

3.10 CORRECTIVE MEASURES

A. Conflicts: The Contractor shall be solely responsible for errors of detailing, fabrication, and placement of reinforcement steel; placement of inserts and other embedded items; and the structural adequacy of all formwork.

B. Compensation for Additional Services: Should additional work by Design Professionals such as design, documentation, meetings and/or site visits be required which are necessitated by failure of the Contractor to perform the work in accordance with the Contract Documents either developing corrective actions or reviewing corrective actions developed by others, the Contractor is responsible for paying for additional work performed by the Design Professionals at their standard firm-wide billing rates plus out-of-pocket

expenses incurred at cost + 10%. Additional costs for testing and inspection by the Owner shall also be compensated by the Contractor.

[Balance of page blank; see form on next page]

CONCRETE MIX DESIGN SUBMITTAL FORM

Project: _____

City: _____

General Contractor: _____

Concrete Contractor: _____

Concrete Strength: _____

Use/Location on Job: _____

Supplier's Mix Designation: _____

Design Mix Information **(Please check one):** *Refer to ACI 301 for requirements of data used to substantiate strength calculations.*

Field Experience (Based on Standard Deviation Analysis): _____

Trial Mixture Test Data: _____

Design Characteristics:

Density: _____ Pcf (kg/m3)

Strength: _____ Psi (MPa) (28 day)

Air: _____ % (specified)

Materials:	**Type/Source**	**Specific Gravity**	**Weight (lb)**	**Absolute Vol. (cu. ft.) (cu. m)**
Cement:				
Fly ash:				
Slag (GGBFS)				

Microsilica:				
Coarse Aggregate:				
Fine Aggregate:				
Water:				
Air:				
Other:				
TOTAL:				27.0 cu. ft. (1.0 m3)
Water/Cementitious Material Ratio (lbs. (kg) water / lbs. (kg) cementitious material) =				%

Admixtures:	**Manufacturer**	**ASTM**	**Dosage (oz/cwt)**
Water Reducer:			
Air Entraining Agent:			
High Range Water Reducer			
Non-corrosive Accelerator:			
Other:			

Slump before HRWR: _____ Inches (mm)

Slump after HRWR: _____ Inches (mm)

Standard Deviation Analysis (from experience records):

No. of Test Cylinders Evaluated: _____

Standard Deviation: _____

Required Average Strength f'cr

Average Strength by Tests

Equation Used (ACI Chapter 5)

(Refer to ACI 318 for increased deviation factor when less than 30 tests are available)

TRIAL MIXTURE TEST DATA

Compressive Strength:	**Age (days)**	**Mix #1**	**Mix #2**	**Mix #3**
	28 [56] [90]	psi (MPa)	psi (MPa)	psi (MPa)

	28 [56] [90]	psi (MPa)	psi (MPa)	psi (MPa)
	28 [56] [90]	psi (MPa)	psi (MPa)	psi (MPa)
	Average	psi (MPa)	psi (MPa)	psi (MPa)
Required Average Strength f'cr				
Average Strength by Tests				
Equation Used (ACI Chapter 5)				

REQUIRED ATTACHMENTS	***Please check***
Coarse Aggregate Gradation Report	
Fine Aggregate Gradation Report	
Fly Ash (or other Supplementary Cementitious Material) Certification	
Concrete Compressive Strength Data or Trial Mixture Test Data	
Admixture Compatibility certification letters	
Chloride Ion Content Certification	
Alkali Aggregate Reactivity Certification	
Shrinkage Test Reports	

SUBMITTED BY:

Name: _____

Address: _____

_____

Phone no.: _____

Main Plant Location: _____

Miles from Project: _____

Secondary Plant Location: _____

Miles from Project: _____

_____

Date: _____

Certification by Concrete Supplier: _____

Signature: _____

Print Name: _____

PE License Number and Expiration Date (print or stamp) _____

Structural Substitution Request Form – to be completed by Contractor

Project:		
Date:		Substitution Request #
Requesting Contractor:		Pages Attached (including this form)

1. Description of Requested Substitution:

2. Related Drawings and Specification Sections:

3. Rationale or Benefit Anticipated:

4. Effect on Construction Schedule[1] (check one): ☐ NONE ☐ See Attached

5. Effect on Owner's Cost[2] attach data (check one): ☐ CREDIT TO OWNER ☐ EXTRA

6. Effect on Construction Documents[3] (design work anticipated): ☐ NONE ☐ See Attached

7. Requesting Contractor Agrees to Pay for Design Changes (check): ☐ YES ☐ NO ☐ NOT APPLICABLE

8. Effect on Other Trades[4]:

9. Effect of Substitution on Manufacturer's Warranty (check): ☐ NONE ☐ See Attachment

Signature[5]: Date:

Company:

General Contractor Signature[5]: Date:

Notes:

1. Contractor is responsible for means and methods and any problems that may arise from making the requested substitution.
2. This is **NOT A CHANGE ORDER FORM**. A separate form is required to adjust costs and/or schedules.
3. Contractor is responsible for any design impacts that may arise from this substitution, including redesign efforts.
4. Contractor is responsible for effects on other trades from this substitution;
   General Contractor must review and agree effects on other trades are fairly represented in items 4-9.
5. Signature by a person having authority to legally bind his/her company to the above terms. Otherwise this request is void
6. All items in form must be completed for substitution request to be considered.

Request Review Responses (completed by Architect and/or Engineer(s)):

ACCEPTED	ACCEPTED AS NOTED	REJECTED	INSUFFICIENT DATA TO SUPPORT REQUEST	ENGINEER / ARCH / MEP SIGNATURE	DATE

Engineer/Architect Comments:

END OF SECTION

SECTION 03 34 00

LOW DENSITY CONCRETE
(Not Used)

SECTION 03 35 29
TOOLED CONCRETE
(Not Used)

SECTION 03 39 00
CONCRETE CURING

PART 1.00 - GENERAL

1.01 WORK INCLUDED
A. Concrete curing.

1.02 REFERENCES
A. ACI 305R
B. ACI 306R

1.03 QUALITY ASSURANCE
A. Ensure concrete is cured and protected in accordance with ACI 305R and 306R.

PART 2.00 - PRODUCTS

2.01 MATERIAL
A. Use concrete and other materials with the characteristics specified in Cast-in-Place Concrete, Section 03 30 00.

PART 3.00 – EXECUTION

3.01 GENERAL
A. Protect freshly placed concrete from premature drying and excessive cold or hot temperatures. Comply with the recommendations of ACI 305R for hot weather protection and ACI 306R for cold weather protection during curing.

3.02 EVAPORATION CONTROL
A. In hot, dry, and windy weather, protect concrete from rapid moisture loss before and during finishing operations with an evaporation-control material. Apply according to manufacturer's instructions.

3.03 EVAPORATION CONTROL
A. Curing Methods: Cure concrete by moisture curing, moisture-retaining-cover curing, curing compound, or a combination of these as follows:
    a. Moisture Curing: Keep surfaces continuously moist for not less than seven (7) days with the following materials:
        i. Water.
        ii. Continuous water-fog spray.
        iii. Absorptive cover, water saturated, and kept continuously wet. Cover concrete surfaces and edges with a 12-inch lap over adjacent absorptive covers.

b. Moisture-Retaining-Cover Curing: Cover concrete surfaces with moisture-retaining cover for curing concrete, placed in widest practicable width, with sides and ends lapped at least 12 inches, and sealed by waterproof tape or adhesive. Immediately repair any holes or tears during curing period using cover material and waterproof tape.
c. Curing Compound: Apply uniformly in continuous operation by power spray or roller according to manufacturer's directions. Recoat areas subjected to heavy rainfall within 3 hours after initial application. Maintain continuity of coating and repair damage during curing period.

END OF SECTION 03 39 00

SECTION 03 40 00
PRECAST CONCRETE

(Not Used)

SECTION 03 60 00
GROUT

PART 1.00 - GENERAL

1.01 SECTION INCLUDES

A. The Contractor shall furnish all labor, tools, and equipment for the placement of grout in tie holes and other locations as shown and specified in the Contract Documents.

B. This section includes basic mixing, application, and curing methods for grout.

1.02 QUALITY STANDARDS

A. ASTM C78 – Standard Test Method for Flexural Strength of Concrete (Using Simple Beam with Third-Point Loading).

B. ASTM C109/C109M – Standard Test Method for Compressive Strength of Hydraulic Cement Mortars (Using 2-in. of [50-mm] Cube Specimens).

C. ASTM C469 – Standard Test Method for Static Modulus of Elasticity and Poisson's Ratio of Concrete in Compression.

D. ASTM C666/C666M – Standard Test Method for Resistance of Concrete to Rapid Freezing and Thawing.

E. ASTM C882 – Standard Test Method for Bond Strength of Epoxy-Resin Systems used with Concrete by Slant Shear.

F. ASTM C1012 – Standard Test Method for Length Change of Hydraulic-Cement Mortars Exposed to Sulfate Solution.

G. ASTM C1202 – Standard Test Method for Electrical Indication of Concrete's Ability to Resist Chloride Ion Penetration.

1.03 SUBMITTALS

A. Submit the following in accordance with Submittals, Section 00 73 33:
   a. Grout
   b. Bonding agent
   c. Curing compound

1.04 DELIVERY, STORAGE, AND HANDLING

A. Cement based mortar shall be delivered and stored in manufacturer's packaging until it is ready to be mixed and placed. Mortar bags shall be stored off the ground and protected from water and all other substances that may penetrate packaging.

PART 2.00 - PRODUCTS

2.01 MATERIAL

A. Mortar for Tie Holes: EMACO R320.

B. Bonding Adhesives: Concresive Liquid LPL or Concresive Standard Liquid.

C. Water: Only clean potable water shall be used.

D. Curing Compound: MB429, Masterkure 100W, Masterkure 200W.

E. (Exposed) Reinforcing Steel Coating: EMACO P22.

F. Evaporation Reducer: Confilm Evaporation Reducer.

PART 3.00 – EXECUTION

3.01 GENERAL

A. The Contractor shall have a printed set of manufacturer's recommendations for product use onsite for review during preparation, mixing, and application of grout.

B. These grouts contain admixtures that increase grout strength and workability. The strength and performance of the grout is dependent on proper surface preparation, grout mixing and curing. The Contractor shall be required to use a calibrated measuring device to add clean potable water to the grout mix. Water added to a grout mix without a calibrated device is cause for grout rejection, removal and replacement.

C. Curing is critical to prevent shrinkage cracks that can develop with grouts containing some admixtures. Curing shall begin immediately after placement.

D. All mixing, surface preparation, handling, placing, consolidation, and other means of execution for pre-packaged mortars shall be done according to the instructions and recommendations of the manufacturer and the Contract Documents. In the event that conflict occurs between the Contract Documents and manufacturer's instructions, the manufacturer's instructions shall prevail in all cases.

3.02 INSTALLATION

A. Preparation:
   a. Thoroughly clean the roughened surface and any exposed reinforcement of rust, dirt, loose chips, and dust. Maintain substrate in a saturated, surface-dry condition.
   b. Where applicable, coat exposed reinforcing steel with EMACO P22 reinforcing steel bar protection coating prior to patching.

B. Mixing:
   a. Comply with mortar manufacturer's recommendations for water quantity. Mechanically mix with a slow speed drill (four hundred to six hundred [400 to 600] rpm) and Jiffler-type paddle. Pour approximately ninety percent (90%) of the mix water into the mixing container; then add the bagged material while continuing to mix. Add remaining water as needed. Mix time shall not exceed five (5) minutes.

C. Application:
   a. Apply bonding adhesive such as Concresive Liquid LPL or Concresive Standard Liquid.
   b. Place and finish with trowel or screed. In hot, windy, or dry conditions, where rapid surface evaporation may occur, apply evaporation reducer.

D. Curing:
   a. Apply Masterkure 200 W curing compound in accordance with label instructions.

3.03 INSTALLATION

A. Field Tests:

a. The Contractor shall be responsible for performing quality control testing.
b. When prescribed in the Contract Documents, length change test specimens will be taken during construction from the first placement of each type of mortar, and at intervals thereafter as selected by the Project Manager to ensure continued compliance with these Contract Documents. Unless otherwise specified in the Contract Documents, the testing will be performed by the Contractor.
c. When required, length change tests and fabrication of specimens for cement-based mortar shall be performed as specified in ASTM C1012 at intervals during construction as selected by the Project Manager. A set of three (3) specimens will be made for testing at seven (7) and twenty eight (28) days.
d. All mortar, already placed, that fails to meet the requirements of the Contract Documents, shall be subject to removal and replacement at the cost of the Contractor.
e. Unless otherwise specified in the Contract Documents, the cost of all laboratory tests on grout shall be borne by the Contractor, and the Contractor shall obtain specimens for testing.

END OF SECTION 03 60 00

SECTION 03 64 23
EPOXY INJECTION SYSTEM
(Not Used)

SECTION 03 70 00
MASS CONCRETE
(Not Used)

SECTION 04 22 00
CONCRETE MASONRY UNITS

PART 1.00 - GENERAL

1.01 GENERAL

Work of this Section shall conform to requirements of Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification sections.

1.02 SCOPE

Provide all labor, materials, equipment, services and transportation required to complete all concrete masonry unit work as shown on Drawings, as specified herein, and as required by the job conditions.

1.03 RELATED WORK SPECIFIED IN OTHER SECTIONS

Submittals	Division 1
Quality Control	Division 1
Quality Assurance: Structural Testing and Inspection	Section 01 45 00
Concrete Reinforcement and Embedded Assemblies	Section 03 20 00
Cast-In-Place Concrete	Section 03 30 00
Structural Steel	Section 05 12 00
Thermal and Moisture Protection	Division 7

1.04 CODES AND STANDARDS

A. Building Code: Concrete masonry unit work shall conform to the requirements of the Building Code identified on the Structural General Notes, and OSHA requirements, except where more stringent conditions or criteria occur in the standards referenced below and on the Drawings.

B. Standards:

1. TMS 402/ACI 530/ASCE 5 – Building Code Requirements for Masonry Structures (TMS 402)
2. TMS 602/ACI 530.1/ASCE 6 – Specification for Masonry Structures (TMS 602)
3. American Society for Testing and Materials "ASTM Standards in Building Codes", various standards as referenced herein.

C. Definitions:

1. See Section 033000 or 051200.
2. CMU: Concrete Masonry Unit(s)

1.05 CONTRACTOR QUALIFICATIONS

A. The work of this section shall be performed by a company specializing in the type of concrete masonry unit work required for this Project, with a minimum of 10 years of documented, successful, experience and shall be performed by skilled workmen thoroughly experienced in the necessary crafts.

B. Grouting and Reinforcement: All masonry grouting and reinforcement work shall be performed by masonry craftworkers who have successfully completed the International Masonry Institute training course for Grouting and Reinforced Masonry Construction or equal.

1.06 SUBMITTALS

A. Required Submittals - Where the SUBMITTALS section of this Specification is in conflict with Division 1 Submittals, the more stringent requirements for the Contractor apply. Required submittal items are listed here; see below for detailed requirements. Do not submit items not requested. Reproduction of Structural Drawings for shop drawings is not permitted.

(1) Submittal Schedule
(2) Shop Drawings
(3) Mix Designs and Test Results
(4) Statement of Compressive Strength
(5) Construction Procedures
(6) Material Certificates
(7) Hot and Cold Weather Procedures
(8) Product Data
(9) Comprehensive Layout Drawings
(10) Structural Repairs
(11) Hazardous Materials Notification

1. **Submittal Schedule**: See Section 033000.
2. **Shop Drawings:** Submit for action shop drawings for masonry that shall clearly indicate, but not be limited to:

   a) Reinforcement consistent with the Shop Drawings submittal requirements of Section 032000.
   b) Concrete Masonry Units including sizes, profiles, coursing, and locations of special shapes.
   c) Contraction (Control) joint type, details, and locations.

3. **Mix Designs and Test Results**: Submit for action data as required to verify the specified values of f'm as determined by the Unit Strength Method per TMS 420. This would include mortar and grout mix designs/types and test results for each concrete masonry unit strength required for the Project at least thirty (30) days before CMU installation begins.

a) Mix designs and test results shall be prepared or reviewed by an approved independent Testing Agency retained by the Contractor and shall be coordinated with design requirements and Contract Documents.
b) Before submitting to Testing Agency, submit complete mix design data for each separate mortar and grout mix to be used on the Project in a single submittal.
c) Mix materials shall be from the same production facility that will be used for this Project.
d) Mortar mix designs for each mortar type indicated on Structural Drawings shall include:

i. Mortar type
ii. Aggregate type and gradation
iii. Locations on the Project where each mix design is to be used corresponding to Structural General Notes on the Drawings.
iv. Type of cement used.
v. Type and proportions of ingredients in accordance with the proportion specification of ASTM C270
vi. Pigment color, type and quantity

e) Grout mix designs for each grout strength indicated on Structural Drawings shall include the following. Cast-in-place concrete mixes are not acceptable substitutes for grout and will be rejected:

i. 28-day compressive strength as indicated on Structural Drawings.
ii. Aggregate type and gradation
iii. Locations on the Project where each mix design is to be used corresponding to Structural General Notes on the Drawings.
iv. Type and proportions as determined by compressive strength tests performed in accordance with ASTM C1019.

4. **Statement of Compressive Strength:** Submit for record for each combination of masonry unit type and mortar type a statement of average net-area compressive strength of masonry units, mortar type, and resulting net-area compressive strength of masonry determined in accordance with TMS 602.
5. **Construction Procedures:** Submit for record procedures for construction of masonry walls. Procedures shall include high lift or low lift grouting as applicable to the Project covering maximum planned lift and pour heights.
6. **Material Certificates:** Submit for record material certificates signed by the material supplier that the masonry units, mortar, grout, admixtures, reinforcement, joint material, anchors, ties, and metal accessories comply with specification requirements and are compatible with each other.

7. **Hot and Cold Weather Procedures**: Submit for record written procedures for placement of CMU in hot and cold weather conditions. Hot and Cold weather are as defined in the CMU Placement section of this Specification.
8. **Product Data**: Submit for action product data clearly marked to indicate locations to be used and all technical information which specifies full compliance with this section and Contract Documents, including published application instructions, product characteristics, compatibility, and limitations for each of the following:

    a) Concrete masonry units: Submit the following for each type of masonry unit indicated in the Structural Drawings:

        i. Average net-area compressive strength of units including material test reports substantiating compliance with the contract documents.
        ii. Unit dimensions
        iii. Web and face shell thickness
        iv. Density
        v. Color
        vi. Texture

    b) Mortar materials
    c) Grout materials
    d) Each material and grade of reinforcement
    e) Each type and size of metal accessories
    f) Pigments

9. **Comprehensive Layout Drawings:** Submit for action comprehensive layout drawings (a single drawing per area/element):

    a) Drawings shall consolidate the work of all trades and shall be coordinated by the Contractor.
    b) Show walls in elevation with dimensions indicating length and height of wall.
    c) Drawings shall show all wall openings. Indicate opening size and location with dimensions.
    d) Locations of contraction (control) joints.
    e) Plan details of columns and pilasters and coursing.
    f) Drawings shall indicate the location of all conduit, plumbing and other items embedded in the masonry walls.
    g) Drawings shall be to scale.

10. **Structural Repairs:** See Section 03 30 00.
11. **Hazardous Materials Notification**: See Section 03 30 00.

B. Submittal Process: See Section 03 30 00 or 05 12 00

C. SER Submittal Review: See Section 03 30 00 or 05 12 00

D. Substitution Request: See Section 03 30 00 or 05 12 00

E. Request for Information (RFI): See Section 03 30 00 or 05 12 00

1.07 DELIVERY, STORAGE, AND HANDLING

A. Comply with General Conditions and Division 1.

B. Delivery:

1. At the time of delivery to the project site, concrete masonry units shall meet the linear shrinkage requirements and physical requirements of ASTM C90. Reject and remove from site all non-conforming materials.

C. Storage:

1. Store units on elevated platforms in a dry location. If units are not stored in an enclosed location, cover tops and sides of stacks with waterproofing sheeting, securely tied. If units become wet, do not install until they are dry.
2. Store cementitious materials on elevated platforms, under cover and in a dry location. Use of cementitious materials that have become caked or hardened from moisture absorption will not be permitted.
3. Store aggregates where grading and other required characteristics can be maintained and contamination avoided.
4. Deliver pre-blended, dry mortar mix in moisture-resistant containers. Store pre-blended, dry mortar mix in delivery containers on elevated platforms in a dry location or in covered weatherproof dispensing silos.
5. Store masonry accessories, including metal items, to prevent corrosion and accumulation of dirt and oil.

D. Handling:

1. Handle fine and coarse aggregates as separate ingredients.

1.08 PRE-INSTALLATION CONFERENCE

A. At least 30 working days prior to the start of concrete masonry unit construction, the Contractor shall hold a meeting to review the approved mortar and grout mix designs and to determine the procedures for producing proper concrete masonry unit construction. The Contractor shall notify the Design Professionals of the meeting and require responsible representatives of every party who is concerned with the concrete masonry unit Work to attend the conference, including but not limited to the following:

1. Contractor.
2. Testing Agency representative.
3. Admixture manufacturer(s).

B. Minutes of the meeting shall be recorded and distributed by the Contractor to all parties concerned within five working days of the meeting. One copy of the minutes shall also be furnished to the following:

1. Design Professionals.
2. Owner's Representative.

C. The minutes shall include a statement by the masonry contractor and admixture manufacturer(s) indicating that the proposed mix design can produce the concrete masonry unit properties and quality required by these Specifications.

1.09 QUALITY ASSURANCE BY OWNER'S TESTING AGENCY

A. See Section 014500.

1.10 QUALITY CONTROL BY CONTRACTOR

A. See Section 01 45 00 and 03 30 00.

1.11 OBSERVATIONS AND CORRECTIONS BY DESIGN PROFESSIONALS

A. Observations: See Section 033000 or 051200.

B. Corrections by Design Professionals: See Part 3 - CORRECTIVE MEASURES section of this specification.

1.12 PERMITS AND WARRANTY

A. Permits: See Section 03 30 00 or 05 12 00.

B. Warranty: See Section 03 30 00 or 05 12 00. Failures include but are not limited to the following:

1. Oily, waxy or loose residue which may interfere with the bonding or discoloration of various applied Architectural finish materials.
2. Discoloration of concrete masonry unit surfaces scheduled to remain exposed as a finish.
3. Areas which show surface failure or defects.
4. Areas which are not properly prepared to receive Architectural finish materials. If necessary, the Contractor, at his own expense, shall have the Testing Agency perform appropriate tests for bond and discoloration.

PART 2 - PRODUCTS

2.01 GENERAL

A. Concrete masonry shall have the minimum compressive strength f'm as indicated in the Structural Drawings.

B. Provide units and materials from a single source and of the same brand throughout the project.

2.02 CONCRETE MASONRY UNITS

A. ASTM C90

1. Net area compressive strength of concrete masonry units shall be as indicated on Structural Drawings.
2. Density classification shall be as indicated on Structural Drawings.
3. Units shall be 8” (203.2 mm) nominal in height and 16” (406.4 mm) nominal in length. Nominal unit thicknesses shall be as indicated on Structural Drawings. Actual dimensions shall be manufactured to 3/8” (9.5 mm) less than nominal dimensions.

B. Provide special shapes for lintels, corners, jambs, sashes, movement joints, headers, bond beams and other special conditions.

C. At exposed faces, provide color and texture matching the range represented by Architect’s sample.

D. At faces to receive plaster, provide textured face units made with gap graded aggregates.

2.03 MORTAR AND GROUT

A. General:

1. Site mixing of mortar or grout shall not be permitted without review and acceptance of Contractor’s procedure by the Testing Agency.
2. Measure all materials accurately. Shovel measurements will not be permitted.
3. Mortar and grout shall be mixed by mechanical means. Mixing by hand is not permitted.
4. Completely empty drum before charging succeeding batch of materials.
5. Admixtures:

a) Do not use admixtures, air-entraining agents, accelerators, retarders, water-repellent agents, antifreeze compounds, pigments or other admixtures unless otherwise indicated
b) Admixtures (excluding pigment) added to either mortar or grout shall also be added to the other so that both contain the same admixtures.
c) Do not use admixtures that contain chlorides.

B. Mortar:

1. Conform to ASTM C270:

a) Mortar type shall be as indicated on Structural Drawings

b) For mortar that is exposed to view, use washed aggregate consisting of natural sand or crushed stone.
c) Do not admixtures that contain chlorides.
d) Color:

i. Mineral oxide pigments only.
ii. Provide mortar that is uniform in color throughout job.

2. Mixing:

a) Furnish dry mortar ingredients in the form of a pre-blended mix.
b) Mix cementitious materials and aggregates on site in batch mechanical mixer

i. Place approximately half of the required water and aggregate into the mixer while turning.
ii. Add cement and remainder of the aggregate and water into mixer in that order.
iii. Add lime and continue mixing as long as required to secure a uniform mass.
iv. Total mixing time may not be less 3 minutes nor more than 5 minutes.

c) Maintain workability of mortar by remixing or re-tempering
d) Do not hand mix mortar.
e) Discard mortar which has begun to stiffen or is not used with 2-1/2 hours after initial mixing.
f) Limit weight of mineral oxide or carbon black pigments added to project site prepared mortar in accordance with TMS 602.

C. Grout:

1. Conform to ASTM C476:

a) Compressive strength as indicated on Structural Drawings.
b) Contractor shall furnish fine grout at no additional cost to the Owner if the clear width of grout space or the clear grout space dimensions for grouting cells of hollow units of the constructed masonry is less than the minimum for course grout per Table 3.2.1 of TMS 402.

2. Mixing:

a) Mix grout in accordance with ASTM C476.
b) Furnish dry ingredients in the form of a pre-blended mix.
c) Mix ingredients in a mechanical batch mixer for a minimum of 5 minutes.
d) Use sufficient water to make a workable mix that will flow into all joints for the masonry units with typical rates of absorption per ASTM C90.

e) Slump shall be between 8” (203.2 mm) and 11” (279.4 mm)

D. Self-Consolidating Grout:

1. Conform to ASTM C476.
2. Mixing:

a) Furnish dry ingredients in the form of a pre-blended mix.
b) Mix ingredients in a mechanical batch mixer for a minimum of 5 minutes.
c) Add water in accordance with the self-consolidating grout manufacturer’s recommendations.
d) Slump shall be between 24” (609.6 mm) and 30” (762 mm)
e) Field addition of admixtures is not permitted.

2.04 ADMIXTURES

A. General:

1. Admixtures specified below can be used only when established in the mix design with Design Professionals' prior written approval.
2. Each admixture approved by Design Professionals shall be used in strict compliance with manufacturer's published instructions.
3. Mortar and grout suppliers shall certify all admixtures to be compatible with each other. (See Submittals Section in Part 1)

B. Air Entraining Admixture:

1. Not permitted in mortar or grout mixes.

C. Retarding Admixture:

1. ASTM C 494, Type B
2. Acceptable Product: Fritz Pak “Mortar Set Retarder”
3. Acceptable Product: Grace Construction & Packaging “Mortard-E”
4. Acceptable Product: Euclid Chemical Company “Eucon Retarder 100m”

D. Non Corrosive Accelerating Admixture:

1. ASTM C 494, Type C
2. Acceptable Product: Fritz Pak “Mortar Set Accelerator”
3. Acceptable Product: Euclid Chemical Company “Euco Winter Admixture”
4. Acceptable Product: Grace Construction & Packaging “Morset”

E. Water-Reducing and Accelerating Admixture:

1. ASTM C 494, Type E
2. Acceptable Product: Fritz Pak "Mortar Set Accelerator”
3. Acceptable Product: Euclid Chemical Company “ACCELGUARD 80 Mortar”

4. Acceptable Product: Kaufman Products, Inc. “Excell NC 80”

2.05 REINFORCEMENT AND METAL ACCESSORIES

A. Reinforcement Bars

1. Horizontal and vertical reinforcement bars shall comply with requirements of Section 032000

B. Joint Reinforcement

1. ASTM A951
2. Carbon Steel
3. Ladder Type Reinforcement:

   a) Longitudinal rod size shall be as indicated on Structural Drawings
   b) Joint reinforcement width to match thickness of units.
   c) Spacing of cross ties and of points of connection of cross ties to longitudinal rods to be 16” (406.4 mm) on-center maximum.
   d) Provide in lengths of not less than 10’-0” (3.05 m).
   e) Provide prefabricated corner and Tee Units.

C. Anchors, Ties and Accessories:

1. Wire Mesh Ties: ASTM A185
2. Wire Ties and Anchors: ASTM A82
3. Headed Anchor Rods: ASTM 307

D. Coatings for Corrosion Protection: Unless otherwise noted, protect carbon steel joint reinforcement, ties and anchors from corrosion by galvanizing in conformance with the following minimums:

1. Hot-Dip Galvanized Coatings per ASTM A153
2. Mill Galvanized Coatings per ASTM A641

2.06 MISCELLANEOUS CMU AND CMU RELATED PRODUCTS

A. Reinforcement Bar Positioners:

1. Provide positioners with two eyes or four eyes for CMU walls with one or two layers of vertical reinforcement respectively.
2. Provide positioner size for each thickness of CMU walls indicated on drawings.
3. Vertical spacing shall not exceed 16” (406.4 mm) on-center.
4. Hot dip galvanized per ASTM A153.
5. Acceptable Products:

   a) Heckmann Building Products: “#376 Rebar Positioner”.
   b) Hohmann & Barnard: “RB Rebar Positioners” or “BR-Twin Rebar Positioners”.

B. Contraction (Control) Joint Material:

1. Shall comply with ASTM D200, M2AA-805 with rubber shear keys with a minimum durometer hardness of 80.

C. Top of Wall Anchors:

1. All anchor components, inserts, dovetail slots and post installed anchors to be hot-dipped galvanized or stainless steel
2. Acceptable Products:

a) For interior, non-load bearing partitions in Seismic Design Categories A and B only:

i. PTA Series by Blok-Lok
ii. PTA Series by Hohmann and Barnard
iii. At Post-Tensioned Slabs provide dovetail slots or 3/4" (19.1 mm) maximum depth post-installed anchors

b) For interior, non-load bearing partitions or exterior back-up walls in Seismic Design Categories A and B only:

i. LSA Series by Blok-Lok
ii. At Post-Tensioned Slabs provide dovetail slots or 3/4" (19.1 mm) maximum depth post-installed anchors

D. Post-installed Anchors:

1. See Structural General Notes and Specification 032000.

E. Embedded Conduits, Pipes and Sleeves

1. Materials shall be compatible with masonry.
2. Aluminum materials are not permitted.

PART 3 - EXECUTION

3.01 CONTRACTOR INSPECTION

A. Prior to start of masonry construction, the Contractor shall verify:

1. The foundation is constructed within a level alignment tolerance of +/- 1/2" (12.7 mm) per Figure SC-8 of TMS 602-13.
2. Reinforcement dowels are positioned in accordance with the Contract Drawings and are free from loose scale, dirt, concrete or other bond inhibiting substances.
3. Edge is true to permit projection of masonry to less than 1/4" (6.4 mm).

B. Contractor shall immediately notify the Design Professionals stated conditions are not met. Construction of masonry shall not begin until unsatisfactory conditions are corrected.

3.02 PREPARATION

A. Cleaning:

1. Clean concrete surfaces to receive masonry. Remove Laitance, loose aggregate and anything else that would prevent mortar from bonding to supporting concrete.
2. Clean reinforcement and shanks of anchor rods by removing mud, oil or other materials that will adversely affect or reduce bond at the time mortar or grout is placed.
3. Reinforcement with rust, mill scale or both are acceptable without cleaning or brushing provided that the dimensions and weights, including heights of deformations, of a cleaned sample are not less than required by ASTM A615.

B. Wetting:

1. Unless otherwise required, do not wet concrete masonry. Wet cutting is permitted.

C. Debris:

1. Construct grout spaces free of mortar dropping, debris, loose aggregates, and any material deleterious to masonry grout.
2. Remove any insulating material from cells that are to receive grout, including polystyrene insulating inserts, prior to grouting.

D. Reinforcement:

1. Place reinforcement and ties in grout spaces prior to grouting.

E. Cleanouts:

1. For grout pours that exceed 5’-4” (1.63 m) in height, provide cleanout openings in the bottom course of masonry for each grout pour.

    a) Construct cleanouts so that the space to be grouted can be cleaned and inspected. In solid grouted masonry, space cleanouts horizontally at a maximum of 32” (813 mm) on center.
    b) Construct cleanouts with an opening of sufficient size to permit removal of debris. The minimum opening dimension shall be 3” (76.2 mm).
    c) After cleaning, close cleanouts with closures braced to resist grout pressure.

F. Ensure CMU are clean and free from dust, dirt or other foreign materials.

G. Approved mix designs must be maintained on file in Contractor's Field Office.

H. Do not place grout having a slump outside of allowable slump range.

I. Unless adequate protection is provided, CMU shall not be placed during rain.

J. Rain water shall not be allowed to increase mixing water.

K. Layout walls in advance for accurate spacing of surface bond patterns with uniform joint thickness and to accurately locate wall openings, movement joints, returns and offsets.

3.03 MASONRY ERECTION

A. Bond Pattern:

1. Unless otherwise indicated in the drawings, lay masonry in running bond.

B. Placing Mortar and CMU

1. General

a) Place clean CMU and adjust to final position while mortar is soft and plastic. Remove and re-lay in fresh mortar any unit disturbed to the extent that bond is broken after initial positioning.
b) Cut exposed edges or faces of CMU smooth, or position so that exposed faces or edges are unaltered manufactured surfaces.
c) When the bearing of a masonry wythe on its support is less than 2/3 of the wythe thickness, notify the Design Professional in writing.
d) Use full size units if possible. Avoid using less than one half size units at jambs, lintels, sills and corners.
e) Cutting of units shall be performed with motor-driven saws to produce clean, unchipped edges. If wet cutting is used, allow units to dry before laying unless otherwise specified. Install cut units so that cut edges and surfaces are concealed.
f) Ensure random color variations of CMU by selecting CMU to be laid from three delivered pallets. Alternate pallets as work progresses.
g) Install anchors and other embedded items accurately as work progresses and prior to grouting.
h) Align cells of units vertically.
i) Where longitudinal run is to be stopped, rack back one half block length in each course. Toothing of units is not permitted.
j) Temporary Formwork and Shoring:

i. Construct formwork and shores as required to support masonry unit during construction
ii. Construct formwork to provide shape, line and dimensions of completed masonry as indicated. Make forms

sufficiently tight to prevent leakage of mortar or grout. Brace forms to maintain position and shape during construction and curing of masonry.

iii. Do not remove forms or shores until masonry has sufficiently cured to carry its self-weight and other construction loads.

2. Bed Joints at Base of Masonry unit:

a) In the starting course on foundations and other supporting members, construct bed joints so that the bed joint thickness is at least 1/4" (6.4 mm) and not more than:

i. 3/4" (19.1 mm) when the masonry unit is not grouted or partially grouted.
ii. 1-1/4" (31.8 mm) when the first course of the masonry unit is grouted solid and supported by a concrete foundation.

3. Bed and Head Joints:

a) Construct 3/8" (9.5 mm) thick bed and head joints except as indicated for bed joints at base of masonry unit.
b) Fill holes not specified in exposed and below grade masonry with mortar.
c) Tool joints slightly concave using a jointer larger than joint thickness to achieve solid, smooth, watertight joints when the mortar is thumbprint hard.
d) Remove masonry protrusions extending 1/2" (12.7 mm) or more into cells or cavities to be grouted.
e) Butter ends with sufficient mortar to fill head joints and shove in place. Do not slush head joints.
f) Where concealed, cut off mortar flush with face of wall using trowel.

4. Collar Joints:

a) Solidly fill collar joints less than 3/4" (19.1 mm) wide with mortar as the work progresses.

5. Hollow CMU: Place hollow units so:

a) Face shells of bed joints are fully mortared.
b) Webs are fully mortared in:

i. All courses of piers, columns and pilasters.
ii. When necessary to confine grout our insulation.

c) Head joints are mortared, a minimum distance from each face equal to the face shell thickness of the CMU.

d) Vertical cells to be grouted are aligned and unobstructed openings for grout are provided in accordance with the drawings.

C. Embedded Items and Accessories:

1. Construct chases as masonry units are laid.
2. Install pipes and conduits passing horizontally through masonry partitions.
3. Place pipes and conduits passing horizontally through piers, pilasters, or columns.
4. Place horizontal pipes and conduits in and parallel to plane of walls.
5. Install and secure connectors, flashing, weep holes, weep vents, nailing blocks, and other accessories.
6. Install movement joints.
7. Do not embed aluminum conduits, pipes, and accessories.
8. Conduits and pipes shall not be embedded in grouted cells with vertical or horizontal reinforcement without prior written approval of Design Professional.
9. Do not cut, bend or displace the reinforcement to facilitate placement of embedded items.
10. Maintain minimum clear cover between embedded items and reinforcement.

D. Bracing of CMU:

1. Bracing and shoring to be designed by the Contractor's engineer. The need for bracing and shoring is to be determined by the Contractor's engineer.
2. Design, provide, and install bracing that will assure stability of CMU during construction.
3. Construction equipment shall not be laterally braced to masonry unit walls without prior written approval from the Design Professional.

E. Site Tolerances:

1. Erect CMU within the following tolerances from the specified dimensions. If specified tolerances cannot be met due to previous construction, notify the Design Professional in writing.
2. Dimension of elements:

   a) In cross-section or elevation: -1/4" (6.4 mm), + 1/2" (12.7 mm)
   b) Mortar joint thickness: +/- 1/8" (3.2 mm).
   c) Grout space or cavity width: -1/4" (6.4 mm), + 3/8" (9.5 mm).

3. Elements:

   a) Variation from level:

      i. Bed joints and top surface of load bearing walls: +/- 1/4" (6.4 mm) in 10'-0" (3.05 m), +/- 1/2" (12.7 mm) maximum.

b) Variation from plumb and true to a line: +/- 1/4" (6.4 mm) in 10'-0" (3.05 m), +/- 3/8" (9.5 mm) in 20'-0" (6.1 m), +/- 1/2" (12.7 mm) maximum.
c) Alignment of columns and walls (bottom versus top):

i. Load bearing walls and columns: +/- 1/2" (12.7 mm).
ii. Non-bearing walls: +/- 3/4" (19.1 mm).

4. Location of elements:

a) Indicated in plan: +/- 1/2" (12.7 mm) in 20'-0" (6.1 m), +/- 3/4" (19.1 mm) maximum.
b) Indicated in elevation: +/- 1/4" (6.4 mm) in story height, +/- 3/4" (19.1 mm) maximum.

3.04 CONTRACTION (CONTROL) JOINTS:

A. Install contraction (control) joints at locations indicated on the drawings in all masonry walls. Nonstructural reinforcement, such as horizontal joint reinforcement, shall not be continuous through contraction (control) joints. Structural reinforcement, such as bond beam reinforcement, shall be continuous through contraction (control) joints.

3.05 REINFORCEMENT, TIES, AND ANCHOR INSTALLATION:

A. General:

1. Place reinforcement and anchors in accordance with sizes, types and locations indicated in the drawings.
2. Do not place dissimilar metals in contact with each other.
3. Place all reinforcement and embedded items prior to grouting.

B. Reinforcement Bars:

1. Support reinforcement to prevent displacement caused by construction loads or by placement of grout or mortar beyond allowable tolerances.
2. Completely embed all reinforcement bars and dowels in grout.
3. Clear distance between reinforcement and concrete masonry unit or mortar protrusion into cell shall be 1/2" (12.7 mm) minimum for course grout and 1/4" (6.4 mm) minimum for fine grout.
4. Clear cover of reinforcement shall be in accordance with Structural Drawings with the following minimums:

a) Masonry face exposed to earth or weather:

i. Bars #5 and smaller: 1-1/2" (38.1 mm)
ii. Bars larger than #5: 2" (50.8 mm)

b) Masonry not exposed to earth or weather:

i. All bar sizes: 1-1/2” (38.1 mm)

5. Maintain a minimum clear distance between parallel bars of (1) bar diameter or 1” (25.4 mm) whichever is greater. Where size of parallel bars varies, bar diameter used to determine minimum clear spacing shall be that of the larger bar.
6. In columns and pilasters, maintain minimum clear distance between vertical bars of one and one-half times the nominal bar size or 1-1/2” (38.1 mm), whichever is greater.
7. Splice bars as indicated in the drawings.
8. Do not bend reinforcement after it is embedded in grout.
9. Position bars spliced by noncontact lap splice no farther apart transversely than one-fifth the required lap length nor more than 8” (203.2 mm).
10. Horizontal bars that are lap spliced may be stacked vertically to ease grout placement.
11. Splices shall not cross cold joints in grout.

C. Joint Reinforcement:

1. Place joint reinforcement so that longitudinal wires are embedded in mortar with a minimum cover of 5/8” (15.9 mm) when exposed to weather or earth. Provide 1/2” (12.7 mm) clear cover elsewhere.
2. Provide minimum 6” (152.4 mm) lap splices.
3. Ensure that all ends of longitudinal wires of joint reinforcement at laps are embedded in mortar or grout.
4. Space joint reinforcement not more than 16” (406.4 mm) on-center.

D. Reinforcement Placement Tolerances:

1. Place reinforcement bars in walls and flexural elements masonry unit within the following tolerances when the distance from the centerline of bars to the opposite face of masonry is as follows:

   a) Equal to 8” (203 mm) or less: +/- 1/2" (12.7 mm).
   b) Less than 24” (610 mm) and greater than 8” (203 mm): +/- 1” (25.4 mm).
   c) Greater than 24” (610 mm): +/- 1-1/4” (31.8 mm).

2. Place vertical bars within the following tolerances along the length of the wall when the wall segment length is as follows:

   a) Equal to 24” (610 mm) or less: +/- 1” (25.4 mm) of required location.
   b) Greater than 24” (610 mm): +/- 2” (50.8 mm).

3. If it is necessary to move bars more than one bar diameter or a distance exceeding the tolerance stated above to avoid interference with other reinforcement, conduits, or other embedded items, notify the Design Professional in writing.

4. Foundation dowels that interfere with webs of CMU may be bent to a maximum of 1” (25.4 mm) horizontally for every 6” (152.4 mm) of vertical height.

    a) It is acceptable to remove a portion of the web to accommodate a bent dowel as long as the dowel is fully encapsulated in grout and masonry cover is maintained.

E. Anchor Rods:

1. Anchor rods shall be embedded in grout.
2. Place anchor rods prior to grouting. Anchor rods shall not be forced into previously poured grout.
3. Maintain minimum masonry cover between anchor rods and masonry inside cells of CMU.
4. For anchor rods placed through a face shell:

    a) The rods may fit tight to the hole drilled through the face shell.
    b) If the hole drilled through the face shell is of a larger diameter than the rod, minimum masonry cover must be provided between the rod and the edge of the hole.

3.06 GROUT PLACEMENT:

A. General:

1. Place grout within 1-1/2 hours from introducing water in the mixture and prior to initial set.

    a) Discard site-mixed grout that does not meet the specified slump without adding water after initial mixing.

2. For ready-mixed grout:

    a) Addition of water is permitted at the time of discharge to adjust slump.
    b) Discard ready-mixed grout that does not meet the specified slump without adding water, other than the water that was added at the time of discharge.
    c) The time limitation is waived as long as the ready-mixed grout meets the specified slump.

3. Confinement: Confine grout to the areas indicated on the drawings. Use material to confine grout that permits bond between masonry units and mortar.
4. Ensure grout flows into voids and completely surrounds reinforcement steel, anchor rods, and embedded items.
5. Grout from inside face of masonry where possible.
6. Do not wet grout spaces prior to grouting.

7. The contractor shall ensure that the masonry has sufficiently cured so that grouting operations will not displace units.

    a) Reinforcement steel shall be in place prior to grouting. Reinforcement shall not be forced into previously poured grout.

B. Grout Pour Height:

1. For conventional and self-consolidating grout, do not exceed the maximum grout pour height given in Table 7 of the TMS 602.

C. Grout Lift Height:

1. Conventional Grout Lift Height:

    a) Where the following conditions are met, place grout in lifts not exceeding 12’-8” (3.86 m):

        i. The masonry has cured for at least 4 hours.
        ii. The grout slump is maintained between 10” (254 mm) to 11” (279.4 mm)
        iii. No bond beams are placed between the top and the bottom of the pour height.
        iv. No intermediate reinforced bond beams are placed between the top and bottom of the pour height.
        v. Cleanouts are provided in the bottom course of the masonry.

    b) When the above conditions are not met, place grout in lifts not exceeding 5’-4” (1.63 m).

2. Self-Consolidating Grout Lift Height:

    a) When placed in masonry that has cured for at least 4 hours, place in lifts not exceeding the grout pour height.
    b) When placed in masonry that has not cured for at least 4 hours, place in lifts not exceeding 5’-4” (1.63 m) or the grout pour height, whichever is less.

3. Consolidation:

    a) Consolidate grout at the time of placement.
    b) For conventional grout pours of 12” (304.8 mm) or less in height:

        i. Consolidate grout at time of placement by mechanical vibration or by puddling.

    c) For conventional grout pours exceeding 12” (304.8 mm) in height:

i. Consolidate each lift of grout at time of placement by mechanical vibration.
ii. Reconsolidate by mechanical vibration after initial water loss and settlement has occurred but not more than 30 minutes after initial consolidation.

d) Mechanical vibration shall be performed with a low velocity vibrator with 3/4" (19.1 mm) diameter head.

i. Vibrate each grouted cell for partially grouted walls or alternate cells for fully grouted walls.
ii. Vibrate at intervals of 16" (406.4 mm) when grouting between wythes.
iii. Extend vibrator into lift the lesser of 8'-0" (2.4 m) or full depth of lift.

e) Consolidation and reconsolidation is not required for self-consolidating grout.

4. Grout Keys:

a) When grouting, form grout keys between grout pours. Form grout keys between grout lifts when the first lift is permitted to set prior to placement of the subsequent lift.

i. Form a grout key by terminating the grout a minimum of 1-1/2" (38.1 mm) below a mortar joint.
ii. Do not form keys within beams.
iii. At beams or lintels laid with closed bottom units, terminate the grout pour at the bottom of the beam or lintel without forming a grout key.

D. Post Installed Anchors:

1. Conform to all manufacturer requirements for preparation and installation.

E. Cold-Weather Placement:

1. When ambient air temperature is below 40°F, implement approved cold-weather procedures and comply with the following provisions:

a) Do not lay masonry units having either a temperature below 20°F or containing frozen moisture, visible ice or snow on the surface.
b) Do not build on frozen substrates. Remove visible ice and snow form the top surface of existing foundations and masonry to receive new construction. Heat these surfaces above freezing using methods that do not result in damage.
c) Do not heat water or aggregates use in mortar or grout above 140°F.

d) Comply with additional cold-weather requirements contained in TMS 602.
e) Remove and replace CMU that are damaged by frost or freezing conditions.

F. Hot-Weather Placement:

1. When ambient air temperature exceeds 100°F or 90°F with a wind velocity greater than 8 mph, or when hot weather conditions exist that would impair quality and strength of concrete masonry unit, comply with the following provisions:

a) Mixing water may be chilled, or chopped ice may be used to control temperature, provided water equivalent of ice is calculated to total amount of mixing water.
b) Comply with additional hot-weather requirements contained in TMS 602.

3.07 PROTECTION

A. Normal Conditions:

1. Protection of Masonry:

a) During construction, cover top of walls, projections, and sills with waterproof sheeting at end of each day's work.
b) Cover partially completed masonry when construction is not in progress.
c) Waterproof sheeting shall extend 24" (610 mm) minimum down each side of wall and be held securely in place.

2. Stain Prevention:

a) Prevent grout and mortar and soil from staining the face of CMU to be left exposed or painted.
b) Remove grout, mortar and soil that come in contact with such masonry.

3. Do not apply uniform or concentrated loads to CMU walls, pilasters or columns for at least three days after completion.
4. Remove misplaced grout or mortar immediately.
5. Protect sills, ledges, offsets and similar items from mortar drippings or other damage during construction.
6. Protect surrounding work as required against damage from masonry work.

B. Cold-Weather Protection:

1. When concrete masonry unit is placed under conditions of cold weather placement, take additional precautions as specified in TMS 602 when curing, monitoring and protecting the masonry.

C. Hot-Weather Protection:

1. When concrete masonry unit is placed under conditions of hot weather placement, take additional precautions as specified in in TMS 602 and as specified when curing, monitoring and protecting the masonry.

a) Hot weather protection is required if hot weather conditions occur within a 24-hour period after completion of concrete masonry unit placement.

3.08 POINTING AND CLEANING

A. Point holes or defective mortar joints upon completion of work. Where necessary, cut out and re-point defective joints.

B. In-Progress Cleaning:

1. Hand clean masonry unit by brushing to remove mortar splotches from walls after initial set. Do not use steel wire brushes.
2. Excess mortar should be periodically removed from scaffolding.
3. Grout spills should be removed immediately by washing and brushing.
4. The base of wall should be protected from splashing mud and mortar and grout droppings by spreading plastic sheets 3’-0” (0.91 m) to 4’-0” (1.22 m)on the ground adjacent to the wall and 2’-0” (0.61 m) to 3’-0” (0.91 m) up the face of the wall.

C. Final Cleaning:

1. Ensure mortar joints have cured prior to beginning cleaning.
2. Adjacent work or landscaping should be adequately protected so as to not be damaged by cleaning methods.
3. Test cleaning methods on an inconspicuous sample wall panel. Leave one-half of panel uncleaned for comparison purposes. Observe panel from a distance of 20’-0” (6.1 m) under diffused lighting to evaluate the results.
4. All masonry surfaces shall be cleaned by the same methods to produce a uniform appearance. Avoid overlap of areas being cleaned.
5. Brushing should be done with a dry, stiff-bristled brush. Do not use steel wire brushes.
6. Approved cleaning methods:

a) Hand cleaning by brushing
b) Water cleaning

i. Remove mortar, grout and dirt by brushing.

ii. Soak wall with water and scrub with a mild detergent that will not alter the appearance of the masonry units.
iii. Rinse wall with water.
iv. Do not use more water than required.

D. Waste Disposal:

1. Upon completion of work, remove from site surplus materials, rubbish and debris resulting from concrete masonry unit work.

3.09 EVALUATION AND ACCEPTANCE OF CMU

A. If, at any time during construction, the mortar or grout resulting from the approved mix design deviates from Specification requirements for any reason, such as lack of workability, or insufficient strength, the Contractor shall have his laboratory verify the deficiency and modify the mix design, until the specified mortar or grout is obtained. Modified mix to be submitted for approval per Part 1 - SUBMITTALS.

3.10 CORRECTIVE MEASURES

A. Where the Contractor requests that the Design Professionals develop the corrective actions or review corrective actions developed by others, the Design Professional shall be compensated as outlined in Part 3 – CORRECTIVE MEASURES section of Specification 033000.

END OF SECTION

SECTION 05 12 00
STRUCTURAL STEEL

PART 1.00 - GENERAL

1.01 GENERAL

Work of this Section shall conform to requirements of Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification sections.

1.02 SCOPE

The work covered by this Section shall include all labor, material, equipment, permits, engineering and other services necessary for the fabrication and installation of structural steel and related work, complete, in accordance with the Drawings and as specified herein.

1.03 RELATED WORK SPECIFIED IN OTHER SECTIONS

Submittals	Division 1
Quality Control	Division 1
Quality Assurance: Structural Testing and Inspection	Section 01 45 00
Concrete Reinforcement and Embedded Assemblies	Section 03 20 00
Cast-In-Place Concrete	Section 03 30 00
Fireproofing	Division 7

1.04 CODES AND STANDARDS

A. Building Code: Structural steel work shall conform to the requirements of the Building Code identified on the Structural General Notes, and OSHA requirements, except where more stringent conditions or criteria occur in the standards referenced below and on the Drawings.

B. Standards:

1. American Institute of Steel Construction (ANSI/AISC 360) "Specification for Structural Steel Buildings" per Structural General Notes.
2. ANSI/AISC 341 and 341s1- Seismic Provisions for Structural Steel Buildings, Including Supplement No. 1; American Institute of Steel Construction, Inc.

3. American Institute of Steel Construction (AISC 303), "Code of Standard Practice" (COSP). Due to potential conflicts between the governing contracts and parts of Section 1 through 5 of the COSP, Sections 1 through

5 are excluded from these Contract Documents. Prior to bid, the Owner and Contractor, in consultation with the Design Professionals, can discuss and determine if any excluded provisions are appropriate to include in the Contract Documents.

4. American Welding Society, AWS D1.1, "Structural Welding Code".
5. Research Council on Structural Connections (RCSC) - "Specification for Structural Joints Using High Strength Bolts".
6. American Society for Testing and Materials "ASTM Standards in Building Codes", various standards as referenced herein.
7. The Society for Protective Coatings (formerly Steel Structures Painting Council, "SSPC") "Steel Structures Painting Manual".

C. Definitions:

1. The term "Contract Documents" in this Specification is defined as the design Drawings and the Specifications.
2. The term "SER" in this Specification is defined as the Structural Engineer of Record for the structure in its final condition.
3. The term "Design Professionals" in this Specification is defined as the Owner's Architect and SER.
4. The term "Contractor" in this Specification is defined to include any of the following: General Contractor and their sub-contractors, Construction Manager, Structural Steel Fabricator or Structural Steel Erector.
5. The term "Heavy Sections" in this Specification is defined to include hot rolled steel shapes with flanges exceeding 2 inches (50mm) in thickness and built up cross sections with plates exceeding 2 inches (50mm) in total thickness.
6. The term "High Restraint Weld" describes welds in which there is almost no freedom of movement for members joined due to geometry or material thickness.
7. The term "Testing Agency" in this Specification is defined as an independent testing and inspection service engaged by the Owner for quality assurance testing and inspection of structural construction in accordance with applicable building code provisions and any additional activities listed in the Contract Documents.
8. The terms "for record" and "submit for record" in this Specification are defined as Contractor submittals that do not require a response from the Design Professionals.
9. The term "Working Days" in this Specification is defined as Monday through Friday, except for federal or state holidays.
10. The term "Delegated Design" in this Specification is defined as a scope of work that meets performance and design criteria established in the Contract Documents and is to be completed by the Contractor's licensed engineer.

1.05 CONTRACTOR QUALIFICATIONS

A. Qualification Data: Submit for record qualification data (personnel and firm resumes, and project lists with references) for the Structural Steel Fabricator ("Fabricator"), Structural Steel Detailer ("Detailer"), Contractor's Engineer(s) and Structural Steel Erector ("Erector").

B. The Fabricator shall have 10 years of comparable experience in installations of this type and shall employ labor and supervisory personnel familiar with the type of installation, experienced in fabrication and erection of structural steel for projects of similar size and complexity. At the time of bid the Fabricator shall be AISC certified to the Standard for Steel Building Structures (BU) and must submit proof of these qualifications. The Fabricator's qualifications shall be subject to review by the Design Professionals and Owner.

C. The Detailer shall have 10 years experience preparing detailed steel shop drawings and CNC downloads for structures of this type and complexity. The detailer's qualifications shall be subject to review by the Design Professionals and Owner.

D. The Contractor's Engineer(s) shall be qualified to perform the type of work required by the project. The Engineer shall be a Professional Engineer licensed in the state where the project is located. The Contractor's Engineer(s) shall have 10 years of experience being in responsible charge of work of this nature. The proposed Engineer(s) shall be subject to approval of Design Professionals and Owner.

E. The Erector shall have 10 years of successful experience erecting structural steel for structures of this type and complexity in the region of the project. At the time of bid the Erector shall be an AISC Certified Steel Erector (CSE) and must submit documentation of this qualification.

F. Welding: Qualify the welding procedures, shop welders, field welders, welding operators and tackers in accordance with AWS D1.1 and for the following periods of effectiveness of certification:

1. Certification and qualification, including period of effectiveness of welding personnel shall be as specified by AWS D1.1. Certification shall remain in effect for duration of work provided welders are continuously engaged in performing the type of welding for which they are certified, unless welders fail to perform acceptable welding, as determined by the Testing Agency. Certification and re-certification of welding personnel is subject to verification by the Testing Agency. Re-testing for re-certification will be the Contractor's responsibility.

1.06 SUBMITTALS

A. Required Submittals - Where the SUBMITTALS section of this Specification is in conflict with Division 1 Submittals, the more stringent requirements for the Contractor apply. Required submittal items are listed here; see below for detailed requirements. Do not submit items not requested. Reproduction of structural drawings for shop drawings is not permitted.

(1) Submittal Schedule
(2) Calculations, Shop Drawings and Erection Drawings
(3) Submittal Letters
(4) Pre-construction Survey
(5) Quality Control Program
(6) Product Data
(7) Samples
(8) Welding Procedures Specification (WPS)
(9) Welder Certifications
(10) Mill Reports
(11) As-built surveys

1. **Submittal Schedule**: The contractor shall submit for action a typical connection design calculation and shop drawing submission schedule at least twenty (20) working days prior to commencing submission of shop drawings.

a) This schedule shall include a list, in order of date to be submitted, of all drawings and other required submittal items scheduled to be submitted. The schedule shall list the proposed submittals for each week, including but not limited to the number of calculation sheets, erection drawings, and piece drawings, as well as their formats. Once shop drawing submissions have commenced any modification or addition to this schedule must be submitted for action at least twenty (20) working days before the modification or addition is proposed to take place.

b) If at any time the total number of connection design calculations, erection drawings and shop drawings received in any one week period exceeds the amount in the approved schedule by more than 10% for that week, the Design Professionals have the right to add two days to the average turnaround time for each 20% increment in excess of the scheduled quantity for that week's submissions. For example, if the weekly total exceeds the schedule by 10% to 20%, two days may be added; if it is exceeded by 21% to 40%, four days may be added. The return dates for subsequent submittals may be extended based on the additional review time stated above.

c) For the purposes of developing a schedule, assume the following review rates:
Calculations – 100 – 8 ½' x 11" sheets per week
Shop drawings – 300 pieces per week

2. **Shop Drawings and Erection Drawings** (including Field Work drawings): Submit for action required shop drawings and erection drawings for all structural steel indicated on the Contract Documents.

a) Material shall not be fabricated or delivered before the shop and erection drawings have been approved or approved as noted by the Design Professionals and returned to the Contractor.

b) Structural Steel Shop Drawings: Submitted shop drawings shall include layouts and details for each member showing the steel type and grade, size, connections, cuts, copes, holes, bolts, welds, surface treatments (cleaning, shop paint, etc.) and provisions for the connection of other work. Steel type, grade and size for all attached elements shall also be shown.

c) Shop and erection drawings shall contain complete dimensional and geometric information, based on established dimensions shown on Contract Documents, and shall not be scaled from Contract Documents. The shop drawings shall clearly distinguish between shop and field welds and bolts, identify pretensioned high strength bolts and identify surface preparation requirements at slip critical connections.

d) Welds: All welds shall be indicated by standard welding symbols in the "Standard Code for Arc and Gas Welding in Building Construction" or as accepted by the SER. Shop and erection drawings shall show the size, length, and type of each weld, including the electrode type to be used.

e) Bolts: Details for bolt assemblies shall indicate bolt size, length, type and the presence, type and location of washers where required as part of the assembly; distinguish between N and X bolts, distinguish between slip-critical and bearing bolts; specify approved slip critical coatings; and distinguish between shop and field bolts. Also, indicate bolt orientation where required by the Contract Documents.

f) Erection Drawings: The erection drawings shall include plans showing exact locations of base and bearing plates, and/or anchor rods and other embedded items. All field connections not specifically shown on shop drawings shall be shown on erection drawings, including field bolt size, type, number, location and any special installation requirements, and field weld size, type, length and location.

3. **Preconstruction Survey**: Submit for record. Where interface with existing construction occurs, before related shop drawings are prepared survey the existing construction and submit the survey prepared by a professional surveyor employed by the Contractor to the Design Professionals. For all steel construction, before steel erection commences, perform and submit to the Design Professionals a complete survey for position and alignment at all points where construction by other trades will support steel elements, including but not limited to pockets, embedded plates, anchor rods and base plates. Include plan location positions relative to the building gridlines and elevations of bearing surfaces and tops of bolts relative to building Datum elevation. Immediately notify the SER of elements that are not within tolerance.
4. **Quality Control Program**: Submit for record complete details of the Contractor's quality control program including the names of the personnel responsible for this work.
5. **Product Data**: Submit for action manufacturers' specifications, test reports and applicable standards for all products listed under Part 2: Products. Standard literature shall be edited to suit job conditions.
6. **Samples**: Submit for record (2) samples each, (2) of shop painted products and (2) of field touch-up painted products. Samples shall be steel material.
7. **Welding Procedures:** Submit for record all Welding Procedure Specifications (WPS) and Procedure Qualification Records (PQR):

    a) All Welding Procedures shall be Signed and Sealed by the Contractor’s Engineer or Certified Welding Engineer, confirming all essential variables meet design requirements as applicable on the Contract Documents and weld electrode manufacturer’s recommendations.
    b) The Contractor’s Engineer or Certified Welding Engineer shall develop all Special Welding Procedures for Heavy Sections and High Restraint Welds. Special Procedures shall be Signed and Sealed by the Contractor’s Engineer or Certified Welding Engineer. Use of AWS D1.1, Annex E forms are recommended for Special Procedure submittals.

8. **Welder Certification**: Submit for record certification that the welders have passed qualification tests acceptable to the governing authority using AWS procedures.

    a) A certification shall be submitted in standard AWS format.
    b) Each certification shall state that the welder has been doing satisfactory welding of the required type within the six-month period prior to the subject work.

For any welder whose period of certification effectiveness has lapsed or whose workmanship is subject to question in the opinion of the Design Professionals or Testing Agency, immediate testing for recertification will be required. Tests, when required, shall be conducted at the sole expense of the Contractor.

9. **Mill Reports**: Submit for record certified copies of all mill reports to the Design Professionals and to the Testing Agency, covering the chemical and physical properties of all structural steel and accessories (as defined in this Specification) for the project.

    a) Such certificates shall be obtained from the mills producing the steel and shall certify in a cover letter submitted with the certificates, that the steel meets the minimum requirements as to physical properties, inspection, marking and tests for structural steel as defined by the current edition of the relevant ASTM Standard Specifications. Any steel that does not meet the ASTM requirements must be clearly identified in a cover letter submitted with the certificates.
    b) Prior to commencing steel erection, the contractor shall deliver certificates to the Owner in number and form as may be required by the local Building Department or other local and State agencies having jurisdiction.

B. Submittal Process

1. Submittal of shop and erection drawings and other submittals by the Contractor shall constitute Contractor's representation that the Contractor has verified all quantities, dimensions, specified performance criteria, installation requirements, materials, catalog numbers and similar data with respect thereto and reviewed or coordinated each drawing with other Drawings and other trades. The Contractor shall place their shop drawing stamp on all submittals confirming the above.
2. Shop and erection drawings: Submit in complete packages so that individual parts and the assembled unit may be reviewed together. This Specification Section and the applicable drawings used in the development of the shop and erection drawings shall be referenced on each shop and erection drawing to facilitate checking. Unless the piece marks are self-indexing, furnish index sheets with the shop drawings, relating piece marks for all beam, girder and column details to the sheet numbers on which they are located.
3. The Contractor shall submit to the Design Professionals one (1) electronic copy for shop drawing review. The naming convention of each drawing must follow the submittal numbering system and include the submittal #, specification #, revision # and drawing # in the prefix of the drawing name.

4. The Contractor shall allow at least ten (10) working days between receipt and release by the SER for the review of shop and erection drawings and submittals other than connection design calculations. The Contractor shall allow at least fifteen (15) working days between receipt and release by the SER for the review of connection design calculations.
5. All modifications or revisions to submittals, shop drawings, connection design calculations and erection drawings must be clouded, with an appropriate revision number clearly indicated. The following shall automatically be considered cause for rejection of the modification or revision whether or not the drawing has been approved by the Design Professionals:

    a) Failure to specifically cloud modifications
    b) Failure to submit calculations for the modifications
    c) Unapproved revisions to previous submittals
    d) Unapproved departure from Contract Documents

6. The Contractor shall deliver to the Design Professionals at the completion of the job two (2) electronic versions of the final as-built shop drawings on a CD-ROM or other media acceptable to the Design Professionals.
7. Resubmittals: Completely address previous comments prior to resubmitting a drawing. Resubmit only those drawings that require resubmittal.
8. Resubmittals Compensation: The Contractor shall compensate the Design Professionals for submittals that must be reviewed more than twice due to contractors' errors. The Contractor shall compensate the Design Professionals at the standard billing rates plus out-of-pocket expenses incurred at cost + 10%.

C. SER Submittal Review

1. The review of connection design and the review and approval of shop and erection drawings and other submittals by the Design Professionals shall be for general conformance with the design intent of the work and with the information given in the Contract Documents only and will not in any way relieve the Contractor or the Contractor's Engineer from:

    a) Responsibility for all required detailing.
    b) Responsibility for the proper fitting of construction work in strict conformance with the contract requirements.
    c) The necessity of furnishing material and workmanship required by contract Drawings and Specifications which may not be indicated on the shop and erection drawings.
    d) Conforming to the Contract Documents.
    e) Coordination with other trades.

f) Control or charge of construction means, methods, techniques, sequences or procedures, for safety precautions and programs in connection with the work.

2. TYPE 1 – Structural Submittal Review Stamp: For shop drawings for building elements designed by the SER, the responses on the shop drawing review stamp used by the SER require one of the following actions:

a) APPROVED indicates that the SER has found that the information presented on the shop or erection drawing appears to conform to the requirements of the Contract Documents. Fabrication, manufacture or construction of the elements of work shown in the shop drawing may proceed, provided that work is in compliance with the Contract Documents.

b) APPROVED AS NOTED indicates that the SER requires the shop or erection drawing to be corrected to reflect the notes and comments shown. Fabrication, manufacture or construction of the elements of work shown in the shop drawing may proceed, provided that work is in compliance with the notations shown on the shop drawings and the Contract Documents. Promptly resubmit the corrected shop or erection drawing for record.

c) REVISE and RESUBMIT indicates that the SER requires resubmission of the shop or erection drawing after correction per notes and comments. None of the elements of work shown on the shop drawing shall be fabricated, manufactured or constructed until the Contractor has received a returned shop drawing marked Approved or Approved as Noted.

d) NOT APPROVED indicates that the shop or erection drawing does not conform to the Contract Documents and must be extensively revised before re-submittal. None of the elements of work shown on the shop drawing shall be fabricated, manufactured or constructed until the Contractor has received a returned shop drawing marked Approved or Approved as Noted.

3. TYPE 2 – Delegated Design Review Stamp: For submittals for building elements which are not designed by the SER but are delegated design items, or for items that do not form part of the completed structural system but impose loads on the structure, or for construction items or activities which have an effect on the final structure. The responses on the stamp used by the SER require one of the following actions:

a) NO EXCEPTIONS indicates that the SER has found that the information presented on the submittal appears to conform to the requirements of the Contract Documents. Fabrication, manufacture or construction of the elements of work shown in the shop drawing

may proceed, provided that work is in compliance with the Contract Documents.

b) EXCEPTIONS NOTED indicates that the SER requires the submittal be corrected to reflect the notes and comments shown. Fabrication, manufacture or construction of the elements of work shown in the shop drawing may proceed, provided that work is in compliance with the notations shown on the shop drawings and the Contract Documents. Promptly resubmit the corrected document for record.

c) REJECTED indicates that the SER requires resubmission of the submittal after correction per notes and comments. None of the elements of work shown on the shop drawing shall be fabricated, manufactured or constructed. Contractor to revise and resubmit until SER response of No Exceptions or Exceptions Noted is received.

D. Substitution Request

1. Requests for any departure from Contract Documents must be submitted in writing by the Contractor and accepted in writing by the Design Professionals, prior to receipt of submittals.
2. All substitutions must be requested using the structural substitution request form included at the end of this section. Acceptance using the structural substitution request form indicates acceptability of the structural concept only. Contractor must submit shop drawings reflecting accepted substitutions for review in accordance with this Specification. The structural substitution request form, even if accepted, does not constitute a change order.
3. Such substitutions or modifications, if acceptable to the Design Professionals shall be coordinated and incorporated in the work at the sole expense of the Contractor.
4. The acceptance by the Design Professionals of a specific and isolated request by the contractor to deviate from these requirements does not constitute a waiving of that requirement for other elements of, or locations in the project, unless specifically addressed as such and permitted by the Design Professionals in writing.
5. Compensation for Additional Services: Should additional work by Design Professionals such as design, documentation, meetings and/or site visits be required which are necessitated for the review and/or incorporation of the Contractor-requested substitution, including indirect effects on other portions of the work, the Contractor is responsible for paying for additional work performed by the Design Professionals at the standard billing rates plus out-of-pocket expenses incurred at cost + 10%. Additional costs for testing and inspection by the Owner shall also be compensated by the Contractor.

6. Contractor is responsible for means and methods and any impacts on other portions of the work that may arise from this substitution.

E. Request for Information (RFI)

1. RFI shall originate with the Contractor. RFI submitted by entities other than that Contractor will be returned with no response.
2. Limit RFI to one subject.
3. Submit RFI immediately upon discovery of the need for interpretation or clarification of the Contract Documents. Submit RFI within timeframe so as not to delay the Construction Schedule while allowing the full response time described below.
4. The response time for answering an RFI depends on the category in which it is assigned.

a) Upon receipt by the SER, each RFI will be assigned to one of the following categories:

i. No cost clarification
ii. Shown in Contract Documents
iii. Change to be issued in future bulletin
iv. Previously answered
v. Information needs to be provided by others.
vi. Request for corrective field work
vii. Request for substitution

b) RFIs in the first five categories listed above will be turned around by the SER on average of five (5) working days.
c) RFIs in the last two categories listed above will be immediately rejected and must be submitted as submittals or requests for substitution.

1.07 TEMPORARY SUPPORT OF STRUCTURAL STEEL FRAME

The structure as shown on the Contract Documents is designed to withstand the design loads only when all structural elements are installed and fully connected. The contractor shall be responsible for the analysis of all components and assemblies for stresses and displacements that may be imposed by fabrication, shipping, handling, erection, temporary conditions, construction loads, etc. The analysis of such shall be performed by the Contractor's Engineer.

1.08 DELIVERY, STORAGE, AND HANDLING

A. Delivery: Unload all structural steel promptly upon arrival and store in an area designated and approved by the Owner at the site of the work. The Contractor shall be responsible for any charges from failure to unload material promptly.

B. Storage: Store structural steel to drain properly. Provide weep holes and clean out as required to keep steel free from water. Provide adequate protection and shoring to prevent distortion and other damage. Store structural steel on timber; do not lay on mud, directly on ground or cinders, or otherwise handle in a manner that damages finishes. Stored sections shall be readily accessible for inspection.

C. Store fasteners in a protected place.

D. Welding materials to be in moisture resistant, undamaged package. Maintain packages effectively sealed until electrode is required for use. Storage and handling shall be per AWS D1.1.

1.09 CONNECTION DESIGN AND DETAILING CONFERENCE

A. At least 20 working days prior to starting connection design and detailing, the Fabricator shall hold a meeting to verify all connection design assumptions and procedures and shop drawing preparation and submittal procedures.

B. The Contractor shall prepare an agenda and require responsible representatives of every party who is concerned with the connection design and detailing to attend this meeting, including but not limited to:

1. General Contractor
2. Fabricator
3. Detailer
4. Design Professionals
5. Erector

C. The Fabricator shall prepare an agenda prior to the meeting, and shall distribute meeting minutes to all parties within 5 working days of the meeting.

1.10 QUALITY ASSURANCE BY OWNER'S TESTING AGENCY

A. See Section 01 45 00.

1.11 QUALITY CONTROL BY CONTRACTOR

A. The Contractor shall provide a program of quality control to ensure that the minimum standards specified herein are attained.

B. The Owner's general review during construction and activities of the Testing Agency are undertaken to inform the Owner of performance by the Contractor but shall in no way replace or augment the Contractor's quality control program or relieve the Contractor of total responsibility for quality control.

C. The Contractor shall immediately notify the Design Professionals of any deficiencies in the work which are departures from the Contract Documents

which may occur during construction. The Contractor shall propose corrective actions and their recommendations in writing and submit them for review by the Design Professionals. After proposed corrective action is accepted by the Design Professionals and Owner, the Contractor shall correct the deficiency at no cost to the Owner. Where the Contractor requests that the Design Professionals develop the corrective actions or review corrective actions developed by others, the Design Professional shall be compensated as outlined in the OBSERVATIONS AND CORRECTIONS BY DESIGN PROFESSIONALS section of this Specification.

1.12 OBSERVATIONS AND CORRECTIONS BY DESIGN PROFESSIONALS

A. Observations: The Design Professionals will observe the construction for general compliance with the provisions of the Contract Documents during various phases of construction.

B. Corrections by Design Professionals: See Part 3 - CORRECTIVE MEASURES section of this Specification.

1.13 PERMITS AND WARRANTY

A. Permits: The Contractor shall apply for, procure, renew, maintain, and pay for all permits required by City, State, or other governing authorities, necessary to execute work under this Contract. Contractor shall furnish copies of all permits to the Owner and Design Professionals.

B. Warranty: Comply with General Conditions, agreeing to repair or replace specified materials or work that has failed within the warranty period.

PART 2 - PRODUCTS

2.01 STRUCTURAL STEEL

A. Structural steel shall conform to the requirements listed on the Structural General Notes.

2.02 SHOP COATINGS

A. Standard Primer: Rust inhibitive, universal phenolic alkyd metal primer 2-4mls. Color to be determined by Architect. Primer shall be compatible with, and from the same manufacturer as, top coats specified in Division 9 specification.

B. Zinc Rich Primer: SSPC-Paint 20, Type I or Type II, Zinc rich primer utilizing either an organic or inorganic binder with a minimum zinc content of 80 percent by weight in the dry film. The primer shall provide a surface meeting AISC Slip Critical Class B (slip coefficient =0.50 min) requirements. Color to be

determined by Architect. Primer shall be compatible with, and from the same manufacturer as, top coats specified in Division 9 specification.

C. Hot Dip Galvanizing: ASTM A123, weight of coating shall average not less than **[2.3]** oz per square foot (**[0.70]** kg/ m^2), with no individual thickness less than **[2.0]** oz per square foot (**[0.61]** kg/m^2).

D. Galvanizing Repair Paint: ZRC Cold Galvanizing Compound, or other coating complying with SSPC-Paint 20.

2.03 ACCESSORIES

A. High Strength Bolts: Conform to the provisions of the Research Council on Structural Connections (RCSC) "Specification for Structural Joints Using High-Strength Bolts" except that nuts shall be ASTM A563 Grades DH or DH3 (hardened) for both A325 and A490 bolts. Twist off type bolts (Tension Control bolts) shall additionally conform to ASTM F1852 or ASTM F2280.

B. All bolts shall be new, and not re-used.

C. Where A325 galvanized bolts nuts and washers are required, they shall be in accordance with ASTM F2329 and ASTM A153, Class C. Where A588 steel is used, bolts, nuts and washers shall be Type 3.

D. Direct Tension Indicators: Meet requirements of ASTM F959.

E. Anchor Rods: Per structural General Notes.

F. Washers:

1. Round washers shall conform to American Standard B 27.2 type b
2. Washers in contact with high-strength bolt heads and nuts shall be hardened in accordance with ASTM Standard F436.
3. Beveled washers shall be square, smooth and sloped so that contact surfaces of the bolt head and nut are parallel.
4. The diameter of the hole of square beveled washers shall be 1/16 inch (1.5mm) greater than the bolt size for bolts smaller than one inch (25mm), and shall be 1/8 inch (3.0mm) greater than the bolt size for bolts larger than one inch (25mm).
5. Comply with requirements of RCSC for all washers including thickness, size and hardness, depending on connection details.

G. Welding Electrodes: Electrodes shall be low hydrogen type and shall have material strength matching characteristics (E70, E80, or E90) as selected from AWS D1.1, Table 3.2.

1. Shielded Metal-Arc Welding (SMAW): Welding electrodes for manual SMAW shall have a maximum H4 series level of diffusible hydrogen and conform to the Specification for Carbon Steel Electrodes; AWS A5.1, or the Specification for Low-Alloy Steel Electrodes; AWS A5.5.
2. Gas Metal-Arc Welding (GMAW): Welding electrodes for semiautomatic GMAW shall have a maximum H4 series level of diffusible hydrogen and conform to the Specification for Carbon Steel Electrodes and Rods; AWS A5.18, or the Specification for Low-Alloy Steel Electrodes and Rods; AWS A5.28
3. Flux Core-Arc Welding-Gas Shielding (FCAW-G): Welding electrodes for semiautomatic FCAW-G shall have a maximum H8 series level of diffusible hydrogen and conform to the Specification for Low-Alloy Steel Electrodes; AWS A5.29
4. Flux Core-Arc Welding-Self Shielding (FCAW-S): Welding electrodes for semiautomatic FCAW-S shall have a maximum H16 series level of diffusible hydrogen and conform to the Specification for Carbon Steel Electrodes; AWS A5.20
5. Submerged-Arc Welding (SAW): Bare electrodes and granular flux used in submerged-arc welding shall conform to F70 or F80 AWS flux classifications of the specification for Gare Mild Steel Electrodes and Fluxes for submerged-arc Welding, AWS A5.17.
6. Intermixing of welding processes shall not be permitted unless clearly indicated in Contractor's WPS submission. Contractor shall coordinate and submit for record all shop/field welding procedures, which overlap different welding process fusion zones
7. Alternate non-prequalified welding processes shall be considered based on Contractor qualifying test result submissions of Welding Procedure Specifications (WPS) and Procedure Qualification Records (PQR)

H. Headed Studs (shear connectors) shall be per Structural General Notes.

I. Deformed Bar Anchors shall be as specified in Structural General Notes.

J. Steel Castings shall conform to ASTM A27, Grade 65-35, medium strength carbon steel.

K. Grout: Refer to General Notes.

L. Post-installed Anchors shall be per Structural General Notes.

PART 3 - EXECUTION

3.01 PREPARATION

A. Work by Others: Examine all work prepared by others to receive work of this Section and report any defects affecting installation to Design Professionals. Commencement of work will be construed as complete acceptance of preparatory work by others. The Contractor alone shall be responsible for checking the dimensions and coordination of the structural steel work with other trades.

B. Anchor Rods: At least 20 working days prior to the start of the structural steel erection, the Contractor shall ascertain by accurate survey the existing location, alignment, and elevation of the anchor rods embedded in the concrete by others. The Contractor shall immediately notify the Design Professionals of any discrepancies observed between the Contract Documents and the as-built conditions. Steel erection shall not start until corrective measures, if required, have been performed.

3.02 FABRICATION

A. Fabricate and assemble structural steel in the shop to the greatest extent possible.

B. Tolerances:

1. Conform to the tolerances of the AISC "Code of Standard Practice," compensate for the difference between the temperature at time of fabrication and the mean temperature in service.
2. Elevator shafts used for temporary hoists shall conform to the detailed requirements of the hoist manufacturer.

C. Holes: Holes shall be provided in members to permit connections to the work of other trades or contracts, and for passage through the member of work of other trades. All holes shall be accurately drilled, cut, or punched at right angles to the surface of the metal in accordance with AISC Specifications. Thermally cut or water jet cut holes made with CNC equipment and that meet the requirements per both AISC and RCSC specifications are permitted. Thermally cut or water jet cut holes shall meet the surface roughness requirements of ASME B46.1. Burning or drifting unfair holes will not be permitted. Holes that must be enlarged shall be reamed. Drift pins will be allowed only to bring together the several parts for connection. Holes in base plates are permitted to be drilled or thermally cut. Thermally cut holes in base plates shall meet the requirements of the AISC specification section M2.2. Holes shall be clean-cut without torn or ragged edges. Outside burrs resulting from drilling operations shall be removed with a suitable tool.

D. Camber: Provide camber as indicated on the Contract Documents. Where no camber is indicated, provide natural camber up.

E. Cutting: Manual gas-cutting in the shop may be used only if automatic or semi-automatic methods are not possible. If manual shop cutting is required, it shall be done only with a mechanically guided torch, except that an unguided torch may be used where the cut is more than 1/2 inch (12mm) from the finished dimension and final removal is completed by means such as chipping or grinding to produce a gouge-free surface of quality equal to that of the base metal. At restrained joints and as indicated elsewhere, weld access holes shall be ground smooth.

F. Cutting of Heavy Sections: Where Heavy Sections are to be joined by partial or complete joint penetration welds in tension, preheating shall be required for all thermal cutting operations. Preheat shall be sufficient to prevent cracking but in no case less than 150 degrees F (65°C). Weld access holes and copes shall be ground to a smooth radius after cutting and tested for cracks by the magnetic particle method. All cut edges shall be free of sharp notches and gouges.

G. Anchor Rods: Rigid steel templates and anchor rods shall be furnished, labeled and shipped in sets indicating sizes and locations of columns, together with instructions for setting of anchor rods. Plate washers per Typical Details shall be provided.

H. Bolting: Bolts shall be driven accurately into the holes without damaging the threads. Bolt heads shall be protected from damage during driving. Bolt heads and nuts shall rest squarely against the metal. Where bolts are to be used on beveled surfaces having slopes greater than 1 in 20 with a plane normal to the bolt axis, beveled washers shall be provided to give full bearing under the head or nut.

I. Bolts indicated as “finger tight” on the Contract Documents shall be prevented from backing off by using lock nuts, thread compound or deformed threads.

J. Installation of High Strength Bolts:

1. Except where "snug tight" installation is specifically permitted on design Drawings, all high strength bolts shall be installed with full pretension using Turn-of-Nut Pretensioning, Twist-Off Type Tension Control Bolt Pretensioning or Direct-Tension-Indicator (DTI) Pretensioning in accordance with the "Specification for Structural Joints Using ASTM A325 or A490 Bolts".
2. Comply with special washer requirements of the RCSC, such as those related to slotted and oversize holes, and tapered flanges. DTI "washers" shall not be substituted for such required washers.
3. All high strength bolt assemblies (including Tension Control bolts and DTI’s) used in pretensioned connections shall be verified in accordance with the Pre-Installation Verification section of the RCSC.

4. Clean and re-lubricate bolts and nuts that become dry or rusty before use, except Tension Control bolts must be re-lubricated by manufacturer.

K. Welding of Structural Steel:

1. Pre-Weld Inspection: The surface to be welded and the filler material to be used shall be subject to inspection before welding is performed.
2. Welds indicated on the Contract Documents or the approved shop or erection drawings shall be created by electric arc welding processes that comply in all respects with the codes and specifications herein noted covering the design, fabrication, and inspection of welded structures and the qualifications of welders and supervisors. Control the heat input, weld length, weld sequence and cooling process to prevent distortion of the completed assembly.
3. Each welder's work shall be traceable.
4. Special Requirements: For High Restraint welds and welds at Heavy Sections, follow approved welding procedures for weld process, sequence, pre-heating and cooling. Use stress relieving techniques where shown in the approved procedure developed by the Contractor's Welding Consultant.

    a) Special Procedures: Prior to the start of production welding, the contractor shall demonstrate to the Testing Agency that preheat can be maintained without relying on heat from the arc. For field welding, the contractor shall provide a shelter to protect each joint from inclement weather (rain, snow, etc.), from start until completion of the joint.
    b) Preheat and Postheat: Preheat shall be sufficient to prevent cracking, but in no case less than required by AWS D1.1. The Contractor shall prepare a written welding sequence and distortion control plan to be included in the welding procedures submittal. Assembly sequence of adjoining parts shall balance applied induced heat from preheat and welding processes to minimize distortion and shrinkage. Complex Assemblies shall include special considerations to minimize significant shrinkage stress restraint in accordance with AWS D1.1, Annex H provisions. Under conditions of severe external shrinkage restraint, preheat temperature limitations for making welds shall be in accordance with AWS D1.1, Annex H, Table H2. Under conditions of severe external restraint, reduction of induced heat and cooling rate shall be monitored under the provisions of the Hydrogen Control/HAZ Hardness Control methods of AWS D1.1, Annex H. The preheat shall be maintained throughout the thickness of the material for a distance equal to twice the material thickness on both sides of the joint at a minimum. Where different thicknesses of steel are being

joined, the greater thickness shall govern. Preheat shall be measured on the face opposite the side of the heat application. Preheat shall be applied uniformly in a manner that does not harm the surface of the material nor cause surface temperatures to exceed 1100 degrees F (600°C). Should stress relief heat treatment be required, the contractor shall submit a written procedure.

c) Prior to heat treatment on a production weld, prepare and treat a test sample per the Contractor's written procedure for tensile tests in accordance with ASTM requirements.

5. Welded Joint Details:

a) Welding Backing: The use of weld backing shall be in accordance with AWS D1.1. Weld backing shall be removed where required by the Contract Documents or for the WPS by AWS D1.1.

b) Weld Tabs:

i. Use of Weld Tabs: Welds shall be terminated at the end of a joint in a manner that will ensure sound welds in accordance with AWS D1.1. Whenever necessary, this shall be done by use of weld tabs.

ii. Heavy Section Joint Weld Tab Removal and Finish: All welded tension splices in Heavy Sections shall have the weld tabs removed and ground smooth.

c) Weld Access Holes:

i. Weld access holes shall meet the dimensional, surface finish, and testing requirements of AISC 360 Chapter J1.6 and AWS D1.1, except as otherwise required by the Contract Documents.

d) Welding for moment connections shall be sequenced so as to minimize residual stress in the joint.

6. Deficient Welds: Welds found deficient in dimensions but not in quality may be enlarged by additional welding. Any weld found deficient in quality shall be removed by grinding or melting and the weld shall be remade.

L. Bearing:

1. Bearing ends of columns shall be milled or sawn square perpendicular to axis of the column, or at slope indicated in the Contract Documents.
2. Finish bearing areas of base plates per AISC M2.8.

M. Stiffeners: Fitted stiffeners shall be ground to fit closely against flanges.

N. Cleaning and Preparation of Steel Surfaces:

1. Clean all steel work in accordance with the Society for Protective Coatings (SSPC) Method specified herein that corresponds to its location and exposure. Steel work to be painted shall be painted within the same day that it is cleaned.

    a) Interior, Not Exposed to View (above suspended ceilings, under sprayed-on fireproofing, steel to be encased in concrete): SSPC-SP-2, Hand Tool Cleaning.
    b) Interior, Exposed in the Finished Building: SSPC-SP-6, Commercial Blast Cleaning, unless noted otherwise on the Drawings.
    c) Exterior (exposed to weather or in unconditioned space): SSPC-SP-6, Commercial Blast Cleaning, unless noted otherwise on the Drawings.
    d) Members to be Hot Dipped Galvanized: SSPC-SP3, Power Tool Cleaning, before galvanizing.

O. Shop Coating:

1. Where painting is specified, paint all steel work in accordance with the Society for Protective Coatings (SSPC) Method specified herein that corresponds to its location and exposure and in accordance with manufacturer's written instructions. Paint steel work the same day that it is cleaned.

    a) Interior, Not Exposed to View (above suspended ceilings, under sprayed-on fireproofing, steel to be encased in concrete): No Paint.
    b) Interior, Exposed in the Finished Building: SSPC – Paint 25
    c) Exterior (exposed to weather or in unconditioned space): SSPC – Paint 20

2. Protect finished bearing surfaces with a rust-inhibiting coating which is to be removed immediately prior to erection.
3. Do not paint:

    a) Surfaces within six (6) inches (150mm) of field welds
    b) Surfaces to be encased in concrete or to receive cementitious fireproofing
    c) Contact surfaces of high-strength bolted Slip Critical connections (unless surface prep and paint has been specifically prequalified by the contractor or approved for use in this location by the SER)

d) Surfaces required for testing and preheat, until all testing and preheat has been performed
e) Finished bearing surfaces (use removable rust-inhibiting coating)
f) Top flange of the beam where steel deck or headed studs are to be attached

4. Paint shall be applied thoroughly and evenly to dry surfaces only when surface temperatures are above dew-point, in strict accordance with manufacturer's instructions.
5. Surfaces of exterior members which are inaccessible after assembly or erection shall receive their second coat of the approved paint, in a different shade, in the shop.
6. Hot-dip galvanize the following steel members:

a) All angles, steel plates and shims supporting exterior masonry or exposed to the weather, including shelf, arch and relieving angles
b) All connections between the above angles and steel plates and the supporting structural member, including clip angles and hardware
c) Any other steel members indicated as "Galvanized" on the Contract Documents.
d) All miscellaneous metal, angles, clips, etc. on exterior masonry walls.

3.03 ERECTION

A. Tolerances: Erect all work plumb, square and true to lines and levels in strict accordance with the structural requirements of the building within tolerances of the AISC Code of Standard Practice, unless otherwise indicated on the Contract Documents. Compensate for the difference between the temperature at time of erection and the mean temperature in service.

B. Bracing: Brace the frame during erection in accordance with the Contractor's erection procedure.

C. Errors: Immediately notify the Design Professionals of any errors in shop fabrication, deformations resulting from handling and transportation, and improper erection that affects the assembly and fitting of parts. Prepare details for corrective work and obtain approval of the method of correction. Approved corrections shall be made expeditiously at the sole expense of the Contractor.

D. Column Base Plates: Support and align on steel shims or setting bolts. After the supported members have been plumbed and properly positioned, tighten anchor rod nuts in preparation for grouting. Cut off wedges and shims flush with edges of plates and leave in place. The use of leveling plates will not be permitted without prior written approval by the SER. Contractor proposing the use of levelling plates shall provide documentation of plumbing procedure and

remediation procedure for gaps between leveling plate and column base plate for SER review.

E. Grouting: Refer to General Notes. Grout base plates immediately after the first tier of columns are plumbed. Do not proceed with steel erection above the first tier until base plates are grouted.

F. Bolting and Welding of Structural Steel: See Section on "Fabrication".

G. Bearing Surface: Clean bearing surfaces and surfaces that will be in permanent contact before the members are assembled.

H. Splices: Splices will be permitted only where indicated on the Contract Drawings or the reviewed shop drawings. Fasten splices of compression members only after surfaces are cleaned and abutting surfaces have been brought completely into contact. Fill any remaining gaps with steel shims driven into place and cut flush. Tack weld shims to each other and to members. Use runoff tabs at bevel weld splices. Cut off runoff tabs and ground smooth after weld completion.

I. Driftpins: Driftpins may be used only to bring together the several parts, and shall not be used in such a manner as to distort or damage the metal. Correct poor matching of holes by drilling to the next larger size and using a larger size bolt. Plug welding and redrilling will not be permitted, unless a specific instance arises and is approved by the SER.

J. Erection bolts: On exposed welded construction, remove erection bolts, fill holes with plug welds and grind smooth at exposed surfaces. On non-exposed welded construction, remove erection bolts.

K. Hammering: Hammering which may damage or distort the members will not be permitted.

L. Do not use cutting torches in the field without the specific approval of the SER for each application. Where cutting torch use is permitted, all the requirements of the Section on "Fabrication" shall apply.

M. Additional Material and Labor: If the Contractor furnishes additional material and labor for the purpose of erection or if the erection method requires that material be added to certain members, the required modifications shall be at the sole expense of the Contractor.

N. Alignment: Following erection, accurately align, level, and adjust all members prior to final fastening. Conform to AISC standard tolerances unless otherwise noted in the Contract Documents.

O. Touch-Up and Field Applied Paint: After erection, clean all damaged areas in the shop coat, exposed surfaces of bolts, bolt heads, nuts and washers and all field

welds and unpainted areas adjacent to field welds according to manufacturers recommendations and paint with the same paint used for the shop coat. Match the touch up and field applied paint color to the as-built paint color. After touch up, at exterior (exposed to the weather or in unconditioned space) steel members apply a full coat of the specified paint in a different shade than the shop applied coat.

P. After erection, clean all damaged galvanized areas, welds and areas adjacent to welds and paint with the specified galvanizing repair paint.

Q. Clean all steel members of mud and debris and construction residue prior to erection.

R. Headed Studs and Deformed Bar Anchors:

1. End weld headed studs and deformed bar anchors with an automatic process in accordance with section 7 of AWS D1.1.
2. Areas to which studs are to be attached must be free of foreign material, such as rust, oil, grease, paint etc. When mill scale is sufficiently thick to cause difficulty in obtaining proper welds, remove by grinding or sand blasting.
3. Remove ceramic ferrules from studs and work after welding.
4. Replace any studs that crack or break. Only straighten studs that would foul other work or have less than 1 inch (25mm) cover in bent position.

3.04 CORRECTIVE MEASURES

A. Conflicts: The Contractor shall be solely responsible for errors of detailing, fabrication, and erection of structural steel.

B. Compensation for Additional Services: Should additional work by Design Professionals such as design, documentation, meetings and/or site visits be required which are necessitated by failure of the Contractor to perform the work in accordance with the Contract Documents either developing corrective actions or reviewing corrective actions developed by others, the Contractor is responsible for paying for additional work performed by the Design Professionals at their standard firm-wide billing rates plus out-of-pocket expenses incurred at cost + 10%. Additional costs for testing and inspection by the Owner shall also be compensated by the Contractor.

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Structural Substitution Request Form – to be completed by Contractor

Project:		
Date:		Substitution Request #
Requesting Contractor:		Pages Attached (including this form)

1. Description of Requested Substitution:

2. Related Drawings and Specification Sections:

3. Rationale or Benefit Anticipated:

4. Effect on Construction Schedule[1] (check one): ☐ NONE ☐ See Attached

5. Effect on Owner's Cost[2] attach data (check one): ☐ CREDIT TO OWNER ☐ EXTRA

6. Effect on Construction Documents[3] (design work anticipated): ☐ NONE ☐ See Attached

7. Requesting Contractor Agrees to Pay for Design Changes (check): ☐ YES ☐ NO ☐ NOT APPLICABLE

8. Effect on Other Trades[4]:

9. Effect of Substitution on Manufacturer's Warranty (check): ☐ NONE ☐ See Attachment

Signature[5]: Date:

Company:

General Contractor Signature[5]: Date:

Notes:

1. Contractor is responsible for means and methods and any problems that may arise from making the requested substitution.
2. This is **NOT A CHANGE ORDER FORM**. A separate form is required to adjust costs and/or schedules.
3. Contractor is responsible for any design impacts that may arise from this substitution, including redesign efforts.
4. Contractor is responsible for effects on other trades from this substitution;
   General Contractor must review and agree effects on other trades are fairly represented in items 4-9.
5. Signature by a person having authority to legally bind his/her company to the above terms. Otherwise this request is void
6. All items in form must be completed for substitution request to be considered.

Request Review Responses (completed by Architect and/or Engineer(s)):

ACCEPTED	ACCEPTED AS NOTED	REJECTED	INSUFFICIENT DATA TO SUPPORT REQUEST	ENGINEER / ARCH / MEP SIGNATURE	DATE

Engineer/Architect Comments:

END OF SECTION

SECTION 06 10 00

ROUGH CARPENTRY

PART 1 - GENERAL

1.1 DESCRIPTION

A. Section Includes: Provision of all lumber framing, rough hardware and blocking as indicated in the contract drawings.

B. Related Sections:

1. Section 03 10 00 - Concrete Forming and Accessories.

1.2 REFERENCES

A. Requirements of GENERAL CONDITIONS and DIVISION NO. 1 apply to all Work in this Section.

B. The following published specifications, standards, tests, or recommended methods of trade, industry, or governmental organizations apply to Work in this Section (latest editions apply).

1. California Code of Regulations. Title 24, 2013 edition, also known as California Building Code (CBC) with DSA Amendments.

2. (APA) - American Plywood Association, "Guide to Plywood Grades."

3. (PS) - United States Product Standard, PS-1 and PS-2 "Construction and Industrial Plywood."

4. (UL) - Underwriters' Laboratories, Inc., "Fire Hazard Classification, FR-S."

5. (WCLIB) - West Coast Lumber Inspection Bureau, "Standard Grading Rules No. 17."

6. (WWPA) - Western Wood Products Association, "Grading Rules for Lumber."

7. (AWPA) - American Wood Preservers Association Standards.

a. T1 – "Processing and Treatment Standard"

b. U1 – "User Specification for Treated Wood"

8. (AF&PA) - American Forest and Paper Association, "National Design Specification for Wood Construction." "Special Design Provisions for Wood & Seismic.".

9. (ASTM) - American Society of Testing and Materials.

1.3 SUBMITTALS

A. Shop Drawings of all specially fabricated rough hardware.

B. Samples only as requested by the architect.

C. LEED Submittals.

1. Provide manufacturers' product data confirming that the composite wood products in the building have low formaldehyde emissions that meet the California Air Resources Board ATCM for formaldehyde requirements for ultra-low-emitting formaldehyde (ULEF) resins or no added formaldehyde resins.
2. Provide manufacturers' product documentation that includes recycled content claims for the products contributing towards compliance. Claims must conform to the definition in ISO 14021-1999, Environmental Labels and Declarations, Self-Declared Environmental Claims.
3. Product specific declarations are defined for this credit as declarations that are based on a life-cycle assessment of a product but not constituting a full EPD. To document this claim, the project team must provide the following information:
   a. Name (declaration holder or producer, typically the manufacturer)
   b. Contact information
   c. Product type
   d. Product name
   e. Product description
   f. Summary of impact categories measured and overall values
   g. Functional unit
   h. Standards met
   i. Independent review entity's name and statement
4. For industry-wide (generic) declarations and product-specific Type III declarations, the project team must provide the following:
   a. Declaration holder (the company, usually the manufacturer, that the EPD is attributed to)
   b. EPD program operator (the entity that creates and registers the EPD)
   c. LCA verifier (the third-party entity that verifies the life-cycle assessment)
   d. PCR reviewer (the third-party entity that has reviewed the product category rules)

1.4 PRODUCT DELIVERY, STORAGE AND HANDLING

A. Provide proper facilities for handling and storage of materials to prevent damage to edges, ends, and surfaces.

B. Keep materials dry. Where necessary, stack materials off ground on level flat forms, fully protected from weather.

1.5 JOB CONDITIONS

A. Environmental Requirements: Maintain uniform moisture content of lumber at not more than 19-percent during and after installation.

B. New lumber adjacent and connected to existing lumber shall have a moisture content of not more than 15 percent at the time of installation.

C. Sequencing, Scheduling: Coordinate details with other Work supporting, adjoining or fastening to rough carpentry Work.

PART 2 - PRODUCTS

2.1 LEED REQUIREMENTS

A. Product Specific Declarations. Manufacturer must meet the following disclosure criteria that products have a publicly available, critically reviewed life-cycle assessment conforming to ISO 14044 that have at least a cradle to gate scope are valued as one quarter (1/4) of a product for the purposes of credit achievement calculation.

B. Environmental Product Declarations. Manufacturer must meet the following disclosure criteria that products have environmental product declarations, which conform to ISO 14025, 14040, 14044, and EN 15804 or IS 21930 and have at least a cradle to gate scope. Specifically one of the following must be met:

1. Industry wide (generic) EPD – products with a third-party Type III certification, including external verification, in which the manufacturer is explicitly recognized as a participant by the program operator, are valued as one half (1/2) of a product for purposes of credit achievement calculation.

2. Product-specific Type III EPD – products with a third party certification (Type III), including external verification, in which the manufacturer is explicitly recognized as the participant by the program operator, are valued as one whole product for purposes of credit achievement calculation.

C. Provide products with the maximum amount possible of post-consumer and pre-consumer recycled content.

D. Composite wood, as defined by the California Air Resources Board, Airborne Toxic Measure to Reduce Formaldehyde Emissions from Composite Wood Products Regulation, must be documented to have low formaldehyde emissions that meet the California Air Resources Board ATCM for formaldehyde requirements for ultra-low-emitting formaldehyde (ULEF) resins or no added formaldehyde resins.

E. Provide products manufactured and extracted within 100 miles of the project site whenever possible.

2.2 MATERIAL

A. Rough Carpentry:

1. Sills on Concrete: Douglas Fir with Preservative Treatment.

2. Lumber (Wood Framing): Material grade shall be as shown on the drawings.

3. Plywood: Provide thickness, grade, and panel identification index shown on drawings. For plywood thickness 15/32 or greater provide a minimum of 5 ply.

B. Rough Hardware: All exterior hardware shall be hot-dipped galvanized.

1. Nails: Common wire per ASTM F1667, typical; hot-dipped zinc-coated galvanized, stainless steel, silicon bronze, or copper at exposed conditions, fire-retardant-treated, and preservative-treated lumber.

2. Expansion Bolts: Reverse cone, self-wedging, expansion type, Tightening of nut or increased tension on bolt shank shall act to force wedges outward to create positive increased resistance to withdrawal, Simpson Strong-Bolt, Hilti Kwik-Bolt TZ, or equal product substituted per Section 01630.

3. Metal Framing Connectors: Fabricate from hot-dipped galvanized steel (G90 coating). Connectors in contact with preservative-treated lumber shall have G185 hot dipped galvanized coating per ASTM A653. Connectors in contact with fire-treated lumber or are in high corrosive environments shall be manufactured with Type 316L stainless steel. Connectors shall be at least 16-gauge material, 1/8-inch plate materials where welded, unless otherwise shown or specified, punched for nailing. Nails and nailing shall conform to the manufacturer's instructions, including coating and material where applicable, with a nail provided for each punched nail hole. Use maximum nail size listed by manufacturer. Manufactured by Simpson Company or equal product substituted per Section 01 63 00.

4. Miscellaneous Hardware: Provide all common screws, bolts, fastenings, washers and nuts required to complete rough carpentry Work.

5. Bolts and sill bolts in wood shall be ASTM A307 with standard cut threads; full diameter bolts (no rolled or "upset" threads permitted) per ANSI/ASME standard B18.2.1.

6. Fasteners used for attachment of exterior wall coverings shall be hot-dipped zinc-coated galvanized steel, mechanically deposited zinc-coated steel, stainless steel, silicon bronze, or copper. The coating weights for hot-dipped zinc-coated fasteners shall be in accordance with ASTM A153. The coating weights for

mechanically deposited zinc-coated fasteners shall be in accordance with ASTM B695, Class 55 minimum.

2.3 TREATMENTS

A. Fire-Retardant Treatment: Furnish in accordance with AWPA Standards T1, U1, and P17, "Fire Retardant Formulations."

B. Preservative Treatment: Furnish in accordance with AWPA Standards T1 and U1. Preservatives with an ammonia base, including Ammoniacal Copper Zinc Arsenate (ACZA) are not permitted.

2.4 FABRICATION

A. Preparation:

1. Verify measurements at job site.

2. Verify details and dimensions of equipment and fixtures integral with finish carpentry for proper fit and accurate alignment.

3. Coordinate details with other work supporting, adjoining, or fastening to casework.

B. Lumber:

1. Air- or kiln-dry to maximum 19-percent moisture content at time of surfacing.

2. Furnish surfaced four sides, S4S, unless otherwise noted.

3. Size to conform with rules of governing standard. Sizes shown are nominal unless otherwise noted.

C. Wood Treatments:

1. Fire-Retardant Treatment:

a. Treat in accordance with AWPA Standards T1 and U1 and approved manufacturer's recommendations. Verify AWPA Use Category with proposed application prior to selected preservative. Fire treated lumber shall conform to the requirements of CBC Section 2303.2.

2. Preservative Treatment:

a. Treat lumber and plywood sheathing that is:

i. In contact with concrete and masonry less than six feet above the ground.

ii. Exposed to weather permanently.

iii. Where specified in the Contract Documents.

b. Treat in accordance with AWPA Standards T1 and U1. Verify AWPA Use Category with proposed application prior to selecting preservative.

c. Treated lumber shall be marked per CBC Section 2303.1.8.1.

d. After Treatment and prior to shipping, air- or kiln-dry lumber to maximum 19-percent moisture content.

2.5 SOURCE QUALITY CONTROL

A. Lumber shall bear grade-trademark or be accompanied by certificate of compliance of appropriate grading agency.

B. Plywood shall bear APA grade-trademark.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine areas to receive rough carpentry Work and verify following:

1. Completion of installation of building components to receive rough carpentry Work.

2. That surfaces are satisfactory to receive Work.

3. That spacing, direction, and details of supports are correct to accommodate installation of blocking, backing, stripping, furring and nailers.

4. That all anchor bolts and holdown bolts are properly installed.

3.2 INSTALLATION

A. Cutting: Perform all cutting, boring, and similar Work required.

B. Studs, Joists, Beams, and Posts: Install all members true to line. No wood shingle shims are permitted. Place joists with crown up; maximum 1/4-inch crown permitted.

C. Nail joints in accordance with applicable requirements of the CBC Table 2304.9.1 unless otherwise shown or specified. Predrill where nails tend to split wood. Nails into preservative-treated lumber shall be hot-dipped galvanized.

D. Bolt holes to be 1/16-inch oversize. Threads shall not bear on wood. Use standard malleable iron washers against wood. Carriage bolts require washers under the nut only.

E. Provide blocking, grounds, nailers, stripping, and backing as shown and as required to secure other Work.

F. Adjoining sheathing panel edges shall bear and be attached to the framing members. Nails shall be placed not less than 3/8-inch from the panel edge.

G. Plywood flooring shall be field glued with adhesive meeting APA specification AFG-01 applied in accordance with the manufacturer's recommendations. Apply continuous line of glue on joists and in groove of tongue and groove panels.

H. Protect preservative-treated and fire-treated lumber per APWA Standard M4, "Standard for the Care of Preservative-Treated Wood Products."

I. Where wood is cut, sawed, planed, bored or marred after preservative or fire-retardant treatment, apply two heavy brush coats of same material used in treatment.

J. Nail heads shall be driven flush with plywood surface. Overdriven nails (nails which fracture the outer ply layer) shall be replaced one for one.

K. Screws (Wood or Lag): Screws shall be screwed and not driven into place. Screw holes for the unthreaded portion shall be predrilled to the same diameter and depth of shank. Holes for threaded portion shall be predrilled less than or equal to the diameter of the root of the thread. Provide standard cut washers under head of lag screws.

L. Sheathing used for diaphragms and shear walls that are part of the seismic-force-resisting system shall be applied directly to framing members. Sheathing is permitted to be fastened over solid limber planking or laminated decking, provided the sheathing panel joints do not align with the planking or decking joints.

3.3 CLEANING AND ADJUSTING EXPOSED TIMBER

A. Remove damaged or otherwise disfigured portions and replace with new prior to the Owner's acceptance.

B. Wash finished Work in strict accordance with product manufacturer's directions and ensure that washed surfaces do not differ from clean unwashed surfaces. Any difference will be considered unsatisfactory work.

3.4 FIELD QUALITY CONTROL

A. The Owner's Testing Agency shall:

1. Inspect erected timber framing as required to establish conformity of work with Drawings.

2. Inspect all timber connectors per CBC Section 1704A.5.3.

3. Inspect high-load diaphragm nailing and support framing per CBC Section 1704A.5.1.

4. Inspect elements of the seismic lateral force resisting system per CBC Section 1705A.11.

    a. Inspect floor and roof diaphragm nailing for nail size, spacing and penetration at plywood panel edges, and special nailing at collector and drag members.

    b. Inspect shear wall nailing for nail size, spacing, edge distance and penetration at plywood panel edges, and nailing at holdown posts.

    c. Inspect all bolted connections of elements that are part of the seismic lateral force resisting system.

    d. Inspect holdown bolts into wood and concrete.

B. Machine Nailing: Use of machine nailing is subject to a satisfactory jobsite demonstration for each project and the approval of the Project Inspector, the Structural Engineer and DSA. The approval is subject to continued satisfactory performance. If the nail heads penetrate the outer ply more than would be normal for a hand-held hammer, or if minimum allowable edge distances are not maintained, the performance will be deemed unsatisfactory and machine nailing shall be discontinued.

END OF SECTION

DIVISION 07:
THERMAL AND MOISTURE PROTECTION

SECTION	TITLE
07 52 00	MODIFIED BITUMINOUS MEMBRANE ROOFING
07 62 00	SHEET METAL FLASHING AND TRIM
07 72 30	ROOFTOP SUPPORT SYSTEMS

SECTION 07 52 00
MODIFIED BITUMINOUS MEMBRANE ROOFING

PART 1.00 - GENERAL

1.01 DESCRIPTION OF WORK

A. Removal of the existing BUR roof membrane, insulation, metal coping, pipe supports and edge metal. Removal, storage, and reinstallation of mechanical equipment indicated on plan. Work related to the extension of shear walls. Installation of a new modified roof membrane using cold process adhesive.

B. WORK INCLUDES

a. Preparation of substrate to receive roofing materials.
b. Roof insulation application to prepared substrate.
c. Roof membrane application.
d. Cover board installation.
e. Roof flashing application
f. Incorporation of sheet metal flashing components and roofing accessories into the roof system
g. Extension of existing mechanical curbs.

1.02 PRODUCTS INSTALLED BUT NOT FURNISHED UNDER THIS SECTION

A. Sheet Metal Flashing and Trim

B. Sheet Metal Roofing Specialties.

1.03 RELATED SECTIONS

A. 07 62 00 Sheet Metal Flashing and trim

B. 07 72 30 Rooftop Support Systems

1.04 DEFINITIONS

A. Roofing Terminology: Definitions per ASTM D1079 and glossary of The NRCA Roofing Manual: Membrane Roof Systems.

1.05 REFERENCE STANDARDS

A.	ANSI	American National Standards Institute/Single-ply Roofing Industry (SPRI).
	a.	ANSI/SPRI FX-1: Standard Field Test Procedure for Determining the Withdrawal Resistance of Roofing Fasteners.
B.	ASCE	American Society of Civil Engineers/Structural Engineering Institute (SEI)
C.	ASTM	American Society for Testing and Materials, Philadelphia, PA.
	a.	C36/C36M: Standard Specification for Gypsum Wallboard (withdrawn)
	b.	C67: Standard Test Methods for Sampling and Testing Brick and Structural Clay Tile.
	c.	C140: Standard Test Methods for Sampling and Testing Concrete Masonry Units and Related Units.
	d.	C1289: Standard Specification for Faced Rigid Cellular Polyisocyanurate Thermal Insulation Board.
	e.	D41/D41M: Standard Specification for Asphalt Primer Used in Roofing, Dampproofing, and Waterproofing.
	f.	D312: Standard Specification for Asphalt Used in Roofing.
	g.	D1668: Standard Specification for Glass Fabrics (Woven and Treated) for Roofing and Waterproofing.
	h.	D2178: Standard Specification for Asphalt Glass Felt Used in Roofing and Waterproofing.
	i.	D3617: Standard Practice for Sampling and Analysis of Built-up Roof Systems during Application.
	j.	D4586: Standard Specification for Asphalt Roof Cement, Asbestos-Free.
	k.	E108: Standard Test Methods for Fire Tests of Roof Coverings.
D.	FM	Factory Mutual Engineering and Research, Norwood, MA
E.	NRCA	National Roofing Contractors Association, Rosement, IL
F.	OSHA	Occupational Safety and Health Administration, Washington, DC
G.	SMACNA	Sheet Metal and Air Conditioning Contractors National Association, Chantilly, VA
H.	UL	Underwriters Laboratories, Northbrook, IL

1.06 PERFORMANCE REQUIREMENTS

A. General Performance: Installed membrane roofing and base flashings shall withstand specified uplift pressures, thermally induced movement, and exposure to weather without

failure due to defective manufacture, fabrication, installation, or other defects in construction. Membrane roofing and base flashings shall remain watertight.

B. Material Compatibility: Provide roofing materials that are compatible with one another under conditions of service and application required, as demonstrated by membrane roofing manufacturer based on testing and field experience.

C. Wind Uplift Design: Per ASCE-07 requirements.

a.	Field-of-Roof Uplift Pressure:	16
b.	Perimeter Uplift Pressure	21
c.	Corner Uplift Pressure	28

D. Energy Performance: Per 2019 Building Energy Efficiency Standards, Subchapter 6, Prescriptive Approach, Section 141.0(b)2Biii, provide a minimum Solar Reflectance Index of 63 when determined in accordance with the Solar Reflectance Index method in ASTM E1980 using a convection coefficient of 2.1 Btu/h·ft2·°F, based on three-year-aged solar reflectance. Provide a three-year-aged thermal emittance tested in accordance with CRRC-1 Standard, a minimum of 0.75, or a minimum SRI of 75.

a. Exception to Section 141.0(b)2Bia: An aged solar reflectance less than 0.63 is allowed provided the maximum roof/ceiling U-factor in Table 41.0-B is not exceeded.

E. Provide roofing membrane to meet applicable local Building Department requirements.

F. Insulation R-Value: Minimum R-25 Long Term Thermal Resistance (LTTR) as determined in accordance with CAN/ULC-S770.

G. Roof Assembly must meet the current version of ASHRAE 90.1.

1.07 SUBMITTALS

A. All submittals which do not conform to the following requirements will be rejected.

B. Submittal of Equals: Submit primary roof systems to be considered as equals to the specified roof system no less than 10 days prior to bid date. Primary roof systems which have been reviewed and accepted as equals to the specified roof system will be listed in an addendum prior to bid date; only then will equals be accepted at bidding. Submittals shall include the following:

a. Two 3 inch x 5 inch samples of the primary roofing and flashing sheets.

b. Latest edition of the roofing system manufacturer's specifications and installation instructions.
c. Evidence that the manufacturer of the proposed roofing system utilizes a quality management system that is ISO 9001 certified. Documentation of ISO 9001 certification of foreign subsidiaries without domestic certification will not be accepted.
d. Evidence and description of manufacturer's quality control/quality assurance program for the primary roofing products supplied. The quality assurance program description shall include all methods of testing for physical and mechanical property values. Provide confirmation of manufacturer's certificate of analysis for reporting the tested values of the actual material being supplied for the project prior to issuance of the specified guarantee.
e. Descriptive list of the materials proposed for use.
f. Evidence of Underwriters' Laboratories Class A acceptance of the proposed roofing system (including mopping asphalt or cold adhesive) without additional requirements for gravel or coatings. No other testing agency approvals will be accepted.
g. The roof membrane configuration shall be approved by FM for Class 1-SH (severe hail) exposure.
h. Letter from the proposed primary roofing manufacturer confirming that a phased roof application, with only the modified bitumen base ply in place for a period of up to 10 weeks, is acceptable and approved for this project.
i. List of 3 of the proposed primary roofing manufacturer's projects, located in the United States, of equal size and degree of difficulty which have been performing successfully for a period of at least 10 years.
j. List of 3 of the proposed primary roofing manufacturer's projects, located in the United States, of equal size and degree of difficulty which have been performing successfully for a period of at least 10 years.
k. Letter from the proposed primary roofing manufacturer confirming that the filler content in the elastomeric blend of the proposed roof membrane and flashing components does not exceed 35% in weight.
l. Complete list of material physical and mechanical properties for each sheet including: weights and thicknesses; low temperature flexibility; peak load; ultimate elongation; dimensional stability; compound stability; high temperature stability; granule embedment and resistance to thermal shock for foil faced products.
m. Evidence that the roof system shall pass 500 cycles of ASTM D 5849 Resistance to Cyclic Joint Displacement (fatigue) at 14°F (-10°C). Passing results shall show no signs of membrane cracking or interply delamination after 500 cycles. The

roof system shall pass 200 cycles of ASTM D 5849 after heat conditioning performed in accordance with ASTM D 5147.

n. Sample copy of the proposed guarantee.

o. Completed Product Substitution Request Form included with this specification section.

C. Submittals Prior to Contract Award:

a. Letter Signed by roofing-system manufacturer, certifying that Roofing Installer complies with manufacturer's requirements to install specified, warranted, roofing system.

b. Letter from the primary roofing manufacturer stating that the proposed application will comply with the manufacturer's requirements in order to qualify the project for the specified guarantee.

c. Submit evidence that Installer's existing company has minimum of five years continuous experience in application of specified materials. Submit list of at least five representative, successfully-completed projects of similar scope and size.

d. Sample Warranty: Copy of roofing-system manufacturer's warranty, stating obligations, remedies, limitations, and exclusions.

D. Action Submittals

a. Product Data: Roofing-system manufacturer's literature, including written instructions for evaluating, preparing, and treating substrate; technical data including tested physical and performance properties; and application instructions.

b. Safety Data Sheets (SDS) for information only; safety restrictions are sole responsibility of Contractor.

E. Submittals Prior to Project Close-out:

a. Manufacturer's printed recommendations for proper maintenance of the specified roof system including inspection frequencies, penetration addition policies, temporary repairs, and leak call procedures.

1.08 QUALITY ASSURANCE

A. Acceptable Products: Primary roofing products, including each type of sheet, all manufactured in the United States, shall be supplied by a single manufacturer which has been successfully producing the specified types of primary products for not less than 10 years. The primary roofing products shall have maintained a consistent composition for a minimum of five years.

B. Product Quality Assurance Program: Primary roofing materials shall be manufactured under a quality management system that is monitored regularly by a third party auditor under the ISO 9001 audit process. A certificate of analysis for reporting/confirming the tested values of the actual material being supplied for the project will be required prior to project close-out.

C. Acceptable Contractor: Contractor shall have a minimum of 5 years experience in successfully installing the same or similar roofing materials and be certified in writing by the roofing materials manufacturer to install the primary roofing products.

D. Scope of Work: The work to be performed under this specification shall include but is not limited to the following: Attend necessary job meetings and furnish competent and full time supervision, experienced roof mechanics, all materials, tools, and equipment necessary to complete, in an acceptable manner, the roof installation in accordance with this specification. Comply with the latest written application instructions of the manufacturer of the primary roofing products. In addition, application practice shall comply with requirements and recommendations contained in the latest edition of the Handbook of Accepted Roofing Knowledge (HARK) as published by the National Roofing Contractor's Association, amended to include the acceptance of a phased roof system installation.

E. Local Regulations: Conform to regulations of public agencies, including any specific requirements of the city and/or state of jurisdiction.

F. Manufacturer Requirements: Ensure that the primary roofing materials manufacturer provides direct trained company personnel to attend necessary job meetings, perform periodic inspections as necessary, and conducts a final inspection upon successful completion of the project.

1.09 PRODUCT DELIVERY

A. Delivery: Deliver materials in the manufacturer's original sealed and labeled containers and in quantities required to allow continuity of application.

B. Storage: Store materials out of direct exposure to the elements on pallets placed over clean, flat and dry surfaces. Storage of pallets over dirt, grass-covered ground or newly placed concrete may result in upward moisture transpiration and contamination of product. Store rolls of roofing on end. For roof-top storage, avoid overloading of deck and building structure. Factory packaging is not intended for job site protection. Slit factory packaging immediately upon arrival at the job site to prevent build-up of condensation and cover materials using a breathable cover such as a canvas.

Polyethylene or other non-breathable plastic coverings shall not be used. Store flammable or temperature sensitive materials away from open flame, ignition sources or excessive heat.

C. Handling: Handle all materials in such a manner as to preclude damage and contamination with moisture or foreign matter. Handle rolled goods to prevent damage to edges or ends.

D. Damaged Material: Any materials that are found to be damaged or stored in any manner other than stated above will be automatically rejected, and will require removal and replacement at the Contractor's expense.

1.10 PROJECT/SITE CONDITIONS

A. Requirements Prior to Job Start:

a. Notification: Give a minimum of 5 days notice to the Owner and manufacturer prior to commencing any work and notify both parties on a daily basis of any change in work schedule.
b. Permits: Obtain all permits required by local agencies and pay all fees which may be required for the performance of the work.

B. Weather Considerations

a. Precipitation: Do not apply roofing materials during precipitation or in the event there is a probability of precipitation during application. Take adequate precautions to ensure that materials, applied roofing, and building interiors are protected from possible moisture damage or contamination.
b. Proceed with installation only when existing and forecasted weather conditions e.g. extreme temperature, high winds, high humidity and moisture, permit roofing system to be installed according to manufacturer's written instructions and warranty requirements.
c. Temperature Restrictions - cold adhesive: At low temperatures, the specified cold adhesive becomes more viscous, making even distribution more difficult. The optimal temperature of the adhesive at point of application is 70° - 100°F (21° - 38°C). To facilitate application when ambient temperatures are below 50°F (10°C), store the adhesive and roll goods in a warm place immediately prior to use. Bulk warmers, inline heaters, or other pre-heating equipment should be used to maintain the proper viscosity of the adhesive when using mechanical application equipment. Consider "flying in" the pre-cut roofing sheets in by placing them into the adhesive rather than rolling them into position. Roll or broom the sheets to ensure contact with the underlying adhesive. Suspend

application in situations where the adhesive cannot be kept at temperatures allowing for even distribution.

d. Temperature Restrictions - self-adhesive sheets: The minimum required substrate temperature at point of application is 40°F (4°C). Maintain a minimum roof membrane material temperature above 60° F (16° C). In low temperature conditions, keep materials warm prior to application. Consider using the specified tacky primer, required for vertical applications, in temperatures below 60° F (16° C) to facilitate proper bonding of self-adhered membrane for horizontal applications. The minimum ambient temperature range at the time of tacky primer application is 45°F to 105°F (7°C - 40°C). Suspend application in situations where the self-adhered base ply cannot be kept at temperatures allowing for proper adhesion.

C. Protection Requirements

a. Membrane Protection: Provide protection against staining and mechanical damage for newly applied roofing and adjacent surfaces throughout this project.
b. Limited Access: Prevent access by the public to materials, tools and equipment during the course of the project.
c. Debris Removal: Remove all debris daily from the project site and take to a legal dumping area authorized to receive such materials.
d. Site Condition: Complete, to the owner's satisfaction, all job site clean-up including building interior, exterior and landscaping where affected by the construction.
e. Ensure that moisture does not penetrate beneath any completed sections of the roof by sealing temporary roof terminations at the end of each work day and prior to the arrival of inclement weather. Inspect existing components for moisture intrusion along the temporary terminations at temporary cut-offs, tie-ins, and night seals after opening the seal on the next workday. Remove any wet, damp or moisture-damaged materials.

1.11 TESTING

A. Pre-installation Testing: Provide fastener withdrawal testing at metal deck and lightweight insulating concrete deck areas per the latest version of ANSI/SPRI FX-1 testing procedures to verify fastener withdrawal resistance and identify fastener quantity and spacing.

B. Owner reserves the right to perform wind uplift testing of installed roof system per FM 1-52. Locations and quantities to be determined by Architect/Engineer. Independent testing agency with experience and capability to conduct testing indicated, as documented according to ASTM E548.

1.12 ENVIRONMENTAL CONSIDERATIONS

A. Ensure that the fume protection device is used correctly and maintained in good working order throughout the job. Doors, vents, and exhausts shall be kept closed to prevent smoke and fume escape.

B. Air Intake: Coordinate with the Roof Engineer and Owner to create a schedule for all rooftop air handler intake protection during the project.

C. Rooftop Air Intakes: Protect rooftop air intakes from fumes and dust using plastic, charcoal, or other suitable products.

1.13 CHANGES IN THE WORK

A. During rehabilitation work, existing conditions may be encountered which are not known or are at variance with the Contract Documents. Such conditions may interfere with the Work and may consist of damage or deterioration of the substrate or surrounding materials that could jeopardize the integrity or performance of the Work.

B. Notify Architect of conditions that may interfere with the proper execution of the Work or jeopardize the performance of the Work prior to proceeding with the Work.

1.14 GUARANTEE / WARRANTY

A. Roof Membrane/System Guarantee: Upon successful completion of the project, and after all post installation procedures have been completed, furnish the Owner with the manufacturer's 20 year labor and materials guarantee covering the rigid insulation, insulation fasteners/plates, insulation adhesive and roof membrane/flashing system. The guarantee shall be a term type, without deductibles or limitations on coverage amount, and shall be issued at no additional cost to the Owner.

PART 2.00 - PRODUCTS

2.01 GENERAL

A. System: An assembly consisting of two plies of a prefabricated, reinforced, homogeneous Styrene-Butadiene-Styrene (SBS) block copolymer modified asphalt membrane, applied over a prepared substrate. Both reinforcement mats shall be impregnated/saturated and coated each side with an SBS modified bitumen blend. The cross sectional area of the

sheet material shall contain no oxidized or non-SBS modified bitumen. The roof system shall pass meet the following requirements.

a. 500 cycles of ASTM D 5849 Resistance to Cyclic Joint Displacement (fatigue) at 14°F (-10°C). Passing results shall show no signs of membrane cracking or interply delamination after 500 cycles.
b. 200 cycles of ASTM D 5849 after heat conditioning performed in accordance with ASTM D 5147.
c. The assembly shall possess waterproofing capability, such that a phased roof application, with only the modified bitumen base ply in place, can be achieved for prolonged periods of time without detriment to the watertight integrity of the entire roof system.

B. Components other than those manufactured or supplied by the roofing system manufacturer shall be submitted for review, prior to ordering. Any product(s) not specifically authorized in writing for the project by the roofing system manufacturer, shall be considered unacceptable.

2.02 SBS-MODIFIED ASPHALT SHEET MATERIALS

A. Siplast
   a. Base Ply: Paradiene 20 SA
   b. Cap Sheet: Paradiene 40 FR BW

B. Johns Manville
   a. Base Ply: Dynalastic 180 S
   b. Cap Sheet: Dynalastic 250 FR

C. Soprema
   a. Base Ply: Elastophene 180 Sanded
   b. Cap Sheet: Sopralene 250 FR GR

D. Cap sheet granules: Bright White

2.03 BASE FLASHING SYSTEMS

A. Siplast

   a. Backer Sheet: Paradiene 20 SA
   b. Flashing Sheet: Veral aluminum, heat welded

B. Johns Manville

   a. Backer Sheet: Dynalastic 180
   b. Flashing Sheet: DynaClad aluminum-foil-surfaced, heat welded

C. Soprema

a. Backer Sheet: Elastophene 180 PS

b. Flashing Sheet: Sopralast 50 TV, aluminum surfaced, heat welded

D. Glass-Fiber Fabric: ASTM D1668, Type 1, woven glass-fiber cloth treated with asphalt.

2.04 LIQUID APPLIED FLASHING SYSTEMS

A. Multi-component, fully reinforced, catalyzed acrylic resin flashing system by the manufacturer of the sheet membrane and flashing systems, consisting of a catalyzed polymethyl methacrylate primer, basecoat and topcoat, combined with a non-woven polyester fleece.

B. Products

a. Siplast: Parapro 123
b. JM: Manufacturer recommended
c. Soprema: Alsan RS

2.05 ADHESIVES

A. Insulation Adhesive: A dual component, polyurethane foam adhesive used to adhere insulation panels to the substrate, as well as to other insulation panels.

a. Siplast: Parafast Insulation Adhesive
b. JM: Manufacturer recommended
c. Soprema: Duotack 365

B. Membrane Cold Adhesives: A blend of special adhesive asphalts and safe, high-flash, quick drying solvents that meets or exceeds ASTM D 4479, Type II requirements.

a. Siplast: PA-311R
b. JM: Manufacturer recommended
c. Soprema: Manufacturer recommended

C. Solvent-Free Membrane Adhesive: A single component, solvent-free modified asphalt adhesive designed for application of the specified roof membrane system.

a. Siplast: SFT Adhesive
b. JM: Manufacturer recommended
c. Soprema: Colply EF Adhesive

D. Solvent-Free Flashing Adhesive: A single-component, solvent-free modified adhesive.

a. Siplast: SFT Cement

b. JM: Manufacturer recommended
c. Soprema: Colply EF Flashing Cement

2.06 INSULATION

A. Rigid roof insulation: UL and FM approved. Insulation shall be approved in writing by the insulation manufacturer for intended use and for use with the specified roof assembly. Maintain a maximum panel size of 4 feet by 4 feet where polyisocyanurate / fiberboard insulation is specified to be installed in insulation adhesive.

a. Closed cell, rigid polyisocyanurate foam core material, integrally laminated between glass fiber reinforced polymer bonded glass fiber facers, in full compliance with ASTM C 1289, Type II, Class 2, Grade 3 (25 psi). Panels shall have a nominal thickness of 1 inch.
b. Where needed for slope: Polyisocyanurate Tapered Roof Insulation. Tapered panels and standard fill panels composed of a closed cell, rigid polyisocyanurate foam core material, integrally laminated between glass fiber reinforced polymer bonded glass fiber facers, in full compliance with ASTM C 1289, Type II, Class 2, Grade 3 (25 psi).

B. Products

a. Siplast: Paratherm CG
b. JM: Energy 3 CGF
c. Soprema: Sopra-Iso+

2.07 GYPSUM SHEATHING PANEL

A. A panel composed of a gypsum based, non-structural water resistant core material integrally bonded with fiberglass mats on both sides. Provide panels having a nominal thickness of 1/4 inch.

B. Products:

a. GCP DensDeck Prime Gypsum Roof Board

2.08 AUXILLIARY ROOF MEMBRANE MATERIALS

A. General: Auxiliary materials recommended by roofing system manufacturer for intended use and compatible with roofing membrane.

B. Primers: An asphalt/solvent blend meeting ASTM D 41, manufactured for intended use.

a. Siplast: TA-119

b. JM: Manufacturer recommended
c. Soprema: Manufacturer recommended

C. Asphalt Roofing Cement: ASTM D 4586, Type II, asbestos free, of consistency required by roofing- system manufacturer for application. Do not use unless specifically approved by roofing- system manufacturer. Do not use for sealing laps in membrane or base flashing, surface or stripping flashing at equipment penetrations and drains, or repairs to membrane or flashing.

D. Ceramic Granules: No. 11 grade specification ceramic granules of color scheme matching the granule surfacing of the finish ply.

E. Cant Strips: ASTM C728

F. Walkway Pads: Standard walk pads from manufacturer.

G. Fasteners

a. Base Sheet and all Fasteners: Base sheet fasteners shall be approved by the manufacturer of the primary roofing products. Acceptable base sheet fasteners for specific substrate types.
b. Flashing Reinforcing Sheet Fasteners for Wood/Plywood Substrates: Square Cap by W.H. Maze Co.
i. A 12 gauge, spiral or annular threaded shank, zinc coated steel roofing fastener having a minimum 1 inch head.

PART 3.00 – EXECUTION

3.01 PREPARATION

A. General: Sweep or vacuum all surfaces, removing all loose aggregate and foreign substances prior to commencement of roofing.

3.02 INSULATION, CRICKETS, AND COVERBOARD

A. Insulation: Install insulation panels with end joints offset; edges of the panels shall be in moderate contact without forcing applied in strict accordance with the insulation manufacturer's requirements and the following instructions. Where insulation is installed in two or more layers, stagger joints between layers Install only as much insulation as can be made watertight within the same work day.

B. Crickets: Construct crickets of tapered insulation panels in a layout as indicated on the roof plan.

C. Insulation & Coverboard: Mechanically attach the insulation to the substrate, using the specified fasteners, at a rate of 1 fastener per 2 square feet of panel area (16 per 4' x 8' panel). Increase the fastening frequency by 50% at the perimeter of the roof and 100% in the corners. Set the cover board in an application of the specified insulation adhesive in strict accordance with the requirements of the insulation adhesive manufacturer. Stagger the panel joints between insulation layers.

3.03 ROOF MEMBRANE PREPARATION

A. Membrane Application: Apply roofing in accordance with roofing system manufacturer's instructions and the following requirements. Application of roofing membrane components shall immediately follow application of base sheet and/or insulation as a continuous operation.

B. Aesthetic Considerations: Construction of an aesthetically pleasing overall appearance of the finished roof application is a standard requirement for this project. Make necessary preparations, utilize recommended application techniques, apply the specified materials (i.e. granules), and exercise care in ensuring that the finished application is acceptable to the Owner.

C. Priming: Prime metal, concrete, wood walls and curbs, and masonry surfaces with a uniform coating of the specified primer.

D. Membrane Adhesive Application: Membrane adhesive can be applied by roller, squeegee or spray unit. Apply cold adhesive in a smooth, even, continuous layer without breaks or voids. Utilize an application rate of 2 to 2 1/2 gal/sq (0.6 to 1.0 l/m^2) over irregular or porous substrates. Utilize an application rate of 1 1/2 to 2 gal/sq (0.6 to 0.8 kg/m^2) for interply applications. Double the adhesive application rate at the end laps of granule surfaced sheets.

E. In the areas surrounding details that are to receive the catalyzed acrylic resin primer and flashing system, apply membrane plies in a full coating of the specified elastomeric sealant in lieu of the solvent based adhesive a minimum 8 inches from the base of the penetration or curb.

F. Bitumen Consistency: Cutting or alterations of bitumen, primer, and sealants will not be permitted.

3.04 ROOF MEMBRANE APPLICATION

A. For applications where sheets are applied perpendicular to the roof slope.

a. Roofing Application: Apply all layers of roofing free of wrinkles, creases or fishmouths. Exert sufficient pressure on the roll during application to ensure prevention of air pockets.

b. Fully bond the base ply to the prepared substrate, utilizing minimum 3 inch side and end laps. Apply each sheet directly behind the cold adhesive applicator. Cut a dog ear angle at the end laps on overlapping selvage edges. Using a clean trowel, apply top pressure to top seal T-laps immediately following sheet application. Stagger end laps a minimum of 3 feet.

c. Fully bond the finish ply to the base ply, utilizing minimum 3 inch side and end laps. Apply each sheet directly behind the cold adhesive applicator. Stagger end laps of the finish ply a minimum 3 feet. Cut a dog ear angle at the end laps on overlapping selvage edges. Using a clean trowel, apply top pressure to top seal T-laps immediately following sheet application. Stagger side laps of the finish ply a minimum 12 inches from side laps in the underlying base ply. Stagger end laps of the finish ply a minimum 3 feet from end laps in the underlying base ply.

B. Granule Embedment: Broadcast mineral granules over all bitumen overruns on the finish ply surface, while the bitumen is still hot or the adhesive is soft, to ensure a monolithic surface color.

C. Flashing Application: Cut the cant backing sheet into 12 inch widths and peel the release film from the back of the sheet. Set the sheet into place over the primed substrate extending 6 inches onto the field of the roof area and 6 inches up the vertical surface utilizing minimum 3 inch laps. Set the non-combustible cant into place dry prior to installation of the roof membrane base ply. Flash walls and curbs using the reinforcing sheet and the metal foil flashing membrane. After the base ply has been applied to the top of the cant, prime the base ply surfaces to receive the reinforcing sheet. Fully adhere the reinforcing sheet, utilizing minimum 3 inch side laps onto the primed base ply surface and up the primed wall or curb to the desired flashing height. After the final roofing ply has been applied to the top of the cant, prepare the surface area that is to receive flashing coverage by torch heating granular surfaces or by application of asphalt primer; allowing primer to dry thoroughly. Torch apply the metal foil-faced flashing into place using three foot widths (cut off the end of roll) always lapping the factory selvage edge. Stagger the laps of the metal foil flashing layer from lap seams in the reinforcing layer. Extend the flashing sheet a minimum of 4 inches beyond the toe of the cant onto the prepared surface of the finished roof and up the wall or curb to the desired flashing height. Exert pressure on the flashing sheet during application to ensure complete contact with the

vertical/horizontal surfaces, preventing air pockets; this can be accomplished by using a damp sponge or shop rag. Check and seal all loose laps and edges. Nail the top edge of the flashing on 9 inch centers. (See manufacturer's schematic for visual interpretation).

D. Aluminum foil coated flashing must be applied in appropriate solvent-free cement or heat-welded.

E. Catalyzed Acrylic Resin Flashing System: Install the liquid-applied primer and flashing system in accordance with the membrane system manufacturer's printed installer's guidelines and other applicable written recommendations as provided by the manufacturer.

F. Water Cut-Off: At end of day's work, or when precipitation is imminent, construct a water cut-off at all open edges. Cut-offs can be built using asphalt or plastic cement and roofing felts, constructed to withstand protracted periods of service. Cut-offs must be completely removed prior to the resumption of roofing.

G. Walktread: Cut the walktread into maximum 5 foot lengths and allow to relax until flat. Adhere the sheet using the specified plastic cement. Apply the specified cement in a 3/8 inch thickness to the back of the product in 5 inch by 5 inch spots in accordance with the pattern as supplied by the walktread manufacturer. Walk-in each sheet after application to ensure proper adhesion. Use a minimum spacing of 2 inches between sheets to allow for proper drainage.

H. Sealant Apply a smooth continuous bead of the specified sealant at the exposed finish ply edge transition to metal flashings incorporated into the roof system.

3.05 FIELD QUALITY CONTROL AND INSPECTIONS

A. Site Condition: Leave all areas around job site free of debris, roofing materials, equipment and related items after completion of job.

B. Notification of Completion: Notify the manufacturer by means of manufacturer's printed Notification of Completion form of job completion in order to schedule a final inspection date.

C. Final Inspection/Post-Installation Meeting: Hold a meeting at the completion of the project, attended by all parties that were present at the pre-job conference. A punch list of items required for completion shall be compiled by the Contractor and the manufacturer's representative. Complete, sign, and mail the punch list form to the manufacturer's headquarters.

D. Issuance of the Guarantee: Complete all post installation procedures and meet the manufacturer's final endorsement for issuance of the specified guarantee.

END OF SECTION 07 52 00

SECTION 07 62 00
SHEET METAL FLASHING AND TRIM

PART 1.00 - GENERAL

1.01 SECTION INCLUDES

A. Formed roof drainage sheet metal fabrications.
B. Formed low-slope roof sheet metal fabrications, including cleats, copings, edge flashings, wind-clips, skirt flashings, two-piece base of wall flashings, sheet metal backing.
C. Rooftop equipment pad covers.
D. Plastic pads, spacers, and fillers.

1.02 RELATED SECTIONS

A. 07 52 00 Modified Bituminous Membrane Roofing

1.03 PERFORMANCE REQUIREMENTS

A. General: Provide sheet metal flashing following the guidelines included herein to provide a complete flashing system capable of withstanding service loads (wind, foot traffic, etc.), while maintaining the following long-term performance requirements.
    a. Sufficient water tightness to prevent building leakage.
    b. Secure attachment to the structure, without noticeable deformation.
    c. Freedom from corrosion, either from atmospheric conditions, galvanic action, or reaction with surrounding materials.
    d. Freedom from excessive scratching, staining, or other aesthetic issues. "Oil-canning" of sheet metal surfaces is not permitted.
B. Flashing installations shall not rely solely on sealants or gaskets for primary waterproofing performance
C. Thermal Movements: Provide sheet metal flashing and trim that allows for thermal movements from ambient and surface temperature changes.
    a. Temperature Change (Range): 120 deg F, ambient; 180 deg F, material surfaces.

1.04 SUBMITTALS

A. Product Data: For each type of product indicated. Include construction details, material descriptions, dimensions of individual components and profiles, and finishes for each manufactured product and accessory.
B. Shop Drawings: Show fabrication and installation layouts of sheet metal flashing and trim, including plans, elevations, expansion-joint locations, and keyed details. Distinguish between shop- and field-assembled work. Include the following:

a. Identification of material, thickness, weight, and finish for each item and location in Project
b. Details for forming sheet metal flashing and trim, including profiles, shapes, seams, and dimensions.
c. Details for joining, supporting, and securing sheet metal flashing and trim, including layout of fasteners, cleats, clips, and other attachments. Include pattern of seams.
d. Details of termination points and assemblies, including fixed points.
e. Details of drift joints, expansion joints and expansion-joint covers, including showing direction of expansion and contraction.
f. Details of edge conditions, including eaves, ridges, crickets, and counterflashings as applicable.
g. Details of special conditions.
h. Details of connections to adjoining work.

C. Samples for Verification: For each type of exposed finish required

1.05 QUALITY ASSURANCE

A. Fabricator Qualifications: Shop that employs skilled workers who custom fabricate sheet metal flashing and trim similar to that required for this Project and whose products have a record of successful in-service performance.

B. Sheet Metal Flashing and Trim Standard: Comply with latest editions of SMACNA's "Architectural Sheet Metal Manual" and Revere's "Copper and Common Sense." Conform to dimensions and profiles shown unless more stringent requirements are indicated.

C. Sheet Metal Flashing and Trim Standard: Comply with SMACNA's "Architectural Sheet Metal Manual" unless more stringent requirements are specified or shown on Drawings.

D. Mockups: Build mockups to verify selections made under sample submittals and to demonstrate aesthetic effects and set quality standards for fabrication and installation.
a. Build mockup of each typical roof parapet and flashing condition, including, approximately long, including supporting construction cleats, seams, attachments, underlayment, and accessories.
b. Approval of mockups does not constitute approval of deviations from the Contract Documents contained in mockups unless Architect specifically approves such deviations in writing.
c. Approved mockups may become part of the completed Work if undisturbed at time of Substantial Completion.

E. Water Penetration:
a. Water penetration, in this specification, is defined as the appearance of uncontrolled water on the indoor face of part of the work. "Controlled" water or condensation is that which is demonstrably drained harmlessly to the exterior of

the work without endangering or wetting adjacent surfaces or insulation, and not visible in the final construction.

b. Provisions shall be made to drain the exterior of the work, water entering at joints, and/or condensation occurring within the work. The work shall be designed to collect and remove secondary water from the surrounding conditions.

c. No water penetration shall occur when the work is tested with the devices described in, and conducted in general conformance with, ASTM E-1105 and AAMA 501.2. Tests may be conducted with no differential air pressure and with differential air pressure of up to 6.24 PSF.

1.06 DELIVERY, STORAGE, AND HANDLING

A. Do not store sheet metal flashing and trim materials in contact with other materials that might cause staining, denting, or other surface damage. Store sheet metal flashing and trim materials away from uncured concrete and masonry.

B. Protect strippable protective covering on sheet metal flashing and trim from exposure to sunlight and high humidity, except to the extent necessary for the period of sheet metal flashing and trim installation.

1.07 GUARANTEE/WARRANTY

A. If, within 2 years after the Date of Substantial Completion of the Work, any of the work of this Section is found to be defective or not in accordance with the Contract Documents the Subcontractor shall, at its sole cost and expense, correct it promptly after receipt of a written notice to do so unless previously given a written acceptance of such condition.

B. The obligations of this Guarantee shall run directly to the Owner and its successors and assigns and may be enforced by the Owner and its successors and assigns against the Subcontractor, shall survive the termination of the Subcontract, and shall not be limited by conditions other than this Contract.

C. Special Warranty on Finishes: Manufacturer's standard form in which manufacturer agrees to repair finish or replace sheet metal flashing and trim that shows evidence of deterioration of factory-applied finishes within specified warranty period.

D. Finish Warranty Period: 5 years from date of Substantial Completion.

PART 2.00 - PRODUCTS

2.01 FABRICATION

A. General

a. Except as otherwise indicated or specified, comply with manufacturer's installation instructions and recommendations and with SMACNA “Architectural Sheet Metal Manual."

b. Comply with details shown to fabricate sheet metal flashing and trim that fit substrates and result in waterproof and weather-resistant performance once installed. Verify shapes and dimensions of surfaces to be covered before fabricating sheet metal.
c. Fabricate sheet metal flashing and trim in thickness or weight needed to comply with performance requirements, but not less than that specified for each application and metal.
d. Obtain field measurements for accurate fit before shop fabrication.
e. Form sheet metal flashing and trim without excessive oil canning, buckling, and tool marks and true to line and levels indicated.
f. Fabrication Tolerances: Fabricate sheet metal flashing and trim that is capable of installation to a tolerance of 1/4 inch in 20 feet on slope and location lines as indicated and within 1/8-inch offset of adjoining faces and of alignment of matching profiles.
g. Form 1/2 inch helm on underside of exposed edges unless noted otherwise.

B. Receivers and cover plates shall be the same temper, thickness, and color as the base metal, unless otherwise specified.

C. Fabricate cleats and attachment devices of sizes as recommended by SMACNA's "Architectural Sheet Metal Manual" for application, but not less than thickness of metal being secured.

D. Arrange work sequence to avoid use of newly completed work or areas scheduled to remain for storage, walking surface, and equipment movement. Protect new and existing work from mechanical damage.
a. Where multiple sections are required, weld sections together to form watertight cover.

E. Low slope roof metal fabrications
a. Copings: Fabricate in minimum 96-inch-long, but not exceeding 10-foot-long sections. Fabricate joint plates of same thickness as copings. Furnish with continuous cleats to support edge of external leg and interior leg. Miter corners, seal, mechanically secure with pop rivets and solder watertight

2.02 PREMANUFACTURED COPING

A. Pre manufactured Coping: Paraguard M, continuous cleat coping
a. Material: Galvanized steel, 22 Ga
b. Finish: Fluoropolymer finish containing not less than 70 percent PVDF resin by weight in both color and clear topcoat. Prepare, pretreat, and apply coating to exposed metal surfaces to comply with coating manufacturer's written instructions.
c. Color: As selected by Owner's representative from manufacturer's full range of colors.

d. Fabricate in minimum 96-inch long, but not exceeding 10-feet long sections. . Fabricate joint plates of same thickness as copings. Furnish with continuous cleats to support edge of external leg and interior leg. Miter corners, seal, mechanically secure with pop rivets and solder watertight

B. Stainless-Steel Sheet: ASTM A 240/A 240M or ASTM A 666, Type 304, dead soft, fully annealed. 18-8, 0.025 inches thick, unless noted otherwise. Make necessary connections and joints with solder of 60% block tin and 40% pig leads using a manufacturer-approved brand of phosphoric acid stainless steel flux.
   a. Finish: 2D (dull, cold rolled).
   b. Surface: Smooth, flat.

C. Metallic-Coated Steel Sheet: Restricted flatness steel sheet, metallic coated by the hot-dip process and pre-painted by the coil-coating process to comply with ASTM A 755/A 755M.
   a. Zinc-Coated (Galvanized) Steel Sheet: ASTM A 653/A 653M, G90 (Z275) coating designation; commercial quality, at minimum 0.028 inches thick, unless noted otherwise.

2.03 ROOFTOP EQUIPMENT PAD FABRICATION

A. Equipment Pad Covers: As needed.
   a. Material: Galvanized Steel: 0.022 inch thick.
   b. Fabricate from one piece, where possible. Where multiple sections are required, solid riveted and soldered watertight all sections.

2.04 UNDERLAYMENT MATERIALS

B. Self-Adhering, High-Temperature Sheet: Minimum 30 to 40 mils thick, consisting of slip-resisting polyethylene-film top surface laminated to layer of butyl or SBS-modified asphalt adhesive, with release-paper backing; cold applied. Provide primer when recommended by underlayment manufacturer:
   a. Thermal Stability: ASTM D 1970; stable after testing at 240 deg F.
   b. Low-Temperature Flexibility: ASTM D 1970; passes after testing at minus 20 deg F.
   c. Products.
      i. Carlisle Coatings & Waterproofing Inc.; CCW WIP 300HT
      ii. Grace Construction Products; Ultra
      iii. Henry Company; Blueskin PE200 HT
      iv. Or approved equal.

C. Slip Sheet: Building paper, 3 pound/100 square feet minimum, rosin sized.

2.05 FLASHINGS

A. Counterflashing: Fabricate from the following materials.
   a. Galvanized Steel, typical: 0.028 inch thick, unless otherwise indicated.

B. Flashing Receivers: Fabricate from the following materials.
   a. Galvanized Steel, typical: 0.028 inch thick, unless otherwise indicated.

C. Wind-clips, Skirt Flashings: Fabricate from galvanized steel, 0.028 inch thick, unless otherwise indicated.

D. Backing Metal: Fabricate from galvanized steel, 0.052 inch thick, unless otherwise indicated.

2.06 WALL SHEET METAL FABRICATIONS

A. Penetration Flashings in Frame Construction: Fabricate as indicated, forming two-piece collars

2.07 MISCELLANEOUS MATERIALS

A. General: Provide materials and types of fasteners, solder, welding rods, protective coatings, separators, sealants, and other miscellaneous items as required for complete sheet metal flashing and trim installation and recommended by manufacturer of primary sheet metal unless otherwise indicated.

B. Fasteners, general: Wood screws, annular threaded nails, self-tapping screws, self-locking rivets and bolts, and other suitable fasteners designed to withstand design loads and recommended by manufacturer of primary sheet metal.
   b. Fasteners for Aluminum Sheet: Aluminum or Series 300 stainless steel.
   c. Fasteners for Stainless-Steel Sheet: Series 300 stainless steel.
   d. Fasteners for Zinc-Coated (Galvanized) Steel Sheet: Hot-dip galvanized steel according to ASTM A 153/A 153M or ASTM F 2329 or Series 300 stainless steel.

C. Non-exposed fasteners
   a. Sheet Metal Flashing to Concrete: 1/4 in. dia. x 1-1/4 in. long Zamac Hammer-Screw with drive screw expansion anchor by Powers/Rawl.
   b. Sheet Metal Flashing to Masonry: Powers/Rawl Nylon Nailin Hit anchors, or approved equal.
   c. Sheet Metal Flashing to Wood - Nails: Electro-galvanized 12 gauge annular ring nails with minimum 1/4 in. dia. flat head, with needle point. Nails shall be of sufficient length to obtain 1-1/4 in. embedment into blocking and full depth into plywood.
   d. Sheet Metal Flashing to Wood - Screws: 10-12 x 1-1/2 in. #2 Phillips Pancake head screw with zinc finish.

e. Sheet Metal to Sheet Metal - Rivets: Solid 3/16 in. dia. flat head rivets of proper length for the material being fastened; material to match that being fastened. "Pop" rivets are prohibited.

D. Exposed fasteners:
   a. Sheet Metal Flashing to Concrete: 1/4 in. dia. x 1-1/4 in. long Zamac Hammer-Screw with drive screw expansion anchor by Powers/Rawl.
   b. Sheet Metal Flashing to Masonry: Powers/Rawl Nylon Nailin Hit anchors, or approved equal.
   c. Sheet Metal Flashing to Wood - Screws: 9-15 HWH screws with bonded metal / EPDM washers, ITW Buildex Trugrip GT or approved equal. Length as indicated or required to penetrate minimum 1-1/2 in.
   d. Sheet Metal to Sheet Metal - Screws: 1/4 -12 x 1-1/4 in. HWH screw with bonded washer, ITW Buildex Traxx or approved equal.
   e. Sheet Metal to Sheet Metal - Rivets: Solid 3/16 in. dia. flat head rivets of proper length for the material being fastened; material to match that being fastened. "Pop" rivets are prohibited.
   f. Heads matching color of sheet metal using plastic caps or factory-applied coating. Provide with bonded neoprene washers.

E. Solder and Flux: Solder ASTM B 32, type recommended for materials being used; flux FS O-F-506C, Type I, Form A or B, 50/50 or better.
   a. Solder and flux shall be 100 percent lead free.

F. Sealant Tape: Pressure-sensitive, 100 percent solids, gray polyisobutylene compound sealant tape with release-paper backing. Provide permanently elastic, nonsag, nontoxic, nonstaining tape 1/2 inch wide and 1/8 inch thick.

G. Sealant:
   a. Non-exposed; within metal flashings: ASTM C 1311, single-component, solvent-release butyl rubber sealant; polyisobutylene plasticized; heavy bodied for hooked-type expansion joints with limited movement.
   b. Exposed: One-part polyurethane.
   c. Products:
      i. Tremco; Dymonic
      ii. Sika; Sikaflex 1a
      iii. Or approved equal

PART 3.00 – EXECUTION

3.01 EXAMINATION

A. Examine substrates, areas, and conditions, with Installer present, to verify actual locations, dimensions and other conditions affecting performance of the Work.

B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.02 INSTALLATION - GENERAL

A. General: Anchor sheet metal flashing and trim and other components of the Work securely in place, with provisions for thermal and structural movement. Use fasteners, solder, welding rods, protective coatings, separators, sealants, and other miscellaneous items as required to complete sheet metal flashing and trim system.
   a. Install sheet metal flashing and trim true to line and levels indicated. Provide uniform, neat seams with minimum exposure of solder, welds, and sealant.
   b. Install sheet metal flashing and trim to fit substrates and to result in watertight performance. Verify shapes and dimensions of surfaces to be covered before fabricating sheet metal.
   c. Install exposed sheet metal flashing and trim without excessive oil canning, buckling, and tool marks.
   d. Install sealant tape where indicated.
   e. Torch cutting of sheet metal flashing and trim is not permitted.
   f. Install fasteners to vertical surfaces only of sheet metal flashing and trim Do not install fasteners on horizontal and sloping surfaces of parapets, equipment pads or other similar conditions.

B. Metal Protection: Where dissimilar metals will contact each other or corrosive substrates, protect against galvanic action by painting contact surfaces with bituminous coating or by other permanent separation as recommended by SMACNA.
   a. Coat back side of uncoated aluminum and stainless-steel sheet metal flashing and trim with bituminous coating where flashing and trim will contact wood, ferrous metal, or cementitious construction.
   b. Underlayment: Where installing metal flashing directly on cementitious or wood substrates, install a course of felt underlayment and cover with a slip sheet or install a course of polyethylene sheet.

C. Fastener Sizes: Use fasteners of sizes that will penetrate metal decking not less than recommended by fastener manufacturer to achieve maximum pull-out resistance.

D. Joints
   a. Sealed Joints: Form non-expansion but movable joints in metal to accommodate elastomeric sealant.
   b. Seams: Fabricate nonmoving seams with flat-lock seams. Form seams and seal with elastomeric sealant unless otherwise recommended by sealant manufacturer for intended use. Rivet joints where necessary for strength.
   c. Non-moving joints shall be solid riveted and soldered watertight.
   d. Seal joints as shown and as required for watertight construction.
      i. Where sealant-filled joints are used, embed hooked flanges of joint members not less than 1 inch into sealant. Form joints to completely conceal sealant. When ambient temperature at time of installation is moderate, between 40 and 70 deg F, set joint members for 50 percent

movement each way. Adjust setting proportionately for installation at higher ambient temperatures. Do not install sealant-type joints at temperatures below 40 deg F

ii. Prepare joints and apply sealants to comply with requirements in Division 07 Section "Joint Sealants."

iii.

e. Expansion Provisions: Provide for thermal expansion of exposed flashing and trim. Space movement joints at a maximum of 10 feet with no joints allowed within 24 inches of corner or intersection. Where lapped expansion provisions cannot be used or would not be sufficiently watertight, form expansion joints of intermeshing hooked flanges, not less than 1 inch deep, filled with sealant concealed within joints.

E. Soldering

a. Do not solder aluminum sheet.
b. Immediately prior to soldering, mechanically clean all metal to be soldered with steel wool or by other acceptable means, apply flux, and pre-tin.
c. Perform all soldering slowly with well-heated, heavy (3 lbs. / pair) irons with properly tinned, clean blunt tips. Do not use torches.
d. Apply enough heat to sweat the solder completely through the full width of the seam.
e. Close clinch lock seams gently with a block of wood and mallet, then flux and show at least 1 in. of continuous and evenly-flowed solder.
f. Whenever possible, do all soldering in flat position.
g. All sloped and vertical seams shall be laced and soldered a second time.
h. Wipe and wash clean soldered joints to remove all traces of acid from the flux immediately after the joints are made.
i. Soldered Joints: Clean surfaces to be soldered, removing oils and foreign matter. Pre-tin edges of sheets to be soldered to a width of 1-1/2 inches, except reduce pre-tinning where pre-tinned surface would show in completed Work.

i. Do not use torches for soldering. Heat surfaces to receive solder and flow solder into joint. Fill joint completely. Completely remove flux and spatter from exposed surfaces.

ii. Stainless-Steel Soldering: Tin edges of uncoated sheets using solder recommended for stainless steel and acid flux. Promptly remove acid flux residue from metal after tinning and soldering. Comply with solder manufacturer's recommended methods for cleaning and neutralization.

3.03 FLASHING INSTALLATION

A. General: Install sheet metal flashing and trim to comply with performance requirements and SMACNA's "Architectural Sheet Metal Manual." Provide concealed fasteners where possible, set units true to line, and level as indicated. Install work with laps, joints, and seams that will be permanently watertight and weather resistant. Coordinate installation of wall flashing.

B. Fabricate inside and outside corners from one piece.

C. Copings: Anchor to resist uplift and outward forces according to recommendations in SMACNA's "Architectural Sheet Metal Manual" and as indicated. Coping shall be designed and installed for winds in accordance with Chapter 16 of the 2010 California Building Code and tested for resistance in accordance with ANSI/SPRI ES-1.

D. Pipe or Post Counterflashing: Install counterflashing umbrella with close-fitting collar with top edge flared for elastomeric sealant, extending a minimum of 4 inches over base flashing. Install draw band and tighten.

E. Counterflashing: Coordinate installation of counterflashing with installation of base flashing. Insert counterflashing in reglets or receivers and fit tightly to base flashing. Extend counterflashing minimum 4 inches over base flashing. Lap counterflashing joints a minimum of 4 inches and bed with sealant. Secure in a waterproof manner by means of interlocking folded seam or blind rivets and sealant.

3.04 ERECTION TOLERANCES

A. Installation Tolerances: Shim and align sheet metal flashing and trim within installed tolerance of 1/4 inch in 20 feet on slope and location lines as indicated and within 1/8-inch offset of adjoining faces and of alignment of matching profiles.

3.05 CLEANING AND PROTECTION

A. Clean and neutralize flux materials. Clean off excess solder.

B. Clean off excess sealants.

C. Remove temporary protective coverings and strippable films as sheet metal flashing and trim are installed unless otherwise indicated in manufacturer's written installation instructions. On completion of installation, remove unused materials and clean finished surfaces. Maintain in a clean condition during construction.

D. Replace sheet metal flashing and trim that have been damaged or that have deteriorated beyond successful repair by finish touchup or similar minor repair procedures.

E. Protect flashing and sheet metal work during construction to ensure that work will be without damage or deterioration other than normal weathering at time of final completion.

END OF SECTION 07 62 00

SECTION 07 72 00
ROOFTOP SUPPORT SYSTEMS

PART 1.00 - GENERAL

1.01 SECTION INCLUDES

A. The work covered by this specification consists of furnishing all labor, equipment, materials and accessories, and performing all operations required for the correct installation of recycled rubber pipe and conduit supports for mechanical and electrical piping systems.

1.02 REFERENCES

A. ASTM A653 G90 SS Gr. 33 - Specification for Steel Sheet, Zinc Coated (Galvanized) by the Hot Dipped Process.
B. ASTM B633 - Specification for Electrodeposited Coatings of Zinc on Iron and Steel.
C. ASTM C531 – Test Method for Linear Shrinkage and Coefficient of Thermal Expansion of Chemical Resistant Mortars, Grouts, Monolithic Surfaces, and Polymer Concretes.
D. ASTM C642 – Test Method for Specific Gravity, Absorption, and Voids in Hardened Concrete.
E. ASTM C672 – Test Methods for Scaling Resistance of Concrete Surfaces Exposed to Deicing Chemicals.
F. ASTM D412 – Test Methods for Vulcanized Rubber and Thermoplastic Elastomers – Tension.
G. ASTM D395 – Standard Test Methods for Rubber Property – Compression Set.
H. ASTM D573 – Test Method for Rubber – Deterioration in an Air Oven.
I. ASTM D746 – Test Method for Brittleness Temperature of Plastics and Elastomers by Impact.
J. ASTM D2240 – Test Method for Rubber Property – Durometer Hardness.
K. NFPA 70 – National Electrical Code.

1.03 QUALITY ASSURANCE

A. Rubber / steel pipe supports shall be manufactured under a strict quality control program assuring quality product delivered to the jobsite. Pipe supports that are damaged shall not be installed.
B. Workmanship: All pipe and conduit supports to be installed by a qualified contractor and installed in accordance with manufacturer’s recommendations.
    a. All work shall comply with all applicable federal, state, and local codes and laws having jurisdiction.

b. All work shall conform to accepted industry and trade standards for pipe support and conduit installations.

1.04 DELIVERY, STORAGE, AND HANDLING

A. Deliver the materials to the project site in the manufacturer's unpacked contains with all labels intact and legible at time of use. Materials shall be stored in a secure, indoor, dry area.

PART 2.00 - PRODUCTS

2.01 ACCEPTABLE MANUFACTURERS

A. Manufacturer: Subject to compliance with these specifications, pipe support systems shall be Dura-Blok™ design as supplied by Cooper B-Line, Inc. or approved equal.

2.02 MATERIALS

A. Curb base must be made of 100% recycled rubber and polyurethane prepolymer with a uniform load capacity of 500 pounds per linear foot of support*. In addition, each base to have a reflective red stripe.
B. Dimensions: As required to support pipes and conduit.
C. Steel frame: Steel, strut galvanized per ASTM A653 or strut galvanized per ASTM A653 for bridge series.
D. Attaching hardware: Zinc-plated threaded rod, nuts and attaching hardware per ASTM B633.
E. Any products claiming to be a similar, like, or equal must demonstrate (meet or exceed) the same physical and performance characteristics as specified below.
    a. Density: 0.52 oz/cu in ASTM D575
    b. Durometer Hardness: 67.2A ± 1 ASTM D5
    c. Tensile Strength: 231 psi minimum ASTM D575
    d. Compression Deformation: 5% at 70psi and 72ºF ASTM D395
    e. Brittleness at Low Temp: 50ºF ASTM D746
    f. Weathering: 70 hours at 120ºF ASTM D573
        i. Hardness retained: 100% (±5%)
        ii. Compressive strength: 100% (±5%)
        iii. Tensile strength: 100% (±5%)
        iv. Elongation retained: 100% (±5%)

2.03 TYPE OF ROOFTOP SUPPORTS

A. Continuous block channel supports – Dura-Blok DB_DS series in sizes to properly support pipe and conduit.

B. Install blocks with minimum 1" gaps to insure free flow of water.
C. Standard strut accessories can be used for attachment.

PART 3.00 – EXECUTION

3.01 INSTALLATION

A. Install in accordance with manufacturer's instructions and recommendations.
B. Install compatible sheet of roofing material under each support.

END OF SECTION 07 72 30